Ontario

Ministry of the Environment
Drinking Water Inspection Report

COMPLIANCE INSPECTION REPORT

CORNWALL WATER TREATMENT PLANT

INSPECTION DATE: ***AUGUST 27, 2003***
REPORT DATE: ***MAY 28, 2004***

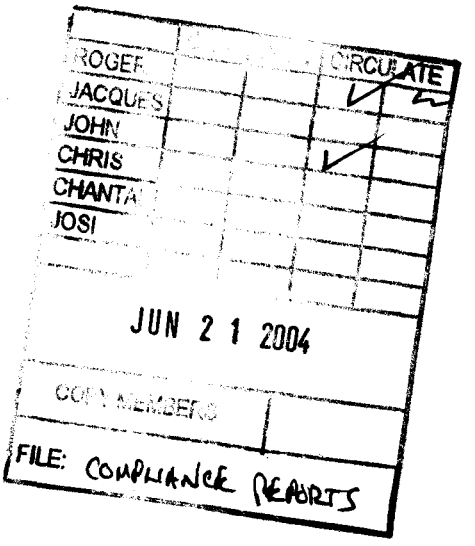
Ministry of the Environment

113 Amelia Street
Cornwall ON K6H 3P1
Telephone: (613) 933-7402
Fax: (613) 933-6402

Ministère de l'Environnement

113 rue Amelia
Cornwall ON K6H 3P1
Téléphone: (613)933-7402
Télécopieur: (613)933-6402

Ontario



June 15, 2004

Mr. Cecil Vincent
City of Cornwall
PO Box 877
360 Pitt Street
Cornwall, Ontario
K6H 5T9

Dear Sir:

Re: Compliance Inspection - 2003/2004
Cornwall Waterworks

The Cornwall Water Treatment Plant was inspected on August 27, 2003, by Jan Franssen, Inspector, Drinking Water Inspection Program, Eastern Region. Enclosed is a copy of the inspection report.

A copy of the Compliance Inspection Report will be sent to Mr. Morris McCormick and to Mr. Tom Gemmel. Copies will also be sent to Dr. Robert Bourdeau, Medical Officer of Health for the Eastern Ontario Health Unit, Mr. Mirek Tybinkowski, MOE Environmental and Approvals Branch, and Mr. Roger Houde of the Raisin River Conservation Authority.

Your attention is directed to Section 6 "Summary of Non-Compliance Issues and Required Actions" and Section 7 "Summary of Best Practice Recommendations" of this report. Please provide a response by July 31, 2004 detailing how the City plans to address the recommendations provided in Sections 6 and 7.

Should you have any questions pertaining to the Compliance Inspection Report please do not hesitate to contact me at (613) 933-7402 extension 234.

Yours truly,

Jan Franssen
Inspector
Drinking Water Inspection Program
Eastern Region

cc:dhm
enclosure

cc: Mr. Morris McCormick, Division Manager - City of Cornwall
Mr. Tom Gemmel, Supervisor Public Works Dept. - City of Cornwall
Dr. Robert Bourdeau, Medical Officer of Health - Eastern Ontario Health Unit
Mr. Mirek Tybinkowski, Specialist: Water and Wastewater - MOE EAAB
Mr. Roger Houde, Manager - Raisin River Conservation Authority
District Office File - ST ST CC SE 540

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INSPECTION DETAILS	
Location:	861 Second Street West, Cornwall, Ontario
Water Works Type:	Treatment With Distribution
Water Works Number:	220001049
Inspection Type:	Unannounced
Date of Inspection:	August 27, 2003
Date of Previous Inspection:	September 17, 2002
Inspection Number:	291

CONTACT INFORMATION	
Municipality/Owner City of Cornwall PO Box 877 360 Pitt Street Cornwall, Ontario K6H 5T9 Attention: Cecil Vincent Chief Administrative Officer Phone: 613-932-6252 Fax: 613-932-2448	**Operating Authority** City of Cornwall Environmental Services Division P.O. Box 877 861 Second Street West Cornwall, Ontario K6J 1H5 Attention: Morris McCormick, Division Manager Tom Gemmel, Public Works Sup. Phone: 613-448-3098 Fax: 613-448-1616
Inspector: Jan Franssen Cornwall Office Eastern Region 613-933-7402 ext 234	Distribution Date: May 28, 2004

Name and address of other contacts can be found in **Appendix E**.

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SECTION 1 INTRODUCTION

1.1 INSPECTION OBJECTIVES

The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and control documents, as well as conformance with Ministry drinking water-related policies for the inspection period. Specifically, this includes a review and assessment of operating practices as they relate to the following documents:

- The Safe Drinking Water Act, 2002
- Drinking Water Systems Regulation (O. Reg. 170/03)
- Operator Certification Regulation (Water Works and Sewage Works - O. Reg. 435/93)
- Certificates of Approval
- Permits to Take Water
- Previous Ministry Compliance Inspection Report
- Engineer's Report dated November 2000

The ministry has implemented a rigorous and comprehensive approach to the inspection of water systems that focuses on source, treatment, and distribution components as well as water system management practices. This inspection report includes the findings from the Inspection of the Cornwall Water Treatment Plant and Distribution System. Findings pertaining to the St.Andrews/Rosedale Distribution System are provided in the 2003/2004 compliance inspection report for that facility.

Table 1 AUTHORIZING AND CONTROL DOCUMENTS REVIEWED

CERTIFICATES OF APPROVAL		
Certificate #	**Date Issued**	**Description**
7187-59GGEQ	June 20, 2002	Amended Certificate of Approval
PERMIT TO TAKE WATER		
Permit #	**Expiry Date**	**Description**
03-P-405	July 21, 2013	Permit to Take Water
PREVIOUS ORDERS		
Order #	**Date Issued**	**Description**
--	--	None Issued

SECTION 2 EXISTING WATER SYSTEM DESCRIPTION

The Cornwall Water Treatment Plant, constructed in 1957, is owned by the City of Cornwall and is operated by the City's Environmental Services Division. Water from Lake St.Lawrence flows through a raw water transmission line to the water treatment works located at 861 Second Street in the City of Cornwall. The raw water is treated by a conventional water treatment plant consisting of coagulation and flocculation, sedimentation, filtration, and disinfection. Treated water is supplied to consumers in the City of Cornwall (population 46,000) and to the communities of Rosedale Terrace and St.Andrews located in the Township of South Stormont.

2.1 WATER SOURCE

The intake structure is located in the west-face of the R.H Saunders Dam, approximately 15 m below the level of Lake St.Lawrence. A steel screen at the intake prevents larger objects from entering the raw water transmission line.

A valve house containing an automatic flow control valve, regulating the flow of water into the transmission line, is situated at the base of the dam. Adjacent to the valve house, is an enclosed building that houses the zebra mussel control system. The zebra mussel control system consists of two raw water recirculation pumps (one duty, one standby), raw water supply line, two chlorine gas cylinders (one duty, one standby), one scale, one chlorinator, one chlorine residual analyzer, and a chlorine solution line extending from the chlorinator to the diffuser device at the raw water intake structure.

Raw water is gravity fed from the valve house to the treatment plant via a 42" transmission line. The flow of raw water into the treatment plant is measured by a venturi type flow meter located at the plant. Additional details regarding the raw water intake and zebra mussel control facilities are provided in the amended CofA a copy of which is provided in Appendix A.

2.2 TREATMENT PROCESSES

Raw water enters the treatment plant at the screen house where a venturi meter measures the raw water flow into the plant. As raw water enters the plant it is injected with a coagulant (Pass C-liquid alum) before it flows through a traveling screen that filters out small debris.

Downstream of the traveling screen, the water flows into a premix chamber (volume of 99 m3) located at the screen house. When chlorine is not injected at the raw water intake it is injected into the premix chamber.

Water then flows from the premix chamber into one of two mixing tanks (combined volume of 179 m3). The mixing tanks are operated in parallel and each tank consists of three chambers

equipped with stationary baffles. There are no mechanical agitator devices installed, instead the kinetic energy of incoming water flow is used for both coagulation and flocculation processes.

Water from the mixing tanks is gravity fed into one of two settling tanks (volume of 1873 m3 each) that are also operated in parallel. Downstream of the settling tanks, water is gravity fed onto four Rapid Gravity Filter-Adsorber units that are operated in parallel. All four filters are dual media, consisting of granular activated carbon and sand.

The filters are equipped with surface agitators that are activated prior to backwashing. Backwash water is pumped from the clear well and through the filters. Backwash water is discharged to the sanitary sewer.

The filtered water flows into a clear well (volume of 1363 m3) located at the treatment plant. Fluoride is added to the water in the clear well through a diffuser. From the clearwell the filtered water overflows into a reservoir (volume of 3182 m3) from which the water is pumped into the distribution system by one of five high lift pumps (three duty and two standby) that discharge to a common header. Of the five pumps, three are electric, one is diesel and one is dual electric-diesel. The treated water is chlorinated prior to being pumped into the distribution system.

Instrumentation at this facility includes: seven flow metering devices (one on the raw water intake pipe, one on each filtrate line, and two on the high lift pump common discharge header); two chlorine residual analyzers (one at the settled water common discharge header and the other at the high lift pump common discharge header), six turbidimeters (one on the raw water intake pipe, one on each filtrate line and one on the high lift pump common discharge header); one fluoride analyzer at the high lift pump common discharge header. A pH meter at the screen house measures the pH at the raw water intake pipe.

A detailed description of the components of the treatment system are provided in the amended CofA (see Appendix A). GPS coordinates for the water treatment plant are provided in Appendix C.

2.3 DISTRIBUTION SYSTEM

Water is pumped through two discharge pipes to the distribution system. The east outlet discharge pipe feeds the north portion of the City as well as the elevated storage tank. The south outlet discharge pipe feeds the east and west sections of Cornwall and the Boundary Road Reservoir.

The distribution system consists of approximately 200 kilometers of pipes and mains. It also consists of two remote reservoirs, Boundary Road Reservoir and Tollgate Elevated Storage Tank.

The Boundary Road Reservoir was constructed in 1973 to augment the pressure in the eastern portion of the City and to provide storage for fire protection. The Boundary Road reservoir has a capacity of 9,091 cubic meter and is equipped with a sodium hypochlorite feed system to augment disinfectant residual levels in the distribution system, and three pumps that transfer treated water from the reservoir to the distribution system. Both incoming and outgoing residual chlorine levels are monitored.

An elevated water tank with a capacity of 4545 cubic meters is located on Tollgate Road between McConnell Avenue and Pitt Street. The elevated tank was built and commissioned in 1991 to act as an emergency reservoir and to maintain the system pressure. In 1991, water service was extended to Rosedale Terrace and St. Andrews in the Township of South Stormont, the elevated tank assists in maintaining pressure in those areas. Typically, the tank is filled during the night and water is then drawn from the tank throughout the day.

2.4 SYSTEM DIAGRAM

The diagram of the water treatment plant is provided in Appendix F.

SECTION 3 INSPECTION FINDINGS

3.1 OPERATIONS

3.1.1 Source/Supply

Water is drawn from Lake St.Lawrence. Potential sources of contamination include the sewage treatment plants at Iroquois, Morrisburg, and Ingleside, and industrial discharges from Rohmax Canada in Morrisburg.

The screen at the raw water intake is inspected yearly, and debris and zebra mussels are removed.

A smooth nozzle tap located at the zebra mussel control facility is used to collect a raw water sample. Due to the configuration of the raw water sampling line the operators must temporarily shut off the supply of chlorine in order to collect a representative sample. The operator indicated that the chlorination equipment is shut off for approximately 30 minutes to collect the sample. Once the sample has been collected the system is immediately reactivated.

The Ministry collected a raw water sample from this location, and the analytical results are discussed in Section 4.2 of this report.

Permit to Take Water Assessment

The Cornwall Water Treatment Plant was constructed in 1957 and therefore did not require a Permit to Take Water as specified under Section 34(3)(b) of the Ontario Water Resources Act. Water Treatment Plants that began operation prior to March 29, 1961 did not require a PTTW.

On March 20, 2003 the owner submitted an application for a PTTW. The PTTW was granted on July 21, 2003 and authorizes a rate of taking up to 125,000 L/min or 100,000,000 L/day. General Condition 2 of the PTTW requires that a copy of the permit is kept at the offices of the Corporation of the City of Cornwall (360 Pitt Street) and at the Cornwall Water Treatment Plant. Special Condition 13 of the PTTW requires that the owner record the daily amount of water taken and to keep records of these amounts at the City's offices and at the Water Treatment Plant.

A raw water flow meter is located at the end of the raw water transmission line a provides a measure of the volume of water entering the treatment plant. The flow meter is connected to the SCADA system and records total and peak flows. A review of the calibration logs indicated that the flow meter was last inspected on September 22, 2003.

A review of the 2003 raw water flow records indicates that the Annual Records of Water Taking for 2002 and 2003 indicated that the highest maximum daily flow was calculated to be 66,752,000 L/day (July, 2003). The owner is in compliance with the rate of taking authorized by the PTTW

PERMIT TO TAKE WATER ASSESSMENT				
PERMIT NUMBER	**RENEWAL DATE**	**SOURCE**	**PERMITTED AMOUNT OF TAKING**	**UNITS**
03-P-4058	July 21, 2013	Lake St.Lawrence	100,000,000	L/day

A copy of the PTTW is provided in **Appendix B**.

The operator indicated that there are no water conservation by-laws in place.

3.1.2 Treatment Processes

The treatment equipment is installed in accordance with the description provided in the amended CofA. The inspection revealed that the facility and equipment appear to be well maintained. The operating authority indicated that the system operated without interruption since the previous MOE compliance inspection, and that only certified operators made adjustments to treatment equipment.

Condition 1.2 of the amended CofA specifies that the maximum rate of take shall not exceed 100,000 m3/day.

Valve House and Zebra Mussel Control Facility

The valve house is built into the foundation of the R.H. Saunders Dam. It is a secure building that houses the shut off valve for the raw water transmission line. Access to the building is gained through a locked door.

Adjacent to the valve house is a heated building that houses the zebra mussel control facility. The inspection revealed that the zebra mussel control facility was surrounded by security fencing with access gained through a locked door. Safety features on the exterior of the building included: hazard signage, windsock, hazard lights, and a warning siren.

The interior of the building contains the chlorine gas cylinders and associated chlorination and monitoring equipment. A description of the chlorination equipment is provided in Section 2.1 of this report and in the CofA. The equipment is installed as described in the CofA.

