



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	210003280
Drinking-Water System Name:	Keswick Water Supply System
Drinking-Water System Owner:	Regional Municipality of York
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2009 to December 31, 2009

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [X] No []</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Regional Municipality of York Administrative Building Environmental Services Department 17250 Yonge Street Newmarket, Ontario</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Town of Georgina, Keswick and Sutton Water Distribution	260062686

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?
 Yes [X] No []



Indicate how you notified system users that your annual report is available, and is free of charge.

Public access/notice via the web

Public access/notice via Government Office

Public access/notice via a newspaper

Public access/notice via Public Request

Public access/notice via a Public Library

Public access/notice via other method _____

Describe your Drinking-Water System

York Region is the wholesale supplier of water to the community of Keswick and is responsible for the supply, production, treatment and storage of water.

York Region operates a water treatment plant in the community of Keswick, along Cook's Bay. The Keswick Water Treatment Plant draws water from Cook's Bay in Lake Simcoe to supply a predominantly residential population.

The Keswick Water Treatment Plant was constructed between, 1982-1983. The 600-millimetre diameter water pipe extends 365 metres out into Cook's Bay and draws water from a depth of 8.5 metres. At certain times of the year, when the incoming water rises above 12 degrees Celsius, chlorine is added at the intake to limit Zebra Mussel growth.

The incoming water is initially screened to remove large objects. The water is chemically treated with a coagulant mixed in the riser pipe prior to the flocculation tanks (a coagulant is used to make suspended particles clump together and eventually settle out during the treatment process). The water moves through sedimentation tank, where settling occurs, and is then filtered by dual media gravity filters. The filters contained granular activated carbon, which removes taste and odour in the water. The water continues to the clearwell and ground reservoir located on the plant site.

The filtered water is disinfected using chlorine and is then pumped to distribution system by the high lift pumps. Fluoride is also added to the water at the Keswick Water Treatment Plant.

Treatment processes throughout the plant are monitored by on-line analyzers. The analyzers are equipped with alarms, which alert operational staff of conditions that require attention.

There are two points of entry from the Keswick Water Treatment Plant to the distribution system, extending east and west, servicing the community. The Keswick water treatment plant has the ability to be feed into the same system as Georgina or independently of Georgina based on the mode of operation. Two storage tanks are available in Keswick.

The Township of Georgina owns and operates the distribution system that delivers the water from the regional watermains to the homes in Keswick.



List all water treatment chemicals used over this reporting period

Chlorine Gas
Hydrofluosilicic Acid
Polyhydroxyaluminum Chloride (PAC)
Carbon Dioxide

Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

Some of the following expenditures represent only part of the total project cost.

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date

Microbiological testing done under the 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	52	<1-2	<1-280		
Treated	52	0	0	52	1-210
Distribution					

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity Treated	8760	0.033 – 0.870
Chlorine	8760	0.964 – 2.941
Fluoride (If the DWS provides fluoridation)	8760	0.009 – 1.576

NOTE: For continuous monitors use 8760 as the number of samples.

NOTE: Record the unit of measure if it is not milligrams per litre.



Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Note: See attached results for Inorganic parameters

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony				
Arsenic				
Barium				
Boron				
Cadmium				
Chromium				
Lead				
Mercury				
Selenium				
Sodium				
Uranium				
Fluoride				
Nitrite				
Nitrate				

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing			
Distribution			

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Note: See attached results for Organic parameters (THM value in table below)



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor				
Aldicarb				
Aldrin + Dieldrin				
Atrazine + N-dealkylated metabolites				
Azinphos-methyl				
Bendiocarb				
Benzene				
Benzo(a)pyrene				
Bromoxynil				
Carbaryl				
Carbofuran				
Carbon Tetrachloride				
Chlordane (Total)				
Chlorpyrifos				
Cyanazine				
Diazinon				
Dicamba				
1,2-Dichlorobenzene				
1,4-Dichlorobenzene				
Dichlorodiphenyltrichloroethane (DDT) + metabolites				
1,2-Dichloroethane				
1,1-Dichloroethylene (vinylidene chloride)				
Dichloromethane				
2-4 Dichlorophenol				
2,4-Dichlorophenoxy acetic acid (2,4-D)				
Diclofop-methyl				
Dimethoate				
Dinoseb				
Diquat				
Diuron				
Glyphosate				
Heptachlor + Heptachlor Epoxide				
Lindane (Total)				
Malathion				
Methoxychlor				
Metolachlor				
Metribuzin				
Monochlorobenzene				
Paraquat				
Parathion				
Pentachlorophenol				



