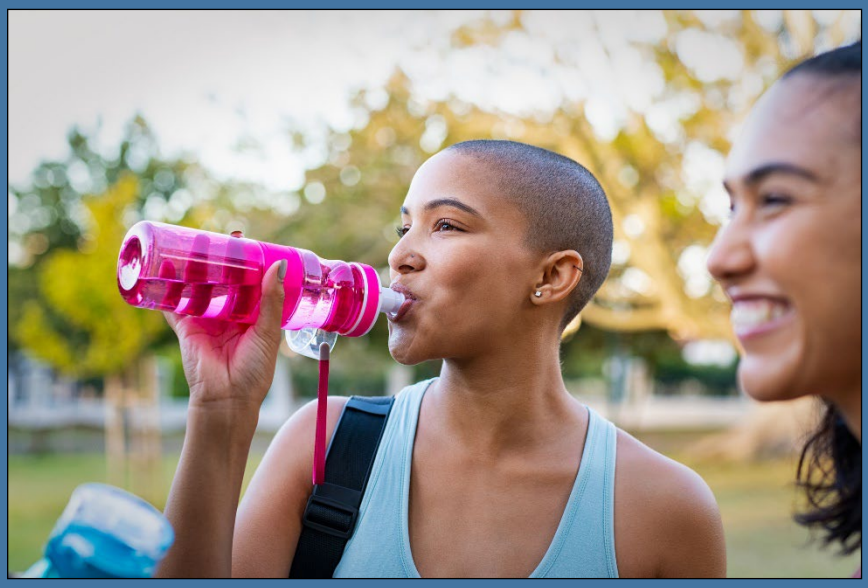
# 2024 Summary Report



## Water and Wastewater Operations

## Region of Waterloo

Region of Waterloo

Presented to Regional Council

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This document is available in alternate formats upon request

## TABLE OF CONTENTS

**1. OVERVIEW & BACKGROUND ..... 3**

**1.1 Safe Drinking Water Act ..... 3**

**1.2 Drinking Water Quality Management System (QMS) Conformance and Municipal Drinking Water Licensing Program ..... 3**

Management Review ..... 4

Infrastructure Review ..... 4

**2. HEALTH RELATED NOTIFICATIONS – BOIL WATER ADVISORIES (BWA)/DRINKING WATER ADVISORIES (DWA) ..... 4**

**3. REGULATORY COMPLIANCE ..... 4**

Chart 1 – **MECP Average Inspections Ratings** ..... 5

Table 1 – **Summary of Non-Compliance Issues under the Safe Drinking Water Act (SDWA), Municipal Drinking Water Licenses (MDWL), Drinking Water Works Permits (DWWP), Permits to Take Water (PTTW), and the Ontario Water Resources Act (OWRA)** ..... 5

**4. HYDRAULIC PERFORMANCE ..... 9**

**5. PREVENTATIVE MAINTENANCE PROGRAMS ..... 9**

**6. WELL MAINTENANCE ..... 10**

**7. ASSET MANAGEMENT AND CAPITAL INFRASTRUCTURE REPLACEMENT PROGRAM ..... 11**

**APPENDIX A – QMS MANAGEMENT REVIEW ..... 20**

**APPENDIX B – MECP INSPECTION COMPLIANCE RATINGS ..... 26**

**APPENDIX C – TREATED WATER FLOW DATA ..... 27**

**APPENDIX D – SYSTEM INFORMATION ..... 56**

# 1. OVERVIEW & BACKGROUND

This summary report represents all the drinking water supply and transmission systems in the Region of Waterloo and the distribution systems in North Dumfries and Wellesley Townships, and 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 report captures non-compliance issues and corresponding corrective action(s) or mitigating measure(s).

## 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 Permit (DWWP), a valid Permit to Take Water (PTTW) for each water source, operational plans as approved by the Ministry of the Environment, Conservation and Parks (MECP), operating authority accreditation (based on a third party audit of the Drinking Water Quality Management Standard (DWQMS) 21 Elements), and financial plans approved by Regional Council. Each Municipal Drinking Water License and each Financial Plan must be renewed every 5 years. Eleven (11) MDWL were issued to the Region in 2021.

In 2024, the MECP provided the Region a Notice of Intention to Issue an Order under Section 114 of the Safe Drinking Water Act (SDWA). The Notice required the Region to take charge of, operate, and maintain the Petersburg non-municipal, year-round residential water system. A DWWP was issued, an operational plan was developed, significant upgrades were completed to the supply facility, and ownership was transferred from the private owner to the Region. A third party audit was performed in January 2025 in order to achieve operating authority accreditation for the

system with the intent to apply for a MDWL in the Fall of 2025 following completion of the Financial Plan.

### 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 November 26, 2024 and included discussion of non-compliance issues and corresponding corrective/preventative action(s). The 2024 management review minutes, identified deficiencies, decisions and action items, are included in Appendix A. There were no major non-conformances identified with the QMS.

