



Region of Waterloo

2017 Summary Report

Presented to Regional Council - March 2018

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1. Overview & Background

This report addresses the requirements as defined under the Safe Drinking Water Act and the Drinking Water Quality Management System.

1.1 Safe Drinking Water Act

Schedule 22-2 of Ontario Regulation 170/03 states that owners of municipal drinking water systems shall ensure that, no later than March 31, of each year, a summary report is prepared for the preceding calendar year and presented to the members of municipal council. This report includes:

- (1) A list of the requirements in the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water license, and any order applicable to the system that was not met at any time during the period covered by the report;
- (2) for each requirement in (1) specify the duration of the failure and the measures that were taken to correct the failure;
- (3) a summary of the quantities of flow rates of water supplied during the period covered by the report, including monthly average and maximum flows;
- (4) a comparison of the summary referred in (3) to the rated capacity flow rates in the system's approval, drinking water works permit or municipal drinking water license.

This summary report represents all the drinking water supply systems in the Region and the distribution systems in North Dumfries and Wellesley. The water supply for the Region is from two sources: approximately 75 percent is from ground water wells and 25 percent is from the Grand River (Mannheim Water Treatment Plant).

This report captures non-compliance issues and corresponding corrective action(s) or mitigating measure(s). The Adverse Water Quality Incidents (AWQIs) not captured in the 2017 Annual Water Quality Report (issued February 28th) are identified in Appendix A.

1.2 Drinking Water Quality Management System (QMS) Conformance and Municipal Drinking Water Licensing Program

To obtain and maintain a Municipal Drinking Water License (MDWL) the Region must hold: a valid Drinking Water Works Permits (DWWP), a valid Permit To Take Water (PTTW) for each water source, operational plans as approved by the Ministry of Environment and Climate Change (MOECC), third party accreditation (audit based on DWQMS 21 Elements), and financial plans approved by Regional Council. Each Municipal Drinking Water License (MDWL) and each Financial Plan must be renewed every 5 years. Reaccreditation was successfully obtained in 2016, and 14 new MDWLs were issued.

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Management Review

The management review must be conducted annually to evaluate the suitability, adequacy and effectiveness of the Quality Management System (QMS) with the results being communicated to Regional Council as the system owner. The management review provides evidence of continued endorsement and commitment to the QMS from Top Management.

The QMS annual management review was conducted on December 19, 2017 and included discussion of non-compliance issues and corresponding corrective/preventative action(s). There were no major non-conformances identified with the QMS. The 2017 management review minutes, identified deficiencies, decisions and action items, are included in Appendix B.

Infrastructure Review

DWQMS (Element 14 and 15) requires that the operational plan document a summary and monitor the effectiveness of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the systems and to communicate these programs and any updates to the Owner. Asset management and maintenance programs are established and maintained to ensure repair and replacement of water system infrastructure. An overview of the infrastructure maintenance is found in section 5.

2. Health Related Notifications – Boil Water Advisories (BWA)/Drinking Water Advisories (DWA)

The Region of Waterloo Water Services Division, in collaboration with the Public Health Department, ensures a safe water supply. There were no BWA or DWA issued during 2017.

3. Regulatory Compliance

The MOECC drinking water system inspections focuses on compliance with the SDWA and related regulations. The following legislative requirements apply to municipally owned and operated drinking water systems:

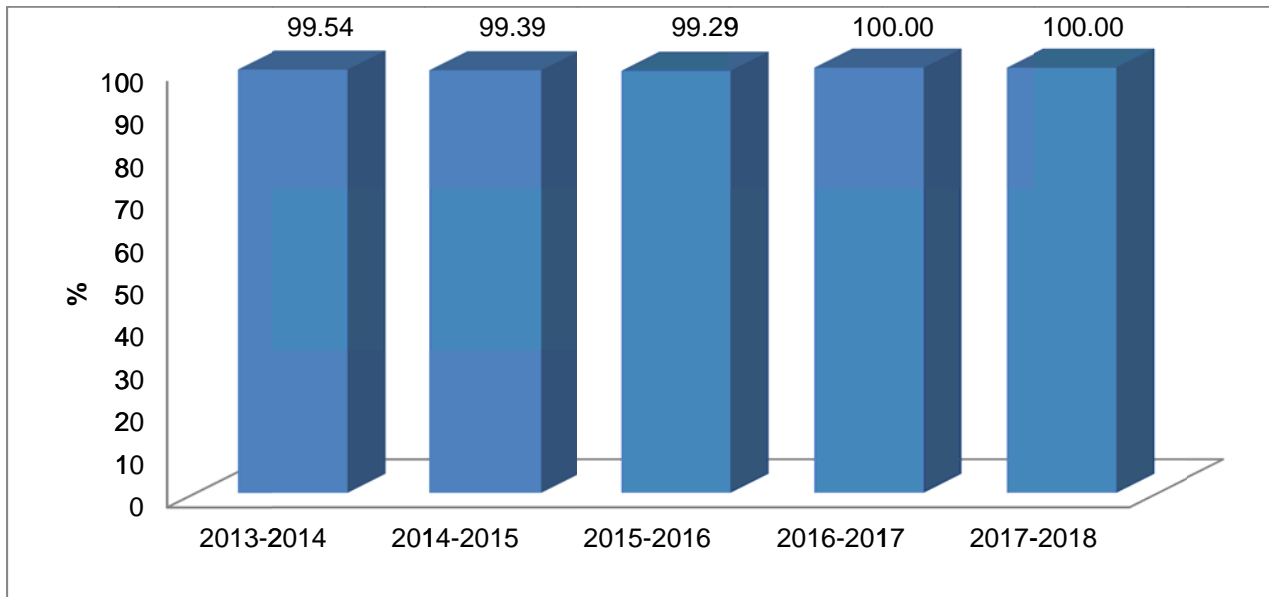
- proper documentation;
- sampling and analytical testing;
- adverse water quality incident reporting (AWQI);
- proper treatment and maintenance;
- corrective actions;
- Municipal Drinking Water Licenses;
- Drinking Water Works Permits;
- accreditation
- continuous water quality monitoring;

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- flow monitoring;
- calibration/verification of flow meters and instrumentation and
- certified operators.

The 2016-17 MOECC Chief Drinking Water Inspector's report released in October 2017 identifies 22 inspection reports with a 100% compliance rating for the Region of Waterloo. During 2017, eighteen (18) drinking water system inspections were completed. One (1) inspection was completed for the 2016/2017 inspection period and seventeen (17) inspections were completed for the 2017/2018 inspection period. For the two most recent inspection periods, all inspections have received a 100 percent compliance rating. The MOECC inspections for the 2017/2018 period not included in this report will be captured in the 2018 Annual Summary Report. Chart 1 below compares the average MOECC inspection compliance ratings over the past 5 years and Appendix E summarizes the ratings for this inspection year.

