

COCHRANE WATER TREATMENT PLANT

WATERWORKS ANNUAL REPORT

JANUARY 1 TO DECEMBER 31, 2003

CORPORATION OF THE TOWN OF COCHRANE

WATERWORKS # 22 000 3047

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1. Introduction

The Cochrane Water Treatment Plant, of the Corporation of the Town of Cochrane is pleased to present its annual report for 2003 to the citizens of the Town of Cochrane. The province's Drinking Water Protection Regulations require that we publish this report for your information. Here you will find the water quality data and other information that was collected throughout the year.

If you have a question about the Cochrane Water System or this report, please call the operator in charge, Mr. Stan Wisniewski at the Plant at 705-272-5445, or the Operations Manager, Mr. Doug Theobald at 705-272-4232 during regular business hours. You can also contact us by mail at P.O. Box 640, Cochrane, Ontario P0L 1C0. The plant staff are all licensed operators.

2. Water Source

The water treatment works relies on groundwater from 3 wells, each with a capacity of 45.3 litres per second. The maximum flow rate for each well cannot exceed 50 litres per second. The wells are located at the east side of Golf Course Road, Lot 19, Concession 1, in Town of Cochrane, next to the Plant. While the population of Cochrane is about 4600, the Plant has the capacity of delivering 8000 cubic metres per day.

3. Treatment Process

The treatment process was designed to remove high iron content, manganese and hardness present in the raw water supplied that is produced by the three wells. "Lime Softening" is the process that is used. First, hydrated lime (calcium hydroxide) is added to the water. This increases the pH of the water causing the calcium carbonate, iron and manganese to precipitate out of the water. Most of the precipitated particles settle out in two settling tanks. Then carbon dioxide is added in a recarbonation tank to reduce the pH to normal levels with the dual media filters used to filter out any remaining particles. The finished water is now stored in an interconnected twin celled in-ground clear well/reservoir that has a capacity of 2,300 cubic metres. Three high-lift pumps, each rated at 83.4 litres per second are used to pump the water into the town's distribution system. On the other side of town, a 2,700 cubic metre elevated storage tank provides gravity flow to the town. This storage is used during peak demand times in the day, and is available to provide the very high flow rates that could be required by the fire department in case of a large fire.

The plant and storage tank (tower) have complete automatic control and alarm systems that notify the operator of any problems. The plant also has an emergency diesel generator that allows water to be treated and pumped in the event of a power outage.

4. Groundwater

Groundwater must be treated to deal with possible disease-causing microorganisms, and aesthetically for iron, manganese and hardness. The regulation made under the **Ontario Water Resources Act** (OWRA) requires that all water entering the distribution system needs to be disinfected. The **Ontario Drinking Water Standards** (ODWS) requires that a minimum of 0.2 mg/L chlorine residual, measured as free chlorine shall be maintained in the distribution system. Cochrane disinfects all the water it supplies. The addition of chlorine has virtually eliminated any adverse bacteriological results. The maintenance of a low free chlorine residual throughout the distribution system helps eliminate bacteria and control disease-causing organisms that accidentally may enter the distribution system through possible cross-connections and watermain breaks.

5. Definitions

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

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.

Parameter

This is a substance that we sample and analyze for in the water

mg/l

milligrams per litre. This is a measure of the concentration of a parameter in water, sometimes called parts per million (ppm). One part per million (mg/l) corresponds to one minute in two years, or a single penny in \$10,000.

ug/l

Micrograms per litre or parts per billion. One part per billion (ppb) corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Some parameters may be present in source water before we treat it. Here is a description of the various groups of parameters.

Microbiological parameters such as bacteria may come from sewage plants, livestock operations, septic systems or wildlife. Microbiological quality is the most important aspect of drinking water 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 as a result of urban storm runoff, 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 runoff 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 byproducts such as trihalomethanes).

Did you know..... There are over 165,000 species of E.coli, 65 of which are harmful to human health. But no level of the bacterium, which lives in fecal matter, is acceptable in drinking water.

6. Compliance Summary

Our Certificate of Approval from the Ministry of Environment plus the new Ontario Drinking Water Regulations sets monitoring requirements. Part 3 of this report summarizes all the detectable results from the monitoring we are required to do. The presence of these substances in drinking water does not necessarily mean that the water poses a health risk.

Most of our testing is performed by Accurassay Laboratories, located in Kirkland Lake, Ontario. However, in order to maintain compliance with Regulations 170/03, some samples are analyzed by Maxxam Analytics Inc., an accredited laboratory located in Mississauga, Ontario. Maxxam Analytics Inc. is currently testing the V.O.C. and THM for our Waterworks operation.

Did we exceed the standards?

