

## **Attachment-2**

# **2023 Water Services' Summary Report**

January 1, 2023, to December 31, 2023

## **Guelph Drinking Water System**

Corporation of the City of Guelph

## **Gazer Mooney Subdivision Distribution System**

Township of Guelph/Eramosa



## **Water Services**

## **Environmental Services Department**

Last Revision: 0

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# Water Services' Summary Report

## Purpose

This report is intended to provide Guelph City Council, as “Owners” of the drinking water system, an understanding of the status of the City of Guelph’s Drinking Water System for the reporting period of January 1, 2023, to December 31, 2023.

Second, the Safe Drinking Water Act (SDWA) (2002) mandates that it is the responsibility of the municipality to:

- Recognize that the people of Ontario are entitled to expect their drinking water to be safe; and,
- Provide for the protection of human health and the prevention of drinking water health hazards through the control and regulation of drinking water systems and drinking water testing.

Finally, this report has also been prepared to satisfy the requirements of Schedule 22, O. Reg. 170/03 (Summary Reports for Municipalities).

For the 2023 reporting period, a separate Annual Report, which contains data related to annual testing and sampling parameters, was prepared to fulfill Section 11 of O. Reg. 170/03. This report will be posted on the City’s website by February 28, 2024.

## Scope

This Water Services Summary Report includes information from both the **Guelph Drinking Water System** and the **Gazer Mooney Subdivision Distribution System** for the period of January 1, 2023 to December 31, 2023, unless otherwise noted. The information is required to be reported to the following:

- the Drinking Water System Owners:
  - Guelph City Council
  - Township of Guelph/Eramosa (Council and CAO).
- Senior officials of Guelph Environmental Services and Township of Guelph/Eramosa; and
- the general public and interested stakeholders.

A copy of this report is available for viewing at:

- **Online** at [guelph.ca/water-testing](https://guelph.ca/water-testing)

- <https://guelph.ca/plans-and-strategies/performance-reporting/>

"Please consider the environment - review the digital copy of the report, instead of printing it.

Any inquiries can be made to:

- City of Guelph Water Services by e-mailing [waterservices@guelph.ca](mailto:waterservices@guelph.ca) or by calling 519-837-5627.
- Township of Guelph/Eramosa Public Works – Water / Wastewater by e-mailing [general@get.on.ca](mailto:general@get.on.ca) or by calling 519-856-9596.

## **Notice**

Please note that every reasonable effort is made to ensure the accuracy of this report. This report is published with the best available information at the time of publication. In the event that errors or omissions occur, the online report will be updated. Please refer to the online version of the report for the most current version.

## **Systems Overview**

### **Guelph Drinking Water System**

Water Services at the City of Guelph is committed to providing consumers with a safe, consistent supply of high-quality drinking water while meeting or exceeding, and continually improving on legal, operational, and quality management system requirements. Water Services strives to provide reliable and cost-effective water treatment and distribution systems for the safe production and delivery of high-quality water. Established in 1879, Water Services is a municipally owned and operated water utility.

The Guelph Drinking Water System is classified as a Class II Water Treatment Subsystem and a Class IV Water Distribution Subsystem. All necessary licences have been obtained by staff to operate the Guelph Drinking Water System. As of December 31, 2023, 26 team members held drinking water certificates to operate and maintain the water system.

In 2023, Water Services maintained full accreditation to the DWQMS Version 2.0 after a successful on-site verification audit, conducted by the third-party accreditation body - NSF International Strategic Registrations. This accreditation satisfies part of the requirements under the Municipal Drinking Water Licensing Program.

## Water Distribution System

The distribution system (including watermains, valves, fire hydrants, water services, and meters) serves a population of approximately 146,175<sup>1</sup> within the City of Guelph. All new system components meet NSF 61<sup>2</sup> and NSF 372<sup>3</sup> requirements, or approved equivalents, and are installed and maintained in accordance with approved industry standards. Water system customers are fully metered and billed in accordance with the Water and Wastewater Customer Rates and Charges by-law. For more information on water rates, please refer to [My water bill and rates](#) on the City of Guelph website.

The Guelph Drinking Water System distribution system is comprised of the following infrastructure:

- 6.47 kilometres of a 900-1,050 mm diameter water supply aqueduct,
- five underground storage reservoirs with a combined approximate capacity of 48,000 cubic metres (48 million litres),
- three water towers with a combined approximate capacity of 11,200 cubic metres (11.2 million litres),
- approximately 563.0 kilometres of in service buried watermain with a diameter < 900 mm,
- 4,316 watermain valves,
- 2,868 fire hydrants; and
- approximately 47,762 water services connections and water meters.

## Guelph Source Water and Treatment Facilities

The source of Guelph's drinking water is a series of 21 operational groundwater wells and a shallow groundwater collector system. The drinking water sources consist primarily of true groundwater, with some "groundwater under the direct influence of surface water with effective in-situ filtration" (GUDI-WEF) sources. The GUDI-WEF sources include Carter Well 1 and 2; Arkell 1; Arkell 15; and the Arkell Springs Glen Collector System.

Figure 1: Guelph Drinking Water System shows the locations of the Guelph Drinking Water System facilities as of January 2024.

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<sup>1</sup> City of Guelph census equivalent population estimate for end of year in 2022.

<sup>2</sup> NSF/ANSI Standard 61: Drinking Water System Components – Health Effects

<sup>3</sup> NSF/ANSI Standard 372: Drinking Water System Components – Lead Content





## Gazer Mooney Subdivision Distribution System

The Gazer Mooney Subdivision Distribution System is a Class 1 Distribution Subsystem that serves approximately 209<sup>4</sup> people and is owned by the Township of Guelph/Eramosa. The system is operated by Guelph Water Services through a legal agreement that was signed by representatives of the City of Guelph and the Township of Guelph/Eramosa. The current agreement came into effect on March 1, 2019 and will continue until February 29, 2024 and will be automatically renewed and extended to February 28, 2029, unless terminated earlier.

All of the water for the Gazer Mooney Subdivision Distribution System is supplied from the Guelph Drinking Water System. All water is treated to provincial standards in the Guelph Drinking Water System and no further treatment chemicals are added to the Gazer Mooney Subdivision Distribution System.

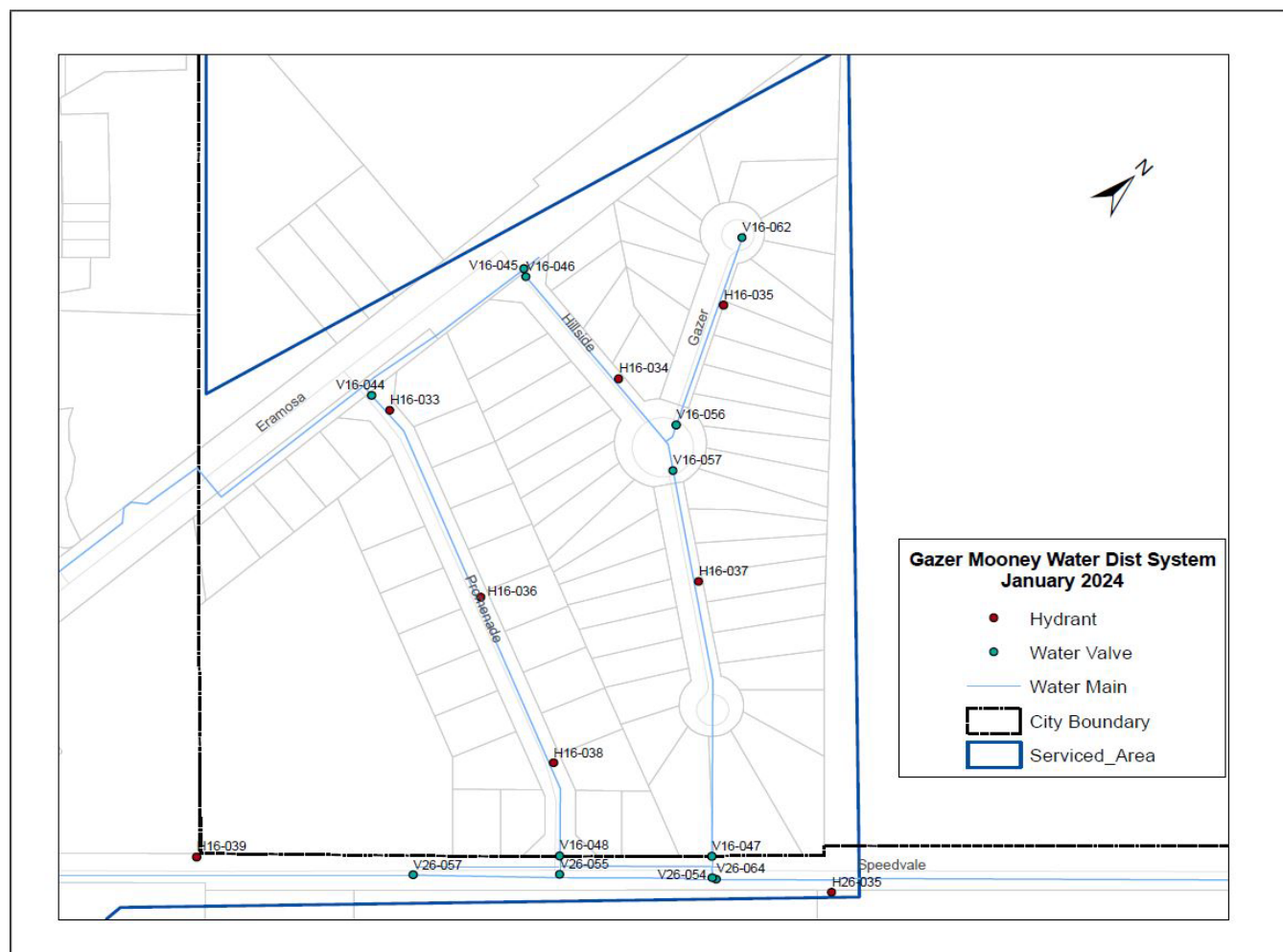
The Gazer Mooney Subdivision Distribution System is comprised of the following infrastructure:

