

O. Reg. 170 SECTION 11 ANNUAL REPORT
**Part III Form 2
Section 11. ANNUAL REPORT.**

Drinking-Water System Number:	220000460
Drinking-Water System Name:	North Bay WTP
Drinking-Water System Owner:	City of North Bay
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 01, 2006 to December 31, 2006

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [<input checked="" type="checkbox"/>] No []</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [<input checked="" type="checkbox"/>] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> The Corporation of the City of North Bay P.O. Box 360 200 McIntyre Street East North Bay, Ontario P1B 8H8 </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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

Drinking Water System Name	Drinking Water System Number
NA	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [] No []

NA

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

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method [Noted on Utility billing.](#)

Describe your Drinking-Water System

The North Bay Water Treatment Plant is a pumping station which partially treats water from Trout Lake which is part of the Mattawa River watershed. It was originally placed in service in 1929. The process consists of pH adjustment (Sodium Carbonate), fluoridation (Hydrofluosilicic Acid) and disinfection (Sodium Hypochlorite). The chemical treatment facilities are housed in a separate building completed in 1984.

The Permit to Take Water permits consumption up to 79,500 cubic meters per day. The North Bay Water Treatment Plant serves a population of approximately 56,000. There is a 12 kW standby diesel gen set at the plant to power emergency lighting and the chemical feed pumps. There is also a 1000 kW portable gen set with a manual switch over to provide partial standby power to the facility during power outages.

The intake structure is a 1200 mm diameter series 45 polyethylene pipe, with the capacity of 80,000 m³/day, which extends approximately 300 meters into Delaney Bay of Trout Lake. The intake was constructed in 1973 and includes an intake crib in approximately 21.5 meters of water at low water level. The intake has a 90 degree elbow terminating with fiber reinforced plastic (FRP) cage. At the shore the polyethylene pipe connects to a concrete pressure pipe which runs to an intake chamber and then a junction chamber. The intake then discharges into a 1.8 m by 1.35 m high reinforced concrete channel to the screen area located inside the pumping station. The North Bay WTP is also equipped with another intake pipe and structure described as follows: a 900 mm iron intake (not in service) extending 122 m into Delaney Bay of Trout Lake at a depth of 7.6 meters meters off the lake bottom with a capacity of 50,000 m³/day.

Raw water is fed through the WTP without the aid of a low lift pumping station. Raw water is chlorinated at the intake structure. Water then enters the plant and passes through two stainless steel 6 mm mesh FRP framed screens in series followed immediately by the fluoride application point. The plant is also equipped with a 100 m³ wet well and four electrically driven high lift pumps, operating at the rated head of 83.8 m, with a firm capacity of 79,500 m³/d (with the largest pump - pump #3-out of service). The suction connections for each high lift pump are connected

directly to the wet well. The water is also disinfected with the aid of ultraviolet disinfection units, located at the discharge of each high lift pump. Following the discharge of the high lift pumps, the pH of the water is adjusted via the soda ash application point before being directed into the distribution system.

The treated water is pumped to the distribution system, which incorporates the following storage and pumping facilities:

The Canadian Forces Base (CFB) Reservoir and Re-chlorination Facility is an 1820 m³ capacity reservoir equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzer for free chlorine and a standby pump to provide water during power outages.

The Birches Road Standpipe and Re-chlorination Station is an 11,775 m³ capacity steel un-baffled treated water standpipe equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzers for free chlorine and turbidity, a fixed 7.5 kW, 120/240 Volt, single phase, diesel powered gen set to power the standpipe systems and communications during prolonged power outages.

The Judge Avenue Valve Chamber and Re-chlorination Station is equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzers for free chlorine and turbidity, a fixed 7.5 kW, 120/240 Volt, single phase, diesel powered gen set to power the re-chlorination and SCADA communications during prolonged power outages.

