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TO: Chair and Members of Standing Committee on Environment and Climate Change

DESTINATAIRE : Présidente et membres du Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets

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SUBJECT: Annual Drinking Water Source Protection Status Update - 2024

OBJET: Compte rendu annuel concernant la protection des sources d'eau potable --
2024

PURPOSE

The purpose of this memorandum is to provide Members of the Standing Committee on Environment and Climate Change, with an annual status update on the City's Drinking Water Source Protection Program.

Source Protection Municipal Implementation and Risk Management Official Reports are required to be submitted to the Source Protection Authorities (Conservation Authorities) by February 1 of each calendar year, as legislated under the [Clean Water Act \(2006\)](#).

BACKGROUND

Drinking Water Source Protection safeguards public health from drinking water threats by raising awareness and protecting our groundwater and surface water resources. Ontario's *Clean Water Act (2006)* requires municipalities to implement Source Protection Plans to protect existing and future sources of municipal drinking water from various threats.

The City of Ottawa lies within two Source Protection Regions, each with their own locally-developed, science-based source protection plan that contain policies to protect municipal drinking water resources:

- [Mississippi-Rideau Source Protection Plan](#) (effective date January 1, 2015); contains policies related to the Intake Protection Zones (IPZs) for the Britannia and Lemieux Island surface water systems and the Wellhead Protection Areas (WHPAs) for the groundwater wells at Carp, Munster, Richmond King's Park, and Richmond West.
- [Raisin-South Nation Source Protection Plan](#) (effective date April 1, 2015); contains policies related to the WHPAs for the groundwater wells Vars and Greely - Shadow Ridge Subdivision.

Attachment 1 shows a map with the City of Ottawa's Drinking Water Protection Zones.

The City has a proactive approach to raising public awareness and managing threats to drinking water resources as part of the Source Water Protection Program, this includes screening new development applications within Drinking Water Protection Zones to ensure that new activities do not pose a significant drinking water threat to municipal drinking water resources, developing risk management plans for existing or new activities that may be a threat, as well as organizing outreach and education programs and opportunities for impacted residents and businesses.

Notable work accomplished in 2024 to support the City's Source Protection program:

1. Fuel Tank (Home Heating Oil) Replacement Rebate Program: Home heating oil (fuel storage) is considered a significant drinking water threat within the highest vulnerable areas near municipal supply wells. Source Protection Plan policies require Risk Management Plans for fuel storage within these zones to manage the threat; a Risk Management Plan is a document that outlines measures to reduce or eliminate the risk that an activity will contaminate municipal drinking water. Fuel tank Risk Management Plans outline that tanks must meet specific design and operational standards, are inspected regularly, and are replaced every 10 to 25 years depending on the type of tank.

The Fuel Tank Incentive Program was approved by the [Agriculture and Rural Affairs Committee on May 5, 2022](#) and Council on May 11, 2022 and is expected to be complete by spring 2025. The program offers financial incentives to remove existing fuel oil tanks that are located near municipal wells and replace them with an alternate heating source (air source heat pump or natural gas), that are not considered a significant drinking water threat. Additional incentives were included to support a green energy option (air source heat pump), to coincide with the City's climate change initiatives. The goal of the fuel tank incentive program is to eliminate existing fuel threats and protect rural communal drinking water resources.

Program eligibility includes 15 residences that had a home heating oil tank within a Wellhead Protection Area (vulnerability score 10) since 2017 when the City completed a source protection threats verification project. Of the 15 eligible residences, three residents had proactively converted to natural gas heating prior to 2022, and 12 residences had existing fuel oil tanks. Risk Management Plans had been negotiated for six existing fuel tanks and fuel threats were unmanaged at six residences with existing fuel tanks (no Risk Management Plan) due to non-responsive or non-compliant landowners.

Preparation for the Fuel Tank Rebate Replacement Program took place between fall 2022 and spring 2023 and included the development of program workplans, processes, communication materials, an online resident application form, legal agreements, and financial procedures. The City partnered with Rideau Valley Conservation Authority, who helped prepare the landowner communication package and made initial contact with eligible residents since they had previously contacted all homeowners as part of the threats verification project in 2017. The program launched in June 2023, with all eligible residents receiving program information and

invitations to participate; in-person visits were scheduled with all interested residents. Most homeowners were very receptive to the program; 11 out of 15 eligible residents have participated in the rebate program, and an additional two fuel tanks were removed however residents did not participate in the program (did not receive the rebate).