- approximately 650 metres of 200mm diameter watermain;
- approximately 600 metres of 150mm diameter watermain;
- six watermain valves;
- six fire hydrants;
- one sampling station; and
- approximately 72 water services and water meters.

An overview of the Gazer Mooney Subdivision Distribution System is illustrated in [Figure 2: Gazer Mooney Subdivision Distribution System](#).

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<sup>4</sup> Estimated, based on 72 water connections multiplied by 2.9 people per household (as per Statistics Canada for low density residential).

**Figure 2: Gazer Mooney Subdivision Distribution System**

## Quality Management System

### Management Review

At least once every calendar year, Water Services' Management and other key members from Water Services' support teams meet to evaluate the adequacy and effectiveness of Water Services' Quality Management System (QMS). Key information reviewed at the meeting, includes, but is not limited to incidences of regulatory non-compliance and corrective actions taken. The results of the meeting, including decisions or action items to prompt changes and improvements in Water Services' QMS are communicated to City of Guelph (owner of the Guelph Drinking Water System) and Township of Guelph/Eramosa

Council (owner of the Gazer Mooney Subdivision Distribution System) by inclusion in this report, see [Appendix A: Management Review Minutes](#).

The review provides evidence of continued endorsement and commitment to the QMS from Water Services Management and other key members from Water Services' support teams.

## **Regulatory Compliance**

### **Compliance with Terms and Conditions of System Approval and Other Orders**

The City of Guelph fulfilled the requirements of the Safe Drinking Water Act, its regulations and the terms and conditions of the Municipal Drinking Water Licences and Drinking Water Works Permit for the Guelph Drinking Water System and the Gazer Mooney Subdivision Distribution System; exceptions, if any, are detailed in Table 1: Summary of non-compliance events and actions taken.

As the Operating Authority for both the Guelph Drinking Water System and the Gazer Mooney Subdivision Distribution System, Guelph Water Services' is inspected annually by the Ministry of the Environment, Conservation and Parks (Ministry) for compliance with regulatory requirements.

Table 1: Summary of Non-compliance events and actions taken, includes non-compliance events that were identified by the Ministry in the 2022-2023 drinking water inspection of the Guelph Drinking Water System and Gazer Mooney Subdivision Distribution System (see Table 1 below) the table includes a non-compliance event that was self identified by Water Services in 2023 (see item 1 in Table 1 below).

The annual MECP Inspection for the Guelph Drinking Water System which began November 6, 2023 was still in-progress at the time of this report. Any updates related to regulatory compliance, coming out of the Inspection Reports (once received), will be captured in the 2024 Water Services Summary Report. Gazer Mooney Subdivision Distribution System inspection was completed and MECP issued a report on January 18, 2024.

Table 1: Summary of Non-compliance events and actions taken, excludes any non-compliance events that were previously reported in the 2022 Water Services Summary Report.

## **Guelph Drinking Water System**

There was one (1) incident of non-compliance associated with the Guelph DWS in 2023. For details, please refer to Table 1: Summary of Non-compliance events and actions taken.

## **Gazer Mooney Subdivision Distribution System**

There were zero (0) incidents of non-compliance in the Gazer Mooney SDS in 2023.

**Table 1 Summary of Non-Compliance events and actions taken**

#	Drinking Water System	Legislative Requirement	Statement of Non-compliance	Corrective Action
1	Guelph Drinking Water System	<p>All parts of the drinking water system in contact with drinking water that are added, modified, replaced, extended shall be disinfected in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the ministry's 2020 Watermain Disinfection Procedure, that is referred in city's Municipal Drinking Water Works Permit (DWWP) under section 2.0- Alterations to the Drinking Water System</p> <p>Operating Authorities shall use Certified Operators for activities that must be performed by a Certified Operator.</p> <p>Activities performed on Isolated watermain are not required to be</p>	<p>May 16, 2023 a city contractor preformed wet tap on the city's watermain that was not isolated from rest of the drinking water subsystem, the person that performed the wet tap on the watermain was not a Ministry of Environment, Conservation and Parks (MECP) certified operator. There was no other certified drinking water operator on site directly supervising the wet tap.</p>	<p>Ministry of Environment, Conservation and Parks (MECP) informed of the non-compliance that was identified by city's water services.</p> <p>An internal memo was sent to Engineering and Transportation Services outlining the regulatory requirements to have a certified operator on site for performing operational activities on city's live watermain.</p> <p>A training course on 'New Watermain Commissioning' is scheduled for March 26 and March 27, 2024 for staff responsible for installation and replacement watermain</p> <p>A letter from Engineering and Transportation Services has been sent to the contractor informing</p>

#	Drinking Water System	Legislative Requirement	Statement of Non-compliance	Corrective Action
		performed by Certified Operators		them of the non-compliance, the contractor has been advised to ensure a MECP certified city's drinking water operator is on site supervising live wet taps.

## Operational Performance

The following section describes Operational Performance statistics of Guelph's Water Services that includes:

- 2023 Totalized Pumpages as per the Municipal Drinking Water Licence and Permits to Take Water;
- 2023 Instantaneous Flows as per Permit to Take Water;
- Water Production, Consumption and Population;
- Water Supply Capacity.