Chart 1 – MOECC Average Inspections Ratings



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Table 1 – Summary of Non-Compliance Issues under the Safe Drinking Water Act (SDWA), Municipal Drinking Water Licenses (MDWL), Drinking Water Works Permits (DWPPs), Permits to Take Water (PTTW) and the Ontario Water Resources Act (OWRA)

Date	Description	Root Cause	Preventative/ Corrective Action
O.Reg. 170/03 – Schedule 6-5 - Continuous Monitoring			
Oct 15 15:28-16:18 (duration – 50 minutes)	<u>Erb Street Reservoir</u> Primary disinfection data not captured. Following a power outage, wells automatically restarted when power was restored while power remained off to the analyzer located at the reservoir building.	Wells and reservoir backup power were not synchronized.	Investigate potential program and network communication changes between wells and reservoir to shut off wells if communication is lost to regulatory analyzer.
Sept 21 09:08-09:27 (duration – 19 minutes)	<u>Mannheim Water Treatment Plant</u> Primary disinfection data not captured. Battery back up failure resulted in a chlorine residual analyzer going offline.	During a scheduled generator test, a UPS failure affected a regulatory analyzer.	Re-routed electrical supply to analyzer.
O.Reg. 170/03 – Schedule 10			
Weeks of July 10 and September 4	<u>Aquifer Storage and Recovery/Recovery Wells</u> Weekly raw water bacteriological samples not collected.	Operator was unaware of requirement to sample.	Discussed the requirements with staff. Weekly verification initiated.
IUS MDWL# 012-102 Sch. C, Section 1.6 Table 4.0 - UV Disinfection Equipment			
Week of Dec 5	<u>Well K24</u> Weekly UV Transmittance sample not collected.	Sampling/scheduling error.	Weekly verification initiated.

4. Hydraulic Performance

A summary of the monthly average and maximum flow rates of water supplied are identified in Appendix C.

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The Region of Waterloo Drinking Water systems have 38 Permits to Take Water (PTTW), 14 Municipal Drinking Water Licenses (MDWL) and 14 Drinking Water Works Permits (DWWP). Refer to Appendix D for a full list of PTTW, MDWLs/DWWPs.

5. Preventative Maintenance Programs

Elements 14 and 15 of the DWQMS require that the operational plan documents a procedure for the annual review of infrastructure necessary to operate and maintain the system. Element 14 requires that the operating authority carry out the review and report to the owner. This ensures that the owner is regularly informed of infrastructure needs and can plan accordingly. Element 15 is about documenting a summary of the maintenance, rehabilitation and renewal programs for the infrastructure. These summaries must be updated as changes occur and must be communicated to the owner. Monitoring the effectiveness of the maintenance program is achieved by periodically reviewing the maintenance program and confirming the effectiveness of the program.

Avantis is a computerized maintenance management software (CMMS) system that manages the infrastructure, equipment and components at water facilities. The system is used to develop, monitor, and report on preventative maintenance plans for the equipment. Preventative maintenance is based on industry standards, regulatory requirements, past history, manufacturers' recommendations and risk analysis. As of 2017, the following preventative maintenance programs exist:

- As per the MDWL and/or Reg. 170/03, instrumentation is calibrated and/or verified in accordance with manufacturer's instructions with the exception of the billing meters; a third party calibrates and/or verifies the billing meters annually.
- Instrumentation such as ultraviolet sensors, ultraviolet transmission, chlorine, and turbidity analyzers, ozone monitors, and other equipment are calibrated and/or verified in-house as per manufacturer's recommendations.
- A software program monitors the status of the SCADA RPU communication system.
- Process and Instrumentation Drawings (P&IDs) are reviewed and maintained as needed.
- Electrically, the UV ballasts are run to failure and the UV lamps are replaced as per manufacturer's instructions.
- CSA guidelines have specific requirements for diesel generators, such as an annual load bank test, run under load for rated power, oil changes, coolant, filters, electrical test of alternator, test oil for engine problems and efficiency. There is a contract with Toromont to ensure CSA requirements are met.
- In house backup diesel generators are run monthly under load and preventative maintenance is conducted in accordance with CSA guidelines.
- Sub Station Maintenance, done twice per year, involves a visual inspection, oil testing of transformers, check connections for tightness and electrical integrity of components by Megger testing.

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- All other electrical components are replaced as needed.
- Mechanically, chlorine injectors are rebuilt monthly at all sites except Mannheim, booster pumps are maintained as required, chemical pumps are checked monthly and rebuilt as required. Piping and valve work is done as required. Air chambers are checked yearly and pumped out as required and Process Flow Diagrams (PFDs) are updated as needed.
- Distribution maintenance for North Dumfries and Wellesley Townships includes annual water main flushing and hydrant maintenance. All valves are operated over a 5 year span. Water main repairs, service leaks, meter replacement and locates occur as needed.
- Distribution maintenance, including water main repairs on the trunk mains are done by the cities or a third party contractor. Programs exist and vary by city for leak detection analysis, locates, and flushing. A more enhanced program continues to be developed to ensure that valves are exercised and remain operational.

6. Well Maintenance

Wells are maintained in accordance with O. Reg. 903, (Ontario Water Resources Act) and O.Reg. 170/03 (Sch.1). Routine well inspections indicated production wells and monitoring wells were in compliance. In 2017, the MOECC expressed concerns with the methodology used to decommission production well FG2. A mitigation plan has been submitted outlining a revised decommissioning methodology.

7. Asset Management and Capital Infrastructure Replacement Program

The Region's key asset management principle is to meet service levels and to manage risk, while minimizing life cycle costs. Risk events, such as an asset failure, are events which may compromise the delivery of the Region's strategic objectives. The Region's asset risk assessment takes into account potential losses to services, financial loss, and potential safety hazards. All assets are scored according to the impact of asset failure against these criteria and the likelihood of that failure occurring based on asset age, condition and performance.

Renewal work involves replacing assets or components of assets to avoid service failure. For those assets with a higher risk profile, renewal works are timed to minimize any risk of failure, while obtaining the longest economic and service life from the assets. The objective is to replace critical assets before condition deteriorates into a poor or very poor state (which would increase the risk of failure).

The predominant drivers of renewals investment are as follows:

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- Current condition and performance: The Region regularly inspects its assets to monitor their condition and performance, according to Water Service's Inventory and Condition Assessment Protocol and supporting data template.
- Rate of deterioration: Examination of the rate of deterioration over time based on current condition, compared to expected service life.
- Renewals intervention point: Establishing a renewals intervention point based on the level of service required and its risk categorization.

The above summary has established the foundation upon which asset management and capital infrastructure replacement decisions are made. In addition, regular preventative maintenance is also performed to maintain the condition of assets and help ensure expected service lives are achieved.

In 2017, asset management activities included:

- Annual Elevated Tank Inspection Program. The Region undertakes an annual tank inspection program to examine ladders, landings, handrails, appurtenances, external and internal coatings, venting and overflow screens. These inspections meet or exceed the recommended requirements set out in the AWWA Standard M42-Steel Water Storage Tanks.
- Reservoir cleaning and re-coating: Based on the finding of the Annual Elevated Tank Inspection Program, elevated tanks undergo or are scheduled for major maintenance of cleaning or re-coating to help ensure sustainable operation and extend service life.
- Energy Assessments: When equipment replacement is being considered, and it is determined that more energy efficient alternatives are available, energy assessments are undertaken. These assessments confirm the cost benefits of replacing an asset with the potential energy savings, replacement incentives, and payback period, to find the most appropriate replacement alternative.
- Annual review, prioritization and coordination of watermain replacements: Watermain replacement requirements are reviewed based on the age, material, and condition (break history and leakage reports where available) and are coordinated with both Regional and Local transportation capital programs.
- Water Facility Inventory, Condition, and Risk Assessment Updates: Facility inventory and condition assessments are performed to recognize all major building, process, and site works assets and components, as well as to assess the current physical and performance (capacity, suitability, quality, quantity, and cost or energy efficiency). These assessments combined with criticality will provide the risk assessment for water facilities. Resulting information provides input into the annual and extended 25 year capital forecast of repair and replacements.
- Optimized Decision Making Process (ODMP): The ODMP draft process flow was developed; that is the process whereby an asset deficiency is observed in the field to

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the point where it is on a list of prioritized projects for implementation. The process is a four (step) processes that includes the following steps and documentation:

- Identify the Asset Issue and the Root Cause analysis
 - Assess the impacts and measures to mitigate
 - Gather Information and Identify the best approach to address the asset issue
 - Review project deliver options
 - Develop project verification, prioritization, and implementation plan.
- **Asset Management Planning:** The Ministry filed O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure on December 27, 2017 under the “Infrastructure for Jobs and Prosperity Act”. The regulation requires that every municipality prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five (5) years. The regulation also requires that every municipality prepare an asset management plan for its core municipal infrastructure assets by July 1, 2021, and for all of its other municipal infrastructure assets by July 1, 2023.

