REPORT TO COUNTY COUNCIL

2023 Drinking Water System Performance

To: **Warden and Members of County Council**

From: **Director of Public Works**

RECOMMENDATION

1. **That County Council receive Report PW 2024-06 entitled "2023 Drinking Water System Performance", including the 2023 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, eight municipal drinking water system inspections have been completed since January 2023 by the MECP. Six systems received 100% inspection ratings, one system received a 97% rating and one system received a 96% rating. The remaining systems inspection report ratings were either not available at the time of this report or the inspection had not yet been conducted.
- 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 in this report.
- 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 2023 Annual Drinking Water Systems Summary Reports will be posted on the County's website by February 28, 2024. An update to Council will be provided after all remaining MECP inspections are complete and the findings will be provided by memorandum.

In March 2024, 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.

Source Water Protection Plan Updates will be presented to Council in separate reports for the Long Point Region (2024), Thames-Sydenham and Region (2025) and Grand River Source Protection Areas (2025).

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 2024 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, 2024 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, Transportation 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, 2024). 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.

2023-2026 STRATEGIC PLAN

Oxford County Council approved the 2023-2026 Strategic Plan on September 13, 2023. The Plan outlines 39 goals across three strategic pillars that advance Council's vision of "Working together for a healthy, vibrant, and sustainable future." These pillars are: *(1) Promoting community vitality, (2) Enhancing environmental sustainability, and (3) Fostering progressive government*.

The recommendations in this report supports the following Strategic Pan Pillars and Goals:

PILLAR 1	PILLAR 2	PILLAR 3
		
Promoting community vitality	**Enhancing environmental sustainability**	**Fostering progressive government**
Goal 1.2 – Sustainable infrastructure and development Goal 1.3 – Community health, safety and well-being	Goal 2.2 – Preserve and enhance our natural environment	Goal 3.1 – Continuous improvement and results-driven solutions Goal 3.2 – Collaborate with our partners and communities Goal 3.4 – Financial sustainability

See: Oxford County 2023-2026 Strategic Plan

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 2023 Annual Drinking Water Systems Summary Reports (Annual Reports - Oxford County) 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

2023 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, 2024. Highlights include:

- 21 communities were served through 17 separate municipal drinking water systems.

- There were 62 active supply wells in 2023 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 10.7 million cubic metres of treated drinking water was supplied to customers.

- Over 4,500 regulated bacteriological samples were collected, with 16 samples being adverse (0.35 %). All adverse results were investigated, resampled and cleared.

- Over 3,200 non-reportable bacteriological samples were collected from the raw and treated water, with approximately 300 being related to system maintenance and repair.

- Results for the approximately 60 different health-related chemical parameters tested (at 10 separate treatment points in 2023) 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 Standards (ODWS) limits prior to customer distribution. In 2023, a pilot project using adsorptive media was conducted which demonstrated promising results for arsenic removal during water treatment. As per the 2024 Budget, a new adsorptive media filter project will be completed to effectively manage drinking water arsenic levels within acceptable ODWS standards prior to customer distribution.

    - 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 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, evaluation of the potential for dedicated filtration at the Well 7A site to facilitate arsenic removal from the raw water supply was a high priority project completed in 2023. In 2024, the design for this filtration facility will be finalized and construction is anticipated to begin in 2025.

- 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. In 2024, work will begin to re-introduce Well 3 (currently not in service) which will improve blending and the ability to better manage overall nitrate concentrations.

- 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. In 2023, work to reduce the potential impact of land activities (nitrate loading) on the raw water aquifer – refer to *2023 Source Water Protection* section of this report.

- 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/advisories-alerts-and-information.aspx#2024.

- 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/advisories-alerts-and-information.aspx#2024.

2023 Water System Infrastructure Investments

As per the revised 2023 Capital Forecasts noted in Report CS 2023-37, the County invested over $21.9 M in rate supported water infrastructure which includes, but is not limited to, several notable capital projects as follows (project costs are rounded):

- Water SCADA Master Plan ($390,000)
- Water and Wastewater Master Plan (water servicing portion $70,000)
- Water Facility Improvements ($600,000)
- Watermain Replacements and New Installations ($6,300,000)
- Ingersoll Tower Painting and Repair ($1,300,000)
- Ingersoll Groundwater Monitoring Improvements ($260,000)
- Norwich Water Tower Painting and Repair ($3,000,000)
- Tavistock New Well Supply Class EA Study ($94,000)
- Thamesford UV Upgrades ($240,000)
- Tillsonburg Well 3 Upgrades ($130,000)
- Tillsonburg Well 7A Upgrades ($50,000)
- Tillsonburg UV Upgrades ($300,000)
- Tillsonburg Boosted Pressure ($335,000)
- Woodstock UV Upgrades ($660,000)
- Woodstock Thornton Feedermain Replacement ($560,000)
- Woodstock Bowerhill Booster Pumping Station ($250,000)
- Water Development Charges Technical Study ($38,000)