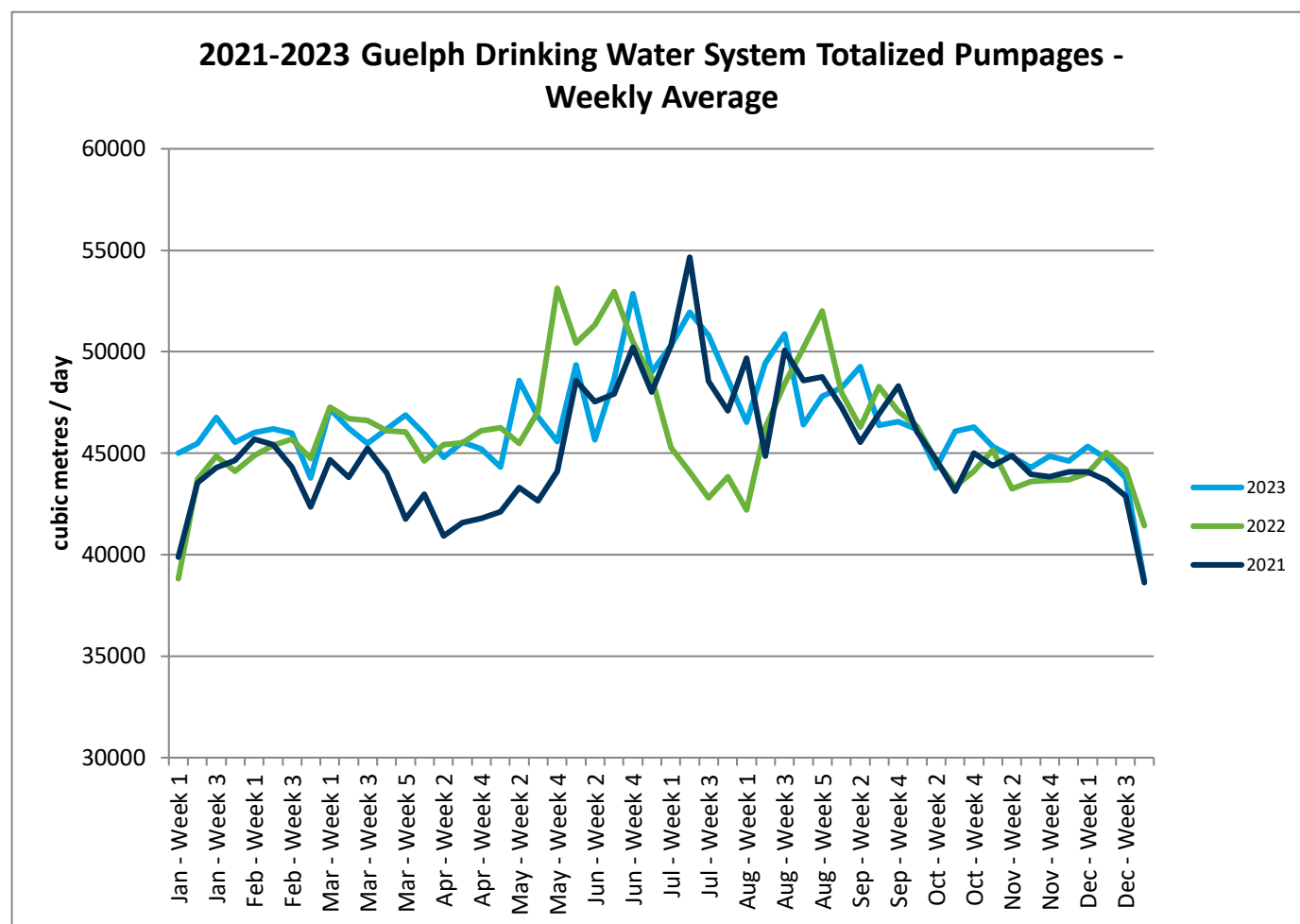
## 2023 Totalized Pumpages and Instantaneous Flows

The Ontario Water Resources Act and the Safe Drinking Water Act, each require that operating authorities record and report both water takings as governed by Permits to Take-Water and treated water supplied to the City of Guelph.

Summaries of total water pumped, instantaneous flows and capacity (flows and volumes compared to rated capacities) by the City of Guelph can be found in [Appendix B: Total Water Pumped and Instantaneous Flows](#).

Figure 3: Totalized Treated Water Pumpages, depicts the Guelph Drinking Water System treated water pumpages in cubic metres as a weekly average. Using a weekly average allows for less data points resulting in a simplified graph for the purpose of this report.

**Figure 3: Totalized Treated Water Pumpages, 2021-2023**



Water Services processed 17,095,721 cubic metres (17.095 billion litres) of water to the distribution system in 2023. This represents 0.63 per cent more water being supplied to the distribution system in 2023 as compared to 2022 and 1.84 per cent more water than in 2021.

The 2023 average daily water demand was 46,837 cubic metres (46.83 million litres). The maximum daily production of water in 2023 was 59,234 cubic metres (59.24 million litres)

and occurred on May 31, 2023. The minimum daily production of water in 2023 was 34,364 cubic metres (34.32 million litres) and occurred on December 25, 2023.

## Water Production, Consumption and Population

Figure 4: Guelph Water Production vs. Water Consumption vs. Population, 2012 - 2022, below, shows the City of Guelph's annual average daily water production, annual average daily consumption, annual peak day demand, and population from 2012 to 2022<sup>5</sup>.

From 2013 to 2022 Guelph's population increased by 15.8%, whereas the annual average consumption increased by 2.4%.

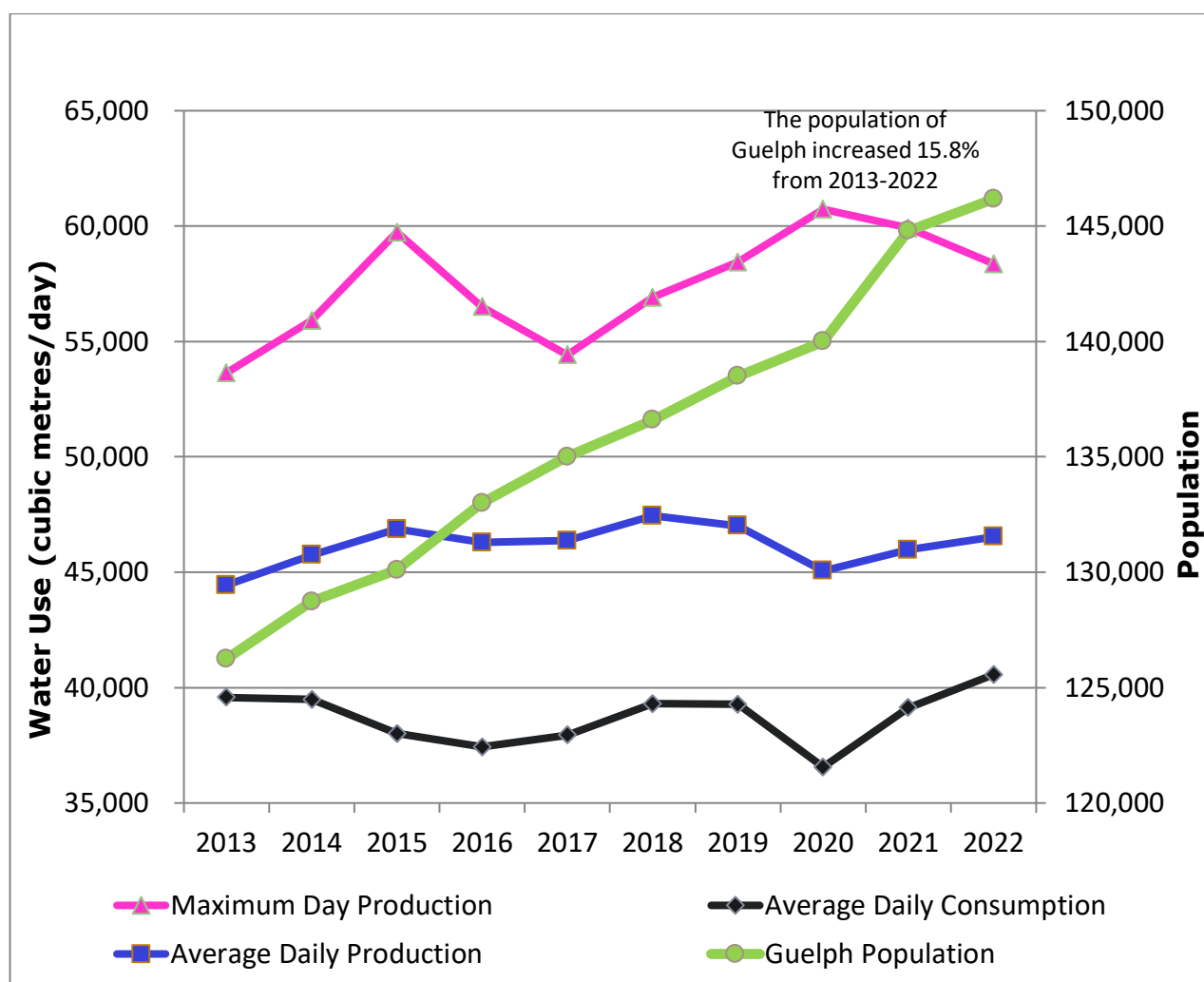
Fluctuation in water production and consumption is anticipated to occur, year to year, based on a number of factors, including seasonal temperatures and annual precipitation, system demands (including planned and unplanned maintenance) and steady population growth; however, the steady to reduced water consumption (and production) rates year over year are attributed to Guelph's Water Efficiency Strategy, Water Loss Management Plan, and resulting programming, as described later in this section. Further, the impacts to consumption (and production) across sectors varied throughout the 2020 year, which can likely be attributed to changes in societal behaviour as a result of the pandemic. While residential consumption increased through 2020 across all three residential sectors (low, medium and high-density), industrial, commercial and institutional consumption had decreased. A significant portion of the precipitous drop in 2020 can be attributed to these changes. The increase in consumption based on 2022 population potentially signify activities including business returning to near normal.

