



**Ontario Clean Water Agency
Agence Ontarienne Des Eaux**

**Annual Summary Report
For the
West Elgin Drinking Water System
2013**

Prepared for the Municipality of West Elgin

By the Ontario Clean Water Agency

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SECTION 1: Overview

This summary report for the West Elgin Drinking Water System (West Elgin DWS) is published in accordance with Schedule 22 of Ontario's Drinking Water Systems Regulation for the reporting period of January 1, 2013 to December 31, 2013. The West Elgin DWS is categorized as a Large Municipal Residential Drinking Water System.

The West Elgin DWS is made up of the West Elgin Water Treatment Plant and Distribution System. The Distribution System was operated by the West Elgin Water Department until May 1, 2013. At this time the Ontario Clean Water Agency began operating the entire West Elgin DWS.

The West Elgin DWS operated in accordance with the Municipal Drinking Water Licence 043-101 (Issue 2: June 4, 2010), Drinking Water Works Permit 043-201 (Issue 2: June 4, 2010) and Permit to Take Water 0515-8L9GX7 (Issued September 1, 2011).

This report was prepared by The Ontario Clean Water Agency on behalf of the Municipality of West Elgin and must be supplied to the West Elgin Municipal Council by March 31, 2014.

SECTION 2: Compliance

The West Elgin DWS was operated and maintained in such a manner that treated water supplied to the consumers serviced by the system satisfied Ontario Drinking Water Quality Standards. However, some of the regulatory requirements were not met as identified in the MOE inspection Report.

The routine inspection was conducted on February 11, 2013 by the MOE and no Ministry of the Environment Provincial Officer's Orders were issued. There were 12 non-compliances with regulatory requirements identified in the inspection report. Eleven of the twelve were for the West Elgin Distribution system; the last one was for the West Elgin WTP. The overall inspection rating was 88.95% for the entire West Elgin Drinking Water System.

The non-compliance with regulatory requirements and actions required for the West Elgin DWS as appeared in the Inspection Report was:

1. **Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

On August 31, 2012, the West Elgin Treatment Plant experienced raw water quality issues at the plant due to heavy organic loading from a Lake Erie thermal inversion (overturn). As a consequence of the event, membrane filtrate appeared colored and caused elevated turbidity readings above the regulatory threshold. The operating authority reported the turbidity exceedance to Ministry of the Environment (MOE) Spills Action Centre (SAC) (Adverse Water Quality Incident (AWQI) #108285). There was a similar occurrence on September 9, 2012 that also caused the turbidity to exceed the regulatory threshold (AWQI#108358). The addition of sodium hypochlorite and hydrogen peroxide downstream from the membrane filters and membrane effluent turbidimeters intensified the yellow color in the drinking water causing the aesthetics of the water to

deteriorate. The operating authorities applied operational strategies (flushing) to manage the situation in the distribution system.

Under the direction of the Elgin St. Thomas Public Health Unit and in consultation with the MOE London Office, additional microbiological monitoring was undertaken within the distribution system. Other corrective action to eliminate the colored water from the system included replacing the water in the storage tanks at the water treatment plant by applying an overflow procedure.

As a result of the incidents described above, the treatment process did not meet criterion specified in the Procedures for Disinfection of Drinking Water in Ontario for Membrane Filtration (s. 3.4.6) for the month of September, 2012. The membrane filtration process must meet the performance criterion for filtered water turbidity of less than or equal to 0.1 NTU in 99% of the measurements each month. When OCWA determined that the criterion was not met, The MOE SAC was notified. This resulted in the issuance of an Adverse Water Quality Incident (AWQI #108723) on October 1, 2012.

Action(s) Required:

The author of this report recommends that the owner and operating authority investigate the incident to determine if additional corrective and preventive actions, other than those implemented during the events, should be considered that are appropriate for the magnitude of the problem and the impacts on the treatment process. The corrective and preventive action that may be considered could include the addition of treatment equipment or processes as well as operational procedures to manage the situation in the future.

