



Centre Wellington

Township of Centre Wellington

Annual Water Report

Centre Wellington Drinking Water System - 20000086

Prepared:

February 2017

Annual Water Report

For the period of January 1, 2016 – December 31, 2016

Centre Wellington Drinking Water System – 220000086

Annual Report Introduction:

As per the Safe Drinking Water Act, 2002 Ontario Regulation 170/03 Section 11, an Annual Report must be prepared and must cover the period from January 1 to December 31 in a year and must be prepared not later than February 28 of the following year.

The Annual Report must include:

- a brief description of the drinking water system;
- a list of water treatment chemicals used;
- a summary of the most recent water test results required under O. Regulation 170/03 or an approval, Municipal Drinking Water Licence or an order;
- a summary of adverse test results and other issues reported to the Ministry including corrective actions taken;
- a description of major expenses incurred to install, repair or replace required equipment;
- the locations where this report is available for inspection.

A copy of the report is available for viewing at:

- Infrastructure Services Office, 7444 County Road 21, Elora
- Municipal Civic Centre, 1 MacDonald Square, Elora
- Online at www.centrewellington.ca

Drinking Water System Description

The Centre Wellington Drinking Water System is a large municipal residential system and is supplied by nine groundwater well sources.

The distribution system covers the village of Elora and the Town of Fergus and is connected by a booster station. It serves a population of approximately 19,300 people and it is comprised of the following infrastructure:

- 108 km of buried watermain;
- 4 elevated storage towers; and
- Watermain valves, service valves, fire hydrants, and water meters.

Water Treatment Chemicals

The water is treated with gas chlorine at all active well sites and sodium hypochlorite at the booster station and two tower locations.

Drinking Water Test Results

From January 1 to December 31, 2016, all regulatory microbiological and chemical quality samples were collected throughout the drinking water system by certified operators and tests were performed by an accredited, licensed laboratory.

- 1) Adverse Test Results reported under the Safe Drinking Water Act, 18(1) or O. Regulation 170/03, Schedule 16-4
 - a) Adverse Water Quality Incidents (AWQI) refers to any unusual test result that does not meet a provincial water quality standard or situation where the disinfection of the drinking water may be compromised.

Table 1: Adverse Water Quality Incidents

Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
January 21, 2016	Sodium	63.6	mg/L	Re-sampled F1 to confirm result; notified Public Health Unit	January 22, 2016
January 21, 2016	Sodium	25.4	mg/L	Re-sampled F4 to confirm result; notified Public Health Unit	January 22, 2016
January 21, 2016	Sodium	35.7	mg/L	Re-sampled F6 to confirm result; notified Public Health Unit	January 22, 2016
January 21, 2016	Sodium	21.5	mg/L	Re-sampled F7 to confirm result; notified Public Health Unit	January 22, 2016

Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
March 15, 2016	Free Chlorine Residual	0.02	mg/L	Drained EPH4 reservoir and flushed to return free chlorine residual to an acceptable level	March 15, 2016
July 13, 2016	Free Chlorine Residual	0.00	mg/L	Flushed water at Aboyne Booster Pumping Station and adjacent fire hydrant to return free chlorine residual to an acceptable level	July 13, 2016
July 28, 2016	Total Coliform	1	MPN/100 mL	Resampled distribution sample site and analyzed; result was 0	July 28, 2016

- 2) Microbiological Testing completed under O. Regulation 170/03, Schedule 10
- The Owner of the drinking water system must ensure water samples are taken at least once every week from the raw water supply, before any treatment has been applied to the water. Samples are taken at all well sites and are tested for both Total Coliform and Escherichia coli (E.coli).
 - The owner of the drinking water system must ensure water samples are taken at least once every week from the treated water supply. Samples are taken at all well sites and are tested for Total Coliform, Heterotrophic Plate Count (HPC) and E.coli.
 - The owner of the drinking water system must ensure water samples are taken from the distribution system once every week and the number of samples is based on population served. Samples are tested for Total Coliform, Heterotrophic Plate Count (HPC) and E.coli.

Table 2: Microbiological Test Results

Type of Sample	Number of Samples	Range (minimum – maximum)	Unit of Measure
Raw – Total Coliform	403	0 – 19	MPN/100 mL
Raw – E.coli	403	0 – 0	MPN/100 mL
Treated – Total Coliform	404	0 – 0	MPN/100 mL
Treated – E.coli	404	0 – 0	MPN/100 mL
Treated – HPC	404	0 – 356	cfu/mL
Distribution – Total Coliform	696	0 – 1	MPN/100 mL
Distribution – E.coli	696	0 – 0	MPN/100 mL
Distribution – HPC	696	0 – 270	cfu/ mL

- 3) Operational Checks completed under O. Regulation 170/03, Schedule 7
- The owner of a drinking water system that provides chlorination for primary disinfection must ensure that sampling and testing for free chlorine residual is carried out by continuous monitoring equipment. The number of samples taken for continuous monitoring is considered to be 8,760.

