utilities kingston
water sewer gas electricity networks
all your utility services under one roof

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

UTILITIES KINGSTON
2006
ANNUAL REPORT

January 1, 2006 – December 31, 2006

Drinking Water System Number: 220006053

Drinking Water System Name: Cana Well System

Drinking Water System Owner: City of Kingston

Drinking Water System Category: Small Municipal Residential

Utilities Kingston is proud to present this annual report on drinking water quality. This report has been prepared in accordance to Section 11 of Ontario Regulation 170/03. Regulation 170/03 sets requirements for public waterworks with regard to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality. Free copies of this report and the Summary report prepared in accordance to Schedule 22 of Ontario Regulation 170/03, are available by public request at any City of Kingston offices, at our water plant locations and at *www.utilitieskingston.com*. Notices of availability are generally made through the local newpapers and radio. Further information on the Drinking Water Regulations can be found on the Ministry of the Environment web site at *www.ene.gov.on.ca*.

For further information about this report please contact Philip Emon at *pemon@utilitieskingston.com* , *or call 613-389-0562.*

Plant Description & Treatment Process

The Cana Well system was established in the early 1950's by a co-operative formed by homeowners living on Marian Crescent, Rochdale Crescent, and Cana Blvd. The system was operated privately by the co-operative, then by the Ministry of the Environment (MOE), until operation was assumed by the former Township of Pittsburgh. When the township amalgamated with the city of Kingston and Kingston Township in 1998, operation of the system passed into the care of Utilities Kingston. Staff from the Utilities Kingston Treatment Group operate the treatment system. The distribution system is maintained by the Utilities' Underground Infrastructure Department.

The water is supplied from a 150mm steel cased drilled well. Sodium hypochlorite used for disinfection is injected into the system after the pressure tank.

The water then passes through detention tanks that allow time for the chlorine to be in contact with the water and to achieve disinfection before it enters the distribution system. On-line analyzers monitoring chlorine residual and turbidity are remotely monitored, recorded and alarmed to ensure water quality.

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

The distribution system was also originally installed by the co-operative, and was constructed from a variety of materials which were available to the co-operative at the time of construction. Much of the distribution system was replaced in 2002, with the remaining portion replaced in 2003.

Treatment Plant staff attend the well on a regular basis to make system checks, take bacteriological samples, and to test chlorine residuals in both the treated water and in the distribution system. All Operators are certified by the MOE.

Monetary expenses incurred during this reporting period

Under Section 11 of Ontario Reg. 170/03, a description of any major expenses incurred during this reporting period must be included in the annual report. The details of major expenses for this drinking water system are listed below.

A new submersible well pump was purchased and installed at the Cana well-house.

Extensive work has continued on the development of a new well and treatment options throughout this reporting period.

Notifications submitted in accordance to the Safe Drinking Water Act

Under Ontario Reg. 170/03, notifications were required for any instances where a sample result indicated that a parameter used to measure water quality exceeded a Maximum Acceptable Concentration (MAC). Once a notification is received from a laboratory or an observation of any other indicator of adverse water quality is made by operations personnel, corrective action as dictated by the regulations is initiated in an effort to confirm the initial result. If confirmed, further action may be recommended by the Medical Officer of Health. If not confirmed, sampling will typically return to the normal schedule, or depending on the parameter, Utilities Kingston may choose to increase the sampling frequency to more closely monitor the parameter for a period of time. The groundwater supply for the Cana well system contains a sodium concentration greater than 20 mg\l which requires a notification to the Medical Officer of Health and to the Spills Action Center once every 60 months. This notification was completed in 2003.

The details of any events requiring notifications during this reporting period are listed below.

On July 1, 2006, the well pump failed causing a loss of pressure in the system. Notifications were made to the Spills Action Center and to the Environmental Health Division of the local Ministry of Health. The failed pump was removed, the standby pump installed and pressure to the system restored. The system was then flushed, chlorine residuals tested throughout the system and bacteriological samples collected and analyzed.