2023 Water Service Agreement Updates

As per the resolution from Report PW 2023-26, staff received direction from Oxford County Council in May 2023 to update the Water Distribution and Wastewater Collection Service Agreements with the Town of Tillsonburg (Town) and the City of Woodstock (City). Updated service agreements were effectively negotiated to have the Town and City perform, under contract to the County, operation and maintenance (O&M) of a limited portion of the County's water distribution (and wastewater collection) systems as well as for specific engineering and construction services performed within the same. Staff received Council direction to then execute the agreements as per Report PW (CS) 2023-39, which were similarly endorsed by local Town and City Councils for execution. Both agreements were subsequently executed on November 16, 2023 with an effective date of January 1, 2024.

As per the updated service agreements, County staff have since processed the subsequent administrative updates to the municipal water Quality Management System, which institutes a consolidated Operational Plan that governs the oversight of Oxford's 17 municipal drinking water systems as part of the upcoming Water Quality Management System Update.

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 2024 Water and Wastewater Master Plan (W/WW MP) details long-term water servicing strategies to support existing needs and accommodate future growth

in population and employment through to the year 2046. County Council endorsed the 2024 Water and Wastewater Master Plan (Report PW 2023-41) following an extended public consultation period. The final report can be found on the county website (www.oxfordcounty.ca/wwwmp).

The 2024 W/WW MP will guide the County's annual capital and operational budgets, become an important input to the 2024 Water and Wastewater Development Charges Technical Study, and will further inform the upcoming 2024 Development Charges Background Study. County Council will consider future implementation of projects identified in the 2024 W/WW MP through the annual budgeting process. Approved projects will be integrated within the County's 2022 Asset Management Plan, which focuses on lifecycle needs of existing projects and incorporates the needs of growth projects identified in the Development Charges Background Study.

Backflow Prevention Program

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. In 2023, Oxford County joined over 60 municipalities in Ontario who have implemented a Backflow Prevention and Cross Connection Control program and supporting By-law (refer to Report PW 2023-29). The By-law passed after an extended Public Consultation Period, which included virtual and in person presentations by the County's project team on the proposed By-law and Transition Plan.

Oxford County staff continue to meet the multi-year, phased implementation targets of the program. Key highlights on the implementation pathway for 2023 include;

- The County has retained a third party contractor to provide administrative and database support for the program.
- County staff are available to provide local support and answer questions from property owners and qualified testers through the transition.
- A permeant program landing page is available on the County website at www.oxfordcounty.ca/backflow.
- Over 30 qualified testers have registered with the County to perform device testing, inspections, and surveys. Oxford County will continue to engage with local testers throughout 2024 to build this registry.
- Transition notices on the program have been distributed to all Area Municipality Chief Building Officials and Service Providers.
- City of Woodstock Implementation Notices to impacted property owners were mailed out December 2023.

Throughout 2024, County staff will continue to engage with stakeholders as annual device inspection notices are delivered and the program begins implementation in the remaining Area Municipalities.

2023 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	1,477
Non-Critical Valve Turning	2,344
Watermain Cleaning (Swabbing) - County only	29,500 m
Hydrant Flushing	3,593
Hydrant Maintenance	3,761
Hydrant Flow Testing	464
System Backflow Preventer Inspections	697

In terms of corrective maintenance, Oxford County Public Works and its contracted service providers (City of Woodstock and Town of Tillsonburg) also repaired 25 distribution watermain breaks and responded to approximately 279 customer water complaints within the various water distribution systems across the County in 2023.

Table 2: Water Supply/Treatment Assets

Preventative Maintenance Activity	Quantity
Water Supply Watermain Cleaning (Swabbing)	500 m
Specialized Rehabilitation of Supply Wells	4
Reservoir Cleaning	11
Water Plant Filter Media Maintenance/Inspection	1
Chlorine, Turbidimeter and Nitrate Analyser Calibrations	368
Ultra-Violet Disinfection System Maintenance	10
Standby Power Generator Maintenance	48
Water Plant Flowmeter Calibrations	36

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

2023 MECP Water System 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, 2023 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 eight inspection reports finalized to date, six received a rating of 100%, one received 97%, and one received 96%. Inspections for the Bright, Drumbo-Princeton, Innerkip, and Tavistock DWS are on-going. The County is awaiting for inspections to be planned for Dereham Centre, Ingersoll, Plattsville, Tillsonburg and Woodstock systems.