Safety and security features include: a key activated entry alarm, chlorine gas detector, high and low temperature alarms, SCUBA gear, emergency eyewash station, MSDS sheets, phone service, and sealed doors. A review of the preventative maintenance program indicated that the detector is tested every 6 months. When triggered the chlorine gas alarm activates the siren and hazard lighting on the exterior of the building and the operators are notified via the SCADA system. The inspection revealed that both the interior and exterior of the building were in excellent condition.

Operators visit the site on a daily basis. A logbook is located at the site to record station inspection dates and details.

The Screen House

Water flows into the Screen House at the Water Treatment Plant via the transmission line. The coagulant (Pass C – liquid alum) is injected into the feed line as it enters the screen house. The coagulant solution tank and chemical pumps (one duty and one standby) are located in the main portion of the water treatment plant building. The coagulant tank was not equipped with spill containment. Absorbent booms are provided to deal with minor spills. The chemical metering pumps are equipped with automatic switchover. The operator provided documentation indicating that the Pass C, supplied by 'Eaglebrook Inc. du Canada', of Varennes, Quebec, meets ANSI and NSF60 certification.

Water passes through a traveling screen that is backwashed every 8 hours unless activated manually. Backwash water and debris from the traveling screen are discharged to the sanitary sewer.

The Screen house is also equipped with a Hach 1720D turbidimeter and a Hach EC 310 pH meter. The turbidimeter is equipped with a high alarm that is set at 1.80 NTU. The pH meter is equipped with both a high and a low alarm that are set at 8.25 and 6.50 respectively. A review of the process equipment logbook indicated that the turbidimeter was calibrated on March 27 and June 18, 2003.

A review of the 2003 annual report indicated that the raw water turbidity ranged from 0.17 NTU (February) to 1.11 NTU (July). The operator indicated that the raw water turbidity is generally around 0.2 NTU but does increase in the summer months and when strong winds occur at the source.

A premix chamber is located at the screen house. Chlorine can be injected into the premix chamber if required.

Mixing and Settling Tanks

Water flows from the premix chamber into one of two mixing tanks. Each tank consists of three chambers equipped with stationary baffles. There are no mechanical agitator devices installed; the kinetic energy of incoming water flow is used for both coagulation and flocculation processes.

Water flows from the mixing tanks into two setting tanks. The operator indicated that the tanks are cleaned and inspected twice a year. The sludge is washed from the tanks and into the sanitary sewer using fire houses.

Filter Beds

At the time of the inspection the granular activated carbon in the filter beds was in the process of being replaced. The operator indicated that the carbon is replaced approximately every three years. The filters are backwashed daily and continually monitored for headloss. Filters can be backwashed remotely or manually. The operator indicated that following a backwash filters are programmed to filter to waste for 300 seconds. Water from the clearwell is used in the backwashing of the filters. A flow meter on the backwash line records the volume of water used in the backwashing process. A review of the calibration records indicated that this flow meter was last calibrated on February 14, 2004.

The operator indicated that low turbidity in the raw water (typically around 0.2 NTU) and the design of the treatment plant's mixing and settling chambers results in the formation of a very

fine floc which has a tendency to carry over onto the filter beds. This results in elevated concentrations of aluminum in treated water, concentrations are routinely above 0.1mg/L; the Ontario Drinking Water Quality Standards operational guideline for aluminum. A review of the 2003 Annual Report indicated that aluminum concentrations in the treated water ranged from 0.060 mg/L (December) to 0.217 (August and September). The operator indicated that aluminum concentration increases in the summer months due to increased flow rates.

The plant manager indicated that an investigation into adding polymer and tube settlers is on going. It is hoped that the addition of polymer will improve floc formation and the installation of tube settlers in the settling tank will prevent floc carry over onto the filter beds.

Each of the filter effluent lines is equipped with a flow meter. A review of the calibration records indicated that the flow meters were last calibrated on the following dates: Filter No. 1 – August 20, 2003; Filter No. 2 – August 22, 2002; Filter No. 3 and Filter No. 4 – June 4, 2003.

The Inspection revealed that piping could permit water to bypass the filters. Each pipe was equipped with a valve that the operator confirmed was permanently shut. The plant manager indicated that these pipes would be capped to prevent a potential bypass. A subsequent site visit revealed that the pipes had been capped. There was no other indication that raw or partially treated water could be conveyed around key treatment units.

Clearwell

The volume of treated water discharged from the clearwell is recorded by a flow meter. The flow meter is connected to the SCADA system and is capable of recording total daily and peak flows. A review of the calibration logs indicated that the treated water flow meter was last inspected on October 22, 2002.

Treated water capacity assessment for the previous three years is provided in the following table:

TREATED WATER CAPACITY ASSESSMENT			
ITEM	2001	2002	2003
Avg. Daily Flow (m3/day)	38,371	36,721	35,659
Max. Daily Flow (m3/day)	68,732	71,314	57,224
Rated Capacity (m3/day)	100,000	100,000	100,000
% (Max. Daily / Rated Capacity)	69%	71%	57%

Condition 1.2 of the CofA specifies the following maximum combined flow rate:100,000,000 L/day. A review of the flow records indicates that the maximum recorded flow rate for 2003 was 57,224 m3/day, or approximately 57% of the rated capacity of the drinking water system.

As build drawings are scheduled to be updated following the completion of the forthcoming upgrades.

The operator confirmed that disinfection of system components following installation and maintenance is completed according to AWWA standards.

Disinfection

The Cornwall Water Purification Plant achieves disinfection with chlorinators that inject chlorine solution to two pre-chlorination points and one post-chlorination point. Additionally, the zebra mussel control system provides disinfection at the raw water intake.

Condition No. 5.3 of the CofA requires the Owner to maintain year around flow proportional chlorination at the raw water intake at a rate resulting in a detectable but not higher than 0.1 mg/L concentration of free chlorine residual upstream of the filters. The owner is required to maintained the intake chlorination until after all of the upgrades specified in Condition 5.1 have been implemented. In addition, the CofA requires the owner to maintain flow proportional post-chlorination at a rate resulting in a concentration of at least 0.2 mg/L free chlorine residuals at all sections in the distribution system.

At the time of the inspection, chlorination was being provided at the raw water intake and at the clear well before the reservoir, and after the reservoir at the high lift pump common discharge header before the treated water enters the distribution system.

The operators confirmed that they routinely check the accuracy of the continuous chlorine analyzers with a Wallace and Tiernan amperometric titrator. The operators collect grab samples of the treated water daily, to measure the free and total chlorine residuals, and compare the value recorded to the continuous chlorine analyzer, and adjust the continuous analyzer as needed. The chlorine residuals are documented by the operators on a sheet along with the chlorine weight and the residual for the zebra mussel control system.

The operating authority provided documentation confirming that both the chlorine gas and sodium hypochlorite meets the applicable American Water Works Association (AWWA) and American National Standards Institute (ANSI) standards.

For surface water sources, the MOE's Disinfection Procedure requires a minimum 2-log (99%) removal or inactivation of Cryptosporidum oocysts, a 3-log (99.9%) removal or inactivation of Giardia cysts and a 4-log (99.99%) removal or inactivation of viruses before the first consumer connection. At least 0.5 log removal or inactivation of Giardia cysts and 2-log removal or inactivation or viruses must be provided through the disinfection portion or the overall water treatment process.

A review of the Engineer's Report (November 2000) indicated that the Engineer concluded that the facility was not in compliance with the MOE's Procedure B13-3 "Chlorination of Potable Water Supplies in Ontario". Section 7.1 of the Engineer's Report provided a summary of the calculation of the chemical disinfection CT values for the treatment process. The Engineer calculated that a CT of 55 was required for removal or inactivation of giardia cysts and a CT of 6 for removal or inactivation of viruses. The Engineer calculated that the CT of 3.4 was being provided.

Condition 5.1 of the CofA provides the owner with the following upgrade requirements that were to be completed by December 31, 2003:

- upgrade the disinfection facilities so that they provide at least 0.5 log inactivation of Giardia cysts and 2.0 log inactivation of viruses downstream of the filter-adsorber units;
- ensuring compliance with the disinfection procedure in the Tollgate Road Elevated Reservoir;
- connecting all chlorine residual analyzers and turbidity metering devices installed in the treatment/supply system unto the SCADA system;
- providing alarm at set levels of free chlorine residuals and/or turbidity; providing and installing a standby filter backwash pump; constructing a separate room for the storage and dosage of each process chemical; and providing secondary spill containment around stored process chemicals.

Condition 5.2 of the CofA requires the owner to implement the following upgrades by July 1, 2003:

- The provision and installation of a standby chemical metering pump at the Boundary Road rechlorination facility;

The operator indicated the funding for the required upgrades has been secured and that tenders are in the process of being developed. Planned upgrades include: The construction of a Chemical Addition Building, replacement of the existing chlorine gas disinfection system with a sodium hypochlorite disinfection system, installation of UV reactors on each of the filter effluent lines, hydrogen proxide feed system, standby power upgrades, and SCADA system upgrades.

Subsequent to the inspection an amended CofA was issued that extended the deadline to December 31, 2004. The operator indicated that it is expected that the upgrades will begin before the end of 2004 to be completed in 2005. The operator indicated that the owner would apply to the Ministry's Approvals Branch for an extension to the deadline.

The treatment plant is equipped with chlorine analyzers, manufactured by Prominent, that are installed on the settled water discharge header and on the high lift pump common discharge header and which provide a continuous measure of chlorine residual. The operating authority

confirmed that the results are checked at least once every 72 hours. Water fed to the analyzer is discharged to the sanitary sewer.

The chlorine analyzer on the treated water discharge header is equipped with an alarm system that provides electronic notification to the operating authority if the test result indicates that the free chlorine residual is above the maximum alarm setting of 2.00 mg/L free chlorine or below the minimum alarm setting of 0.25 mg/L free chlorine. The disinfection system is equipped with a high-lift pump lockout when the low alarm is triggered.

The alarm settings are consistent with the maximum concentration of 4.0 mg/L specified in the MOE document "Procedure for Disinfection of Drinking Water in Ontario" (March 17, 2003).

A review of the operations manual for the analyzers indicated that the analyzers are factory calibrated and do not require recalibration. Since the manufacture's instructions do not provide a recommended calibration schedule Schedule 6-5 Section 10 of O.Reg 170 applies and the analyzer is required to be checked and calibrated as often as necessary to ensure that the test results are within 0.05 mg/L at a concentration of 1.0 mg/L or proportionally higher if the concentrations measured are greater then 1.0mg/L.

The operating range for the analyzer is +/- 0.5 % (ie: +/- 0.05 mg/L at 1.0 mg/L). The manufacture recommends that the chlorine analyzer is calibrated every three weeks using the DPD method. A review of the preventative maintenance plan indicated that analyzer is compared with the results from a colorimeter on a weekly basis. The operator provided documentation that showed that the manufacturer calibrated the pocket colorimeter on October 2, 2003.

The operating authority indicated that the analyzer is compared with the results from a titrator located in the site laboratory.

Turbidity Monitoring

Turbidimeters are installed at the following locations: screen house (raw water intake pipe); one on each of the four filter effluent lines; and one on the treated water discharge line. The turbidimeter at the screen house is a Hach model 1720D, with Hach model 1720C turbidimeters installed on the filter effluent lines, and the treated water discharge.

Both the Hach model 1720C and 1720D turbidimeters provide a continuous measure of turbidity. The quality control band for these specific models of turbidimeter is ± 2% (ie: ± 0.02 at 1 NTU). The high alarm setting on the turbidimeter is set at 0.8 NTU. Water fed to the turbidimeters is discharged to the sanitary sewer.

Schedule 6-5 Section 8 of O.Reg 170/03 requires that continuous monitoring equipment be calibrated in accordance with the manufacture's instructions. A review of the 1720C and 1720D

Operations Manuals indicated that the manufacturer recommends that the instruments are recalibrated using a formazin primary standard after any significant maintenance or repair and at least once every four months of normal operation. A review of the calibration logbook revealed that each of the turbidimeters was last serviced and calibrated on September 12, 2003.

Fluoride

The Fluorodation system is located in the basement of the water treatment plant. The system consists of a 32 cubic meter lined wooden solution tank, and two diaphragm metering pumps (one duty and one standby). The metering pumps draw the fluorosilicic acid from the solution tank and inject the acid into the clearwell through a diffuser. Hydrofluosilicic acid solution dosage is monitored by the SCADA system. The pump speed and stroke are adjusted according to the flow rate to obtain a dosage of approximately 1.0 mg/L.

Fluorosilicic acid with a concentration of 20-30% is injected into the clearwell. The owner provided documentation from the supplier indicating that the Hydrofluosilicic Acid meets AWWA standard B703-94 and ANSI/NSF Standard 60.

The inspection revealed that spill containment for the fluorosilicic acid solution tank is not provided. Minor spills are contained with an absorbent boom located at the site. A safety shower is provided on site. The planned upgrades include the provision of a new solution tank with spill containment.

Water from the treated water discharge line is directed to a continuous fluoride analyzer. On January 30, 2003 a new fluoride probe was installed. The analyzer is equipped with a high alarm set at 1.2 mg/L and a low alarm set at 0.05 mg/L. If the alarm is activated the well pump is automatically shut down and an alarm activated. In 2003, the average monthly fluoride levels have ranged from 0.57 mg/L to 0.69 mg/L. The Ontario Drinking Water Quality Standard for fluoride is 1.5 mg/L. The analyzer is connected to a SCADA system that provides a continuous record of the fluoride in the treated water as it is discharged from the plant.

3.1.3 Process Wastewater

Process wastewater is generated from the backwashing of filters is discharged to the sanitary sewer. Waste water from the floor drains is also directed to the sanitary sewer. The settling tanks are cleaned twice a year and the sludge is discharged to the sanitary sewer

City of Cornwall By-law No. 103-2003 (Sewer Use By-law) provides rules and regulations for the discharge of wastes and sewage into the public sewers. No information was provided with regard to compliance with this By-law.

3.1.4 Distribution System

The operation and maintenance of the distribution system is the responsibility of the Cornwall Public Works Department.

The Public Works Department stated that there routine leak detection is undertaken on the distribution system. Plans of the distribution system are located at the Public Works Yard. The Manager indicated that there were no pressure problems encountered in the distribution system, and the private applicators are not permitted to use hydrants for the mixing of pesticides.

Residential clients are not metered, but meters are installed at some Industrial, Commercial, and Institutional (ICI) clients.

