



Revised Report

April 2/2024



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Virginiatown-Kearns Drinking Water System

2023 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Township of McGarry

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Virginiatown-Kearns Drinking Water System

Section 11

2023 ANNUAL REPORT



INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Schedule 22 of the regulation also requires a Summary Report, which must be presented & accepted by Council by March 31st of each year for the preceding calendar year.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirement the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act* (2002) and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows,
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2023 Annual/Summary Report.



Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name: Virginiatown-Kearns Drinking Water System
Drinking-Water System No.: 220000317
Drinking-Water System Owner: The Corporation of the Township of McGarry
Drinking-Water System Category: Large Municipal, Residential System
Period being reported: January 1 to December 31, 2023

Does your Drinking Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet? No

Location where the report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

McGarry Township Office
27 Webster Street,
Virginiatown Ontario P0K 1X0

Drinking Water Systems that receive drinking water from the Virginiatown-Kearns Drinking Water System

The Virginiatown-Kearns Drinking Water System provides all drinking water to the communities of Virginiatown, North Virginiatown and Kearns.

The Annual Report was not provided to any other Drinking Water System Owners.

The Ontario Clean Water Agency prepared the 2023 Annual/Summary Report for the Virginiatown-Kearns Drinking Water System and provided a copy to the system owner; the Township of McGarry. The Virginiatown-Kearns Drinking Water System is a stand-alone system that does not receive water from or send water to any other system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- Notice on the Town’s website



2.0 VIRGINIATOWN DRINKING WATER SYSTEM (DWS No. 220000317)

The Virginiatown-Kearns Drinking Water System is owned by the Corporation of the Township of McGarry and operated by the Ontario Clean Water Agency (OCWA). The system consists of a Class 2 water distribution and supply subsystem. The Ontario Clean Water Agency (OCWA) is the accredited operating authority and is designated as the Overall Responsible Operator for both the water supply and water distribution facilities.

Raw Water Supply

The main building for the water treatment plant/pumphouse is located approximately 6 km northeast of the Virginiatown Community Centre and approximately 500 metres east of Cheminis Road. Groundwater is supplied to the plant from production Well No. 1 (Cheminis Well) which is situated within the plant and Well No. 2 (T3/91); a standby well which is located 10 metres east of the well house.

Well No.1 (Cheminis Well) was drilled in October 1994 to a depth of 26.2 metres. The well is “double-case” constructed which consists of a 300 mm diameter steel casing and is equipped with a vertical turbine pump assembly and fixed-rate control system to pump at a maximum rate of 1,420 L/minute. A magnetic flow meter is mounted on the 150 mm diameter discharge line from the well into the treatment process.

Well No. 2 (T3/91) was originally drilled in February 1991 and maintained as a test well. It was modified in December 2014 to service as a standby well. It is located approximately 10 m east of the well house and Well No. 1. It is drilled to a depth of 28.65 metres and equipped with a submersible deep well pump rated at 1,105 L/minute. It includes a newly installed pitless adaptor and 100 mm diameter discharge pipe that connects to the Well No. 1 discharge header at a point just before the flow meter located inside the plant.

The standby well is intended for use when production Well No.1 has been taken out of service for repair and maintenance, or in an emergency situation. The well can also be used periodically as required to ensure water quality; it is currently configured to operate once in every 60 tower filling cycles.

Water Treatment

The wells feed the water treatment system that has a maximum rated capacity of 2,045 cubic meters per day (m³/d).

The groundwater is chlorinated using a sodium hypochlorite disinfection system, complete with a chemical feed panel consisting of duplicate chemical metering pumps (duty and standby), and a single 400 L storage tank with secondary spill containment and an outside fill line. Also integrated into the treatment process are off-site chlorine contact facilities. The first is a 6 km long by 200 mm diameter ductile iron forcemain (pipe) with no service connections that extends from the treatment plant to the elevated reservoir/tower.



Water Storage and Pumping Capabilities

The tower is located approximately 150 m to the west of the Virginiatown Community Centre at the intersection of Twenty-Seventh Avenue and Twenty-Seventh Street within the community of North Virginiatown. The tower has 1,300 cubic metres of usable volume for water storage. A free chlorine residual analyzer and a pressure transmitter both using a circular chart recorder are on-site and utilize the alarm communication device. An 8" Promag 50W magnetic flow meter was installed on the tower discharge line in June 2015 to continuously monitor the flow rate and daily volume of treated water directed to the distribution system. Piping for filling, discharging, draining, sampling and bypassing purposes are also housed within the elevated water storage.

