

1. Introduction

This provides the City of Owen Sound's Quarterly Drinking Water Quality Report for the First Quarter of 2001. The Ontario Ministry of the Environment's recently tabled legislation, The Drinking Water Protection Regulation (Reg. 459/00), mandates this reporting requirement. Further information concerning this Regulation can be found either through the Ministry of Environment's Web Site at www.ene.gov.on.ca/envision/WaterReg/WaterReg.htm, or by calling the local Ministry of the Environment Office at 371-2901.

This, and future reports, are available at:

Clerk's Office		City of Owen Sound's
Owen Sound City Hall	or	Public Works Division
808 2 nd Avenue East		1900 20th Street East
Owen Sound, Ontario		Owen Sound, Ontario
N4K 2N4		N4K 5N3

Or on the City's Web Site at www.city.owen-sound.on.ca/water/

This report covers the period from January 1st, 2001 to March 31st, 2001.

2. Introduction

The City's Drinking Water is supplied by the Richard H. Neath Water Treatment Plant (R.H. Neath WTP), is located at 2600 3rd Avenue East in Owen Sound, Ontario. The facility was built in two phases. Plant 1 was constructed in 1967. In 1980 the facility was twinned with the addition on Plant 2. This expansion doubled the facility's capacity to provide a total treatment capacity of 60.48 ML/d. The facility provides potable water to approximately 22,000 residents, an expanding commercial base, and several large industrial customers.

3. Facility Background

The R.H. Neath WTP is a direct filtration plant with the following unit process components:

- raw water pumping
- pre-chlorination (including seasonal zebra mussel control)
- coagulant addition
- flash mixing
- flocculation
- filtration
- backwash capabilities
- post-chlorination
- fluoridation
- treated water storage
- municipal treated water pumping
- industrial treated water pumping

Facility Background Continued;

The R.H. Neath WTP contains two water treatment trains. Each treatment train is equipped with similar unit process components, but convey separate flow streams according to equipment on line, demand and their individual rated capacities. A process flow diagram of the R.H. Neath WTP is presented in Figure 1.

The raw water for the R.H. Neath WTP is supplied by a 0.9-meter diameter intake extending approximately 670 meters into Georgian Bay into the plant's low lift pumping station. The low lift pumping station contains 3 pumps, one of which is equipped with a diesel drive. Raw water is screened, pre-chlorinated at the low lift pumping station or at the mouth of the intake pipe during warmer weather for zebra mussel control, and pumped via the low lift pump station to the rapid mix tanks through twinned 35 centimetre diameter pipes, one for each of the two Plants.