The City operates two metering chambers located at Mack Street and Cornwall Center Road and Highway 138 and Cornwall Center Road. Water supplied to the St.Andrews/Rosedale Distribution System passes through these metering chambers. The operator indicated that the metering chambers are equipped with flow meters and check valves. The Inspector was unable to gain access to the metering chambers as there are located in subterranean chambers located beneath Cornwall Center Road. The inspection revealed that these metering chambers are not routinely inspected.

Maintenance Programs

The Public Works Department indicated that repairs are performed by certified operators and that the repairs are documented in the logbook assigned to each of the waterworks repair vehicles.

The Public Works Department confirmed that disinfection of repaired distribution system components is undertaken in accordance with the AWWA (American Water Works Association) Standards for Disinfecting Watermains (AWWA C652-92) and Storage Facilities (C653-97).

The Public Works Department confirmed that the fire hydrants connected to the distribution system are inspected and exercised on a routine basis in accordance with AWWA standards. Hydrants are inspected during the routine spring and fall flushing activities. The most recent fall and spring flushing events took place on October 8 and 9, 2002 and May 6 and 7, 2003. Hydrants are pumped dry each fall to avoid damage caused by freezing.

Cross Connection and Backflow Prevention

The operator indicated that the owner plans to have backflow prevention installed by the owners of all ICI business connected to the distribution system.

Water Haulers are able to draw water from a locked valve/hose connection located at the Cornwall Water Treatment Plant. The supply line to this hose connection is equipped with a backflow preventor.

Storage Structure Assessment

The tank was built and commissioned in 1991. The operator indicated that the elevated storage tank is usually drained in the spring and inspected and cleaned each fall.

On June 25, 2003 the City of Cornwall submitted an application for an amendment to the Certificate of Approval to have a rechlorination facility at the elevated tower. The inspection revealed that the components of the rechlorination facility have already been installed but had yet to be put into service.

The Operator indicated that they would be contacting the Ministry's Approval's Branch to amended the application to allow for the installation of a recirculation system and an additional chlorine analyzer to monitor residual at the elevated tank.

Operators visit the storage tank on a daily basis to monitor free chlorine residual in the distribution system.

Security fencing surrounds an area around the base of the tank. Access into the base of the tank is through a locked access door that is alarmed.

Overflow from the tank is discharged to a drainage ditch adjacent to the tank.

Boundary Road Reservoir

A description of the Boundary Road Reservoir is provided in Section 2.3 of this report and in the CofA.

Access into the reservoir building is gained through a locked access door. The reservoir located adjacent to the building is grass covered and surrounded by security fencing. Locked access hatches and vents are located at the top of the reservoir and are located within this secured area. A security camera monitors this area with images transmitted back to the water treatment plant where there are displayed and recorded. Another security camera monitors the entrance to the facility.

The facility is equipped to inject sodium hypochlorite both on the influent and effluent lines. Prominent chlorine analyzers provide a continuous measurement of the free chlorine residual in the both the influent and effluent. At the time of the inspection the influent residual was 0.40 mg/L and the effluent residual was 0.71 mg/L.

Three electrically driven pumps are located at the reservoir.

Water from the sump discharge and from the reservoir overflow are directed via underground piping to the drainage ditch located along the edge of Boundary Road.

Safety features at this facility included LEL and Oxygen sensors; smoke detectors, and an emergency eyewash station.

The facility is equipped with a backup generator which is exercised for one hour each week under load. The generator provides electrical power during power failures. The generator is fueled by natural gas.

On November 21, 2002 Bill DeWitt contacted the Ministry regarding cracks in the reservoir that were uncovered during routine inspection/cleaning of the reservoir. Mr. DeWitt reported that a consultant was arriving to provide recommendations on repairing the leaks and the recommend repairs would be implemented immediately. The operator indicated that the repairs had been successfully completed.

The operating authority confirmed that pesticides are not applied or stored around, over or in the immediate vicinity of the elevated storage tank and reservoir.

3.2 WATER SYSTEM MANAGEMENT PRACTICES

3.2.1 Operational Manuals

The operations and maintenance manuals take the form of a binder located in the control room at the water treatment plant. The binder contains the following: drawings, daily operational procedures, SCADA system information, process adjustment information, plant procedures, safety information.

3.2.2 Logbooks

The Operations Log is a bound notebook kept at the water treatment plant control room. A review of the logbook indicated that it provided a good summary of operating conditions at the plant.

The logbook review indicated that the operating authority performs operational checks at the treatment plant on a daily basis and performs after-hours site visits when system alarms are triggered. Entries in the logbook are made chronologically, and the operators are providing the dates and times of the site visits and recording information concerning the operation of the

facility and any departures from normal operating conditions. A minimum of two years of logbook entries are available at the site.

The operator who signs the entries in the logbook is considered to be the Operator in Charge for that day. The following operators made signed entries into the logbook in 2003: Gerald Menard, Claude Oulette, Medard Godard, Julien Chartrand.

3.2.3 Contingency and Emergency Planning

The Cornwall Water Treatment Plant is equipped with security and alarm systems capable of remote notification of the Operator in Charge in the event of an alarm condition. If an alarm is triggered the Operator in Charge will receive notification via a remote dialer that will call the pager held by the Operator in Charge. If the Operator in Charge does not respond to the on-call pager within a specified period of time then backup operators will be notified until one is contacted.

Alarms at the water treatment plant include: chlorine leak, fire alarm, high and low chlorine on the reservoir discharge line, lost of communications, basement flooding, discharge pressure high and low, clearwell high and low, pH meter high and low, raw water turbidity high and low, fluoride high and low, premix chamber water level high and low. Additional alarms at the elevated tower include: fire alarm, illegal entry, and tank level high and low. Alarms at the Boundary Road Reservoir include: illegal entry, fire alarm, flood, discharge pressure high and low, and reservoir level high and low.

A Contingency Plan has been developed for the facility. Contingencies include: contaminated raw water, broken raw water main, bacterial contamination in clearwell, chlorination system failure, filter failure, and chemical spill containment. Also included in the Contingency Plan is a procedure for adverse water in the distribution system. The Contingency Plan is kept in the control room at the water treatment plant.

A self contained emergency power generator is located inside a trailer located adjacent to the water treatment plant. The trailer is owned by Cornwall Electric. In addition, power to High Lift Pump No. 5 can be switched from electric to diesel power, and power on High Lift Pump No. 4 is supplied by diesel. The Boundary Road reservoir is equipped with a natural gas powered generator for the provision of a backup power supply.

The operating authority does not have a contingency plan for the position of Operator in Overall Responsibility to ensure that overall operation of the facility is placed with an operator who holds a license that is applicable to the facility.

3.2.4 Security

Doors into the treatment plant building and water tower are locked and equipped with alarms. The water tower is surrounded by security fencing and there are security cameras at all locations.

3.2.5 Communication with Consumers

Complaints received at the Water Treatment are recorded on forms maintained in a separate binder and are forward to the Public Works Department who then responds to the compliant. The operator indicated that complaints are recorded on a "Customer Complaint Record". A review of the records provided by the Public Works Manager indicated that there were seven complaints recorded in 2003. Three complaints were regarding taste/odour problems, four complaints were regarding discoloured water. In all cases the Public Works Department investigated and resolved the problem.

The operating authority confirmed that the following documents are available to the public during normal business hours:

- All of the lab reports on the analysis of water samples required to be taken under O.Reg 170/03;
- Copies of Annual Reports and Summary Reports for Municipalities required by O.Reg 170/03;
- All of the approvals, orders, and directions related to system;
- A Copy of the most recent Engineer's Report;
- Annual Compliance Report;
- A copy of the Drinking Water Systems Regulation (Regulation 170/03; and
- The Ontario Drinking Water Quality Standards (Regulation 169/03).

3.2.6 Operator Certification and Training

The operator in overall responsibility for the Cornwall Water Treatment Plant is Morris McCormick. Mr. McCormick possesses a Class 3 Water Treatment License and a Class 3 Water Distribution License. The Operator in overall responsibility of the Cornwall Distribution System is Tom Gemmel. Mr. Gemmel possesses a Class 3 Water Distribution License.

The Cornwall Water Treatment Plant is classified as a Class 3 Water Treatment System and the distribution system is classified as a Class 3 Distribution System.

The following table provides a list of the operators who work at the Cornwall Water Treatment Plant and at the Cornwall Public Works Department and their levels of certification for treatment and distribution systems. Certification details for each of the operators is provided in Appendix D.

Operator Name	Treatment System Classification	Distribution System Classification
Morris McCormick	Class 3	--
Medard Godard	Class 2	--
Julien Chartrand	Class 2	--
Claude Oulette	Class 3	--
Bill deWitt	Class 2	--
Tom Gemmel	--	Class 3
Shawn O'Brien	--	Class 1
Paul DeJong	--	Class 2
Viet Hoang	--	Class 1
Kim Delorme	--	OIT
Russ Wylie	--	OIT
Mike Roger	--	OIT

As required by O.Reg 435/93 the operator licenses were conspicuously displayed at the water treatment plant and at the public works yard. The plant classification was displayed at the entrance to the water treatment plant and the distribution system certificate were conspicuously displayed at the public works yard.

As of the end of 2003, all the operators at the Water Treatment Plant had received a minimum of 40 hours of annual training as required by Regulation 435/93 Section 17. As of the end of 2003 none of the operators at the Cornwall Public Works Department had received the required minimum of 40 hours of annual training.

SECTION 4 WATER QUALITY MONITORING & ASSESSMENT

4.1 WATER QUALITY MONITORING

The water quality monitoring requirements for the Cornwall drinking water system as specified in Regulation 170/03 are as follows:

Raw Water

- one sample per week

Treated Water

- one sample per week for microbiological analyses;
- one sample per quarter for nitrates/nitrites;
- one sample every 60 months for sodium analysis;
- one sample per annum for inorganics (Schedule 23);
- one sample per annum for organics (Schedule 24); and

Distribution System

- 54 samples per month (at least one per week) for microbiological analyses, including 25% of each batch for a heterotrophic plate count;
- one sample for trihalomethanes per quarter, collected at a point reflecting the maximum residence time in the system; and
- one sample for lead per annum, collected at a point reflecting the maximum residence time in the system.

It is important to note that under Schedule 13-5 of Regulation 170/03, where a test result for an inorganic parameter (Schedule 23), lead, or organic parameter (Schedule 24) exceeds half of the standard prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards (Regulation 169/03), then the frequency of sampling and testing for that parameter must be increased to once sample every three months.

Operators routinely collect weekly raw water samples from the sample ports located at the zebra mussel control facility. The raw water samples are submitted to Accutest Laboratories, of Ottawa, Ontario for microbiological analyses. All samples are analyzed for *E.Coli* and Total Coliforms.

The operating authority collects weekly treated water samples at the treatment plant, and submits them to Accutest Laboratories of Ottawa, Ontario for microbiological analysis. Samples are analyzed for *E.Coli*, Total Coliforms and heterotrophic plate count.

Treated water samples were submitted for analysis of nitrates/nitrites, volatile organics, and pesticides and PCBs on January 20, April 14, July 14, October 14, 2003. The samples were analyzed for all the parameters listed in Regulation 170/03 Schedule 24.

The required sample for inorganics was submitted on October 14, 2003. The sample was analyzed for all the parameters listed in Regulation 170/03 Schedule 23.

There was no evidence provided that a treated water sample had been submitted for analysis of sodium.

The operator collected a minimum of 54 samples per month from the distribution system and submitted them to Accutest Laboratories of Ottawa, Ontario for microbiological analyses. All samples were analyzed for *E.Coli*, Total Coliforms. The required percentage of distribution samples were also analyzed for a heterotrophic plate count.

The required distribution samples for trihalomethanes were collected on a monthly basis at the elevated storage tank. The required annual distribution sample for lead was collected on January 21, 2003.

A review of the sampling schedule and laboratory analytical reports indicated that from the Cornwall Drinking Water System operated in compliance with the water quality sampling requirements of O.Reg 170/03. All water samples submitted for analyses during the aforementioned period were analyzed by a laboratory accredited for the specific parameter that was analyzed.

A review of the operations log indicated that the operator conducts daily chlorine residual readings at the elevated tower and at the Boundary Road Reservoir. A review of the analytical results indicated that chlorine residual readings are being collected at the same time as microbiological samples.

On November 16, 2003 the required "Notification of Laboratory Services Provided to Waterworks" form was submitted to the MOE's Laboratory Services Branch. A review of the Standards Council of Canada (SCC) scopes of accreditation for the laboratories indicated on the "Notification of Laboratory Services Provided to Waterworks" form indicated that the subject laboratories are accredited to conduct the test requested by the operating authority.

The operating authority confirmed that the laboratory analytical reports are kept for required periods of time directed within O. Reg. 170/03.

The Ministry collected a raw water sample on July 9, 2003 from the raw water sample tap at the zebra mussel control facility. The samples were subsequently submitted to the MOE Laboratory

in Toronto for analyses of the following parameters: Total Coliforms, *E. Coli*, and Heterotrophic Plate Count. The results of the laboratory analyses are presented in Section 4.2 of this report.

4.2 WATER QUALITY ASSESSMENT

4.2.1 Bacteriological

On July 9, 2003 the Ministry collected distribution system samples from various locations throughout the distribution system. At all of the above locations samples were also collected for the onsite analyses of total and free chlorine residual. A Hach Pocket Colorimeter was used to perform the analyses. Water samples were collected in laboratory prepared sample bottles containing the preservative sodium thiosulphate, and were subsequently submitted to the MOE Laboratory in Toronto for analyses of the following parameters: Total Coliforms, E. Coli, and a heterotrophic plate count.

The results from the on-site analyses of chlorine residual are provided in the following table.

Sampling Location	**Free Chlorine** (mg/L)	**Total Chlorine** (mg/L)
Richelieu	0.8	0.93
Water Tower	0.38	0.50
Fifth Wheel	0.32	0.47
Esso	0.5	0.65
Boundary Road Reservoir	0.65	0.83
Glen Store Dunn Lodge	0.8	0.96
Cornwall Public Works	0.45	0.62
Cornwall WTP	0.93	1.02

The results of the onsite analyses of free chlorine residual in the Cornwall distribution system indicated that the free chlorine residuals were well above the minimum required concentration of 0.05 mg/L required by O.Reg 170/03 Schedule 1-2.

4.2.2 Physical/Chemical

As indicated in Section 3.1 the treated water contains an elevated concentration of aluminum due to floc carryover onto the filter beds. The aluminum concentrations in the treated water are

checked daily at the plant. In 2003 the maximum concentration reported was 0.217 mg/L. The operational objective for aluminum is 0.1 mg/L (Ontario Drinking Water Quality Standards, 2003).