Emergency Power

A 56 kW diesel engine generator set and its associated fuel storage and secondary spill containment is available at the pump house for standby power.

A 15 KW diesel generator is also available outside the water tower to provide emergency power in case of a power failure.

Distribution System

The distribution system serves an estimated population of approximately 600 people spread throughout the residential areas of Virginiatown, North Virginiatown and Kearns. The distribution system itself consists primarily of ten (10), eight (8), and six (6) inch ductile iron constructed water mains. The service life of the distribution system ranges from 60 years (for the North Virginiatown sector) to 80 years (for the Virginiatown sector). More recent watermain installations and repair sections are comprised of polyvinyl chlorite (PVC) piping. There are 48 fire hydrants connected to the distribution system to aid in fire protection. Based on the number of service connections, the system is classified as a Large Municipal Residential Drinking Water System.

3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD

Sodium Hypochlorite, used as a disinfectant, was the only chemical used at the Water Treatment Plant.

This chemical meets AWWA and NSF/ANSI standards.

4.0 SIGNIFICANT EXPENSES INCURRED IN THE DRINKING WATER SYSTEM

OCWA is committed to maintaining the assets of the drinking water system and sustains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).



Significant expenses incurred in the drinking water system include:

- chemical upset limit
- genset maintenance
- lifting device inspections
- main break AWQI 161079
- main break Dorfman
- replace hour meter

5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER

March 28 – Revised the table below as incidents for October 12 (AWQI 163782) and 13 (AWQI 163800) were previously missed

Based on information kept on record by OCWA, the following adverse water quality incidents were reported to the Ministry’s Spills Action Centre in 2023.

Date	AWQI No.	Details
January 3	161079	<p>Category 2 watermain break at 4 Lynch Avenue caused a loss of pressure to 19 homes. The main was isolated prior to repairing 2 holes with repair bands. The local Health Unit was notified and a precautionary boil water advisory (BWA) was issued for the affected area.</p> <p>After the repair was complete, the pressure was restored and the area was flushed until an acceptable chlorine residual was achieved (0.56 mg/L). Two sets of 3 bacteriological samples were collected (upstream, downstream and at the site of the break) on January 3rd and 4th. Sample results indicated no total coliforms or E.coli. BWA was lifted on January 5th at approximately 4:30 PM</p>
January 30	161250	<p>Category 2 watermain break at 28th Street caused a loss of pressure to 18 homes. The main was isolated to repair a circumferential break on a 6 inch main with a clamp. The local Health Unit was notified and a precautionary BWA was issued for the affected area.</p> <p>After the repair was complete, the pressure was restored and the area was flushed until an acceptable chlorine residual was achieved (1.52 mg/L). Two sets of 3 bacteriological samples were collected (upstream, downstream and at the site of the break) on January 30th and 31st. Sample results indicated no total coliforms or E.coli (lab reports attached). BWA was lifted on February 1st at approximately 4:38 PM.</p>
April 26	161838	<p>April 26 - Category 2 watermain break at 17 Dorfman Street caused a loss of pressure to 6 homes with active service, and 1 business (Legion building). One home on the line has no active service. The main was isolated to repair a split in a 6 inch main with a repair band. The local Health Unit was notified and a BWA was issued for the affected area.</p>



