

To: Warden and Members of County Council

From: Director of Public Works

2022 Drinking Water System Performance

RECOMMENDATION

1. That County Council receive Report PW 2023-07 entitled “2022 Drinking Water System Performance”, including the attached 2022 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 Ontario Regulation (O. Reg.) 170/03 under the *Safe Drinking Water Act, 2002*.
- At the time that this report was prepared, eleven municipal drinking water system inspections have been finalized since January 2022 by the MECP, with eight systems receiving 100% inspection ratings, one system receiving a 99% rating and two systems receiving a 95% rating. The inspections for the remaining six systems (Tavistock, Ingersoll, Thamesford, Tillsonburg, Dereham Centre and Woodstock) are in progress and will be provided to Council when finalized by the MECP.
- A summary of annual water system capital investments and an overview of key maintenance activities that were completed on the water infrastructure assets is also noted.
- This report also summarizes the Source Water Protection program implementation efforts undertaken over the last year across various watersheds within the County’s jurisdiction.

Implementation Points

As required by legislation, the 2022 Annual Drinking Water Systems Summary Reports (Attachment 1) will be posted on the County’s website by February 28, 2023. An update to Council will be provided after all remaining MECP inspections are complete and the findings will be provided by memorandum.

In March 2023, a separate report to Council will include the results of the Management Review of the Drinking Water Quality Management System (DWQMS). In addition, staff will continue to implement Source Water Protection Plan policies to remain in compliance with the *Clean Water Act, 2006* requirements.

Financial Impact

There are no financial impacts as a result of this report. Any required actions that will result in expenditures have been accounted for in the 2023 Operating or Capital Budgets of the respective drinking water systems.

Communications

As indicated, the Drinking Water System Performance reports will be posted to the County website as legislatively required by February 28, 2023 at www.oxfordcounty.ca/water-wastewater. The results of each system's performance report will also be shared directly with area municipal CAOs 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, 2023). The Drinking Water System Performance reports are also featured as a highlighted item in Council this Week, which is released to media, posted to the website, and shared with employees.

Strategic Plan (2020-2022)

					
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* holds 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 the County's drinking water systems includes, 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.

Severe penalties are possible for municipal officials who fail to act in good faith and do not exercise honesty, competence and integrity to ensure the protection and safety of the users of municipal drinking water systems.

Some of the ways members of Council can provide diligent oversight under the Standard of Care requirements is to have awareness of drinking water legislation and regulations, the County's Water System Operational Plans, local watershed Source Water Protection Plan policies and the drinking water annual reporting (the County's Operational Plans will be reviewed in the upcoming DWQMS report to Council in March).

Of note, the Annual Drinking Water System Performance Report and Annual Water System budget process are the primary methods in which 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*, the 2022 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.

Comments

2022 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, 2023. Highlights include:

- 21 communities were served through 17 separate municipal drinking water systems.
- There were 62 active supply wells in 2022 receiving treatment ranging from disinfection by chlorination to more complex forms of treatment including filtration to remove parameters such as iron, arsenic, manganese or hydrogen sulphide followed by disinfection through chlorination and/or Ultra Violet light (UV).

- Approximately 10.9 million cubic metres of treated drinking water was supplied to customers.
- Over 4,400 regulated bacteriological samples were collected, with only 1 sample being adverse (<0.05 %). All adverse results were investigated, resampled and cleared.
- Over 3,000 non-reportable bacteriological samples were collected from the raw and treated water, with approximately 400 being related to system maintenance and repair.
- Results for the approximately 60 different health-related chemical parameters tested (at 7 separate treatment points in 2022) 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 monitored quarterly. 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. A Municipal Class Environmental Assessment (EA) Study to look into the addition of filter media to facilitate arsenic removal is planned for 2023.
 - Dereham Centre Supply Wells - Naturally occurring arsenic levels in untreated raw water remain notably present in the raw well water. Raw water arsenic levels have been successfully reduced below ODWS through filtration at the Water Treatment facility (WTF) prior to distribution since 2021. Arsenic levels in the raw water and treated water continue to be monitored quarterly as per the Municipal Drinking Water Licence.
 - Springford Supply Wells - Naturally occurring arsenic levels in untreated raw water remain notably present in Well 4 and are monitored quarterly while the wells are in service. Water from Well 4 is blended with Well 5 to effectively manage overall drinking water arsenic levels within acceptable ODWS standards prior to customer distribution.
 - Norwich Supply Wells - Naturally occurring arsenic levels in untreated raw water remain high in Wells 2 and 5. The arsenic from the source water in these wells has been successfully reduced below ODWS through filtration at the Pitcher Street Water Treatment facility (WTF) prior to distribution since 2008. Samples from the raw and treated water continue to be monitored quarterly.
 - Tillsonburg Supply Wells (Broadway Street) - Naturally occurring arsenic levels in untreated raw water remain notably present in Well 7A and are monitored quarterly. Water from Well 7A is blended with Wells 4 and 5 (North Street) at the Fairview WTF to effectively manage overall drinking water arsenic levels within acceptable treated ODWS limits prior to customer distribution. Well 4 and 5 (North Street) noted in the next bullet under Tillsonburg Supply Wells (Brownsville Road) have high Nitrate levels. Due to the importance of this water supply, the Municipal Class EA Study, which will evaluate the potential addition of dedicated water treatment filtration to