As required by O.Reg 170/03 Schedule 13-3 and 13-6, the operator collects its lead and THM samples at the extremities of the system. A review of the THM data indicated that samples collected at the elevated tower THMs ranged from 0.014 mg/L to 0.0487 mg/L. The Ontario Drinking Water Quality Standard for THMs is 0.100 mg/L.

A review of the analytical results for the sample collected by the operator on October 14, 2003 indicated that all the Schedule 23 inorganic parameters were well below the Ontario Drinking Water Quality Standards. A review of the analytical results for samples collected on January 20, April 14, July 14, and October 14, 2003 indicated that Schedule 24 organic parameters were not detected.

A sample of treated water collected by the inspector was submitted to the MOE laboratory in Toronto for organic and inorganic analyses. A review of the analytical results indicated that the Schedule 23 inorganic parameters were well below the Ontario Drinking Water Quality Standards.

A review of the analytical results from the sample collected by the MOE, indicated that the Schedule 24 organic parameters were well below the Ontario Drinking Water Quality Standards. Please note that the organic analysis of the MOE sample did not include the analysis of the following Schedule 24 parameters: benzo(a)pyrene, and pesticides compounds.

The sample submitted to the MOE laboratory was also analyzed for non-health related chemical and physical parameters. A review of the results indicated that the treated water was well below the applicable operational and aesthetic objectives, with the exception of aluminum. The concentration of aluminum was 0.216 mg/L. The Operational Guideline for aluminum is 0.100 mg/L.

The Cornwall Water Treatment Plant participates in the Ministry's Drinking Water Surveillance Program (DWSP). DWSP is a voluntary program operated by the Ministry of the Environment (MOE) in cooperation with municipalities to gather scientific data on drinking water quality in Ontario. From 2000 to the end of 2002, approximately 3,461 chemical, physical and radiological tests were conducted on samples submitted from the Cornwall Water Treatment Plant and Distribution System. A review of the analytical results suggests that none of tests yielded indicators of adverse water quality.

4.2.3 Reporting, Notification & Corrective Action

A total of six adverse water quality conditions were identified at the Cornwall drinking water system in 2003. A distribution system sample collected on August 5, 2003 had a concentration of 4 Total Coliforms (cfu/100mL). The operator was notified of the adverse sample on August 7, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

A sample collected on January 6, 2003 had a concentration of 1 Total Coliforms (cfu/100mL). The operator was notified of the adverse sample on January 8, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

A distribution system sample collected on May 12, 2003 had a concentration of 81 Total Coliforms (cfu/100mL). The operator was notified of the adverse sample on May 14, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

A distribution system sample collected on September 29, 2003 had a concentration of 3 Total Coliforms (cfu/100mL). The operator was notified of the adverse sample on October 1, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

A distribution system sample collected on October 21, 2003 had a concentration of >500 HPC (cfu/1mL). The operator was notified of the adverse sample on October 24, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

A distribution system sample collected on December 1, 2003 had a concentration of 10 Total Coliforms (cfu/100mL). The operator was notified of the adverse sample on December 3, 2003 and collected a resample on the same day. The results of the resampling showed that the adverse condition was no longer present.

The laboratory analytical reports for the regulated samples collected from the drinking water system are kept on file at the Water Treatment Plant for a minimum of five years. The Annual Compliance Reports and Engineers Report are also kept at the Water Treatment Plant along with a copy of the Drinking Water Systems Regulation. These reports are available to the public without charge during normal business hours.

The 2002 Annual Report was received and reviewed by Cornwall City Council on April 28, 2003. The annual report included a summary listing of treatment chemicals used and a discussion of the quantity of water supplied during the reporting period compared to the design

values for the population serviced. The report includes a summary of the monthly average daily flows and maximum daily flows.

SECTION 5 ASSESSMENT OF PREVIOUS INSPECTION ISSUES

5.1 NON COMPLIANCE WITH REGULATORY REQUIREMENTS

The previous MOE inspection revealed the following regulatory issues:

Item 1
Evidence that MOE has not been immediately notified of adverse water quality as per the requirements of section 8 of O.R 459/00.

A records review indicated that the owner has initiated the required corrective action and issued the required notices following adverse quality incidents in 2003.

Item 2
The Owner appears to be complying with the sampling and analysis requirements stipulated in the Certificates of Approval and in Schedule 2 of Ontario Regulation 459/00, except for lead, nitrate and nitrite. The Owner is required to sample for lead annually in the distribution system at a point reflecting the maximum residence time in
the distribution system, and nitrate and nitrite quarterly in the treated water at the treatment plant.

A review of the laboratory analytical reports indicates that the operator is collecting the required samples within the required time frames.

Item 3
The Owner is in non-compliance with Condition No. 5.3 of Certificate of Approval No. 7187-59GGEQ where the "Note" requires the Owner in addition to maintaining intake chlorination, flow proportional post-chlorination shall be applied at a rate resulting in a concentration of at least 0.2 mg/L free chlorine residuals at all sections in the distribution system.

The inspection revealed that the operator is successfully maintaining 0.2 mg/L free chlorine residual throughout the distribution system.

Item 4
Condition No. 3.14 of Certificate of Approval No. 7187-59GGEQ stipulates that the Owner shall ensure that procedures are established and followed for receiving, responding to, and recording complaints. The water works has not developed a customer complaint process. Copies of the complaint forms should be maintained in a separate binder at the water purification plant. It is

recommended that the complaint process and complaint form be shared with the Public Works Department which oversees the operation and maintenance of the water distribution system.

The inspection revealed that waterworks has now developed a procedure for receiving, responding to, and recording complaints. Compliants received at the Water Treatment are recorded on forms maintained in a separate binder and are forward to the Public Works Department who then respond to the compliant.

Item 5
In the fourth quarterly report for 2001 (October to December), the report indicates that there were two (2) exceedances where the free chlorine residual was less than 0.05 mg/L in the distribution system, when in fact three (3) such incidents were reported to the MOE for residuals taken on October 9, October 29 and November 8, 2001. The incident that occurred on October 9, 2001 was not reported to the MOE until November 8, 2001, and the incident on October 29, 2001 was not reported to the MOE until November 9, 2001.

Section 8 of Ontario Regulation 459/00 requires the Owner to ensure that for an indicator of adverse water quality, notice is given to the Ministry and medical officer of health immediately and must be confirmed in writing within 24 hours. The Owner is required to comply with sections 8 of Ontario Regulation 459/00 at all times by ensuring that all indicators of adverse water quality are reported immediately and in writing within 24 hours as per section 8, and that all notices required under section 8 are summarized in the quarterly reports as required by section 12 (c).

A records review indicated that the owner has initiated the required corrective action and issued the required notices following adverse quality incidents in 2003.

5.2 BEST MANAGEMENT PRACTICES RECOMMENDATIONS

The previous inspection report provided the following recommendations to the owner / operating authority:

Item 1
Condition No. 3.9 of Certificate of Approval No. 7187-59GGEQ requires the Owner to ensure that an operations manual that incorporates, at a minimum, the requirements of this certificate, and any adopted operation and maintenance recommendations of the Engineer's Report based on which this certificate has been issued, is prepared within twelve (12) months of issuance of this certificate of approval, and ensure that the operations manual is kept up to date. Therefore, the City is required to ensure that the operations manual is prepared by June 20, 2003.

The inspection revealed that an operations manual is located in the control room of the water treatment plant. The binder contains: drawings, daily operational procedures, SCADA system information, process adjustment information, plant procedures, safety information. The information in the binder is not organized in the form of a manual.

Item 2

Also, the MOE Inspector requires confirmation that applications for Air Approvals were completed for the remaining two diesel and one natural gas generators, if it was determined that they are required. Please note that Cornwall Electric owns and operates a mobile 1.2 mW (1200 kW) diesel generator manufactured by Caterpillar, located outside on the property of the Cornwall Water Purification Plant. The diesel fuel is stored underneath the generator. Cornwall Electric is required to have a Certificate of Approval Air for the mobile diesel generator. Cornwall Electric has been contacted by the MOE, and they have been informed that they are required to submit an application for Air Approval.

A file review indicated that the Air Approvals have not been issued.

Item 3

Regarding operator training, according to the training records provided by the City only one operator, Patrick Carriere, received a minimum of 40 hours of training in 2001, and all but one operator, Medard Goddard, received a minimum of 40 hours of training in 2002.

As of the end of 2003, all the operators at the Water Treatment Plant had received a minimum of 40 hours of annual training as required by Regulation 435/93 Section 17. As of the end of 2003 none of the operators at the Cornwall Public Works Department had received the required minimum of 40 hours of annual training.

Item 4

The Cornwall Water Purification Plant is a participant in the MOE's Drinking Water Surveillance Program (DWSP). DWSP is a monitoring program developed to provide reliable and current information on drinking water. DWSP sampling was conducted during each of the quarters in 2001 and to date in 2002. As mentioned previously, nitrate and nitrite were not sampled and analyzed for in the treated water for the third and fourth quarters of 2001 and/or the third quarter of 2002. However, in the respective quarterly reports, the DWSP results for nitrate and nitrite were reported. DWSP is not a compliance monitoring program, and therefore the Owner cannot submit the analytical results from DWSP to satisfy the sampling and analysis requirements of Ontario Regulation 459/00.

A review of the 2003 sampling program indicated that all the required samples were collected within the required time frames.

Item 5
The logbook documents process changes and abnormal operations. There were some days where nothing was documented in the logbook. It is recommended that the daily checks/routine checks performed by the operators be documented in the logbook and initialed by the operator who performs them.

A review of the 2003 operations log indicated that entries were made on a daily basis and that routine checks and the operators performing them were documented in the logbook.

SECTION 6 SUMMARY OF NON COMPLIANCE ISSUES & ACTIONS REQUIRED

The following section indicates the non compliance issues and action required:

Item 1
The owner is not in compliance with the O.Reg 435/93 Section 17 requirement operations staff receive a minimum of 40 hours training per year. A review of the 2003 training records for the operations staff in the Public Works Department indicated that none of the staff received the required 40 hours of training. This Item has been forward to the Ministry's Investigation and Enforcement Branch for review.

Item 2
The Cornwall Water Treatment Plant does not comply with the Ministry's "Procedure for Disinfection of Drinking Water in Ontario" and the required chlorine contact time is not being provided. The proposed upgrades that are required to be completed by December 31, 2004 will address this problem. No further action is required to address this Item provided that the upgrades are completed by the deadline specified in the Certificate of Approval.

Item 3
Condition No. 3.9 of Certificate of Approval No. 7187-59GGEQ requires the Owner to ensure that an operations manual that incorporates, at a minimum, the requirements of this certificate, and any adopted operation and maintenance recommendations of the Engineer's Report based on which this certificate has been issued, is prepared within twelve (12) months of issuance of this certificate of approval, and ensure that the operations manual is kept up to date. The inspection revealed that an operations manual is a binder located in the control room of the water treatment plant. The binder does contain drawings, daily operational procedures, SCADA system information, process adjustment information, plant procedures, and safety information, however the information in the binder is not organized in the form of a manual. This issue was identified in the previous Compliance Inspection Report.

Item 4
The Inspection revealed that the overflow pipe from the Boundary Road Reservoir was not equipped with a screen. The owner should ensure that a screen that would prevent vermin and debris from entering the reservoir is installed as soon as possible.

Please submit a letter the Ministry by no later then July 31, 2004 indicating how the owner will address the Items provided above.

SECTION 7 SUMMARY OF BEST PRACTICE RECOMMENDATIONS

Legislated requirements have been identified in the previous section. In the interest of continuous improvement, we provide the following suggestions:

Item 1
Treated water at the Cornwall Water Treatment Plant routinely exceeds the Ontario Drinking Water Quality Standard's Operational Guideline for aluminum. It is recommended that the owner prepare an action plan detailing how they will address this issue.

Item 2
The owner should organize regular meetings between Water Treatment Plant and Public Works Management along with representatives from the Township of South Stormont to discuss water supply issues relating to the Cornwall Waterworks and the St.Andrews/Rosedale Distribution System.

Item 3
The operating authority does not have a formal contingency plan for the position of Operator in Overall Responsibility. A contingency plan should be developed to ensure that this position is held by an operator with the appropriate level of certification.

Item 4
The owner should ensure that a first sample for sodium is collected prior to June 1, 2004 as per the requirements of O.Reg 170/03

Please submit a letter the Ministry by no later then July 31, 2004 indicating how the owner will address the Items provided above.

SIGNATURES

Inspected By: Jan Franssen	*Signature: (Inspector):*
Reviewed & Approved By: James Mahoney	*Signature (Supervisor):* for: James Mahoney
Review & Approval Date: (yyyy/mm/dd) *2004/05/26*	

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

cc: Mr. Cecil Vincent, Chief Administrative Officer – City of Cornwall
Mr. Morris McCormick, Division Manager – City of Cornwall
Mr. Tom Gemmel, Supervisor Public Works Dept. – City of Cornwall
Dr. Robert Bourdeau, Medical Officer of Health – Eastern Ontario Health Unit
Mr. Mirek Tybinkowski, Specialist: Water and Wastewater – MOE EAAB
Mr. Roger Houde, Manager – Raisin River Conservation Authority
District Office File – ST ST CC SE 540

Ontario

APPENDICIES

APPENDIX A

CERTIFICATE OF APPROVAL

(AS ATTACHED)

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE WATER WORKS
NUMBER [redacted]

The Corporation of the City of Cornwall
1225 Ontario Street
Cornwall, Ontario
K6H 4E1

Site Location: City of Cornwall Water Purification Plant
861 2nd Street West
Cornwall City, United Counties of Stormont, Dundas & Glengarry

You have applied in accordance with Section 52 of the Ontario Water Resources Act for approval of:

a surface water treatment and supply, serving the City of Cornwall located at Second Street West in the City of Cornwall (NAD 27: UTM Zone 18: 519650.00 m E., and 4984500.00 m N.) and rated at a maximum daily flow of 100,000 m^3/d, consisting of:

Raw Water Intake

- an Intake Structure complete with an intake screen and a chlorine solution diffuser device, located in the west-face of the Power Dam in Lake St. Lawrence, approximately 15 m below lake level;

- a Raw Water Intake Pipe, 61 m long, 1,220 mm diameter section extending from the intake structure to a valve enclosure building described below, and 3,600 m long, 1,070 mm diameter section extending from the valve enclosure building to the plant enclosure building described below, concrete;

- an Enclosure Building, located 61 m east of the intake structure, 3.7 m by 4.6 m, housing an automatically controlled isolation valve on the raw water intake pipe;

- an Enclosure Building, 8.4 m by 4.8 m, located east of the R. H. Saunders Power Dam, housing zebra mussel control facilities including two raw water recirculation pumps (one duty and one standby), each rated 1.2 L/s at a total dynamic head (TDH) of 35.2 m, one 38 mm diameter raw water supply line, two chlorine gas cylinders (one duty and one standby), one scale, one chlorinator, one chlorine residual analyzer measuring free chlorine residual concentration, a 38 mm diameter chlorine solution line extending from the chlorinator to the diffuser device at the raw water intake structure;

Treatment and Supply

- one (1) Butterfly Flow Control Valve, located on the raw water intake pipe;

- one (1) Raw Water Chamber, 1.3 m by 1.3 m by 4.5 m side water depth (SWD) housing one Mechanical Screening Device complete with a screen wash system and a screen bypass;

- one (1) Coagulator Tank, 3.6 m by 3.6 m by 7.7 m SWD, concrete, located donwnstream of the raw water chamber;

- two (2) Flocculator Chambers in parallel, each consisting of two baffled compartments, each upstream compartment 4.8 m by 6.4 m by 4.8 m SWD, each downstream compartment 4.8 m by 4.8 m by 4.8 m SWD, located downstream of the coagulator tank;

  NOTE: The kinetic energy of incoming water flow is used for both coagulation and flocculation processes (*i.e.*, no mechanical agitator devices installed).