The Ellendale Reservoir (also known as the High Lift Pumping Station) is a double cell 18,200 m³ capacity reservoir equipped with a sodium hypochlorite re-chlorination system. The facility is also comprised of an on-line, continuous water quality analyzers for free chlorine and turbidity and a standby gen set to operate the entire facility during power outages.

The Canadore Pumping Station is a facility equipped with high lift pumps and pressurized cushion tanks maintain to pressure in a pressurized zone of the distribution system servicing Canadore College and Nipissing University. There is an on-line continuous water quality analyzer to monitor free chlorine residual and a standby gen set to provide power to operate one (1) 50 hp pump (Pump P0 or P2) during power outages.

Although the North Bay WTP draws water from a surface water source and currently only provides disinfection with Cl₂ and UV, the owner has been granted regulatory relief to install chemically assisted filtration, or equivalent. Subject to Section 9.1 of the C of A, the owner is not required to comply with the provisions listed in Schedule 1 of Ontario Regulation 170/03 until March 31, 2008. Construction of a new membrane filtration water plant began in May 2006.

List all water treatment chemicals used over this reporting period

Sodium Carbonate
Sodium Hypochlorite
Hydrofluosilicic Acid

Were any significant expenses incurred to?

- Install required equipment
 Repair required equipment
 Replace required equipment

Describe

- **Installed a solenoid valve by-pass for pre-chlorination System at the WTP**
- **Installed a sodium hydroxide feed system for pilot study at the WTP**
- **Installed a raw water pH continuous on-line analyzer**
- **Installed a new potable water line to the chemical building at the WTP**
- **Repairs to the Birchs Road Standpipe, included re-sealing the floor with epoxy paint and repairs and painting the exterior of the bottom ring**
- **Replaced sodium hypochlorite re-chlorination system c/w auto switchover at the Birchs Road Standpipe. Also replaced the chemical injection point corporation stop and fittings**
- **Installed VFD controls on the 2 service pumps at the CFB Reservoir/Pumping Stn**
- **Replace the motor on one the CFB service pump, old one repaired as a spare**
- **Replaced 20 m of 600 mm water main on Milani Rd. @ Chippewa Creek**
- **Replaced 250 mm water main on Nipissing St. from Main St. to Jane St. (3 blocks)**
- **Replaced a 600 mm butterfly valve on Milani @ O'Brien**
- **Replaced 600 mm butterfly valve and a 400 mm gate valve on Ski Club Rd.**
- **Replaced 2 existing 300 mm and 400 mm water mains with 200 m of 7 50 mm pipe on Lakeside Dr. between Trout Lake Rd. and Ski Club Road**
- **Completed reconstruction of Fisher St. from 5th Ave. to 2nd Ave.**
- **Completed reconstruction of Jane St. from Nipissing St. to Rock St.**
- **Cleaned 800 m of 100 mm water main on lakeshore Dr. and Premier Rd. from Birch's Rd to Archibald Rd.**
- **Completed relocation of water services from the 100 mm water main to the 200 mm water main on Premier Rd.**
- **Replaced 800 m of water main on Eloy's Rd.**
- **Looped in the dead end water main of Douglas St. to Hillcrest Ave.**
- **Replaced the 100 mm water main on Lakeshore Dr. from Sunset to Mowat with 400 mm pipe.**