Date	AWQI No.	Details
		After the repair was complete, the pressure was restored and the area was flushed until an acceptable chlorine residual was achieved (0.55 mg/L). Two sets of 3 bacteriological samples were collected (upstream, downstream and at the site of the break) on April 27th and 28th. Sample results indicated no total coliforms or <i>E. coli</i> . BWA was lifted on May 1st at approximately 10:15 AM
August 5	162949	Watermain repair/LOP/BWA – 24 th Ave and 25 th Ave were without pressure during a watermain break; a boil water advisory was issued. After sampling, the BWA was lifted on August 11
September 4	163291	Watermain repair/LOP/BWA Dorfman Street south of Connell Ave was without pressure during a watermain break thus a boil water advisory was issued. After sampling, the BWA was lifted on September 7
September 17	163488	Alarms unable to call out – the service issues Northern Telephone experienced, and were working to fix, impacted the ability of the alarm at the water plant to call an operator during an alarm condition. Remote monitoring of the plant conditions via SCADA/Wonderware were increased. The loss of the ability of alarms to call out was reported as a precaution. There were no true adverse conditions in the water plant. With the landline service fully restored, this issue is now resolved.
October 12	163782	Watermain break and subsequent loss of pressure during repairs affecting all of Lynch, Hummle, Casselman and Barkley Avenues. BWA was issued by THU and lifted on October 17 after two sets of samples taken 24-48 hours apart were free of bacteria.
October 13	163800	October 13 sample from 100 Highway 66 (Cheminis Lodge) taken at 19:16 was positive for TC - 2 cfu/100 mL; free chlorine residual of 1.0 mg/L. This sample was collected as part of the samples to lift the BWA (AWQI 163782) but is upstream of the affected area. October 15 - re-samples were collected at 100 Hwy 66, upstream (POE) and downstream (23 Kearns Ave). These samples were free of TC/EC thus resolving this incident.
November 20	164057	Watermain break and subsequent loss of pressure during repairs caused a BWA to be issued affecting Casselman Ave
December 12	164197	Due to the location of the required repair on the line to the tower, and the strong chance of contamination, a BWA was issued to the entire community



6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples	Range of <i>E. coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw (production well)	52	0 to 0	0 to 1	N/A	N/A
Raw (standby well)	52	0 to 0	0 to 16	N/A	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to >2000
Distribution	104	0 to 0	0 to 0	52	< 10 to 80

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

"<" denotes less than the laboratory's method detection limit.

Notes:

- One microbiological sample is collected and tested each week from the raw (each well) and treated water supply. A total of two microbiological samples are collected and tested each week from the Virginiatown-Kearns distribution system. At least 25% of the distribution samples must be tested for HPC bacteria.

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure
Turbidity (production well)	23	0.11 to 1.06	NTU
Turbidity (standby well)	23	0.13 to 3.39	NTU

Note:

- Turbidity samples are required once every month.

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	8760	0.66 to 2.00	mg/L	CT

Notes:

- For continuous monitors 8760 is used as the number of samples.
- CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Virginiatown-Kearns drinking water system if the free chlorine residual level drops below 0.10 mg/L to ensure primary disinfection is achieved.



Summary of Chlorine Residual Data in the Distribution System

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	364	0.35 to 2.36	mg/L	≥ 0.05

Note: A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.

Summary of Nitrate & Nitrite Data (sampled at the plant's point of entry into the distribution every quarter)

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 9	0.1	< 0.01	mg/L	No
April 11	0.1	< 0.01	mg/L	No
July 10	< 0.1	< 0.01	mg/L	No
October 10	< 0.1	0.02	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L

MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 9	2.2	ug/L		
April 11	2.4	ug/L		
July 10	22	ug/L	7.5	No
October 10	3.2	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acid Data (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 9	<8	ug/L		
April 11	<8	ug/L		
July 10	<8	ug/L	<8	No
October 10	<8	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acid = 80 ug/L (Four Quarter Running Average)



Summary of Most Recent Lead Data under Schedule 15.1

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Virginiatown-Kearns Drinking Water System was eligible to follow the “Exemption from Plumbing Sampling” as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L for lead. As such, the system was required to test for total alkalinity and pH in two distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Two rounds of alkalinity and pH testing were carried out on March 13th and October 12th of 2023. Results are summarized in the table below.

