

To: Warden and Members of County Council

From: Director of Public Works

2020 Drinking Water System Performance

RECOMMENDATION

1. That County Council receive Report PW 2021-04 entitled “2020 Drinking Water System Performance”, including the attached 2020 Annual Drinking Water System Summary Reports.

REPORT HIGHLIGHTS

- The Ministry of the Environment, Conservation and Parks (MECP) requires that an annual status summary report on the performance of the County’s 17 municipal drinking water systems be prepared and provided to Council in accordance with the regulatory requirements of Schedule 22 and Section 11 of Regulation 170/03 under the *Safe Drinking Water Act, 2002*.
- 8 of the 12 Oxford County municipal drinking water systems inspected since April 2020 by the MECP received 100 percent inspection ratings (four systems received inspection ratings of 95, 98 with two at 96 percent). At the time of preparation of this report, the MECP inspection report for Oxford’s municipal drinking water systems in Embro, Ingersoll and Tavistock had not been finalized. The remaining two systems, Drumbo-Princeton and Plattsville, have not yet been scheduled for inspection by the MECP.
- The results of the Management Review of the Drinking Water Quality Management System (DWQMS), including decisions and action items, are reported for all three of the County’s Operating Authorities as required by provincial legislation.
- This report also summarizes the Source Water Protection program implementation efforts undertaken over the last year across various watersheds within Oxford County’s jurisdiction.

Implementation Points

As required by legislation, the 2020 Annual Drinking Water Systems Summary Reports (Attachment 1) will be posted on the County’s website by February 28, 2021. An update to Council will be provided after all remaining MECP well inspections are complete and the findings will be provided by memorandum.

Financial Impact

There are no financial impacts to date as a result of this report. Any required actions that will result in expenditures have been accounted for in the 2021 Operating or Capital Budgets of the respective water system.

Communications

As indicated, the Drinking Water System Performance reports will be posted to the County website as legislatively required by February 28, 2021 at www.oxfordcounty.ca/water-wastewater. The results of each system's performance report will also be shared directly with area municipal CAO and Public Works senior management respectively.

The County communicates the performance of key Public Works systems (Water, Wastewater, and Waste Management) annually to the public through an annual social media campaign after the last performance report has been submitted to Council (March 31, 2021).

Strategic Plan (2015-2018)

					
WORKS WELL TOGETHER	WELL CONNECTED	SHAPES THE FUTURE	INFORMS & ENGAGES	PERFORMS & DELIVERS	POSITIVE IMPACT
1.ii.				5.ii.	

DISCUSSION

Background

The Statutory Standard of Care provisions of the *Safe Drinking Water Act, 2002* make individuals with oversight responsibilities for municipal drinking water systems legally responsible for decisions made regarding the system. The intent of this Standard of Care is to ensure that owner representatives (Oxford County Council and CAO) and various levels of decision makers of the municipal drinking water systems are acting diligently and making informed decisions when required. These decisions can impact the quality and safety of the municipal drinking water provided to all customers.

Decision making authority over Oxford County's water systems include, but is not limited to, members of municipal Council. All persons who oversee the operating authority or exercise decision-making authority must:

- exercise the level of care, diligence and skill that a reasonably prudent person would be expected to exercise in a similar situation; and
- act honestly, competently and with integrity, with a view of ensuring the protection and safety of the users of the municipal drinking water system.

Some of the ways members of Council can provide diligent oversight under the Standard of Care requirements is to have awareness of governing drinking water legislation and regulations, Oxford County's Operational Plans and the drinking water annual reporting. Of note, the annual Drinking Water System Performance Report is the primary method Senior Management and Council demonstrate due diligence in providing oversight of the County's municipal drinking water systems and meeting their Standard of Care legal requirement.