- two (2) Settling Tanks in parallel, each 12 m by 15 m by 5.2 m SWD, each tank having direct gravity supply from the corresponding flocculator tank;

- four (4) Rapid Gravity Filter-Adsorber units in parallel, each gravity supplied with settled water, each loaded with granular activated carbon topped sand media, two unit surface areas 78 m^2, two unit surface areas 82 m^2, surface wash assisted backwash;

- one (1) Centrifugal Filter Backwash Pump discharging chlorinated filtrate from the clearwell described below to either of the filter-adsorber units, rated 757 L/s at a TDH of 10 m;

- one (1) Clearwell, 19.9 m by 31.4 m by 2.9 m SWD, single cell;

- one (1) High Lift Wet Well, 29 m by 31.4 m by 3.1 m SWD, single cell;

- five (5) Centrifugal High Lift Pumps (three duty and two standby), three rated 421 L/s at a TDH of 49 m and two rated 263 L/s at a TDH of 49 m, discharging to a 610 mm diameter common header and

- two (2) Vacuum Priming Pumps (one duty and one standby).

Process Chemicals

- a Gas Chlorination System (one duty and one standby) consisting of two chlorine gas cylinders, one cylinder weight scale, two vacuum regulators, three chlorinator units two rated 227 kg/d one rated 45 kg/d with feed lines discharging chlorine solution to upstream of the coagulator tank and to the filtrate common discharge line, respectively;

- a Coagulant Feed System consisting of a chemical solution tank 32,000 L usable volume, two chemical metering pumps (one duty and one standby), each rated 1.74 L/min at a backpressure of 1 MPa with feed line discharging coagulant solution to upstream of the coagulator tank and

- a Fluoride Feed System consisting of a chemical solution tank 32,000 L usable volume, two chemical metering pumps (one duty and one standby) each rated 1.74 L/min at a backpressure of 1 MPa with feed line discharging hydrofluosilicic acid solution to the filtrate common discharge line.

Standby Power Facility

- a 125 kW Diesel Engine Standby Power Generator Set.

Monitoring and Recording

- a Supervisory Control and Data Acquisition System (SCADA);

- seven (7) Flow Metering Devices, one on the raw water intake pipe, one on each filtrate line and two on the high lift pump common discharge header, all with 4-20 mA output to SCADA;

- two (2) Chlorine Residual Analyzer units, both measuring free chlorine residual concentration and supplied with continuous samples from the settled water common discharge header and the high lift pump common discharge header, respectively, both with 4-20 mA output to SCADA;

- six (6) Turbidity Metering Devices, one on the raw water intake pipe, one on each filtrate line and one on the high lift pump common discharge header, all with 4-20 mA output to SCADA and

- one (1) Fluoride Analyzer supplied with continuous samples from the high lift pump common discharge header, 4-20 mA output to SCADA.

Rechlorination and System Storage

- an Off-Site Booster Pumping and Rechlorination Facility located at Boundary Road (NAD 27: UTM Zone 18: 520500.00 m E., and 4988500.00 m N.) consisting of:

- one (1) Underground Reservoir, 36.9 m by 48.8 m by 5 m SWD;

- three (3) Centrifugal Booster Pumps (two duty and one standby), each rated 95 L/s at a TDH of 70 m;

- a Rechlorination System consisting of one chemical solution tank 200 L usable volume, one chemical metering pump rated 11.8 L/min at a backpressure of 850 kPa with feed line discharging sodium hypochlorite solution to near the reservoir influent and/or effluent, one chlorine residual analyzer measuring free chlorine residual concentration and supplied with continuous samples from the booster pump common discharge header and

- a 350 kW Natural Gas Engine Standby Power Generator Set.

all in accordance with the Engineer's Report prepared by " The Thompson Rosemount Group " dated November 30 , 2000 and any additional information and documentation that may have been provided in support of the Report .

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

(1) "certificate" means this entire certificate of approval document, issued in accordance with Section 52 of the *Ontario Water Resources Act*, and includes the schedules to it, if any, and any applications for approval for which certificates of approval have previously been issued, and supporting information to the applications;

(2) "Director" means any Ministry employee appointed as Director pursuant to Section 5 of the *Ontario Water Resources Act*;

(3) "Ministry" means the Ontario Ministry of the Environment;

(4) "Owner" means The Corporation of the City of Cornwall, and includes its successors and assignees;

(5) "works" means the water works described in this certificate and in the supporting documentation included in the Engineer's Report for Water Works, to the extent approved by this certificate;

(6) "water treatment plant" means the entire water treatment system, including the water intake facilities, and any water storage facilities associated with the water treatment plant;

(7) "water treatment or distribution system" means a system for collecting, producing, treating, storing, supplying or distributing water that includes one or more water works;

(8) "quarter" means the three-month period beginning on January 1, April 1, July 1 and October 1 in each year;

(9) "maximum flow rate" means the maximum rate of water flow for which the plant or process unit was designed and

(10) "contact time" means the detention time T_{10} which is the time for 10% of the water (tracer) to pass through the process unit, storage reservoir or pipe.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. PERFORMANCE

1.1 The Owner shall ensure that, subject to Conditions 3.1 through 3.14, the water treatment or distribution system is operated and maintained in such a manner, and with such facilities that water supplied to the consumers serviced by the system satisfies the requirements of the "Ontario Drinking Water Standards", dated January 2001, as amended from time to time.

1.2 The Owner shall ensure that, subject to Conditions 3.1 through 3.14, the water treatment plant (WTP) is operated to treat water at a rate not exceeding the maximum flow rate of 100,000 m^3/d.

(a) For the interim, the WTP is approved to be operated without a Permit To Take Water (PTTW). The Owner shall, however, apply and obtain a PTTW prior to application for any future WTP upgrades (capacity or treatment) excluding the works specified in Condition 5 of this Certificate

(b) The Owner shall submit an application for an amendment to this Certificate when the maximum daily flow rate exceeds 100,000 m^3/d or as specified in any PTTW obtained after the issuance of this Certificate.

1.3 The Owner shall ensure that the flows into the water treatment plant do not exceed the maximum flow rate(s) set out in Condition 1.2, except where necessary for the purpose of maintenance of the works and essential to its efficient operation, and provided that the treated water quality satisfies the requirements set out in the Ministry Procedure B13-3 entitled "Chlorination of Potable Water Supplies in Ontario", dated January 2001, as amended from time to time.

1.4 The Owner shall ensure that the disinfection facilities in the water treatment plant are operated and maintained in such a manner and with such facilities as is necessary to be in accordance with the Ministry Procedure B13-3 entitled "Chlorination of Potable Water Supplies in Ontario", dated January 2001, as amended from time to time.

2. MONITORING AND RECORDING

2.1 The Owner shall ensure that the following monitoring program is established and carried out:

(a) Maintain and operate a sufficient number of flow measuring devices to measure:

(i) the flow rate and daily quantity of water being taken from the intake and conveyed to and through the water treatment plant and

(ii) the flow rate of treated water supplied to the distribution system.

(b) Calibrate the flow measuring devices required by clause (a) above at regular intervals not exceeding one year to ensure their accuracy to within plus or minus 5% of actual rate of flow within the range of 10% to 100% of the full scale reading of the measuring devices, or as specified by the instrument manufacturer's instructions.

(c) Record the results of the flow measurements made in accordance with clause (a) above as total daily flow and as daily peak flows.

(d) Record the date, time, duration and cause of each occasion that the flow rate exceeds that specified in Condition 1.3.

(e) Install, maintain and operate continuous water quality analyzers and indicators with alarm systems, calibrated as specified by the instrument manufacturer's instructions or as in "Standard Methods for the Examination of Water and Wastewater" 20th Edition, 1998, or a more recently published edition, to monitor the following parameters at the indicated locations:

(i) free chlorine residual in treated water at the point(s) of entrance to the distribution system (quality control band: $\pm$ 0.05 mg/L at a chlorine concentration of 1.0 mg/L chlorine or a proportionately wider band where the plant stream being monitored routinely contains a higher concentration of chlorine),

(ii) turbidity of filtered water at the point(s) of discharge from each filter (quality control band: $\pm$ 0.1 NTU) and

(iii) fluoride concentration in treated water at the point(s) of entrance to the distribution system (quality control band: $\pm$ 0.1 mg/L).

(f) Samples of raw water and treated water shall be collected and analyzed for parameters at the locations and frequencies in accordance with Regulation 459/00, Drinking Water Protection, Schedule 2, Sampling and Analysis Requirements, as amended from time to time.

NOTE: Works which do continuous monitoring of chlorine residual or turbidity may do so instead of taking and analyzing grab samples as may be required by O. Reg. 459/00.

NOTE: Samples of raw water do not need to be analyzed for heterotrophic plate count or background colonies.

(g) The sampling required by clause (f) above shall be performed in a manner that ensures samples have a composition which is representative of the water stream from which they are taken and also in accordance with the instructions provided by the accredited laboratory engaged to perform the analyses.

2.2 The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring, sampling and analyzing activities required by this certificate.

3. OPERATIONS AND MAINTENANCE

3.1 The Owner, when making decisions within its authority, shall consider the impact of these decisions on the drinking water supply source for water works approved by this Certificate.

3.2 The Owner shall ensure that, subsequent to repairs to the water supply or distribution system, or interruptions in the operation of the water supply resulting in negative pressure conditions in the distribution system, and prior to utilization of the affected parts of the works for the supply of potable water, the affected parts of the water supply or distribution system have been adequately disinfected in accordance with the Ministry Procedure B13-3 entitled "Chlorination of Potable Water Supplies in Ontario", dated January 2001, as amended from time to time.

3.3 The Owner shall ensure that there is an operator who holds a valid licence that is applicable to this type of water treatment plant and that is of the same class as or higher class than the class determined for the water treatment plant in accordance with O. Reg. 435/93, as amended from time to time, and who is responsible for the operation of the water treatment plant.

3.4 The Owner shall exercise due diligence in ensuring that, at all times, the works and the related equipment and appurtenances used to achieve compliance with this certificate are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this certificate and the Act and regulations, adequate laboratory facilities, process controls and alarms, and the use of process chemicals and other substances that come in contact with water being treated, that are suitable for the process, compatible with each other and appropriate for drinking water.

3.5 In addition to the requirements of Condition 3.4, the Owner shall ensure that all chemicals used in the treatment process and all materials contacting the water meet both the American Water Works Association (AWWA) quality criteria as set out in AWWA standards and the American National Standards Institute (ANSI) safety criteria as set out in ANSI standard NSF/60 or NSF/61. For all chemicals used in the water treatment process and all materials contacting the water being treated, the Owner shall have evidence of current chemical and material product registration by a testing institution accredited under the Standards Council of Canada Act or by the ANSI or, documents showing the Ministry is satisfied that the information provided by the product manufacturer indicates the chemical or material product will meet the criteria of the ANSI standards.

3.6 The Owner shall immediately discontinue use of any chemical upon written notice by the Director.

3.7 The Owner shall establish written procedures for the notification of the Medical Officer of Health and the Ministry required by O. Reg. 459/00, and shall ensure that these procedures are followed.

3.8 The Owner shall ensure that contingency plans and procedures are established and adequate equipment and material are available for dealing with emergencies, upset conditions and equipment breakdowns in the works, and that such plans and procedures are implemented.

3.9 The Owner shall ensure that an operations manual that incorporates, at a minimum, the requirements of this certificate, and any adopted operation and maintenance recommendations of the Engineer's Report based on which this certificate has been issued, is prepared within twelve (12) months of issuance of this certificate of approval, and ensure that the operations manual is kept up to date. Upon request, the Owner shall make the manual available for inspection by the Ministry personnel.

3.10 The Owner shall ensure that based on the raw water source characterization and the treatment process, the operations manual includes monitoring and reporting of the necessary raw water and in-process parameters that are essential for control of the treatment process and for the assessment of the performance of the works. The manual shall also contain procedures that are required for adequate operation and maintenance of the monitoring equipment.

3.11 Within one (1) year of substantial completion of the construction of the new water works required by this Certificate, the Owner shall ensure that drawings accurately showing the new works as constructed (record drawings) are prepared and kept up-to-date, including timely incorporation of all modifications made to the works throughout its operational life.

3.12 The Owner shall ensure that a Process and Instrumentation Diagram (PID) for the entire water treatment plant is prepared and kept up-to-date, including timely incorporation of all modifications made to the works throughout its operational life.

3.13 The Owner shall keep a complete set of up-to-date record drawings and diagrams required to be prepared by Conditions 3.11 and 3.12, and all existing record drawings which are currently in retention throughout the operational life of the water works, and upon request, shall make them readily available for inspection by Ministry staff.

3.14 The Owner shall ensure that procedures are established and followed for receiving, responding to, and recording complaints about any aspects of the works, including recording the steps that were taken, if any, to determine the cause of complaint and the corrective measures taken to alleviate the cause and prevent its reoccurrence.

4. COMPLIANCE REPORT

4.1 (a) The Owner shall ensure that a written report detailing compliance with all terms and conditions of this approval is completed annually ("Compliance Report").