### 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 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 and Wastewater Operations Division, in collaboration with the Public Health Department, ensures a safe water supply. There were no BWA or DWA issued during 2024.

## 3. REGULATORY COMPLIANCE

The MECP's annual drinking water system inspections focus 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;
- flow monitoring;

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

A summary of the non-compliances related to the above can be found in Table 1.

The 2023-24 MECP Chief Drinking Water Inspector's report, released in December 2024, identifies 19 inspection reports with an average compliance rating of 99.6% for the Region of Waterloo, with 16 of 19 inspections receiving 100%. Chart 1 below compares the average MECP inspection compliance ratings over the past 5 years and Appendix B summarizes the most recent ratings for Region owned systems.

CHART 1 – **MECP AVERAGE INSPECTIONS RATINGS**

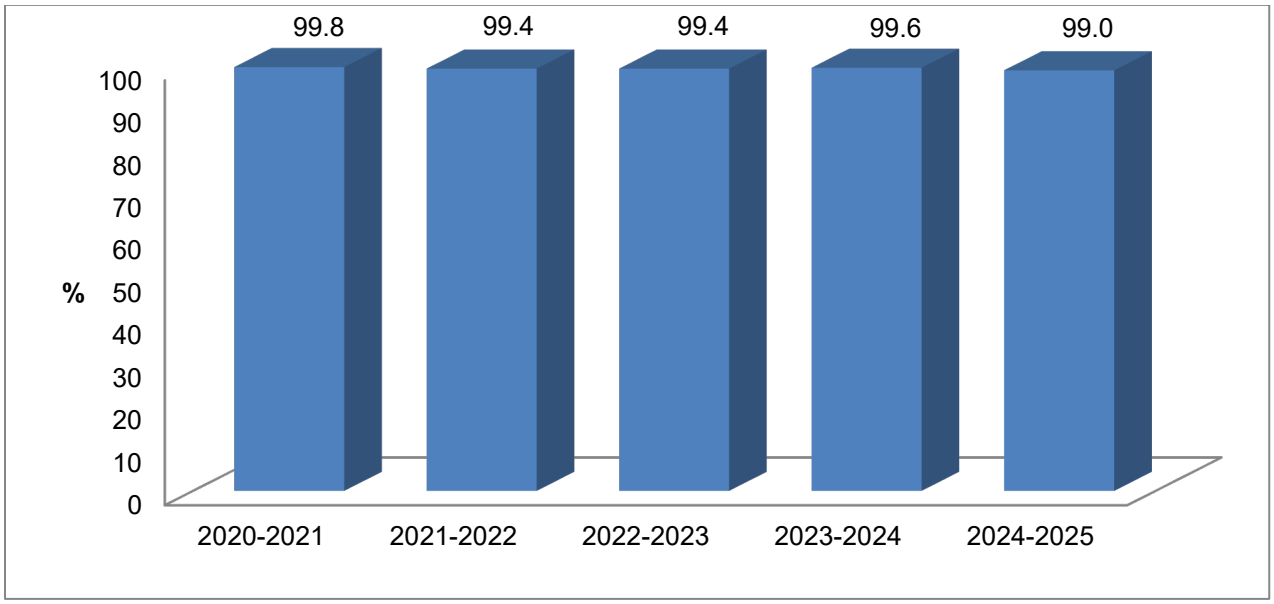


TABLE 1 – **SUMMARY OF NON-COMPLIANCE ISSUES UNDER THE SAFE DRINKING WATER ACT (SDWA), MUNICIPAL DRINKING WATER LICENSES (MDWL), DRINKING WATER WORKS PERMITS (DWWP), PERMITS TO TAKE WATER (PTTW), AND THE ONTARIO WATER RESOURCES ACT (OWRA)**

| Date | Description | Root Cause | Preventative/ Corrective Action |
|---|---|---|---|
| **O. Reg 170/03, 1-2(1)1 – Treatment Equipment** | | | |
| December 9, 2024 | Wellesley<br><br>The production well was not maintained in a manner sufficient to prevent entry | An electrical conduit was not properly attached to well WY6 at the time of inspection. Cause was a failure due to installation issues (no expansion joint). | Repair on conduit completed. Provided well inspection training to relevant staff. |