### **Figure 4: Guelph Water Production vs. Water Consumption vs. Population, 2013-2022<sup>5</sup>**

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<sup>5</sup> 2023 Consumption and Population data was not available when Figure 4: Guelph Water Production vs. Water Consumption vs. Population, 2012 – 2023 was prepared.





## Water Supply Capacity

Water Services staff uses source specific calculated firm capacity values in order to aid planning of scheduled shutdowns and maintenance of the water supply wells. Staff hold monthly meetings to review project and programming activities that affect firm capacity. The purpose of the monthly meetings are to ensure adequate servicing capacity is available to meet the City's water demands while maintenance and capital upgrades are undertaken to ensure the operates in a fit state of repair.

Values used for permitted pumping rate and firm capacity calculations by well are provided below in Table 2: Permitted Rates and Point of Entry Firm Capacities of Water Supply Wells (includes only wells that were in-use for production/supply in 2023). The permitted pumping

rate is the rate of pumping allowed as identified in the Permits to Take Water. The firm capacity rate is the actual rate of pumping that can be sustainably achieved at each well.

**Table 2: Permitted Rates and Point of Entry Firm Capacities of Water Supply Wells**

<b>Well Name</b>	<b>Permitted Daily Maximum (m3/day)</b>	<b>Permitted Rate (L/s)</b>	<b>Point of Entry Firm Capacity<sup>6</sup> (m3/day)</b>	<b>Point of Entry Firm Capacity<sup>6</sup> (L/s)</b>
<b>Arkell 1</b>	3,273	37.9	1,640	19.0
<b>Arkell Springs Wellfield<sup>7</sup></b>	28,800	333.3	28,800	333.3
<b>Arkell Infiltration Gallery (Glen Collector)</b>	25,000	290	5,908	59
<b>Burke</b>	6,546	75.8	5,790	60.0
<b>Carter 1 and Carter 2</b>	7,855	75.8	5,184	60.0
<b>Membro</b>	6,050	78.0	3,200	37.0
<b>Water St.</b>	3,400	44.4	1,702	19.7
<b>Dean</b>	2,300	34.6	1,500	17.4
<b>University</b>	3,300	38.2	1,500	17.4
<b>Downey</b>	5,237	60.6	2,592	30.0
<b>Park 1 and Park 2</b>	10,300	119.2	9,500	110.0
<b>Emma</b>	3,100	35.9	2,330	27.0

<sup>6</sup> The firm capacity rate is the actual rate of pumping that can be achieved at each well.

<sup>7</sup> The Arkell Springs Wellfield consists of five (5) municipal drinking water production wells: Arkell 6, Arkell 7, Arkell 8, Arkell 14 and Arkell 15. All of the aforementioned Arkell Wells are contained within the same Permit to Take Water. Notwithstanding the specified maximum permitted taken per day, any combination of these wells can be used to obtain the permitted rate.

Well Name	Permitted Daily Maximum (m3/day)	Permitted Rate (L/s)	Point of Entry Firm Capacity <sup>6</sup> (m3/day)	Point of Entry Firm Capacity <sup>6</sup> (L/s)
<b>Helmar</b>	3,273	37.9	804	9.3
<b>Paisley</b>	3,200	37.0	804	9.3
<b>Calico</b>	5,237	60.6	1,040	12.0
<b>Queensdale</b>	5,237	60.6	501	5.8

Note: Wells Admiral, Edinburgh, Sacco and Smallfield are currently not connected to the drinking water system, Calico and Helmar are not in service. All of these wells have been issued a Permit to Take Water.

## Appendix A: Management Review Minutes

Meeting	<b>Management Review for 2023-year</b>
Date	February 12, 2024
Time	9:00 a.m. – 11:30 a.m.
Location	WS Boardroom and MS Teams (Hybrid option)
Present	Kelly Beirnes, Matt Bender, Ryan Costello, Liana D’Andrea, Wayne Galliher, Dawn Hamilton, Shawna Hughes, Kewal Kharbanda, Deigh Madejski, Mathew Newman, Kristin Pressey, Nathan Siniowski, Tim Spence, Emily Stahl, Heather Yates

Item #	Discussion Items	Actions / Decisions (for deficiencies or recommendations)
1.	Introduction - Reviewed purpose of Management Review.	- None.
2.	a) Incidents of regulatory non-compliance - Reviewed any new incidences of non-compliance since the last Management Review in February 2023 (number of incidents reviewed was two). Reviewed immediate actions taken and confirmed root cause analysis was completed for each incident.	- None.
3.	b) Incidents of Adverse Drinking Water Tests - There were no incidents of adverse drinking water tests since the last Management Review in February 2023.	- None.
4.	c) Deviations from Critical Control Point (CCP) and limits (CCL) and response actions - There were no deviations for Critical Control Limits (CCLs) in 2023. - Discussed improvement opportunities for defining CCLs and recording deviations from CCLs and noted that improvements will be considered/implemented in 2024.	- None.

5.	<p>d)The effectiveness of the risk assessment process</p> <ul style="list-style-type: none"> <li>- Annual risk assessment was completed by respective risk assessment teams in September 2023 and October 2023.</li> <li>- Top Management reviewed the risk assessment outcomes, made minor changes to it and approved it on October 30, 2023.</li> </ul>	- None.
6.	<p>e)Internal and external DWQMS audit results</p> <ul style="list-style-type: none"> <li>- Reviewed internal/external DWQMS audit results, including number of non-conformances, corrective actions opened, opportunities for improvement, staff suggestions, system strengths, interviewees and auditors.</li> <li>- Confirmed that all items of continual improvement raised in internal/external DWQMS audits have been entered into the continual improvement tracker.</li> </ul>	- None.
7.	<p>f) Results of emergency response testing</p> <ul style="list-style-type: none"> <li>- An emergency test exercise was conducted on November 13, 2023. The objective of the test exercise was met (to have a facilitated discussion on emergency response, clarify roles and responsibilities in an emergency, validate an existing emergency response action plan for the drinking water system and identify strengths and weaknesses of the test exercise).</li> <li>- Eight (8) opportunities for improvement for emergency management were identified through the completion of the test exercise. Confirmed that the items of continual improvement have been entered into the continual improvement tracker.</li> </ul>	- None.
8.	<p>g)Operational performance.</p> <p>The following data was reviewed and considered:</p> <ul style="list-style-type: none"> <li>- most recent Ministry of the Environment, Conservation and Parks (MECP)</li> </ul>	- None.

	<p>Inspection Ratings for the systems (Guelph Drinking Water System (DWS) and Gazer Mooney Subdivision Distribution System (DS)).</p> <ul style="list-style-type: none"> <li>- Treated water production statistics for the Guelph DWS (e.g., total production, maximum day production for 2023). Flow rate trends for the most three-year period illustrated that demand is higher in summer months compared to winter months (as expected).</li> <li>- Water Production, consumption and population data for 2013 – 2022. Data illustrated City of Guelph population increased 16% and annual average drinking water system consumption increased by 5%.</li> <li>- Summary of maintenance activities completed in 2023 for distribution subsystem, water treatment subsystem and SCADA, including number of pre-authorized minor modifications that were made.</li> <li>- It was noted that the list of number and types of installation of backflow preventers (e.g., new permits), which had been provided in previous Management Reviews was removed from this year's discussion since the City's backflow prevention program is administered by another department within the City.</li> </ul>	
9.	<p>h) Raw water supply and drinking water quality trends.</p> <p>Data was reviewed for 2021, 2022 and 2023.</p> <p>Guelph Drinking Water System:</p> <ul style="list-style-type: none"> <li>- Microbiological and chemical parameters (O. Reg. 170/03 Schedule 23 inorganic parameters, O. Reg. 170/03 Schedule 24 organic parameters, nitrates, nitrites and fluoride) for treated water samples consistently met the Ontario Drinking Water Quality Standards (i.e., there were no instances of adverse test results).</li> </ul>	- None.

