Ontario

Ministry of the Environment
Drinking Water Inspection Report
Ground Water

SHELBURNE WATER SUPPLY SYSTEM
INSPECTION REPORT

INSPECTION DETAILS

Location:	***Pumphouse PH1/2 (Andrew Street Pumphouse)*** South east corner of Dufferin Street and Andrew Street, Shelburne ***Pumphouse PH3 (Cedar Street Pumphouse)*** West half of Lot 2, Concession 3, former Township of Melancthon ***Pumphouse PH5/6 (Fourth Line Pumphouse)*** 38 m east of 4th Line Melancthon on Lot 1, Concession 3 in the Township of Melancthon
Water Works Type:	Treatment With Distribution
Water Works Number:	220004965
Inspection Type:	Announced
Date of Inspection:	September 9, 2004
Date of Previous Inspection:	February 19, 2004
Inspection Number:	1-TYSN

CONTACT INFORMATION

Municipality/Owner Town of Shelburne P.O. Box 69 Shelburne, Ontario L0N 1S0 Attention: Mr. Larry McGregor Director of Public Works Phone: (519) 925-2600 Fax: (519) 925-6134	**Operating Authority** Ontario Clean Water Agency 16 Townline Road Orangeville, Ontario L9W 3T6 Attention: Richard Merling Operation Manager Phone: (519) 941-1938 Fax: (519) 941-1794
Inspector: Karla Everard Guelph District West Central Region (519) 826-4275	Distribution Date: November 2, 2004

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

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APPENDICES

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 in relation to the following documents:

- Safe Drinking Water Act
- Drinking Water Protection Regulation (O. Reg. 170/03)
- The Well Regulation (Wells - O. Reg. 903)
- Operator Certification Regulations (O. Reg. 435/93, O. Reg. 128/04)
- Certificates of Approval
- Permits to Take Water
- Director's Orders and/or Provincial Officer's Orders
- Report on previous Ministry inspection of February 19, 2004
- Engineer's Report dated November 2000
- Any other reports/information required.

The Ministry is implementing a rigorous and comprehensive approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as water system management practices.

Table 1 AUTHORIZING AND CONTROL DOCUMENTS REVIEWED

CERTIFICATES OF APPROVAL		
Certificate #	**Date Issued**	**Description**
3032-5RBP8E	Sept. 22, 2003	A drinking water system serving the Town of Shelburne in the County of Dufferin.
8-2036-94-006	Apr. 27, 1994	The installation of an 80 kW diesel generator set used for emergency power at the Fourth Line (PW5 and PW6) pumphouse.

PERMIT TO TAKE WATER		
Permit #	**Expiry Date**	**Description**
88-P-2013	Mar. 31, 2009	Municipal Well PW1 Maximum Rate: 1,140 LPM Maximum Amount: 1,637,000 LPD
92-P-2042	Mar. 31, 2012	Municipal Well PW2 Maximum Rate: 680 LPM Maximum Amount: 979,000 LPD
79-P-2050	Mar. 31, 2009	Municipal Well PW3 Maximum Rate: 909 LPM Maximum Amount: 1,309,000 LPD
93-P-2112	Mar. 31, 2013	Municipal Wells PW5 and PW6 Maximum Rate: 1,364 LPM Maximum Amount: 1,964,000 LPD

PREVIOUS ORDERS		
Order #	**Date Issued**	**Description**
N/A	N/A	N/A

SECTION 2 EXISTING WATER SYSTEM DESCRIPTION

2.1 WATER SOURCE

Well PW1 is located at the southeast corner of Dufferin Street and Andrew Street in the pumphouse. It is a 300 mm diameter casing, 23.5 m deep drilled groundwater well, equipped with a submersible pump, rated at 1,140 L/min at a total dynamic head of 73.0 m. A flow meter measures the amount of water extracted from the well. Well PW1 was determined to be groundwater under the direct influence of surface water with in situ filtration. Well PW1 was not in use during the inspection period.

Well PW2 is located at the northeast corner of Dufferin Street and Town Laneway. It is a 300 mm diameter casing, 30.5 m deep drilled groundwater well, equipped with a submersible pump, rated at 680 L/min at a total dynamic head of 67.1 m, with a 150 mm PVC watermain discharge connection, pitless adapter and welded cap. A flow meter measures the amount of water extracted from the well.

