



# **GUELPH WATERWORKS DIVISION**

**Provincial Regulation 170/03  
Annual Report  
For the Period  
January 1 to December 31, 2003**

***Submitted to:***

***District Manager  
Guelph District Office  
West Central Region  
Ontario Ministry of the Environment***

***Prepared by: The City of Guelph***





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# **SECTION 1 EXECUTIVE SUMMARY**



## **Section 1 Executive Summary**

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**This report is submitted to satisfy Section 11 of Ontario Regulation 170/03 (O.Reg. 170/03, S. 11) requirement to prepare and distribute an Annual report. According to this regulation, the Annual report must contain the following information:**

- **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 Regulation 170/03 or an approval;**
- **A summary of Reports of Adverse Test Results and other problems followed by a summary of corrective actions taken; and**
- **A description of major expenses incurred to install, repair, or replace equipment.**

**Please see Section 2 of this report for a brief description of the drinking-water system.**

**In 2003, all water was treated consistent with MOE standards using approved treatment chemicals – specifically sodium hypochlorite and sodium silicate.**

**In 2003, over 25,000 microbiological and chemical quality tests were performed on water provided by Guelph Waterworks. All samples were collected by certified Waterworks operators following industry standard protocols. Analyses were performed by these same operators and by accredited independent laboratories on water samples collected throughout the water system.**

**In 2003, all water supplied to consumers met or surpassed all health-related Ontario Drinking Water Standards.**

**Of the 2,126 bacteriological analyses performed, only nine samples or 0.4 percent indicated the presence of adverse indicator bacteria or high general bacteria counts. Indicator bacteria are not disease causing but show potential for a bacterial problem. None of these incidents, when resampled, showed any persistent water quality deterioration. At no time was E. coli detected in Guelph drinking water.**

**In 2003, Waterworks operated and maintained the water supply, treatment, and distribution system in such a manner that water supplied to all consumers serviced by the system met the requirements of the Safe Drinking Water Act, 2002. All management, operation, and maintenance duties were performed by certified, adequately trained supervisors and operators.**

**In 2003, major maintenance of the water supply and distribution system was accomplished with \$4.3 million dollars in funding from the operating budget and \$4.5 million dollars in capital funding.**





**SECTION 2**  
**INTRODUCTION**



## **Section 2 Introduction**

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The mission of the City of Guelph Waterworks Division is to provide customers and the community with valued service through responsible water resource management. Waterworks provides and promotes reliable, cost effective systems for the safe delivery of consistently high quality water.

Guelph Waterworks is a municipally owned and operated water utility first established in 1879. The source of Guelph's drinking water is a series of 23 groundwater wells and a shallow groundwater collector system. Guelph's water supply and distribution system is comprised of the following infrastructure:

- 6 kilometres of 1,067 mm diameter water supply aqueduct;
- 5 underground storage reservoirs with a combined capacity of 48,000 cubic metres;
- 3 water towers with a combined capacity of 11,300 cubic metres;
- 500 kilometres of buried water main ranging in size from 100 mm to 900 mm;
- 3,100 watermain valves;
- 2,100 fire hydrants; and
- 30,000 water services and water meters.

The replacement cost of the entire system is estimated to be \$327 million or \$3,000 per capita. The 2003 Operating Budget contained expenditures totalling \$9.3 million. All Waterworks operations and capital improvement projects are funded directly from the sale of water.

In 2003, a total of 19 million cubic metres of water was pumped and treated. Lost water totalled 13 percent of all water pumped. The average daily water demand was 51,975 cubic metres. The highest daily use of water occurred on June 25 when 65,647 cubic metres of water was pumped.

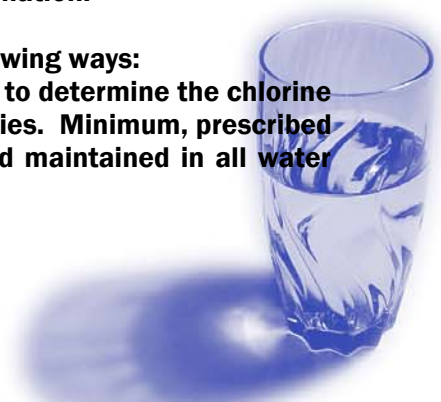
In 2003, over 25,000 microbiological and chemical quality tests were performed by certified operators and accredited, licensed laboratories on water samples collected throughout the water system. In all cases, the drinking water supplied to all customers was safe and better than all Ontario and Canadian health-related guidelines.