Summary of Lead Data (sampled in the distribution system)

Date of Sample	# of Samples	Field pH (min to max)	Field Temperature (°C) (min to max)	Alkalinity (mg/L) (min to max)	Lead (ug/L) (min to max)
March 13	2	7.39 to 7.45	6.9 to 7.1	61 to 125	0.2 to 0.6
October 11&12	2	7.33 to 8.01	9.1 to 11.3	71 to 72	<0.1 to 0.2

Note: Next lead sampling scheduled for 2026

Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	1.0	ug/L	10	No	No
Barium	9.0	ug/L	1000	No	No
Boron	< 2.0	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	< 0.2	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

Note: Sample required every 36 months (sample date = October 10, 2023). Next sampling scheduled for October 2026

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.289	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.216	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No



Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Bromoxynil	< 0.099	ug/L	5	No	No
Carbaryl	< 2.0	ug/L	90	No	No
Carbofuran	< 4.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.216	ug/L	90	No	No
Diazinon	< 0.216	ug/L	20	No	No
Dicamba	< 0.087	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.2	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.2	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.371	ug/L	100	No	No
Diclofop-methyl	< 0.124	ug/L	9	No	No
Dimethoate	< 0.216	ug/L	20	No	No
Diquat	< 0.2	ug/L	70	No	No
Diuron	< 10.0	ug/L	150	No	No
Glyphosate	< 20.0	ug/L	280	No	No
Malathion	< 0.216	ug/L	190	No	No
Metolachlor	< 0.144	ug/L	50	No	No
Metribuzin	< 0.144	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.2	ug/L	10	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.144	ug/L	2	No	No
Picloram	< 0.087	ug/L	190	No	No
Prometryne	< 0.072	ug/L	1	No	No
Simazine	< 0.216	ug/L	10	No	No
Terbufos	< 0.144	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	10	No	No
2,3,4,6-Tetrachlorophenol	< 0.3	ug/L	100	No	No
Triallate	< 0.144	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	5	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 6.18	ug/L	100	No	No
Trifluralin	< 0.144	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = October 10, 2023). Next sampling scheduled for October 2026



Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	15.3	mg/L	20	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	< 0.05	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Additional Testing Performed in Accordance with an Approval, Order or Legal Instrument

No additional regulatory sampling and testing was required for the Virginiatown-Kearns Drinking Water System during the 2023 reporting period.

The background features four thick, light blue wavy lines that curve across the page, creating a sense of movement and water. The lines are positioned behind the text, with the top line arching over the title and the others following a similar wavy pattern below.

Virginiatown-Kearns Drinking Water System

Schedule 22

2023 SUMMARY REPORT

FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name:	Virginiatown-Kearns Drinking Water System
Municipal Drinking Water Licence (MDWL) No.:	280-101-5 (issued November 9, 2020)
Drinking Water Work Permit (DWWP) No.:	279-201-5 (issued November 9, 2020)
Permit to Take Water (PTTW) No.:	8844-C6UQEY (issued September 16, 2021)
Period being reported:	January 1 to December 31, 2023

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Virginiatown-Kearns Drinking Water System failed to meet the following requirements during the 2023 reporting period:

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Corrective Action(s)
O. Reg. 170/03, 6-5, (1)1-4; (1)5-10; (1.1);	Where required continuous monitoring equipment, used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person did not respond in a timely manner and/or did not take appropriate actions	On September 17, 2023, the landlines were discovered to be down at 12:30pm, which prevented the alarms to call-out. The operators remotely monitored the system until the lines were restored on September 17, 2023 at 11:30pm. Reported as an AWQI

It should be mentioned that eight (8) adverse water quality incidents were reported to the Ministry’s Spills Action Center. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 5 of this report for details.

3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS

Flow Monitoring

MDWL No. 280-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.



The Virginiatown-Kearns drinking water system has a flow meter installed on the raw water header which was considered sufficient to satisfy the requirement of the licence since there was no water loss from processes between the raw source and the point of discharge of treated water at the water tower. Although this flow meter satisfied the flow monitoring requirements, a magnetic flow meter was installed on the discharge header of the North Virginiatown Elevated Storage Tank to continuously monitor the treated water entering the distribution system. These flow meters are calibrated on an annual basis as specified in the manufacturers’ instructions

Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2023 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

Table A: 2023 - Monthly Summary of Water Takings from Cheminis Well No. 1

Regulated by Permit to Take Water (PTTW) # 1034-9UHP99, issued March 12, 2015 and PTTW # 8844-C6UQEY issued on September 16, 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	15,183	13,256	15,572	14,489	14,582	12,597	12,098	11,153	9,136	10,017	10,616	10,752	149,451
Average Volume (m ³ /d)	490	473	502	483	470	420	390	360	305	323	354	347	410
Maximum Volume (m ³ /d)	590	586	572	564	638	509	495	599	434	672	563	459	672
PTTW - Maximum Allowable Volume (m ³ /day)	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045
Maximum Flow Rate (L/min)	1,389	1,328	1,355	1,331	1,344	1,401	1,378	1,372	1,401	1,402	1,410	1,370	1,410
PTTW - Maximum Allowable Flow Rate (L/min)	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420	1,420