Well PW3 is located in the west half of Lot 2, Concession 3 in the pumphouse. It is a 300 mm diameter casing, 19.2 m deep drilled groundwater well, equipped with a submersible pump, rated at 909 L/min at a total dynamic head of 76.0 m, with a 200 mm ductile iron Class 52 watermain discharge connection. A flow meter measures the amount of water extracted from the well.

Well PW5 is located approximately 38 m east of 4th Line Melancthon on Lot 1, Concession 3 in the Township of Melancthon in the pumphouse. It is a 300 mm diameter casing, 23.5 m deep drilled groundwater well, equipped with a submersible pump, rated at 1,380 L/min at a total dynamic head of 76 m. A flow meter measures the amount of water extracted from the well.

Well PW6 is located approximately 4 m west of PW5. It is a 150 mm diameter, 24.4 m deep drilled groundwater well, equipped with a submersible pump, rated at 1,080 L/min at a total dynamic head of 76 m. A flow meter measures the amount of water extracted from the well.

GPS coordinates for each of the wells can be found in Appendix C.

2.2 TREATMENT PROCESSES

Treatment at Pumphouse PH1/2 consists of disinfection and iron sequestering. The disinfection system is comprised of one 190 L sodium hypochlorite solution tank with spill containment and individual chemical metering pumps for each well supply, rated at 0.69 L/hr and 1.0 L/hr for Wells PW1 and PW2 respectively. Contact time is provided by a 9,000 L tank for PW1 and a 10,500 L tank for PW2. The iron sequestering system is comprised of one 190 L Calciquest solution tank with spill containment, and individual chemical metering pumps for each well, rated at 0.69 L/hr and 1.0 L/hr for Wells PW1 and PW2 respectively. There is online monitoring of chlorine residual and turbidity. A flow meter measures the amount of water supplied to the distribution system.

Treatment at Pumphouse PH3 consists of disinfection and iron sequestering. The disinfection system is comprised of one 20 L sodium hypochlorite solution tank with spill containment and a chemical metering pump, rated at 1.6 L/hr. Contact time is provided by approximately 100 m of 450 mm diameter watermain on the well pumphouse property with no service connections along its entire length. The iron sequestering system is comprised of one 100 L Calciquest solution tank with spill containment, and a chemical metering pump, rated at 1.6 L/hr. There is online monitoring of chlorine residual and turbidity.

Treatment at Pumphouse PH5/6 consists of disinfection and iron sequestering. The disinfection system is comprised of one 135 L sodium hypochlorite solution tank with spill containment and individual chemical metering pumps for each well supply, rated at 1.55 L/hr and 0.69 L/hr for Wells PW5 and PW6 respectively. Contact time is provided by approximately 145 m of 450 mm

diameter watermain on the well pumphouse property with no service connections along its entire length. The iron sequestering system is comprised of one 135 L Calciquest solution tank with spill containment, and individual chemical metering pumps for each well, rated at 1.55 L/hr and 0.69 L/hr for Wells PW5 and PW6 respectively. There is online monitoring of chlorine residual and turbidity. Standby power is provided by an 80 kW diesel generator set.

Details on the treatment process can be found in the facility Certificate of Approval in Appendix A. GPS coordinates for each of the pumphouses can be found in Appendix C.

2.3 DISTRIBUTION SYSTEM

The Shelburne water distribution system provides water to a population of approximately 4,600 people. An elevated tank, constructed in 1990, provides equalization and emergency storage. The single pedestal composite elevated water storage reservoir is located between Gordon and Owen Sound Streets, just south of Third Avenue. It has a storage capacity of 3,410 m^3 and high and low water operating levels of 536.2 m and 524.8 m, respectively.

GPS coordinates for the elevated tank can be found in Appendix C.

2.4 SYSTEM DIAGRAM (where available)

Treatment process schematics are available in Appendix F.

SECTION 3 INSPECTION FINDINGS

3.1 OPERATIONS

3.1.1 Source/Supply

Wellhead Assessment

Well PW1 is located within Pumphouse PH1/2. As the well is indoors, there is limited potential for water ponding in its vicinity. The well casing extends more than 15 cm above the constructed floor, an air vent is provided and the well is capped as required by Ontario Regulation 903. The air vent screen was not visible but the operating authority indicated that it was present. The Water Well Record indicates that the annular space was sealed from 0 to 18 feet with bentonite.