facilitate arsenic removal from the raw water supply, has been planned as a high priority project to be undertaken in 2023.

- Tillsonburg Supply Wells (Brownsville Road) – Nitrate levels in raw water remain notably present in Wells 4 and 5 (North Street). Raw water from Wells 4 and 5 (North Street) is blended with Well 7A (Broadway Street) at the Fairview WTF to effectively manage and continuously monitor overall drinking water nitrate levels within acceptable treated ODWS limits prior to customer distribution. Water samples from the Fairview WTF are also taken as part of an enhanced nitrate monitoring system.
- Otterville Supply Wells – Nitrate levels in raw water remain notably present in Wells 3 and 4. Source water supplies from Wells 3 and 4 are blended to effectively manage nitrate levels within acceptable treated ODWS limits prior to customer distribution. Continuous monitoring of Nitrate levels using an online analyzer has been in place since 2021. Water samples are also taken from the treated water as part of an enhanced nitrate monitoring system.
- Woodstock Supply Wells (Sweaburg Road) - Nitrate levels in raw water remain notably present in Wells 1, 3, 5, 8 and 11. Raw water from these wells is blended with other well supplies to effectively manage overall drinking water nitrate levels within acceptable treated ODWS limits prior to customer distribution. Continuous nitrate monitoring using an online analyzer has been in place since 2021. Water samples on the raw, treated, and processed water continue as part of an enhanced nitrate monitoring system.
- Five systems (Brownsville, Ingersoll, Lakeside, Mount Elgin and Oxford South - Springford) 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
- Eleven systems (Bright, Brownsville, Embro, Ingersoll, Mount Elgin, Oxford South, Plattsville, Tavistock, Thamesford, and some of Woodstock and Tillsonburg water treatment facilities) have elevated levels of naturally occurring sodium greater than 20 mg/L. 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. 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

2022 Water System Infrastructure Investments

As per the revised 2022 Forecast in the 2023 Business Plan and Budget, the County invested over \$20 M in rate supported water infrastructure which includes, but is not limited to, several notable capital projects as follows:

- Townships Water Facility Improvements (\$225,000)
- Tavistock New Well Supply Class EA Study and Well Exploration (\$110,000)
- Hydraulic Water Model (\$100,000)
- Water & Wastewater SCADA Master Plan (\$1,246,000)
- Ingersoll Water Facility Improvements (\$611,000)
- Ingersoll Watermain Replacements (\$1,210,000)
- Woodstock Watermain Replacements (\$1,640,000)
- Tillsonburg Watermain Replacement Projects/New Construction (\$972,000)
- OR 4/Landsdowne Watermain Extension/Looping (\$4,400,000)
- Woodstock Water Supply Feeder mains Condition Assessment (\$350,000)
- Ingersoll Water Tower Paint Repair (\$3,570,000)

2022 Water System Asset Management Plan Update

In addition to the above noted capital investments, the County continues to prioritize the long term sustainability of its water systems. The County maintains a diverse portfolio of infrastructure assets necessary to produce and supply safe and clean drinking water. In 2022, as part of the update to the County's Asset Management Plan, the current asset condition and lifecycle needs for each of the County's drinking water system were documented. This information will be used as a primary source for setting water and wastewater rates, capital requirements, and to determine appropriate target reserve balances. The summary of these findings were detailed in Report No. [CS 2022-20, 2022 Asset Management Plan](#). A summary of the overall condition of water infrastructure and related assets is detailed in Figure 1.