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

Table 3: Municipal Water System Inspection Ratings

System	MECP Inspection Rating
Beachville	96%
Bright	*MECP Inspection – In progress**
Brownsville	100%
Dereham Centre	*MECP Inspection – Pending**
Drumbo-Princeton	*MECP Inspection – In progress**
Embro	100%
Hickson	100%
Ingersoll	*MECP Inspection – Pending**
Innerkip	*MECP Inspection – In progress**
Lakeside	97%
Mount Elgin	100%
Oxford South (Norwich, Otterville & Springford)	100%
Plattsville	*MECP Inspection – Pending**
Tavistock	*MECP Inspection – In progress**
Thamesford	100%
Tillsonburg	*MECP Inspection – Pending**
Woodstock	*MECP Inspection – Pending**

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

Two minor non-compliances for the Beachville drinking water system were noted due to irretrievable continuous monitoring data from a corrupt data download for free chlorine and flow data that spanned approximately 57 days. It is important to note that during this timeframe, the plant was still equipped with automatic alarms and shut offs to ensure the water supplied to distribution continued to meet ODWS limits and that County Water Operators attended the site and confirmed that the chlorine residuals and plant operations were normal. The County is undertaking a multi-year SCADA Master Plan and the Beachville DWS upgrade is in the design phase and is anticipated to be implemented in early 2024. The MECP did not require any corrective actions from this non-compliance.

One minor non-compliance for the Lakeside drinking water system was noted related to the Operations and Maintenance Manual which required an update to the chlorine contact time calculations for primary disinfection. The manuals was subsequently updated and provided to the MECP with no further actions required.

The MECP best management practice recommendation that the Owner implement a by-law or policy for limiting access to hydrants was recommended during two inspections in 2023. This can limit potential introduction of contamination to the distribution system and the County will consider this recommendation as part of their review during the drafting of a Water By-law in 2024.

2023 Boil Water and Adverse Water Quality Incidents

There were three precautionary Boil Water Advisories in 2023:

- Drumbo-Princeton (3 days) - Damage to a watermain on August 9, 2023 by a third party contractor resulted in low water pressure in the Princeton distribution system and potential impact to secondary disinfection. The incident triggered the need for water watermain repair and flushing.

- Drumbo-Princeton (3 days) - An instrumentation failure on August 20, 2023 resulted in sustained low pressure at the Drumbo Water Treatment Facility which impacted water pressure to Drumbo residents only.

- Ingersoll (3 days) - A watermain break occurred on August 9, 2023 under Hall Creek which posed a risk to secondary disinfection. The incident was reported to the MECP and Ministry of Health (MOH). A precautionary boil water advisory was enacted for three impacted properties as the watermain need to be depressurized to complete the repair.

  In all above cases, these incidents were reported to the MECP and MOH and precautionary boil water advisories were temporarily enacted. Water distribution system free chlorine residuals were then immediately collected by staff and confirmed to be within acceptable levels. Additionally, two sets of bacteriological water samples were collected by staff to confirm that there was no contamination to the drinking water system. All results were found to be acceptable and the advisory was lifted by Southwestern Public Health.

There were two operational Adverse Water Quality Incidents (AWQI) in 2023:

- Woodstock - Following a power failure on June 9, 2023, there was a brief interruption to UV Disinfection at the Thornton Water Treatment Facility. In this instance the isolation valve failed to fully seal. The failure was quickly identified and isolation was established. System pressure and chlorine residuals were maintained within normal operating parameters during the event. The event was reported to MOH and MECP and no further corrective action was required.

- Ingersoll - A low distribution chlorine residual of 0.02 mg/L was noted on January 17, 2023 when performing dead end flushing. The dead end continued to be flushed until an acceptable free chlorine residual was restored. The incident was reported to MECP and MOH. No further action was required.

- There were sixteen (16) bacteriological AWQIs in 2023 for total coliforms. Of these, twelve (12) were for samples collected in the distribution system and four (4) were collected from Water Treatment Facilities. In all cases, resamples were collected from upstream or downstream locations (as appropriate) and at the site of the initial adverse. All resamples were determined to be acceptable by ODWS.