Well PW2 is located outside Pumphouse PH1/2, at the northeast corner of Dufferin Street and Town Laneway. The well casing extends more than 30 cm above the ground. It appeared that

surface drainage around the wellhead was adequate to ensure that water would not collect or pond in the vicinity of the well. An air vent is provided and the well is capped as required. The air vent screen was not visible but the operating authority indicated that it was present. The Certificate of Approval indicates that the well is equipped with a pitless adapter. The Water Well Record indicates that the annular space was sealed from 0 to 20 feet with bentonite.

Well PW3 is located within Pumphouse PH3. As the well is indoors, there is limited potential for water ponding in its vicinity. The well casing extends more than 15 cm above the constructed floor, an air vent is provided and the well is capped as required by Ontario Regulation 903. The air vent extends to the ceiling as Well PW3 is an artesian well. The location of the air vent opening limits the potential for contaminants entering the well. The Water Well Record did not indicate how the annular space was sealed.

Well PW5 is located within Pumphouse PH5/6. As the well is indoors, there is limited potential for water ponding in its vicinity. The well casing extends more than 15 cm above the constructed floor, a screened air vent is provided and the well is capped as required by Ontario Regulation 903. The Water Well Record indicates that the annular space was sealed from 0 to 18 feet with bentonite.

Well PW6 is located within Pumphouse PH5/6. As the well is indoors, there is limited potential for water ponding in its vicinity. The well casing extends more than 15 cm above the constructed floor, a screened air vent is provided and the well is capped as required by Ontario Regulation 903. The Water Well Record indicates that the annular space was sealed with a holeplug and slurry.

Permit to Take Water Assessment

PERMIT TO TAKE WATER ASSESSMENT			
PERMIT NUMBER	**RENEWAL DATE**	**SOURCE**	**PERMITTED AMOUNT OF TAKING**
88-P-2013	Mar. 31, 2009	Municipal Well PW1	Maximum Rate: 1,140 LPM Maximum Amount: 1,637,000 LPD
92-P-2042	Mar. 31, 2012	Municipal Well PW2	Maximum Rate: 680 LPM Maximum Amount: 979,000 LPD
79-P-2050	Mar. 31, 2009	Municipal Well PW3	Maximum Rate: 909 LPM Maximum Amount: 1,309,000 LPD
93-P-2112	Mar. 31, 2013	Municipal Wells PW5 and PW6	Maximum Rate: 1,364 LPM Maximum Amount: 1,964,000 LPD

PERMIT TO TAKE WATER EXCEEDANCES		
DATE	**FLOW M^3/DAY**	**LOCATION**
N/A	N/A	N/A

Copies of the Permits to Take Water, including Special Terms and Conditions, are included in Appendix B. It was verified that the maximum amounts identified in the PTTWs were not exceeded during the inspection period. The maximum day for Well PW2 occurred on June 12, 2004 with an amount of 838.7 m^3/day. The maximum day for Well PW3 occurred on June 12, 2004 with an amount of 986.1 m^3/day. The maximum day for Wells PW5 and PW6 combined occurred on March 30, 2004 with an amount of 1403.2 m^3/day. The owner and operating authority indicated that the other terms and conditions were met during the inspection period.

The operating authority indicated that aquifer levels are being monitored daily at the production wells and continuously at the monitoring wells.

A Well Inspection and Maintenance Plan has been prepared as required by Certificate of Approval Number 3032-5RBP8E.

The Town of Shelburne has passed a water conservation by-law (Number 19-1989) to limit usage during the summer months.

3.1.2 Treatment Processes

It was verified that water treatment equipment was provided in accordance with regulatory requirements. All of the upgrades are complete, with the exception of the installation of the UV treatment system at Well PW1. Well PW1 is currently offline and will not be brought back into service until the upgrades are complete.

Ontario Clean Water Agency staff indicated that treatment equipment is in operation whenever water is being obtained or supplied to the distribution system in order to ensure that chlorine residuals are maintained in the distribution system in accordance with the secondary disinfection requirements of the regulation.

Treatment equipment appeared to be installed in accordance with the Certificate of Approval system description.