	<ul style="list-style-type: none"> <li>- Sodium concentrations in raw water typically exceeded 20 mg/L. Although there is no health-based standard for sodium in the Ontario Drinking Water Quality Standards, the operating authority for the drinking water system must notify the Ministry of the Environment, Conservation and Parks and public health unit when test results exceed 20 mg/L (the notification is only required once every 5 years). Public Health uses the information to help keep anyone on a strict sodium-reduced diet informed.</li> <li>- Chemical parameters (total trihalomethanes and haloacetic acids) in distribution system samples consistently met the Ontario Drinking Water Quality Standards (i.e., there were no instances of adverse test results).</li> </ul> <p>Gazer Mooney Subdivision Distribution System:</p> <ul style="list-style-type: none"> <li>- Microbiological and chemical parameters (total trihalomethanes and haloacetic acids) in distribution samples consistently met the Ontario Drinking Water Quality Standards (i.e., there were no instances of adverse test results).</li> </ul>	
10.	<p>i) Follow-up action items from previous Management Reviews</p> <ul style="list-style-type: none"> <li>- There were twelve (12) action items raised in the previous Management Review. Six (6) items are complete. Three (3) items are pending, meaning they are ideas to keep open (i.e., they are items for future implementation), but no due date needs to be assigned. Three (3) items remain open:             <ol style="list-style-type: none"> <li>1. Improving staff suggestion process (work has started and continues to be in-progress).</li> <li>2. Ensuring personnel from the Water Services Technical Services team are provided with an opportunity to participate in the operational sampling planning for the system (action item</li> </ol> </li> </ul>	- None.

	<p>has been tied in with additional sampling planning initiatives, which are set for completion in 2024).</p> <p>3. Determining if additional raw and treated water quality trends should be included in Management Review (additional trends were added for current Management Review. However, item remains open as Technical Services team should be consulted for any additional inputs on trends to be included at Management Review).</p> <ul style="list-style-type: none"> <li>- All items have been entered into the continual improvement tracker.</li> <li>- There are no additional items open from Management Reviews held prior to 2023.</li> </ul>	
11.	<p>j) The status of management action items identified between reviews</p> <p>Continual improvement is on-going:</p> <ul style="list-style-type: none"> <li>- There were seventy-seven (77) continual improvement items opened since the last Management Review.</li> <li>- For items opened since last Management Review, reviewed pie chart illustrating percentage of items open and closed and rationale for any items open and past due (only two items are open and past due).</li> <li>- Considered total number of continual improvement action items open, including actions items opened prior to 2023 (items open = 105) and total number actions items closed since last Management Review, regardless of date opened was 44.</li> </ul>	- None.
12.	<p>k) Changes that could affect the drinking water system and the quality management system</p> <p>Considered and discussed a number of changes that could affect the Quality Management System (QMS), including:</p> <ul style="list-style-type: none"> <li>- New issue of Municipal Drinking Water Licence (MDWL) and Drinking Water Works Permit (DWWP) for Guelph</li> </ul>	- None.



	<p>Drinking Water system to be issued in 2024. New issues could mean new conditions.</p> <ul style="list-style-type: none"> <li>- New issue of Permit To Take Water (PTTW). There are two (2) PTTW for the Guelph Drinking Water System that will need to be renewed in 2024. New issue could mean new conditions.</li> <li>- Ministry of the Environment, Conservation and Parks working group has been established for developing new procedure for disinfection (replacing AWWA C652, AWWA C653 and AWWA C654). Future publication of the procedures may require new in-house procedures or revision to existing procedures and training for staff.</li> <li>- Proposed updates to the Ministry of the Environment, Conservation and Parks documents: <ul style="list-style-type: none"> <li>o <i>Protocol of Accepted Drinking Water Testing Methods</i>. Document is used by accredited laboratories. However, if our lab uses alternative testing methods, it may impact our ability to compare results year over year.</li> <li>o <i>Practices for the Collection and Handling of Drinking Water Samples</i>. If proposed changes are published, document could serve as a source of best management practices.</li> <li>o Future publication of <i>Drinking Water Benchmarks List</i>. If proposed changes are published, document could serve as a source of best management practices.</li> <li>o <i>GUDI Terms of Reference</i> (draft). May impact drinking water system requirements and subsequently the QMS.</li> </ul> </li> <li>- Updates to Health Canada's <i>Guidelines for Drinking Water Quality</i>. Internal working group established to monitor changes and determine impact.</li> <li>- The Ministry of the Environment, Conservation and Parks Drinking Water/Wastewater Operator Workforce Assessment. The outcome of the</li> </ul>	
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	<p>assessment could benefit human resources needed to maintain the QMS.</p> <ul style="list-style-type: none"> <li>- Transition from hard copy to electronic record keeping. Prior to implementation need for procedure creation or update and staff training should be considered.</li> <li>- Potential use of new sample planning software. Prior to implementation need for procedure creation or update and staff training should be considered.</li> <li>- Changes to the organizational structure (e.g., addition of new roles). Procedure creation or update may be required when new roles are added or existing roles removed.</li> <li>- Changes to source of raw water supply (e.g., addition of new well, removal of existing well). If changes are needed, new Ministry of the Environment, Conservation and Parks approvals may be required, which could mean new conditions for the drinking water system.</li> </ul>	
13.	<p>l) Consumer Feedback</p> <ul style="list-style-type: none"> <li>- Reviewed number and type of services requests received at Water Services in 2021, 2022 and 2023.</li> </ul>	- None.
14.	<p>m) Resources needed to the maintain the quality management system</p> <ul style="list-style-type: none"> <li>- The resources needed to maintain the QMS continue to be the same as previous years. For example:             <ul style="list-style-type: none"> <li>○ On-going commitment from Top Management, including participation in Management Review, risk assessment outcomes, internal and third-party DWQMS audits, root cause analyses, infrastructure reviews, ensuring staff follow procedures.</li> <li>○ Procedures that direct and control the organization with respect to quality.</li> <li>○ Trained personnel on procedures.</li> <li>○ An effective document control system.</li> </ul> </li> </ul>	- None.

15.	<p>n) Results of the infrastructure review</p> <ul style="list-style-type: none"> <li>- Confirmed that infrastructure review occurs annually and is on-going.</li> <li>- Vertical infrastructure review is captured under the Capital Needs Assessment Report for Water Facilities, prepared by GM BluePlan Engineering, dated July 2022 and updated every five years. Meeting to administer process for review state of fit repair based on facility works and those that can be accelerated from timing noted in the Capital Needs Assessment Report is conducted annually. Meeting held on April 24, 2023.</li> <li>- Water Distribution linear infrastructure review was conducted on April 28, 2023. Linear infrastructure needs from previous year (2022) were reviewed and updated (e.g., new projects added, existing projects removed or modified if completed, and scoring used to rank priorities updated where necessary).</li> </ul>	- None.
16.	<p>o) Operational plan currency, content and updates</p> <ul style="list-style-type: none"> <li>- The Operational Plan, which documents the quality management system was last updated on April 25, 2023, and it was last endorsed by the drinking water system owners in 2023 (due to newly elected Council) and Top Management in 2024 (due to change in Top Management).</li> </ul>	- None.
17.	<p>p) Staff suggestions</p> <ul style="list-style-type: none"> <li>- Figure illustrating number of staff suggestions by year from 2016 to 2023 was reviewed.</li> <li>- There is an open continual improvement action item to revisit the staff suggestion process.</li> </ul>	- None.

## **Appendix B: Total Water Pumped and Instantaneous Flows**

This section summarizes the total volume of treated water pumped to the distribution system as well as raw water pumped and corresponding instantaneous flows for all in-service sources in 2023.

Capacity is calculated by comparing the average pumped or flow value against the Municipal Drinking Water Licence (MDWL) allowable volume or Permit to Take Water (PTTW) flow. Capacity is representative of the conditions of pumping for that year which may be influenced by other testing programs, maintenance or special operational conditions. Additionally, the actual capacity of the source may not be achievable due to well performance and/or current infrastructure. Optimization efforts are included as a component of the Water Supply Master Plan, with the intent to match the actual capacity of the water source with the appropriate infrastructure, where possible.

City of Guelph Water Services – Treated Water Pumpages, January 1, 2023 – December 31, 2023

Table 3 below shows the amount of treated water in cubic metres pumped to the distribution system from each facility in 2023.