In the past year, we took about 427 microbiological and chemical samples. Of all the treated samples that were done, one exceedence was reported (refer to Part 2).

Part 3 is a detailed chart of the sampling and test results throughout 2003.

7. Laboratory Services

The Cochrane Public Utilities Commission employs the services of Accurassay Laboratories for all testing of water samples. Accurassay also sub-contracts some of these samples to other laboratories who provide the required testing as per Regulation 170/03. All laboratories employed for the Cochrane PUC's water testing are accredited. A list of these laboratories are as follows:

Accurassay Laboratories
3 Industrial Drive, P.O.
Kirkland Lake, ON P2N 3J1
Tel: (705) 567-3361

Maxxam Analytics
50 Bathurst St. Unit 12
Waterloo, ON N2V 2C5
Tel: (800) 747-3806

Becquerel Laboratories Inc.
6790 Kitimat Road, Unit 4
Mississauga, ON L5N 5L9
Tel: (905) 826-3080

Philip Analytical Services
8577 Commerce Court
Burnaby, BC

Philip Analytical Services
5555 North Service Road
Burlington, ON L7L 5H7
Tel: (800) 668-0639

Philip Analytical Services
5735 McAdam Road
Mississauga, ON
Tel: (905) 890-8566

Operational Parameters

to Microbiological Quality	MAC or IMAC	No. of Samples	Detectable Results	Sample Date	Range	Exceedence	Typical Source of Contaminant
Turbidity (NTU) Plant	1	365	365	01/01/03 to 12/31/03	01/01/03 to 12/31/03	No	Indicates presence of particles in water due to treatment difficulties
Free Chlorine - Plant	-	365	365	01/01/03 to 12/31/03	0.55-1.80	No	See below
Free Chlorine - System	-	272	272	01/01/03 to 12/31/03	0.09-1.56	No	Recommended level of at least 0.2 mg/l in system to maintain microbiological quality in a system
Residual Chlorine	-	365	365	01/01/03 to 12/31/03	0.75-1.94	No	
Hardness	-	365	365	01/01/03 to 12/31/03	98.00-213.00	No	
Temperature	-	365	365	01/01/03 to 12/31/03	7.8°C	No	
pH	-	365	365	01/01/03 to 12/31/03	6.95-9.66	No	
Colour	-	365	0	01/01/03 to 12/31/03	n/a	No	
Inorganic Parameters	MAC or IMAC	Number of Samples	Detectable Results	Sample Date	Range	Exceedence	Typical Source of Contaminant
Fluoride	1.5	356	356	01/01/03 to 12/31/03	0.50-0.83	No	Recommended concentration is to be adjusted between 0.50 - 0.85 mg/L, the optimum level for control of tooth decay

ODWS Table A - Microbiological Results (Weekly)

Microbiological Parameters (Raw - Well #5-6-7)	MAC or IMAC	No. of Samples	Number of Detectable Results	Sample Date	Range	Exceedence	Typical Source of Contaminant
Total Coliforms (counts/100 ml)	-	160	31	01/01/03 to 12/31/03	<1->200	No	Indicates possible presence of Fecal matter
E. coli (counts/100 ml)	<1	160	31	01/01/03 to 12/31/03	0-<1	No	Definite indicator of fecal contamination
Heterotrophic Plate Count (HPC)	500	160	1	01/01/03 to 12/31/03	0-<2	No	Indication of water quality in terms of general bacterial content (non disease bacteria)

* indicator of adverse water quality if detected in treated water

Microbiological Parameters (Treated Water Plant)	MAC or IMAC	Number of Samples	Number of Detectable Results	Sample Date	Range	Exceedence	Typical Source of Contaminant
Total Coliforms (counts/100 ml)	0	53	0	01/01/03 to 12/31/03	n/a	No	Indicates possible presence of Fecal matter
E. coli (counts/100 ml)	0	53	0	01/01/03 to 12/31/03	n/a	No	Definite indicator of fecal contamination
Heterotrophic Plate Count (HPC)	500	53	45	01/01/03 to 12/31/03	<2-43	No	Indication of water quality in terms of general bacterial content (non disease bacteria)

* indicator of adverse water quality if detected in treated water

Microbiological Parameters (Distribution)	MAC or IMAC	Number of Samples	Number of Detectable Results	Sample Date	Range	Exceedence	Typical Source of Contaminant
Total Coliforms (counts/100 ml)	<1	222	0	01/01/03 to 12/31/03	n/a	No	Indicates possible presence of Fecal matter
E. coli (counts/100 ml)	<1	222	0	01/01/03 to 12/31/03	n/a	No	Definite indicator of fecal contamination
Heterotrophic Plate Count (HPC)	500	222	99	01/01/03 to 12/31/03	<2-720*	Yes	Indication of water quality in terms of general bacterial content (non disease bacteria)

* indicator of adverse water quality if detected in treated water

Tours of the water plant can be arranged by phoning the water plant at 272-5445. Water analyses are available at the water plant. Please phone the water treatment plant to make arrangements.