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

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
8-May-2006	Microbiological General Background Plate Count	>200	CFU/100 mL	Water main flushed and re-sampled 9 May 2006. Re-sample results clear of any bacterial contamination	9- May-2006
4-Jul-2006	Turbidity	1.29	ntu	Treated turbidity exceeded 1.0 ntu for 21 minutes and peaked at 1.29 ntu. Main 16" line was damaged by contractors.	4-Jul-2006
18-Jul-2006	UV Disinfection			Emergency pumpage of water with chlorination only. UV offline 07:15-08:43. Hydro restored at 08:50. WTP back online with full normal disinfection (UV + chlorination) 09:05.	18-Jul-2006
26-Jul-2006	Turbidity	1.11	ntu	After talking with MOH to inform that high turbidity was treated water and raw water turbidity was 0.44 ntu and also chlorine residual for treated was 1.625 mg/L free, the health unit indicated the plant could return to normal operations. Notification was to exercise due diligence.	27-Jul-2006
18-Aug-2006	Chlorine	< 0.05	mg/L	Suspect loss of chlorine residual was due to new chlorine probe membrane cap having been installed earlier in the day and it was burning in. As a precaution, the pump well was spiked with sodium hypochlorite before the plant was restarted to ensure the required chlorine residual was re-established. Chlorine residual was re-established.	18-Aug-2006
18-Aug-2006	UV Disinfection	< 40	MJ/cm ²	#3 UV reactor shut down 08:44:51 - 08:47:57 resulting in log removal of Giardia and Crypto to drop below provincial regulation for approximately 3 minutes. #2 reactor manually shut down 09:29:53 - 09:32:10 resulting in log removal of Giardia and Crypto to drop below provincial regulation for approximately 3 minutes. Discharge valve not open. After #2 reactor alarm, everything running good.	18-Aug-2006
21-Aug-2006	Virus removal	< 4	log	Giardia and crypto reduction values dropped below minimum for 2 minutes; 32 seconds from 22:44:06 to 22:46:38. Chlorine was 1.70 mg/L free. Reviewed trends and printed graphs. Restarted plant. Left #3 drive off (this was the problem pump). Tech onsite Tuesday morning trying to fix problem.	22-Aug-2006

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22-Aug-2006	UV Disinfection	< 40	mJ/cm ²	Low UV dose on #3 reactor. At 13:01 pump failed and adverse for 3 minutes 2 seconds. Chlorine residual stayed constant at 1.43 mg/L. 2 other reactors were running and experienced no problems. Changed sensor from manual to auto, reset fault, re-started and monitored. Corrective maintenance was completed on unit, unit now operating normally.	30-Aug-2006
8-Sep-2006	UV Disinfection	< 40	mJ/cm ²	Low UV dose event 07:27:00-07:29:29. Chlorine residual during event 1.55 mg/L free. Mechanical failure led to subsequent UV fault. Capacitor was changed and cause of event was corrected.	8-Sep-2006
26-Sep-2006	Virus removal	< 4	log	Giardia and crypto dropped below provincial regulations for approximately 3 minutes. #2 reactor failed on ballast ground fault. 4 capacitors need to be replaced. Switch to #2 pump/reactor. Now running in auto.	26-Sep-2006
19-Oct-2006	Virus removal	< 4	log	Giardia and crypto dropped below provincial regulations. New chlorine pump installed and tested. Discharge valve was closed. Treated chlorine residual leaving plant dropped to cl2F 0.18 mg/L (non-reportable). Virus from 13:45:45 to 13:51:00 dropped below 4.0 log removal (5 min 15 sec) due to the chlorine residual dropping below 0.18 mg/L. Once valve on discharge was opened, everything back to normal.	19-Oct-2006
26-Oct-2006	Virus removal	< 4	log	Giardia and crypto log removal dropped below provincial regulation for 2 minutes 2 seconds. Power failure on #3 reactor caused UV alarm. Replaced blown capacitor and put #3 reactor back online.	27-Oct-2006
11-Nov-2006	Virus removal	< 4	log	Required dosage was reinstated 123 seconds after second pump started. Also increased hypo pump trim.	11-Nov-2006
22-Dec-2006	Fluoride	1.56	mg/L	12:51 fluoride spiked from 0.63 mg/L to 1.56 mg/L. 12:53 fluoride spike peaked at 1.68 mg/L and gradually dropped. 13:03 fluoride dropped to 0.99 mg/L. 13:05 fluoride reading 0.81 mg/L. Fluoride exceeded MAC of 1.50 mg/L for 12 minutes.	22-Dec-2006

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Microbiological testing done under section 8-2 during this reporting period.