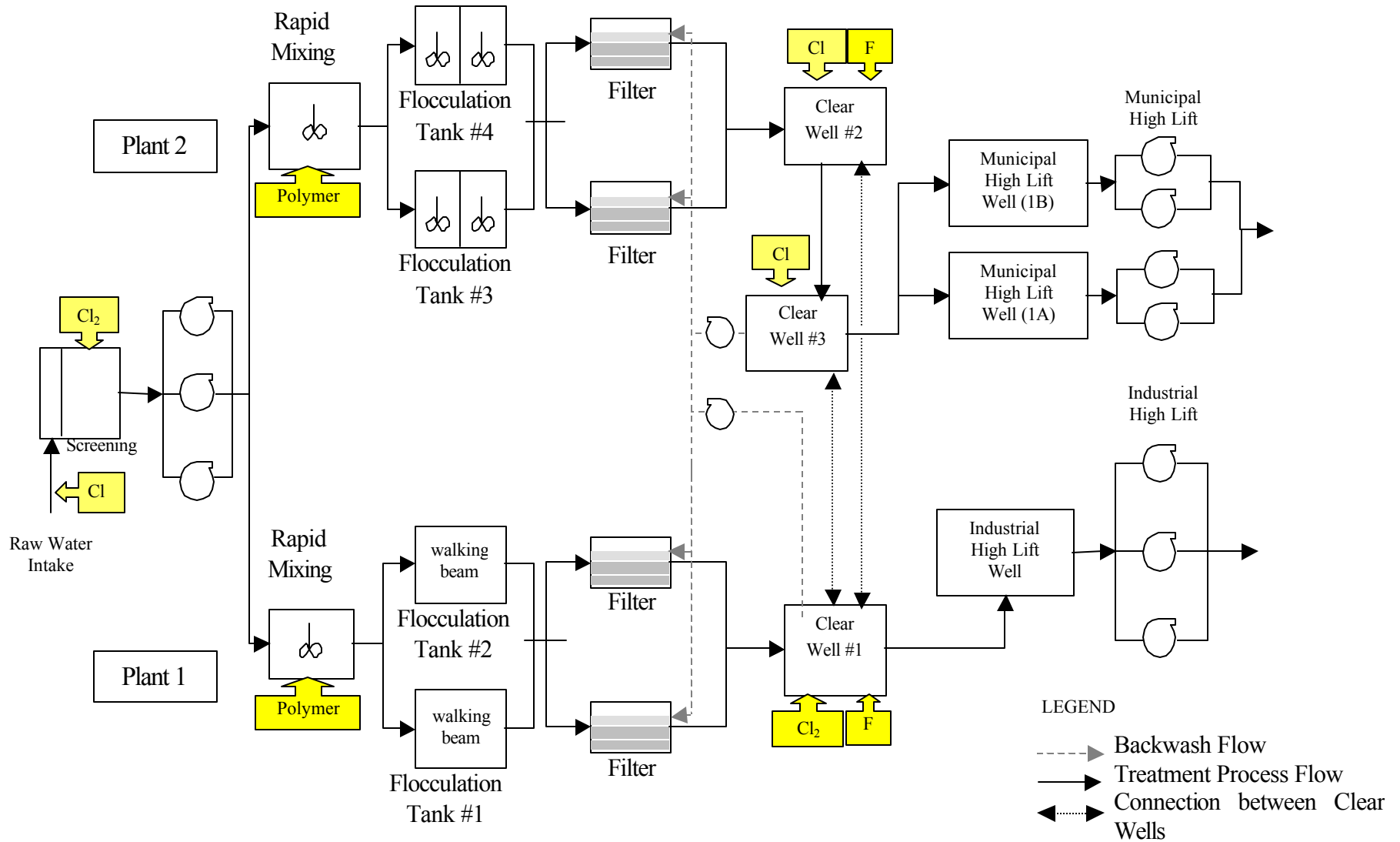
A coagulant, poly-aluminum chloride, is added to the raw water in the rapid mix tanks. Coagulated water from the rapid mix tanks is divided between the two parallel flocculation tanks in each Plant. Plant 1 uses walking beam flocculators and Plant 2 uses two stage tapered turbine mixing. Flocculation tank effluents are combined within each plant before being split between two parallel dual media filters for filtering. Filtered water from both Plants 1 and 2 is stored in Clear Wells 1 and 2, respectively, which are located below the process building. The treated water is post-chlorinated and fluoridated as it enters the Clear Wells.

Clear Wells 1, 2, and 3 are interconnected in order to provide equal water level in all wells. Treated water from Clear Well 1 is directed to the Industrial High Lift Pump Well for distribution to the pressurized Industrial Supply System through three Industrial high lift pumps, one of which is equipped with an auxiliary diesel engine. Treated water from Clear Well 1 flows into Clear Well 3 before it is directed into the Municipal High Lift Pump Wells for distribution to the municipal supply system through four municipal high lift pumps that pump treated water to the relevant distribution systems.

Filters are backwashed on a regular basis using treated water from Clear Well 1 and 3 on an alternating duty. Wastewater from the backwash process is returned untreated to Georgian Bay.

The facility boasts a state of the art Supervised Control And Data Acquisition (SCADA) System. The SCADA System continuously monitors all unit processes within the plant. It offers remote plant operations capabilities and full monitoring and alarm capabilities to facilitate operator intervention, either manually or through the Control system.

Figure 1: Process Schematic



4. Raw Water Quality

The turbidity and pH of raw water are measured on-line in the Low Lift Pump Well and are monitored by the SCADA system. Raw water samples, taken from the intake pipe prior to entering the Low Lift Pumping Station, are analyzed at the in-plant laboratory for turbidity once per day and aluminum concentration once per week. Tests for colour are performed daily, problems with colour usually are found during the seasonal spring/fall high runoff period.

5. Treated Water Quality

The treated water characteristics are monitored daily. The pH and chlorine residual of treated water are monitored by the SCADA system at various points of the treatment process. Daily treated water samples are taken for in-plant laboratory analysis for fluoride, chlorine residual, turbidity and colour. A new online turbidimeter was installed in March, 2001 which monitors the turbidity just before it leaves the water plant to the municipal customers.