| Date | Description | Root Cause | Preventative/ Corrective Action |
|---|---|---|---|
| | into the well of surface water and other foreign materials. | | |
| **O. Reg 170/03, 1-2(2)5 – Operator certification** | | | |
| January 8, 2024 | Maryhill<br><br>An unlicensed contractor shut off well MH2 without Regional operations staff present. | A formal process did not exist to provide contractors authorization to assume control of the site. | Followed up with the contractor to emphasize the implications of not following regulatory requirements. Formalize a process to request facility isolation. Draft a communication emphasizing the certification requirements for facility operation. |
| May 23, 2024 | The Region of Waterloo became aware that a contracted individual was working in Regional water systems with an expired water licence. | Checks and balances, both internal and external, were ineffective. | Immediately informed relevant Region supervisors to discontinue all work using the individual in question. Add any external operators to internal tracking system. Ensure supervisors verify licensing for any contractors performing operational tasks. |
| May 23, 2024 | It was identified that several Regional operators held only an Operator in Training (OIT) Water Treatment (WT) certificate while potentially performing operational duties in a Water | It was incorrectly assumed that OIT WT certificates offered transferability to OIT WD certificates, as is the case for higher certification levels. | The operators were directed not to work on Regional WD systems until the appropriate OIT Certificates were issued. Ensure all new staff obtain both WT and WS/WD OIT licences. |

| Date | Description | Root Cause | Preventative/ Corrective Action |
|---|---|---|---|
| | Distribution (WD) system. | | |
| **O. Reg 170/03 – Schedule 6-5, Continuous Monitoring** | | | |
| January 8, 2024 08:45-09:10 (duration – 25 minutes)<br><br>January 10, 2024 08:20-09:42 (duration – 82 minutes) | <u>Well K50</u><br><br>Primary disinfection free chlorine residual data was not recorded for greater than 5 minutes. | During Site Acceptance Testing, inadequate preparation and communication by the contractor led to unexpected impacts on regulatory monitoring requirements. Insufficient care and attention by the contractor when setting up the temporary power supply for the regulatory analyzer. | Debrief was held with the contractor. To reduce the likelihood of recurrence, the project team implemented process improvements including improved planning so staff can be better prepared. |
| March 11, 2024 07:52-08:14 (duration – 22 minutes) | <u>Foxboro</u><br><br>Primary disinfection free chlorine residual data was not recorded for greater than 5 minutes. | During Site Acceptance Testing, ineffective communication by the contractor led to staff not being informed when FCR readings were required to be recorded. | Debrief was held with the contractor. To reduce the likelihood of recurrence, include assigned staff in the co-ordination meetings & clarify expectations and responsibilities. Investigate visual indication on the regulatory analyzers and other impacted equipment at site Ensure plan indicates when manual readings must be recorded. |
| May 22, 2024 11:00-12:32 (duration – 92 minutes) | <u>St. Clements</u><br><br>Discharge free chlorine residual was noted to be gradually trending down. | Staff determined that there was no water supply to the analyzer. | Analyzer water supply restored. |

| Date | Description | Root Cause | Preventative/ Corrective Action |
|---|---|---|---|
| May 30, 2024 10:56-11:04 (duration – 8 minutes) | St. Clements<br><br>Primary disinfection free chlorine residual data was not recorded for greater than 5 minutes. | Following a power loss and subsequent loss of pressure in the distribution system, a booster pump was started locally in order to re-pressurize the system. Regulatory monitoring requirements were unclear to the operator at site. | Power, pressure, and continuous monitoring restored to site.<br>Email reminder regarding regulatory monitoring requirements sent to staff. |
| **O. Reg 170/03 – Schedule 13-7, Chemical Sampling and Testing** | | | |
| July and October 2024 | Wells K50, K51, K23, K24, K26, Strange Street WTP, New Hamburg WTP<br><br>Although the required number of samples were collected, the sampling timelines for nitrate/nitrite sampling were not met. | Misinterpretation of three month vs. quarterly sampling requirements. | Discussed scheduling requirements, and expectations were clearly provided.<br>Confirmed that the Master Drinking Water Sampling Schedule was accurate for parameters with either quarterly or 3 month sampling requirements. |
| **Municipal Drinking Water Licence (MDWL) – Schedule E, UV Disinfection** | | | |
| June 27, 2024 | Middleton<br><br>Monthly UV sensor checks were not performed within the required 20-40 day interval. | Workorder software scheduling limitations, exacerbated by staffing challenges. | Investigate modifications to current work order scheduling process.<br>Investigate upgrades to scheduling capabilities from the vendor. |

| Date | Description | Root Cause | Preventative/ Corrective Action |
|---|---|---|---|
| Permit to Take Water (PTTW) | | | |
| July 9 – 15, 2024 (duration – 916 minutes) | Petersburg – Well PE1<br><br>Permitted instantaneous flow rate exceeded. | During upgrades and ownership transfer of the facility, online flow monitoring was initiated. The pre-existing flow rate setpoint was above the PTTW. | Investigate setpoint review process for new facilities. Investigate impacts to performance grading for consultants to incentivize avoiding non-compliances. |

## 4. HYDRAULIC PERFORMANCE

A summary of the monthly average and maximum flow rates of water supplied are identified in Appendix C. There was one non-compliance attributed to MDWL or PTTW flow limit exceedances in 2024, as identified in Table 1.

The Region of Waterloo Drinking Water systems have 38 Permits to Take Water (PTTW), 11 Municipal Drinking Water Licenses (MDWL) and 12 Drinking Water Works Permits (DWWP). Refer to Appendix D for a full list of PTTW, MDWLs and DWWPs.