Municipal Drinking Water System Reporting

In accordance with the *Safe Drinking Water Act, 2002*, 2020 Annual Drinking Water Systems Summary Reports (Attachment 1) have been prepared for each of the County's 17 municipal drinking water systems. Under Schedule 22 and Section 11 of O.Reg. 170/03, drinking water system owners must prepare reports that provide the following information:

- brief description of the system;
- any incidents of adverse test results, inadequate disinfection or where any mandatory requirement was not met;
- all test results; and
- a summary of the amount of water supplied with a comparison to the system's rated capacity.

Further, the *Clean Water Act, 2006* specifies that municipalities and the Risk Management Official must report yearly on activities undertaken to meet the requirements of the Source Protection Plans (SPPs) by February 1 of the following year. A summary of the submitted reports are provided in the sections below.

Municipal Drinking Water Licensing Program

The Municipal Drinking Water Licensing Program implemented by the MECP requires all municipal drinking water systems to be operated by accredited Operating Authorities. Oxford County has three separate operating authorities as described in the table below.

Operating Authority	Responsibility
Oxford County Public Works Department	Treatment, supply, pumping and storage in all systems. Distribution in all systems except Woodstock and Tillsonburg.
City of Woodstock	Partial Distribution in the City of Woodstock (no storage or pumping) as per current contract service agreement.
Town of Tillsonburg	Partial Distribution in the Town of Tillsonburg (no storage or pumping) as per current contract service agreement.

All three Operating Authorities maintained full accreditation following third-party surveillance audits in October 2020. Accreditation is based on the Operating Authority's ability to implement and maintain a DWQMS as documented in their Operational Plans. There were no significant changes to the Operational Plans for each Operating Authority since last reported to Oxford County Council in September 2020 (refer to [PW 2020-41](#)).

Comments

2020 Annual Water Systems Summary Reports

The individual annual water system reports will be available for review by the public on the County's website at www.oxfordcounty.ca/drinkingwater by February 28, 2021. Highlights include:

- 21 communities were served through 17 separate municipal drinking water systems.
- There were 60 active supply wells in 2020 receiving treatment ranging from disinfection by chlorination to more complex forms of treatment including filtration to remove parameters such as iron, manganese or hydrogen sulphide followed by disinfection through chlorination and/or Ultra Violet light (UV).
- Approximately 10.7 million cubic metres of drinking water was supplied to customers.
- 4,133 regulated bacteriological samples were collected, with 6 samples being adverse (0.1%). All adverse results were investigated, resampled and cleared. Additionally, 5,078 non-reportable bacteriological samples were collected from the raw and treated water.
- Results for the approximately 60 different health-related chemical parameters tested for, at 30 separate treatment points, all met MECP requirements.
- Source Water Quality:
 - Brownsville Supply Wells – Naturally occurring arsenic levels in untreated raw water remain notably present in Well 6 and are closely monitored. Raw water from Well 6 is currently blended with Well 5 in a reservoir to effectively manage overall drinking water arsenic levels within acceptable treated Ontario Drinking Water Standard (ODWS) limits prior to customer distribution.
 - Dereham Centre Supply Wells - Naturally occurring arsenic levels in untreated raw water remain notably present in Well 2 and are closely monitored. Raw water (Well 2) is currently receiving pilot treatment filtration to remove arsenic to effectively manage overall drinking water arsenic levels within acceptable treated ODWS limits prior to customer distribution. Capital works for new permanent treatment filtration (arsenic removal) is planned in 2021.
 - Springford Supply Wells - Naturally occurring arsenic levels in untreated raw water remain notably present in Well 4 and are closely monitored. Water from Well 4 is blended with Well 5 to effectively manage overall drinking water arsenic levels within acceptable treated ODWS limits prior to customer distribution.
 - Tillsonburg Supply Wells (Broadway Street) - Naturally occurring arsenic levels in untreated raw water remain notably present in Well 7A and are closely monitored. Water from Well 7A is blended with Wells 4 and 5 (North Street) at the Fairview Water Treatment Facility to effectively manage overall drinking water arsenic levels within acceptable treated ODWS limits prior to customer distribution. Capital works (filtration) for arsenic removal in Well 7A is planned for 2022.