TREATED WATER CAPACITY ASSESSMENT - PUMPHOUSE PH1/2			
ITEM	**2002**	**2003**	**2004 (to date)**
Average Day Flow (m^3/day)	421.5	370.9	441.5
Maximum Day Flow (m^3/day)	902.9	877.2	838.7
Rated Capacity of Plant (m^3/day)	2261	2261	2261
Maximum Day/Rated Capacity (%)	39.9	38.8	37.1

TREATED WATER CAPACITY ASSESSMENT - PUMPHOUSE PH3			
ITEM	**2002**	**2003**	**2004 (to date)**
Average Day Flow (m^3/day)	603	612.6	579.0
Maximum Day Flow (m^3/day)	1079.6	1108.6	986.1
Rated Capacity of Plant (m^3/day)	1309	1309	1309
Maximum Day/Rated Capacity (%)	**82.5**	**84.7**	75.3

TREATED WATER CAPACITY ASSESSMENT - PUMPHOUSE PH5/6			
ITEM	**2002**	**2003**	**2004 (to date)**
Average Day Flow (m^3/day)	646.2	676.8	666.3
Maximum Day Flow (m^3/day)	1742	1891.4	1403.2
Rated Capacity of Plant (m^3/day)	1964	1987	1987
Maximum Day/Rated Capacity (%)	**88.7**	**95.2**	70.6

Data provided by the Ontario Clean Water Agency.

Certificate of Approval Number 3032-5RBP8E requires the installation of a sufficient number of flow measuring devices within the drinking water system to permit the measurement and recording of the daily maximum flow rate and maximum daily volume of water conveyed into the treatment system from each well. Each well is equipped with a flow meter and the SCADA system monitors the flow rate and amount. The daily volume is also recorded manually by operators when doing their daily checks. The maximum daily volume was not exceeded at any of the pumphouses during the inspection period. The maximum day for Pumphouse PH1/2 occurred on June 12, 2004 with an amount of 838.7 m^3/day. The maximum day for Pumphouse PH3 occurred on June 12, 2004 with an amount of 986.1 m^3/day. The maximum day for

Pumphouse PH5/6 occurred on March 30, 2004 with an amount of 1403.2 m^3/day. All of the flow meters were calibrated on October 14, 2003 to within 2 percent accuracy.

Treatment at the Shelburne facilities consists of disinfection and iron sequestering. Water is pumped from a well and dosed with sodium hypochlorite, which meets the AWWA and ANSI standards in accordance with the Certificate of Approval. During the inspection period, the target chlorine residual at Pumphouse PH1/2 was typically between 0.70 and 0.90 mg/L, at Pumphouse PH3 between 0.60 and 0.80 mg/L and at Pumphouse PH5/6 between 0.80 and 1.00 mg/L. Contact time at Pumphouse PH1/2 is provided by a 9,000 m^3 tank (Well PW1) and by a 10,500 m^3 tank (Well PW2). Contact time at Pumphouse PH3 is provided by approximately 100 m of 450 mm diameter watermain. Contact time at Pumphouse PH5/6 is provided by approximately 145 m of 450 mm diameter watermain. The Shelburne systems are equipped with continuous chlorine residual analyzers, alarmed to ensure continuous disinfection. The high level alarms are set at 1.4 mg/L free chlorine and the low level alarms are set at 0.2 mg/L. In the event of a high or low chlorine level alarm, the well is automatically locked out. An operator will typically respond to an alarm within an hour. The chlorine residual is automatically recorded by the SCADA system. If operators notice that the online chlorine analyzers are out of calibration during their daily checks, they will calibrate them to their handheld chlorine analyzers. The operators check the accuracy of the handheld chlorine analyzers against standards on a monthly basis and they are calibrated by the manufacturer on an annual basis. They were last calibrated in June 2004. The online chlorine analyzers manufacturer's specifications indicate that the units have the required accuracy. They were calibrated and serviced by an independent consultant in February 2004.

Town of Shelburne and Ontario Clean Water Agency staff indicated that they are not aware of pesticides being applied or stored around, over, or in the immediate vicinity of the water system, nor are they aware of private pesticides applicators mixing pesticides on the premises of the waterworks.

The floor drains within the containment area at Pumphouse PH1/2 discharge to the sanitary system. The other floor drains at Pumphouse PH1/2 discharge outside the building. The floor drains at Pumphouse PH3 discharge to a stream after dechlorination with sodium bisulphate pucks. The floor drains at Pumphouse PH5/6 discharge to an outside ditch after dechlorination with sodium bisulphate pucks. There did not appear to be any negative impacts resulting from these practices.

The operating authority indicated that the generator is tested on a monthly basis. Records are kept in the Workplace Management System. The Town of Shelburne also hires a contractor to test the system under load every 6 months.