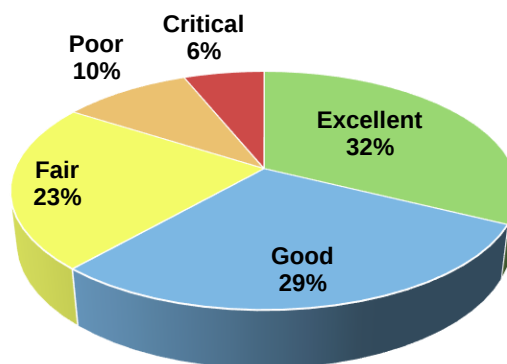


Figure 1 - County Water System Asset Condition (2022)

Oxford County continues to manage its water asset inventory and asset maintenance work orders using a digital asset management system. Through proactive asset management, the County strives to optimize the service life of its water assets and promote the overall long term

sustainability of its water system. The County continues to integrate its water infrastructure, among other assets, within the corporate Asset Management Systems Enhancement project as part of overall compliance to O. Reg. 588/17 – Asset Management Planning for Municipal Infrastructure, under the *Infrastructure for Jobs and Prosperity Act, 2015*.

Oxford County continues to incorporate industry best management practices to monitor the levels of service and financial performance of its water infrastructure and ensure that our water infrastructure assets are maintained in good condition through effective preventative maintenance, optimized infrastructure decision-making and strategic capital planning (replacement, repair, expansion).

2022 Water Service Delivery Review

As per Report No. [CS 2021-14](#), staff received direction from Oxford County Council in March 2021 to seek Municipal Modernization funding to collectively undertake a joint Water Distribution and Wastewater Collection Operations and Maintenance standardized delivery review with Tillsonburg and Woodstock to identify potential opportunities to modernize service delivery and reduce future operating costs. The outcomes and recommendations of the review were presented to Council (Reports No. [PW 2022-32](#) and [PW 2022-19](#)). Staff received Council direction to continue with the status quo service water service delivery model with consideration for continuous improvement relating to the implementation of industry best management practices including, but not limited to, the following:

- User-Fee Backflow Prevention Program (in progress);
- Service Level Alignment to Standards (in progress to achieve consistent LOS);
- Full Cost Recovery (in progress as per 2023 County Fees & Charges By-law updates);
- Joint Procurement (seeking opportunities with contracted service providers); and
- Streamlining Responsibilities in Right-Of-Way Capital Coordination (seeking GIS and Cartegraph work order system enhancements required for integrated asset management).

2024 Water and Wastewater Master Plan

Oxford County communities are growing and so is our water and wastewater infrastructure. Supplying clean, safe drinking water to our residents and industry users has a direct impact on the health of our community. The Water and Wastewater Master Plan will set out the long-term water servicing strategies to support existing needs and accommodate future growth in population and employment through to the year 2046. Through this Master Plan, the long term ability of Oxford's water system to service existing water demand, as well as future growth needs, is being assessed in detail in terms of sustainable, affordable and reliable infrastructure.

Project milestones for 2022 included detailed site visits of all County water and wastewater systems and the first round of public consultation related to the project. A summary of the consultation process to date was shared with County Council through Report No. [PW 2022-47](#). The project is expected to come to completion later in 2023 and the findings/recommendations will be shared with County Council at that time.

Proposed Backflow Prevention Program and Draft By-law

Oxford County is committed to ensuring that residents have access to clean, safe, and reliable drinking water and strives to implement industry best management practices that support in this objective. Oxford County is looking to join the more than 60 municipalities who have already enacted Backflow Prevention Programs to safeguard the municipal water drinking water system from contamination by non-drinking water sources.

Backflow events can significantly impact residents, businesses, and the environment by impacting water quality, posing a health risk to consumers, and causing service interruptions. Under normal operating conditions, drinking water flows from the municipal distribution system into private homes and services. Backflow is a reversal of this normal direction. It occurs when there is a change in pressure that can push or pull water from inside a private-service connection back into the municipal drinking water system (watermain). These events can impact the water quality in the distribution system and neighbouring properties if the water “backflows” through any source of contamination (a cross connection).

