MEMO / NOTE DE SERVICE

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DESTINATAIRE : Maire et Membres du conseil

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SUBJECT: MUNICIPAL DRINKING WATER SYSTEMS – 2024 SUMMARY REPORT

OBJET : RÉSEAUX MUNICIPAUX D'ALIMENTATION EN EAU POTABLE – RAPPORT SOMMAIRE DE 2024

EXECUTIVE SUMMARY

The purpose of this memorandum is to provide Members of Council with the City of Ottawa's 2024 Drinking Water Summary Report in fulfillment of Schedule 22 of O.Reg.170/03, which requires a Summary Report be prepared annually and circulated to all Members of the Municipal Council by March 31 of the following calendar year. The report also satisfies the requirement that Owners of municipal drinking water systems "be informed," as part of their responsibilities under the Standard of Care (Section 19) of the *Safe Drinking Water Act (2002)*.

The report is based on the operational period from January 1, 2024 to December 31, 2024, and reviews the eight municipal water systems owned and/or operated by the City of Ottawa:

- Britannia Water Purification Plant
- Lemieux Island Water Purification Plant
- Carp Drinking Water System
- Kings Park (Richmond) Drinking Water System
- Richmond West (Richmond) Drinking Water System
- Munster Hamlet Drinking Water System
- Shadow Ridge (Greely) Drinking Water System
- Vars Drinking Water System

This report details key aspects of Ottawa's municipal drinking water systems including operational performance, water quality, flowrates, capital projects, inspections, regulatory requirements, and any items of non-compliance noted during the year. A thorough review of Licences, Permits, Regulations, and Ministry Inspection Reports indicates that Ottawa residents were provided with safe drinking water during 2024.

In preparation of this report, technical staff intensively reviewed 35 sets of regulatory requirements for each of Ottawa's eight municipal water systems. Some notable highlights and challenges experienced during 2024 are summarized below.

- **Water Quality Monitoring** – during 2024, more than 100,000 laboratory and operational tests were conducted to ensure the safety of Ottawa's drinking water supply. The monitoring program includes more than 75 continuous analyzers and eight laboratories analyzing more than 300 test parameters. The results confirm that Ottawa residents continue to be supplied with high quality drinking water.
- **Annual Inspection Ratings** – All eight Ottawa municipal water systems were inspected for 2024, but no final reports or ratings for these systems have been received at the time of this report.
- **Radioactivity in the Ottawa River** – during 2024, radioactivity levels at both surface water treatment plants remained very low and representative of natural background levels, meeting all radiological drinking water standards.
- **Regulatory compliance** – Ottawa's municipal water systems complied with all drinking water regulatory requirements with the exception of one area of non-

compliance. This non-compliance item did not affect the quality of drinking water supplied to the public.

- **Water production rates** – each day, an average of 295 million litres of drinking water was treated and distributed to Ottawa residents and businesses, which represents a small fraction of the Ottawa River flow (0.3 per cent).
- **Emerging issues in drinking water** – a number of substances continue to be highlighted in the media such as: microplastics, Perfluoroalkyl substances (PFAS), pharmaceuticals, and radioactivity. In all cases, test results from Ottawa's monitoring program demonstrated the safety of Ottawa's drinking water supply. Ottawa continues to be an industry leader in monitoring, evaluating, and responding to emerging issues in water quality.

The City remains committed to continually improving our water supply through research, process optimization, quality management, public reporting, and diligence in complying with provincial regulations and Health Canada guidelines for safe drinking water.

RÉSUMÉ

La présente note de service a pour but de fournir aux membres du Conseil le rapport sommaire de 2024 sur l'eau potable de la Ville d'Ottawa, conformément à l'annexe 22 du Règlement de l'Ontario 170/03, qui exige qu'un rapport sommaire soit préparé chaque année et distribué à tous les membres du Conseil municipal au plus tard le 31 mars de l'année civile suivante. Ce rapport répond aussi à l'exigence selon laquelle les propriétaires de réseaux municipaux d'eau potable doivent être tenus informés, dans le cadre de leurs responsabilités en lien avec l'article 19 (degré de diligence) de la Loi de 2002 sur la salubrité de l'eau potable.

Le rapport couvre la période qui s'étend du 1er janvier au 31 décembre 2024, et porte sur les huit réseaux municipaux d'eau potable qui appartiennent à la Ville d'Ottawa ou qui sont exploités par elle :

- Usine de purification de l'eau Britannia
- Usine de purification de l'eau de l'île Lemieux
- Réseau d'eau potable de Carp
- Réseau d'eau potable de Kings Park (Richmond)
- Réseau d'eau potable de Richmond-Ouest (Richmond)
- Réseau d'eau potable de Munster Hamlet
- Réseau d'eau potable de Shadow Ridge (Greely)
- Réseau d'eau potable de Vars

Le rapport détaille des aspects clés des réseaux municipaux d'eau potable d'Ottawa, notamment le rendement opérationnel, la qualité de l'eau, le débit, les projets d'immobilisations, les inspections, les exigences réglementaires, ainsi que les points de non-conformité relevés au cours de l'année. Un examen rigoureux des licences, permis, règlements et rapports d'inspection du ministère a montré que l'eau potable consommée par les résidents d'Ottawa en 2024 était salubre.