### **Regulatory Changes**

In response to an outbreak of *Escherichia (E.coli):O157* in Walkerton, the Ontario Provincial Ministry of the Environment (MOE) announced Operation Clean Water and enacted the Safe Drinking Water Act (the Act) in 2002. The Act prescribes strict, mandatory requirements for testing and treatment of all municipal drinking water, and actions necessary when standards are not met. The regulation also identifies accountability for drinking water safety and supports the consumer's right to timely and accurate reporting of water quality information.

The Act has impacted Guelph Waterworks and its customers in the following ways:

- Previously, Waterworks relied on regular bacteriological testing to determine the chlorine levels required for disinfection of our various groundwater supplies. Minimum, prescribed levels of chlorine must now be added to all water supplies and maintained in all water



**distributed to customers. Customers have noticed and commented on the increased chlorine taste and odour in Guelph's water;**

- **The additional chlorine in Guelph's water is reacting with natural iron and manganese in the groundwater to create more frequent episodes of discoloured water for customers. Waterworks has increased watermain cleaning activities to limit these incidents;**
- **Additional sampling and testing, the generation of this Annual Report, and an annual Compliance report is required by the legislation;**
- **All water systems must follow minimum disinfection standards. This involves upgrades to system infrastructure including chemical systems, control and monitoring systems, and storage reservoirs;**
- **System upgrades have resulted in decreased system capacity in the short term as existing supplies undergo treatment upgrades to comply with new legislation; and**
- **Schedule 22 of Regulation 170/03 requires Waterworks to produce and distribute an annual Summary Report. The Summary Report for 2003 will be completed and submitted to Guelph City Council by March 31, 2004. Copies will be available at that time for customers at both Woods Station at 29 Waterworks Place, and at the Environment & Transportation Group, 3<sup>rd</sup> floor of 2 Wyndham Street. An electronic copy of the report will also be available on the City's web site at [www.city.guelph.on.ca/waterworks](http://www.city.guelph.on.ca/waterworks).**

**Water rates have been increased significantly to pay for these activities and upgrades with the goal of providing a more secure water supply.**

**On November 25, 2003 the MOE issued Guelph's latest Consolidated Certificate of Approval (CC of A). The CC of A acts as a license for water supply and distribution operations and sets out a schedule of mandatory facility upgrades to comply with the Act. Currently 8 of our 23 water supply facilities require major disinfection and treatment upgrades.**