Properly installed and tested backflow prevention devices stop this reversal of flow and potential introduction of contaminants. Implementing a County-wide backflow prevention program will further strengthen the multi-barrier approach the County uses to protect our municipal drinking water. The proposal for a County-wide Backflow Prevention Program and draft by-law was received by County Council in July 2022 (Report No. PW 2022-35) and staff were directed to begin public consultation on the draft by-law. Public consultation centers are planned to be held in each area municipality in 2023. Following the public consultation period, staff will be considering feedback received in potential updates to the draft by-law before seeking County Council endorsement in late 2023.

2022 Maintenance of Water System Infrastructure

In addition to the drinking water system capital investments noted above, several planned preventative maintenance activities are carried out annually to help optimize the useful service life and efficiency of water infrastructure assets. A number of key maintenance activities are noted below for water distribution and water supply/treatment infrastructure respectively.

Table 1: Water Distribution Assets

Preventative Maintenance Activity	Quantity
Critical Valve turning	1,414
Non-Critical Valve turning	2,196
Watermain Cleaning (Swabbing) – County only	30,000 m
Hydrant Flushing	3,387
Hydrant Maintenance	2,991
Hydrant Flow Testing	509
System Backflow Preventer Inspections	712

In terms of corrective maintenance, Oxford County Public Works and its contracted service providers (City of Woodstock, Town of Tillsonburg) also repaired 33 distribution watermain breaks and responded to approximately 483 customer water complaints within the various water distribution systems across the County in 2022.

Table 2: Water Supply/Treatment Assets

Preventative Maintenance Activity	Quantity
Water Supply Main Cleaning (Swabbing)	2,900 m
Specialized Rehabilitation of Supply Wells	4
Reservoir Cleaning	11
Water Plant Filter Media Maintenance/Inspection	6
Chlorine, Turbidimeter & Nitrate Analyser Calibrations	568
Ultra-Violet Disinfection System Maintenance	10
Standby Power Generator Maintenance	47
Water Plant Flowmeter Calibrations	174
Facility Backflow Preventer Inspections	64

As well, Oxford County Public Works performed over 200 inspections on critical water supply wells, instruments, and storage facilities.

2022 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 MECP's inspections take place during their fiscal year (April to March), inspection reports are not always finalized in time to be included in the County's annual reports.

Overall, 2022 demonstrated the continuous exceptional performance at the County's water treatment and distribution facilities as reflected in the MECP inspection reports and ratings. Of the 11 inspection reports finalized to date, eight received a rating of 100%, one received 99%, and two received 95%. Inspections for the Ingersoll, Tavistock, Thamesford, Tillsonburg, Dereham Centre and Woodstock systems have not yet been finalized.

The table below outlines the status of each system's MECP inspection reports and ratings.

Table 3: Inspection Ratings

System	MECP Inspection Rating
Beachville	100%
Bright	100%
Brownsville	100%
Dereham Centre	<i>MECP Inspection – In progress*</i>
Drumbo-Princeton	100%
Embro	100%
Hickson	99%
Ingersoll	<i>MECP Inspection – In progress*</i>
Innerkip	100%
Lakeside	95%
Mount Elgin	95%
Oxford South (Norwich, Otterville & Springford)	100%
Plattsville	100%
Tavistock	<i>MECP Inspection – In progress*</i>
Thamesford	<i>MECP Inspection – In progress*</i>
Tillsonburg	<i>MECP Inspection – In progress*</i>
Woodstock	<i>MECP Inspection – In progress*</i>

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

Two minor non-compliances for the Lakeside drinking water system were noted due to a loss of continuous monitoring for free chlorine and flow data that spanned approximately 2.5 hours on a single day when both the primary and back up data recorders failed. It is important to note that during this brief outage, the plant was still equipped with automatic alarms and shut offs to ensure the water supplied to distribution continued to meet ODWS limits. During the outage, County Water Operators also attended the site and confirmed that the chlorine residuals and plant operations were normal. The MECP did not require any corrective actions from this non-compliance.