ODWS - Table C Inorganics (Every 3 months)							
Inorganics	MAC or IMAC mg/l	Number of samples	Number of detectable results	Sample date	Range Treated mg/l	Exceedence	Description
Nitrate	10	4	4	2003	<0.10-<0.5	No	Used as a fertilizer
Nitrite	1.0	4	4	2003	<0.10-<0.5	No	Used as a preservative
Trihalomethanes	MAC or IMAC mg/l	Number of samples	Number of detectable results	Sample date	Range Distribution ug/l	Exceedence	Description
Chloroform	0.1	4	4	2003	14-Nov	No	Results from chemical interaction of chlorine
Bromodichloromethane	0.1	4	4	2003	2.1-2.9	No	
Dibromochloromethane	0.1	4	4	2003	<0.20 -<0.5	No	
Bromoform	0.1	4	4	2003	<0.20 -<0.5	No	
Total Trihalomethanes	100			2003	13.1-17.9	No	

ODWS - Table C Inorganics (Every 12 months)				
Parameter	Date of Sample	Raw	Treated	Distribution
Lead	2-Jun-03		0.003	

ODWS - Table C Inorganics (Every 36 months)				
Parameter	Date of Sample	Raw	Treated	Distribution
Arsenic	14-Apr-03	<0.002	<0.002	<0.002
Barium	14-Apr-03	0.1	0.009	0.01
Boron	14-Apr-03	0.054	0.046	0.042
Cadmium	14-Apr-03	<0.00007	<0.00007	0.00033
Chromium	14-Apr-03	<0.002	0.002	0.002
Mercury (ug/l)	14-Apr-03	<0.05	<0.05	<0.05
Selenium	14-Apr-03	<0.002	<0.002	<0.002
Uranium	14-Apr-03	0.0002	0.0002	0.0004

All results expressed as milligrams per litre unless otherwise stated

*expressed as Micro Siemens as per centimetre

< denotes less than method detection limit

ODWS - Table B Volatile Organics (Every 36 months)							
Volatile Organic	MAC or IMAC	Number of samples	Number of detectable results	Sample date	Treated ug/l	Exceedence	Description
Benzene	5	1	1	2-Jun-03	<0.30	No	Known to be a human carcinogen
Benzo(a)pyrene							
Carbon tetrachloride	5	1	1	2-Jun-03	<0.30	No	Classified as a carcinogen
1,2 - Dichloroabenzen	200	1	1	2-Jun-03	<0.40	No	Imparts an unpleasant taste to water
1,4 - Dichloroabenzene	5	1	1	2-Jun-03	<0.20	No	Imparts an unpleasant taste to water
1,2 - Dichloroethane	5	1	1	2-Jun-03	<0.40	No	Used as a lead scavenger in gasoline
1,1 - Dichloroethylene	14	1	1	2-Jun-03	<0.60	No	Used in the preparation of vinyl chloride

ODWS - Table D Pesticides and PCBs (Every 36 months)

Pesticides & PCB	MAC or IMAC mg/l	Number of samples	Number of detectable results	Sample date	Range mg/l	Exceedence	Description
<i>* All results expressed as mg/l unless otherwise stated</i>							
Dichloromethane	50	1	1	2-Jun-03	<0.30	No	Used as an industrial solvent
Monochlorobenzene	80	1	1	2-Jun-03	<0.30		
Tetrachloroethylene	30	1	1	2-Jun-03	<0.20	No	Used primarily as a solvent in dry cleaning
Trichloroethylene	50	1	1	2-Jun-03	<0.30	No	Used in metal degreasing operations
Vinyl Chloride	2	1	1	2-Jun-03	<0.40	No	Is classified as a human carcinogen
Alachlor	0.0005	1	1	2-Jun-03	<0.0005	No	Known to be a human carcinogen
Aldicarb	0.009	1	1	2-Jun-03	<0.0005	No	Classified as a carcinogen
Aldrin+Dieldrin	0.0007 ug/l	1	1	2-Jun-03	<0.002	No	Imparts an unpleasant taste to water
Atrazine	0.005	1	1	2-Jun-03	<0.0005	No	(Herbicide) used for weed control
Azinophos-methyl	0.02	1	1	2-Jun-03	<0.001	No	Imparts an unpleasant taste to water
Bendiocarb	0.04	1	1	2-Jun-03	<0.001	No	Used as a lead scavenger in gasoline
Bromoxynil	0.005	1	1	2-Jun-03	<0.0005	No	Used in the preparation of vinyl chloride
Carbaryl	0.09	1	1	2-Jun-03	<0.001	No	Used as an industrial solvent
Carbofuran	0.09	1	1	2-Jun-03	<0.001	No	Used in the manufacture of styrene
Chlordane (Total)	0.007 ug/l	1	1	2-Jun-03	<0.002	No	Used as a solvent in paints
Chlorpyrifos	0.09	1	1	2-Jun-03	<0.001	No	Used primarily as a solvent in dry cleaning
Cyanazine	0.01	1	1	2-Jun-03	<0.001	No	Used in metal degreasing operations
Diazinon	0.02	1	1	2-Jun-03	<0.001	No	Results from chemical interaction of chlorine
Dicamba	0.12	1	1	2-Jun-03	<0.0002	No	(Herbicide) used for weed control
2,4 -Dichlorophenol	0.9	1	1	2-Jun-03	<0.0003	No	(Organic) will impart an unpleasant taste
DDT	0.03	1	1	2-Jun-03	<0.004	No	Known to be a human carcinogen
2,4 -D	0.9	1	1	2-Jun-03	<0.0002	No	Classified as a carcinogen
Diclofop-methyl	0.009	1	1	2-Jun-03	<0.0002	No	Imparts an unpleasant taste to water