Lors de la préparation de ce rapport, le personnel technique a examiné 35 séries d'exigences réglementaires visant les huit réseaux municipaux d'eau potable d'Ottawa. Voici certains des principaux points forts et points à améliorer relevés en 2024.

- **Surveillance de la qualité de l'eau** – En 2024, plus de 100 000 analyses en laboratoire et vérifications du fonctionnement ont été effectuées pour assurer la salubrité de l'eau potable distribuée à Ottawa**.** Le programme comprend plus de 75 analyseurs continus et huit laboratoires qui analysent plus de 300 paramètres. Les résultats confirment que les résidents d'Ottawa continuent d'avoir accès à une eau potable de qualité.
- **Notes d'inspections annuelles** – Les huit réseaux municipaux d'eau potable d'Ottawa ont été inspectés en 2024, mais les résultats de ces réseaux n'ont pas encore été communiqués.
- **Radioactivité dans la rivière des Outaouais** — Au cours de l'année 2024, les indices de radioactivité dans les deux usines de traitement de l'eau sont restés très faibles et représentatifs des concentrations naturelles, respectant toutes les normes de salubrité de l'eau potable en ce qui a trait aux paramètres radiologiques.
- **Conformité aux règlements** – Les réseaux municipaux d'eau potable d'Ottawa répondent à toutes les exigences réglementaires en matière d'eau potable à l'exception d'un seul point de non-conformité**.** Ce point de non-conformité n'a pas touché la qualité de l'eau potable distribuée au public.
- **Taux de production d'eau** – Chaque jour, ce sont en moyenne 295 millions de litres d'eau potable qui ont été traités et acheminés aux résidents et aux entreprises d'Ottawa, ce qui représente une petite fraction du débit (0,3 %) de la rivière des Outaouais.
- **Nouvelles préoccupations en matière d'eau potable** — Les médias continuent de signaler la présence de plusieurs substances préoccupantes comme : les microplastiques, les substances perfluoroalkylées, les produits pharmaceutiques et les produits radioactifs. Dans tous les cas, les résultats des analyses effectuées dans le cadre du programme de surveillance ont confirmé la salubrité de l'eau potable d'Ottawa. Dans le secteur, Ottawa demeure un chef de file en matière de surveillance, d'évaluation et de résolution des problèmes émergents qui concernent la qualité de l'eau.

La Ville demeure résolue à améliorer de façon continue l'approvisionnement en eau, par la recherche, l'optimisation des processus, la gestion de la qualité, les rapports publics et le respect diligent de la réglementation provinciale et des directives de Santé Canada concernant l'eau potable.

DISCUSSION

Description of Ottawa's Water Supply

The City of Ottawa provides treatment, storage, and distribution of drinking water to approximately 994,000 residents, businesses, and institutions. The central water system

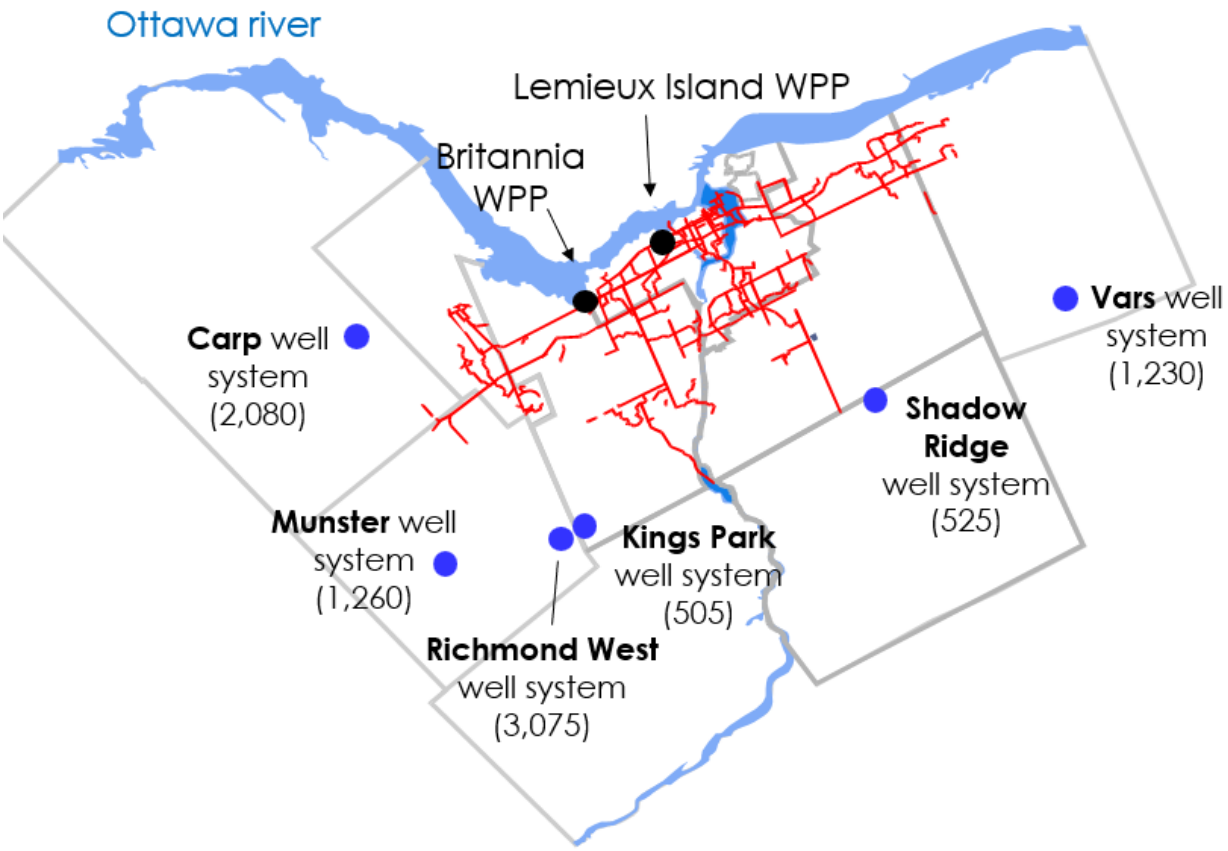
supplies roughly 90 per cent of Ottawa's population and includes two surface water treatment plants, the Britannia Water Purification Plant (c.1961) and the Lemieux Island Water Purification Plant (c.1932). Both plants draw source water from the Ottawa River and utilize a multiple-barrier treatment process to remove microorganisms, particles, organic matter, and other impurities to produce safe drinking water for Ottawa residents and businesses.