Table 3: Treated Water Pumpages, 2023

Facility		Burke	Calico	Dean	Downey	Emma	Helmar	Membro	Paisley Net	Park	Queensdale	University Net	Water Street	F.M. Woods	Total System Discharge
Units		m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³
Regulatory Limit		6,546	5,237	2,300	5,237	3,100	3,273	6,050	13,738	10,300	5,273	5,108	3,400	65,000	n/a
Jan	Average	5,317	0	1,326	3,341	2,432	0	2,311	0	1,917	473	1,648	1,471	24,781	45,017
	Maximum	5,497	0	1,393	3,442	2,521	0	2,765	0	4,059	483	2,184	1,542	28,529	48,156
	Total	164,841	0	41,105	103,565	75,387	0	71,649	0	59,417	14,675	51,085	45,592	768,224	1,395,541
Feb	Average	5,475	0	1,283	3,361	2,426	0	2,756	0	2,080	461	1,715	1,454	24,516	45,527
	Maximum	5,507	0	1,396	3,408	2,501	0	2,765	0	6,315	468	2,009	1,506	28,126	49,159
	Total	153,288	0	35,921	94,108	67,919	0	77,181	0	58,229	12,918	48,028	40,717	686,444	1,274,753
Mar	Average	5,437	0	1,195	2,868	2,448	0	2,752	0	1,751	375	1,637	1,244	26,544	46,249
	Maximum	5,481	0	1,388	3,352	2,524	0	2,766	0	3,593	499	2,012	1,456	31,593	50,836
	Total	168,554	0	37,030	88,902	75,873	0	85,303	0	54,293	11,614	50,732	38,566	822,856	1,433,724
Apr	Average	5,440	0	1,086	2,523	2,466	0	2,730	0	1,630	487	891	1,420	26,936	45,609
	Maximum	5,481	0	1,097	2,564	2,554	0	2,765	0	2,662	539	1,768	1,534	31,419	50,359
	Total	163,201	0	32,585	75,699	73,995	0	81,894	0	48,895	14,623	26,729	42,591	808,072	1,368,284
May	Average	5,403	0	1,204	2,511	2,447	0	2,749	0	1,761	469	621	1,180	30,542	48,887
	Maximum	5,442	0	1,385	2,564	2,547	0	2,765	0	5,701	519	2,427	1,507	36,192	59,234
	Total	167,500	0	37,319	77,829	75,868	0	85,214	0	54,605	14,544	19,236	36,588	946,790	1,515,492
Jun	Average	5,393	0	968	2,270	2,419	0	1,376	0	3,009	470	1,345	1,149	32,951	51,348
	Maximum	5,430	0	1,026	2,539	2,520	0	2,765	0	5,905	557	2,444	1,405	37,813	58,991
	Total	161,792	0	29,041	68,090	72,564	0	41,282	0	90,258	14,087	40,337	34,456	988,527	1,540,433
Jul	Average	5,334	0	978	2,714	2,458	0	2,595	0	2,129	461	1,747	1,334	28,035	47,784
	Maximum	5,378	0	1,017	3,138	2,533	0	2,765	0	6,010	528	1,867	1,528	36,495	58,435
	Total	165,363	0	30,304	84,144	76,183	0	80,457	0	65,986	14,285	54,145	41,356	869,081	1,481,305

Facility Units Regulatory Limit		Burke m³ 6,546	Calico m³ 5,237	Dean m³ 2,300	Downey m³ 5,237	Emma m³ 3,100	Helmar m³ 3,273	Membro m³ 6,050	Paisley Net m³ 13,738	Park m³ 10,300	Queensdale m³ 5,273	University Net m³ 5,108	Water Street m³ 3,400	F.M. Woods m³ 65,000	Total System Discharge m³ n/a
Aug	Average	5,267	0	951	2,906	2,340	0	1,200	0	2,008	404	1,677	565	29,515	46,833
	Maximum	5,362	0	1,001	3,042	2,550	0	2,765	0	2,554	496	1,879	1,187	36,869	53,554
	Total	163,288	0	29,488	90,082	72,541	0	37,199	0	62,261	12,509	51,979	17,505	914,968	1,451,819
Sep	Average	5,213	0	1,185	2,935	2,463	0	3,243	0	1,807	434	1,736	0	30,777	49,794
	Maximum	5,243	0	1,280	3,000	2,542	0	4,320	0	2,617	487	1,858	0	34,757	54,510
	Total	156,383	0	35,559	88,065	73,891	0	97,289	0	54,220	13,009	52,093	0	923,316	1,493,825
Oct	Average	5,140	0	1,245	2,809	2,371	0	3,322	30	1,503	411	1,707	715	27,353	46,606
	Maximum	5,197	0	1,281	2,976	2,546	0	3,456	466	2,178	475	1,832	1,626	32,271	51,962
	Total	159,327	0	38,601	87,080	73,503	0	102,993	931	46,607	12,745	52,917	22,150	847,930	1,444,785
Nov	Average	4,626	0	1,230	2,227	2,056	0	2,868	728	1,411	391	1,630	1,466	27,044	45,677
	Maximum	5,307	0	1,256	2,730	2,152	0	3,118	792	1,721	434	1,870	1,565	30,954	48,993
	Total	138,772	0	36,890	66,802	61,691	0	86,028	21,851	42,328	11,735	48,907	43,987	811,324	1,370,314
Dec	Average	5,047	0	1,217	2,365	2,022	0	1,359	704	1,331	130	1,943	1,511	25,129	42,756
	Maximum	5,149	0	1,242	2,726	2,079	0	2,938	789	2,069	422	2,291	1,577	29,815	47,682
	Total	156,455	0	37,719	73,306	62,667	0	42,133	21,838	41,258	4,018	60,220	46,836	778,994	1,325,445
2023 Year	Average	5,258	0	1,156	2,736	2,362	0	2,438	122	1,861	414	1,525	1,126	27,843	46,841
	Maximum	5,507	0	1,396	3,442	2,554	0	4,320	792	6,315	557	2,444	1,626	37,813	59,234
	Total	1,918,763	0	421,561	997,672	862,082	0	888,623	44,621	678,357	150,764	556,407	410,346	10,166,525	17,095,721
	Average Process Capacity	80%	0%	50%	52%	76%	0%	40%	4%	18%	8%	46%	33%	43%	n/a

## City of Guelph Water Services – Permit-to-Take-Water Raw Pumpages, January 1, 2023 – December 31, 2023

Table 4 and Table 5 presented below, outline the Permit to Take Water Pumpages for 2023. Table 4 includes the following sources: Arkell Well 1, Arkell Well 6, Arkell Well 7, Arkell Well 8, Arkell Well 14, Arkell Well 15, Arkell Recharge Pump, Arkell Springs Glen Collector System, Burke Well, Calico Well, and Carter Well 1 and 2. Table 5 includes the following sources: Dean Well, Downey Well, Emma Well, Helmar Well, Membro Well, Paisley Well, Park Wells 1 and 2, Queensdale Well, University Well and Water Street Well.

**Table 4: Permit-To-Take-Water Raw Pumpages, 2023**

Facility Units		Arkell Well #1 m <sup>3</sup>	Arkell Well #6 m <sup>3</sup>	Arkell Well #7 m <sup>3</sup>	Arkell Well #8 m <sup>3</sup>	Arkell Well #14 m <sup>3</sup>	Arkell Well #15 m <sup>3</sup>	Arkell Wellfield (#6, 7, 8, 14, 15) Total m <sup>3</sup>	Arkell - Recharge Pump m <sup>3</sup>	Arkell Springs Glen Collector System m <sup>3</sup>	Burke Well m <sup>3</sup>	Calico Well m <sup>3</sup>	Carter Wells #1 & #2 m <sup>3</sup>
Regulatory limit		3,273	9,600	9,600	9,600	9,600	9,600	28,800	9,092	25,000	6,546	5,237	6,547
Jan	Average	0	5,540	6,129	1,918	2,262	4,666	20,515	0	4,385	5,584	0	0
	Maximum	0	7,757	7,625	4,963	5,169	6,788	23,978	0	4,650	5,776	0	0
	Total	0	171,740	190,006	59,454	70,108	144,648	635,957	0	135,923	173,105	0	0
Feb	Average	0	7,314	5,466	1,107	3,656	3,417	20,960	0	4,088	5,753	0	0
	Maximum	0	7,850	6,616	7,138	5,577	5,466	25,098	0	4,181	5,779	0	0
	Total	0	204,789	153,049	31,007	102,367	95,677	586,889	0	114,461	161,073	0	0
Mar	Average	0	7,439	5,734	1,456	3,816	3,981	22,426	0	4,125	5,715	0	560
	Maximum	0	7,781	7,054	6,573	6,836	5,936	27,564	0	4,865	5,760	0	4,990
	Total	0	230,618	177,748	45,143	118,298	123,404	695,211	0	127,890	177,172	0	17,371
Apr	Average	0	7,562	4,305	184	3,755	1,208	17,014	3,535	6,860	5,718	0	3,183
	Maximum	0	8,022	5,771	3,776	5,170	5,531	21,269	8,437	9,169	5,759	0	3,763
	Total	0	226,874	129,136	5,508	112,658	36,233	510,409	106,044	205,810	171,548	0	95,488
May	Average	0	7,030	4,680	665	3,264	1,384	17,024	8,231	10,156	5,681	0	3,466
	Maximum	0	8,037	6,944	7,015	5,946	7,331	21,319	8,449	10,848	5,717	0	4,215
	Total	0	217,933	145,076	20,626	101,191	42,913	527,739	255,161	314,836	176,107	0	107,443
Jun	Average	0	7,659	5,404	620	3,087	1,811	18,581	7,947	11,493	5,673	0	3,009
	Maximum	0	7,931	6,698	3,456	5,474	4,135	22,361	8,060	11,916	5,705	0	4,478
	Total	0	229,757	162,126	18,602	92,603	54,344	557,433	238,410	344,784	170,180	0	90,273
Average		0	7,606	4,042	474	2,110	496	14,728	7,787	12,414	5,610	0	1,818