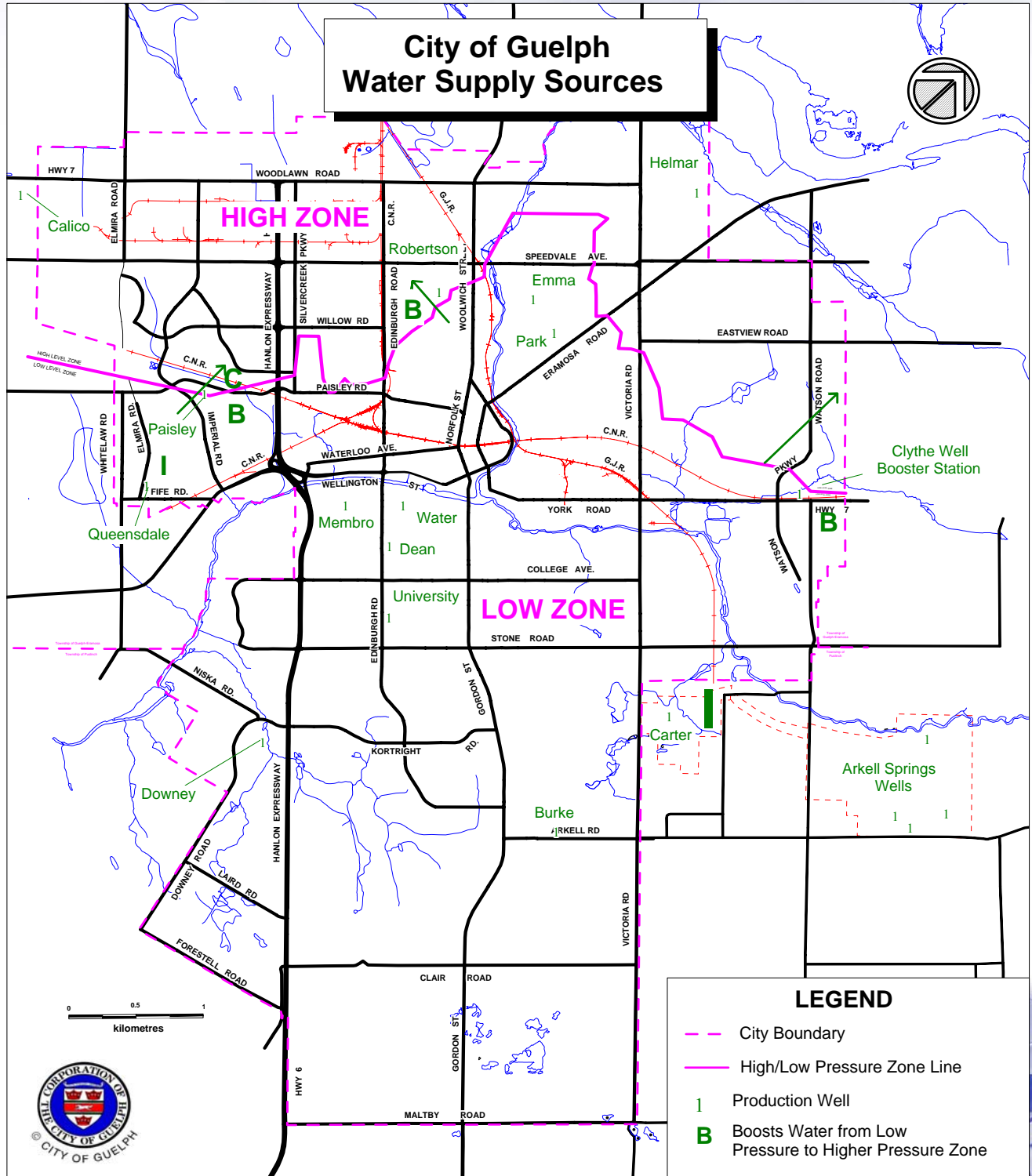
**The Guelph water system is currently licensed as a MOE Class II Water Treatment system and MOE Class III Water Distribution system. Currently 21 water supply and distribution operators and 3 supervisors are licensed to operate and maintain the water system.**

**Figure A shows the locations of water supply facilities that were active in 2003.**





**Figure A 2003 Active Water Supply Facilities**





**SECTION 3**  
**WATER TREATMENT SUMMARY**



## Section 3 Water Treatment Summary

This section describes the type and amount of drinking water treatment chemicals used in 2003.

In 2003, chlorine in the form of sodium hypochlorite was added to disinfect all water supplied to consumers. Liquid sodium silicate was also added to all water supplied from the Helmar and Queensdale wells to control high levels of naturally occurring iron. Through the act of sequestration, sodium silicate prevents this iron from precipitating when the water is treated and thereby prevents discoloured water.

In 2003, there were no periods of abnormal use of sodium hypochlorite or sodium silicate.

Tables A and B below summarize sodium hypochlorite and sodium silicate use at each supply facility in 2003.

**Table A 2003 Sodium Hypochlorite Usage and Chlorine Dosage**

<b>FACILITY</b>	<b>SODIUM HYPOCHLORITE kg/Day</b>	<b>WATER PRODUCED Cubic Metres/Day</b>	<b>CHLORINE DOSE mg/L</b>	<b>PURPOSE</b>
Woods	248.3	25,261	1.2	Well water disinfection
Helmar	36.2	939	4.6	Well water disinfection
Park	43.3	4,822	1.1	Well water disinfection
Burke	61.9	5,475	1.4	Well water disinfection
Downey	42.0	4,323	1.2	Well water disinfection
Membro	55.3	3,230	2.0	Well water disinfection
Queensdale	35.0	1,287	3.3	Well water disinfection
Water	20.0	1,702	1.4	Well water disinfection
Dean	6.8	649	1.3	Well water disinfection
University	23.9	1,691	1.7	Well water disinfection
Calico	14.7	972	1.8	Well water disinfection
Emma	38.6	2,377	2.0	Well water disinfection
Clythe	1.4	1,363	0.1	Rechlorination
Paisley	42.0	6,305	0.8	Rechlorination & well water disinfection

mg/L - milligrams per litre. Equivalent to parts per million.