Three minor non-compliances were noted requiring updates to the Operations and Maintenance Manuals to document recent finalized capital upgrades information (Graydon Water Treatment Facility) and to include chlorine contact time calculations for primary disinfection for all operational configurations (Tavistock Water Treatment Facility). These manuals were subsequently updated and provided to the MECP with no further actions required.

Minor non-compliances were issued following the Hickson, Lakeside, and Mount Elgin drinking water system MECP inspections as the summary of the raw water turbidity results were not stated in the 2021 Annual Report. Raw water turbidity is not a reportable parameter in groundwater systems but is checked weekly by Water Services staff. The inclusion of raw water turbidity results in the Annual Report has been incorporated in 2022 reporting for all County drinking water systems moving forward.

2022 Boil Water and Adverse Water Quality Incidents

There was one precautionary Boil Water Advisory in 2022:

- Mount Elgin – Damage to a watermain on February 9, 2022 by a third party contractor resulted in low water pressure in the distribution system and potential impact to secondary disinfection. The incident was reported to the MECP and Medical Officer of Health (MOH). A precautionary BWA was enacted for all residents. Distribution free chlorine residuals were collected immediately and found to be within acceptable levels. Additionally, two sets of bacteriological water samples were collected to confirm that there was no contamination to the drinking water system, and all results were found to be acceptable.

There were two operational Adverse Water Quality Incidents (AWQI) in 2022:

- Mount Elgin – A low free chlorine residual of 0.02 mg/L was reported to the MECP and MOH on January 24, 2022. The system was subsequently backflushed and the chlorine residual was tested and restored to an acceptable ODWS concentration (above 0.05 mg/L).
- Mount Elgin – The failure of two highlift pumps during system flushing on October 31, 2022 resulted in potential low distribution system pressure at higher elevations for approximately 20 minutes. The incident was reported to the MECP and MOH. The system was subsequently flushed at all dead ends and high elevations. The chlorine residual was tested and found to be within acceptable ODWS levels (above 0.05 mg/L).

There was one bacteriological AWQI in 2022:

- Ingersoll – A bacteriological sample result taken from the Hamilton Road Water Treatment Facility on July 25, 2022 was found to have total coliforms of 18 cfu/100 mL. The result was reported to the MECP and MOH. Resamples were collected at the site and two downstream locations and all re-samples were determined to be acceptable by ODWS levels.

There were four chemical AWQIs in 2022:

- Tillsonburg – Two AWQIs related to nitrate concentrations (greater than 10 mg/L) in the treated water were reported to the MECP and MOH in July 2022. Both AWQIs were precautionarily reported when an online nitrate analyzer at the Fairview Water Treatment Facility recorded a nitrate concentration above acceptable ODWS levels. The high result registered by the analyzer triggered a plant shut down as expected within two minutes of the reading. New conservative procedures were put into place to manage well supplies in order to ensure treated water entering the distribution system does not exceed the ODWS level.
- Plattsville / Tavistock – Two treated water samples for sodium had a concentration of 21.7 mg/L and 21.0 mg/L respectively. Although drinking water is considered safe for consumption at sodium levels up to 200 mg/L, water containing levels greater than 20 mg/L are required to be reported to the MECP and MOH. Confirmatory resamples were taken and had sodium concentration of 20.3 mg/L and 18.7 mg/L respectively. These sodium concentrations are considered typical for this drinking water system which has naturally elevated sodium levels.
- Springford - A treated water sample for fluoride had a concentration of 1.57 mg/L. Although drinking water is considered safe for consumption at fluoride levels up to 2.4 mg/L, levels greater than 1.5 mg/L are required to be reported to the MECP and MOH. A confirmatory resample was taken and also had fluoride concentration of 1.57 mg/L. While Oxford County does not add fluoride to its municipal drinking water, naturally occurring levels of Fluoride are common in groundwater sources.

2022 Water Conservation Efforts

Oxford County relies entirely on groundwater for its drinking water supply. Compared to other communities near rivers or lakes, groundwater supplies may take longer to recharge and can be at times more vulnerable to overuse. Oxford County takes water conservation seriously and operates 3 rebate programs (toilet replacement rebate, washer replacement rebate, and ICI water buy-back program) and a Summer Water Conservation By-law (By-law No. 4193-2002) to ensure that our groundwater supply is protected for future generations.