Treated drinking water from both plants is pumped into a vast water distribution network that includes 16 pumping stations, five reservoirs, four elevated tanks, and over 3000 kilometers of watermains. The total volume of water stored in reservoirs is 275 million litres, which is roughly equivalent to the daily amount of water consumed in Ottawa. All treatment, pumping, and storage systems are controlled by a dedicated computer control system and monitored by certified Water Treatment Operators 24 hours per day. The central system also provides a direct water supply to Russell Township.

In addition to the central water supply, the City operates six municipal well systems that provide drinking water to rural communities located in Carp, Richmond (Kings Park), Richmond West (West Development Lands), Munster, Greely (Shadow Ridge subdivision), and Vars. Collectively, these systems provide municipal water to approximately one per cent of Ottawa's population, while approximately nine per cent use private wells.

Figure 1 provides a map that shows the layout of Ottawa's water supply and municipal well systems, with the service population for each well system:

Figure 1: Map of Ottawa's Water Supply and Municipal Well Systems



Regulation of Municipal Drinking Water

In Canada, municipal drinking water is regulated by provincial legislation, and governed by the Ministry of Environment, Conservation and Parks (MECP, or "Ministry"). In Ontario, the *Safe Drinking Water Act (2002)* was created in response to the waterborne outbreak in Walkerton to ensure the provision of safe drinking water throughout the province. Under the authority of the *Safe Drinking Water Act (2002)*, several key regulations for drinking water have been established:

- O.Reg.170/03 – Drinking Water Systems Regulation
- O.Reg.169/03 – Ontario Drinking Water Quality Standards
- O.Reg.248/03 – Drinking Water Testing Services
- O.Reg.128/04 – Certification of Drinking Water Systems Operators
- O.Reg.188/07 – Licensing of Municipal Drinking Water Systems
- O.Reg.170/03 (Sch.15.1) – Community Lead Testing Program
- O.Reg.287/07 – Source Water Protection Regulation
- O.Reg.588/17 – Asset Management Planning for Municipal Infrastructure

These regulations cover all aspects of municipal water supply, including treatment requirements, quality standards, test frequency, operations and maintenance, operator qualifications, laboratory testing, inspections, reports, and public notification.

Regulatory directions for each municipal drinking water system are provided through O.Reg.170/03 and a combination of Licences, Permits, Provincial Officer Orders, and Annual Inspections conducted by the Ministry. This report reviews the 2024 operational performance of Ottawa's municipal water systems in comparison to these regulatory requirements.

Licenses and Permits

In Ontario, all owners of municipal drinking water systems are required to obtain a Municipal Drinking Water Licence (MDWL) for each drinking water system. Each licence is comprised of five elements: Permit to Take Water (PTTW), Drinking Water Works Permit (DWWP), Operational Plan, Accreditation as an Operating Authority, and a Financial Plan.