Phorate				
Picloram				
Polychlorinated Biphenyls(PCB)				
Prometryne				
Simazine				
THM (NOTE: show latest annual average) Keswick WTP Clearwell		0.024	Mg/L	
Temephos				
Terbufos				
Tetrachloroethylene				
2,3,4,6-Tetrachlorophenol				
Triallate				
Trichloroethylene				
2,4,6-Trichlorophenol				
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)				
Trifluralin				
Vinyl Chloride				

York Region monitors another group of disinfection by-products called haloacetic acids (HAAs). There are no limits set for HAAs in Ontario Drinking Water Standards.

Reading Name	Keswick WTP Clearwell Mg/L June 30
Bromochloroacetic acid	0.004
Dibromoacetic acid	0.004
Dichloroacetic acid	0.012
Monobromoacetic acid	0.004
Monochloroacetic acid	0.02
Trichloroacetic acid	0.012

“<” indicates the result is below the Method Detection Limit

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample

(Only if DWS category is large municipal residential, small municipal residential, large municipal non residential, non municipal year round residential, large non municipal non residential)



Inorganics Test Results

Reading	Units	ODWS		05/01/2009	20/04/2009	27/07/2009	26/10/2009
Antimony as Sb	mg/L	0.006	IMAC	0.0006	0.0004	0.0003	0.0001
Arsenic as As	mg/L	0.025	IMAC	0.0006	0.0006	0.0006	0.0007
Barium as Ba	mg/L	1	MAC		0.0272		
Boron as B	mg/L	5	IMAC		0.022		
Cadmium as Cd	mg/L	0.005	MAC	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium as Cr	mg/L	0.05	MAC	0.0004	< 0.0001	< 0.0001	< 0.0001
Fluoride as F	mg/L	0.8	MAC	0.46	0.41	0.649	0.481
Lead as Pb	mg/L	0.01	MAC	< 0.0001	< 0.0001	< 0.0001	0.0001
Mercury as Hg	mg/L	0.001	MAC		< 0.00002		
Nitrate + Nitrite as N	mg/L	10	MAC	0.21	0.25	0.08	0.06
Nitrate as N	mg/L	10	MAC	0.21	0.25	0.081	0.061
Nitrite	mg/L	1	MAC	< 0.01	< 0.03	< 0.002	< 0.002
Selenium as Se	mg/L	0.01	MAC	0.0003	0.0004	0.0004	0.0008
Sodium as Na	mg/L	200	AO	28.5	26.7	23.4	24.3
Uranium as U	mg/L	0.02	MAC		0.0002		

"<": indicates the result is below Method Detection Limit
 ODWS: Ontario Drinking Water Standard
 MAC: Ontario Drinking Water Standard - Health Related (Maximum Acceptable Concentration)
 AO: Ontario Drinking Water Standard - Non Health Related (Aesthetic Objective)
 mg/L: milligrams per litre, parts permillion (ppm)