All incidents were reported to MECP and MOH with no further action being required. Details on system specific AWQIs can be found in the specific water system reports. There were no chemical AWQIs in 2023.

Oxford County staff investigated all AWQIs through the DWQMS. An improvement and corrective action plan was established following the higher number of AWQIs in 2023. This included operator training on best practices for sampling and improved disinfection methods on taps prior to sample collection.

2023 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 currently operates three rebate programs (toilet replacement rebate, washer replacement rebate, and Industrial/Commercial/institutional (ICI) water buy-back program) and a Summer Water Conservation By-law (By-law 4193-2002) to ensure that our groundwater supply is protected for future generations.

Summer Water Conservation By-law

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 peak in water demand 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 30 annually. The By-law outlines designated times for outdoor water use to better manage our community water demand in peak months and 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 2023, Oxford County continued to raise awareness on the Summer Water Conservation By-law through social media and a digital ad campaign. Infographics about the By-law lawn watering days, low water response, lawn care, gardening and water conservation tips were shared across County platforms throughout the summer. Approximately 480 watering exemption permit applications were processed in 2023.

Water Rebate Programs

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 2023, thirteen (13) 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 ICI and multi-residential users whose water conservation upgrades could have a large potential impact on the overall Water Efficiency Program at the County. In 2023, the County received and approved one application under this program. County staff will return to Council to update the eligibility criteria of the program and will be undertaking efforts to improve community uptake of the rebate in 2024.

2023 Source Water Protection Program

The County's Source Water Protection Coordinator and Risk Management Inspector (RMI), along with Area Municipalities, implement Source Protection Plan policies in the 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 72.5% 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.

2023 Source Protection Undertakings

On February 1, 2024, the County submitted summary reports to each Source Protection Region summarizing the County's 2023 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.
    - 21 Notices to Proceed were issued in 2023 (under Section 59 of the *Clean Water Act, 2006*). These 21 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.
    - 71 application reviews did not require any source water protection measures such as a Notice to Proceed, Risk Management Plan, or Prohibition Notice.
- 31 property and tenant drinking water threat inspections at industrial, commercial, residential, and agricultural properties were conducted in 2023.
    - These inspections are part of the ongoing monitoring performed at sites where a potential risk to municipal drinking water has been identified.
- 13 Risk Management Plans were finalized in 2023 to incorporate best management practices to safeguard our municipal drinking water.
    - Risk Management Plans are established with property owners to manage agricultural threat land use activities (i.e. manure application, manure storage, livestock grazing or pasturing of land, pesticide application, fertilizer application, and fertilizer storage and handling) and prevent potential contamination of the drinking water supply.

- 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.
    - One scheduled septic tank maintenance inspection was required and completed in 2023 by East-Zorra Tavistock in the community of Hickson.
    - Four septic tank inspections were expected to be completed by the Township of Blandford-Blenheim in the community of Bright in 2023. These four inspections have been postponed to 2024.
    - No other area municipalities had scheduled inspections required for 2023.

2023 Agricultural Land Lease Agreement Monitoring

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. 2023 was the first year of implementation of these agreements. Some fields planned to have zero nitrogen inputs to protect the Thornton Drinking Water Well Supply System. The success of these lease agreements has been extensively studied for over 20 years by researchers at University of Waterloo. These leases expire in four years and will be monitored and adjusted accordingly to ensure the safety of the Thornton Drinking Water Well Supply System.

2023 Source Protection Plan Updates

In 2021, Director Technical Rules (DTR) 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 potential drinking water threat specific circumstances. Subsequently, the Catfish Creek Source Protection Plan was updated to incorporate these changes and were finalized in 2023 (Report PW 2023-01) with final approval from the MECP expected in 2024.

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 locations. The County is currently investigating enhanced groundwater modeling in Ingersoll through the installation of monitoring wells to improve the data that informs the wellhead protection area model updates. Between 2021 and 2024, four multi-level monitoring wells have been installed in and around the Ingersoll area and are actively being monitored to collect groundwater elevation data. In South-West Oxford, the County also performed additional modeling efforts to establish an area of influence for nitrates around the Thornton Wellfield for the Woodstock Water Supply.

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 municipalities and/or local Source Protection Authorities (SPAs) to identify, designate and implement Issues Contributing Areas (ICA) on the landscape. An ICA delineates an area where current/past land uses are likely inferred to contribute to the elevated contaminant concentration in raw water supplies.