6. Terms You Need To Know

Here are some terms you should know about before reading the information below.

MAC

Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.

IMAC

Interim Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

AO

Aesthetic Objective. There is not a MAC or IMAC for this parameter. It is an aspect of drinking water quality, namely taste, odour, colour and clarity that are perceivable to the senses.

Parameter

This is a substance that we sample and analyze in water.

mg/l

milligrams per litre. This is a measure of the concentration of a parameter in water, also known as parts per million (ppm).

ug/l

microgram per litre. This is a measure similar to mg/l but 1000 times smaller, also known as parts per billion (ppb).

NTU

Nephelometric Turbidity Unit. This is a unit measurement for turbidity in a water sample.

n/a

Not applicable. Some columns may contain an n/a which means there is not a required value.

ns

No sample. This means that if for some reason a sample was not taken, the sample was damaged during transportation or not analyzed in a certain time period, there will not be a result.

nd

Not detectable. This means that a value could not be detected with means of analysis.

P

Pending. Results of the test has not come back from the laboratory yet. Update to follow.

7. What is in your water?

Water contains various microbes, metal salts, and organic and inorganic substances generally referred to as parameters. These parameters may be present in source water before the treatment process. Here is a description of the various groups of parameters.

Microbiological parameters such as bacteria may come from sewage plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of drinking water quality because of its association with dangerous water-borne diseases which can strike quickly.

Inorganic parameters such as salts and metals can be naturally occurring or a result of urban storm run-off, industrial or domestic wastewater discharge, mining or agriculture. Some may be a result of treatment and distribution of water (for example, lead from old solder in pipes).

Organic parameters can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm run-off and other sources. Included in this group are pesticides that originate from both rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination by-products such as trihalomethanes).

Our certificate of approval from the Ministry of the Environment sets monitoring requirements. The following tables summarizes all sample results from our monitoring program for the period from January 1 – March 31, 2001, and also added is Table 1 for Raw Water characteristics that were analyzed in the October 1 through to December 31, 2000. The presence of these substances does not necessarily mean that the water poses a health risk.

8. Compliance with the Ontario Drinking Water Standards

All health related sample results met the Ontario Drinking Water Standards with the following exceptions:

Bacteriological

There was one adverse sample during this quarter.

A February 16, 2001 sample indicated total coliform count at the Public Works building. The location was re-sampled on February 19, 2001 with this sample meeting standards.

It was determined that sampling protocol was not adhered to.

A review of sampling protocol was conducted with all Treatment Plant Staff.

Chlorine Residuals

During this quarter there were several samples taken which did not meet the Residual Free Chlorine requirement of 0.05 mg/l. The areas that did not meet this chlorine requirement are end of pipe, low flow areas.

All bacteriological results from these areas met the Ontario Drinking Water Standards.

The areas in question are:

- Stone Tree- former Sydenham Township
- Greenwood Cemetery Area- City of Owen Sound
- Inglis Falls Area- former Derby Township

Remedial action in these areas has included an enhanced flushing program as well as increasing chlorine residual levels in the Treated Water.. A detailed report concerning this issue was submitted to the Ministry of Environment on April 20, 2001.

• Engineer's Report

The Ontario Drinking Water Standard requires preparation of an Engineer's Report for the Water Treatment Plant. The City has retained Earth Tech (Canada) Inc. to prepare this report. The report was received on March 30, 2001. City Staff are currently conducting a review of this report.

Laboratory Services

The City of Owen Sound utilizes two laboratories for its Water Sampling Program.

1. **MDS Laboratories** provides microbiological testing and analysis, and is fully accredited for this testing.
2. **Areco Canada Inc.** provides analysis for inorganics, organics, pesticides & PCB's, and is fully accredited for this testing.

10. Contacts

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Troy Pelletier e-mail address	Water Treatment Supervisor tpelletier@city.owen-sound.on.ca	372-2170

The following information contains the analytical results for this quarter. The raw water results for the fourth quarter of last year are included in this report.

Table A - Microbiological Parameters	MAC or IMAC or AO	# of Samples		# of Detectable Results		Sampling Date	Range		Exceeded ?	Typical Source of Contaminant
		Raw	Treated	Raw	Treated		Raw	Treated		
E. Coli (counts/100 ml)	*	16	148	11	0	01/01-03/31	20.7	0	NO	Indicates presence of fecal matter.
Total Coliform (counts/100 ml)	*	16	148	15	1	01/01-03/31	37.1	3	YES	Indicates possible presence of fecal matter.