- b) The owner of a drinking water system must ensure that a water sample is taken at least once per month, from a location that is before raw water enters the treatment system, and is tested for turbidity. If the system obtains water from a raw water supply that is groundwater, then a sample must be taken from each well that is supplying water to the system.

Table 3: Chlorine and Turbidity Results

Parameter	Number of Samples	Range (minimum – maximum)	Unit of measure
Chlorine	8760	0.24 – 3.07	ppm
Turbidity	404	0.05 – 1.83	NTU

- 4) Treated Water Quality Results under O. Regulation 170/03, Schedule 13-6 and 13-7
- a) The owner of a drinking water system that provides chlorination must ensure that at least one distribution sample is taken in each calendar quarter, and tested for trihalomethanes (THMs). The sample must be taken at a point in the system that is likely to have an elevated potential for the formation of THMs. The annual report value is based on a running annual average of quarterly THMs results.
- b) The owner of a drinking water system must ensure that at least one water sample is taken every three months and tested for nitrate and nitrite. Samples were taken at every well site that is supplying water to the system.
- c) The Maximum Allowable Concentrations (MAC) for the parameters are listed as per O. Regulation 169/03 Schedule 2.

Table 4: Trihalomethanes Running Annual Average (RAA)

Location	Date	THMs RAA	THMs MAC	Unit of Measure
Distribution	2016 Sampling	11.8	100	ug/L

Table 5: Nitrate and Nitrite Results (4th sampling round in 2016)

Location	Date	Nitrate (as Nitrogen)	Nitrate MAC	Nitrite (as Nitrogen)	Nitrite MAC	Unit of Measure
Fergus Well 1	October 24, 2016	0.559	10	<0.010	1.0	mg/L
Fergus Well 4	October 24, 2016	0.158	10	<0.010	1.0	mg/L
Fergus Well 5	October 24, 2016	0.357	10	<0.010	1.0	mg/L
Fergus Well 6	October 31, 2016	<0.020	10	<0.010	1.0	mg/L
Fergus Well 7	October 24, 2016	<0.020	10	<0.010	1.0	mg/L
Elora Well 1	October 24, 2016	<0.020	10	<0.010	1.0	mg/L
Elora Well 3	October 24, 2016	<0.020	10	<0.010	1.0	mg/L
Elora Well 4	October 31, 2016	<0.020	10	<0.010	1.0	mg/L

- 5) Treated Water Quality Results under O. Regulation 170/03, Schedule 13-2
- a) The owner of a drinking water system must ensure that at least one water sample is taken every 36 months and tested for Schedule 23, Inorganics. Samples were taken at every well site that is supplying water to the system.
- b) The Maximum Allowable Concentrations (MAC) for the parameters are listed as per O. Regulation 169/03 Schedule 2

Table 6: Fergus Well 1 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	55	1000	ug/L
Boron	Jan 21, 2015	<50	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 7: Fergus Well 4 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	31	1000	ug/L
Boron	Jan 21, 2015	69	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 8: Fergus Well 5 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	1.8	25	ug/L
Barium	Jan 21, 2015	35	1000	ug/L
Boron	Jan 21, 2015	72	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 9: Fergus Well 6 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	27	1000	ug/L
Boron	Jan 21, 2015	87	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 10: Fergus Well 7 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	2.3	25	ug/L
Barium	Jan 21, 2015	21	1000	ug/L
Boron	Jan 21, 2015	57	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 11: Elora Well 1 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	25	1000	ug/L
Boron	Jan 21, 2015	<50	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 12: Elora Well 3 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	30	1000	ug/L
Boron	Jan 21, 2015	<50	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

Table 13: Elora Well 4 Schedule 23 Inorganics

Parameter	Sample Date	Result	MAC	Unit of Measure
Antimony	Jan 21, 2015	<0.60	6	ug/L
Arsenic	Jan 21, 2015	<1.0	25	ug/L
Barium	Jan 21, 2015	20	1000	ug/L
Boron	Jan 21, 2015	<50	5000	ug/L
Cadmium	Jan 21, 2015	<0.10	5	ug/L
Chromium	Jan 21, 2015	<1.0	50	ug/L
Mercury	Jan 21, 2015	<0.10	1	ug/L
Selenium	Jan 21, 2015	<5.0	10	ug/L
Uranium	Jan 21, 2015	<5.0	20	ug/L

6) Treated Water Quality Results under O. Regulation 170/03, Schedule 13-8 and 13-9

- a) The owner of a drinking water system must ensure that at least one water sample is taken every 60 months and tested for Sodium. Samples were taken at every well site that is supplying water to the system.
- b) The owner of a drinking water system must ensure that at least one water sample is taken every 60 months and tested for Fluoride. Samples were taken at every well site that is supplying water to the system.
- c) The Maximum Allowable Concentrations (MAC) for the parameters are listed as per O. Regulation 169/03 Schedule 2.
- d) The aesthetic objective (AO) for sodium in drinking water is 200 mg/L. The local Medical Officer of Health must be notified when the sodium concentration exceeds 20 mg/L.