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

- *Woodstock:*

    - Tabor Wellfield - Wells 2 and 4 already 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).

    - Thornton Wellfield - Similar land use activities may also be impacting nitrate levels in other Woodstock supply wells (Wells 1, 3, 5, 8 and 11). To mitigate these impacts, the County retained a third party consultant in 2023 to delineate a Nitrate ICA around the Thornton Wellfield Wells (Wells 1, 3, 5, 8, 11 and 12). The University of Waterloo continues to complete groundwater investigations in the area to study the relationship of agricultural practices and its impacts on groundwater. The delineation of the ICA for the remaining wells is complete and changes will be brought forward to Council in a report in 2024.

    - The Strik Drain expansion/upgrade is a municipal drain project (Township of South-West Oxford) intended to improve the functioning of the existing drain in order to manage surface water and shallow soil drainage occurring over an approximate 210 hectare agricultural area. However, County source water protection staff identified that this change may increase loading of nitrates and pathogens transferred from the agricultural lands through the Strik Drain into the recharge zones to the Thornton Wellfield (Wells 1, 3, 5, 8 and 11) down gradient from the drain outlet. In 2023, County staff finalized the conceptual design for a treatment facility that will aid in nitrate reduction and pathogen removal for water received by the Strik Drain prior to discharge in the well recharge zone. The detailed design will be completed and construction will begin in 2024.

- *Tillsonburg:*

    - The County and the local SPA instituted a Nitrate ICA around Tillsonburg Wells 4 and 5 in 2013, along with supportive 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 has remained a continued focus of the Oxford County's Risk Management Official and Inspector in 2023 with ongoing efforts to eliminate and manage potential drinking water threats associated with the above noted land use activities. Specifically, Risk Management Plans (RMPs) have and continue to be negotiated with and implemented by several landowners within the Nitrate ICA to manage such threats. Below is a figure demonstrating implementation efforts and properties that have potential significant drinking water threats managed through either an RMP or Nutrient Management Plan (highlighted in blue) and outstanding properties yet to establish a RMP (highlighted in yellow).

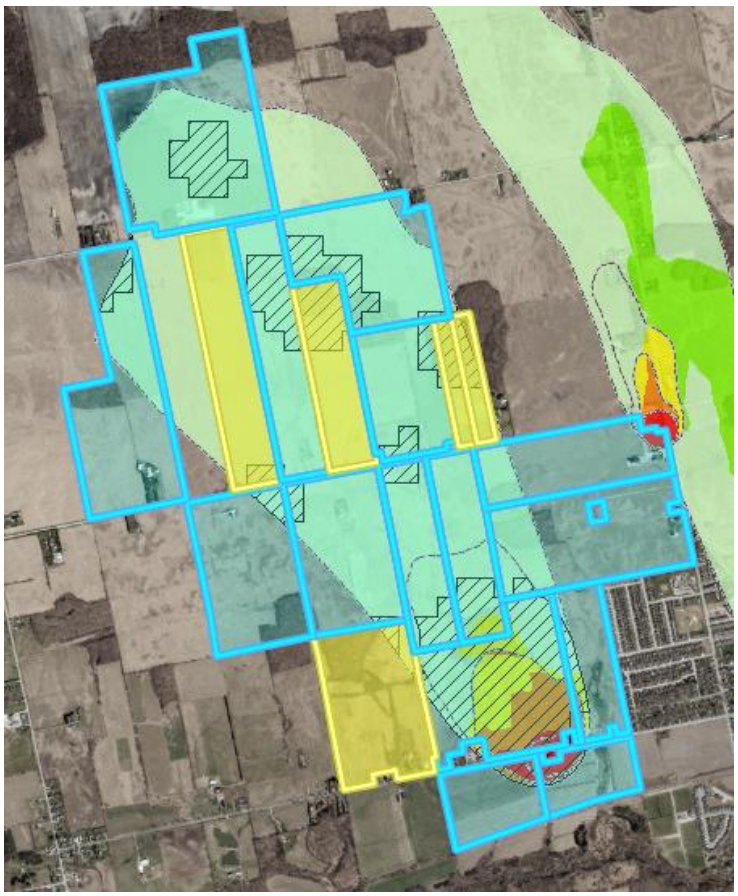

Figure 1: Tillsonburg ICA Implementation Efforts

- *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 RMPs will be developed.

CONCLUSIONS

The 2023 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 residential and business users.

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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