Water use can increase by up to 50 per cent during the summer months due to an increase in outdoor water use for watering lawns/gardens and filling pools. This increased water use can quickly increase household water bills and put additional strain on the municipal water supply and distribution system. The Summer Water Conservation By-law is in effect from May 1 – September 21 annually. The By-law outlines designated times for outdoor water use to help ensure a sustainable supply of water for everyone. Exemption permits are available for residents and businesses who may need to use water outside their dedicated watering times. The County approves exemption permits for new seed/sod, pool filling, and special consideration where appropriate and when conditions in the watershed are favourable.

In 2022, Oxford County Water Services undertook the first ever social media campaign to raise awareness over the Summer Water Conservation By-law. As part of the campaign curated infographics, lawn care and gardening water conservation tips, and information about the by-law were shared across County platforms throughout the summer. Approximately 450 watering exemption permit applications were processed in 2022.

Oxford County continues to offer rebates for residents looking to update old inefficient toilets and washing machines to modernized water efficient (low flow) models. In 2022, 43 applications from residents were reviewed as part of this initiative.

In an effort to extend water conservation best management practices beyond residential users, the County enacted a Water Capacity Buy-Back Program (2015). This program is targeted to Industrial, Commercial, Institutional, and Multi-residential users whose water conservation upgrades could have a large potential impact on the overall Water Efficiency Program at the County. In 2022, the County received and approved 1 application under this program.

2022 Source Water Protection Program

In Q4 2022, a new Risk Management Inspector (RMI) was appointed for Oxford County. The new RMI will be working with the County's Source Water Protection Coordinator, Area Municipalities, and County Staff to implement Source Protection Plan policies in the four Source Protection Areas located in Oxford County.

Source Protection Plan implementation efforts continue in Catfish Creek, Grand River, Long Point, and Upper Thames River Source Protection Areas. Across the four Source Protection Plans, it is estimated that their overall implementation to address, eliminate and manage potential drinking water threat activities is approximately 68% complete.

It should be noted that future amendments made to the Source Protection Areas Source Protection Plans will reflect up-to-date science and may result in an increase to the overall inventory of potential drinking water threats on the County landscape.

2022 Source Protection Undertakings

On February 1, 2023, the County submitted summary reports to each Source Protection Region summarizing the County's 2022 source water protection implementation actions. The highlights of these summaries are detailed below.

- Source Protection staff continue to screen all development applications and building permits near drinking water supplies (vulnerable areas) that have the potential to introduce a new threat to municipal drinking water.
 - 11 Notices to Proceed were issued in 2022 (under Section 59 of the *Clean Water Act, 2006*). These 11 notices allow development activities near municipal drinking water supplies to proceed to the planning and approval stage as no risk to the drinking water sources were identified during permit application screening.
 - 85 application reviews did not require any source water protection measures such as a Notice to Proceed, Risk Management Plan, or Prohibition Notice.
- 36 property and tenant drinking water threat inspections at industrial, commercial, residential, and agricultural properties were conducted in 2022.
 - These inspections are part of the ongoing monitoring that Source Protection staff performs at sites where a potential risk to municipal drinking water has been identified.

- Seven Risk Management Plans were finalized in 2022.
 - Risk Management Plans are established with property owners to manage agricultural threat activities and prevent potential contamination of the drinking water supply. Threat activities include; manure application, manure storage, livestock grazing or pasturing of land, pesticide application, fertilizer application, and fertilizer storage and handling. Source Protection staff work with property owners to ensure that Risk Management Plans incorporate best management practices to safeguard our municipal drinking water.
- Area Municipalities are responsible for sewage maintenance inspections under the Source Protection Plans and Part 8 of the *Building Code Act, 1992*. Septic systems are identified as potential significant drinking water threats and must be inspected every 5 years.
 - 70 septic tank maintenance inspections were completed in 2022. 4 septic tank maintenance inspections were completed by Blandford Blenheim Township, 11 were completed by Zorra Township, 8 were completed by East-Zorra Tavistock, while South-West Oxford completed 47 septic tank maintenance inspections.
 - 6 septic tank inspections that were expected to be completed by the Townships in 2022 have been postponed to 2023 (South-West Oxford: 1, Blandford-Blenheim: 4, and East Zorra-Tavistock: 1).