Municipal Drinking Water Licences for each municipal system are issued for a five-year period and renewed by the Ministry through a comprehensive application and review process every five years. The municipal drinking water licences and drinking water works permits were renewed on June 11, 2024 for all eight of the City operated drinking water systems. These documents contain revised conditions and obligations related to turbidity reporting, discharges to the environment, source water monitoring, procedures and operations manuals. Staff will be addressing these new conditions prior to the deadlines set forth by the MECP. Permits to take water were updated for all systems except Richmond West which is valid until 2026.

Table 1 – Ottawa's Municipal Drinking Water Licences and Permits

Water System	Municipal Drinking Water Licence No.	Drinking Water Works Permit No.	Permit to Take Water
Britannia Water Purification Plant	008-102	008-202	2131-BVRL8S
Lemieux Island Water Purification Plant	008-102	008-202	7340-BBHRLT
Carp Well System	008-101	008-201	2667-DA3H7B
Kings Park Well System	008-103	008-203	4325-D93GU8
Richmond West Well System	008-107	008-207	3821-AF9PUV
Munster Well System	008-104	008-204	4044-AASLU7
Vars Well System	008-108	008-208	5156-9HDRJ7
Shadow Ridge Well System	008-106	008-206	2088-C7YTM2

Provincial Officer Orders and Regulatory Relief

No Provincial Officer Orders were issued in 2024.

Results of Ministry Annual Inspections

Through the office of Ontario's Chief Drinking Water Inspector, each of Ottawa's municipal water systems undergoes an annual inspection by the Ministry. The inspection process is comprehensive and includes approximately two days of on-site review with technical staff in each water system. Each of the eight inspections require a significant amount of staff time (about one week) for the collection and submission of water quality data, documentation, and operating records.

These inspections focus on regulatory compliance, plant operations, data records, process trends, operator certification, record keeping, and management practices over the past year. Following each inspection, the Ministry issues a full inspection report of findings, including a final Inspection Rating, which is a risk-weighted score derived from approximately 100 regulatory questions covering 15 operational categories.

Table 2 below summarizes the most recent annual inspection dates. At the time of this report, all systems have been inspected on site, but no inspection reports or ratings have been received.

Table 2 – Summary of Most Recent Ministry Annual Inspection Results for Ottawa's Drinking Water Systems

Water System	Inspection Date	Prov. Officer Orders	Non-Compliance Items	Best Practice Items	Inspection Rating
Britannia	Feb. 5, 2025	-	-	-	100%*
Lemieux	Feb. 11, 2025	-	-	-	100%*
Carp	Feb. 14, 2025	-	-	-	96.3%*
Kings Park	Jan. 17, 2025	-	-	-	98.1%*
Munster	Jan. 21, 2025	-	-	-	100%*
Richmond West	Feb. 12, 2025	-	-	-	100%*
Shadow Ridge	Feb. 12, 2025	-	-	-	100%*
Vars	Feb. 12, 2025	-	-	-	100%*

*2023 inspection rating cited since 2024 inspection rating not yet received

Compliance with Drinking Water Regulations

The primary purpose of this report is to review Ottawa's compliance with provincial drinking water regulations during the period January 1 to December 31, 2024. To achieve this, a staff team of engineers, technologists, and managers spend approximately two to three weeks each year during the first quarter of the year to conduct a comprehensive review of operational performance of each water system in relation to 35 categories of regulatory requirements.

Each year, staff prepare a detailed compliance tracking table for each municipal water system, listing all 35 categories of regulatory requirements in comparison to results achieved during the previous year. A summary table of compliance for all eight water systems is presented in Document 1. This table illustrates both the comprehensive nature of provincial drinking water regulations and the diligence of staff in measuring and tracking compliance.

During 2024, Ottawa's municipal water systems met all regulatory requirements under Ontario's *Safe Drinking Water Act (2002)* with the exception of two items noted below.

Items of Non-Compliance

At the time of this report, no MECP inspection reports have been received so the below are only those that were found by staff through completion of the compliance tables. During 2024, there was one non-compliance issue that was identified in one of Ottawa's municipal drinking water systems. This regulatory non-compliance did not affect the quality of drinking water supplied to the public. The issue found is described below for both systems, including corrective actions taken and the impact on water quality.

1. A Schedule C document was issued by the Director in 2024 for a Richmond West Well reservoir expansion project. A DWWP amendment application form was completed and submitted to the MECP following construction commencement. The MECP requires that Schedule C applications are submitted prior to/before going ahead with the work.

In the above case, staff took corrective actions to promptly address each of the non-compliance issues. Most importantly, the non-compliance incident noted was technical and/or administrative in nature and did not affect the quality of drinking water supplied to the public.

Water Quality

The Ontario Drinking Water System Regulation O.Reg.170/03 defines requirements for water quality sampling and testing based on categories of test parameters: microbiological, operational, inorganic, and organic. Water quality is carefully monitored from source-to-tap using on-line analyzers, field instruments, process lab instruments, Ottawa's Robert O. Pickard Environmental Centre (ROPEC) Laboratory, along with eight external laboratories that provide specialized water quality analysis. Certified operators and water quality technologists also perform routine water tests at over fifty sample locations throughout the central system and ten to fifteen locations in the well systems. (e.g. pump stations, reservoirs, fire halls) and respond directly to customer inquiries and concerns about water quality.