## 5. PREVENTATIVE MAINTENANCE PROGRAMS

Elements 14 and 15 of the DWQMS require that the operational plan document 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 reporting 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.

In 2019, the Water and Wastewater Operations Division adopted a Corporate wide Enterprise Asset Management System (Lucity) which replaced the previous computerized maintenance management software. Lucity is a system that manages the installation, maintenance and replacement of 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. The following preventative maintenance programs are in place:

- 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 transmittance, 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 communication system.
- Process and Instrumentation Diagrams (P&IDs) and Process Flow Diagrams (PFDs) are reviewed, updated and maintained as required.
- Electrically, the UV ballasts are run to failure and the UV lamps are replaced as per manufacturer's instructions.
- Canadian Standards Association (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 a third party 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, involving visual inspections, are performed several times per year.
- All other electrical components are replaced as required.
- Mechanically, sodium hypochlorite injectors are rebuilt monthly at all sites, 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.
- Distribution system 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 required.
- Distribution maintenance, including water main repairs on the trunk mains are performed by the cities, townships 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 Reg. 903, (Ontario Water Resources Act) and O. Reg. 170/03 (Schedule 1). Routine internal well inspections and annual MECP inspections indicated that production wells and monitoring wells were in compliance, with the exception of well WY6 as identified in Table 1.

## 7. ASSET MANAGEMENT AND CAPITAL INFRASTRUCTURE REPLACEMENT PROGRAM

The Region's overall objective is to support the achievement of service levels goals, and manage risk, while minimizing lifecycle 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 framework takes into account potential losses to services, financial loss, and potential safety hazards. All assets are considered 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 or rehabilitating assets or components of assets to avoid service failure or interruption. 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:

- Current condition and performance: The Region regularly inspects its assets to monitor their condition and performance, according to Water and Wastewater Infrastructure Management's Inventory, Condition, and Capital Planning Assessment Protocol and supporting Template. Asset specific programs, targeting assets that have higher replacement values, higher consequence of failure and/or are more challenging to inspect continue to be developed and updated to help further refine requirements for renewal investment.
- 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.
- Coordination with other planned capital work such as upgrades or expansion, or coordination with other business units or local municipalities.

Asset renewal requirements are bundled into capital projects based on the type of renewal required and the required timing. Asset Management has also defined a prioritization framework to help define capital project priority. Project prioritization criteria, include the following:

- Project to address capacity deficiency or to support planned growth
- Project to address compliance requirements (Design / Regulatory)
- Project with funding from higher orders of government with defined timelines
- Project to address a health and safety concern
- Project to provided needed redundancy

- Project to address asset condition / end-of-life
- Project to undertake a time-sensitive rehab to extend service life
- Project to address a performance deficiency or opportunity to improve process performance
- Project that addresses corrective maintenance requirements / reliability concerns
- Project that will reduce energy consumption / greenhouse gases
- Project that improves climate change resiliency

The above framework has established the foundation upon which asset management and capital infrastructure investment 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 2024, key asset management activities are summarized below.

- **Corporate Asset Management System Program**

The Corporate Asset Management System includes the following:

1. Work Management System (Lucity) - an enterprise level software product to be used by asset-owning Divisions at the Region of Waterloo to perform maintenance and all other work on assets. Water and Wastewater Operations' implementation of Lucity was completed in early 2019. Continuous improvements are on-going.

- **Asset Management Planning**

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 year) and a long term (50 year) 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 forecasts 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 affect customer levels of service.

Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure, requires that Asset Management Policy be reviewed and updated as required at least every five years. That asset management policy establishes the framework and guiding principles and process for asset management practice. The asset management policy is based on the following:

- Corporate strategies, organization and culture
- Customer and stakeholder requirements
- Industry and Regional asset management practice maturity including process, people and technology.

In 2023, the Asset Management Policy review and update was completed and approved by Council (November 2023). Updates to the policy included alignment with the Region's current Strategic Plan.

The regulation also requires that every municipality prepare an AM Plan for all of its municipal infrastructure assets by July 1, 2025. In 2024, the Region retained a consultant to support the development of the 2025 AM Plan. Ongoing efforts were made in 2024 to support the 2025 Asset Management Plan.

- **Lucity Data Standardization and Data Uploads**

Lucity, in addition to being a corporate work management system (WMS), is also the Region's asset registry: a single source of data for the Region's vertical and linear infrastructure assets. The goal is to have a single asset repository that will also support the corporate decision support system (DSS), regulatory asset management reporting, and other required reporting through Power BI.