2. Logs for the drinking water subsystem(s) did not contain the required information.

An operator-in-charge (OIC) or a person authorized by an OIC shall record the following information in the logs or other record-keeping mechanisms in respect of each operating shift: 1. The date, the time of day the shift began and ended and the number or designation of the shift. 2. The names of all operators on duty during the shift. 3. Any departures from normal operating procedures that occurred during the shift and the time they occurred. 4. Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions. 5. Any unusual or abnormal conditions that were observed in the subsystem during the shift, any action that was taken and any conclusions drawn from the observations. 6. Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift. (O. Reg. 128/04, s. 27 (5)).

During the inspection, it was observed that on multiple occasions there were no entries in the West Elgin distribution system logbook maintained at the Rodney Tower that show an individual was assigned the duties of an OIC. It is verified that the owner and operating authority did not maintain a schedule to designate an OIC for the distribution system.

It was also observed that information pertaining to the watermain construction in late May through to early August of 2012 was not recorded in the logbook as per O. Reg. 128/04 s. 27 (5).

Action(s) Required:

Since this issue was brought to the attention of owner and operating authority, a number of changes have been instituted by the municipality to correct and mitigate issues arising from log entries by staff operating the West Elgin distribution system. According to the owner and operating authority, the following changes have been initiated:

- procedural changes to the DWQMS Operational Plan for scheduling and assigning staff for Overall Responsible Operator (ORO) and Operator-In-Charge (OIC) duties,

- administrative procedures for scheduling and assigning ORO responsibilities,
- on-the-job staff training to review logbook record-keeping requirements as per O. Reg. 128/04 s. 27, and
- monthly meetings between the Municipal Administrator/Treasurer and operational staff to review water management issues within the West Elgin Water Supply System.

A review of the effectiveness of the above corrective actions will occur during the 2014 MOE inspection.

3. The record system did not allow the reader to unambiguously identify the person who made the logbook entry.

A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry (O. Reg. 128/04 s. 27. (4)).

There were entries made in the West Elgin distribution system logbook maintained at the Rodney Tower that does not identify the maker of the entry. More specifically, these incidents occurred on August 30, September 4, 7, 12, 20, October 15, 24, 31, November 7.

Action(s) Required:

According to the owner and operating authority, training for the West Elgin distribution system operational staff on the requirements specified in O. Reg. 128/04 s. 27 have been completed. As referenced in another section of this report, the owner now meets regularly with operational staff to review activities and issues related to the operation of the system. A review of the effectiveness of the above corrective actions will occur during the 2014 MOE inspection.

4. Entries in the logbook were not always made by appropriate and authorized personnel.

No person shall make an entry in a log or other record-keeping mechanism unless the person is an overall responsible operator, an operator-in-charge or is authorized to make an entry by the owner, the operating authority, the overall responsible operator or an operator-in-charge (O. Reg. 128/04, s. 27 (3)).

An individual without a valid operators licence signed the logbook as an operator and/or an Overall Responsible Operator (ORO) on June 7, July 16, 31 and August 20, 21 of 2012.

Action(s) Required:

The owner and operating authority shall ensure that recording-keeping entries into West Elgin distribution logbooks maintained at the Rodney Tower are made by individuals authorized to do so under O. Reg.128/04 s. 27.

A review of the effectiveness of the above corrective actions will occur during the 2014 MOE inspection.

5. For every required operational test and every required sample, a record was not made of the date, time, location, name of the person conducting the test and result of the test.

The owner and the operating authority for the drinking water system shall ensure that, for every sample required by O. Reg. 170/03, a record is made of the date and time the

sample was taken, the location where the sample was taken and the name of the person who took the sample (O. Reg. 170/03 Schedule 6 s. 6-10 (1) 2.)

The operating authority did not record the times for chorine residual testing as per O. Reg. 170/03 Schedule 7 s. 7-2. (3).