In 2017 the Region outlined a proposed schedule to meeting the primary requirements of O. Reg. 588/17:

- Council approved the Region’s Corporate Asset Management Policy in 2016. Region staff propose to complete their second asset management policy during the first six months of 2019 to meet the July 1, deadline.
- The 2015 Region of Waterloo Corporate Asset Management Plan, completed in 2016, already includes all infrastructure assets and staff propose that the second version of the Asset Management Plan be completed in 2020 using 2019 data inclusive of all municipal infrastructure as required of the province by July 1, 2023.
- The Asset Management Plan (AM Plan) is a long range planning document that is used to provide a rational framework for managing the Region’s assets. The Region’s AM Plan contains consolidated information that is currently available for the Region’s assets to provide both a short term (10 years) and a long term (100 years) focus. The AM Plan is a written representation of proposed risk reduction programs and strategies for the Region’s assets based on understanding of customer requirements, regulatory compliance, and the ability of the assets to meet required levels of service. This AM Plan identifies future costs and assists in predicting future problems that may hinder service delivery. This creates opportunities for the Region’s asset managers and operators to remove physical, financial and political barriers before they negatively impact customer levels of service.

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In addition to the above mentioned asset management activities within Water Services, the Region of Waterloo also began a multi-year Asset Management System Implementation Project (AMSIP). The project is comprised of two primary components:

1. Work Management System Implementation (Lucity) - an enterprise level software product to be used by all asset-owning Divisions at the Region of Waterloo to perform maintenance and all other work on assets.
2. Decision Support System acquisition and implementation - a set of correlated tools that work with the Work Management System in an integrated fashion to facilitate decision making for determining the appropriate rehabilitation, restoration, replacement, or maintenance strategies for optimal Asset performance.

Integrated with other key corporate systems, these systems will enable staff to make better decisions related to asset maintenance, help forecast capital works, improve efficiencies through enhanced work planning and scheduling, provide consistent metrics for comparing assets across Divisions and allow better reporting to help Council make more informed decisions.

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Appendix A – Adverse Water Quality Incidents (AWQI) for Regional Distribution Systems (IUS)

AWQI	Date	Location	Parameter	Result	Unit	Corrective Action
135870	August 24	Waterloo Drinking Water Supply System - Elmira	Combined Chlorine	<0.25	mg/L	Resampled, Disinfection restored, Flushed mains
136741	September 16	Waterloo Drinking Water Supply System - St. Agatha	Combined Chlorine	<0.25	mg/L	Resampled, Disinfection restored, Flushed mains

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Appendix B – QMS Management Review

DATE: December 19, 2017

TIME: 1:30pm – 4:00pm

PLACE: Mannheim Training Room

PRESENT:

Thomas Schmidt

Nancy Kodousek

Olga Vrentzos

Dale Wiens

Peter Clarke

Kathy Taylor

Frank Infante

Chris Komorowski (PH)

ABSENT:

N/A

1) **QMS MANAGEMENT REVIEW PROCESS**

A summary was provided of the Management Review purpose and objectives - to evaluate the effectiveness and appropriateness of the QMS and to address any deficiencies.

2) **QMS POLICY REVIEW AND APPROVAL**

The QMS policy (DOCS#[981236](#)) was reviewed and continues to be appropriate.

3) **DWQMS MANAGEMENT REVIEW REQUIREMENTS**

Required Management Review agenda items were discussed in accordance with the procedure DOCS#[500605](#).

4) **ROUNDTABLE DISCUSSION**

Management Review discussion conducted as per presentation (DOCS#[2561055](#)) and agenda (DOCS#[2589148](#)).

5) **PREVIOUS ACTION ITEMS- FOLLOW-UP**

Reviewed 2016 Management Review action status:

I. UPS Testing

UPS bypass circuits are being installed at required locations. Critical sites have generator backups and UPS are not providing useful information during power outages. UPS will be removed where not required.

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Action: Systems Group

Timeline: Complete

II. Mannheim Filters - Extended Terminal Subfluidization Wash (ETSW)

ETSW has been implemented with filter to waste step included for a one year data collection period. Prior to elimination of filter to waste step, an amendment to the MDWL and DWWP is required.

Action: Supervisor, Process and Compliance

Status: Ongoing (2018)

III. Protocol for Operating Hidden Valley WMR Wells and the K80 Wells During Grand River Watershed Upsets

Work and protocol changes are planned for 2018, the required team is assembled. Reference to West Montrose wells (no longer in service) will be removed.

Action: Manager, Operations and Maintenance

Timeline: Ongoing (2018)

IV. Flood Protocol

A new SOP (DOCS#[2006598](#)) captures potential extreme weather conditions, including flooding conditions.

Action: Water Service Management Staff

Timeline: Complete

6) INCIDENTS OF REGULATORY NON-COMPLIANCE REVIEW

Four (4) regulatory non-compliance issues occurred in 2017. For each non-compliance issue a corrective/preventative action was implemented (see Management Review Presentation Slides #13-16, DOCS#[2561055](#) for details).

7) OPERATIONAL PLANS AND MUNICIPAL DRINKING WATER LICENSES

- 1 new MDWL and 4 new DWWPs were issued in 2017.

8) General

- Maryhill WTP secondary disinfection was successfully converted to a free system.
- Confirm if new Allen Bradley Controllers will impact decision to remove UPS.

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- Discussion about lowered MAC for Arsenic and verifying treatment removal.
- Add Arsenic to Raw Water Characterization in applicable Operational Plans.
- Discussed history of regulatory relief granted for AWQI reporting.
- Remove reference to West Montrose wells in applicable SOPS – wells to be decommissioned.
- Monochlor top up chloramination system trialled at Elmira West Tank – feasibility meeting scheduled in early 2018.
- Blue Green Algae SOP could be referenced in new Climate Change/Extreme Weather SOP
- When new main from St Jacobs to Conestoga Plains is online (planned for 2019), discussed proactive monitoring for HAA's.
- Discussion on changes to Reg 248 "Open Data" – all raw, treated and distribution data, including non-regulatory testing results, must be uploaded to the MOECC DWIS site beginning Jan 1, 2018.
- Discussion on impacts to Source Water Protection Plans when new wells are brought online or abandoned.
- Mannheim Reservoir dropped below 60% on one day in 2017 – result of planned maintenance activities.
- Discussed including Lead levels as a standing agenda item at meetings with Public Health.
- Invite Corporate Emergency Management Planning staff to attend next Water O&M emergency scenario testing. Scheduled for 2019.

9) NEW ACTION ITEMS

I. **Include Arsenic in 2018 Risk Assessment**

- Ontario Drinking Water Standard to be lowered from 25ug/l to 10ug/L on Jan 1, 2018. Assess applicable risk at 2018 Risk Assessment considering raw water levels and treatment effectiveness.