Table 14: Sodium and Fluoride Results

Location	Sample Date	Sodium	Sodium AO	Fluoride	Fluoride MAC	Unit of Measure
Fergus Well 1	Jan 19, 2016	63.6	200	0.40	1.5	mg/L
Fergus Well 4	Jan 19, 2016	25.4	200	0.90	1.5	mg/L
Fergus Well 5	Jan 19, 2016	9.59	200	0.12	1.5	mg/L
Fergus Well 6	Jan 19, 2016	35.7	200	0.34	1.5	mg/L
Fergus Well 7	Jan 19, 2016	21.5	200	0.37	1.5	mg/L

Location	Sample Date	Sodium	Sodium AO	Fluoride	Fluoride MAC	Unit of Measure
Elora Well 1	Jan 19, 2016	17.3	200	0.28	1.5	mg/L
Elora Well 3	Jan 19, 2016	10.3	200	<0.10	1.5	mg/L
Elora Well 4	Jan 19, 2016	14.3	200	0.25	1.5	mg/L

- 7) Treated Water Quality Results under O. Regulation 170/03, Schedule 13-4
- The owner of a drinking water system must ensure that at least one water sample is taken every 36 months and tested for Schedule 24 parameters. Samples were taken at every well site that is supplying water to the system.
 - The Maximum Allowable Concentrations (MAC) for the parameters are listed as per O. Regulation 169/03 Schedule 2.

Table 15: Fergus Well 1 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	Jan 21, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	Jan 21, 2015	<0.20	5	ug/L
Azinphos-methyl	Jan 21, 2015	<0.10	20	ug/L
Benzene	Jan 21, 2015	<0.50	5	ug/L
Benzo(a)pyrene	Jan 21, 2015	<0.010	0.01	ug/L
Bromoxynil	Jan 21, 2015	<0.20	5	ug/L
Carbaryl	Jan 21, 2015	<0.20	90	ug/L
Carbofuran	Jan 21, 2015	<0.20	90	ug/L
Carbon Tetrachloride	Jan 21, 2015	<0.50	5	ug/L
Chlorpyrifos	Jan 21, 2015	<0.10	90	ug/L
Diazinon	Jan 21, 2015	<0.10	20	ug/L
Dicamba	Jan 21, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	Jan 21, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	Jan 21, 2015	<0.50	5	ug/L
1,2-Dichloroethane	Jan 21, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	Jan 21, 2015	<0.50	14	ug/L
Dichloromethane	Jan 21, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	Jan 21, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan 21, 2015	<0.20	100	ug/L
Diclofop-methyl	Jan 21, 2015	<0.20	9	ug/L
Dimethoate	Jan 21, 2015	<0.10	20	ug/L
Diquat	Jan 21, 2015	<1.0	70	ug/L
Diuron	Jan 21, 2015	<1.0	150	ug/L
Glyphosate	Jan 21, 2015	<5.0	280	ug/L
Malathion	Jan 21, 2015	<0.10	190	ug/L
Metolachlor	Jan 21, 2015	<0.10	50	ug/L
Metribuzin	Jan 21, 2015	<0.10	80	ug/L
Monochlorobenzene	Jan 21, 2015	<0.50	80	ug/L
Paraquat	Jan 21, 2015	<1.0	10	ug/L
Pentachlorophenol	Jan 21, 2015	<0.50	60	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
Phorate	Jan 21, 2015	<0.10	2	ug/L
Picloram	Jan 21, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	Jan 21, 2015	<0.035	3	ug/L
Prometryne	Jan 21, 2015	<0.10	1	ug/L
Simazine	Jan 21, 2015	<0.10	10	ug/L
Terbufos	Jan 21, 2015	<0.20	1	ug/L
Tetrachloroethylene	Jan 21, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	Jan 21, 2015	<0.50	100	ug/L
Triallate	Jan 21, 2015	<0.10	230	ug/L
Trichloroethylene	Jan 21, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	Jan 21, 2015	<0.50	5	ug/L
Trifluralin	Jan 21, 2015	<0.10	45	ug/L
Vinyl Chloride	Jan 21, 2015	<0.20	2	ug/L