* indicator of adverse water quality if detected in treated water

Parameter Related to Microbiological Quality	MAC or IMAC or AO	# of Samples		# of Detectable Results		Sampling Date	Range		Exceeded ?	Typical Source of Contaminant
		Raw	Treated	Raw	Treated		Raw	Treated		
Turbidity - Filter # 1 (NTU)	1.0	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	n/a	0.10	NO	Indicates a small presence of particulates in water after filtration.
Turbidity - Filter # 2 (NTU)	1.0	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	n/a	0.11	NO	Indicates a small presence of particulates in water after filtration.
Turbidity - Filter # 3 (NTU)	1.0	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	n/a	0.11	NO	Indicates a small presence of particulates in water after filtration.
Turbidity - Filter # 4 (NTU)	1.0	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	n/a	0.09	NO	Indicates a small presence of particulates in water after filtration.
Turbidity - Finished (NTU)	1.0	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	n/a	0.10	NO	Indicates a small presence of particulates in water after filtration.
Turbidity - Raw (NTU)	n/a	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	1.65	n/a	n/a	Indicates a presence of suspended and colloidal matter. Indication of the clarity of the water.
Free Chlorine-Plant-Pre (mg/l)	n/a	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	0.19	n/a	n/a	First line of defence of contaminants. A free chlorine residual indicates that the chlorine demand has been met, and available chlorine is available.
Total Chlorine-Plant-Pre	n/a	Continuous monitoring	Continuous monitoring	Continuous monitoring	Continuous monitoring	01/01-03/31	0.24	n/a	n/a	First line of defence of contaminants. A total chlorine residual indicates

(mg/l)										the amount of chlorine added to reach breakpoint chlorination.
Free Chlorine-Plant-Post 1 (mg/l)	n/a	Continuous monitoring		Continuous monitoring		01/01-03/31	n/a	0.70	n/a	Additional protection against contaminants, also adds protection in the distribution system.
Free Chlorine-Plant-Post 2 (mg/l)	n/a	Continuous monitoring		Continuous monitoring		01/01-03/31	n/a	0.70	n/a	Additional protection against contaminants, also adds protection in the distribution system.
Free Chlorine-System (mg/l)	n/a	n/a	118	n/a	118	01/01-03/31	n/a	0.28	n/a	Recommended level of at least .20 mg/l in system to maintain microbiological quality in system.
Aluminum - Raw (mg/l)	n/a	13	n/a	13	n/a	01/01-03/31	0.001	n/a	n/a	Aluminum in effective in coagulation/filtration and used at our Water Plant. There isn't clear evidence that aluminum had any effect on health.
Aluminum - Treated (mg/l)	0.1	n/a	13	n/a	13	01/01-03/31	n/a	0.041	NO	Aluminum in effective in coagulation/filtration and used at our Water Plant. There isn't clear evidence that aluminum has any effect on health.
Colour - Raw (NTU)	n/a	70	n/a	70	n/a	01/01-03/31	2.1	n/a	n/a	The substances in water that impart a yellowish-brown color to the water. Theses substances are the result of iron, manganese, peat materials, plankton, aquatic weeds, and industrial waste present in the water.
Colour - Treated (NTU)	5	n/a	70	n/a	70	01/01-03/31	n/a	0.5	n/a	The substances in water that impart a yellowish-brown color to the water. Theses substances are the result of iron, manganese, peat materials, plankton, aquatic weeds, and industrial waste present in the water.
Fluoride-Treated (mg/l)	1.5	n/a	87	n/a	87	01/01-03/31	n/a	0.85	NO	Added to prevent tooth decay.
Fluoride-Raw (mg/l)	n/a	13	n/a	13	n/a	01/01-03/31	0.05	n/a	n/a	naturally occurring in our surface water (Georgian Bay).
Nitrate (as nitrogen) (mg/l)	10	1	n/a	1	n/a	01/01-03/31	n/a	nd	NO	Present in water as a result of plant and animal matter, agricultural fertilizers and treated wastewater contamination.
Nitrite (as nitrogen) (mg/l)	1	1	n/a	1	n/a	01/01-03/31	n/a	0.8	NO	Seldom present in surface water because it oxidizes fairly rapidly.