In 2021, a data standardization initiative was initiated. This ongoing initiative has the following objectives:

- Develop a consistent data standard
- Establish a process for data uploading in Lucity
- Apply a data standard to data already loaded into Lucity from previous work management systems
- Pair and load data collected through Water and Wastewater Infrastructure Management's Inventory, Condition, and Capital Planning Assessments

In 2021, existing data within Lucity was updated according to the defined data standard, and a process for bulk updates of asset data in Lucity was established. The focus in 2022 was to begin the process of pairing and loading data collected from recent Water Inventory, Condition, and Capital Planning Assessments (2018 or more recent) in Lucity. The process was completed in 2023 with more than 15,000 new equipment assets added in Lucity. Numerous updates were also made through the data cleansing process. A similar process is on-going for wastewater assets.

Significant progress in data quality will support the 2025 Asset Management Plan referenced above. By the end of 2024 approximately 80% of asset registry data now resides in Lucity.

**Inventory Management Protocol**

In 2022, a project to formalize the workflow for inventory management associated with capital and Operation & Maintenance work was initiated. The objective of this project was to identify and define improvements to the Inventory Management Protocol (IMP) and develop clear workflow(s) for implementation. The goal is to ensure changes to assets resulting from all types of work, both capital and operations and maintenance, are accurately and efficiently reflected in Lucity, in support of data management and effective lifecycle management of Water and

Wastewater assets. The project continued into 2023/2024 and included consultation with all stakeholders that oversee capital or operation and maintenance work. Collaboration with stakeholders and documentation of workflow(s) were completed, increasing alignment on the "what", "why", and "how" to manage assets within Lucity, as well as improve the timeliness of updating asset data, consistency, and completeness within Lucity.

A training program was developed and offered to staff in February 2024 to support use of the protocol and template.

- **Project Tracking Tool: "PeTey"**

PeTey is a web-based application used to identify and track water and wastewater projects. Project Managers within Water and Wastewater Infrastructure Management, Water and Wastewater Operations, and Design and Construction have been provided access to this tool to track project scope, schedule, budget, spending and prioritization of capital projects. PeTey provides a consolidated list of capital projects: completed projects, projects that are in progress, as well as planned future projects. This tool is used to support Project Status Reporting (PSR), preparation of the capital program each year, as well as to monitor project spending against capital budgets.

The following summarizes the improvements made to the system in 2024:

- Continued administrative support of the PeTey web-based tool as well as providing ongoing training and support to staff.
- Continued support of the Power BI PSR Dashboard.
- Addition of 295 capital projects, 208 of which are future year projects.

- **Project Requests Tracking System: Bitrix**

Bitrix is an online application used to track water and wastewater capital project requests, with the objective of improving consistent and transparent review of new capital project requests as well as communication. In 2024, 52 project requests were submitted by staff, 40 were reviewed and recommended for the capital budget as required, four (4) were not recommended for capital planning, and eight (8) requests are still in review. Project requests approved in Bitrix are incorporated into the Project Tracking Tool – PeTey, for input into the capital program.

- **Annual Project Prioritization**

Each year a meeting is conducted to review and prioritize capital infrastructure projects identified to start the following year. Meeting stakeholders include representation from Engineering & Planning, Infrastructure & Program Planning, Water Operations, SCADA & Operational Technology, Hydrogeology & Water Programs, and others as required. The objectives of the project prioritization meeting are as follows:

- Review the water capital project list
    - Consistent with DWQMS – Element 15, 4.8.5 The Manager, Water Operations and Maintenance Shall Ensure:

In collaboration with the Manager, Infrastructure & Program Planning, a long-term forecast for infrastructure maintenance, rehabilitation, and renewal programs are reviewed at least every calendar year.

- Confirm Project Prioritization
    - Consistent with DWQMS – Element 14, 4.1.3: The Manager, Infrastructure & Program Planning Shall Ensure:

      A capital works priority projects list is developed and updated annually, in collaboration with Hydrogeology and Water Programs, and Engineering and Planning personnel, to include:
        - new supply and distribution system infrastructure
        - existing infrastructure upgrades, identified through the Master Plans, studies and maintenance plans
        - priorities are confirmed through the 10 year budget process, containing the required infrastructure
    - New asset renewal projects are prioritized based on a number of criteria, ranked between 1 to 10, and assigned an overall project priority of High, Medium, Low.
    - Project prioritization will inform the order of execution as well as support decision making related to budget, supply, and/or resource constraints.

The annual meeting serves to create increased project awareness, provide an opportunity for open dialogue, and identify if changes or alternative actions are required to projects such as risk mitigation measures or modified project scope.

- **Water Facility Inventory, Condition, and Capital Planning Assessments**

These assessments are performed to recognize/update all major building, process, and site works assets and components, as well as to assess the current physical condition and performance (capacity, suitability, quality, quantity, and cost or energy efficiency). This information is then used to support a 10 year capital renewal plan and long-term renewal forecast (50 year) for the facility/system.