Table 16: Fergus Well 4 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	Jan 21, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	Jan 21, 2015	<0.20	5	ug/L
Azinphos-methyl	Jan 21, 2015	<0.10	20	ug/L
Benzene	Jan 21, 2015	<0.50	5	ug/L
Benzo(a)pyrene	Jan 21, 2015	<0.010	0.01	ug/L
Bromoxynil	Jan 21, 2015	<0.20	5	ug/L
Carbaryl	Jan 21, 2015	<0.20	90	ug/L
Carbofuran	Jan 21, 2015	<0.20	90	ug/L
Carbon Tetrachloride	Jan 21, 2015	<0.50	5	ug/L
Chlorpyrifos	Jan 21, 2015	<0.10	90	ug/L
Diazinon	Jan 21, 2015	<0.10	20	ug/L
Dicamba	Jan 21, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	Jan 21, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	Jan 21, 2015	<0.50	5	ug/L
1,2-Dichloroethane	Jan 21, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	Jan 21, 2015	<0.50	14	ug/L
Dichloromethane	Jan 21, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	Jan 21, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan 21, 2015	<0.20	100	ug/L
Diclofop-methyl	Jan 21, 2015	<0.20	9	ug/L
Dimethoate	Jan 21, 2015	<0.10	20	ug/L
Diquat	Jan 21, 2015	<1.0	70	ug/L
Diuron	Jan 21, 2015	<1.0	150	ug/L
Glyphosate	Jan 21, 2015	<5.0	280	ug/L
Malathion	Jan 21, 2015	<0.10	190	ug/L
Metolachlor	Jan 21, 2015	<0.10	50	ug/L
Metribuzin	Jan 21, 2015	<0.10	80	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
Monochlorobenzene	Jan 21, 2015	<0.50	80	ug/L
Paraquat	Jan 21, 2015	<1.0	10	ug/L
Pentachlorophenol	Jan 21, 2015	<0.50	60	ug/L
Phorate	Jan 21, 2015	<0.10	2	ug/L
Picloram	Jan 21, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	Jan 21, 2015	<0.035	3	ug/L
Prometryne	Jan 21, 2015	<0.10	1	ug/L
Simazine	Jan 21, 2015	<0.10	10	ug/L
Terbufos	Jan 21, 2015	<0.20	1	ug/L
Tetrachloroethylene	Jan 21, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	Jan 21, 2015	<0.50	100	ug/L
Triallate	Jan 21, 2015	<0.10	230	ug/L
Trichloroethylene	Jan 21, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	Jan 21, 2015	<0.50	5	ug/L
Trifluralin	Jan 21, 2015	<0.10	45	ug/L
Vinyl Chloride	Jan 21, 2015	<0.20	2	ug/L

Table 17: Fergus Well 5 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	April 22, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	April 22, 2015	<0.20	5	ug/L
Azinphos-methyl	April 22, 2015	<0.10	20	ug/L
Benzene	April 22, 2015	<0.50	5	ug/L
Benzo(a)pyrene	April 22, 2015	<0.010	0.01	ug/L
Bromoxynil	April 22, 2015	<0.20	5	ug/L
Carbaryl	April 22, 2015	<0.20	90	ug/L
Carbofuran	April 22, 2015	<0.20	90	ug/L
Carbon Tetrachloride	April 22, 2015	<0.50	5	ug/L
Chlorpyrifos	April 22, 2015	<0.10	90	ug/L
Diazinon	April 22, 2015	<0.10	20	ug/L
Dicamba	April 22, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	April 22, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	April 22, 2015	<0.50	5	ug/L
1,2-Dichloroethane	April 22, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	April 22, 2015	<0.50	14	ug/L
Dichloromethane	April 22, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	April 22, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 22, 2015	<0.20	100	ug/L
Diclofop-methyl	April 22, 2015	<0.20	9	ug/L
Dimethoate	April 22, 2015	<0.10	20	ug/L
Diquat	April 22, 2015	<1.0	70	ug/L
Diuron	April 22, 2015	<1.0	150	ug/L
Glyphosate	April 22, 2015	<5.0	280	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
Malathion	April 22, 2015	<0.10	190	ug/L
Metolachlor	April 22, 2015	<0.10	50	ug/L
Metribuzin	April 22, 2015	<0.10	80	ug/L
Monochlorobenzene	April 22, 2015	<0.50	80	ug/L
Paraquat	April 22, 2015	<1.0	10	ug/L
Pentachlorophenol	April 22, 2015	<0.50	60	ug/L
Phorate	April 22, 2015	<0.10	2	ug/L
Picloram	April 22, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	April 22, 2015	<0.035	3	ug/L
Prometryne	April 22, 2015	<0.10	1	ug/L
Simazine	April 22, 2015	<0.10	10	ug/L
Terbufos	April 22, 2015	<0.20	1	ug/L
Tetrachloroethylene	April 22, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	April 22, 2015	<0.50	100	ug/L
Triallate	April 22, 2015	<0.10	230	ug/L
Trichloroethylene	April 22, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	April 22, 2015	<0.50	5	ug/L
Trifluralin	April 22, 2015	<0.10	45	ug/L
Vinyl Chloride	April 22, 2015	<0.20	2	ug/L