On Dec. 21, 2006, the well pump failed causing a loss of pressure in the system. Notifications were made to the Spills Action Center and to the Environmental Health Division of the local Ministry of Health. The failed pump was removed, the standby pump installed and pressure to the system restored. The system was then flushed, chlorine residuals tested throughout the system and bacteriological samples collected and analyzed.

utilities kingston
water sewer gas electricity networks
all your utility services under one roof

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Definition & Terms

^{o}C - degrees Celsius
kg - kilogram
m - meter
TCU - True Colour Units
mg - milligram
N/A - Not Applicable
N/D - Non -Detectable
^{o}F - degrees Fahrenheit
l - litre
m^3 - cubic meter=1000 litres.
$CaCO_3$ -Calcium carbonate
psi - pounds per square inch
NTU - Nephelometric Turbidity Units - A measure of the amount of particles in water.
mg/l - Milligrams per litre. This is a measure of the concentration of a parameter in water, also called parts per million (**ppm**).
ug/l - Micrograms per litre, also called parts per billion.
ng/l - Nanograms per litre, parts per trillion.

Parameter-A substance that we sample and analyze for in the water.

AO - Aesthetic objective. AOs are not health related, but may affect the taste, odour, colour or clarity of the water
OG - Operational guideline. Set to ensure efficient treatment and distribution of water.
MAC - Maximum Acceptable Concentration. This is a health-related drinking water standard established for contaminants having 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.

Microbiological Testing Done Under Schedule 10, 11 or 12 of Regulation 170/03, During This Reporting Period

	Number of Samples	Range of E. Coli or Fecal Results (min # - max #)	Range of Total Coliform Results (min # - max #)	Number of HPC Samples	Range of HPC Results (min # - max #)
Raw	56	0	0 - 200	0	
Treated	57	0	0	56	0 – 50
Distribution System	63	0	0	57	0 – 30

Operational Testing Done Under Schedule 7, 8 or 9 of Regulation 170/03 During This Reporting Period

Parameter	Number of Samples	Range of Results (min # - max #)	Unit of Measure	Parameter Description
Turbidity	Continuous	0.02 – 2.0	NTU	Turbidity is a measure of particles in

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

				water.
Chlorine (Treated.)	Continuous	1.80 – 5.00	mg/l	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l min.
Chlorine Residual (Distribution System)	Continuous	1.10 – 5.00	mg/l	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l min.

Summary Of Treated Water Inorganic Parameters Tested During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Antimony	1	<0.001	mg/l	No	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	1	<0.001	mg/l	No	Naturally occurring in surface waters / mine drainage
Barium	1	0.212	mg/l	No	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron	1	0.101	mg/l	No	Erosion of natural deposits, industrial waste effluents.
Cadmium	1	<0.0001	mg/l	No	Industrial discharge
Chromium	1	<0.002	mg/l	No	Industrial residues
Mercury	1	<0.00006	mg/l	No	Erosion of natural deposits, industrial discharges.
Selenium	1	<0.001	mg/l	No	Discharge from refineries, mines, chemical manufacture
Sodium	19	88.9 - 108	mg/l	Yes	Occurs naturally in the earth's crust.
Uranium	1	0.0020	mg/l	No	Erosion of natural deposits.

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Fluoride	2	<0.1 – 0.3	mg/l	No	Naturally occurring.
Nitrite	12	<0.1	mg/l	No	A natural component of water at this level.
Nitrate	12	<0.1 – 0.2	mg/l	No	Runoff from fertilizer use, erosion of natural deposits