**Table B 2003 Sodium Silicate Usage and Dosage**

<b>FACILITY</b>	<b>SODIUM SILICATE kg/Day</b>	<b>WATER PRODUCED Cubic Metres/Day</b>	<b>SILICATE DOSE mg/L</b>	<b>PURPOSE</b>
<b>Helmar</b>	<b>6.3</b>	<b>946</b>	<b>1.9</b>	<b>Iron control</b>
<b>Queensdale</b>	<b>7.1</b>	<b>1,231</b>	<b>1.6</b>	<b>Iron control</b>

mg/L - milligrams per litre. Equivalent to parts per million.





## **SECTION 4 SUMMARY OF WATER TEST RESULTS**



## **Section 4 Summary of Water Test Results**

**This section summarizes water quality test results required by the Ontario Drinking-Water System Regulation 170/03 for the period January to December, 2003.**

**In 2003, all water supplied to consumers met or surpassed all health-related Ontario Drinking Water Standards. Of the 2,126 bacteriological analyses performed, only nine samples or 0.4 percent showed the presence of adverse indicator bacteria or high general bacteria counts. Indicator bacteria are not disease causing but show potential for a bacterial problem. None of these incidents, when resampled, showed any persistent water quality deterioration. At no time was E. coli detected in Guelph drinking water.**

**The more than 25,000 analytical results for inorganic, organic and radiological parameters also surpassed all health-related Ontario Drinking Water Standards.**

**Hardness and total dissolved solids were the only aesthetic parameters that consistently exceeded the levels prescribed by the MOE. These parameters measure the mineral content of groundwater. Groundwater by its nature has a high natural mineral content. This contributes to the pleasant taste of Guelph drinking water and has no adverse effect on public health.**

**Iron levels in a number of samples were also higher than the aesthetic objective prescribed by the MOE. The Queensdale well may require treatment to remove iron. This issue is being considered in the Waterworks capital improvement strategy.**

**The following Tables C through H provide a summary of 2003 laboratory and process parameter results.**



**Table C 2003 Water Supply Bacteriological Results Summary**

<b>Parameter</b>	<b>O.D.W.S.</b>	<b>Total Samples</b>	<b>Adverse Samples</b>	<b>Percent Adverse</b>	<b>Range</b>	<b>Average</b>	<b>Typical Source of Contaminant</b>
<b>Total Coliform count/100 mL</b>	*	734	0	0	N/A	N/A	<b>Indicates possible presence of fecal matter</b>
<b>E. Coli count/100 mL</b>	*	734	0	0	N/A	N/A	<b>Definite indicator of fecal matter</b>
<b>Heterotrophic Plate Count count/100 mL</b>	500	710	5**	0.7	2-1700	16	<b>Indicator of water quality deterioration</b>
<b>Raw Water Bacti Tests</b>	N/A	914	0	0	N/A	N/A	<b>Indicator of Environmental Water Quality</b>
<b>O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards</b> <b>N/A – Not Applicable</b> <b>mL - Millilitre</b> <b>* Indicator of Adverse Water Quality if Detected in Treated Water</b> <b>** Resample Results Were Good and below O.D.W.S guidelines.</b>							



**Table D 2003 Water Distribution Bacteriological Results Summary**

<b>Parameter</b>	<b>O.D.W.S.</b>	<b>Total Samples</b>	<b>Adverse Samples</b>	<b>Percent Adverse</b>	<b>Range</b>	<b>Average</b>	<b>Typical Source of Contaminant</b>
<b>Total Coliform count/100 mL</b>	*	1,392	0	0	N/A	N/A	<b>Indicates possible presence of fecal matter</b>
<b>E. Coli count/100 mL</b>	*	1,392	0	0	N/A	N/A	<b>Definite indicator of fecal matter</b>
<b>Heterotrophic Plate Count count/mL</b>	500	755	4**	0.5	2-2200	17	<b>Indicator of water quality deterioration</b>