Table 18: Fergus Well 6 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	April 22, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	April 22, 2015	<0.20	5	ug/L
Azinphos-methyl	April 22, 2015	<0.10	20	ug/L
Benzene	April 22, 2015	<0.50	5	ug/L
Benzo(a)pyrene	April 22, 2015	<0.010	0.01	ug/L
Bromoxynil	April 22, 2015	<0.20	5	ug/L
Carbaryl	April 22, 2015	<0.20	90	ug/L
Carbofuran	April 22, 2015	<0.20	90	ug/L
Carbon Tetrachloride	April 22, 2015	<0.50	5	ug/L
Chlorpyrifos	April 22, 2015	<0.10	90	ug/L
Diazinon	April 22, 2015	<0.10	20	ug/L
Dicamba	April 22, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	April 22, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	April 22, 2015	<0.50	5	ug/L
1,2-Dichloroethane	April 22, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	April 22, 2015	<0.50	14	ug/L
Dichloromethane	April 22, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	April 22, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 22, 2015	<0.20	100	ug/L
Diclofop-methyl	April 22, 2015	<0.20	9	ug/L
Dimethoate	April 22, 2015	<0.10	20	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
Diquat	April 22, 2015	<1.0	70	ug/L
Diuron	April 22, 2015	<1.0	150	ug/L
Glyphosate	April 22, 2015	<5.0	280	ug/L
Malathion	April 22, 2015	<0.10	190	ug/L
Metolachlor	April 22, 2015	<0.10	50	ug/L
Metribuzin	April 22, 2015	<0.10	80	ug/L
Monochlorobenzene	April 22, 2015	<0.50	80	ug/L
Paraquat	April 22, 2015	<1.0	10	ug/L
Pentachlorophenol	April 22, 2015	<0.50	60	ug/L
Phorate	April 22, 2015	<0.10	2	ug/L
Picloram	April 22, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	April 22, 2015	<0.035	3	ug/L
Prometryne	April 22, 2015	<0.10	1	ug/L
Simazine	April 22, 2015	<0.10	10	ug/L
Terbufos	April 22, 2015	<0.20	1	ug/L
Tetrachloroethylene	April 22, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	April 22, 2015	<0.50	100	ug/L
Triallate	April 22, 2015	<0.10	230	ug/L
Trichloroethylene	April 22, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	April 22, 2015	<0.50	5	ug/L
Trifluralin	April 22, 2015	<0.10	45	ug/L
Vinyl Chloride	April 22, 2015	<0.20	2	ug/L

Table 19: Fergus Well 7 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	April 22, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	April 22, 2015	<0.20	5	ug/L
Azinphos-methyl	April 22, 2015	<0.10	20	ug/L
Benzene	April 22, 2015	<0.50	5	ug/L
Benzo(a)pyrene	April 22, 2015	<0.010	0.01	ug/L
Bromoxynil	April 22, 2015	<0.20	5	ug/L
Carbaryl	April 22, 2015	<0.20	90	ug/L
Carbofuran	April 22, 2015	<0.20	90	ug/L
Carbon Tetrachloride	April 22, 2015	<0.50	5	ug/L
Chlorpyrifos	April 22, 2015	<0.10	90	ug/L
Diazinon	April 22, 2015	<0.10	20	ug/L
Dicamba	April 22, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	April 22, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	April 22, 2015	<0.50	5	ug/L
1,2-Dichloroethane	April 22, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	April 22, 2015	<0.50	14	ug/L
Dichloromethane	April 22, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	April 22, 2015	<0.30	900	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 22, 2015	<0.20	100	ug/L
Diclofop-methyl	April 22, 2015	<0.20	9	ug/L
Dimethoate	April 22, 2015	<0.10	20	ug/L
Diquat	April 22, 2015	<1.0	70	ug/L
Diuron	April 22, 2015	<1.0	150	ug/L
Glyphosate	April 22, 2015	<5.0	280	ug/L
Malathion	April 22, 2015	<0.10	190	ug/L
Metolachlor	April 22, 2015	<0.10	50	ug/L
Metribuzin	April 22, 2015	<0.10	80	ug/L
Monochlorobenzene	April 22, 2015	<0.50	80	ug/L
Paraquat	April 22, 2015	<1.0	10	ug/L
Pentachlorophenol	April 22, 2015	<0.50	60	ug/L
Phorate	April 22, 2015	<0.10	2	ug/L
Picloram	April 22, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	April 22, 2015	<0.035	3	ug/L
Prometryne	April 22, 2015	<0.10	1	ug/L
Simazine	April 22, 2015	<0.10	10	ug/L
Terbufos	April 22, 2015	<0.20	1	ug/L
Tetrachloroethylene	April 22, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	April 22, 2015	<0.50	100	ug/L
Triallate	April 22, 2015	<0.10	230	ug/L
Trichloroethylene	April 22, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	April 22, 2015	<0.50	5	ug/L
Trifluralin	April 22, 2015	<0.10	45	ug/L
Vinyl Chloride	April 22, 2015	<0.20	2	ug/L