- Otterville Supply Wells – Nitrate levels in raw water remain notably present in Wells 3 and 4. Source water protection authorities have mandated an “Issue Contributing Area” around the well supply and more advanced source protection plan policy requirements to manage surrounding area land uses (agriculture) which have been inferred as contributing to nitrate issue due to nutrient loading (fertilizer and manure application). Such policy serves to further support the County’s historical practices of blending source water supplies from Wells 3 and 4 to effectively manage nitrate levels within acceptable treated ODWS limits prior to customer distribution.
- Tillsonburg Supply Wells (Brownsville Road) – Nitrate levels in raw water remain notably present in Wells 4 and 5. Source water protection authorities have identified an “Issue Contributing Area” around the well supply and advanced source protection plan policy requirements are being implemented to manage surrounding area land uses (agriculture) which have been inferred as contributing to the nitrate issue due to nutrient loading (fertilizer and manure application). Raw water from Wells 4 and 5 is blended with Well 7 (Broadway Street) at the Fairview Water Treatment Facility to effectively manage overall drinking water nitrate levels within acceptable treated ODWS limits prior to customer distribution.
- Woodstock Supply Wells (Sweaburg Road) - Nitrate levels in raw water remain notably present in Wells 1,3,5,8 and 11. Oxford County previously purchased most of the Wellhead Protection areas around these wells to fully manage and regulate surrounding area land uses (agriculture) which have been inferred as contributing to nitrate issue due to nutrient loading (fertilizer and manure application). In addition to this source protection measure, raw water from these wells is blended with other water supplies to effectively manage overall drinking water nitrate levels within acceptable treated ODWS limits prior to customer distribution.
- Four well systems (Brownsville, Ingersoll, Lakeside and Oxford South) have naturally occurring fluoride levels greater than 1.5 mg/L. At levels up to 2.4 mg/L, the water is considered safe for consumption; however, parents with children under the age of six are advised to limit exposure to other sources of fluoride when levels exceed 1.5 mg/L. For more information visit https://www.swpublichealth.ca/en/partners-and-professionals/resources/Health-Care-Providers/Alerts-Advisories-Updates/Advisories/ADV_HIA-Fluoride-20201203.pdf
- Marginally elevated levels of naturally occurring sodium greater than 20 mg/L exist in nine systems (Bright, Brownsville, Embro, Ingersoll, Mount Elgin, Oxford South, Thamesford, and parts of Woodstock and Tillsonburg). At levels up to 200 mg/L, the water is considered safe for consumption; however, levels above 20 mg/L may be of concern for individuals on a sodium-restricted diet due to various medical conditions and illnesses. For more information visit https://www.swpublichealth.ca/en/partners-and-professionals/resources/Health-Care-Providers/Alerts-Advisories-Updates/Advisories/ADV_HIA-Sodium-20201203.pdf

- The capacity of the water systems have been assessed against anticipated community growth. All systems have sufficient excess capacity to meet the 20-year growth projections for the community with the exception of following:
 - *Ingersoll* - Pressure filter issues have been limiting supply to the distribution system. Current filter optimization work ongoing in 2021 will mitigate this issue.
 - *Bright* – Insufficient well supply capacity. A potential interconnection with the Plattsville system may be considered once water quality studies have been completed.
 - *Mount Elgin* – Insufficient well supply capacity. Construction is currently underway on a new well treatment facility which will provide additional supply by Q2, 2021.
 - *Otterville* - Ongoing nitrate issue may limit the ability to service growth in Oxford South. Enhanced online nitrate monitoring and ongoing source protection inspections are planned for 2021 to further manage this water supply.
- Oxford will be undertaking a County-wide Water Servicing Master Plan in 2022 at which time all system capacities, water quality/quantity trending and forecast demands will be re-evaluated in further detail.
- A Municipal Class Environmental Assessment Study project for Tavistock is underway to complete the necessary hydrogeological investigations and source water protection technical work to consider implementation of a new supply well which will provide increased operational flexibility and overall security of the Tavistock water supply.