Table B - Volatile Organics Parameters	MAC or IMAC or	# of Samples	# of Detectable	Sampling Date	Range	Exceeded ?	Typical Source of Contaminant
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	AO	Results		Results			Raw	Treated		
		Raw	Treated	Raw	Treated					
Benzene (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Present in gasoline and other refined petroleum products.
Carbon Tetrachloride (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Found in ground water from old industrial sites where chlorinated solvents were made or used.
1,2-Dichlorobenzene (mg/l)	0.2	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Used in a variety of chemical blends such as degreasing agents.
1,4-Dichlorobenzene (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Persistent synthetic material found in toilet pucks and mothballs.
1,2-Dichloroethane (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Released into the environment via atmospheric emissions and discharge from industrial waste.
1,1-Dichloroethylene (mg/l)	0.014	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Imported and used in the food packaging and the textile industry.
Dichloromethane (mg/l)	0.05	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Used extensively as an industrial solvent and degreasing agent.
Ethylbenzene (mg/l)	0.0024	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Used as a gasoline and paint additive.
Monochlorobenzene (mg/l)	0.03	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	May be present in industrial discharges.
Tetrachloroethylene (mg/l)	0.03	n/a	1	n/a	ns	01/01-03/31	n/a	0.0006	NO	Found in ground water , primarily after improper disposal or dumping of cleaning solvents.
Toluene (mg/l)	0.024	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	May be found in industrial effluents.
Trichloroethylene (mg/l)	0.05	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Introduced into ground and surface water via industrial spills or illegal disposal of effluents.
Trihalomethanes (mg/l)	0.1	n/a	1	n/a	1	01/01-03/31	n/a	0.0216	NO	The principle source of trihalomethanes in drinking water is the action of chlorine with organics left in the water after filtration.

Vinyl Chloride (mg/l)	0.002	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used in making PVC plastic items such as water main pipes and other common plastic items.
Xylene (mg/l)	0.3	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Used as an industrial solvent and in organic synthesis.

Table D - Pesticides & PCBs Parameters	MAC or IMAC or AO	# of Samples		# of Detectable Results		Sampling Date	Range		Exceeded ?	Typical Source of Contaminant
		Raw	Treated	Raw	Treated		Raw	Treated		
Alachlor (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Introduced into ground and surface water during herbicide applications. Banned in Canada in 1985.
Aldicarb (mg/l)	9.0	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Carbamate insecticide which is highly soluble and has a high potential to enter ground water.
Aldrin + Dieldrin (mg/l)	0.0007	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Aldrin & dieldrin are organochlorine pesticides used to control soil insects. Banned in Canada in 1994.
Atrazine (mg/l)	0.005	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Highly persistent herbicide that is moderately mobile in soil.
Azinphos-methyl (mg/l)	0.02	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	An organophosphorus insecticide used against foliage-feeding insects.
Bendiocarb (mg/l)	0.04	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Carbamate insecticide used to control specific insects in buildings and greenhouses.
Bromoxynil (mg/l)	0.005	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used in Ontario to control specific weed seedlings in grain crops.
Carbaryl (mg/l)	0.09	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Broad spectrum carbamate insecticide used in agriculture and forestry.
Carbofuran (mg/l)	0.09	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Carbamate insecticide used in agricultural for control of foliar pests. Also used to control root maggot, wire worm & some species of nematodes.

Chlordane(Total) (mg/l)	0.007	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Carbamate insecticide used in agriculture to control foliar pests.
Chlorpyrifos (mg/l)	0.09	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organophosphorus insecticide used for the control of insects on agricultural crops for domestic use, and flea and tick control.
Cyanazine (mg/l)	0.01	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Triazine herbicide registered for control of weeds in crop and non-crop areas
Diazinon (mg/l)	0.02	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organophosphorous insecticide that is used to control foliar and soil dwelling pests.
Dicamba (mg/l)	0.12	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Benzoic acid herbicide used in lawn care.
2,4-Dichlorophenol (mg/l)	0.9	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Highly odorous synthetic materials which are most often present in water due to the action of chlorine on phenolic precursors.
DDT (mg/l)	0.03	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Persistent in the environment and concerns with potential biomagnification resulting in environmental damage. Banned in 1988.
2,4-D (mg/l)	0.1	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Herbicide used for control of broadleaf weeds in cereal crops and lawns.
Diclofop-methyl (mg/l)	0.009	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used in the control of annual grasses in vegetable crops. Relatively soluble in water.
Dimethoate (mg/l)	0.02	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organophosphorous miticide and insecticide used for fly control in livestock pens.
Dinoseb (mg/l)	0.01	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Contact herbicide and desiccant. It's no longer used in Ontario.
Diquat (mg/l)	0.07	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used primarily as an aquatic herbicide.
Diuron (mg/l)	0.15	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Herbicide used to control vegetation in crop areas. Its moderately soluble in water.
Glyphosate (mg/l)	0.28	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Non-selective herbicide used for weed control. Its very soluble in water.