Table B: 2023 - Monthly Summary of Water Takings from Standby Well T3/91 Well No. 2

Regulated by Permit to Take Water (PTTW) # 1034-9UHP99, issued March 12, 2015 and PTTW # 8844-C6UQEY issued on September 16, 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	280	265	288	198	281	273	201	196	257	187	225	169	2,820
Average Volume (m ³ /d)	9	9	9	7	9	9	6	6	9	6	8	5	8
Maximum Volume (m ³ /d)	74	68	74	65	77	70	67	66	69	62	77	63	77
PTTW - Maximum Allowable Volume (m ³ /day)	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Maximum Flow Rate (L/min)	1,105	1,097	1,101	1,105	1,102	1,101	1,104	1,099	1,101	1,104	1,222	1,100	1,222
PTTW - Maximum Allowable Flow Rate (L/min)	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105	1,105

Note: High flows on November 30th due to a spike on startup of the well pump.

Table C: Combined Water Taking (Well No. 1 and Well No. 2)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	15,463	13,521	15,860	14,687	14,863	12,870	12,299	11,349	9,393	10,204	10,841	10,921	152,271
Average Volume (m ³ /d)	499	483	512	490	479	429	397	366	313	329	361	352	418
Maximum Volume (m ³ /d)	590	586	572	605	638	509	495	665	437	672	563	459	672
PTTW - Maximum Allowable Volume (m ³ /day)	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045



The system’s Permit to Take Water #1034-9UHP99, allows the Township to withdraw water at the following rates:

Well No. 1 (Cheminis Well):	2,044.8 m ³ /day	1,420 L/minute
Well T3/91 No. 2 (Standby Well):	1,500 m ³ /day	1,105 L/minute
Total Combined Daily Volume:	2,044.8 m³/day	

A review of the raw water flow data indicates that the system did not exceed the maximum allowable volumes during the reporting period. However, the flow rate was exceeded for Standby Well No. 2 on November 30th due to a spike on startup.

Note: The standby well (Well No. 2) is allowed to run for a maximum of 10 hours per day and 140 days per year. The well operated for a total of 90 days in 2023 and did not exceed its maximum allowable run time.

Treated Water

Table D: 2023 - Monthly Summary of Treated Water from the Water Tower to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #280-101 - Issue 5, dated November 9, 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	15,446	13,506	15,856	14,665	14,755	12,821	12,231	11,032	9,191	9,758	9,617	9,684	148,564
Average Volume (m ³ /d)	498	482	512	489	476	427	395	356	306	315	321	312	407
Maximum Volume (m ³ /d)	579	532	538	630	626	494	468	591	420	684	516	408	684
MDWL - Rated Capacity (m ³ /day)	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045

Schedule C, Section 1.0 (1.1) of MDWL No. 280-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 2045 m³/day. The Virginiatown-Kearns DWS complied with this limit having a recorded maximum volume of 684 m³, which represents 33.4% of the rated capacity.

Table E and Figure 1 compare the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL.

Table E: 2023 - Comparison of Treated Water Flows to the Rated Capacity

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m ³ /day)	498	482	512	489	476	427	395	356	306	315	321	312
Maximum Flow (m ³ /day)	579	532	538	630	626	494	468	591	420	684	516	408
MDWL - Rated Capacity	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045	2,045
% Rated Capacity	28.3	26.0	26.3	30.8	30.6	24.2	22.9	28.9	20.5	33.4	25.2	20.0