**O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards**

**N/A – Not Applicable**

**mL - Millilitre**

**\* Indicator of Adverse Water Quality if Detected in Treated Water**

**\*\* Resample Results Were Good and below O.D.W.S. guidelines.**





**Table E 2003 Water Supply & Distribution Process Parameter Results Summary**

<b>Parameter</b>	<b>O.D.W.S.</b>	<b>Total Samples</b>	<b>Adverse Samples</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>	<b>Typical Source of Contaminant</b>
<b>Turbidity in Supply (NTU)</b>	<b>1</b>	<b>4,179</b>	<b>0</b>	<b>0.2</b>	<b>0.07-0.9</b>	<b>NO</b>	<b>Indicator of particles in water</b>
<b>Free Chlorine in Supply (mg/L)</b>	<b>4</b>	<b>4,808</b>	<b>0</b>	<b>0.66</b>	<b>0.21-1.5</b>	<b>NO</b>	<b>MOE recommends 0.2 mg/L to maintain microbiological quality</b>
<b>Free Chlorine in Distribution (mg/L)</b>	<b>4</b>	<b>1,908</b>	<b>0</b>	<b>0.37</b>	<b>0.17-0.88</b>	<b>NO</b>	<b>MOE recommends 0.2 mg/L to maintain microbiological quality</b>

**O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards**

**NTU – Nephelometric Turbidity Units**

**mg/L – milligrams per litre. Equivalent to parts per million**



**Table F 2003 Reg. 170/03 Schedule 23 Results Summary**

<b>Parameter</b>	<b>ODWS mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>	<b>Typical Source of Contaminant</b>
Antimony	0.006	52	8	0.0007	0.0006 – 0.0008	NO	Natural Component of Water
Arsenic	0.025	52	0	0.002	0.002	NO	Natural Component of Water
Barium	1	52	52	0.057	0.027- 0.079	NO	Natural Component of Water
Boron	5	52	52	0.028	0.009- 0.097	NO	Natural Component of Water
Cadmium	0.005	52	3	0.0001	0.0001- 0.0002	NO	Natural Component of water
Chromium	0.05	52	0	0.005	0.005	NO	Natural Component of water
Mercury	0.001	52	0	0.00005	0.00005	NO	Rare in Groundwater
Selenium	0.01	52	0	0.002	0.002	NO	Natural Component of Water
Uranium	0.1	52	49	0.0012	0.0001- 0.0021	NO	Natural Component of Water

**O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million**



**Table G 2003 Reg. 170/03 Schedule 24 Results Summary**

Parameters	O.D.W.S. mg/L	Total Samples	Samples Above Detection	Average	Range	Health Exceedance
Alachlor	0.005	44	0	ND	N/A	NO
Aldicarb	0.009	44	0	ND	N/A	NO
Aldrin + Dieldrin	0.0007	44	0	ND	N/A	NO
Atrazine + N-dealkylated metabolites	0.005	44	0	ND	N/A	NO
Azinphos -methyl	0.02	44	0	ND	N/A	NO
Bendiocarb	0.04	44	0	ND	N/A	NO
Benzene	0.005	88	0	ND	N/A	NO
Benzo(a)pyrene	0.00001	21	0	ND	N/A	NO
Bromoxynil	0.005	44	0	ND	N/A	NO
Carbaryl	0.09	44	0	ND	N/A	NO
Carbofuran	0.09	44	0	ND	N/A	NO
Carbon Tetrachloride	0.005	88	0	ND	N/A	NO
Chlordane (Total)	0.007	44	0	ND	N/A	NO
Chlorpyrifos	0.09	44	0	ND	N/A	NO
Cyanazine	0.01	44	0	ND	N/A	NO
Diazinon	0.02	44	0	ND	N/A	NO
Dicamba	0.12	44	0	ND	N/A	NO
1,2-Dichlorobenzene	0.2	88	0	ND	N/A	NO
1,4-Dichlorobenzene	0.005	88	0	ND	N/A	NO
DDT + metabolites	0.03	44	0	ND	N/A	NO
1,2-Dichloroethane	0.005	88	0	ND	N/A	NO
1,1-Dichloroethylene (Vinylidene Chloride)	0.014	88	0	ND	N/A	NO
Dichloromethane	0.05	88	0	ND	N/A	NO
2,4-Dichlorophenol	0.9	44	0	ND	N/A	NO
2,4-D	0.1	44	0	ND	N/A	NO

O.D.W.S. - Regulation 160/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.