The City conducts additional testing for many other trace organic, inorganic, pharmaceutical, and radiological substances. In total, more than 100,000 water quality tests are conducted each year covering over 300 specific test parameters. Ottawa's water quality monitoring program is one of the most comprehensive in Canada and

goes well beyond the minimum regulatory requirements. All water quality test results are reported annually and posted on www.ottawa.ca for public awareness and transparency.

During 2024, all test results were well within safe drinking water standards, with any exceptions noted in the Adverse Water Quality Incident section of this report. All chemical test results (organic, inorganic, metals, radiological) were well within the Maximum Acceptable Concentration (MAC) levels as per Ontario Drinking Water Standards.

As a general overview of water quality, table 3 below shows 2024 test results for common parameters in each of Ottawa's municipal water systems. The values in the table represent average concentrations measured in the treated drinking water. Differences between systems reflect the unique source waters used for treatment in each case (e.g. groundwater well vs. river source):

Table 3 – Comparison table of water quality in Ottawa's municipal water systems (average values)

	Units	Britannia	Lemieux	Carp	Kings Park	Munster	Richmond West	Shadow Ridge	Vars
Physical									
Turbidity	NTU	0.04	0.05	0.38	0.48	0.40	0.25	0.04	0.15
Temperature	°C	13.0(1.5–28.2)	11.6 (0.2–25.7)	11.5	10.3	10.3	10.3	10.5	10.5
Conductivity	µmhos/cm	148	148	689	1163	894	714	927	538
Microbiological (number of exceedances)									
Total coliforms	cfu/100mL	0	0	0	0	0	0	0	0
E.coli	cfu/100mL	0	0	0	0	0	0	0	0
HPC bacteria	cfu/mL	0	0	0	0	0	0	0	0
Chemical									
pH	log_{10}	9.41	9.43	7.90	7.44	7.60	7.67	7.64	7.73
Alkalinity	mg/L	33.0	32.8	221	263	276	247	216	232
Total Hardness	mg/L	27.9	28.0	225	348	284	309	328	217
Calcium	mg/L	7.8	7.8	57.0	81.8	59.7	77.7	92.1	66.5
Magnesium	mg/L	2.1	2.1	19.3	42.3	31.8	26.5	23.1	12.3
Potassium	mg/L	0.7	0.7	5.0	6.3	5.4	3.0	3.2	4.3
Chloride	mg/L	6.4	6.4	69.0	182.0	83.2	58.4	111.0	19.1
Fluoride	mg/L	0.68	0.70	0.53	0.39	0.64	0.25	0.05	0.17
Phosphate	mg/L	0	0	NA	NA	NA	NA	NA	NA
Sodium	mg/L	18.0	18.0	57.2	94.8	79.6	32.9	65.6	30.4
Sulphate	mg/L	25.9	25.6	36.0	57.2	71.3	47.0	81.9	28.1
Nitrate	mg/L	0.18	0.18	0	0.01	0.03	0	3.5	0
Nitrite	mg/L	0	0	0	0	0	0	0	0
Iron	mg/L	0.002	0.003	0.04	0.56	0.23	0.20	0	0.03
Manganese	mg/L	0.003	0.003	0.03	0.02	0.01	0.01	0	0.01
Trihalomethane	mg/L	33.1	48.3	14.3	6.4	25.9	12.0	4.7	32.5
Haloacetic acids	mg/L	27.5	38.4	2.5	3.2	6.5	2.5	2.5	29.2
Radiological									
Alpha activity	Bq/L	<0.04	<0.04	<0.10	0.25	<0.10	<0.10	<0.10	<0.10
Beta activity	Bq/L	<0.1	<0.1	0.19	0.26	0.20	<0.10	0.23	0.18
Tritium	Bq/L	2.0	2.0	<1.56	<1.56	<0.74	<0.77	<1.56	<1.56

Note: < indicates below laboratory detection limit; NA indicates no sample required

Overall, the 2024 test results demonstrate that drinking water supplied from Ottawa's municipal water systems was of high quality and met the Ontario Drinking Water Standards (O.Reg.169/03) and the Health Canada Guidelines for Canadian Drinking Water Quality.

For further details on water quality, please refer to the 2024 Annual Reports which are posted on the www.ottawa.ca website for each municipal water system. The website also provides a detailed Water Quality Summary Table for each water system, which lists results for all test parameters analysed during the year.

Adverse Water Quality Incidents

O.Reg.170/03 identifies several "Indicators of Adverse Water Quality" for which the waterworks must immediately notify health officials and the Ministry. An Adverse Water Quality Incident (AWQI) refers to any operational measurement or laboratory test result that does not meet a provincial water quality standard. During 2024, there were a total of 19 AWQI results reported in Ottawa's municipal water systems, which is similar to previous years and not unexpected given the size of the system and the number of tests conducted (approx. 100,000 tests per year). All these occurred in the central water distribution system.