Facility Units		Arkell Well #1 m³	Arkell Well #6 m³	Arkell Well #7 m³	Arkell Well #8 m³	Arkell Well #14 m³	Arkell Well #15 m³	Arkell Wellfield (#6, 7, 8, 14, 15) Total m³	Arkell - Recharge Pump m³	Arkell Springs Glen Collector System m³	Burke Well m³	Calico Well m³	Carter Wells #1 & #2 m³
Regulatory limit		3,273	9,600	9,600	9,600	9,600	9,600	28,800	9,092	25,000	6,546	5,237	6,547
Jul	Maximum	0	8,044	6,890	5,399	6,511	3,179	27,841	7,859	13,231	5,663	0	3,883
	Total	0	235,785	125,288	14,698	65,415	15,380	456,566	241,405	384,844	173,921	0	56,344
Aug	Average	0	7,780	4,730	177	2,275	778	15,740	7,221	12,793	5,547	0	1,170
	Maximum	0	8,046	6,744	3,434	5,211	4,382	22,832	7,772	13,308	5,634	0	2,469
	Total	0	241,193	146,644	5,477	70,519	24,114	487,947	223,845	396,592	171,951	0	36,269
Sep	Average	0	7,678	5,125	1,416	2,584	530	17,331	6,997	12,112	5,493	0	1,472
	Maximum	0	7,882	7,426	6,535	5,180	3,551	20,756	7,420	12,432	5,515	0	2,324
	Total	0	230,330	153,745	42,468	77,510	15,890	519,942	209,921	363,359	164,783	0	44,161
Oct	Average	0	5,910	4,775	1,090	1,626	1,885	15,287	7,023	11,709	5,421	0	1,105
	Maximum	0	8,044	7,596	5,422	4,575	5,517	23,835	7,235	12,049	5,478	0	1,932
	Total	0	183,217	148,010	33,796	50,415	58,448	473,884	217,711	362,966	168,049	0	34,249
Nov	Average	0	7,444	4,204	1,338	3,085	1,530	17,602	3,086	9,194	4,899	0	945
	Maximum	0	7,948	6,715	5,355	6,250	3,787	26,374	7,146	11,656	5,598	0	1,913
	Total	0	223,314	126,126	40,143	92,565	45,915	528,062	92,591	275,808	146,980	0	28,342
Dec	Average	0	6,974	5,183	1,995	3,553	1,674	19,378	0	5,898	5,336	0	0
	Maximum	0	7,899	7,455	4,504	5,973	5,015	24,226	0	6,434	5,432	0	0
	Total	0	216,191	160,660	61,856	110,134	51,885	600,726	0	182,823	165,416	0	0
2023 Year	Average	0	7,161	4,981	1,037	2,923	1,947	18,049	4,319	8,769	5,536	0	1,394
	Maximum	0	8,046	7,625	7,138	6,836	7,331	27,841	8,449	13,308	5,779	0	4,990
	Total	0	2,611,739	1,817,613	378,776	1,063,783	708,854	6,580,765	1,585,088	3,210,094	2,020,285	0	509,941
	Average Pumped	0%	75%	52%	11%	30%	20%	63%	81%	35%	85%	0%	21%



Table 5: Permit-to-Take-Water Raw Pumpages, 2023

Facility		Dean Well	Downey Well	Emma Well	Helmar Well	Membro Well	Paisley Well	Park Wells #1 and #2	Queensdale Well	University Well	Water Street Well
Units		m³	m³	m³	m³	m³	m³	m³	m³	m³	m³
Regulatory limit		2,300	5,273	3,100	3,273	6,050	3,200	10,300	5,237	3,300	3,400
Jan	Average	1,326	3,402	2,432	0	2,279	0	1,911	480	1,648	1,471
	Maximum	1,420	3,506	2,521	0	2,725	0	4,236	524	2,184	1,542
	Total	41,117	105,453	75,387	0	70,654	0	59,228	14,875	51,085	45,592
Feb	Average	1,281	3,426	2,426	0	2,716	0	2,074	476	1,715	1,454
	Maximum	1,415	3,468	2,501	0	2,724	0	6,299	506	2,009	1,506
	Total	35,865	95,936	67,919	0	76,041	0	58,084	13,317	48,028	40,717
Mar	Average	5,715	1,177	2,448	0	2,711	0	1,759	381	1,637	1,244
	Maximum	5,760	1,403	2,524	0	2,725	0	3,566	539	2,012	1,456
	Total	177,172	36,475	75,873	0	84,048	0	54,516	11,814	50,732	38,566
Apr	Average	1,085	2,576	2,466	0	2,698	0	1,641	487	891	1,420
	Maximum	1,120	2,609	2,554	2	2,733	0	2,653	539	1,768	1,534
	Total	32,538	77,266	73,995	2	80,936	0	49,217	14,623	26,729	42,591
May	Average	1,205	2,555	2,447	0	2,716	0	1,910	469	621	1,180
	Maximum	1,411	2,605	2,547	2	2,734	0	5,680	519	2,427	1,507
	Total	37,347	79,212	75,868	2	84,196	0	59,211	14,544	19,236	36,588
Jun	Average	969	2,361	2,419	0	1,369	0	2,995	470	1,345	1,149
	Maximum	1,058	2,587	2,520	2	2,734	0	5,878	557	2,444	1,405
	Total	29,055	70,824	72,564	12	41,071	0	89,841	14,087	40,337	34,456
Jul	Average	976	2,761	2,458	1	2,565	0	2,012	461	1,747	1,334
	Maximum	1,038	3,178	2,533	4	2,739	0	5,416	528	1,867	1,528
	Total	30,268	85,584	76,183	18	79,523	0	62,368	14,285	54,145	41,356

Facility		Dean Well	Downey Well	Emma Well	Helmar Well	Membro Well	Paisley Well	Park Wells #1 and #2	Queensdale Well	University Well	Water Street Well
Units		m³	m³	m³	m³	m³	m³	m³	m³	m³	m³
Regulatory limit		2,300	5,273	3,100	3,273	6,050	3,200	10,300	5,237	3,300	3,400
Aug	Average	952	2,976	2,341	0	1,189	0	1,997	404	1,677	567
	Maximum	1,019	3,111	2,550	1	2,736	0	2,539	496	1,879	1,187
	Total	29,517	92,251	72,576	7	36,871	0	61,896	12,509	51,979	17,575
Sep	Average	1,187	3,011	2,463	0	3,170	0	1,796	434	1,736	0
	Maximum	1,298	3,078	2,542	1	4,190	0	2,547	487	1,858	0
	Total	35,599	90,345	73,901	5	95,109	0	53,868	13,009	52,093	0
Oct	Average	1,246	2,882	2,371	0	3,248	30	1,491	411	1,707	715
	Maximum	1,306	3,052	2,546	1	3,378	466	2,164	475	1,832	1,626
	Total	38,616	89,343	73,504	2	100,674	931	46,210	12,745	52,917	22,150
Nov	Average	1,233	2,281	2,057	0	2,818	728	1,388	391	1,630	1,466
	Maximum	1,257	2,797	2,152	0	3,059	792	1,712	434	1,870	1,565
	Total	36,990	68,426	61,720	0	84,544	21,851	41,647	11,735	48,907	43,987
Dec	Average	1,220	2,426	2,022	0	1,335	704	1,318	130	1,943	1,511
	Maximum	1,254	2,794	2,079	0	2,877	789	2,041	422	2,291	1,577
	Total	37,822	75,219	62,678	0	41,373	21,838	40,849	4,018	60,220	46,836
2023 Year	Average	1,533	2,653	2,363	0	2,401	122	1,857	416	1,525	1,126
	Maximum	5,760	3,506	2,554	4	4,190	792	6,299	557	2,444	1,626
	Total	561,906	966,333	862,168	48	875,040	44,621	676,935	151,562	556,407	410,416
	Average Pumped	67%	51%	76%	0%	40%	4%	18%	8%	46%	33%

City of Guelph Water Services – Permit-to-Take-Water Instantaneous Flows, January 1, 2023 – December 31, 2023

Table 6 and Table 7 presented below, outline the Instantaneous Flow Summary for 2022. Table 6 includes the following sources: Arkell Well 1, Arkell Well 6, Arkell Well 7, Arkell Well 8, Arkell Well 14, Arkell Well 15, Arkell Recharge Pump, Arkell Springs Glen Collector System, Burke Well, Calico Well, Carter Wells 1 and 2. Table 7 includes the following sources: Dean Well, Downey Well, Emma Well, Helmar Well, Membro Well, Paisley Well, Park Wells 1 and 2, Queensdale Well, University Well and Water Street Well.