**Table G 2003 Reg. 170/03 Schedule 24 Results Summary Continued**

<b>Parameters</b>	<b>O.D.W.S. mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>
Diclofop-methyl	0.009	44	0	ND	N/A	NO
Dimethoate	0.02	44	0	ND	N/A	NO
Dinoseb	0.01	44	0	ND	N/A	NO
Diquat	0.07	44	0	ND	N/A	NO
Diuron	0.15	44	0	ND	N/A	NO
Glyphosate	0.28	44	0	ND	N/A	NO
Heptachlor + Heptachlor Epoxide	0.003	44	0	ND	N/A	NO
Lindane (Total)	0.004	44	0	ND	N/A	NO
Malathion	0.19	44	0	ND	N/A	NO
Methoxychlor	0.9	44	0	ND	N/A	NO
Metolachlor	0.05	44	0	ND	N/A	NO
Metribuzin	0.08	44	0	ND	N/A	NO
Monochlorobenzene	0.08	88	0	ND	N/A	NO
Paraquat	0.01	44	0	ND	N/A	NO
Parathion	0.05	44	0	ND	N/A	NO
Pentachlorophenol	0.06	44	0	ND	N/A	NO
Phorate	0.002	44	0	ND	N/A	NO
Picloram	0.19	44	0	ND	N/A	NO
Polychlorinated Biphenyls (PCB)	0.003	44	0	ND	N/A	NO

O.D.W.S. - Regulation 160/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.



**Table G 2003 Reg. 170/03 Schedule 24 Results Summary Continued**

<b>Parameters</b>	<b>O.D.W.S. mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>
Prometryne	0.001	44	0	ND	N/A	NO
Simazine	0.01	44	0	ND	N/A	NO
Temephos	0.28	44	0	ND	N/A	NO
Terbufos	0.001	44	0	ND	N/A	NO
Tetrachloroethylene (perchloroethylene)	0.03	88	3	0.0001	0.0001- 0.0005	NO
2,3,4,6- Tetrachlorophenol	0.1	44	0	ND	N/A	NO
Triallate	0.23	44	0	ND	N/A	NO
Trichloroethylene	0.05	88	29	0.0004	0.0001- 0.0031	NO
2,4,6-Trichlorophenol	0.005	44	0	ND	N/A	NO
2,4,5-T	0.28	44	0	ND	N/A	NO
Trifluralin	0.045	44	0	ND	N/A	NO
Vinyl Chloride	0.002	88	0	ND	N/A	NO

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.



**Table H 2003 Miscellaneous Test Results Summary**

<b>Parameters</b>	<b>O.D.W.S. mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>
<b>Nitrate</b>	<b>10</b>	<b>74</b>	<b>72</b>	<b>2.5</b>	<b>0.2 – 10.9*</b>	<b>NO</b>
<b>Nitrite</b>	<b>1.0</b>	<b>74</b>	<b>0</b>	<b>ND</b>	<b>N/A</b>	<b>NO</b>
<b>Lead in Distribution Samples</b>	<b>0.01</b>	<b>4</b>	<b>2</b>	<b>0.00065</b>	<b>0.0005 – 0.0008</b>	<b>NO</b>
<b>Trihalomethanes in Distribution Samples</b>	<b>0.1</b>	<b>4</b>	<b>4</b>	<b>0.023</b>	<b>0.013 – 0.027</b>	<b>NO</b>
<b>Sodium</b>	<b>N/A</b>	<b>24</b>	<b>24</b>	<b>40.6</b>	<b>14.1 – 96.7</b>	<b>NO</b>
<b>Fluoride</b>	<b>1.5</b>	<b>22</b>	<b>19</b>	<b>0.289</b>	<b>0.1 – 0.5</b>	<b>NO</b>

**O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.**

**\*Only one test result greater than O.D.W.S. of 10 mg/L. This test was conducted on raw water prior to treatment.**





**SECTION 5**  
**SUMMARY OF ADVERSE TEST RESULTS AND CORRECTIVE**  
**ACTIONS**



## Section 5 Summary of Adverse Test Results and Corrective Actions

This section summarizes adverse water quality test results and corresponding corrective actions taken for the period January to December, 2003.