For each AWQI, City of Ottawa staff must immediately notify the Ottawa Public Health Department and the Ministry as required by regulations. Corrective actions, re-sampling, reporting, and documentation are required in each case.

The AWQI events for 2024 are summarized in Table 4 including corrective actions taken and resolution of the incident.

Table 4 – Summary of 2024 Adverse Water Quality Incidents (AWQI)

Test parameter and number of occurrences	Summary of Reported Events
Total coliform bacteria (4 events)	• (1) routine sample following watermain breaks in the distribution system, resamples samples were clear; • (1) routine sample at the distribution location in the Shadow Ridge well systems, resamples were clear; • (1) routine sample from a temporary service, resamples were clear; • (1) routine sample from a valve replacement in the distribution system, resamples samples were clear

Low chloramine <0.25 mg/L (11 events)	• (5) events due to a closed valve in distribution system; valve opened, and the system flushed; • (3) events due to low water flow in watermain; system was flushed; • (3) events due to a dead end, system flushed
Sodium > 20 mg/L (2 events)	• (2) sodium exceedance event. Sodium is required to be reported every five years. Events resulted from routine reporting for Lemieux treatment plant and the Richmond West well system.
Improperly disinfected water directed to system (1 event)	• (1) event occurred when it was noted that air, not completely purged from a pressurized and isolated section of watermain, leaked through a closed valve into the adjacent, live water distribution system, the system was flushed and samples were taken.

For the AWQI events observed during 2024, there were no indications of unsafe drinking water being directed to residents.

For further details on AWQI events, please refer to the 2024 Annual Report for each municipal water system, which are posted on www.ottawa.ca.

Drinking Water Advisories

Advisories are issued by Ottawa's Medical Officer of Health in consultation with relevant drinking water staff, in cases where there is potential for contamination of the drinking water supply. In most cases, advisories are issued on a precautionary basis rather than in response to evidence of contamination. Drinking Water Advisories are typically in effect for several days and help to safeguard public health until water quality tests can be taken to verify safe drinking water.

During 2024, there were no Drinking Water Advisories issued.

Perfluorinated alkyl substances (PFAS) in drinking water

The presence of perfluorinated alkyl substances have become an increasing concern for the environment and human health. These substances are stable and persistent organic compounds that are widely used in industry and consumer products including: non-stick cookware, stain-resistant fabric treatments, and firefighting foams. Health Canada updated the guideline with the objective for PFAS in drinking water represented as a precautionary group-based approach. The objective value of 30 ng/L (for the sum total of 25 specific PFAS) was established to reduce exposure to PFAS in drinking

water. Treated water samples were collected quarterly from all eight municipal water systems and sent to Eurofins laboratory for analysis of 40 PFAS. There was one sample detected at the Richmond West well system in June 2024 (Hexafluoropropylene oxide dimer acid or HFPO-DA) at a level of 6 ng/L. Subsequent testing has not shown the presence of PFAS in this well system.

Further monitoring was completed for the Carp well system monthly, since this system has PFAS detected in both the raw water wells. Monitoring was done to assess performance of the granular activated carbon (GAC) filter system which removed PFAs substances. No PFAS substances were found, with the exception of PFPeA (Perfluoro-n-pentanoic acid). Trace amounts of PFPeA were detected, with an average of 3.1 ng/L; well below the objective value of 30 ng/L.

Sodium in Drinking Water

Ground water systems tend to have elevated levels of sodium due to naturally occurring geological formations. In cases where the sodium level exceeds 20 mg/L, the City of Ottawa is required to notify the MECP and the Medical Officer of Health on a five-year basis. While these concentrations are not a concern for most residents, it may be a contributing source of sodium for those on sodium-restricted diets.

City Staff are working with Ottawa Public Health representatives and the Medical Officer of Health to better communicate the potential health implications associated with elevated sodium in drinking water for homeowners served by the communal well systems.

Lead in Drinking Water

The City of Ottawa's treated drinking water is lead-free. The watermains throughout the distribution system are also lead-free. Trace amounts of lead, however, can be dissolved in water as it travels through a lead service line or when it comes in contact with household plumbing components such as lead solder and brass fittings. The water service line refers to the small pipe that conveys water from the watermain to the house. It is estimated that there are approximately 30,000 homes in Ottawa, built prior to 1955, that are currently supplied with a lead service pipe. Each year, City staff conduct testing every winter and summer in a subset of older homes to verify lead concentrations in household tap water. For regulatory purposes, two 1-litre samples are taken from the customer's tap following a 30-minute stagnation period.

For decades, the City's water treatment process has included corrosion control using pH adjustment to minimize the dissolution of metals from household plumbing and fixtures. As a result, Ottawa lead concentrations have consistently met the Ontario regulatory standard of ten parts per billion measured at the customer's tap. However, in March 2019, Health Canada lowered the acceptable concentration to five parts per billion for lead in drinking water due to increasing concerns about health effects in children. It is expected that Ontario will lower the provincial lead standard from ten parts

per billion to five parts per billion accordingly, although an implementation date has not yet been announced.