Boil Water and Drinking Water Advisories

There was one precautionary Boil Water Advisories (BWA) in Princeton from an extended low pressure event in the water system on July 7, 2019. A 40 minute loss of pressure event was due to a hydro failure in Drumbo-Princeton which caused a series of control issues concurrent with the elevated water storage standpipe being offline for maintenance. Time sensitive operational corrective measures were implemented to restore the water system. Confirmatory samples taken showed no contamination had occurred. Approximately 215 customers in Princeton were mildly impacted by the BWA which lasted two days.

2020 MECP Inspection Reports

Every year, the MECP inspects each drinking water system to assess compliance with the requirements of the *Safe Drinking Water Act, 2002* and the *Ontario Water Resource Act, 1990*. As the provincial government's fiscal year is April to March and inspections take place throughout that period, Inspection Reports are not always finalized in time to be included in the County's annual reports.

Overall, the 2020 year marked exceptional performance at Oxford County's water treatment and distribution facilities as reflected in the MECP Inspection Reports and ratings. Of the 12 Inspection Reports finalized to date, 8 received a rating of 100%.

System	MECP Inspection Rating
Beachville	100%
Bright	96%
Brownsville	98%
Dereham Centre	100%
Drumbo-Princeton	<i>MECP Inspection not yet scheduled due to Covid-19*</i>
Embro	<i>MECP Inspection report not yet finalized*</i>
Hickson	100%
Ingersoll	<i>MECP Inspection report not yet finalized*</i>
Innerkip	100%
Lakeside	100%
Mount Elgin	95%
Oxford South (Combination of Norwich, Otterville & Springford)	100%
Plattsville	<i>MECP Inspection not yet scheduled due to Covid-19*</i>
Tavistock	<i>MECP Inspection report not yet finalized*</i>
Thamesford	100%
Tillsonburg	100%
Woodstock	96%

* An update to Council will be provided after all remaining MECP well inspections are complete and the findings will be provided by memorandum.

2020 Non Compliance Issues from Inspections

The Brownsville Water System annual MECP inspection noted one non-compliance finding related to water quality sampling. The Mount Elgin Water System and Woodstock Water System annual MECP inspections each noted one procedural non-compliance related with operational AWWA standards. The Bright Water System annual MECP inspection noted two non-compliance findings related to administrative issues.

The non-compliance findings are summarized in the table below along with a description of the corrective actions implemented. Corrective actions are based on a root cause analysis of the incident and are completed within the timelines prescribed by the MECP.

Non-compliance	Corrective Action	System
Sampling:		
A quarterly arsenic sample was not taken within a required period.	The sample schedule will now send an alert message when a sample result is missing for a required period.	Brownsville
Disinfection Procedures:		
Disinfection of a reservoir following maintenance work was not repeated after the chlorine residual dropped below a required level.	AWWA Standard C652 was reviewed with operations staff.*	Mt. Elgin
The holding time for disinfection of the new Pittock water booster pumping station after commissioning was not provided.	AWWA Standards C651 and C653 were reviewed with operations staff.	Woodstock
Administrative Documentation:		
A Form 2 to document a minor modification to the treatment process was not completed prior to the modification.	Email communications concerning time sensitive documents will be marked with a flag and/or follow-up date.	Bright
A treatment process modification was not timely incorporated into the Operations Manual and/or Process Flow diagram.	The documents will be updated and provided to the MECP Inspector by March 31, 2021.	Bright

* AWWA Standard C652 was revised following this occurrence and a specified minimum residual level is no longer specified in the procedure.

Drinking Water Quality Management System

The County's DWQMS is documented in the Operating Authority's water system Operational Plans. The Operational Plans reflect a fully implemented DWQMS with a focus on continual improvement and they are made available to the public upon request. There are no significant changes to the Plans at this time.