Action: Supervisor, Process and Compliance

Timeline: 2018

II. **REVISE CURRENT CRITICAL CONTROL LEVELS**

- Review and revise current HIHI and LOLO SCADA alarm setpoints to reduce number of CCP deviations and increase effectiveness.

Action: Supervisor, Process and Compliance

Timeline: 2018

III. **REVIEW INTERNAL AUDIT FINDINGS**

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- Six (6) non-conformance issues were identified (conducted by BluMetric).
- Twenty-three (23) opportunities for improvement were identified, implementation to be assessed and decided by management staff.

Action: Supervisor, Process and Compliance

Timeline: Ongoing (2018)

10) **NEXT STEPS**

- Non- conformance corrective action follow-up to ensure effective implementation.
- Surveillance audit scheduled for week of January 14th, 2018 off-site (document review).
- Apply to close West Montrose DWWP and MDWL when watermain from Conestoga Plains is brought online. West Montrose will no longer be a treatment system.
- Develop Non Conformance corrective action plans as applicable.
- Required to upgrade primary disinfection for K23, W10, G4/G4A, and K22A (if it is to be brought online) before December 31st, 2018.

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Appendix C – Treated Water Flow Data

The following tables summarize the flow rates for 2017, including MDWL Schedule C-Table 1 flow limits and treated water monthly average daily volumes. There were no MDWL flow limit exceedances in 2017. See Table 1 for PTTW flow exceedances.

Cambridge Drinking Water System – Wells G4/G4A			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1900 m³/day)	Monthly Average (m³/d)
January	18.37	1569	1468
February	18.38	1570	1563
March	18.44	1570	1536
April	18.42	1572	1341
May	18.26	1559	339
June	18.95	1603	1188
July	19.16	1602	1590
August	18.83	1598	1297
September	18.58	1579	1568
October	18.51	1576	1573
November	19.74	1665	708
December	19.94	1648	1130
Average			1275
Maximum	19.94	1665	

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Cambridge Drinking Water System – Wells G5/G5A			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4320 m ³ /day)	Monthly Average (m ³ /d)
January	26.13	2191	1971
February	25.75	2198	2180
March	25.79	2203	2035
April	26.32	2209	2106
May	25.91	2197	2151
June	26.44	2230	2152
July	26.02	2193	2085
August	25.78	2187	2070
September	25.56	2180	2162
October	25.80	2188	2157
November	25.39	828	31
December	25.75	2199	1345
Average			1870
Maximum	26.44	2230	

Cambridge Drinking Water System – Well G6			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1,900 m ³ /day)	Monthly Average (m ³ /d)
January	15.16	1276	1257
February	17.39	1284	1117
March	15.54	1298	1278
April	15.72	1301	1014
May	15.72	1302	1229
June	15.55	1294	1262
July	15.58	1282	1260
August	30.00*	1280	1258
September	30.00*	1612	1271
October	30.00*	1357	1372
November	16.20	1400	1343
December	16.21	1366	1346
Average			1251
Maximum	30.00*	1612	

*Brief flow spikes due to analyzer issues.

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Cambridge Drinking Water System – Well G9			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 3,280 m ³ /day)	Monthly Average (m ³ /d)
January	16.69	0	0
February	0.00	0	0
March	0.00	0	0
April	0.00	0	0
May	0.00	0	0
June	21.12	0	0
July	0.00	0	0
August	0.00	0	0
September	0.00	0	0
October	0.00	0	0
November	0.00	0	0
December	0.00	0	0
Average			0
Maximum	21.12	0	

Cambridge Drinking Water System – Well H3			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1642 m ³ /day)	Monthly Average (m ³ /d)
January	0.00	0	0
February	0.00	0	0
March	0.00	0	0
April	0.00	0	0
May	0.00	0	0
June	0.00	0	0
July	0.00	0	0
August	0.00	0	0
September	0.00	0	0
October	0.00	0	0
November	0.00	0	0
December	0.00	0	0
Average			0
Maximum	0.00	0	

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Cambridge Drinking Water System – Wells H4/H4A			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 2074 m ³ /day)	Monthly Average (m ³ /d)
January	19.22	1471	1437
February	19.27	1481	1383
March	24.13*	1494	880
April	23.83	1504	327
May	20.33	1525	1440
June	20.23	1555	1375
July	19.66	1548	1485
August	19.25	1525	1511
September	19.56	1511	1361
October	15.64	568	19
November	16.18	1379	1302
December	16.15	1320	1268
Average			1149
Maximum	24.13	1555	

*Less than 10 minute flow spike, typically on startup.

Cambridge Drinking Water System – Well H5			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1987 m ³ /day)	Monthly Average (m ³ /d)
January	0.00	0	0
February	16.24	1	0
March	0.00	0	0
April	0.00	0	0
May	15.66	82	4
June	11.34	22	1
July	13.12	821	199
August	13.28	917	845
September	12.84	881	811
October	12.24	878	848
November	12.48	899	824
December	13.78	904	844
Average			365
Maximum	16.24	917	

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Cambridge Drinking Water System – Middleton Wells (G1, G1A, G2, G3, G14, G15)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 40349 m³/day)	Monthly Average (m³/d)
January	465.31*	20873	18220
February	441.96	20657	18277
March	451.17*	19935	18191
April	450.89	21075	19176
May	450.28	21520	19398
June	450.25	21597	19751
July	445.69	20853	19337
August	403.12	21161	19409
September	430.13	21539	19796
October	429.06	20896	16428
November	405.81	18426	16470
December	421.59	17689	15789
Average			18356
Maximum	465.31	21597	

*Less than 10 minute flow spike.

Cambridge Drinking Water System – Pinebush Wells (P10, P11, P17)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 10368 m³/day)	Monthly Average (m³/d)
January	57.29	3440	2669
February	60.48	2743	1946
March	54.36	3343	2624
April	55.77	3082	2788
May	55.11	3058	2724
June	57.25	3175	2960
July	54.13	3018	2543
August	58.42	3126	2706
September	58.58	3208	2735
October	58.10	3229	2815
November	58.89	3097	2781
December	54.45	2554	1243
Average			2545
Maximum	60.48	3440	

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Cambridge Drinking Water System – Well P6			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1987 m ³ /day)	Monthly Average (m ³ /d)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Average			0
Maximum	0	0	

Cambridge Drinking Water System – Well P16			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1961 m ³ /day)	Monthly Average (m ³ /d)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Average			0
Maximum	0	0	

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Cambridge Drinking Water System – Well P9			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 2592 m ³ /day)	Monthly Average (m ³ /d)
January	20.05	1373	1281
February	16.68	1418	1362
March	16.42	1389	1346
April	16.82	1388	1323
May	16.13	1374	1319
June	16.18	1375	1335
July	16.52	1387	1305
August	15.65	1343	1294
September	14.64	1255	1209
October	16.36	1376	1060
November	16.59	1416	1346
December	16.11	1372	1327
Average			1292
Maximum	20.05	1418	

Cambridge Drinking Water System – Well P15			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1642 m ³ /day)	Monthly Average (m ³ /d)
January	16.08	822	493
February	15.56	875	753
March	12.20	893	816
April	12.85	756	680
May	12.20	715	661
June	8.00	626	614
July	8.45	649	624
August	7.53	623	610
September	29.99	1076	647
October	10.99	925	915
November	10.52	856	785
December	9.21	770	739
Average			695
Maximum	29.99	1076	