Summary Of Treated Water Organic Parameters Tested During This Reporting Period

Parameter	**Number of Samples**	**Results Range**	**Unit of Measure**	**MAC Exceedance**	**Parameter Description**
Alachlor	1	<0.3	ug/l	No	Agricultural herbicide
Aldicarb	1	<3	ug/l	No	Agricultural insecticide
Aldrin + Dieldrin	1	<0.02	ug/l	No	Residue from banned insecticide
Atrazine + N-dealkylated metobolites	1	<0.5	ug/l	No	Agricultural herbicide
Azinphos-methyl	1	<1	ug/l	No	Insecticide
Bendiocarb	1	<3	ug/l	No	Insecticide
Benzene	1	<0.5	ug/l	No	Discharge from plastics manufacturing, leaking fuel tanks
Benzo(a)pyrene	1	<0.005	ug/l	No	Formed from the incomplete burning of organic matter.
Bromoxynil	1	<0.3	ug/l	No	Agricultural herbicide
Carbaryl	1	<3	ug/l	No	Agricultural/Forestry/ Household insecticide
Carbofuran	1	<1	ug/l	No	Agricultural insecticide
Carbon Tetrachloride	1	<0.2	ug/l	No	Discharge from chemical and industrial activities
Chlordane (Total)	1	<0.04	ug/l	No	Residue from banned insecticide

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Chlorpyrifos	1	<0.5	ug/l	No	Agricultural/ Household insecticide
Cyanazine	1	<0.5	ug/l	No	Agricultural/ Residential herbicide
Diazinon	1	<1	ug/l	No	Agricultural/ Livestock Operation/ Residential insecticide
Dicamba	1	<5	ug/l	No	Agricultural herbicide
1,2-Dichlorobenzene	1	<0.1	ug/l	No	Discharge from industrial chemical factories
1,4-Dichlorobenzene	1	<0.2	ug/l	No	Discharge from industrial chemical factories
Dichlorodiphenyltrichloroethane (DDT) + metabolites	1	<0.1	ug/l	No	Residue from banned insecticide
1,2-Dichloroethane	1	<0.1	ug/l	No	Discharge from industrial chemical factories
1,1-Dichloroethylene (vinylidene chloride)	1	<0.1	ug/l	No	Discharge from industrial chemical factories
Dichloromethane	1	<0.3	ug/l	No	Discharge from pharmaceutical and chemical factories
2-4 Dichlorophenol	1	<0.1	ug/l	No	Industrial contamination/ reaction with chlorine
2,4-Dichlorophenoxy acetic acid (2,4-D)	1	<5	ug/l	No	Agricultural/ Residential herbicide
Diclofop-methyl	1	<0.5	ug/l	No	Agricultural herbicide
Dimethoate	1	<1	ug/l	No	Agricultural/ Livestock Operation/ Forestry insecticide
Dinoseb	1	<0.5	ug/l	No	Herbicide residue
Diquat	1	<5	ug/l	No	Agricultural/ Aquatic herbicide
Diuron	1	<5	ug/l	No	Agricultural/ Industrial/ herbicide

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Glyphosate	1	<25	ug/l	No	Agricultural/Forestry/ Household herbicide
Heptachlor + Heptachlor Epoxide	1	<0.1	ug/l	No	Residue from banned insecticide
Lindane (Total)	1	<0.1	ug/l	No	Agricultural/ Pharmaceutical insecticide
Malathion	1	<5	ug/l	No	Fruit & Vegetable / pest control insecticide
Methoxychlor	1	<0.1	ug/l	No	Agricultural/ Livestock Operation/ Residential insecticide
Metolachlor	1	<3	ug/l	No	Agricultural herbicide
Metribuzin	1	<3	ug/l	No	Agricultural herbicide
Monochlorobenzene	1	<0.2	ug/l	No	Discharge from industrial and agricultural chemical factories and dry cleaning facilities
Paraquat	1	<1	ug/l	No	Agricultural/ Aquatic herbicide
Parathion	1	<3	ug/l	No	Agricultural insecticide
Pentachlorophenol	1	<0.1	ug/l	No	Pesticide/ wood preservative residue
Phorate	1	<0.3	ug/l	No	Agricultural insecticide
Picloram	1	<5	ug/l	No	Industrial herbicide
Polychlorinated Biphenyls(PCB)	1	<0.05	ug/l	No	Residue from various industrial uses
Prometryne	1	<0.1	ug/l	No	Agricultural herbicide
Simazine	1	<0.5	ug/l	No	Agricultural herbicide or its residue
Total Trihalomethanes (NOTE: show latest annual average)	1	18.9	ug/l	No	By-product of chlorination. * The MAC for THMs of 100 ug/l is based on a running annual average.