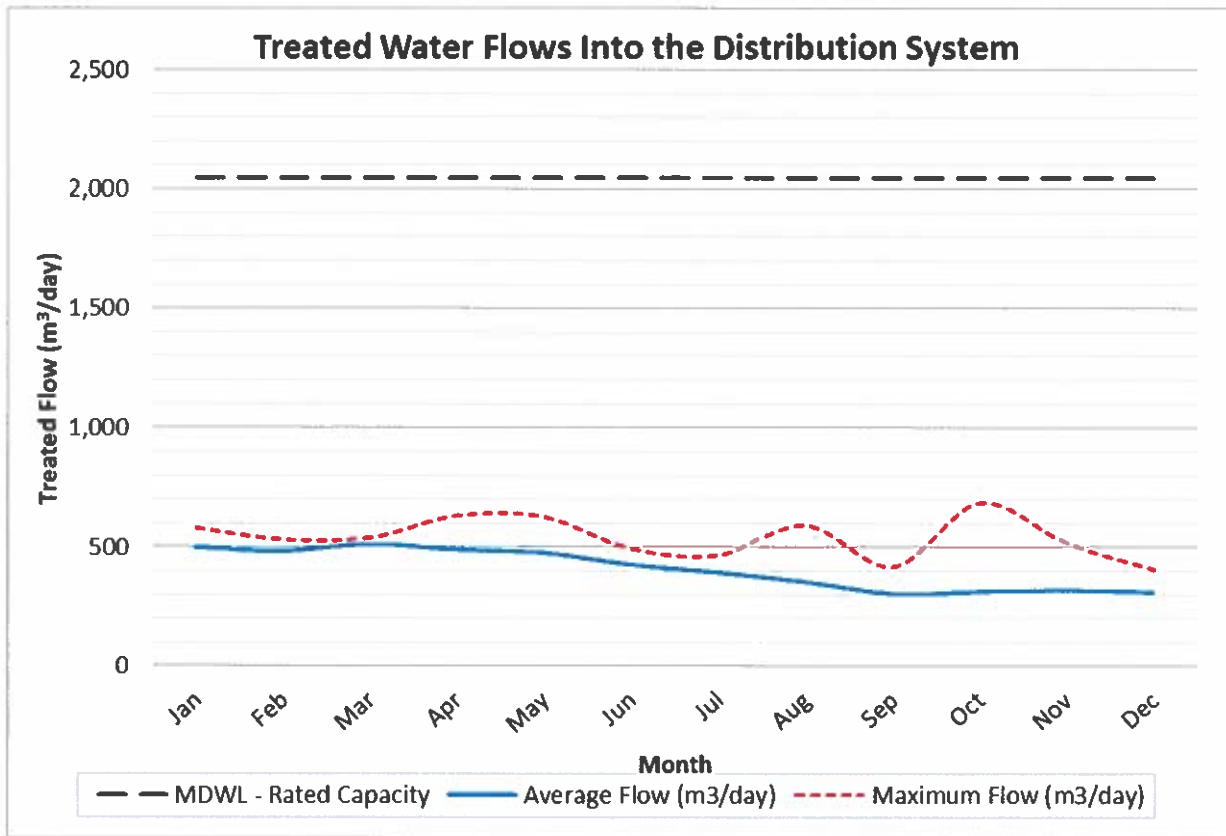


Figure 1: 2023 - Comparison of Treated Water Flows to the Rated Capacity

Summary of System Performance

The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs.

Rated Capacity of the Plant (MDWL)	2,045 m ³ /day	
Average Daily Flow for 2023	407 m ³ /day	19.9 % of the rated capacity
Maximum Daily Flow for 2023	684 m ³ /day	33.4 % of the rated capacity
Total Treated Water Produced in 2023	148,564 m ³	

Historical Flows

Virginiatown-Kearns Water Treatment Plant – Historical Flow Comparison

Year	Maximum Treated Flow (m ³ /d)	Average Daily Treated Flow (m ³ /d)	Average Day % of Rated Capacity (2045 m ³ /d)
2023	684	407	19.9%
2022	1,254	458	22.4%
2021	789	391	19.1%
2020	889	515	25.2%
2019	988	634	31.0%

Table F and Figure 2 compare the average treated water flows from 2019 to 2023.