* AO = Aesthetic Objective

ODWS - Table D Pesticides and PCBs (Every 36 months)

Pesticides & PCB	MAC or IMAC mg/l	Number of samples	Number of detectable results	Sample date	Range mg/l	Exceedence	Description
Dimethoate	0.02	1	1	2-Jun-03	<0.001	No	Imparts an unpleasant taste to water
Dinoseb	0.01	1	1	2-Jun-03	<0.00005	No	Used as a lead scavenger in gasoline
Diquat	0.07	1	1	2-Jun-03	<0.010	No	(Herbicide) used as a crop desiccant
Diuron	0.15	1	1	2-Jun-03	<0.0005	No	Used as an industrial solvent
Glyphosate	0.28	1	1	2-Jun-03	<0.010	No	Used in the manufacture of styrene
Heptachlor	0.003 ug/l	1	1	2-Jun-03	<0.002	No	Used as a solvent in paints
Lindane (Total)	0.004 ug/l	1	1	2-Jun-03	<0.002	No	Used primarily as a solvent in dry cleaning
Malathion	0.19	1	1	2-Jun-03	<0.001	No	Used in metal degreasing operations
Methoxychlor	0.9 ug/l	1	1	2-Jun-03	<0.040	No	Results from chemical interaction of chlorine
Metolachlor	0.05	1	1	2-Jun-03	<0.001	No	(Herbicide) used for weed control
Metribuzin	0.08	1	1	2-Jun-03	<0.001	No	(Herbicide) used for weed control
Paraquat	0.01	1	1	2-Jun-03	<0.010	No	(Herbicide) used for weed control
Parathion	0.05	1	1	2-Jun-03	<0.001	No	Known to be a human carcinogen
Pentachlorophenol	0.06	1	1	2-Jun-03	<0.002	No	Classified as a carcinogen
Phorate	0.002	1	1	2-Jun-03	<0.0002	No	Imparts an unpleasant taste to water
Picloram	0.19	1	1	2-Jun-03	<0.00005	No	Imparts an unpleasant taste to water
PCB	0.003 ug/l	1	1	2-Jun-03	<0.050	No	Used as a lead scavenger in gasoline
Prometryne	0.001	1	1	2-Jun-03	<0.0002	No	Used in the preparation of vinyl chloride
Simazine	0.01	1	1	2-Jun-03	<0.001	No	Used as an industrial solvent
Temephos	0.28	1	1	2-Jun-03	<0.005	No	Used in the manufacture of styrene
Terbufos	0.001	1	1	2-Jun-03	<0.0002	No	Used as a solvent in paints
2,3,4,6 Tetrachlorophenol	0.1	1	1	2-Jun-03	<0.0005	No	Used primarily as a solvent in dry cleaning
Triallate	0.23	1	1	2-Jun-03	<0.001	No	Used in metal degreasing operations
2,4,6 -Trichlorophenol	0.005	1	1	2-Jun-03	<0.0005	No	Results from chemical interaction of chlorine
Trifluralin	0.045	1	1	2-Jun-03	<0.001	No	(Herbicide) used for weed control

2,4,5 - T	0.28	1	1	2-Jun-03	<0.00005	No	(Herbicide) used for weed control
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ODWS - Table C Inorganics (Every 60 months)				
Parameter	Date of Sample	Raw	Treated	Distribution
Sodium	4-Feb-02	18	19	18