(b) The first Compliance Report shall cover a period commencing not later than the date of issue of this certificate to the end of the calendar year in which the certificate is issued and shall be completed and made available not later than March 31 of the following year. Each subsequent Compliance Report shall be completed and made available not later than March 31 following the end of the calendar year to which the Compliance Report applies.

(c) A Compliance Report shall include, at a minimum, the following information:

(i) Under a heading of 'Compliance with Terms and Conditions of the Certificate of Approval', a statement as to compliance with all of the terms and conditions of the certificate and a detailed description of the measures taken to ensure compliance with the certificate, including any supporting data or other information;

(ii) In the event of any non-compliance during the reporting period, and under a heading of 'Non-Compliance with Terms and Conditions of the Certificate of Approval', details of the non-compliance as well as details of how and when any non-compliance was corrected;

(iii) A summary and discussion of the quantity of water supplied during the reporting period compared to the rated capacity specified in this certificate of approval, including monthly average and maximum daily flows;

(iv) A summary of records made under Condition 2.1 related to flow rate exceedances, and a summary of analytical results of sampling required by the certificate, including raw water and in-process parameters as specified in the operations manual in accordance with Condition 3.10; and

(v) A summary listing treatment chemicals used, including average dosage rates with special reference to any abnormal usage.

(d) The Compliance Report shall be signed by a person designated by the Council of the municipality that owns the works.

(e) Within three months of completion of the Compliance Report, the Owner shall confirm by a resolution of council that the Compliance Report has been presented to council.

(f) The Owner shall ensure that copies of the Compliance Report are available for inspection by any member of the public during normal business hours without charge and at the same location as that required by s.11 of O. Reg. 459/00 for reports under that regulation. Each 4th quarter report required under section 12 of that regulation shall include information about when the Compliance Report is required to be completed, an outline of the requirements for its contents, and the location where the completed report can be inspected.

5. UPGRADING REQUIREMENTS

5.1 Subject to Condition 5.4 below, by **December 31, 2003,** the Owner shall implement the following physical improvements to the works, in keeping with recommendations of the Engineers' Report and related correspondence:

(a) All works and measures necessary to ensure that appropriate free chlorine residual and associated contact time calculated at the plant rated capacity with the unit processes providing contact time at a minimum operating level and under limiting temperature and pH conditions meet requirements of the "Procedure B13-3 Chlorination of Potable Water Supplies in Ontario", including but not limited to:

(i) upgrading disinfection facilities for providing at least 0.5 log inactivation of *Giardia* cysts and 2.0 log inactivation of viruses downstream of the filter-adsorber units and

(ii) ensuring compliance with Procedure B13-3 in the Tollgate Road Elevated Reservoir supplied distribution system.

(b) All works and measures necessary to ensure the effective treatment and integrity of the works, including but not limited to:

(i) connecting all chlorine residual analyzers and turbidity metering devices installed in the treatment/supply system to SCADA and providing alarm at set levels of free chlorine residuals and/or turbidity;

(ii) providing and installing a standby filter backwash pump;

(iii) constructing a separate room for the storage and dosage of each process chemical and

(iv) providing secondary spill containment around stored process chemicals.

5.2 Subject to Condition 5.4 below, by **December 31, 2002,** the Owner shall implement the following physical improvements to the works, in keeping with recommendations of the Engineers' Report and related correspondence:

(a) All works and measures necessary to ensure the effective treatment and integrity of the works, including but not limited to:

(i) providing and installing a standby chemical metering pump at the Boundary Road rechlorination facility;

(ii) ensuring that each inplant water supply line is supplied with a backflow prevention device and

(iii) providing secondary spill containment around generator fuel.

5.3 The Owner shall implement, by **December 31, 2002,** the following <u>interim</u> measure:

(i) maintaining year around flow proportional chlorination at the raw water intake at a rate resulting in a detectable but not higher than 0.1 mg/L concentration of free chlorine residual upstream of the filter-adsorber units.

NOTE: In addition to the maintained intake chlorination, flow proportional post-chlorination shall be applied at a rate resulting in a concentration of at least 0.2 mg/L free chlorine residuals at all sections in the distribution system.

NOTE: Maintained intake chlorination shall be discontinued after all Condition 5.1 listed physical improvements are implemented.

5.4 The Owner shall not construct or allow the construction of any portion of the works necessary to comply with the requirements of Conditions 5.1 and 5.2 above for which an approval under the *Ontario Water Resources Act* or the *Environmental Protection Act* is required unless a complete application for approval of such portion of the works, including detailed design drawings, specifications and a design brief containing detailed design calculations, has been submitted to and approved by the Director.

5.5 The Owner shall ensure that a complete application for approval under Section 52 of the *Ontario Water Resources Act*, and if necessary, under Section 9 of the *Environmental Protection Act*, is submitted to the Director for each item listed in Conditions 5.1 and 5.2 above for which an approval is required at a date which will allow the Owner to obtain approval for the required physical upgrades to the works, and implement the upgrades on or before the compliance date stipulated in Conditions 5.1 and 5.2 above.

6. SUBSEQUENT ENGINEERS' REPORTS

6.1 The Owner shall ensure that not later than **July 31, 2004** a Second Engineer's Report, prepared in accordance with the Ministry publication "Terms of Reference for Second and Subsequent Engineers' Reports for Water Works" current at the time of the preparation of the Report, is submitted to the Director.

6.2 The Owner shall ensure that each subsequent Engineer's Report, required by O. Reg. 459/00 to be submitted to the Director not later than the third anniversary of the submission of the previous report, is prepared in accordance with the Ministry publication "Terms of Reference for Second and Subsequent Engineers' Reports for Water Works" current at the time of the preparation of the Report.

7. REVOCATION OF EXISTING APPROVALS

7.1 The descriptions of the approved works and conditions of approval in this certificate apply in place of all existing descriptions and conditions in the certificates of approval under the *Ontario Water Resources Act* for water works which are part of the works approved by this certificate.

7.2 Notwithstanding Condition 7.1 above, the original applications for approval, including design calculations, engineering drawings and reports prepared in support of the existing certificate(s) of approval whose descriptions of the approved works and conditions are now replaced pursuant to Condition 7.1 above, shall form part of this certificate.

7.3 Where an existing certificate of approval referred to in Condition 7.1 above applies to works in addition to the works approved by this certificate, it shall continue to apply to those additional works.

8. INFORMATION

8.1 The requirements in this certificate shall not be construed as limiting in any way the ability of the Ministry to request or require the Owner to furnish any information related to compliance with this certificate, as limiting in any way the authority of the Ministry to require certain steps be taken, or as evidence of the fulfillment of the obligation to report or notify of non-compliance where reporting or notification is required by a statute, regulation, order or other approval.

8.2 In the event the Owner provides the Ministry with information, records, documentation or notification in accordance with this certificate ("Information"),

(a) the receipt of the Information by the Ministry;

(b) the acceptance by the Ministry of the Information's completeness or accuracy; or

(c) the failure of the Ministry to prosecute the Owner or to require the Owner to take any action, under this certificate or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Owner relating to the Information, amounting to non-compliance with the certificate.

9. CHANGE OF OWNERSHIP

9.1 The Owner shall notify the Manager of the local District office of the Ministry in writing of any of the following changes within 30 days of the change occurring:

(a) change of owner or operating authority, or both;

(b) change of address of owner or operating authority or address of new owner or operating authority;

(c) change of partners where the owner or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Partnerships Registration Act* shall be included in the notification to the Manager of the local District office of the Ministry;

(d) change of name of the corporation where the owner or operating authority is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1, 2 or 3 of O. Reg. 189, R.R.O. 1980, as amended from time to time), filed under the *Corporations Information Act* shall be included in the notification to the Manager of the local District office of the Ministry;

9.2 In the event of any change in ownership of the works, other than change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this certificate, and a copy of such notice shall be forwarded to the Manager of the local District office of the Ministry.

9.3 The Owner shall ensure that all communications made pursuant to Conditions 9.1 and 9.2 will refer to this certificate's number.

10. INTERPRETATION (Severability and Conflicts)

10.1 The requirements of this certificate are severable. If any requirement of this certificate, or the application of any requirement of this certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

10.2 In all matters requiring the interpretation and implementation of this certificate, the conditions of the certificate shall take precedence, followed by the documentation submitted in support of the applications associated with any previously issued certificates of approval for works which are part of the works approved by this certificate.

The reasons for the imposition of these terms and conditions are as follows:

1. Conditions 1.1, and 1.4 are included so that the water quality delivered by the water treatment plant satisfies the current Ontario Drinking Water Standards in order to protect public health and so that the water is aesthetically acceptable.

2. Conditions 1.2 and 1.3 are included so that the flow rate of water through the works is within the approved treatment capacity of the works.

3. Conditions 2.1 and 2.2 related to the flow metering, sampling and monitoring program are imposed so that all pertinent data are available for the works performance evaluation and so that the works is operated and maintained at the level consistent with the design objectives, and is effective in producing water of an acceptable quality at all times.

4. Conditions 3.1 through 3.9 and 3.11 through 3.14 are included so that the works will be operated, maintained, funded, staffed and equipped in a manner enabling compliance with the terms and conditions of this certificate and that the Owner can deal with contingency and/or emergency situations.

5. Condition 3.10 is included so that adequate information is available to allow proper control of the treatment process in order to achieve the desired water quality and efficiency of the treatment process.

6. Condition 4.1 is included so that the Owner will regularly review compliance with the terms and conditions of this certificate, be alerted to its obligations with respect to any non-compliance, and allow the public enhanced participation in monitoring compliance.

7. Conditions 5.1 and 5.2 are included to require the Owner to implement improvements to the works necessary for the works to be capable of providing safe drinking water in accordance with Ontario Regulation 459/00 and Ontario Drinking Water Standards in a consistent and reliable manner.

Note: The requirement to implement the improvements to the works identified in Conditions 5.1 and 5.2 are based on the minimum treatment requirements applicable to all water supplies using surface waters as a source of raw water, and should it at any time be determined that the waters used as a source of raw water by the works have an increased potential for the presence of parasite cysts, the Owner may be required to provide further improvements to the works.

8. Condition 5.3 is included to require the Owner to implement a water quality safety related measure until the implementation of Condition 5.1 required upgrades.

9. Conditions 5.4 and 5.5 are included so that the Owner is aware that Conditions 5.1 and 5.2, which identifies the requirements for improvements to the works, do not constitute an approval for the implementation of the improvements, and before undertaking any of the improvements, the Owner must apply for and obtain Director's approval under Section 52 of the *Ontario Water Resources Act*.

10. Conditions 6.1 and 6.2 are included to set specific dates for the submission of a second and subsequent engineers' reports, which are required by Ontario Regulation 459/00.

11. Conditions 7.1 through 7.3 are included to stipulate that this certificate replaces all previous approvals for the works being the subject of this certificate, and that the existing approvals remain in force for the purpose of any works which are not subject to this certificate (e.g., a distribution system or its portions, including any in-distribution storage facilities not associated with a water treatment process).

12. Conditions 8.1 and 8.2 are included to emphasize the distinction between the requirements of this certificate and other legal requirements with which the Owner is required to comply.

13. Conditions 9.1 through 9.3 are included so that the Ministry records are kept accurate and current with respect to approved works, and so that subsequent owners of the works are made aware of the certificate and continue to operate the works in compliance with it.

14. Conditions 10.1 and 10.2 are included to clarify how the certificate is to be judicially interpreted, and specifically, to clarify that the requirements of the certificate are severable and that they prevail over supporting documentation.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 9938-547RJS issued on February 5, 2002

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days

after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

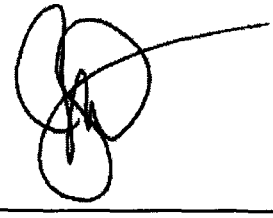
AND

The Director
Section 52, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted water works are approved under Section 52 of the Ontario Water Resources Act.

DATED AT TORONTO this 20th day of June, 2002



Mohamed Dhalla, P.Eng.
Director
Section 52, *Ontario Water Resources Act*

PO/

c: District Manager, MOE Cornwall
Manager, Drinking Water, Wastewater and Watershed Standards Section, Standards Development Branch

Ontario

APPENDIX B

PERMIT TO TAKE WATER

(AS ATTACHED)

Cornwall Office
SIS 7 ... 220 (...)

21 July 2003

Corporation of The City of Cornwall
360 Pitt Street, PO Box 877
Cornwall, ON K6H 5T9

Attention: Morris McCormick
Division Manager, Environmental Services

Dear Mr. McCormick:

Re: Permit to Take Water 03-P-4058

Enclosed please find Permit to Take Water Number 03-P-4058 which authorizes the taking of water from Lake St. Lawrence, St. Lawrence River located on the upstream of the Robert Saunders Dam, City of Cornwall.

The Permit has been issued in accordance with the procedures and amounts stated on the application for the Permit To Take Water. The Permit is subject to the General Conditions and Special Conditions that may be stated on the Permit. The Conditions have been designed to allow for the development of water resources for beneficial purposes, while providing reasonable protection to existing water uses and users.

Please note that because the current rated capacity of the water treatment facility is 100,000,000 litres per day, I have issued a Permit for that amount instead of for the amount of 125,000,000 litres per day requested. Permits are not issued for amounts greater than the amounts approved on any associated approvals and furthermore the reported amounts of water taking demonstrate that the actual water taking is far below the rated amount of the water treatment plant.

The Permit is valid until July 21, 2013, or until such time as there are changes in the rate, amount or method of water taking. If changes occur, an application must be submitted to and approved by this Ministry prior to the commencement of the changes. The attached application form must be used to request an amendment to the Permit. Please submit applications for renewal of the Permit at least 60 days prior to the expiry date to allow for processing of the application.

The Permit should be reviewed carefully prior to water taking. Compliance with the Conditions of the Permit is the responsibility of the Permit Holder. Any person taking water under the authority of this Permit must be familiar with the Conditions.

It has been brought to my attention that from time to time your area may experience drought or water shortage conditions and therefore General Condition 11 has been added to the Permit. This General Condition is necessary to ensure equitable access to the water supply and to provide protection for the natural resources. This condition does not affect the right to appeal the Director's Notice to the Environmental Review Tribunal under the *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40, Subsection 100(3).

If you have any questions regarding your Permit please contact Nicholas Murphy at this office.