The following assessments were ongoing in 2024:

- Northfield Pumping Station
- St. Andrews Pumping Station
- Mannheim Water Treatment Residual Management Plant
- Mannheim WTP Chambers
- Mannheim Reservoir and Pumping Station Chambers
- Mannheim Raw Water Transmission Main Chambers
- St. Jacobs and Elmira Transmission Main Chambers

- Shades Mill, Turnbull WTP Filter Wall Cracks Study
- Environmental Enforcement and Laboratory Services Facility
- Petersburg Ground Water Supply System
- Greenbrook Ground Water Supply System
- Laurel Ground Water Supply System / Elevated Tank Discharge Piping
- St. Clements Ground Water Supply System
- Zone 7 Pumping Station and Wells W7 and W8

- **Annual Review 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. Coordination meetings with area municipalities occurred in June/July 2024 in support of capital budgeting processes.

- **Priority Watermain Chamber Assessments**

In 2024, condition assessments were completed for chambers along the Mannheim Raw Water Transmission Main, and the St. Jacobs / Elmira Transmission Main. Both transmission mains currently have no redundancy, and have a very high consequence of failure. The assessments will confirm condition of each chamber and associated assets and provide recommendations for required short and long-term renewal. Report and recommendations will be completed in 2025.

- **Grand River Intake Weir System Assessment**

In 2024, a consultant was retained to undertake a Public Safety Assessment of the Mannheim Water Treatment Plant Grand River Intake Weir. The assessment was completed in 2024; reporting and recommendations will be completed in 2025.

- **Elevated Tank Program**

The Region's Water System includes 10 treated water elevated tanks, in addition to two (2) raw water elevated tanks. The Elevated Tank Program includes regular inspections and rehabilitation as described below.

  - Elevated Tank Inspections: The Region undertakes an annual tank inspection program to examine ladders, landings, handrails, appurtenances, venting and overflow screens. These inspections meet or exceed the recommended requirements set out in the AWWA Standard M42-Steel Water Storage Tanks. In addition to annual safety inspections, ROV (Remotely Operated Underwater Vehicle) inspections were carried out for selected tanks as part of the ongoing inspection program while storage facilities are kept online. Cathodic protection inspections were also completed where applicable.
  - Reservoir cleaning and re-coating: The Region is continuing to optimize the capital and O&M program for elevated water storage tanks, with consideration of levels of service, alignment of maintenance or warranty inspections, coating

replacement/rehabilitation or maintenance work with other capital projects. The overall program objective is to define service levels goals, manage risk, minimize lifecycle costs, and improve alignment with other capital projects to minimize downtime.

- In 2024, the Elmira West Elevated tank re-coating warranty inspection and the Laurel tank re-coating warranty inspections were completed. The Mannheim West Raw Water tank was also drained, cleaned and inspected.

- **In-Ground Reservoir/Tank Inspection Program**

The Region's Water System includes many underground or at grade water storage structures (raw water storage tanks, potable water storage tanks, chlorine contact chambers, ozone contact chambers, backwash feed and storage tanks, other storage tanks). The physical condition of these assets and the assets located within are difficult to inspect. Assessment of these structures is facilitated by either ROV (Remotely Operated Underwater Vehicle) while the asset is in service, or physical inspection through person entry. Inspection requires significant advanced planning and may require isolation, draining, cleaning and confined space entry to undertake the inspection. The objective for the reservoir inspection program is to develop a consistent approach to reservoir inspections and renewal to ensure that all assets (i.e. structural, process, electrical, and instrumentation) are captured, and quality information is generated for capital planning.

In 2022, a document to support site-specific Terms of Reference for reservoir inspection and renewal was developed. The document identifies three (3) phases that can be executed as a single project or multiple projects as required:

Phase I is an in-service assessment:

- Inspection undertaken via a Remotely Operated Underwater Vehicle (ROV)
- Accompanied by exterior inspection and chamber inspection
- Minimal operational interruption / involvement required

A Phase I assessment provides an initial look at condition of the reservoir and indication of renewal requirements. This assessment is used to prioritize when the Phase II inspection should be planned.

Phase II is an offline assessment followed by immediate renewal before the reservoir is put back in service:

- Before the reservoir is taken out of service, the necessary planning is completed to ensure efficient project delivery and minimized downtime.
- Reservoir isolation, draining, cleaning, and inspection via person entry (structural and process specialists).
- Following the inspection, a scope of work recommended to be completed prior to putting the reservoir back online is developed. The goal is to undertake the necessary repairs such that there is not a need to take the reservoir offline again for a least 5 years.
- Contractor retained and repairs completed.

- Disinfection, sampling, and reservoir put back in service.
- Standardized deliverables, including future recommended works.

Phase III is a tender for renewal (if required):

Phase III will be planned and undertaken if additional future renewal work was recommended by the consultant at a later date (ideally a minimum of 5 years following Phase II).