Action(s) Required:

The owner and operating authority for the distribution system shall record the time for very sample collected and tested under O. Reg. 170/03 as prescribed under O. Reg. 170/03 Schedule 6 s. 6-10 (1) Compliance with this requirement will be assessed during the 2014 Ministry of the Environment drinking water inspection.

6. The overall responsible operator had not been designated for each subsystem.

The owner or operating authority of a municipal residential subsystem shall designate an Overall Responsible Operator (ORO) of the subsystem who holds a certificate for that type of subsystem of the same class or higher class for the subsystem (O. Reg. 128/04 s. 23 (1)).

During the inspection, it was observed that on multiple occasions there were no entries in the West Elgin distribution system logbook maintained at the Rodney Tower that show an individual was assigned the duties of an ORO. More specifically, the logbook did not indicate an individual assigned the duties and responsibilities of ORO during 2012 for the following dates: January 27, February 3, 20, March 15-16, April 11-13, May 25, 31, June 1-3, 7-10, 16, 23, 24, 29, 30, July 1, 5, 7, 8, 14, 15- 31, August 1-21, 22-26.

It is verified that the owner and operating authority did not maintain a schedule to designate an ORO for the distribution system.

System logbook records show an individual made an entry in the system logbook as an ORO that was not a certified operator. Based on logbook entries, the individual acted as the ORO with an expired licence on July 16 and August 20 and 21. The licence expired on May 31, 2012. During the time period between June 1, 2012 to August 26, 2012, the individual acted on behalf of water department for the municipality and:

- communicate information to the Ontario Clean Water Agency (OCWA) staff that allowed the municipal staff to undertake activities to manage operations within the distribution system, and
- communicated with the Ministry of the Environment staff as a representative of the municipal drinking water system during the management of an adverse water quality incident (AWQI #106829) and the selection of an accreditation body (June 25-29, 2012).

Action(s) Required:

The owner and operating authority for the West Elgin distribution system shall ensure that following:

- every operator employed in the subsystem holds a certificate applicable to that type of subsystem (O.Reg. 128/04 s. 22. (a)), and
- an overall responsible operator is designated for the subsystem holds a certificate for that type of subsystem and that it is the same class as, or higher than, the class of that subsystem (O. Reg. 128/04 s.23. (1)).

According to the owner and operating authority, administrative and procedural changes have been instituted to continually improve the management of the human resources for the water system. These are summarized in other areas of this report. The Ministry will verify compliance with O. Reg. 128/04 s. 23 (1) during the 2014 inspection.

7. Operators in charge had not been designated for all subsystems which comprised the drinking water-system.

The owner or operating authority of a subsystem or a person authorized by the owner or operating authority shall designate one or more operators as operators-in-charge (OIC) of the subsystem (O. Reg. 128/04 s. 25. (1)).

During the inspection, it was observed that on multiple occasions there were no entries in the West Elgin distribution system logbook maintained at the Rodney Tower that show an individual acted as, or was assigned the duties of an OIC. More specifically, the logbook did not indicate an individual assigned the duties and responsibilities of OIC during 2012 for the following dates: February 28, March 9, 29, April 5, 18, 19, 25, 27, June 2-9, 11, 12, 14, 15, 17, 18-22, 25, 28, 30, July 1-7, 9, 10, 12, 13, 27, August 3, 5, 22, 23 and 25. It is verified that the owner or operating authority did not maintain a schedule to designate an OIC for the distribution system.

Action(s) Required:

The owner and operating authority of the West Elgin distribution system or person authorized by the owner or operating authority of the West Elgin distribution system shall designate one or more operators as Operators-In-Charge (OIC) of the subsystem (O. Reg. 128/04 s. 25. (1)). The owner and operating authority or person authorized by the owner of operating authority shall ensure that records are maintained of the amount of time each operator works as an OIC (O. Reg. 128/04 s. 25 (2)).

According to the owner and operating authority, administrative and procedural changes have been instituted to continually improve the management of the human resources for the water system. These are summarized in other areas of this report.