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Cambridge Drinking Water System – Shades Mill Wells (G7, G8, G38, G39)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 12960 m ³ /day)	Monthly Average (m ³ /d)
January	84.67	5527	3379
February	83.05	5898	3513
March	75.72	5826	3652
April	76.52	5609	4060
May	77.19	5982	4138
June	71.97	6054	4558
July	78.40	5840	3716
August	72.51	5308	4080
September	108.47	5265	3062
October	109.72	6509	4204
November	105.54	6704	4786
December	111.98	6449	4072
Average			3935
Maximum	111.98	6704	

Cambridge Drinking Water System – Turnbull Wells (G16, G17, G18)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 10368 m ³ /day)	Monthly Average (m ³ /d)
January	85.95	3784	2212
February	85.76	3859	2365
March	85.52	3725	2322
April	85.46	5143	2895
May	88.77	4460	2838
June	87.08	6271	3498
July	147.05*	5874	2960
August	109.03	3516	2454
September	113.67	5789	3505
October	93.79	6482	4249
November	86.86	6265	4525
December	87.49	5828	3808
Average			3136
Maximum	147.05	6482	

*Less than 10 minute flow spike, typically on startup.

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Kitchener Drinking Water System – Greenbrook Wells (K1A, K2A, K4B, K5A, K8)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 12269 m³/day)	Monthly Average (m³/d)
January	157.18	8780	7565
February	148.32	8839	7748
March	213.25	8824	7237
April	165.12	8095	6152
May	133.67	8640	7106
June	146.69	8474	7756
July	234.38	8668	8000
August	149.63	9376	7310
September	136.30	8864	6084
October	149.06	8455	5252
November	141.34	8962	8070
December	145.91	8582	2600
Average			6741
Maximum	234.38	9376	

Kitchener Drinking Water System – Wells K34/K36			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6868 m³/day)	Monthly Average (m³/d)
January	44.53	3596	3491
February	44.95	3598	2610
March	45.52	3631	2789
April	44.54	3553	3371
May	43.99	3549	3506
June	42.73	3484	3456
July	44.32	3488	3399
August	44.24	3485	3228
September	43.79	3484	3112
October	38.37	3115	2701
November	43.07	3436	3354
December	44.57	3480	3134
Average			3179
Maximum	45.52	3631	

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Kitchener Drinking Water System – Well K21			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4925 m ³ /day)	Monthly Average (m ³ /d)
January	35.03	2820	2796
February	34.46	2800	2756
March	34.19	2879	2820
April	34.54	2872	2827
May	35.62	2881	2866
June	34.23	2875	2864
July	43.13	2930	2843
August	34.25	2807	2773
September	33.92	2773	2726
October	32.28	2762	2634
November	32.22	2748	2632
December	32.09	2642	1936
Average			2706
Maximum	43.13	2930	

Kitchener Drinking Water System – Well K25			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6826 m ³ /day)	Monthly Average (m ³ /d)
January	61.76	4641	4621
February	61.22	4801	4538
March	61.76	4955	4806
April	61.85	4944	4811
May	64.80	4843	4823
June	61.43	4831	4820
July	61.70	4822	4715
August	62.25	4830	4807
September	62.30	4856	4806
October	59.41	4809	4591
November	56.37	4790	4590
December	55.07	4657	3401
Average			4611
Maximum	64.80	4955	

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Kitchener Drinking Water System – Well K29			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 5270 m ³ /day)	Monthly Average (m ³ /d)
January	57.70	4299	4272
February	60.78	4400	4275
March	49.38	3335	3269
April	52.27	3297	3241
May	46.21	3288	3259
June	40.14	3262	3246
July	46.96	3271	3231
August	46.97	3253	3235
September	45.41	3282	3212
October	41.80	3165	2985
November	41.65	3118	2990
December	50.95	3071	2232
Average			3287
Maximum	60.78	4400	

Kitchener Drinking Water System – Well K22A			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6566 m ³ /day)	Monthly Average (m ³ /d)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Average			0
Maximum	0	0	

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Kitchener Drinking Water System – Well K23			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6566 m ³ /day)	Monthly Average (m ³ /d)
January	28.23	2323	2308
February	30.78	2334	2266
March	30.59	2348	2300
April	28.83	2354	2309
May	50.00	2348	2297
June	47.15	2342	2287
July	50.00	2316	2175
August	50.00	2119	2024
September	25.35	2094	2064
October	32.78	2430	1930
November	26.51	2207	1974
December	25.98	2183	1895
Average			2152
Maximum	50.00	2430	

Kitchener Drinking Water System – Well K24			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6566 m ³ /day)	Monthly Average (m ³ /d)
January	42.30	2939	2897
February	60.00	2934	2834
March	60.00	2921	2873
April	60.00	2923	2704
May	60.00	2916	2767
June	60.00	2908	2785
July	60.00	2908	2870
August	35.33	2894	2865
September	35.03	2902	2871
October	42.85	2918	2843
November	35.82	2995	2869
December	42.95	2919	2800
Average			2831
Maximum	60.00	2995	

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Kitchener Drinking Water System – Well K26			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 9158 m ³ /day)	Monthly Average (m ³ /d)
January	87.69	7445	7434
February	89.64	7476	7119
March	90.15	7628	7527
April	91.51	7692	7188
May	90.69	7682	7496
June	92.20	7581	7395
July	90.80	7541	7434
August	100.33	7542	7002
September	95.53	7579	7556
October	91.58	7635	7290
November	91.90	7559	7268
December	90.59	7487	7326
Average			7336
Maximum	100.33	7692	

Kitchener Drinking Water System – ASR1			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 6566 m ³ /day)	Monthly Average (m ³ /d)
January	30.65	1785	227
February	44.29	1770	351
March	31.18	1551	132
April	89.81	175	33
May	49.04	2197	310
June	45.01	2123	535
July	46.39	1743	436
August	35.39	2132	651
September	36.58	2172	828
October	46.12	2076	241
November	50.24	1020	76
December	37.00	633	63
Average			323
Maximum	89.81	2197	

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Kitchener Drinking Water System – ASR2			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 3283 m ³ /day)	Monthly Average (m ³ /d)
January	34.83	2114	241
February	30.67	2179	385
March	30.69	345	11
April	35.50	1526	51
May	30.02	1818	289
June	31.55	1889	419
July	30.52	2156	491
August	30.79	2214	620
September	30.62	837	135
October	31.14	306	10
November	38.52	1398	83
December	30.65	505	58
Average			233
Maximum	38.52	2214	

Kitchener Drinking Water System – ASR3			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 3974 m ³ /day)	Monthly Average (m ³ /d)
January	22.35*	0	0
February	20.44	917	165
March	24.41	193	6
April	20.52	825	28
May	27.40	1259	175
June	21.55	1312	295
July	20.99	1117	199
August	18.49	1247	347
September	26.76	680	70
October	28.68	172	6
November	28.48	148	7
December	24.34	50	2
Average			108
Maximum	28.68	1312	

*Well running to waste.