	Number of Samples	Range of E.Coli Results (#-#)	Range of Total Coliform Results (#-#)	Number of Samples Back-ground Colony Counts	Range of Results Background Colony Counts (#-#)	Number of Samples HPC Counts	Range of Results HPC Counts (#-#)
Raw	52	0 - 5	0 - 51	52	0 - >200	NA	NA
Treated	52	0 - 0	0 - 0	52	0 - 0	26	0 - 5
Distribution Fixed Sites (reservoirs & rechlorination)	330	0 - 0	0 - 0	329	0 - 21	56	0 - 6
Distribution Random Sites	524	0 - 0	0 - 0	524	0 - >200	72	0 - 138

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

POE Grab Samples

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity	306	0.31 - 0.678 mg/L
Chlorine	471	1.12 - 1.77 mg/L
Fluoride (If the DWS provides fluoridation)	233	0.38 - 0.67 mg/L

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

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

Distribution Grab Samples

	Number of Grab Samples	Range of Results (min #)-(max #)
Chlorine Fixed Sites	365	0.21 - 2.00 mg/L
Chlorine Random Sites	524	0.07 - 1.12 mg/L

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

POE On-line Continuous Analyzers

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity	8760	0.0 - 6.0 NTU
Free Chlorine Residual	8760	0 - 2.0 mg/L
Fluoride (If the DWS provides fluoridation)	8760	0.0 - 1.68 mg/L

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

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

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

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	25 Jan 06	<0.001	mg/L	
Arsenic	25 Jan 06	<0.0014	mg/L	
Barium	25 Jan 06	0.014	mg/L	
Boron	25 Jan 06	0.007	mg/L	
Cadmium	25 Jan 06	<0.00001	mg/L	
Chromium	25 Jan 06	0.0019	mg/L	
Lead	19 Jan 06	<0.5 to 0.7	mg/L	
	25 Jan 06	<0.0022	mg/L	
Mercury	25 Jan 06	<0.00000001	mg/L	
Selenium	25 Jan 06	<0.0016	mg/L	
Sodium	25 Jan 06	12	mg/L	
Uranium	25 Jan 06	<0.0016	mg/L	
Fluoride	25 Jan 06	0.7	mg/L	
Nitrite	25 Jan 06	<0.1	mg/L	
	28 Mar 06	<0.1	mg/L	
	15 May 06	<0.1	mg/L	
	15 Aug 06	<0.01	mg/L	
	<u>14 Nov 06</u>	<u><0.01</u>	<u>mg/L</u>	
	Average	0.06	mg/L	
Nitrate	25 Jan 06	0.2	mg/L	
	28 Mar 06	0.2	mg/L	
	15 May 06	0.1	mg/L	
	15 Aug 06	0.2	mg/L	
	<u>14 Nov 06</u>	<u>0.2</u>	<u>mg/L</u>	
	Average	0.2	mg/L	