Compliance with O. Reg. 128/04 s. 25 (1) and (2) will be reviewed in the 2014 Ministry of the Environment water inspection.

8. All operators did not possess the required certification.

The owner or operating authority of a subsystem shall ensure that every operator employed in the subsystem hold a certificate applicable to that type of system (O. Reg. 128/04 s. 22. (a)).

An operator employed by the municipality that acts as the Overall Responsible Operator (ORO) for the distribution system operated without an operators licence from June 1, 2012 to August 27, 2012. The owner and operating authority notified the Ministry of the Environment London Office of this situation on November 27, 2012. The owner and operating authority informed the Ministry that the individual was relieved of operator duties pending renewal of the operator certificate. They also notified the Ministry that an operator with the required qualifications was designated as the Overall Responsible Operator since August 28, 2012.

Action(s) Required:

The owner and operating authority of the distribution system shall ensure that every operator employed in the subsystem:

- holds a certificate applicable to that type of subsystem (O. Reg. 128/04 s. 22. (a)), or
 - holds a certificate applicable to that subsystem, in the case of an operator who holds a conditional certificate issued or renewed under O. Reg. 128/04 s. 10 (O. Reg. 128/04 s. 22. (b)).
- The Ministry shall verify that operators meet certification requirements during the 2014 inspection.

- 9. An adequately licenced operator was not designated to act in place of the overall responsible operator when the overall responsible operator was unable to act.**
The owner or operating authority of a municipal residential subsystem shall designate an Overall Responsible Operator (ORO) of the subsystem who holds a certificate for that type of subsystem of the same class or higher class for the subsystem (O. Reg. 128/04 s. 23 (1)).

As reviewed and stated previously in this report, it was observed that on multiple occasions there were no entries in the West Elgin distribution system logbook maintained at the Rodney Tower that show an individual was assigned the duties of an ORO. It is verified that the owner and operating authority did not maintain a schedule to designate an ORO for the distribution system. Therefore, the identity of the ORO for those occasions cannot be determined.

Action(s) Required:

The owner and operating authority shall take action to ensure an adequately licensed operator for the West Elgin distribution system is designated to act in place of the Overall Responsible Operator as per O.Reg. 128/04 s. 23 (1). The actions taken by the owner and operating authority will be reviewed during the next annual Ministry of the Environment drinking water system inspection.

- 10. All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were not met.**

The owner did not meet the sampling requirement for Column 3 (Number of Sampling Points in Plumbing that Serves Private Residences) as prescribed in O. Reg. 170/03 Schedule 15.1 s. 15.1-5. (3) (a). The owner collected and tested samples from 19 residences instead of the required 20. The Ministry of the Environment was notified of the error by the owner. No further action to correct the situation is required.

The owner was advised through the inspection process to submit the Schedule 15.1 results to the Ministry of the Environment using the form specified in O. Reg. 170/03 Schedule 15.1 s. 15.1-9. (6.1).

Action(s) Required:

The owner and operating authority for the West Elgin distribution system has satisfied the requirements specified by the Ministry of the Environment with respect the O. Reg. 170/03 Schedule 15.1-9. (6.1). No further action is required.

- 11. All changes to the system registration information were not provided within ten (10) days of the change.**

During a review of the Drinking Water Information System profile, it was observed that Drinking Water System Owner Information was not correctly identified. When brought to the attention of the owner, updated information was submitted to the Ministry of the Environment.

Action(s) Required:

The owner for the West Elgin Drinking Water System has updated information for the Drinking Water Information System profile that identifies Drinking Water System Owner Information as per O. Reg. 170/03 s. 10.1 (3). No further action is required.

12. The following instance(s) of non-compliance were also noted during the inspection:

During the review of the Rodney Tower storage tank data and operator logbook entries, it was found that the storage facility was unable to maintain sufficient free chlorine residuals (above 0.20 mg/L) on numerous occasions during the summer months of 2012 to ensure secondary disinfection levels as prescribed in the "Procedure for Disinfection of Drinking Water in Ontario". The Procedure states that the recommended optimum target for free chlorine concentration in the distribution system is 0.20 mg/L.