Heptachlor + heptachlor epoxide (mg/l)	0.003	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organochlorine insecticide once used in agriculture. Banned in 1969.
Lindane(Total) (mg/l)	0.004	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used in pharmaceutical preparations for human lice and mite shampoos.
Malathion (mg/l)	0.19	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Insecticide used on fruits and vegetables. It has low mammalian toxicity.
Methoxychlor (mg/l)	0.9	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organochlorine insecticide that's non-persistent and non-accumulative in biological tissue.
Metolachlor (mg/l)	0.05	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Selective herbicide used for pre-emergence and pre-plant weed control.
Metribuzin (mg/l)	0.08	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Triazine herbicide used to control grass infestations in agricultural crops.
Paraquat (mg/l)	0.01	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Highly toxic herbicide used to control non-crop and industrial weeds.
Parathion (mg/l)	0.05	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Organophosphorous insecticide used in agriculture to control foliar pests.
Pentachlorophenol (mg/l)	0.06	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used extensively as a pesticide and wood preservative.
Phorate (mg/l)	0.002	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Insecticide used to control corn rootworm.
Picloram (mg/l)	0.19	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Herbicide used for broadleaf weed and brush control. Can be persistent in soil for up to a year after application.
PCB (mg/l)	0.003	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Among the most persistent pollutants in the global ecosystem. They are no longer manufactured.
Prometryne (mg/l)	0.001	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Herbicide used selectively to control annual grasses and broadleaf weeds in crops and non-crops.
Simazine (mg/l)	0.01	n/a	1	n/a	1	01/01-03/31	n/a	nd	NO	Herbicide which is used for pre-emergence weed control in annual row crops.

Temephos (mg/l)	0.28	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Insecticide used to control mosquito and blackfly larvae.
Terbufos (mg/l)	0.001	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Insecticide used for insect control in corn.
2,3,4,6-Tetrachlorophenol (mg/l)	0.1	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	It is an aesthetic parameter. It has an unpleasant taste to the water.
Trichlorophenol (mg/l)	0.005	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Used in the manufacturing of pesticides. It is an animal carcinogen but inadequate for human carcinogenicity.
Trifluralin (mg/l)	0.045	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Herbicide used for weed control in summer fallow and for controlling annual grasses in wheat, barley and canola.
2,4,5-T (mg/l)	0.28	n/a	1	n/a	ns	01/01-03/31	n/a	nd	NO	Herbicide that was once an important stem/foliage treatment for deciduous brush on road sides and power lines. No longer used in Can.

TABLE 1 ODWS Raw Water	MAC or IMAC or AO	# of Samples		# of Detectable Results		Sampling Date	Range		Exceeded ?	Typical Source of Contaminant
		Raw	Treated	Raw	Treated		Raw	Treated		
Alachlor (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Introduced into ground and surface water during herbicide applications. Banned in Canada in 1985.
Aldicarb (mg/l)	0.009	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Found in ground water from old industrial sites where chlorinated solvents were made or used.
Aldrin + Dieldrin (mg/l)	0.0007	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in a variety of chemical blends such as degreasing agents.
Arsenic (mg/l)	0.025	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Persistent synthetic material found in toilet pucks and mothballs.
Atrazine + N-dealkylated metabolites (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Released into the environment via atmospheric emissions and discharge from industrial waste.
Azinphos-methyl	0.02	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Imported and used in the food packaging and the textile