Program Results - Removal or management of 13 out of 15 existing Fuel tank threats near municipal wells:

- Of the six residents who had Risk Management Plans for their fuel tanks:
 - three residents converted to natural gas (two converted as part of the program and one converted prior to the start of the program);
 - one resident converted to green energy (air source heat pump);
 - one resident has opted to retain their home heating oil system and will maintain their fuel oil tank through the negotiated Risk Management Plan; and
 - one resident has been non-responsive; staff will continue communication to encourage program participation in 2025.
- Of the six residents who did not have Risk Management Plans for their fuel tanks: all six fuel oil tanks have been removed and residents converted to natural gas heating. Note that five residents had proactively converted prior to the start of the program and were included in the Fuel Tank Incentive Program to receive the rebate.

In summary, of the 12 existing fuel tank threats: ten threats have been removed, and there are negotiated Risk Management Plans for the two remaining fuel tank threats, thus all home heating oil (fuel) threats have been eliminated or managed and are in compliance with Source Protection Plan policies.

2. Greely – Shadow Ridge Municipal Well Update: The existing municipal supply wells for the Shadow Ridge development in Greely extract water from the overburden sand aquifer. The supply wells have experienced issues related to elevated nitrate levels (approaching, but not exceeding, half of the Maximum Acceptable Concentration for drinking water). The nitrate source is likely anthropogenic due to shallow contamination potentially from private septic systems, agricultural nutrient application (manure or chemical fertilizer) and storage of non-agricultural source material (i.e. compost) within the existing wellhead protection area.

The Raisin-South Nation Source Protection Plan includes a policy which recommends that the City of Ottawa explore the opportunity to deepen the Shadow Ridge Municipal Well to the Nepean Aquifer to reduce the significant threats related to septic systems and septic system holding tanks in the Village of Greely ([Policy SEWG-4c](#)), as such the City has committed to exploring the option.

The City of Ottawa initiated the Nepean Aquifer Study in December 2016 to investigate the potential to deepen the Shadow Ridge Municipal well system to the Nepean Aquifer and gain information about the hydrogeologic properties of the Nepean Aquifer within Greely. Study results indicated that the Nepean Aquifer is a viable and prolific groundwater source and project deliverables were used to support the new municipal well system design. In 2019, the City acquired land to construct the new municipal wells for Shadow Ridge, adjacent to the existing pumping station and municipal water treatment and distribution facility.

The City drilled two 250 millimetre diameter, 150 meter deep production wells in January and April 2023. Aquifer testing (pump tests) was completed in May 2023, which confirmed sufficient well yield and verified that a third well was not needed. Data from the aquifer testing is being analyzed to support decision-making related to the future water supply for the Shadow Ridge subdivision, including detailed design and an assessment of pump station modifications and upgrades needed to treat the deeper aquifer groundwater supply, should the City move forward.

Results from the pump tests were also used to support the source protection technical work, which included the delineation of a new Wellhead Protection Area for the deeper wells using 3D numerical groundwater modelling. Source protection technical studies commenced in August 2023; background information, a conceptual model and numerical model development methodology were discussed with the project's technical advisory team during Q4 2023. Preliminary groundwater model results were presented in January 2024, draft Wellhead Protection Area mapping with vulnerability scores were presented in April 2024, and an assessment of potential existing significant drinking water threats and associated mapping were presented in November 2024. Results from each assessment were technically reviewed by City staff and a third-party consultant. A draft final Wellhead Protection Area report was provided in December 2024 and will be reviewed in Q1 2025. It is anticipated that the source protection technical studies will be completed in the first half of 2025.

If the City decides to move forward with using the new deeper wells as municipal production wells, then a Section 34 Amendment under the *Clean Water Act* would be required prior to the provision of water to the public. The amendment would incorporate the above-mentioned technical studies into the South Nation Source Protection Assessment Report and the new Wellhead Protection Area would be added to the Raisin-South Nation Source Protection Plan to ensure that policies are in place to protect the new drinking water source.