3.1.3 Process Wastewater

There is no process wastewater at the Shelburne pumphouses.

3.1.4 Distribution System

Maintenance Programs

Plans of the distribution system were available at the Town of Shelburne municipal offices.

Town of Shelburne staff indicated that AWWA and Ontario Provincial Standards are used for the design and construction of components of the distribution system.

The Shelburne distribution system is flushed twice a year during non-freezing temperatures. When flushing, a diffuser is used to dechlorinate the water. The water is typically directed away from high traffic areas. If there are no grassy areas, the water is directed to storm drains. Flush water is not metered. Hydrants are maintained and valves are exercised during the flushing program. Hydrants are pumped out after each use and a de-icer is used as there is a high water table.

Ontario Clean Water Agency staff indicated that they follow AWWA standards when disinfecting and repairing watermains. The standards are available on site at the Shelburne pumphouses. There were two watermain breaks and one new watermain installed during the inspection period.

Pressure readings are taken daily at the elevated storage tower. Shelburne is a single pressure zone with no known pressure problems.

The Town of Shelburne does not have an official watermain replacement program.

Water consumption is not metered in the Shelburne distribution system, with the exception of commercial and industrial users. Residential customers are billed using a flat rate as the water consumption rate is low. There is no estimate of unaccounted for water. There is no proactive leak detection and repair program.

The Environmental Contingency Plan contains the Ontario Clean Water Agency procedure for watermain breaks, as well as AWWA standards for disinfection of watermains.

Cross Connection and Backflow Prevention

Town of Shelburne and Ontario Clean Water Agency staff are not aware of any cross connections in the distribution system. The Town of Shelburne does not have a bylaw which prohibits cross connections in the distribution system.

The owner indicated that backflow preventers have been installed at new lateral connections to major industries for the last 5 to 10 years.

Town of Shelburne and Ontario Clean Water Agency staff are not aware of any private pesticides applicators using hydrants for mixing pesticides. The Town of Shelburne does not have a bylaw that limits access to hydrants.

Storage Structure and Booster Station Assessment

The cleaning and maintenance program for the elevated storage tank is documented in the Shelburne operations manual. The next cleaning of the tower is scheduled for October 2004.

Town of Shelburne and Ontario Clean Water Agency staff indicated that pesticides are not applied or stored around, over, or in the immediate vicinity of storage works in the distribution system.

3.2 WATER SYSTEM MANAGEMENT PRACTICES

3.2.1 Operational Manuals

The Shelburne operations manual was available at each facility. A copy of the manual was also available at the Ontario Clean Water Agency office for review. The operators are required to be aware of the manual, its location and contents.

The operations manual requires updating to be in compliance with Certificate of Approval Number 3032-5RBP8E. The manual contained certificates of approval but did not include the current certificate. It also included outdated and incomplete versions of the permits to take water (including two that had expired). The operator classification section was also out of date, including a number of operators who are no longer employed in the system and did not include any of the Ontario Clean Water Agency operators. The operations manual refers to O. Reg. 459/00 and not O. Reg. 170/03.

The operations manual contained system information, detailed unit operations summaries, facility schematics and an emergency contact list. The contact list also needs updating.

The Ontario Clean Water Agency uses the Workplace Management System to ensure that all equipment used in the treatment process is monitored, inspected and maintained as required. Each piece of equipment is tagged with a barcode and its maintenance schedule is entered into the system as per the manufacturer's specifications (eg. frequency of calibration). The sampling plan is also entered into the Workplace Management System. The system then automatically generates a work order whenever maintenance or sampling is required, and gives the operator a certain amount of time to complete the task before closing it on the system.

Up-to-date, as-built plans of the water system were available at the Town of Shelburne municipal offices.

3.2.2 Logbooks

Logbooks were available at each of the facilities. A review of the logbooks indicated that operational testing and adjustments or repairs to equipment were only conducted by certified operators. For every required operational test and sample, the date, time, location, individual who took the sample and the result were recorded. Logbook entries suggest that operators were examining test results within 24 hours of the test being conducted. Any departures from normal operating procedures were also recorded in logbooks. Entries were chronological and appeared to be made by authorized personnel.

Disinfection residual is recorded for samples taken in the distribution system.