Table 20: Elora Well 1 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	Jan 21, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	Jan 21, 2015	<0.20	5	ug/L
Azinphos-methyl	Jan 21, 2015	<0.10	20	ug/L
Benzene	Jan 21, 2015	<0.50	5	ug/L
Benzo(a)pyrene	Jan 21, 2015	<0.010	0.01	ug/L
Bromoxynil	Jan 21, 2015	<0.20	5	ug/L
Carbaryl	Jan 21, 2015	<0.20	90	ug/L
Carbofuran	Jan 21, 2015	<0.20	90	ug/L
Carbon Tetrachloride	Jan 21, 2015	<0.50	5	ug/L
Chlorpyrifos	Jan 21, 2015	<0.10	90	ug/L
Diazinon	Jan 21, 2015	<0.10	20	ug/L
Dicamba	Jan 21, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	Jan 21, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	Jan 21, 2015	<0.50	5	ug/L
1,2-Dichloroethane	Jan 21, 2015	<0.50	5	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
1,1-Dichloroethylene (vinylidene chloride)	Jan 21, 2015	<0.50	14	ug/L
Dichloromethane	Jan 21, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	Jan 21, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan 21, 2015	<0.20	100	ug/L
Diclofop-methyl	Jan 21, 2015	<0.20	9	ug/L
Dimethoate	Jan 21, 2015	<0.10	20	ug/L
Diquat	Jan 21, 2015	<1.0	70	ug/L
Diuron	Jan 21, 2015	<1.0	150	ug/L
Glyphosate	Jan 21, 2015	<5.0	280	ug/L
Malathion	Jan 21, 2015	<0.10	190	ug/L
Metolachlor	Jan 21, 2015	<0.10	50	ug/L
Metribuzin	Jan 21, 2015	<0.10	80	ug/L
Monochlorobenzene	Jan 21, 2015	<0.50	80	ug/L
Paraquat	Jan 21, 2015	<1.0	10	ug/L
Pentachlorophenol	Jan 21, 2015	<0.50	60	ug/L
Phorate	Jan 21, 2015	<0.10	2	ug/L
Picloram	Jan 21, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	Jan 21, 2015	<0.035	3	ug/L
Prometryne	Jan 21, 2015	<0.10	1	ug/L
Simazine	Jan 21, 2015	<0.10	10	ug/L
Terbufos	Jan 21, 2015	<0.20	1	ug/L
Tetrachloroethylene	Jan 21, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	Jan 21, 2015	<0.50	100	ug/L
Triallate	Jan 21, 2015	<0.10	230	ug/L
Trichloroethylene	Jan 21, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	Jan 21, 2015	<0.50	5	ug/L
Trifluralin	Jan 21, 2015	<0.10	45	ug/L
Vinyl Chloride	Jan 21, 2015	<0.20	2	ug/L