The province released proposed updates to the Director's Directions - Minimum Requirements for Operational Plans (Environmental Register of Ontario posting 019-2787). Most of these are long-anticipated administrative updates as this document has not been changed since the DWQMS was first implemented in Ontario. There are no changes required to the Oxford County Operational Plan.

The provincial DWQMS requires each Operating Authority to conduct an annual Management Review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System (QMS). The Standard also requires that the outcomes of the annual Management Review of the Operating Authority's DWQMS be communicated to the system Owner (County Council) as presented below:

- Management Reviews for all three Operating Authorities were conducted in January 2021. Management reviewed the system performance including the annual reports, annual report data, results of internal and external audits, customer feedback and any suggestions brought forward by Operating Authority staff.
- The DWQMS is continually improving and integration with regular operational practices is routine. Operational considerations and challenges were reviewed with the following action items to be addressed:
 - Oxford County Operating Authority will work with local business to discuss solutions regarding the impacts of pressure fluctuations in the Tavistock system.
 - Oxford County Operating Authority has also identified several items in different systems for future consideration in the upcoming 2022 Water/Wastewater Master Plan.
 - The Town of Tillsonburg Operating Authority will do a business case needs and cost analysis of a fleet purchase of a hydro vac truck. Business cases are to be prepared and reviewed with County staff in advance of 2022 Budget submission. This item was deferred from the previous management review.
 - The City of Woodstock Operating Authority will investigate a solution for the electronic entry of maintenance and customer service field data (with consideration of a work order management system that can be ultimately implemented) and provide information to County staff in advance of 2022 Budget submission. This item was deferred from the previous management review.
- The updated provincial Watermain Disinfection Procedure was released by the Ministry in August 2020. The QMS procedure and form for watermain breaks was reviewed and updated and was effective February 1, 2021, as required by the Municipal Drinking Water Licence (MDWL).
- Internal DWQMS audits were conducted in December 2020. The findings were positive and a few minor administrative opportunities for improvement (OFIs) were brought forward. There were no non-conformance findings for the three Operating Authorities. All OFIs are being addressed through the DWQMS Continual Improvement Process.
- 2020 represented the second year of the continual improvement process following the re-accreditation audit of 2018. External third party surveillance audits were conducted for each Operating Authority in October 2020 with the following results:
 - Zero non-conformances for each of the three Operating Authorities.
 - Five OFIs were noted, mainly related to clarification of procedures and record-keeping for the Oxford County Operating Authority, and are being addressed.
 - Two OFIs were identified for both Woodstock and Tillsonburg Operating Authorities regarding internal audit notes and risk assessments which have both been addressed.

- The quantity of watermain breaks in 2020 was average compared to previous years, with the majority of breaks due to failing cast iron pipes. The failing cast iron pipes is addressed through a regular replacement program. Continued monitoring of breaks will be conducted to assess the long term trending. An increasing trend would suggest the need for accelerated watermain replacement. Approximately 94 km of cast iron pipe in service (12.8 %) across the total water distribution network.
- Training or testing of the Emergency Response Plan was undertaken by each of the Operating Authorities:
 - For Oxford County Operating Authority, training sessions took the form of procedural reviews by Operations Staff for the updated Power Outage procedures.
 - The Town of Tillsonburg Operating Authority conducted training and review of the procedures for responding to low system pressure and watermain breaks with Operators in December 2020.
 - For the Woodstock Operating Authority debriefing sessions are being completed following all water main breaks.
- Oxford County, as the water authority, continues to review Woodstock and Tillsonburg service contracts with respect to expected levels of service, cost effectiveness and key performance indicators.
- No additional resources were identified by management as being necessary to maintain the DWQMS at this time.

Source Water Protection

Staff continue to implement Source Protection Plan policies from the four Source Protection Areas across the County. It is estimated that implementation efforts on existing properties are now 60% complete. Implementation within the Catfish Creek Source Protection Area is 100% complete while implementation efforts continue in the Grand River, Long Point and Upper Thames River Source Protection Areas.