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	25 Jan 06	<0.5	ug/L	
Aldicarb	25 Jan 06	<5	ug/L	DL > ½ MAC
Aldrin + Dieldrin	25 Jan 06	<0.012	ug/L	
Atrazine + N-dealkylated metabolites	25 Jan 06	<1	ug/L	
Azinphos-methyl	25 Jan 06	<2	ug/L	
Bendiocarb	25 Jan 06	<2	ug/L	
Benzene	25 Jan 06	<0.5	ug/L	
Benzo(a)pyrene	25 Jan 06	<0.01	ug/L	DL > ½ MAC
Bromoxynil	25 Jan 06	<0.5	ug/L	
Carbaryl	25 Jan 06	<5	ug/L	
Carbofuran	25 Jan 06	<5	ug/L	
Carbon Tetrachloride	25 Jan 06	<0.5	ug/L	
Chlordane (Total)	25 Jan 06	<0.012	ug/L	
Chlorpyrifos	25 Jan 06	<1	ug/L	
Cyanazine	25 Jan 06	<1	ug/L	
Diazinon	25 Jan 06	<1	ug/L	
Dicamba	25 Jan 06	<1	ug/L	
1,2-Dichlorobenzene	25 Jan 06	<0.5	ug/L	
1,4-Dichlorobenzene	25 Jan 06	<0.5	ug/L	
Dichlorodiphenyltrichloroethane (DDT) + metabolites	25 Jan 06	<0.006	ug/L	
1,2-Dichloroethane	25 Jan 06	<0.5	ug/L	
1,1-Dichloroethylene (vinylidene chloride)	25 Jan 06	<0.5	ug/L	
Dichloromethane	25 Jan 06	<1.0	ug/L	
2-4 Dichlorophenol	25 Jan 06	<0.5	ug/L	
2,4-Dichlorophenoxy acetic acid (2,4-D)	25 Jan 06	<1	ug/L	
Diclofop-methyl	25 Jan 06	<0.9	ug/L	
Dimethoate	25 Jan 06	<2.5	ug/L	
Dinoseb	25 Jan 06	<1	ug/L	
Diquat	25 Jan 06	<7	ug/L	
Diuron	25 Jan 06	<10	ug/L	
Glyphosate	25 Jan 06	<10	ug/L	
Heptachlor + Heptachlor Epoxide	25 Jan 06	<0.012	ug/L	
Lindane (Total)	25 Jan 06	<0.006	ug/L	
Malathion	25 Jan 06	<5	ug/L	
Methoxychlor	25 Jan 06	<0.024	ug/L	
Metolachlor	25 Jan 06	<0.5	ug/L	
Metribuzin	25 Jan 06	<5	ug/L	
Monochlorobenzene	25 Jan 06	<0.5	ug/L	
Paraquat	25 Jan 06	<1	ug/L	
Parathion	25 Jan 06	<1	ug/L	
Pentachlorophenol	25 Jan 06	<0.5	ug/L	
Phorate	25 Jan 06	<0.5	ug/L	
Picloram	25 Jan 06	<5	ug/L	

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Polychlorinated Biphenyls(PCB)	25 Jan 06	<0.05	ug/L	
Prometryne	25 Jan 06	<0.25	ug/L	
Simazine	25 Jan 06	<1	ug/L	
THM (NOTE: show latest annual average)	25 Jan 06	72	ug/L	
	28 Mar 06	52.1*	ug/L	
	15 May 06	74.6	ug/L	
* not included in average (only the highest value for each quarter is used for the average)	15 Aug 06	63.0	ug/L	
	<u>14 Nov 06</u>	<u>93.9</u>	<u>ug/L</u>	
	Average	75.9	ug/L	
Temephos	25 Jan 06	<10	ug/L	
Terbufos	25 Jan 06	<0.7	ug/L	DL > ½ MAC
Tetrachloroethylene	25 Jan 06	<0.5	ug/L	
2,3,4,6-Tetrachlorophenol	25 Jan 06	<0.5	ug/L	
Triallate	25 Jan 06	<1	ug/L	
Trichloroethylene	25 Jan 06	<0.5	ug/L	
2,4,6-Trichlorophenol	25 Jan 06	<0.5	ug/L	
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	25 Jan 06	<1	ug/L	
Trifluralin	25 Jan 06	<1	ug/L	
Vinyl Chloride	25 Jan 06	<0.2	ug/L	

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

Parameter	Result Value	Unit of Measure	½ MAC VALUE	Date of Sample
Aldicarb	<5 lab detection level	ug/L	4.5 ug/L	25 Jan 06
Benzo(a)pyrene	<0.01 lab detection level	ug/L	0.005 ug/L	25 Jan 06
Tebufos	<0.7 lab detection level	ug/L	0.5 ug/L	25 Jan 06

Note! In all three cases above the analysis result value was less than the lab detection limit. However the lab detection limit is above the ½ MAC value.