Table 6: Permit-to-Take-Water Instantaneous Flows, 2023

Facility		Arkell Well #1	Arkell Well #6	Arkell Well #7	Arkell Well #8	Arkell Well #14	Arkell Well #15	Arkell - Recharge System	Arkell Springs Glen Collector System	Burke Well	Calico Well	Carter Wells
Units		L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s
Regulatory limit		37.9	111.0	111.0	111.0	111.0	111.0	157.8	290.0	75.8	60.6	75.8
Jan	Average	0.0	64.3	70.7	22.2	26.2	54.0	0.0	50.7	64.6	0.0	0.0
	Maximum	0.0	93.3	90.6	86.9	90.6	89.2	0.0	55.5	67.5	0.0	0.0
Feb	Average	0.0	85.1	63.0	12.9	42.3	39.8	0.0	42.0	66.6	0.0	0.0
	Maximum	0.0	92.7	90.8	87.6	91.0	87.4	0.0	50.0	67.9	0.0	0.0
Mar	Average	0.0	86.7	66.0	16.9	44.2	46.1	0.0	47.7	66.2	0.0	6.5
	Maximum	0.0	92.9	90.8	85.7	90.6	86.8	0.0	58.1	67.8	0.0	58.6
Apr	Average	0.0	87.8	49.9	2.1	43.5	14.0	40.9	79.1	66.2	0.0	36.4
	Maximum	0.0	93.6	92.8	87.2	93.4	89.0	114.6	108.8	68.0	0.0	58.7
May	Average	0.0	81.7	54.2	7.7	37.8	16.0	95.3	117.4	65.7	0.0	40.2
	Maximum	0.0	93.2	91.9	87.6	92.2	88.8	98.4	128.1	67.4	0.0	58.4
Jun	Average	0.0	88.8	62.5	7.2	35.8	21.0	92.0	133.0	65.7	0.0	35.0
	Maximum	0.0	92.3	90.6	86.5	89.7	85.6	93.4	141.1	67.1	0.0	59.0
Jul	Average	0.0	87.6	47.1	5.5	24.7	5.8	90.2	135.6	64.9	0.0	21.2
	Maximum	0.0	92.8	91.4	85.7	91.7	85.1	91.2	158.3	66.6	0.0	57.5

Facility		Arkell Well #1	Arkell Well #6	Arkell Well #7	Arkell Well #8	Arkell Well #14	Arkell Well #15	Arkell - Recharge System	Arkell Springs Glen Collector System	Burke Well	Calico Well	Carter Wells
Units		L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s
Regulatory limit		37.9	111.0	111.0	111.0	111.0	111.0	157.8	290.0	75.8	60.6	75.8
Aug	Average	0.0	89.9	54.9	2.0	26.4	9.0	83.6	148.0	64.2	0.0	13.6
	Maximum	0.0	93.6	91.0	86.7	90.4	86.8	90.6	158.9	65.8	0.0	57.4
Sep	Average	0.0	89.3	59.2	16.4	29.9	6.1	81.0	140.0	63.6	0.0	17.1
	Maximum	0.0	92.3	90.3	86.7	89.4	83.3	86.5	147.9	64.8	0.0	57.1
Oct	Average	0.0	68.4	55.2	12.6	18.8	21.8	81.3	128.8	62.8	0.0	12.9
	Maximum	0.0	92.4	90.3	87.4	91.7	86.3	84.1	143.3	64.5	0.0	50.0
Nov	Average	0.0	86.2	48.4	15.3	35.4	17.6	36.3	100.3	56.6	0.0	11.2
	Maximum	0.0	92.3	90.5	87.0	90.6	86.0	82.6	134.1	65.5	0.0	25.1
Dec	Average	0.0	80.9	60.1	23.1	41.5	19.4	0.0	68.4	61.8	0.0	0.0
	Maximum	0.0	92.2	90.5	86.1	91.3	85.9	0.0	76.7	63.7	0.0	0.0

Table 7: City of Guelph - Instantaneous Flow Summary, 2023

Facility		Dean Well	Downey Well	Emma Well	Helmar Well	Membro Well	Paisley Well	Park Wells	Queensdale Well	University Well	Water Street Well
Units		L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s
Regulatory limit		34.6	60.6	40.9	37.9	78.0	42.5	127.2	60.6	46.2	44.4
Jan	Average	15.4	39.5	28.2	0.0	26.4	0.0	22.4	5.6	19.1	17.0
	Maximum	24.2	45.1	30.5	0.0	51.4	0.0	113.2	11.3	27.8	21.5
Feb	Average	14.9	39.7	28.2	0.0	31.4	0.0	24.2	5.5	19.8	16.9
	Maximum	20.4	41.2	30.6	0.0	52.4	0.0	106.8	11.1	37.3	22.6
Mar	Average	13.7	34.1	28.6	0.0	31.4	0.0	20.4	4.7	19.0	14.4
	Maximum	19.9	42.8	30.7	0.0	56.4	0.0	106.4	25.4	27.6	20.6
Apr	Average	12.6	30.0	28.8	0.0	31.2	0.0	18.7	5.7	10.3	16.5
	Maximum	16.3	42.4	30.8	0.0	49.1	0.0	106.4	11.4	20.8	25.0
May	Average	14.0	29.9	28.9	0.0	31.4	0.0	20.3	5.5	7.2	13.7
	Maximum	30.2	44.1	31.1	0.0	38.7	0.0	106.1	11.1	28.7	21.9
Jun	Average	11.1	28.1	28.3	0.0	15.9	0.0	34.6	5.5	15.6	13.5
	Maximum	17.4	44.3	30.8	0.0	62.2	0.0	105.2	10.4	28.8	22.4
Jul	Average	11.4	32.9	28.6	0.0	29.7	0.0	24.5	5.4	20.2	16.7
	Maximum	18.0	42.7	30.9	0.0	52.4	0.0	105.5	50.0	21.9	22.3
Aug	Average	11.1	35.5	27.3	0.0	14.4	0.0	23.1	4.7	19.4	6.8
	Maximum	19.6	37.8	32.3	0.0	55.4	0.0	105.2	12.9	22.3	16.6
Sep	Average	13.8	35.4	28.8	0.0	35.9	0.0	20.7	5.1	20.1	0.0
	Maximum	20.5	37.1	31.0	0.0	62.2	0.0	105.2	11.6	21.8	0.0

Facility		Dean Well	Downey Well	Emma Well	Helmar Well	Membro Well	Paisley Well	Park Wells	Queensdale Well	University Well	Water Street Well
Units		L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s
Regulatory limit		34.6	60.6	40.9	37.9	78.0	42.5	127.2	60.6	46.2	44.4
Oct	Average	14.5	34.5	28.9	0.0	37.7	0.3	17.5	4.9	19.8	8.6
	Maximum	18.5	36.4	31.1	0.0	57.6	10.6	105.4	10.3	21.7	32.6
Nov	Average	14.8	29.4	28.8	0.0	32.6	8.4	17.6	5.0	18.8	17.7
	Maximum	17.5	41.3	31.0	0.0	58.2	10.0	105.2	10.1	21.7	27.1
Dec	Average	14.6	29.9	28.7	0.0	15.7	8.2	16.7	1.7	22.5	18.6
	Maximum	17.3	35.6	30.9	0.0	60.2	10.5	104.9	9.1	27.4	28.3