Reservoir Inspection and Renewal work that progressed in 2024 included the following:

- Wellesley Ground Water Supply System – Initiated in 2022, in coordination with upgrades to the Facility, Phase II inspection and renewal was completed in 2023. Final documentation and future recommendations provided in 2024.
- Greenbrook Ground Water Supply System –In coordination with upgrades to the Water Treatment Facility, Phase II inspection and renewal of Reservoirs and Tanks was initiated in 2022. Recommended renewal for Treated Reservoir 2, and the treatment tanks was completed in 2023. Inspection of the Raw Water Reservoir and Treated Water Reservoir 1 resulted in recommendations to decommission both reservoirs. By-passes for both reservoirs were constructed to enable the plant to return to service in 2024. A future reservoir replacement project is identified in the Capital Program.
- Turnbull Reservoir - A Phase I in-service reservoir assessment was undertaken in 2023/2024. Phase II / III design for renewal is now in progress.
- Mannheim Reservoir (5 Cells) – A Phase I in-service reservoir assessment was undertaken in 2023/2024. The scope of work also included interior investigation of the Concrete Pressure Pipe within the reservoir. This project is ongoing with final recommendations anticipated in 2025.
- Linwood Ground Water Supply System – In coordination with upgrades to the Facility, Phase II inspection and renewal was completed in 2024. Final documentation and future recommendations to be provided in 2025.

- **Water Filters Asset Program Development**

Initiated in late 2021, the key objective of this initiative is to refine the filtration system asset hierarchy in the corporate work management system, Lucity, and recommend best practice life-cycle management strategies for filtration assets. The deliverables of the program will include a 10 year capital program for filter assets, a 50 year forecast, operation and maintenance recommendations, as well as technical levels of service and key performance indicators. Final documentation and future recommendations were provided in 2024. The existing asset data is currently being reviewed to be updated to represent the recommended hierarchy. Further development and implementation will continue in 2025.

- **Flow Meter Replacement Program**

In 2024, a flow meter replacement strategy was developed to identify and prioritize all flow meters that were nearing or at end of life. The objective was to align flow meter replacement with other planned capital works, or identify logical groupings for new projects. Over 200 flow meters are identified for replacement.

- **Facility/Asset Imaging**

LiDAR (light detection and ranging) is a technology that is being used by Water and Wastewater Infrastructure Management to generate virtual imagery of the Region's water and wastewater facilities.

This technology is used to facilitate discussion during meetings and project planning activities, assist design, tendering and construction activities. The imaging of the water and wastewater facilities enables staff, consultants, and contractors to view the sites, without the need for in-person site visits. The imaging is a widely and routinely used resource for staff for many purposes, and has the added benefit of reducing Greenhouse Gas (GHG) emissions by reducing the travel to sites.

The library of virtual tours includes 336 active spaces at both water and wastewater sites. Imaging has been expanded to include assets when they are taken out of service for inspection such as chambers, reservoirs, and tanks.

## APPENDIX A – QMS MANAGEMENT REVIEW

**DATE:** November 26, 2024

**TIME:** 12:30pm – 4:30pm

**PLACE:** Mannheim Training Room

**PRESENT:** Peter Clarke, Dale Wiens, Kathy Taylor, Mark Chen, Ryan Snider, Mari MacNeil, Jennifer Rose, Aldo Franco (Public Health), Bernadette Moussa (Public Health), Frank Kosa (Design & Construction)

**REGRETS:** None

### 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 was reviewed and continues to be appropriate.

### 3) DWQMS Management Review Requirements

Required Management Review agenda items were discussed in accordance with the procedure.

### 4) Roundtable Discussion

Management Review discussion conducted as per presentation and agenda.

### 5) Previous Action Items - Follow-up

Reviewed 2023 Management Review action items and status:

#### I. Review/Implement 2023 Internal and External Audit Findings

Zero (0) non-conformance issues were identified. Sixteen (16) opportunities for improvement (OFI) were identified. Implementation to be assessed and decided by management staff.

**Action:** QMS Team, Operations & Maintenance (O&M) Supervisors

**Status:** Ongoing - 8 OFI implemented, 7 in progress, 1 closed.

#### II. Provide QMS Training to the Design & Construction and Engineering & Planning Groups

Including Municipal Drinking Water Licence (MDWL) and Drinking Water Works Permit (DWWP) training.

**Action:** QMS Team

**Status:** Complete. To be provided annually.

**III. DEVELOP A MEMO SUMMARIZING POTENTIAL WATER QUALITY REGULATORY CHANGES AND ASSOCIATED IMPACTS TO WATER OPERATIONS & MAINTENANCE CAPITAL PROJECTS**

**Action:** Manager, O&M

**Status:** Complete

**IV. CONTINUE THE DEVELOPMENT AND PROVISION OF IN-HOUSE TRAINING SESSIONS TO ASSIST WITH ACHIEVING REQUIRED ON THE JOB TRAINING HOURS**

Particularly beneficial for new staff and supervisors.

**Action:** QMS Team, O&M Supervisors

**Status:** Ongoing. Several additional training sessions provided in 2024.

## 6) INCIDENTS OF REGULATORY NON-COMPLIANCE REVIEW

Ten (10) regulatory non-compliance issues occurred in 2024. For non-compliance issues a corrective/preventative action plan was implemented.