Yours truly,

Original Signed by
C. HAMMOND

Clyde Hammond, Director
Section 34, R.S.O. 1990
Ontario Water Resources Act, R.S.O. 1990, Chapter O.40
Ministry of the Environment
NM/GM/sh

Enclosure

bc: Cornwall Area Office ✓
R.F. PTTW\03-P-4058\STAR #18325

PERMIT TO TAKE WATER
Number 03-P-4058

Notice of Terms and Conditions
Section 100, *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40

Pursuant to Section 34 of the *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40 permission is hereby granted

TO: Corporation of The City of Cornwall
360 Pitt Street, P.O. Box 877
Cornwall, ON
K6H 5T9

for the taking of water from Lake St. Lawrence, St. Lawrence River located upstream of the Robert Saunders Dam, in the City of Cornwall, for municipal water supply. The rate of taking shall not exceed 125,000 litres per minute, or 100,000,000 litres per day.

Except where modified by this Permit the water taking shall be in accordance with the application dated March 20, 2003, and signed by Morris McCormick.

You are hereby notified that this Permit is issued to you subject to the following Definitions, General Conditions and Special Conditions.

DEFINITIONS

1. (a) "Director" means a Director, Section 34, *Qntario Water Resources Act*, R.S.O. 1990, Chapter O.40.

(b) "District Office" means Kingston District, Eastern Region, Ontario Ministry of the Environment.

(c) "District Manager" means District Manager, Kingston District, Eastern Region, Ontario Ministry of the Environment.

(d) "Ministry" means Ontario Ministry of the Environment.

(e) "Permit" means this entire Permit to Take Water including its schedules, if any, issued in accordance with Section 34 of the *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40.

(f) "Permit Holder" means Corporation of The City of Cornwall.

GENERAL CONDITIONS

2. This Permit shall be kept available at the offices of Corporation of The City of Cornwall, 360 Pitt Street, P.O. Box 877, Cornwall, ON, with a copy to be kept on-site at the City of Cornwall Water Treatment Plant at 861 2nd Street West, Cornwall, Ontario, for inspection by Ministry staff at all times.

3. The Director may, from time to time, where a situation of interference or anticipated interference with water supplies exists, or in a situation requiring information on water takings for purposes of water resource inventory and planning, give written notice to the Permit Holder to undertake any of the following actions. The Permit Holder shall comply with any such notice:

   (a) To establish and maintain a system for the measurement of the quantities of water taken;
   (b) To operate such a system and to record measurements of the quantities of water taken on forms provided by the Director, with such frequency or for such time periods as the Director may specify;
   (c) To return to the Director records made pursuant to clause 3(b) at such times or with such frequency as the Director may specify; and
   (d) To keep records made pursuant to clause 3(b) available for inspection until such time as they are returned to the Director pursuant to clause 3(c).

4. The Permit Holder shall immediately notify the District Manager of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint.

5. For Surface-Water Takings, the taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that stream flow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

6. For Ground-Water Takings, if the taking of water is forecast to cause any negative impact, or is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent the forecast negative impact or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so doing.

7. The Permit Holder shall report to the Director any changes of address or telephone number, or change of ownership of the property for which this Permit is issued and shall report to the Director any changes in the general conditions of water taking from those described in the Permit application within thirty days of any such change. The Permit Holder shall not assign his rights under this Permit to another person without the written consent of the Director.

8. No water may be taken under authority of this permit after the expiry date of this Permit, unless the Permit is renewed, or after the expiry date shown on any subsequent renewal of this permit, unless it is likewise renewed.

9. This Permit does not release the Permit Holder from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law. This Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

10. The Permit Holder must forthwith, upon presentation of credentials, permit Ministry personnel, or a Ministry authorized representative(s) to carry out any and all inspections authorized by Section 15, 16 or 17 of the *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40, Section 156, 157 or 158 of the *Environmental Protection Act*, R.S.O. 1990 of Section 19 or 20 of the *Pesticides Act*, R.S.O. 1990.

11. The Director may, at times of drought or water shortage in the locality of the taking, give notice to the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director. The suspension or reduction in the taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect the right to appeal the notice to the Environmental Review Tribunal under the *Ontario Water Resources Act*, R.S.O. 1990, Chapter O.40, Subsection 100(3).

12. The Permit does not abrogate the Permit Holder's responsibility to comply with all applicable legislation, including O.Reg. 285/99, which provides, among other things, that no person shall use water by transferring it out of a water basin (as defined in the Regulation) in a container having a volume greater than 20 litres. The Regulation divides Ontario into three water basins, being the Great Lakes-St. Lawrence, the Nelson and Hudson Bay Basins.

SPECIAL CONDITIONS

13. The Permit Holder shall measure and record daily amount and duration of each water taking event and shall ensure copies of these records are kept at the offices of Corporation of The City of Cornwall, 360 Pitt Street, P.O. Box 877, Cornwall, ON, with a copy to be kept on-site at the City of Cornwall Water Treatment Plant at 861 2nd Street West, Cornwall, Ontario, until this Ministry requests them to be submitted or states otherwise.

14. No water shall be taken under authority of this Permit after July 21, 2013.

The reason for the imposition of Special Condition 13 is to establish a record of water taking.

The reason for the imposition of Special Condition 14 is to ensure that this Ministry has an opportunity to review the continued availability of water to be taken under authorization by this Permit as it relates to interference with other established uses.

You may, by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the *Ontario Water Resources Act*, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each Term or Condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit number;
6. The date of the Permit;
7. The name of the Director;
8. The municipality within which the taking is located;

And the Notice should be signed and dated by the appellant.

This notice must be served upon:

The Secretary
Environmental Review Tribunal
P.O. Box 2382
2300 Yonge Street, 12th Floor
TORONTO, Ontario
M4P 1E4

AND The Director
Section 34, *Ontario Water Resources Act*
Ministry of the Environment
133 Dalton Avenue, Box 820
KINGSTON, Ontario
K7L 4X6

Dated at Kingston this 21st day of July, 2003.

Director
Section 34, Ontario Water Resources Act
Ministry of the Environment.

APPENDIX C

GPS COORDINATES

GPS REFERENCING	
ITEM	GLOBAL POSITIONING SYSTEM (GPS) COORDINATES
MAP DATUM:	NAD83
UTM ZONE:	18T
TREATMENT PLANT:	0519734 / 4984673 (±8.6m)
INTAKE:	0516421 / 4984505 (±10.0m)
ELEVATED STORAGE TANK:	0520286 / 4988528 (±9.8m)
BOUNDARY ROAD RESERVOIR:	0525705 / 4987641 (±6.6m)
DISTRIBUTION SYSTEM: ESSO	0522494 / 4986881 (±10.0m)
DISTRIBUTION SYSTEM: Fifth Wheel	0520777 / 4988506 (±10.0m)
DISTRIBUTION SYSTEM: Richelieu	0517188 / 4984437 (±10.0m)
DISTRIBUTION SYSTEM: Glen Store Dunn Lodge	0524985 / 4985900 (±10.0m)
DISTRIBUTION SYSTEM: Cornwall Public Works	0521143 / 4986988 (±10.0m)

Ontario

APPENDIX D

APPENDIX D

Plant Name: Cornwall Water Treatment Plant

Facility Level: Class 3 Water Treatment and Class 3 Water Distribution

Certificate Number: 103

Date of Issue: July 7, 1987

Operator Name: Morris McCormick	**Title:** Division Manager
Water Treatment Classification: Class 3	**Water Distribution Classification:** Class 3
Certificate Number: 9980	**Certificate Number:** 9981
Expiry Date:	**Expiry Date:**

Operator Name: Bill de Witt	**Title:** Water Plant Supervisor
Water Treatment Classification: Class 2	**Water Distribution Classification:** --
Certificate Number: 11337	**Certificate Number:** --
Expiry Date: May 31, 2006	**Expiry Date:** --

Ontario

Ministry of the Environment
Drinking Water Inspection Report

Operator Name: Medard Godard	**Title:** Operator
Water Treatment Classification: Class 2	**Water Distribution Classification:** --
Certificate Number: 9496	**Certificate Number:** --
Expiry Date: March 31, 2005	**Expiry Date:** --

Operator Name: Claude Ouellette	**Title:** Operator
Water Treatment Classification: Class 3	**Water Distribution Classification:** --
Certificate Number: 11799	**Certificate Number:** --
Expiry Date: November 30, 2006	**Expiry Date:** --

Operator Name: Tom Gemmel	**Title:** Supervisor
Water Treatment Classification: --	**Water Distribution Classification:** Class 3
Certificate Number: --	**Certificate Number:** 7596
Expiry Date: --	**Expiry Date:** July 31, 2005

Operator Name: Paul DeJong	**Title:** Operator
Water Treatment Classification: --	**Water Distribution Classification:** Class 2
Certificate Number: --	**Certificate Number:** 1057
Expiry Date: --	**Expiry Date:** April 30, 3005

Operator Name: Viet Hoang	**Title:** Operator
Water Treatment Classification: --	**Water Distribution Classification:** OIT
Certificate Number: --	**Certificate Number:** OT19119
Expiry Date: --	**Expiry Date:** February 28, 2006

Ontario

Ministry of the Environment
Drinking Water Inspection Report

Operator Name: Kim Delorme	**Title:** Operator
Water Treatment Classification: OIT	**Water Distribution Classification:** OIT
Certificate Number:	**Certificate Number:** OT19674
Expiry Date: June 30, 2006	**Expiry Date:** March 31, 2006

Operator Name: Shawn O'Brien	**Title:** Sub Foreman
Water Treatment Classification: --	**Water Distribution Classification:** Class1
Certificate Number: --	**Certificate Number:** 14850
Expiry Date: --	**Expiry Date:** October 31, 2006

Ontario

APPENDIX E

CONTACT INFORMATION

Local Health Unit

Eastern Ontario Health Unit
1000 Pitt Street
Cornwall, ON

Attention: Dr. Bourdeau

Medical Officer of Health:

Dr. Robert Bourdeau

Phone: 613-933-1375
Fax: 613-933-9707

Conservation Authority or Ministry of Natural Resources

Raisin Region Conservation Authority
P.O. Box 429
6589 Boundary Road
Cornwall, ON
K6H 5T2
Attention: Mr. Roger Houde
General Manager

Phone: 613-938-3611
Fax: 613-938-3221

MOE Environmental Assessment and Approvals Branch

Ministry of the Environment
2 St. Clair Avenue West
Floor 12A
Toronto ON M4V 1L5

Attention: Mirek Tybinkowski
Water and Wastewater
Specialist

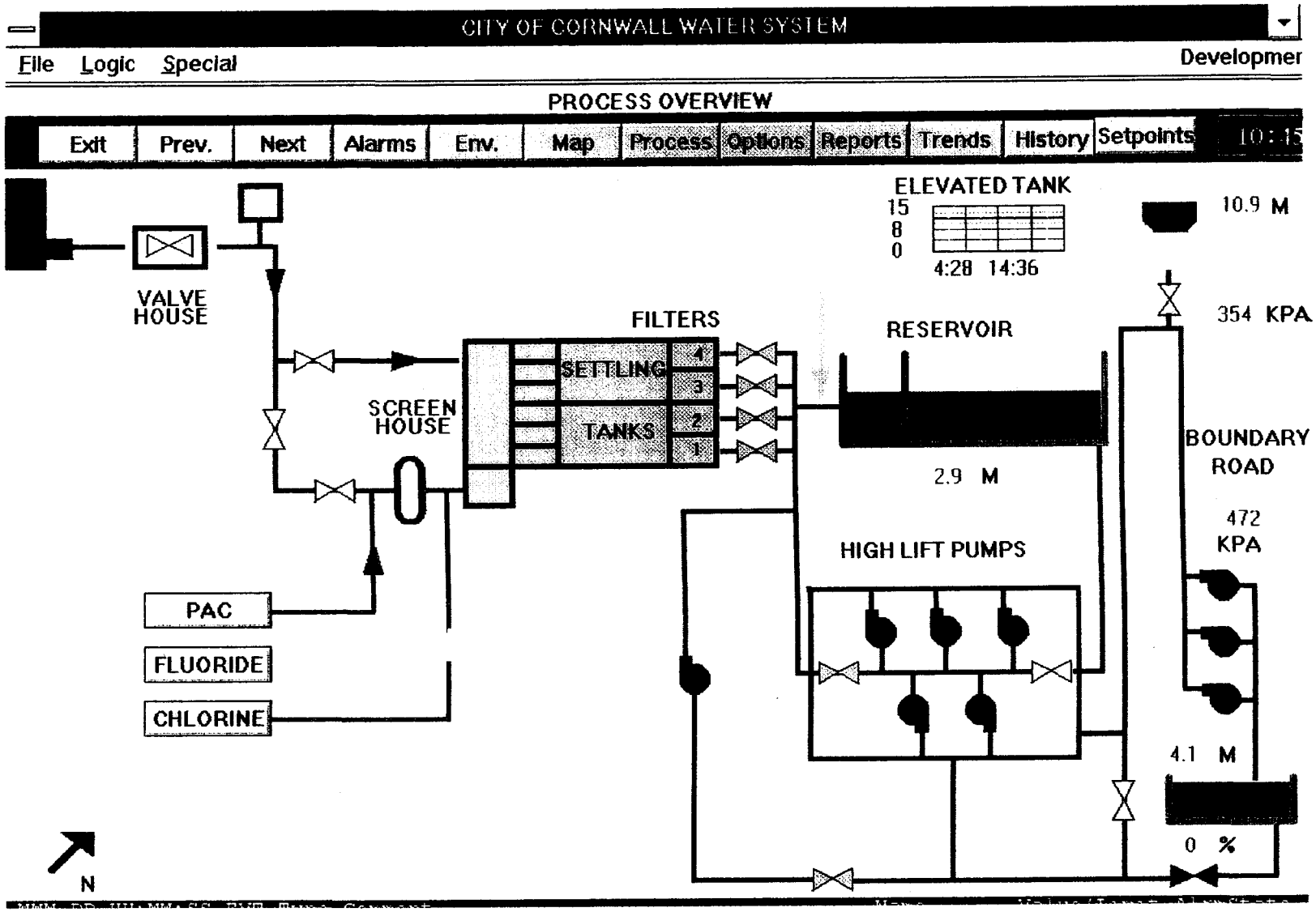
Phone: 416-314-8202
Fax: 416-314-6935

Ontario

APPENDIX F

PLANT SCHEMATIC

(SEE ATTACHED)