The majority of Oxford County's Wellhead Protection Areas (WHPAs) were last modelled using a 2001 groundwater model. Since then, a more detailed groundwater model has been created in 2014 using more current data to better inform the WHPAs. Modeling the vulnerable areas around the County's municipal wells using the most up-to-date science and incorporating the latest technical field and operational data will mean that Source Protection Plan policies will be implemented in the best represented locations. Accordingly, a technical project was initiated in 2020 to update the WHPAs for 5 County municipal drinking water systems (Beachville, Embro, Innerkip, Mount Elgin and Thamesford). This project is anticipated to be completed in 2021 and incorporated into the Approved Updated Thames – Sydenham and Region Source Protection Plan in 2022.

As well, a technical study was initiated in 2019 at the Otterville wells due to recent increasing trends in nitrate levels. A new "Issue Contributing Area" and revised Well Head Protection Area was completed for the well field and approved by the Province in 2020 along with applicable Source Protection Plan amendments. Staff have begun work to develop Risk Management Plans for agricultural activities that are inferred to be contributing to groundwater nitrate levels.

Similarly, Sweaburg Wells 2 & 4 and Tillsonburg Wells 4 & 5 also have had nitrate “Issue Contributing Areas” previously designated by Source Water Protection Authorities to help manage nitrate loading from nearby agricultural activities which have been inferred to be contributing to nitrate levels in the source water. As well, the County previously acquired the majority of lands within the Sweaburg Well Head Protection Area to further manage land use activities and nutrient loading.

The County submitted summary reports to each of the four Source Protection Regions on February 1, 2021 summarizing the County’s 2020 source water protection implementation actions which included:

- Issuing 11 Notices to Proceed (under Section 59 of the *Clean Water Act, 2006*) allowing development activities near municipal drinking water supplies (vulnerable areas) to proceed to planning approval stage as no risk to these water sources was identified during planning and building permit application screening. Staff continue to screen all development applications and building permits in vulnerable areas that have the potential to introduce a new threat to municipal drinking water.
- Conducting 34 site drinking water threat inspections at industrial, commercial, residential and agricultural properties where there is a potential risk to municipal drinking water.
- Finalizing three Risk Management Plans with property owners to manage agricultural threat activities (manure application, manure storage, livestock grazing or pasturing of land, pesticide application, fertilizer application, and fertilizer storage and handling) using best management practices.
- The Area Municipalities are responsible for sewage maintenance inspections under the Source Protection Plans and Part 8 of the Building Code Act. Septic systems, which are identified as potential significant drinking water threats, are required to be inspected every 5 years. Nine septic systems were due to be inspected in Brownsville by the Township of South-West Oxford in 2020 but were not performed. These inspections, along with other renewal inspections in the Long Point Source Protection Area, are expected to be completed in 2021.

Conclusions

The 2020 Annual Water Systems Summary Reports demonstrate the continued outstanding performance of the County's Municipal Drinking Water Systems. Issues that arise are generally minor in nature and are resolved in a timely fashion. Subsequent root-cause analysis of the issues are fully carried out in order to prevent potential reoccurrences.

Through continued compliance with these regulations and an ongoing commitment to the County's DWQMS and continuous improvement initiatives, Oxford County provides a safe, reliable and sustainable supply of municipal drinking water for its residents and businesses.

Implementation of Source Water Protection Plan policies continue as County staff work with property owners on compliance with the *Clean Water Act, 2006*.

SIGNATURES

Report Author:

Original signed by:

Don Ford, BA, CMM III, C.Tech.
Manager of Water and Wastewater Services

Departmental Approval:

Original signed by:

David Simpson, P.Eng., PMP
Director of Public Works

Approved for submission:

Original signed by

Michael Duben, B.A., LL.B.
Chief Administrative Officer

ATTACHMENT

Attachment 1: 2020 Annual Drinking Water System Summary Reports