2022 Agricultural Land Lease Agreement Update

In 2022, new lease agreements were signed for the Oxford County owned agricultural land around the Thornton Drinking Water Well Supply System. These lease agreements have been prepared to allow agricultural practices on the land to persist while limiting nitrogen application (commercial fertilizers) to the lands and subsequently the potential for nitrates to enter the groundwater and contaminate the groundwater drinking water supply. The success of these lease agreements has been extensively studied for over 20 years by researchers at University of Waterloo. These leases expire in 5 years and will be monitored and adjusted accordingly to ensure the safety of the Thornton Drinking Water Well Supply System.

2022 Source Protection Plan Updates

In 2021, Director Technical Rules were updated to reflect the most up-to-date science which directs Source Protection Authorities to update Source Protection Plans and Assessment Reports to address threat specific circumstances. The four Source Protection Plans relevant to Oxford County will be updated over the next few years to incorporate these changes. Updates to the Catfish Creek Source Protection Plan and Assessment Report began in 2022 and are expected to be finalized at the end of 2023. A summary of these updates were detailed in the Proposed Catfish Creek Source Protection Plan Update (Report No. [PW 2023-01](#)).

Updated modeling of 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 serves to ensure that Source Protection Plan policies are applied and implemented in the appropriate geographical land areas.

Issue Contributing Areas

When municipal raw water (before treatment) demonstrates an exceedance of an ODWS or increasing trend of a contaminant of concern, the *Clean Water Act, 2006* allows local Source Protection Authorities (SPAs) to designate municipal wellhead protection areas as an Issues Contributing Areas (ICA). An ICA delineates an area where current/past land use are likely inferred to contribute to the elevated contaminant concentration in raw water supplies.

In Oxford County, the local SPAs have identified and delineated three nitrate ICAs within the following water systems:

- **Woodstock:** Wells 2 and 4 have a nitrate ICA in place which is intended to manage and regulate surrounding area land uses (agriculture) which have been inferred to be contributing to the raw water supply nitrate issue due to historical nutrient loading (fertilizer and manure application activities).
 - Similar activities may also be impacting nitrate levels in other Woodstock supply wells (Wells 1, 3, 5, 8 and 11). The County is currently working with the University of Waterloo to further understand the potential land-use impacts on nitrate raw water quality at these wells and to potentially expand the delineation of the current Nitrate ICA around Sweaburg Wells 2 and 4 to incorporate the above mentioned wells as an enhanced source protection measure.
 - The Strik Drain expansion/upgrade is a municipal drain project proposed for construction in the Township of South-West Oxford. The project is intended to improve the functioning of the proposed drain allowing it to handle surface water and shallow soil drainage occurring over an approximate 210 hectare agricultural area to the northwest of the Wells 1, 3, 5, 8 and 11). County source protection staff has initiated a study of technologies and approaches to appropriately manage potential loading of nitrates and pathogens transferred from the agricultural lands through the Strik drain into the recharge zones to the Wells (down gradient of the drain outlet).
- **Tillsonburg:** Local SPAs have identified a Nitrate ICA around Tillsonburg Wells 4 and 5 in 2013 and instituted advanced source protection plan policy requirements 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). This ICA was a focus for Oxford County's Risk Management Official and Inspector in 2022 to eliminate and manage threats identified in the Long Point Source Protection Plans Assessment Report. Risk Management Plans are being implemented to manage land use drinking water threat activities being undertaken by several landowners within the Nitrate ICA.
- **Otterville:** Local SPAs designated a nitrate ICA around Wells 3 and 4 in 2020 and instituted advanced source protection plan policy requirements 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). Work has begun to verify potential landowner drinking water threat activities within the Otterville Nitrate ICA from which future Risk Management Plans will be developed.

Conclusions

The 2022 Annual Water Systems Summary Reports demonstrate Public Works' continued oversight of the County's Municipal Drinking Water Systems in order to provide a safe, reliable and sustainable supply of municipal drinking water for its residents and businesses.

The County continues to institute industry best management standards to annually monitor the levels of service and financial performance of its water systems and to ensure water assets are maintained in optimal condition through effective preventative maintenance, and optimized asset decision-making.

SIGNATURES

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ATTACHMENT

Attachment 1: 2022 Annual Drinking Water System Summary Reports