The City of Ottawa received relief for both sessions of lead testing in 2021 & 2022 for the Central system and Richmond West well system and resumed testing in 2023. Combining results for all twenty-nine rounds of testing between 2007 – 2024 the average lead concentrations measured in Ottawa homes with lead supply pipes 2.7 parts per billion in litre-1 and 2.5 parts per billion in litre-2. The 90th percentile concentrations are 4.2 parts per billion and 5.2 parts per billion in litre-1 and litre-2 respectively. The 90th percentile lead concentrations comply with the current Ontario Drinking Water Standard of ten parts per billion for lead in drinking water but would be slightly above the revised Health Canada guideline of five parts per billion. Accordingly, a strategy has been developed to address the more stringent health target of five parts per billion. The City is prepared to implement a new corrosion control strategy with the addition of low-level phosphate if drinking water regulations shift in Ontario. The City is currently in the design phase for this project and would be prepared to implement this new treatment strategy when required.

New and Emerging Issues in Drinking Water

The City of Ottawa has always been a leader in evaluating new and emerging issues for drinking water. Technical staff from Infrastructure and Water Services work closely with industry experts and university researchers to evaluate new substances of concern and to anticipate future regulations and standards for drinking water. Results from exploratory testing are made available to the public through annual reporting and through specific data requests.

During 2024, some of the current issues and concerns that have garnered attention within the drinking water industry include the following:

- Cyanobacterial toxins
- Perfluoroalkyl substances (PFAS)
- Pharmaceuticals and Personal Care Products
- Microplastics
- Radioactivity
- Manganese
- MPA (Microscopic Particulate Analysis)

Water Quality staff have conducted testing for these emerging substances in Ottawa's municipal water systems, including both source and treated water samples. In most cases, the substances have not been detected or have been found at natural background levels (radioactivity). Water Quality staff continue to watch developments for these emerging areas of concern and evaluate any new and proposed drinking standards and guidelines. Staff also provide comments on new drinking water guidelines through industry associations and committees such as the Water Quality Committee of the Canadian Water and Wastewater Association (CWWA) and the Treatment Committee of the Ontario Water Works Association.

If further information is desired on any of these substances of concern, please contact the Drinking Water Quality Unit for more details or up to date test results.

Partnership with Ottawa Public Health

Ottawa Public Health (OPH) is a key partner in the provision of safe drinking water for Ottawa residents and businesses. Over the years, a strong relationship has developed between drinking water staff and OPH to review and respond to potential risks related to drinking water, such as drinking water advisories. Drinking water staff and OPH maintain a 24/7 response system to address potential water quality issues. In the event of a water emergency or Adverse Water Quality Incident, procedures are in place to ensure close cooperation between the Medical Officer of Health, the City of Ottawa, and the Ministry to provide effective communication and protection of public health.

To maintain continuity and responsiveness, drinking water staff and OPH staff meet to review water quality test results, adverse incidents, communication protocols, and potential risks of new and emerging issues in drinking water. This meeting, for 2024 and together with drinking water and OPH staff, was held on December 12, 2024.

Flow Rates and System Capacity

The licence and permit documents for each municipal water system set out maximum rates of water taking and treatment capacity. During 2024, all drinking water systems operated within the permitted volume and capacity limits. Table 5 below shows the daily flowrates observed during 2024 including the average and maximum values, in relation to the system rated capacity.

Table 5 – Summary of 2024 water production rates vs. rated capacity

Water System	Average daily flow	Maximum daily flow	Rated capacity
Britannia Water Purification Plant	158.3 ML/d	246.4 ML/d	360 ML/d
Lemieux Water Purification Plant	135.9 ML/d	195.7 ML/d	400 ML/d
Carp Well System	700.3 m^3/d	1142.7 m^3/d	2782 m^3/d
Kings Park Well System	109.0 m^3/d	343.9 m^3/d	2620 m^3/d
Munster Well System	225.0 m^3/d	1020.8 m^3/d	2160 m^3/d
Richmond West Well System	598.7 m^3/d	1023.4 m^3/d	2420 m^3/d
Shadow Ridge Well System	125.2 m^3/d	221.3 m^3/d	550 m^3/d
Vars Well System	308.1 m^3/d	523.5 m^3/d	2290 m^3/d

ML/d = Megalitres per day = million litres per day
m^3/d = cubic meters per day

During 2024, the combined average flowrate from the Britannia and Lemieux Island purification plants was 295 megalitres per day which represents the water demand for Ottawa's urban water supply. While this is a large volume of water, it represents only 0.3 per cent of the Ottawa River flowrate.

For a detailed table of 2024 water flowrates for each municipal water system, please refer to Document 2.