Schedule 16 of the Drinking-Water Systems Regulation 170/03 prescribes the reporting procedures that must be followed when adverse water quality is detected during routine testing. Waterworks contract laboratories must notify the Ministry of the Environment, the Wellington-Dufferin-Guelph Health Unit, and the Waterworks Supervisor of the adverse result by phone immediately. The Waterworks Supervisor must then again notify, both by phone and in writing, the Ministry and Health Unit of the adverse result and the conditions of operation at the time of sampling. If applicable, the Supervisor will then implement corrective actions such as resampling, increasing the chlorine dose, isolating a source, or flushing the system. Waterworks must then report the results of the corrective actions taken to both the Ministry and Health Unit within seven days of the issue resolution.

When an adverse bacteriological result is detected, the first action required under Schedule 17 of Regulation 170/03 is the resampling of the source of the adverse result. It is the nature of microbiological analysis to occasionally have false positive results. If additional adverse results are not detected, then no additional action is taken.

<b>Table I 2003 Summary of Adverse Test Results and Corrective Actions</b>					
<b>#</b>	<b>Date</b>	<b>Location</b>	<b>Description</b>	<b>Corrective Action</b>	<b>Resample Results Good</b>
1	July 23	Clythe Station	HPC >1,000 (O.D.W.S. < 500)	Increased Chlorine Residual and Resampled	Yes
2	August 11	Woods Station	HPC >2,200 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes
3	August 13	Clythe Station	HPC =1,700 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes

HPC – Heterotrophic Plate Count: An indicator of general bacterial quality. HPC is measured in colony forming units per millilitre (cfu/mL).  
O.D.W.S. – Regulation 169 Ontario Drinking Water Standards





**Table I 2003 Summary of Adverse Test Results  
and Corrective Actions Continued**

<b>#</b>	<b>Date</b>	<b>Location</b>	<b>Description</b>	<b>Corrective Action</b>	<b>Resample Results Good</b>
4	Sept. 2	Pine Drive	HPC = 1,100 (O.D.W.S. < 500)	Increased Chlorine Residual and Resampled	Yes
5	Sept. 5	Park Well	HPC = 690 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes
6	Sept. 11	Wyndham St.	HPC > 500 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes
7	Sept. 29	Calico Well	HPC = 1,000 (O.D.W.S. < 500)	Increased Chlorine Residual and Resampled	Yes
8	Nov. 3	Victoria Rd. N.	HPC = 710 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes
9	Nov. 11	Burke Well	HPC > 1,500 (O.D.W.S. < 500)	Maintained Chlorine Residual and Resampled	Yes

HPC – Heterotrophic Plate Count: An indicator of general bacterial quality. HPC is measured in colony forming units per millilitre (cfu/mL).

O.D.W.S. – Regulation 169 Ontario Drinking Water Standards





**SECTION 6  
SUMMARY OF MAINTENANCE**



## **Section 6 Summary of Maintenance**

This section summarizes the 2003 major operating and capital expenses incurred to maintain the water supply and distribution system.

The Waterworks Division of the Environmental Services Department is responsible for the supply and distribution of potable water to the citizens of Guelph. Water quality objectives established by the Ministry of the Environment are achieved through a combination of groundwater protection initiatives, disinfection of water from 23 groundwater wells and the maintenance of a distribution network consisting of almost 500 km of watermain. All Waterworks revenue is derived directly from the sale of water to customers.

The water programs and services described below contribute to the Waterworks and Wastewater vision:

“We will be a recognized leader in municipal water management, moving forward consistently at the forefront of our industry and setting a standard for others to follow.”