(mg/l)										industry.
Barium (mg/l)	1	1	n/a	1	n/a	10/01-12/31	0.01	n/a	NO	Used extensively as an industrial solvent and degreasing agent.
Bendiocarb (mg/l)	0.04	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used as a gasoline and paint additive.
Benzene (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	May be present in industrial discharges.
Benzo(a)pyrene (mg/l)	0.00001	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Found in ground water , primarily after improper disposal or dumping of cleaning solvents.
Boron (mg/l)	5	1	n/a	1	n/a	10/01-12/31	0.01	n/a	NO	May be found in industrial effluents.
Bromoxynil (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Introduced into ground and surface water via industrial spills or illegal disposal of effluents.
Cadmium (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	The principle source of trihalomethanes in drinking water is the action of chlorine with organics left in the water after filtration.
Carbaryl (mg/l)	0.09	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in making PVC plastic items such as water main pipes and other common plastic items.
Carbofuran (mg/l)	0.09	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Carbamate insecticide used in agricultural for control of foliar pests. Also used to control root maggot, wire worm & some species of nematodes.
Carbon Tetrachloride (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Found in ground water from old industrial sites where chlorinated solvents were made or used.
Chloramines (mg/l)	3	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Produced when ammonia is added to chlorinated water during the disinfection stage. On raw water there is no chlorine present
Chlordane (Total) (mg/l)	0.007	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Carbamate insecticide used in agriculture to control foliar pests.
Chlorpyrifos (mg/l)	0.09	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organophosphorus insecticide used for the control of insects on agricultural crops for domestic use, and flea and tick control.
Chromium	0.05	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Chromium is not considered toxic, unless it is oxidized to

(mg/l)										its hexavalent form during chlorination.
Cyanazine (mg/l)	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Triazine herbicide registered for control of weeds in crop and non-crop areas
Cyanide (mg/l)	0.2	1	n/a	1	n/a	10/01-12/31	0.002	n/a	NO	Used in metals plating and refining industries, and industrial effluents and are the major potential sources of cyanide contamination.
Diazinon (mg/l)	0.02	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organophosphorous insecticide that is used to control foliar and soil dwelling pests.
Dicamba (mg/l)	0.12	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Benzoic acid herbicide used in lawn care.
1,2-Dichlorobenzene (mg/l)	0.2	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in a variety of chemical blends such as degreasing agents.
1,4-Dichlorobenzene (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Persistent synthetic material found in toilet pucks and mothballs.
DDT (mg/l)	0.03	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Persistent in the environment and concerns with potential biomagnification resulting in environmental damage. Banned in 1988.
1,2-dichloroethane (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Released into the environment via atmospheric emissions and discharge from industrial waste.
1,1-Dichloroethylene (mg/l)	0.014	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Imported for use in the food industry and textile industry for furniture and automotive upholstery, drapery fabric and outdoor furniture.
Dichloromethane (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used extensively as an industrial solvent and degreasing agent.
2,4-Dichlorophenol (mg/l)	0.9	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Highly odorous synthetic materials which are most often present in water due to the action of chlorine on phenolic precursors.
2,4-D (mg/l)	0.1	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used for control of broadleaf weeds in cereal crops and lawns.
Diclofop-methyl (mg/l)	0.009	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in the control of annual grasses in vegetable crops. Relatively soluble in water.
Dimethoate	0.02	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organophosphorous miticide and insecticide used for fly control in

(mg/l)										livestock pens.
Dinoseb (mg/l)	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Contact herbicide and desiccant. It's no longer used in Ontario.
Dioxin and Furan (mg/l)	0.00000001	1	n/a	1	n/a	10/01-12/31	1.E-10	n/a	NO	Formed in very small amounts in combustion processes.
Diquat (mg/l)	0.07	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used primarily as an aquatic herbicide.
Diuron (mg/l)	0.15	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used to control vegetation in crop areas. Its moderately soluble in water.
Fluoride (mg/l)	1.5	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	naturally occurring in our surface water (Georgian Bay).
Glyphosate (mg/l)	0.28	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Non-selective herbicide used for weed control. Its very soluble in water.
Heptachlor - Heptachlor Epoxide (mg/l)	0.003	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organochlorine insecticide once used in agriculture. Banned in 1969.
Lead (mg/l)	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Lead is only present as a result of corrosion of lead solder, lead containing brass fittings/pipes which could be in domestic plumbing.
Lindane (Total) (mg/l)	0.004	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in pharmaceutical preparations for human lice and mite shampoos.
Malathion (mg/l)	0.19	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Insecticide used on fruits and vegetables. It has low mammalian toxicity.
Mercury (mg/l)	0.001	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Sources of mercury in drinking water include air pollution, metal refining operation and from natural mineral deposits.
Methoxychlor (mg/l)	0.9	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organochlorine insecticide that's non-persistent and non-accumulative in biological tissue.
Metolachlor (mg/l)	0.05	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Selective herbicide used for pre-emergence and pre-plant weed control.
Metribuzin	0.08	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Triazine herbicide used to control grass infestations in agricultural crops.