Table F: Virginiatown-Kearns Water Treatment System - Average Treated Water Tower Flows from 2019 to 2023

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019 Average Flow (m ³ /day)	701	856	785	704	650	624	575	513	565	509	509	610
2020 Average Flow (m ³ /day)	646	609	589	604	640	621	534	452	458	332	326	372
2021 Average Flow (m ³ /day)	385	448	492	476	440	365	369	332	303	355	378	355
2022 Average Flow (m ³ /day)	434	410	570	610	535	455	449	315	288	379	497	552
2023 Average Flow (m ³ /day)	498	482	512	489	476	427	395	356	306	315	321	312
MDWL - Rated Capacity (m ³ /day)	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045

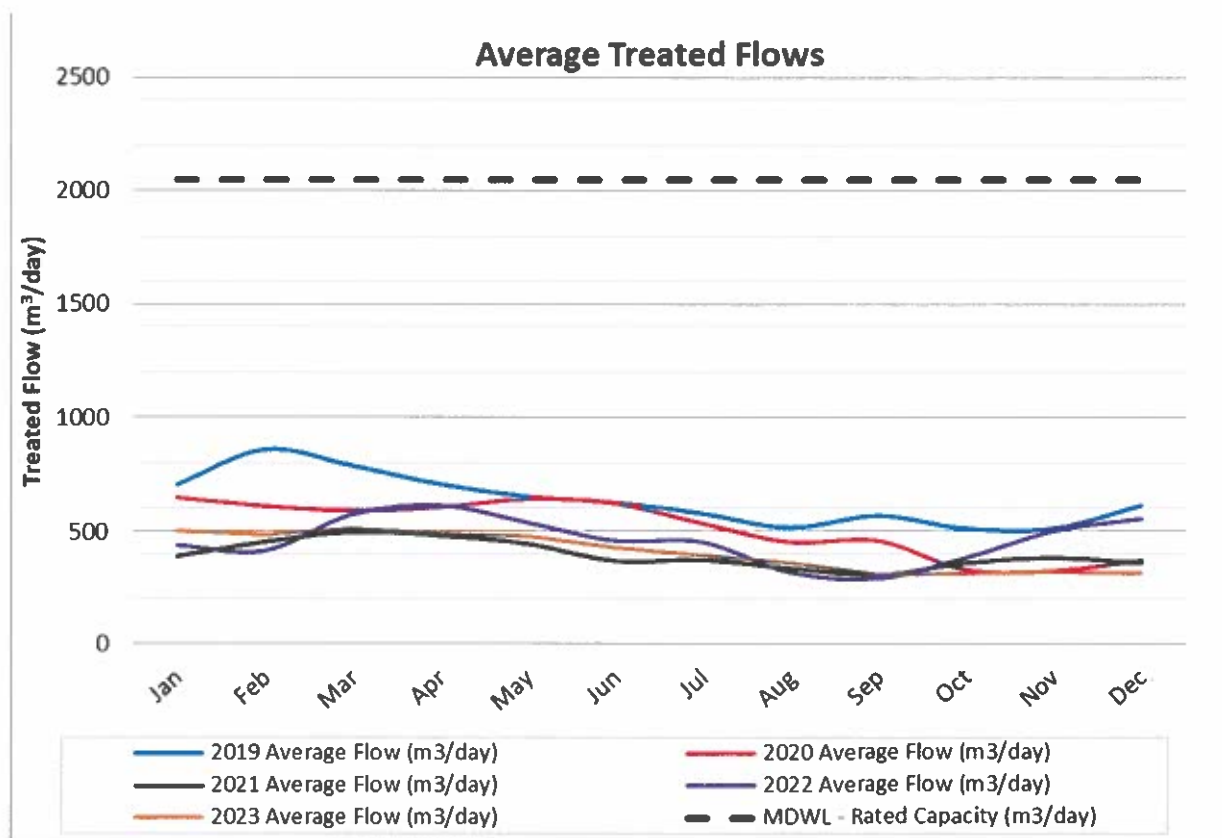


Figure 1: 2023 - Comparison of Treated Water Flows to the Rated Capacity

CONCLUSION

The water quality data collected in 2023 demonstrates that the Virginiatown-Kearns drinking water system provided high quality drinking water to its users.

The system was able to operate within the water taking volumes of the permit to take water and in accordance with the rated capacity of the licence while meeting the community’s demand for water use.



All Adverse Water Quality Incidents were reported to the Ministry's Spills Action Center and the corrective actions were completed as required and any non-compliances that were identified were resolved as soon as possible.