Table 21: Elora Well 3 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	April 22, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	April 22, 2015	<0.20	5	ug/L
Azinphos-methyl	April 22, 2015	<0.10	20	ug/L
Benzene	April 22, 2015	<0.50	5	ug/L
Benzo(a)pyrene	April 22, 2015	<0.010	0.01	ug/L
Bromoxynil	April 22, 2015	<0.20	5	ug/L
Carbaryl	April 22, 2015	<0.20	90	ug/L
Carbofuran	April 22, 2015	<0.20	90	ug/L
Carbon Tetrachloride	April 22, 2015	<0.50	5	ug/L
Chlorpyrifos	April 22, 2015	<0.10	90	ug/L
Diazinon	April 22, 2015	<0.10	20	ug/L
Dicamba	April 22, 2015	<0.20	120	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
1,2-Dichlorobenzene	April 22, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	April 22, 2015	<0.50	5	ug/L
1,2-Dichloroethane	April 22, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	April 22, 2015	<0.50	14	ug/L
Dichloromethane	April 22, 2015	<5.0	50	ug/L
2-4 Dichlorophenol	April 22, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 22, 2015	<0.20	100	ug/L
Diclofop-methyl	April 22, 2015	<0.20	9	ug/L
Dimethoate	April 22, 2015	<0.10	20	ug/L
Diquat	April 22, 2015	<1.0	70	ug/L
Diuron	April 22, 2015	<1.0	150	ug/L
Glyphosate	April 22, 2015	<5.0	280	ug/L
Malathion	April 22, 2015	<0.10	190	ug/L
Metolachlor	April 22, 2015	<0.10	50	ug/L
Metribuzin	April 22, 2015	<0.10	80	ug/L
Monochlorobenzene	April 22, 2015	<0.50	80	ug/L
Paraquat	April 22, 2015	<1.0	10	ug/L
Pentachlorophenol	April 22, 2015	<0.50	60	ug/L
Phorate	April 22, 2015	<0.10	2	ug/L
Picloram	April 22, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	April 22, 2015	<0.035	3	ug/L
Prometryne	April 22, 2015	<0.10	1	ug/L
Simazine	April 22, 2015	<0.10	10	ug/L
Terbufos	April 22, 2015	<0.20	1	ug/L
Tetrachloroethylene	April 22, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	April 22, 2015	<0.50	100	ug/L
Triallate	April 22, 2015	<0.10	230	ug/L
Trichloroethylene	April 22, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	April 22, 2015	<0.50	5	ug/L
Trifluralin	April 22, 2015	<0.10	45	ug/L
Vinyl Chloride	April 22, 2015	<0.20	2	ug/L

Table 22: Elora Well 4 Schedule 24 Organic Results

Parameter	Sample Date	Result	MAC	Unit of Measure
Alachlor	April 22, 2015	<0.10	5	ug/L
Atrazine + N-dealkylated metabolites	April 22, 2015	<0.20	5	ug/L
Azinphos-methyl	April 22, 2015	<0.10	20	ug/L
Benzene	April 22, 2015	<0.50	5	ug/L
Benzo(a)pyrene	April 22, 2015	<0.010	0.01	ug/L
Bromoxynil	April 22, 2015	<0.20	5	ug/L
Carbaryl	April 22, 2015	<0.20	90	ug/L
Carbofuran	April 22, 2015	<0.20	90	ug/L
Carbon Tetrachloride	April 22, 2015	<0.50	5	ug/L

Parameter	Sample Date	Result	MAC	Unit of Measure
Chlorpyrifos	April 22, 2015	<0.10	90	ug/L
Diazinon	April 22, 2015	<0.10	20	ug/L
Dicamba	April 22, 2015	<0.20	120	ug/L
1,2-Dichlorobenzene	April 22, 2015	<0.50	200	ug/L
1,4-Dichlorobenzene	April 22, 2015	<0.50	5	ug/L
1,2-Dichloroethane	April 22, 2015	<0.50	5	ug/L
1,1-Dichloroethylene (vinylidene chloride)	April 22, 2015	<0.50	14	ug/L
Dichloromethane	April 22, 2015	<5.0	50	ug/L
2,4-Dichlorophenol	April 22, 2015	<0.30	900	ug/L
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 22, 2015	<0.20	100	ug/L
Diclofop-methyl	April 22, 2015	<0.20	9	ug/L
Dimethoate	April 22, 2015	<0.10	20	ug/L
Diquat	April 22, 2015	<1.0	70	ug/L
Diuron	April 22, 2015	<1.0	150	ug/L
Glyphosate	April 22, 2015	<5.0	280	ug/L
Malathion	April 22, 2015	<0.10	190	ug/L
Metolachlor	April 22, 2015	<0.10	50	ug/L
Metribuzin	April 22, 2015	<0.10	80	ug/L
Monochlorobenzene	April 22, 2015	<0.50	80	ug/L
Paraquat	April 22, 2015	<1.0	10	ug/L
Pentachlorophenol	April 22, 2015	<0.50	60	ug/L
Phorate	April 22, 2015	<0.10	2	ug/L
Picloram	April 22, 2015	<0.20	190	ug/L
Polychlorinated Biphenyls(PCB)	April 22, 2015	<0.035	3	ug/L
Prometryne	April 22, 2015	<0.10	1	ug/L
Simazine	April 22, 2015	<0.10	10	ug/L
Terbufos	April 22, 2015	<0.20	1	ug/L
Tetrachloroethylene	April 22, 2015	<0.50	30	ug/L
2,3,4,6-Tetrachlorophenol	April 22, 2015	<0.50	100	ug/L
Triallate	April 22, 2015	<0.10	230	ug/L
Trichloroethylene	April 22, 2015	<0.50	5	ug/L
2,4,6-Trichlorophenol	April 22, 2015	<0.50	5	ug/L
Trifluralin	April 22, 2015	<0.10	45	ug/L
Vinyl Chloride	April 22, 2015	<0.20	2	ug/L