Irregular and wide fluctuations in the chlorine levels were also observed at the Rodney Tower throughout the inspection period. In accordance with O. Reg. 170/03 Schedule 1-5, the owner must ensure the following conditions have been met regarding secondary disinfection:

"The owner of a drinking water system shall ensure provision of, (a) water treatment equipment that is designed to be capable of secondary disinfection using chlorination or chloramination in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario and that is designed to be capable of achieving, at all locations within the distribution system, (i) a free chlorine residual of 0.2 milligrams per litre, if the drinking water system provides chlorination and does not provide chloramination, or (ii) a combined chlorine residual of 1.0 milligrams per litre, if the drinking water system provides chloramination; or (b) other water treatment equipment that, in the Director's opinion, is designed to be capable of providing secondary disinfection that is equivalent to or better than the secondary disinfection provided by the equipment described in clause (a)."

Action(s) Required:

To ensure that the free chlorine residual is maintained (>0.02 mg/L) in water contained in, and from the Rodney Tower, the Owner shall forthwith retain the services of a qualified individual to assess the West Elgin Water Supply System design capabilities to meet with the secondary disinfection requirements as per O. Reg. 170/03 Schedule 1-5. A comprehensive investigation and review must be completed to address operational challenges (secondary disinfection chlorination decay) to ensure that a persistent secondary disinfection residual can be maintained to reduce the potential of microbial contamination within the distribution system. Findings from the above assessment should be implemented to improve the general operating requirements and reduce any limitations to ensure secondary disinfection of the West Elgin Water Supply System can be met. The Owner shall provide a summary report of the findings and evaluation to author of this report by April 30, 2013.

SECTION 3: Corrective Action

The non-compliances identified in the MOE Inspection Report for the West Elgin DWS were all addressed as follows.

1. Corrective actions were taken at the Water Treatment Plant in order to try and manage should a coloured water event occur again. This has included regular sampling for manganese and iron of the raw and treated water; colour, taste and odour inspections; monitoring of dissolved oxygen of the raw water during a possible event. The Tri-county Management Committee has requested a report from OCWA Engineering Services to review the 2012 event and make recommendations on treatment options.
2. Corrective action was taken immediately by the owner to address non-compliances 2-9 will be evaluated by the MOE in the 2014 inspection.

3. There were no required actions for the missed lead plumbing sample because notification was made at the time of the incident.
4. The Drinking Water Information System was updated by the owner as soon as it was brought to their attention and no further actions were required by the MOE.
5. Stantec was hired to assess the Rodney Tower operation and provide recommendations to maintain a free chlorine residual of 0.2mg/L in the distribution system. The report was forwarded to the MOE on April 30, 2013 to address the non-compliance. Considerations for implementation of the recommendations will be made upon receiving capital costs from the engineers.

SECTION 4: Summary and Discussion of Quantity of Water Supplied

In accordance with Schedule 22-2(3) find a summary and discussion of the quantity of water supplied during the reporting period compared to the rated capacity specified in the MDWL, DWWP and Permit to Take Water, including monthly average and maximum daily flows.

Attached as Appendix A, find a summary of the raw flows including total, average, and maximum daily flows, and peak flow rates for the reporting period. As well, a comparison of flows to the Permit to Take Water limits is provided. The Permit to Take Water (PTTW) specifies flow rates and total water takings permitted. For the West Elgin DWS the maximum flow rate limit is 9,400L/min. The total daily water taking is 13,500m³/day. There were no PTTW exceedances in 2013. The West Elgin DWS is at 29% capacity of the total water taking limit, which is down 2.7% from last year.