CITY OF CORNWALL WATER SYSTEM
File Logic Special
Developmer
PROCESS OVERVIEW
Exit Prev. Next Alarms Env. Map Process Options Reports Trends History Setpoints
ELEVATED TANK
15
8
0
4:28 14:36
10.9 M
VALVE HOUSE
FILTERS
SETTLING TANKS
4
3
2
1
SCREEN HOUSE
RESERVOIR
2.9 M
354 KPA
BOUNDARY ROAD
472 KPA
HIGH LIFT PUMPS
PAC
FLUORIDE
CHLORINE
4.1 M
0 %
N

Ontario

APPENDIX G

MINISTRY AUDIT SAMPLE RESULTS

(SEE ATTACHED)

APPENDIX
Table 1
CORNWALL WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 09-JUL-2003
CHEMICAL / PHYSICAL PARAMETERS - HEALTH RELATED

Sample # 1 - (REG) WATER TOWER
Sample # 2 - (REG) TREATED WATER

Parameter	Units	MAC [1]	IMAC [2]	AO [3]	SAMPLE # 1	SAMPLE # 2
ANTIMONY, UNFILTERED TOTAL	UG/L		6			.57 +/-0.15
ARSENIC, UNFILTERED TOTAL	UG/L		25			.6 +/-0.10
BARIUM, UNFILTERED TOTAL	UG/L	1000				23.3 +/-2.30
BENZENE C6H6	UG/L	5			.05 <=W	.05 <=W
BORON, UNFILTERED TOTAL	UG/L		5000			23 +/-4.00
BROMODICHLOROMETHANE	UG/L				12.2	8.2
BROMOFORM	UG/L				.5 <=W	.5 <=W
CADMIUM, UNFILTERED TOTAL	UG/L	5				.01 +/-0.05
CARBON TETRACHLORIDE	UG/L	5			.2 <=W	.2 <=W
CHLOROBENZENE	UG/L	80			.05 <=W	.05 <=W
CHLORODIBROMOMETHANE	UG/L				4.4	3
CHLOROFORM CHCL3	UG/L				24	13.8
CHROMIUM, UNFILTERED TOTAL	UG/L	50				.5 +/-0.50
DICHLOROBENZENE 1,2	UG/L	200			.05 <=W	.05 <=W
DICHLOROBENZENE 1,4	UG/L	5			.05 <=W	.05 <=W
DICHLOROETHANE 1,2	UG/L		5		.05 <=W	.05 <=W
DICHLOROETHYLENE 1,1	UG/L	14			.05 <=W	.05 <=W
FLUORIDE, UNFILTERED REACTIVE	MG/L	1.5 b				.61
LEAD, UNFILTERED TOTAL	UG/L	10 c			.12 +/-0.12	.02 +/-0.05
MERCURY, UNFILTERED TOTAL	UG/L	1				.02 <=W
METHYLENE CHLORIDE	UG/L	50			.2 <=W	.2 <=W
NITRATES TOTAL, UNFIL.REAC	MG/L	10 d				.292
NITRITE, UNFILTERED REACTIVE	MG/L	1 d				.001 <=W
SELENIUM, UNFILTERED TOTAL	UG/L	10				0 +/-1.00
TETRACHLOROETHYLENE	UG/L	30			.05 <=W	.05 <=W
TRICHLOROETHYLENE C2HCL3	UG/L	50			.05 <=W	.05 <=W
TRIHALOMETHANES, TOTAL	UG/L	100 e			40.5	25
URANIUM, UNFILTERED TOTAL	UG/L	20				.2 +/-0.05
VINYL CHLORIDE C2H3CL	UG/L	2			.05 <=W	.05 <=W

Shortforms:

<T	-	A measurable trace amount; interpret with caution	NA	-	Result not available
<W	-	No measurable response (zero) : < Reported value	NS	-	Not sampled
<=W	-	No measurable response (zero) : < Reported value	NG/L	-	Nanograms per litre
<	-	Actual result is less.than reported value	UG/L	-	Micrograms per litre
ND	-	Not detected	MG/L	-	Milligrams per litre
!NP	-	No appropriate procedure available			

Footnotes:

1 Maximum Acceptable Concentration

2 Interim Maximum Acceptable Concentration

3 Aesthetic Objective

4 Includes *alpha*-chlordane, *gamma*-Chlordane and Oxychlordane

5 Includes *p,p'*-DDE, o,p'-DDT, *p,p'*-DDD and *p,p'*DDT

a) Total toxic equivalents when compared with 2,3,7,8,-TCDD (tetrachlorodibenzo-p-dioxin)

b) Where fluoride is added to drinking water, it is recommended that the concentration be adjusted to 0.5 - 0.8 mg/L, the optimum level for control of tooth decay. Where supplies contain naturally occurring fluoride at levels higher than 1.5 mg/L but less than 2.4 mg/L the Ministry of Health and Long Term Care recommends an approach through local boards of health to raise public and professional awareness to control excessive exposure to fluoride from other sources. Levels above the MAC must be reported to the local Medical Officer of Health.

c) This standard applies to water at the point of consumption. Since lead is a component in some plumbing systems, first flush water may contain higher concentrations of lead than water that has been flushed for five minutes.

d) Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).

e) The standard is expressed as a running annual average of quarterly samples measured at a point reflecting the maximum residence time in the distribution system.

APPENDIX
Table 2
CORNWALL WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 09-JUL-2003
MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

Sample # 1 - RAW WATER RESERVOIR
Sample # 2 - (REG) RICHELLEU
Sample # 3 - (REG) WATER TOWER
Sample # 4 - (REG) FIFTH WHEEL
Sample # 5 - (REG) ESSO
Sample # 6 - (REG) WATER RESERVOIR
Sample # 7 - (REG) GLEN STORE DUNN LODGE
Sample # 8 - (REG) PUBLIC WORKS
Sample # 9 - (REG) TREATED WATER

Parameter	Units	MAC [1]	AO [2]	SAMPLE # 1	SAMPLE # 2
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200		200 >	
COLIFORM, TOTAL MF	C/100ML	0		68	
ESCHERICHIA COLI MF	C/100ML	0		67	
HETEROTROPH MF 35 C	C/ML	500			10 <
NT: DETERIORATION INDICATORS	C/100ML		0		NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0			ABSENT
NT: TOTAL COLIFORMS	C/100ML	0			ABSENT

APPENDIX
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Sample # 4 - (REG) FIFTH WHEEL
Sample # 5 - (REG) ESSO
Sample # 6 - (REG) WATER RESERVOIR
Sample # 7 - (REG) GLEN STORE DUNN LODGE
Sample # 8 - (REG) PUBLIC WORKS
Sample # 9 - (REG) TREATED WATER

Parameter	Units	MAC [1]	AO [2]	SAMPLE # 3	SAMPLE # 4
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200			
COLIFORM, TOTAL MF	C/100ML	0			
ESCHERICHIA COLI MF	C/100ML	0			
HETEROTROPH MF 35 C	C/ML	500		10 <	10 <
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED	NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT	ABSENT
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT	ABSENT

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MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

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Sample # 3 - (REG) WATER TOWER
Sample # 4 - (REG) FIFTH WHEEL
Sample # 5 - (REG) ESSO
Sample # 6 - (REG) WATER RESERVOIR
Sample # 7 - (REG) GLEN STORE DUNN LODGE
Sample # 8 - (REG) PUBLIC WORKS
Sample # 9 - (REG) TREATED WATER

Parameter	Units	MAC[1]	AO[2]	SAMPLE # 5	SAMPLE # 6
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200			
COLIFORM, TOTAL MF	C/100ML	0			
ESCHERICHIA COLI MF	C/100ML	0			
HETEROTROPH MF 35 C	C/ML	500		10 <	10 <
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED	NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT	ABSENT
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT	ABSENT

APPENDIX
Table 2
CORNWALL WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 09-JUL-2003
MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

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Sample # 3 - (REG) WATER TOWER
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Sample # 5 - (REG) ESSO
Sample # 6 - (REG) WATER RESERVOIR
Sample # 7 - (REG) GLEN STORE DUNN LODGE
Sample # 8 - (REG) PUBLIC WORKS
Sample # 9 - (REG) TREATED WATER

Parameter	Units	MAC [1]	AO [2]	SAMPLE # 7	SAMPLE # 8
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200			
COLIFORM, TOTAL MF	C/100ML	0			
ESCHERICHIA COLI MF	C/100ML	0			
HETEROTROPH MF 35 C	C/ML	500		10 <	10 <
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED	NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT	ABSENT
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT	ABSENT

APPENDIX
Table 2
CORNWALL WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 09-JUL-2003
MICROBIOLOGICAL PARAMETERS - HEALTH RELATED

Sample # 1 - RAW WATER RESERVOIR
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Sample # 3 - (REG) WATER TOWER
Sample # 4 - (REG) FIFTH WHEEL
Sample # 5 - (REG) ESSO
Sample # 6 - (REG) WATER RESERVOIR
Sample # 7 - (REG) GLEN STORE DUNN LODGE
Sample # 8 - (REG) PUBLIC WORKS
Sample # 9 - (REG) TREATED WATER

Parameter	Units	MAC [1]	AO [2]	SAMPLE # 9
COLIFORM, TOTAL M/F BCKGRD	C/100ML	200		
COLIFORM, TOTAL MF	C/100ML	0		
ESCHERICHIA COLI MF	C/100ML	0		
HETEROTROPH MF 35 C	C/ML	500		10 <
NT: DETERIORATION INDICATORS	C/100ML		0	NOT DETECTED
NT: ESCHERICHIA COLI	C/100ML	0		ABSENT
NT: TOTAL COLIFORMS	C/100ML	0		ABSENT

Notes:

- Escherichia coli is a more definitive indicator of fecal contamination than fecal coliforms or total coliforms.
- At elevated levels, the general bacterial population may interfere with the detection of coliforms. This general population can be estimated from either background colony counts on the total coliform membrane filters or heterotrophic plate counts (HPC).

Shortforms:

C/100mL - Count per 100 millilitre

C/mL - Count per millilitre

Footnotes:

1. Maximum Acceptable Concentration
2. Aesthetic Objective

According to section 16-3 of O.Reg. 170/03,the following are prescribed as adverse results of a drinking-water test for the purpose of section 18 of the Safe Drinking Water Act 2002:

1. A result that exceeds any of the standards prescribed by Schedule 1, 2 or 3 to the Ontario Drinking-Water Quality Standards, other than the standard for fluoride, if the result is from a sample of drinking water.

2. A result indicating the presence of Aeromonas spp., Pseudomonas aeruginosa, Staphylococcus aureus, Clostridium spp. or fecal streptococci (Group D streptococci) in a sample of drinking water.

3. A result indicating the presence of a pesticide not listed in Schedule 2 to the Ontario Drinking-Water Quality Standards in a sample of drinking water, at any concentration.

4. A result indicating that the concentration of free chlorine residual is less than 0.05 milligrams per litre in a distribution sample, if the drinking-water system provides chlorination and does not provide chloramination.

5. A result indicating that the concentration of combined chlorine residual is less than 0.25 milligrams per litre in a distribution sample, if the drinking-water system provides chloramination.

6. If the drinking-water system is required to provide filtration and a report under subsection 18 (1) of the Act has not been made in respect of turbidity in the preceding 24 hours, a result indicating that turbidity exceeds 1.0 Nephelometric Turbidity Units (NTU) in,

i. a grab sample of water taken from a filter effluent line, or

ii. two samples of water from a filter effluent line that are tested by continuous monitoring equipment, if the two samples were taken 15 minutes or more apart and the later of the two samples was the first sample that was taken 15 minutes or more after the earlier sample.

7. If an approval or order, including an OWRA order, identifies a parameter as a health-related parameter and establishes a maximum concentration for the parameter, a result indicating that the parameter exceeds the maximum concentration in a sample of drinking water.

8. A result indicating that the concentration of sodium exceeds 20 milligrams per litre in a sample of drinking water, if a report under subsection 18 (1) of the Act has not been made in respect of sodium in the preceding 60 months.

9. A result indicating that the concentration of fluoride exceeds 1.5 milligrams per litre in a sample of drinking water, if,

i. the drinking-water system provides fluoridation and a report under subsection 18 (1) of the Act has not been made in respect of fluoride in the preceding 24 hours, or

ii. the drinking-water system does not provide fluoridation and a report under subsection 18 (1) of the Act has not been made in respect of fluoride in the preceding 60 months.

APPENDIX
Table 3
CORNWALL WATER TREATMENT PLANT
AUDIT SAMPLE RESULTS - 09-JUL-2003
CHEMICAL / PHYSICAL PARAMETERS - NOT HEALTH RELATED

Sample # 1 - (REG) WATER TOWER
Sample # 2 - (REG) TREATED WATER

Parameter	Units	OBJECTIVE	TYPE OF OBJECTIVE	SAMPLE # 1	SAMPLE # 2
ALUMINIUM, UNFILTERED TOTAL	UG/L	100	OG		216 +/-18.00
AMMONIUM, TOTAL UNFIL.REAC	MG/L	a	a		.006 <T
COPPER, UNFILTERED TOTAL	UG/L	1000	AO		.6 +/-0.50
ETHYLBENZENE C8H10	UG/L	2.4	AO	.05 <=W	.05 <=W
IRON, UNFILTERED TOTAL	UG/L	300	AO		2 +/-6.00
MANGANESE,UNFILTERED TOTAL	UG/L	50	AO		.61 +/-0.61
TOLUENE C7H8	UG/L	24	AO	.05 <=W	.05 <=W
TURBIDITY	FTU	5 e	AO		.05 <=W
XYLENE-M C8H10	UG/L	300	AO	.15 <T	.05 <=W
XYLENE-O C8H10	UG/L	300	AO	.1 <T	.05 <=W
XYLENE-P C8H10	UG/L	300	AO	.05 <=W	.05 <=W
ZINC, UNFILTERED TOTAL	UG/L	5000	AO		1.2 +/-0.80

Shortforms:

<T - A measurable trace amount; interpret with caution
<W - No measurable response (zero) : < Reported value
<=W - No measurable response (zero) : < Reported value
< - Actual result is less than reported value
ND - Not detected
NA - Result not available
NS - Not sampled
DEG - Degree celsius

AO - Aesthetic Objective
OG - Operational Guideline
FTU = NTU - Nephelometric Turbidity Unit
TCU - True Colour Units
NG/L - Nanograms per litre
UG/L - Micrograms per litre
MG/L - Milligrams per litre

Footnotes:

a) No limit has been established for this parameter.

b) Organic Nitrogen = (Total Kjeldahl Nitrogen - Ammonia)

c) The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

d) When sulphate levels exceed 500 mg/L, water may have a laxative effect on some people.

e) Applicable for all water at the point of consumption.