- 8) Lead Results under O. Regulation 170/03, Schedule 15.1-5
- The owner of a drinking water system must ensure that the distribution system is sampled and tested for lead concentrations as per the Reduced Sampling table. The samples must be taken during the period of December 15 – April 15 (winter sampling) and during the period of June 15 – October 15 (summer sampling) every 3 years.
 - The Maximum Allowable Concentrations (MAC) for the parameters are listed as per O. Regulation 169/03 Schedule 2.
 - The owner of a drinking water system must ensure that the distribution system is sampled and tested for pH and total alkalinity during each of the periods in 8 (a) in every 12-month period.

- d) The Operational Guideline for pH is 6.5-8.5 and the Operational Guideline for Alkalinity (as CaCO₃) is 30-500 mg/L.

Table 23: Lead Testing Results

Location	Sample Date	Lead	Lead MAC	Unit of Measure
Distribution Location 1	February 18, 2016	<1.0	10	ug/L
Distribution Location 2	February 18, 2016	<1.0	10	ug/L
Distribution Location 3	February 18, 2016	<1.0	10	ug/L
Distribution Location 4	February 18, 2016	<1.0	10	ug/L
Distribution Location 1	July 14, 2016	<1.0	10	ug/L
Distribution Location 2	July 14, 2016	<1.0	10	ug/L
Distribution Location 3	July 14, 2016	<1.0	10	ug/L
Distribution Location 4	July 14, 2016	<1.0	10	ug/L

Table 24: pH and Alkalinity Sampling Required Only

Location	Sample Date	pH	Alkalinity (as CaCO ₃)	Alkalinity Unit of Measure
Distribution Location 1	February 18, 2016	7.44	218	mg/L
Distribution Location 2	February 18, 2016	6.91	188	mg/L
Distribution Location 3	February 18, 2016	7.21	209	mg/L
Distribution Location 4	February 18, 2016	7.36	228	mg/L
Distribution Location 1	July 14, 2016	7.68	228	mg/L
Distribution Location 2	July 14, 2016	7.40	193	mg/L
Distribution Location 3	July 14, 2016	7.37	223	mg/L
Distribution Location 4	July 14, 2016	7.36	223	mg/L

- 9) Summary of Additional Testing and Sampling under the Township's Municipal Drinking Water Licence (MDWL), 4.1, Table 5
- The Township is required to complete quarterly sampling for Trichloroethylene (TCE) at Fergus Well 1 raw water.
 - The Maximum Allowable Concentrations (MAC) for TCE is listed as per O. Regulation 169/03 Schedule 2.

Table 25: Trichloroethylene Sampling Results (Raw Water)

Location	Sample Date	TCE	TCE MAC	Unit of Measure
Fergus Well 1	January 19, 2016	0.76	5	ug/L
Fergus Well 1	April 14, 2016	9.88	5	ug/L
Fergus Well 1	July 14, 2016	11.0	5	ug/L
Fergus Well 1	October 24, 2016	11.5	5	ug/L

10) Review of the Data

- a) The Annual Report must list any inorganic or organic parameter that exceeded half the standard ($\frac{1}{2}$ MAC) prescribed in Schedule 2 of the Ontario Drinking Water Standards.
- b) The Maximum Allowable Concentration (MAC) was established for parameters which when present above a certain concentration, have known or suspected adverse health effects.
- c) The results of the organic parameter analysis are below the $\frac{1}{2}$ MAC for each parameter and the majority were under the laboratory's MDL (minimum detection limit).
- d) The results of the inorganic parameter analysis are below the $\frac{1}{2}$ MAC for each parameter with the following exception:

Table 26: Inorganic and Organic Parameters Exceeding $\frac{1}{2}$ MAC

Parameter	Location	Result	MAC	$\frac{1}{2}$ MAC	Units
Fluoride	Well F4	0.90	1.5	0.75	mg/L

- 11) The Annual Report must describe any major expenses incurred during the year to install, repair or replace required equipment.

Table 27: Equipment Major Expenses

Location	Description	Cost
Daniel Cr Tower	Interior and Exterior Recoating	\$350,000
Fergus Well 5	Pump Replacement / New Riser / New Headworks / Geophysics	\$51,000
Elora Well 1	Highlift Drives	\$15,000