Financial Expenditures

For the City of Ottawa to maintain the safe and efficient operation of the waterworks, capital expenditures are required above baseline operating and maintenance costs. Table 6 lists some of the major expenditures, for upgrades and new capital investment in Ottawa's municipal water treatment systems, recently completed or ongoing in 2024:

Table 6 – Expenditures for Maintenance and Capital Improvements

Water System	Project	Duration
Britannia & Lemieux	• Chemical System Upgrades: ($610,000) • G2 Generator Replacements ($10,400,000) • SCADA HMI Upgrade Project ($3,500,000) • Britannia & Lemieux Surge Protection Devices Upgrade ($1,000,000)	• 2016-2025 • 2019-2025 • 2023-2024 • 2021-2025
Britannia	• High lift/Low Lift pump replacement ($2,500,000) • High-lift flowmeter replacement ($1,200,000) • Roof Repair/Renewal Project ($1,800,000) • Asphalt Surface Repairs ($500,00) • Carlington Heights Pumping Station Upgrade ($13,500,000) • Barrhaven Pumping Station Upgrades ($1,500,000)	• 2020-2025 • 2020-2025 • 2018-2025 • 2023-2024 • 2021-2025 • 2024-2026
Lemieux	• Plant Intake Replacement Project ($38,000,000) • Lemieux Island WPP Settled Water Conduit Repairs ($3.3 million) • Lemieux Island WPP High Lift Pumping Station Suction Header Condition Assessment and Function Design • Lemieux Island WPP Basins 4 and 5 Gate Valve Replacements ($2,300,000) • Brittany Drive Pumping Station Replacement ($7,700,000)	• 2016-2025 • 2022-2024 • 2023-2025 • 2023-2025 • 2020-2024 • 2021-2026

	• Hurdman's Bridge Pumping Station Upgrades ($18,100,000) • Ottawa South Pumping Station Upgrades ($16,300,000) • Phosphoric Acid (and Ammonia) Addition for Corrosion Control ($13,000,000)	• 2021-2026 • 2024-2025
Carp	• Granular Activated Carbon treatment and Electrical Upgrades ($4,900,000)	• 2018-2024
Vars	• Vars Potassium Permanganate Pump 1 Replacement ($2,500)	• 2024
Shadow Ridge	• New, Deeper Source Wells ($3,600,000)	• 2020-2025
Kings Park	• King's Park Chlorine Analyzer Replacement ($20,000)	• 2024-2025
Munster	• Well systems Aquifer Assessment and Inspection ($700,000)	• 2023-2024
Richmond West	• Communal Well system Expansion ($5,500,000*)	• 2023-2024

* Developer-funded

Source Water Protection

Under the authority of the *Clean Water Act, 2006*, the Source Water Protection General Regulation (O. Reg. 287/07) was established to assess and manage potential contamination risks and protect source waters that are used for municipal drinking water supply. The City submitted the Annual Source Protection Update Report (ACS2025-IWS-AM-0001) to the Environment and Climate Change Committee on February 18, 2025.

Operator Certification and Licenses

The City of Ottawa ensures that all municipal water systems are operated by certified operators, licenced by the Ministry. Operator certification levels range from Level 1 to Level 4 and are attained through a combination of education, operating experience, training, and examinations. Ottawa's treatment plants and distribution system are classified as Level IV and III respectively due to their size and complexity.

There are approximately 72 certified operators working in water treatment and 86 in the water distribution system. To maintain their operating licence, each operator must receive 40 to 50 hours per year of job-related training. The department has developed a training program involving a combination of mandatory training courses, on-the-job training, and certified Continuing Education Unit courses on relevant topics in drinking water. The training program represents a major undertaking in staff time and financial support to ensure that operators receive the required hours of training to maintain their certification.

During 2024 all operators operating within the treatment facilities and distribution system maintained the required certification.

Quality Management System

The annual Drinking Water Quality Management System Management Review Report (ACS2024-IWS-WF-0001) was completed following a series of meetings held between March and August 2024. The report presented a comprehensive review of the City's drinking water quality management system and its operational performance during the previous year. In accordance with Drinking Water Quality Management System requirements, the report was reviewed by Top Management on August 13, 2024 and was subsequently summarized and presented to the Environment and Climate Change Committee on October 15, 2024 and City Council on October 30, 2024.

Overall Review

We are pleased to report that a thorough review of Licences, Permits, Regulations, and Ministry Inspection Reports indicates the provision of safe drinking water during 2024. During the preparation of this report, technical staff intensively reviewed all 35 sets of regulatory requirements in relation to the operating performance for the eight municipal water systems.

From the review, items of non-compliance were noted and described in the report. These incidents were minor and did not affect the quality of drinking water supplied to the community. In all cases, staff took appropriate response actions and reported the incidents to the Ministry and Ottawa Public Health. The City remains committed to continual improvement of our drinking water supply through research, process optimization, public reporting, and diligence in complying with provincial regulations.

Overall, the findings confirm that residents of the City of Ottawa continue to be supplied with reliable and high-quality drinking water.

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SUPPORTING DOCUMENTATION

Document 1	2024 Summary Table of Regulatory Compliance
Document 2	2024 Flow Summary