3.2.3 Contingency and Emergency Planning

The Environmental Contingency Plan binder included a contact list, plant equipment information, spill reporting information, contingencies (eg. identification, notification and corrective actions for Adverse Water Quality Incidents, loss of chlorine residual, loss of pressure, procedure if the operator of overall responsibility is unable to act, chemical spills, power failure, etc.), standard operating procedures (bacteriological sampling, sample submission, high chlorine residual, storage facilities), maps and schematics, lab/sample information, AWWA Standards and Customer Complaint forms. Staff are required to be familiar with this plan.

There are five production wells in the Shelburne system. If any of the wells fail or are offline, water can be supplied to the system by the other wells. The elevated tower also provides emergency storage.

There is an individual chemical metering pump for each well as required. In the event of a low chlorine alarm, the well automatically shuts down.

An 80 kW standby diesel generator is located within Pumphouse PH5/6. Secondary containment is provided for the diesel fuel by a concrete berm. The operating authority indicated that the generator is typically tested on a monthly basis, sometimes under load. Records are kept in the Workplace Management System.

Spill containment is provided for the sodium hypochlorite and iron sequestering solution tanks by either plastic bins or concrete berms. If there was a spill on site, the chlorine would be diluted further and dechlorinating pucks would be added. It would then be tested and mopped to waste.

3.2.4 Security

Pumphouses PH1/2, PH3 and PH5/6 and the elevated tower are locked. The Town of Shelburne plans to install an intrusion alarm at the elevated tower. Wells PW1, PW3, PW5 and PW6 are all located within pumphouses. Well PW2 is within a locked wooden structure. The air vents for the underground contact chambers at PH1/2 are screened. Only authorized personnel have access to the sites, and visit them on a daily basis.

Monitory wells in the vicinities of the pumphouses appeared to be secure.

3.2.5 Communication with Consumers

The Ontario Clean Water Agency uses a computer program to manage customer complaints. It records the facility information, nature of the complaint, description, and the action taken. The program is updated when the issue has been resolved and a record of the complaint and actions taken to resolve the issue are maintained. There was only one complaint during the inspection period.

The following documents are available during normal business hours:

- A copy of every test result obtained in respect of a test required under Ontario Regulation 170/03, including reports prepared under Section 11, and Schedule 20, 21 or 22,
- All of the approvals and orders related to the system,
- Reports prepared under Section 11 of Ontario Regulation 170/03.

The Town of Shelburne notifies users of the availability of reports by placing an advertisement in the local paper, on their website and at their municipal offices. The 2003 Annual Report is available on the Town of Shelburne website, at their municipal offices and at the Ontario Clean Water Agency office.

3.2.6 Operator Certification and Training

The Shelburne system has a Class 3 Water Distribution classification. Jim Kerr is the overall responsible operator of the system. He has a Class 3 Distribution licence and a Class 2 Treatment licence. The plant's classification certificate was on display at the Town of Shelburne municipal offices. The operators' licences were on display at the facility. A list of all operators and their certification details is located in Appendix D.

Operator training records were reviewed for the year 2003 and 2004 (to date). All of the operators received 40 hours of training in 2003 and have received almost or more than 40 hours of training in 2004. Training records included the names and positions of operators, the dates and durations of training sessions and the subjects considered.

Operators are required to be familiar with the operations manual, contingency plan and emergency plan. They have access to these documents.

SECTION 4 WATER QUALITY MONITORING & ASSESSMENT

4.1 WATER QUALITY MONITORING

Through a review of sample records, it was verified that all monitoring programs required under the Safe Drinking Water Act and applicable regulations were met during the inspection period.

As test results for Arsenic have exceeded half of the standard prescribed by O. Reg. 169/03, the owner was required to increase the monitoring frequency for that parameter. Samples are taken from Wells PW3, PW5 and PW6 and tested for arsenic every three months as per O. Reg. 170/03, Schedule 13-5.

The raw water sampling ports are located before any chemicals or disinfectant are added. The operating authority indicated that the interior of all the raw water and treated water sampling ports were smooth nozzled.

There is a monitoring program in place to ensure that water entering the distribution system is disinfected in accordance with Ministry requirements. Online chlorine analyzers, equipped with alarms set at 0.20 mg/L, are located at the facilities.

OCWA staff indicated that operators are conducting chlorine residuals at strategic points such as dead ends and extremities of the distribution system. Samples for trihalomethane and lead analysis are being collected from points in the distribution system that are likely to have an

elevated potential for these parameters. The chlorine residual was monitored in the distribution system on a daily basis as required by Ontario Regulation 170/03.