(mg/l)										
Monochlorobenzene (mg/l)	0.08	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	May be present in industrial discharges.
Nitrate (as nitrogen) (mg/l)	10	1	n/a	1	n/a	10/01-12/31	0.7	n/a	NO	Present in water as a result of plant and animal matter, agricultural fertilizers and treated wastewater contamination.
Nitrite (as nitrogen) (mg/l)	1	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Seldom present in surface water because it oxidizes fairly rapidly.
Nitrate + Nitrite (as nitrogen) (mg/l)	10	1	n/a	1	n/a	10/01-12/31	0.7	n/a	NO	Total of the two, nitrate + nitrite.
Nitrioltriacetic Acid (NTA) (mg/l)	0.4	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Mainly used in laundry detergents, most is eventually disposed of in domestic wastewater.
Nitrosodimethylamine (NDMA) (mg/l)	0.000009	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Rarely used but has been used as an antioxidant, as an additive for lubricants, and as a softener of copolymers.
Paraquat (mg/l)	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Highly toxic herbicide used to control non-crop and industrial weeds.
Parathion (mg/l)	0.05	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Organophosphorous insecticide used in agriculture to control foliar pests.
Pentachlorophenol (mg/l)	0.06	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used extensively as a pesticide and wood preservative.
Phorate (mg/l)	0.002	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Insecticide used to control corn rootworm.
Picloram (mg/l)	0.19	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used for broadleaf weed and brush control. Can be persistent in soil for up to a year after application.
Polychlorinated Biphenyls (PCB) (mg/l)	0.003	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Among the most persistent pollutants in the global ecosystem. They are no longer manufactured.
Prometryne (mg/l)	0.001	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used selectively to control annual grasses and broadleaf weeds in crops and non-crops.
Selenium	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Occurs naturally in surface waters as a result of geochemical

(mg/l)										processes such as weathering of rocks.
Simazine (mg/l)	0.01	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide which is used for pre-emergence weed control in annual row crops.
Temephos (mg/l)	0.28	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Insecticide used to control mosquito and blackfly larvae.
Terbufos (mg/l)	0.001	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Insecticide used for insect control in corn.
Tetrachloroethylene (mg/l)	0.03	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Introduced into ground and surface water via industrial spills or illegal disposal of effluents.
2,3,4,6-Tetrachlorophenol (mg/l)	0.1	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	It is an aesthetic parameter. It has an unpleasant taste to the water.
Triallate (mg/l)	0.23	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used for control of wild oats in grain crops, mustard and sugar beets.
Trichloroethylene (mg/l)	0.05	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Introduced into ground and surface water via industrial spills or illegal disposal of effluents.
2,4,6-Trichlorophenol (mg/l)	0.005	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	It is used in the manufacturing of pesticides.
2,4,5-T (mg/l)	0.28	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide that was once an important stem/foilage treatment for deciduous brush on road sides and power lines. No longer used in Can.
Trifluralin (mg/l)	0.045	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Herbicide used for weed control in summer fallow and for controlling annual grasses in wheat, barley and canola.
Trihalomethanes (mg/l)	0.1	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Synthetic organics found in chlorinated drinking water. The four most commonly detected are bromoform, chloroform, bromodichloromethane, and chlorodibromomethane. The principal source in drinking water is the action of chlorine with natural organics left in the water after filtration.
Turbidity (mg/l)	1	1	n/a	1	n/a	10/01-12/31	3.1	n/a	NO	Indicates a presence of suspended and colloidal matter. Indication of the clarity of the water.
Uranium	0.1	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Normally present in aqueous media as the uranyl ion.

(mg/l)										
Vinyl Chloride (mg/l)	0.002	1	n/a	1	n/a	10/01-12/31	nd	n/a	NO	Used in making PVC plastic items such as water main pipes and other common plastic items.