Organics Test Results

Reading	Units	ODWS		20/04/2009	27/07/2009	26/10/2009
(DDT) + Metabolites	mg/L	0.03	MAC	< 0.000008		
1,1-dichloroethylene (vinylidene chloride)	mg/L	0.014	MAC	< 0.0003	< 0.0003	< 0.0003
1,2-(o-dcb) Dichlorobenzene	mg/L	0.2	MAC	< 0.0001	< 0.0001	< 0.0001
1,2-Dichloroethane	mg/L	0.005	IMAC	< 0.0001	< 0.0001	< 0.0001
1,4-(p-dcb) Dichlorobenzene	mg/L	0.005	MAC	< 0.0001	< 0.0001	< 0.0001
2,3,4,6-Tetrachlorophenol	mg/L	0.1	MAC	< 0.0005		
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	mg/L	0.28	MAC	< 0.0005		
2,4,6-Trichlorophenol	mg/L	0.005	MAC	< 0.0005		
2,4-Dichlorophenol	mg/L	0.9	MAC	< 0.0004		
2,4-dichlorophenoxyacetic acid (2,4-D)	mg/L	0.1	IMAC	< 0.0008		
Alachlor	mg/L	0.005	IMAC	< 0.0004		
Aldicarb	mg/L	0.009	MAC	< 0.006		
Aldrin + Dieldrin	mg/L	0.0007	MAC	< 0.000006		
Atrazine + N-dealkylated metabolites	mg/L	0.005	IMAC	< 0.0002		
Azinphos-methyl	mg/L	0.02	MAC	< 0.0003		
Bendiocarb	mg/L	0.04	MAC	< 0.003		
Benzene	mg/L	0.005	MAC	< 0.0001	< 0.0001	< 0.0001
Benzo(a)pyrene	mg/L	0.00001	MAC	< 0.00001		
Bromoxynil	mg/L	0.005	IMAC	< 0.0004		
Carbaryl	mg/L	0.09	MAC	< 0.003		
Carbofuran	mg/L	0.09	MAC	< 0.003		
Carbon Tetrachloride	mg/L	0.005	MAC	< 0.0002	< 0.0002	< 0.0002
Chlordane (Total)	mg/L	0.007	MAC	< 0.000006		
Chlorpyrifos	mg/L	0.09	MAC	< 0.0002		
Cyanazine	mg/L	0.01	IMAC	< 0.0003		
Diazinon	mg/L	0.02	MAC	< 0.0002		
Dicamba	mg/L	0.12	MAC	< 0.0004		
Dichloromethane	mg/L	0.05	MAC	< 0.0005	< 0.0005	< 0.0005
Diclofop-methyl	mg/L	0.009	MAC	< 0.0004		
Dimethoate	mg/L	0.02	IMAC	< 0.0003		
Dinoseb	mg/L	0.01	MAC	< 0.0005		
Diquat	mg/L	0.07	MAC	< 0.001		
Diuron	mg/L	0.15	MAC	< 0.003		
Glyphosate	mg/L	0.28	IMAC	< 0.025		
Heptachlor + Heptachlor Epoxide	mg/L	0.003	MAC	< 0.000008		
Lindane	mg/L	0.004	MAC	< 0.000005		
Malathion	mg/L	0.19	MAC	< 0.0002		
Methoxychlor	mg/L	0.9	MAC	< 0.000009		
Metolachlor	mg/L	0.05	IMAC	< 0.0002		
Metribuzin	mg/L	0.08	MAC	< 0.0003		
Monochlorobenzene	mg/L	0.08	MAC	< 0.0001	< 0.0001	< 0.0001
Paraquat	mg/L	0.01	IMAC	< 0.001		
Parathion	mg/L	0.05	MAC	< 0.0002		



Organics Test Results

Reading	Units	ODWS		20/04/2009	27/07/2009	26/10/2009
Pentachlorophenol	mg/L	0.06	MAC	< 0.0004		
Phorate	mg/L	0.002	IMAC	< 0.0002		
Picloram	mg/L	0.19	IMAC	< 0.0007		
Polychlorinated Biphenyls (PCBs)	mg/L	0.003	IMAC	< 0.00002		
Prometryne	mg/L	0.001	IMAC	< 0.0002		
Simazine	mg/L	0.01	IMAC	< 0.0002		
Temephos	mg/L	0.28	IMAC	< 0.003		
Terbufos	mg/L	0.001	IMAC	< 0.0002		
Tetrachloroethylene (perchloroethylene)	mg/L	0.03	MAC	< 0.0003	< 0.0003	< 0.0003
Triallate	mg/L	0.23	MAC	< 0.004		
Trichloroethene	mg/L	0.005	MAC	< 0.0001	< 0.0001	< 0.0001
Trifluralin	mg/L	0.045	IMAC	< 0.000006		
Vinyl Chloride	mg/L	0.002	MAC	< 0.0002	< 0.0002	< 0.0002

"<": indicates the result is below Method Detection Limit

ODWS: Ontario Drinking Water Standard

MAC: Ontario Drinking Water Standard - Health Related (Maximum Acceptable Concentration)

AO: Ontario Drinking Water Standard - Non Health Related (Aesthetic Objective)

mg/L: milligrams per litre, parts permillion (ppm)