### **Regulatory Compliance**

In February 2002, the Ministry of the Environment (MOE) issued a Consolidated Certificate of Approval (CCofA) to Waterworks based on the findings of the *2001 Engineers Report*. The CCofA outlines the following requirements that have direct budgetary impact:

#### **A) Completion of Disinfection Upgrades by June 2006**

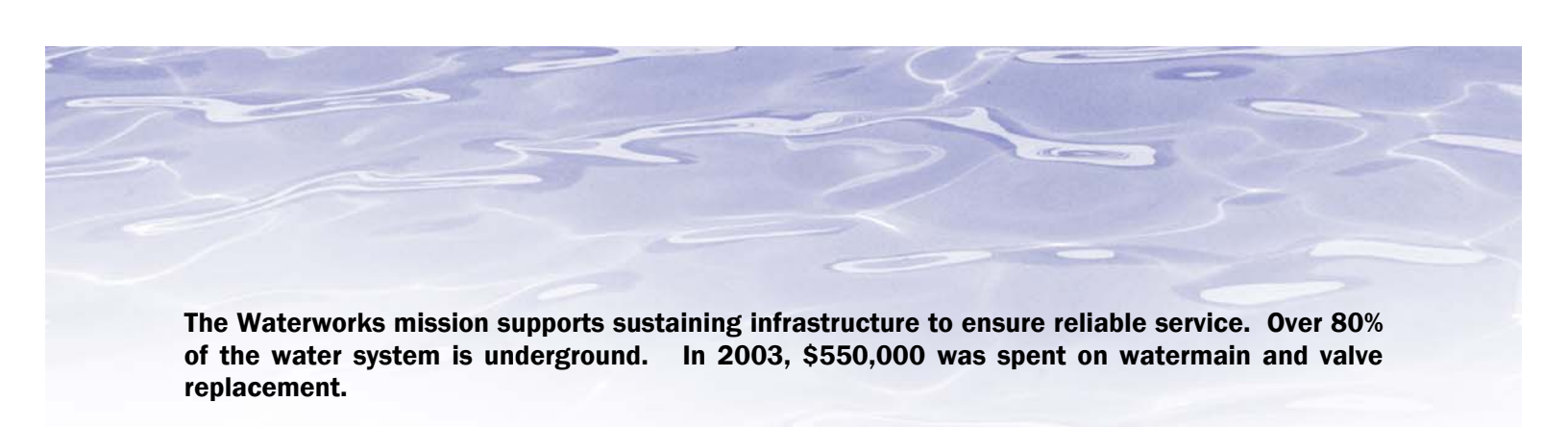
Disinfection upgrades are required at nine facilities with one facility complete, four underway, and the remaining to be initiated in 2003 and 2004. Funding for these upgrades is split equally between the municipality, province and federal government with the City portion forecast at approximately \$3.5 million.

#### **B) Completion of Groundwater Under the Direct Influence of Surface Water (GUDI) Compliance Treatment Study and Potential Treatment Upgrades**

In July of 2002, the City completed and submitted for MOE review a GUDI study on five water sources. In November of 2003, a revised CC of A was received listing additional treatment upgrades and a compliance schedule. The upgrades will likely be required to be completed by the middle of 2006. Staff anticipate these upgrades will cost an additional \$5 million and are seeking Provincial and Federal support.

### **Sustaining Infrastructure**





**The Waterworks mission supports sustaining infrastructure to ensure reliable service. Over 80% of the water system is underground. In 2003, \$550,000 was spent on watermain and valve replacement.**

## **Operating Budget Highlights**

**In 2003, Waterworks budgeted \$2 million and \$2.3 million to operate and maintain the water distribution and supply systems respectively.**

**The following maintenance activities were funded by the Waterworks Operating budget in 2003:**

- **Repair of an annual record of 101 watermain breaks at a cost of \$590,000;**
- **Replacement of 57 watermain valves at a cost of \$193,000;**
- **Repair of 66 fire hydrants at a cost of \$74,000;**
- **Replacement of 1,056 water meters at a cost of \$200,000;**
- **Rehabilitation of 3 water supply wells at a cost of \$70,000;**
- **Lining of 5 water supply wells at a cost of \$300,000; and**
- **Replacement of 9 water supply pumps at a cost of \$300,000.**