Attached as Appendix B, find a summary of treated water flows including total, average, and maximum daily flows for the reporting period. As well, a comparison of flows to the Municipal Drinking Water Licence (MDWL) rated capacities is provided. The rated capacity of the plant is 12,160m³/day of treated water as specified in the MDWL. The daily average flow for the reporting period was 3,620m³/day, which is an 8.6% decrease from 2012. The maximum daily flow for the reporting period was 5,667m³/day which corresponds to a 17.4% decrease from 2012. The plant is operating at 30% of its rated capacity, down from 2012 by 2.6%.

Attached as Appendix C, find a summary of flows including total, average, and maximum daily flows for the reporting period for the Iona Interconnection. The Iona Interconnection rated capacity is 1,600m³/day as specified in the MDWL. The daily average flow for the reporting period was 404m³/day, which corresponds to a 0.7% increase from the previous year. The average daily flow is controlled by the SCADA programming in attempts to meet the agreement with Southwold to take 400m³/day.

The West Elgin DWS is capable of meeting its current uses for the system. It is operating at well below the limits set out in the Permit to Take Water and the design capacity for the plant.

APPENDIX A

Raw Flows for the West Elgin DWS compared to the specified limits in the Permit to Take Water. The maximum flow rate specified is 9,400L/min (156.7L/s) with a total water taking of 13,500,000L/day.

Month	Total Flow (m ³)	Average Day Flow (m ³)	% of PTFW Limit	Max Day Flow (m ³)	% of PTFW Limit	Max Day Flow Rates (L/s)	% of PTFW Limit
January	112,886	3,641	27	5,132	38	149	
February	97,149	3,470	26	4,214	31	90	58
March	100,617	3,246	24	4,204	31	132	84
April	101,050	3,368	25	4,893	36	88	56
May	126,094	4,068	30	5,356	40	142	91
June	137,003	4,567	34	5,813	43	140	89
July	144,353	4,657	34	5,847	43	143	91
August	134,541	4,340	32	5,624	42	150	96
September	121,344	4,045	30	5,319	39	153	98
October	119,557	3,857	29	4,842	36	141	90
November	101,201	3,373	25	5,148	38	147	94
December	111,223	3,588	27	5,026	37	134	86
Total	1,407,016						
Average		3,855	29			177	98
Maximum				5,847	43		

APPENDIX B

Treated flows for the West Elgin DWS compared to the specified rated capacity of 12,160m³/day in the Municipal Drinking Water Licence.

Month	Total Flow (m ³)	Average Day Flow (m ³)	% of Rated Capacity	Max Day Flow (m ³)	% of Rated Capacity
January	101,485	3,274	27	5,137	42
February	90,978	3,249	27	4,491	37
March	96,165	3,102	26	4,229	35
April	95,595	3,187	26	4,206	35
May	121,301	3,913	32	5,667	47
June	131,373	4,379	36	5,191	43
July	138,575	4,470	37	5,283	43
August	129,129	4,165	34	4,965	41
September	107,627	3,588	30	4,474	37
October	110,796	3,574	29	5,012	41
November	94,160	3,139	26	4,755	39
December	104,003	3,355	28	4,615	38
Total	1,321,187				
Average		3,620	30		
Maximum				5,667	47

APPENDIX C

Iona Interconnection flows compared to the specified rated capacity of 1,600m³/day in the Municipal Drinking Water Licence. West Elgin has an agreement to purchase 400m³/day from the Southwold Distribution System.

Month	Total Flow (m ³)	Average Day Flow (m ³)	% of Rated Capacity	Max Day Flow (m ³)	% of Rated Capacity
January	13,341	430	27	440	28
February	12,241	437	27	440	28
March	13,497	435	27	440	28
April	13,200	440	28	440	28
May	13,356	431	27	440	28
June	11,145	371	23	440	28
July	6,539	211	13	390	24
August	9,137	295	18	390	24
September	16,155	538	34	1,500	94
October	11,124	359	22	390	24
November	18,843	628	39	1,424	89
December	8,847	285	18	1,119	70
Total	147,425				
Average		404	25		
Maximum				1,500	89