OCWA staff notified Laboratory Services Branch of which accredited laboratories they use to carry out the analysis of samples collected from the Shelburne municipal supply, including:

- SGS Lakefield Research Limited, Lakefield, Accredited Laboratory No. 184, Licence Number 2206
- Maxxam Analytics Inc., Mississauga, Accredited Laboratory No. 97, Licence Number 2207

Town of Shelburne staff indicated that lab reports on the analysis of water samples would be kept for the prescribed period of time.

4.2 WATER QUALITY ASSESSMENT

4.2.1 Bacteriological

Bacteriological sample results from each source, each point of entry of treated water to the distribution system and from within the distribution system were reviewed for the period of February 1, 2004 to August 31, 2004. On March 15, 2004, a sample taken in the distribution system had a result of 1 total coliform. On August 3, 2004, a sample taken at Well PW6 had a result of 1 total coliform. The prescribed corrective actions were taken for each incident and written notice was provided within 7 days of resolution summarizing the actions taken and the results achieved.

Ministry of Environment audit samples were taken at the time of the inspection. A copy of the sample results is attached in Appendix H.

4.2.2 Physical/Chemical

Physical and chemical sample results from each point of entry of treated water to the distribution system and from within the distribution system were reviewed for the period of February 1, 2004 to August 31, 2004. One parameter exceeded its maximum acceptable concentration during the inspection period. On June 3, 2004, a treated sample taken from Pumphouse PH5/6 had an arsenic level of 0.041 mg/L. Corrective action was taken and resample results indicated that the water quality was no longer adverse. Written notice was provided within 7 days of resolution summarizing the actions taken and the results achieved.

There were no instances in which the free chlorine residual was greater than 4.0 mg/L or less than 0.05 mg/L.

It was verified that all water provided by the system to the point where the system is connected to the users' plumbing meets the requirements of the prescribed drinking water quality standards.

Ministry of Environment audit samples were taken at the time of the inspection. A copy of the sample results is attached in Appendix H.

4.2.3 Reporting, Notification & Corrective Action

There were three adverse water quality incidents during the inspection period. On March 15, 2004, a sample taken in the distribution system had a result of 1 total coliform. On June 3, 2004, a treated sample taken from Pumphouse PH5/6 had an arsenic level of 0.041 mg/L. On August 3, 2004, a sample taken at Well PW6 had a result of 1 total coliform. The prescribed corrective actions were taken for each incident and written notice was provided within 7 days of resolution summarizing the actions taken and the results achieved.

An engineer's report was prepared and submitted in November 2000.

The 2003 Annual Report was completed on time and included the following:

- A brief description of the drinking water system, including a list of water treatment chemicals used by the system during the period covered by the report,
- A summary of reports made to the Ministry under subsection 18 (1) of the Safe Drinking Water Act or section 16-4 of Schedule 16 of O. Reg. 170/03 and a description of corrective actions taken under Schedule 17 of O. Reg. 170/03 during the reporting period,
- A summary of tests required under O. Reg. 170/03, or an approval or order, including an OWRA order, during the reporting period and, if tests required under the Regulation were not required during the period, a summary of the most recent results for that parameter,
- A description of major expenses incurred during the period covered by the report,
- A statement indicating where a report prepared under Schedule 22 will be available for inspection.

The 2003 Summary Report was completed on time and included the following:

- Details of non-compliance with the Safe Drinking Water Act, regulations, the Certificate of Approval and any order, and how the non-compliance was corrected,
- The annual average and maximum day for each pumphouse, with a comparison to their design capacities. The report did not include a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows and daily instantaneous peak flow rates, compared to the rated capacity. The Shelburne facility did not have the capability of recording the instantaneous peak flow rate for the majority of 2003 but has since been equipped with a SCADA system. Ontario Clean Water Agency staff indicated that all of the required information will be included in future reports.

During the inspection it was verified that all information listed in section 12 of the DWSR was available. Records are being maintained for the prescribed periods.