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Temephos	1	<10	ug/l	No	Insecticide for Mosquito/Black fly control
Terbufos	1	<0.4	ug/l	No	Agricultural insecticide
Tetrachloroethylene	1	<0.2	ug/l	No	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)
2,3,4,6-Tetrachlorophenol	1	<0.1	ug/l	No	Wood preservative
Triallate	1	<10	ug/l	No	Agricultural herbicide
Trichloroethylene	1	<0.1	ug/l	No	Discharge from metal degreasing sites and other factories
2,4,6-Trichlorophenol	1	<0.1	ug/l	No	Pesticide manufacturing
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	1	<10	ug/l	No	Industrial herbicide residue
Trifluralin	1	<0.5	ug/l	No	Agricultural herbicide
Vinyl Chloride	1	<0.2	ug/l	No	Leaching from PVC pipes; discharge from plastics factories

Summary Of Additional Treated Water Testing Analyzed By Accredited Laboratories During This Reporting Period

Parameter	**Number of Samples**	**Results Range**	**Unit of Measure**	**MAC Exceedance**	**Parameter Description**
Alkalinity (as $CaCO_3$)	1	380	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	1	<0.01	mg/l	No	May be naturally present or a residual from the coagulation process.

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Ammonia N	1	<0.05	mg/l	No	Occurs naturally from organic nitrogen containing compounds.
Calcium	1	115	mg/l	No	Naturally occurring.
Chloride	1	230	mg/l	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour	12	<2	TCU	No	Typically the result of organic matter in surface waters.
Conductivity	1	1370	Us/cm	No	A measure of ability of water to carry an electric current due to the presence of ions.
Hardness	12	510 - 605	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
Iron	19	0.207 – 0.532	mg/l	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Manganese	19	0.034 – 0.095	mg/l	No	Erosion of natural deposits.
Sulphate	1	65	mg/l	No	An inorganic constituent that may cause tastes at high levels.
Total Kjeldahl Nitrogen	1	<0.1	mg/l	No	Indicator of organic contamination or the potential for taste and odour problems.
Zinc	1	0.026	mg/l	No	An inorganic constituent that may cause tastes.

utilities kingston
water sewer gas electricity networks
all your utility services under one roof

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Summary Of Distribution System Water Inorganic Parameters Tested During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Descrption
Lead(Distribution)	2	0.0009 – 0.0011	mg/l	No	Internal corrosion of household plumbing, erosion of natural deposits.
Fluoride	2	0.2 – 0.3	mg/l	No	Naturally occurring.

Summary Of Distribution System Water Organic Parameters Tested During This Reporting Period

Parameter	Number of Samples	Result Value	Unit of Measure	MAC Exceedance	Parameter Descrption
Total Trihalomethanes (NOTE: shows latest annual average)	4	14.9	ug/l	No	By-product of chlorination. * The MAC for THMs of 100 ug/l is based on a running annual average.

Summary Of Additional Distribution System Water Testing Analyzed By Accredited Laboratories During This Reporting Period

Parameter	Number of Samples	Result Value	Unit of Measure	Exceedance	Parameter Description
Benzo(a)pyrene	1	<0.005	ug/l	No	Formed from the incomplete burning of organic matter.
Cyanide	1	<0.005	mg/l	No	Industrial discharge
Dioxin and Furan	1	<1.44	pg/l	No	Formed in very small amounts in combustion processes
Gross Alpha	1	<0.1	Bq/l	No	Decay of natural deposits.

1211 John Counter Boulevard
P.O. Box 790
Kingston, Ontario
K7L 4X7

Gross Beta	1	0.1	Bq/l	No	Decay of natural deposits.
Nitrilitriacetic acid -NTA	1	<0.03	mg/l	No	Used in laundry detergents.
Nitrosodimethylamine - NDMA	1	<0.0016	ug/l	No	Rarely used industrially but has been used as an antioxidant, and an additive for lubricants
Tritium (Bq/l)	1	<1000	Bq/l	No	Decay of natural & man made deposits.