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Kitchener Drinking Water System – ASR4			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 5443 m ³ /day)	Monthly Average (m ³ /d)
January	41.02	3132	347
February	46.17	2935	508
March	51.87	1498	68
April	44.24	1972	66
May	39.66	2531	344
June	43.09	3374	758
July	41.14	3428	698
August	48.09	2590	672
September	47.50	805	50
October	40.66	2461	268
November	41.88	1444	98
December	42.79	1049	111
Average			332
Maximum	51.87	3428	

Kitchener Drinking Water System – RCW1			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 5961 m ³ /day)	Monthly Average (m ³ /d)
January	65.06	4755	578
February	53.11	4214	759
March	51.84	2620	169
April	52.03	3048	102
May	55.62	4755	676
June	52.84	4522	897
July	61.78	4811	930
August	60.41	4323	1507
September	57.78	4951	1904
October	56.16	4163	562
November	59.01	3053	194
December	52.06	2498	380
Average			722
Maximum	65.06	4951	

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Kitchener Drinking Water System – RCW2			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 5443 m ³ /day)	Monthly Average (m ³ /d)
January	55.17	4714	562
February	55.20	4707	850
March	51.81	2638	170
April	51.95	3052	102
May	53.77	4609	659
June	55.28	4733	937
July	55.81	4772	916
August	50.70	4333	1486
September	60.20	4828	1936
October	65.52	3786	532
November	53.98	3003	188
December	50.76	2475	371
Average			726
Maximum	65.52	4828	

Kitchener Drinking Water System – K91			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4492 m ³ /day)	Monthly Average (m ³ /d)
January	37.76	3085	1012
February	36.63	3091	874
March	36.42	2780	290
April	36.88	2426	321
May	36.23	3056	863
June	35.41	3036	1096
July	35.25	3030	798
August	35.46	1554	398
September	35.62	3044	1512
October	35.65	2298	828
November	35.33	2825	881
December	36.10	2907	1217
Average			841
Maximum	37.76	3091	

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Kitchener Drinking Water System – Well K92			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4492 m ³ /day)	Monthly Average (m ³ /d)
January	49.23	4047	1387
February	49.50	4009	1093
March	48.98	3722	356
April	48.95	3195	248
May	51.16	4050	1315
June	46.91	4019	1452
July	47.02	4020	1052
August	46.81	2270	505
September	46.86	4015	2131
October	46.86	2710	1045
November	47.50	3863	1362
December	47.61	3942	1617
Average			1130
Maximum	51.16	4050	

Kitchener Drinking Water System – Well K93			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4492 m ³ /day)	Monthly Average (m ³ /d)
January	48.11	3576	1148
February	49.51	3355	945
March	46.90	3096	329
April	43.51	2651	370
May	48.84	3369	935
June	42.21	3302	1197
July	40.27	2957	813
August	37.32	1663	355
September	36.16	2839	1398
October	36.22	2260	760
November	40.90	2980	851
December	41.41	3181	1340
Average			870
Maximum	49.51	3576	

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Kitchener Drinking Water System – Well K94			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 4492 m ³ /day)	Monthly Average (m ³ /d)
January	45.90	3649	1266
February	46.07	3625	967
March	45.08	3351	327
April	45.50	2884	225
May	45.51	3640	1160
June	45.26	3626	1314
July	45.48	3686	1010
August	45.18	2059	416
September	45.28	3626	1885
October	43.70	2108	909
November	44.19	3421	1128
December	44.49	3514	1424
Average			1003
Maximum	46.07	3686	

Kitchener Drinking Water System – Grand River Intake (Mannheim WTP)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 72576 m ³ /day)	Monthly Average (m ³ /d)
January	710.51	35397	31130
February	779.58	42551	31552
March	654.73	44023	34528
April	944.40	44063	35766
May	657.15	44184	31788
June	730.95	50643	37510
July	590.08	46831	35840
August	619.02	49488	36495
September	665.15	54151	39109
October	709.59	47815	38683
November	633.33	47412	34606
December	719.50	45896	34639
Average			35137
Maximum	944.40	54151	

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Kitchener Drinking Water System – Parkway Wells (K31, K32, K33)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 13737 m ³ /day)	Monthly Average (m ³ /d)
January	71.07	5660	3047
February	107.01	6410	2670
March	105.65	6702	2762
April	109.53	3862	2303
May	106.18	7780	3965
June	104.71	8295	5231
July	105.24	8276	4574
August	103.87	8211	4148
September	63.81	5305	4133
October	63.18	5299	3435
November	99.72	6113	2582
December	96.95	7705	5053
Average			3659
Maximum	109.53	8295	

Kitchener Drinking Water System Strange St. Wells (K10A, K11A, K13, K13A, K18, K19)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 15854 m ³ /day)	Monthly Average (m ³ /d)
January	35.86	2950	2789
February	36.02	2902	2823
March	45.49	3039	2511
April	49.64	3248	3020
May	34.59	2808	2597
June	30.97	2495	2454
July	29.58	2505	2381
August	29.12	2421	2269
September	42.27	3510	2393
October	40.06	3336	3151
November	38.18	3161	2582
December	37.69	3125	2965
Average			2661
Maximum	49.64	3510	

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Shingletown Drinking Water System – Wells K50/51			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 13651 m³/day)	Monthly Average (m³/d)
January	119.40	9557	9257
February	111.72	9049	8996
March	126.66	9088	8783
April	113.11	9115	8824
May	113.49	9015	8921
June	125.93	9104	8774
July	115.32	9090	9044
August	114.61	9137	9027
September	118.60	9071	8856
October	111.18	8858	8771
November	113.40	9206	8786
December	115.83	9262	8996
Average			8920
Maximum	126.66	9557	

Kitchener Drinking Water System – Woolners Wells (K80, K81, K82)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 11146 m³/day)	Monthly Average (m³/d)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Average			0
Maximum	0	0	

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Waterloo Drinking Water System – Erb Street Wells (W6A, W6B, W7, W8)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 24139 m³/day)	Monthly Average (m³/d)
January	135.02	12284	10827
February	134.72	12881	11301
March	134.85	13503	11113
April	115.84	10571	9592
May	142.29	12128	10783
June	130.99	12052	10842
July	129.80	12145	10827
August	128.88	12210	10796
September	128.45	11949	10609
October	125.12	12367	9919
November	113.68	10670	9281
December	133.32	12823	11120
Average			10584
Maximum	142.29	13503	

Waterloo Drinking Water System – William Street Wells (W1B, W1C, W2, W3)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 16753 m³/day)	Monthly Average (m³/d)
January	66.58	4953	3445
February	72.33	4755	4219
March	67.44	4704	4592
April	71.05	4917	4674
May	67.43	5059	4916
June	69.95	5104	4564
July	68.22	5149	4576
August	65.43	4910	4665
September	64.00	4960	4597
October	66.10	4889	4619
November	63.23	4942	4789
December	66.58	4908	4592
Average			4521
Maximum	72.33	5149	

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Waterloo Drinking Water System – Well W10			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 2160 m ³ /day)	Monthly Average (m ³ /d)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Average			0
Maximum	0	0	

New Hamburg/Baden Drinking Water System – Well NH3			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 3542 m ³ /day)	Monthly Average (m ³ /d)
January	39.68	1724	984
February	39.07	1167	359
March	39.67	2590	1201
April	38.86	1961	1326
May	40.19	2382	1183
June	39.16	2584	1643
July	37.48	2583	1299
August	39.00	2586	1534
September	37.65	2314	1693
October	40.01	2091	1594
November	36.64	2591	1486
December	34.99	2588	1512
Average			1318
Maximum	40.19	2591	

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Ayr Drinking Water System – Wells (A1, A2, A3)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 5478 m³/day)	Monthly Average (m³/d)
January	71.52*	2280	1999
February	53.12	2353	2171
March	79.40*	3348	2041
April	65.57*	3096	2136
May	63.96*	2871	2129
June	63.17	2874	2208
July	55.75	2620	1929
August	53.50	2467	1842
September	54.46	2342	2034
October	47.08	2209	1763
November	54.62	2495	1807
December	49.65	2266	1775
Average			1986
Maximum	79.40	3348	

*Less than 10 minute flow spike, typically on startup.