3. Carp Sanitary Sewage Overflow Risk Assessment Project and Policy Interpretation: The Carp sanitary pumping station does not have an emergency overflow, which does not meet current City standards. In 2016, the City initiated a project to design a sanitary pumping station overflow to bring the Carp sanitary pumping station up to standard and allow further expansion in the village. The project was put on hold following issues identified related to Source Protection policies. The proposed overflow location is within the Carp wellhead protection area (WHPA-B, vulnerability score 10), where it is considered a significant drinking water threat and prohibited in the Mississippi-Rideau Source Protection Plan, unless it is supported that installation of the overflow is less of a health risk than not having the overflow.

A risk assessment study was initiated in 2022 and completed in 2024 to determine the relative risk to human health from sanitary sewage backup, with and without the proposed emergency overflow. The study included an exploratory drilling program to determine the potential connection between the Carp River and the underlying municipal supply aquifer. The risk assessment found that building the emergency overflow at the proposed location near the Carp River will lower the risk of ground surface and basement flooding along Rivington Street and will lower the risk of such flooding causing contamination to the Carp municipal wells. Overall, construction of the emergency overflow will result in lower risk to human health than not constructing the emergency overflow. This conclusion supports the Environmental Compliance Approval application for approval of the emergency sewage pumping station overflow to the Ministry of the Environment, Conservation and Parks.

The Source Protection Region provided a policy interpretation and corresponding support for the project conclusions, which will be included with the application.

4. Other source protection projects: Additional projects were advanced in 2024, and will continue in 2025 to meet legally binding source protection policies:

- Preparation of source protection reports and screening procedure documents to support the City's new Consolidated Linear Infrastructure – Environmental Compliance Approval (CLI-ECA) for sewage and stormwater, and
- Updates to the City's zoning by-laws to conform to Source Protection Plan Policies.

In addition to the legally-binding policies, there are several non-legally binding source protection policies that the City plans implement to protect municipal drinking water sources, such as updating emergency response plans, installing signage on municipal roads and waterways, and oversight of geothermal systems near municipal supply wells. The City is developing workplans to implement non-legally binding policies, where feasible, and will provide an update in the 2025 Annual Report.

More information about Drinking Water Source Protection and the City's Source Protection Program can be found at: www.Ottawa.ca/SourceProtection

2024 ANNUAL REPORTS

In accordance with the regulations of the *Clean Water Act (2006)*, the City is required to provide an annual report to local Source Protection Authorities describing Source Protection Plan implementation. More specifically the reports must include updates of the following:

- 1) Activities performed by the City's Risk Management Official, which include screening development applications for potential significant threat activities or working with landowners to develop risk management plans for existing significant threat activities, for example fuel or chemical storage.
- 2) Implementation of Source Protection Plan policies that include actions directed at municipalities; this includes activities the City must undertake at its physical plants and sanitary sewer infrastructure, operational practices as well as outreach and education efforts.

As required, attached are the Risk Management Official's Reports and Municipal Implementation Reports for the 2024 reporting period, to be submitted to the Source Protection Authorities by the reporting deadline of February 1, 2025.

Overview of Reports:

The implementation of activities by the Risk Management Official as well as municipal activities is ongoing and the City is compliant with Source Protection Plan policies, as outlined in the attached 2024 source protection annual reports.

The Ministry of Environment, Conservation and Parks transitioned to an optional electronic reporting format in 2023 for source protection annual reports, as such, source protection program updates for the City have been entered into Ministry of Environment, Conservation and Park's electronic forms and print-outs of the reports are attached for the Mississippi-Rideau Source Protection Region. The Raisin-South Nation Source Protection Region provided a different electronic template for annual reporting, which is attached.

Should you require further information, please contact Susan Johns, Director, Asset Management at 613-580-2424, extension 16003.

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Original signed by

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CC: Senior Leadership Team

SUPPORTING DOCUMENTATION

Document 1 Map of Drinking Water Protection Zones in the City of Ottawa

Document 2 Mississippi-Rideau Source Protection 2024 Electronic Annual Report 1 –
Municipal Report

Document 3 Mississippi-Rideau Source Protection 2024 Electronic Annual Report 2 –
Policy Implementation

Document 4 RMO and Source Protection Municipal Implementation Annual Report for
2024 South Nation Source Protection Area