SECTION 5 ASSESSMENT OF PREVIOUS INSPECTION ISSUES

Previous Inspection Issues	Current Status
During the inspection of PH3, the continuous chlorine analyzer wastewater was observed to be discharged to the pumphouse floor drain, which subsequently discharged to the ground outside the northwest corner of the pumphouse. This wastewater was observed to be moving towards and into Walters Creek which is approximately 5 m north of PH3. OCWA staff informed the MOE inspector that the upgrade works to PH3 would include redesigning the floor drain in order to utilize sodium bisulphate pucks to dechlorinate the continuous chlorine analyzer wastewater before it is discharged outside the pumphouse.	Sodium bisulphate pucks are now used to dechlorinate any water that is discharged outside.
It was recommended that the Town of Shelburne continue to monitor arsenic levels in the treated drinking water from wells PW3, PW5 and PW6. Also, the Town of Shelburne should consult with the Wellington-Dufferin-Guelph Health Unit to seek advice/recommendations on the arsenic detected in the municipal water supply system. If two consecutive quarterly sample results for arsenic are below 12.5 ug/L and the increased frequency no longer applies as per Schedule 13-5(2)(b), then it is recommended that the Town of Shelburne consult with the Wellington-Dufferin-Guelph Health Unit prior to returning to a sampling frequency of every three years as per Schedule 13-2(1)(b) of O.Reg. 170/03.	The Town of Shelburne has continued to monitor arsenic levels and consulted with the health unit.
It was recommended that the Town of Shelburne develop and implement a leak detection program in order to minimize the potential for unaccounted water from the Town of Shelburne's water supply system.	See Section 7.

SECTION 6 SUMMARY OF NON COMPLIANCE ISSUES & ACTIONS REQUIRED

Non-Compliance Issue: On February 9, 2004, an operator failed to take a chlorine residual sample at the same time as a microbiological sample as required by O. Reg. 170/03 Sch. 6.
Action Taken: A Standard Operating Procedure for bacteriological sampling was introduced in April 2004. The SOP clearly states that the chlorine residual must be recorded on the chain of custody form.

Non-Compliance Issue: The operations manual requires updating to be in compliance with Certificate of Approval Number 3032-5RBP8E. The manual contained certificates of approval but did not include the current certificate. It also included outdated versions of the permits to take water (including two that had expired). The special terms and conditions of the permits were not always included, either. The operator classification section was also out of date, including a number of operators who are no longer employed in the system and did not include any of the Ontario Clean Water Agency operators. The operations manual refers to O. Reg. 459/00 and not O. Reg. 170/03. The emergency contact list also needs updating.
Action Taken: Ontario Clean Water Agency staff indicated that the engineering consultant will be updating the operations manual when the upgrades are complete.

Non-Compliance Issue: The 2003 Summary Report did not include a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows and daily instantaneous peak flow rates, compared to the rated capacity, as per O. Reg. 170/03 22-2 (3). The Shelburne facility did not have the capability of recording the instantaneous peak flow rate for the majority of 2003 but has since been equipped with a SCADA system.
Action Taken: Ontario Clean Water Agency staff indicated that all of the required information will be included in future reports.

Non-Compliance Issue: The Well PW3 air vent extends to the ceiling as the well is artesian. The location of the air vent opening limits the potential for contaminants entering the well. However, the air vent should be screened as required by O. Reg. 903.
Action Required: Ontario Clean Water Agency staff indicated that a screen has since been installed on the air vent for Well PW3.

If a Provincial Officers Order has been issued, a copy of the Order, along with a Provincial Officer's Report, can be found in Appendix G.

SECTION 7 SUMMARY OF BEST PRACTICE RECOMMENDATIONS

Legislated requirements have been identified in the previous section. In the interest of continuous improvement, the following best management practices are recommended:

1. Develop and implement a proactive leak detection and repair program in order to minimize the potential for unaccounted water from the Town of Shelburne's water supply system.

2. Consider metering residential water consumption in the Shelburne distribution system.

3. Ensure that backflow preventers have been installed at all lateral connections to major industries in the Shelburne distribution system.

4. Consider passing a by-law to prohibit cross connections in the distribution system.

5. Consider passing a by-law that limits access to hydrants.

6. Ensure that the generator is tested under load.

SIGNATURES

Inspected By: Karla Everard	Signature: (Inspector): Karla Everard
Reviewed & Approved By: Lou-Ann Cornacchio	Signature (Supervisor): L. Cornacchio
Review & Approval Date: November 2, 2004	

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: Chief Administrative Officer/Clerk (owner)
Water System Manager
Distribution System Manager
Overall Responsible Operator
Local Health Unit
MOE Environmental Assessment and Approvals Branch
Conservation Authority/Ministry of Natural Resources
District Office File