Branchton Drinking Water System – Wells (BM1, BM2)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 130 m³/day)	Monthly Average (m³/d)
January	1.32	38	23
February	1.38	27	22
March	1.30	25	20
April	1.51*	32	22
May	1.41	56	26
June	1.99*	60	29
July	2.00*	34	24
August	1.36	71	31
September	1.38	46	27
October	1.32	30	21
November	1.29	36	24
December	1.30	53	26
Average			25
Maximum	2.00	71	

*Less than 10 minute flow spike, typically on startup.

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Roseville Drinking Water System – Wells (R5, R6)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 357.7 m ³ /day)	Monthly Average (m ³ /d)
January	4.52*	68	57
February	4.49*	67	56
March	4.51*	70	56
April	4.49*	87	60
May	4.52*	102	65
June	4.56*	125	92
July	4.52*	125	94
August	7.71*	117	93
September	6.67*	110	91
October	5.02*	93	70
November	4.49*	81	66
December	4.50*	89	64
Average			72
Maximum	7.71	125	

*Less than 10 minute flow spike, typically on startup.

Heidelberg Drinking Water System – Wells (HD1, HD2)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1373.8 m ³ /day)	Monthly Average (m ³ /d)
January	8.97	200	165
February	8.30	195	163
March	20.00*	191	157
April	8.18	212	172
May	7.97	351	194
June	7.96	297	213
July	7.88	291	201
August	7.91	226	176
September	8.01	221	184
October	7.80	200	163
November	7.78	184	149
December	7.73	224	177
Average			176
Maximum	20.00	351	

*Less than 10 minute flow spike, typically on startup.

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Conestogo Golf Drinking Water System – Wells (C5, C6)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 601.3 m³/day)	Monthly Average (m³/d)
January	5.32	162	99
February	5.39	118	92
March	5.42	107	89
April	6.85	216	112
May	6.57	196	134
June	9.10	340	198
July	5.51	336	211
August	5.43	312	222
September	5.08	299	204
October	8.53	228	126
November	5.13	120	99
December	5.00	135	108
Average			141
Maximum	9.10	340	

Conestogo Plains Drinking Water System – Wells (C3, C4)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 786.2 m³/day)	Monthly Average (m³/d)
January	4.45	94	73
February	4.84	75	70
March	3.61	85	67
April	4.62	104	74
May	5.75	149	85
June	3.92	145	89
July	4.46	110	81
August	4.65	265	108
September	4.62	167	84
October	4.37	122	89
November	3.89	242	99
December	3.81	275	110
Average			86
Maximum	5.75	275	

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West Montrose Drinking Water System – Wells (WM1, WM2, WM3, WM4)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 238 m³/day)	Monthly Average (m³/d)
January	1.24	50	33
February	1.19	37	30
March	1.37	51	28
April	1.51	74	39
May	1.19	130	54
June	1.39	101	66
July	1.69	114	67
August	1.65	95	65
September	0.00	96*	64
October	0.00	94*	64
November	0.00	86*	74
December	0.00	96*	70
Average			55
Maximum	1.69	130	

*Wells were locked out, treated water provided via alternate source.

Maryhill Drinking Water System – Maryhill WTP- Wells (MH1, MH2)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 157 m³/day)	Monthly Average (m³/d)
January	1.21	73	56
February	1.18	77	55
March	1.87*	71	61
April	3.21*	79	58
May	2.24*	78	61
June	3.79*	79	52
July	2.00*	77	55
August	3.40*	70	62
September	1.93*	77	63
October	2.18*	70	62
November	2.00*	64	60
December	2.00*	68	61
Average			59
Maximum	3.79	79	

*Less than 10 minute flow spike, typically on startup.

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Maryhill Drinking Water System – Maryhill Heights- Wells (MH3, MH4A)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 812 m³/day)	Monthly Average (m³/d)
January	5.63	33	25
February	5.60	33	24
March	5.58	34	23
April	5.69	98	38
May	5.66	103	29
June	5.65	43	29
July	5.66	62	29
August	5.62	45	29
September	5.66	99	39
October	5.65	35	26
November	5.61	71	27
December	5.60	40	30
Average			29
Maximum	5.69	103	

Linwood Drinking Water System – Wells (L1A, L2)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 604.8 m³/day)	Monthly Average (m³/d)
January	6.06	242	225
February	6.08	253	228
March	6.24	269	234
April	6.48	287	257
May	6.46	300	263
June	6.05	350	283
July	6.30	277	242
August	6.37	270	239
September	6.21	280	248
October	6.43	260	248
November	6.61	275	246
December	6.43	267	239
Average			246
Maximum	6.61	350	

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St. Clements Drinking Water System – Wells (SC2, SC3, SC4)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 1771.2 m³/day)	Monthly Average (m³/d)
January	20.10	230	193
February	20.14	214	189
March	37.04*	232	187
April	18.34	246	200
May	18.36	289	214
June	18.23	322	243
July	17.57	279	221
August	20.45	267	213
September	16.24	458	236
October	16.05	266	207
November	16.13	225	196
December	16.05	273	213
Average			209
Maximum	37.04	458	

*Less than 10 minute flow spike, typically on startup.

Wellesley Drinking Water System – Wells (WY1, WY5, WY6)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 3006 m³/day)	Monthly Average (m³/d)
January	15.95	651	562
February	16.06	648	561
March	15.81	637	544
April	16.10	712	576
May	16.04	744	595
June	15.84	797	626
July	15.96	720	594
August	15.94	628	565
September	15.91	674	586
October	15.99	943	623
November	16.14	678	569
December	15.88	710	598
Average			583
Maximum	16.14	943	

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Foxboro Drinking Water System – Wells (FG1, FG2A, FG4)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 288 m ³ /day)	Monthly Average (m ³ /d)
January	3.44	108	92
February	3.21	105	88
March	3.06	108	91
April	6.00	119	99
May	2.85	122	105
June	3.36	180	115
July	3.08	122	101
August	4.61	116	100
September	2.88	117	103
October	4.01	120	102
November	5.80	111	96
December	4.05	142	103
Average			100
Maximum	6.00	180	

New Dundee Drinking Water System – Wells (ND4, ND5)			
Month	Raw Peak Flow Rate (L/s)	Treated – Max Day (MDWL Limit= 982.2 m ³ /day)	Monthly Average (m ³ /d)
January	18.82*	265	216
February	17.73*	270	215
March	16.89*	255	206
April	17.05*	243	208
May	16.71*	248	197
June	15.00*	362	221
July	16.72*	255	202
August	16.26*	228	186
September	16.72*	240	195
October	6.24	217	177
November	16.99*	216	168
December	16.72*	210	175
Average			197
Maximum	18.82	362	

*Less than 10 minute flow spike, typically on startup

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Appendix D – System Information

Municipality	Location	Water Source	MDWL# / DWWP#	PTTW #	Sub-System Class /Number	Type
Cambridge Drinking Water Supply System (IUS)	Galt Wells	G4/G4A	012-102 / 012-202	1224-88MK7Q	WT Class III #8125	LARGE
		G5/G5A		4220-8HZHZQ		
		G6		8842-9FDJUC		
		G9		Grandfathered		
	Hespeler Wells	H3/H3A		1438-97BM7N		
		H4/H4A		8456-85DJHL		
		H5/5A		7145-8Z8QUN		
	Middleton WTP	G1, G1A, G2, G3, G14		7214-AMGR5G		
		G15		6132-AKURBN		
	Pinebush WTP	P10		Grandfathered		
		P11		7343-9FFJBX		
		P17				
	Preston Wells	P6		Grandfathered		
		P16		2004-AKXNEB		
Rahmands Wells	P9 P15/P15A	7600-A27NB5				
Shades Mill WTP	G7, G8, G38, G39, G40	3004-A9GHYU				
Turnbull WTP	G16, G17, G18	8842-9FDJUC				
Kitchener Drinking Water Supply System (IUS)	Greenbrook WTP	K1A, K2A, K4B, K5A, K8	012-102 / 012-202	0318-8DXPUL	WT Class III #8126	LARGE
	Kitchener WTP	K34, K36		6732-A3FJYA		
	Parkway WTP	K31, K32		Grandfathered		
		K33		3115-AMHHXH		
	Strange Street WTP	K10A, K11A, K13, K13A, K18, K19		7163-A27HM3		
Woolners Wells	K80, K81, K82	3281-8VPQYV				

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Municipality	Location	Water Source	MDWL# / DWWP#	PTTW #	Sub-System Class /Number	Type	
Mannheim Drinking Water Supply System (IUS)	Mannheim WTP	HVLL	012-102 / 012-202	Hidden Valley 7508-7G7QXE (Mannheim WTP supply only) Mannheim Consolidated 2671-AC9PFQ (Mannheim Wells, Peaking Wells and ASRs)	WT Class IV #1843	LARGE	
	ASR Wells	ASR1, ASR2, ASR3, ASR4, RCW1, RCW2					
	K90 Peaking Wells	K91 K92 K93 K94					
	Mannheim Wells	K21 K25 K29					
	Mannheim Village Wells	K22A K23 K24 K26			WT Class I #3603		
Waterloo Drinking Water Supply System (IUS)	Erb Wells	W6A, W6B, W7, W8	012-102 / 012-202	6126-A5PQ35	WT Class II #8127	LARGE	
	Waterloo Wells	W10		3436-9SGLDK			
	William St. Wells	W1B/W1C, W2/W2A & W3		3208-8VPRY5			
IUS Distribution System	Cambridge, Kitchener and Waterloo	IUS Sources	012-102 / 012-202	N/A	WD Class IV #8128	LARGE	
North Dumfries Township Drinking Water Supply Systems	Ayr WTP	A1 A2 A3	012-113 / 012-213	6350-8VPSBP	WT Class II #2591 & WD Class II #362	LARGE	
	Branchton WTP	BM1 BM2 BM3	012-111 / 012-211	2577-9TPMWL	Limited Groundwater	SMALL	
	Lloyd Brown Distribution			012-102 / 012-202	N/A	Limited Groundwater	SMALL
	Roseville WTP	R5 R6		012-101 / 012-201	6063-8M6M8M	Limited Groundwater	SMALL

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Municipality	Location	Water Source	MDWL# / DWWP#	PTTW #	Sub-System Class /Number	Type
Wellesley Township Drinking Water Supply Systems	Heidelberg WTP	HD1 HD2	012-104 / 012-204	8624-824PKF	WT Class II #3101 Class II WD 3610	LARGE
	Linwood WTP	L1A L2	012-108 / 012-208	2287-8VQGV4	WT Class II #3594 WD Class II #1951	LARGE
	St. Clements WTP	SC2 SC3 SC4	012-110 / 012-210	0152-998JPE	WT Class II #2598 WD ClassII 1952	LARGE
	Wellesley WTP	WY1 WY5 WY6	012-115 / 012-215	0345-94UQ6A	WT Class II #2601 WD Class II 1953	LARGE
	New Dundee Wells	ND4 ND5	012-107 / 012-207	6562-837S4S	WDS Class I #3595	LARGE
	New Hamburg WTP	NH3 NH4	012-102 / 012-202	7021-AQRK39	WT Class II #2930	LARGE
	Shingletown Wells	K50 K51	012-102 / 012-202	4874-9SGL5L	WDS Class I #3593	LARGE
Woolwich Township Drinking Water Supply Systems	Conestogo Golf Wells	C5 C6	012-103 / 012-203	2006-8VQQ4Z	WDS Class I #8129	LARGE
	Conestogo Plains Wells	C3 C4	012-112 / 012-212	2407-837SX8	WDS Class I #3609	LARGE
	Maryhill Village Hts. Wells	MH3 MH4A	012-106 / 012-206	7733-8ADP56	Limited Groundwater	SMALL
	Maryhill WTP	MH1 MH2		2876-837JDT	Limited Groundwater	SMALL
	West Montrose WTP	WM1, WM2, WM3, WM4	012-109 / 012-209	6432-88UHLX	WT Class II #3104	SMALL

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Appendix E – MOECC Inspection Compliance Ratings

Drinking Water System	Type	Water Works #	Inspection #	Inspection Period	Inspection Date	Compliance Rating %
New Hamburg Baden	Large	220000111	1-F6PXU	Dec 1, 2016 to Nov 30, 2017	Dec 13, 2017	100
Waterloo	Large	220000157	1-F6PTE	April 20, 2016 to Apr 24, 2017	April 24, 2017	100
Cambridge	Large	220000166	1-F6JYX	May 9, 2016 to May 17, 2017	May 17, 2017	100
Foxboro	Large	220009210	1-F6PQU	May 26, 2016 to May 26, 2017	June 15, 2017	100
Maryhill	Small	220004171	1-F6NDP	June 1, 2016 to May 31, 2017	May 31, 2017	100
Maryhill Village Heights	Small	260007413	1-F6NEO	June 1, 2016 to May 31, 2017	May 31, 2017	100
Conestogo Plains	Large	26002772	1-GWAQ5	July 1, 2016 to Dec 31, 2017	Jan 3, 2018	100
Conestogo Golf	Large	260001994	1-GWASK	July 1, 2016 to Dec 31, 2017	Jan 3, 2018	100
St. Clements	Large	220005811	1-F6QAM	July 6, 2016 to April 11, 2017	April 11, 2017	100
Mannheim Village	Large	260002668	1-F6PWU	Jun 14, 2016 to April 24, 2017	April 24, 2017	100
New Dundee	Large	220004180	1-F6PW5	July 1, 2016 to Sep 30, 2017	Oct 4, 2017	100
Branchton	Small	260002538	1-F6JUN	Aug 17, 2016 to Sep 15, 2017	Oct 27, 2017	100
Roseville	Small	220007301	1-F6K5N	Aug 17, 2016 to Sep 15, 2017	Oct 27, 2017	100

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Drinking Water System	Type	Water Works #	Inspection #	Inspection Period	Inspection Date	Compliance Rating %
Kitchener	Large	220003092	1-F6QRW	Oct 1, 2016 to Oct 31, 2017	Nov 20, 2017	100
Mannheim	Large	220006981	1-F6QSL	Sep 26, 2016 to Sep 30, 2017	Oct 18, 2017	100
Wellesley	Large	220004215	1-FGQBV	Nov 6, 2016 to May 15, 2017	May 15, 2017	100
Shingletown	Large	260002707	1-F6PYJ	Nov 1, 2016 to Oct 31, 2017	Nov 15, 2017	100
Heidelberg	Large	20007310	1-CLQKC	Jan 01, 2016 to December 31, 2016	Jan 11, 2017	100