## 7) OPERATIONAL PLANS AND MUNICIPAL DRINKING WATER LICENSES

- Organizational Changes in Water & Wastewater Services Division.
    - Addition of the Infrastructure and Project Planning Group
    - Updates made to Roles, Responsibilities and Authorities Tables for several positions. Competency Tables to be updated.
- Splitting existing Water and Wastewater Division into 'Water and Wastewater Infrastructure Management' and 'Water and Wastewater Operations'.
- Form 2s generated for the following:
    - Zone 4, 5 Diesel Fuel day tank replacements
    - Well K50 pump replacement
    - Well K21/K21A flow meter removal
    - Well K34 & K29 VFD installation
    - Parkway FCR analyzer feed location relocated

    <u>Upcoming</u>
    - Wellhouse K22A demolition
    - Erb Street Reservoir ammonium sulphate dosing point change
    - Twinning Mannheim Raw Watermain
- Schedule C received for the following:
    - New well W6C commissioned

- Laurel WTP commissioned
- New Pinebush WTP wells commissioned
- Greenbrook raw and treated reservoir bypasses
- St. Clements to Heidelberg watermain
- Linwood significant upgrades underway
- Petersburg upgrades completed

Upcoming

- William Street new wells connected to Strange Street WTP
- Chlorine gas system upgrades at Mannheim WTP

- Construction of the watermain connecting the Heidelberg and St. Clements distribution systems will result in end-dating the Heidelberg waterworks system.
- Operational Plans updated to reflect 2024 Risk Assessment Outcomes

**8) General Discussion**

- The Ministry of Environment Conservation and Parks (MECP) is in the process of revising the GUDI Terms of Reference and associated Procedure for Disinfection of Drinking Water in Ontario. New facilities and system wells require 4 log virus inactivation vs. current 2 log inactivation. New groundwater wells classified as provisional groundwater may require additional monitoring for potential surface water influence.
- MECP has a working group in place to review and revise the disinfection requirements for water treatment plants, storage facilities and wells in Ontario. Currently, O&M must follow American Water Works Association (AWWA) Standards.
- MECP indicated an application for Regulatory Relief from Schedule 6-2 of Regulation 170/03 (sampling locations) required. Inventory of all IUS facilities underway to determine where relief will be required.
- Increase awareness of the QMS Policy and document review with new hires. Included in the onboarding presentation for O&M staff.
- Discussed occurrences of unlicensed individuals making adjustments to the drinking water system. Letter to be drafted for inclusion at project kick-off meetings.
- Frank K. requests to be notified of any compliance issues related to projects performed by D&C. O&M staff to verify validity of certification for any contracted operators.
- The potential benefits of pairing Transportation D&C Project Managers with Environmental D&C Project Managers on select watermain and road restoration projects was discussed. This approach would provide opportunities to improve

compliance with the Watermain Project Delivery Protocol and the associated design, construction, and commissioning of watermains.

- Linwood iron/manganese filters to be bypassed for approximately 2 months in early 2025. Letter to be sent to homeowners indicating the potential for discoloured water. Commissioner to provide notification to Wellesley Township mayor.
- Discussed MDWL renewals and potential future changes to regulatory requirements. MDWL application submissions required in Fall 2025. Current Licenses expire April 2026.
- New MDWL requirements may include changes to harmful algal bloom response, NSF14 (polyvinyl chloride (pvc) piping) requirements, below grade well inspection frequency, increased primary disinfection requirements from 2 log to 4 log virus inactivation, changes to compliance implications for adverse distribution chlorine residuals among others.
- Discussion on increasing Nitrate levels in the Grand River, particularly in winter. Region has blending with groundwater sources in the Mannheim Reservoir keeping finished water nitrate levels in an acceptable range.
- Discussion on increased cybersecurity risks and control measures. Consider including in an emergency management training session.
- Discussed the requirement for the Region to take over the ownership and operation of the small non-municipal water treatment system in Petersburg. Operational Plan required; Risk Assessment completed. To be included in the 2025 External Reaccreditation Audit. Numerous documents revisions are required.
- Discussed the benefits of reviewing the Public Health AWQI Communication Protocol. Set up a meeting with Public Health, Water Operations and the Corporate Communications Group to review.
- Discussed resources required to maintain and improve the QMS, including:
    - Several internal and external QMS audits and a Municipal Benchmarking exercise completed in late 2023 indicate additional staffing is required to maintain and improve the QMS. Additionally, it has been identified that in the period of 2019-2024 water infrastructure grew by 24.7% and the 10-year capital program grew by 46%, while staff grew by only 3.3%. The Region has become the fastest growing community in Canada, at a time when much of our above ground infrastructure is reaching end of life; the combination of increased equipment failures and increased population-based demand has increased pressure to enhance preventative maintenance, maximize production, and respond quickly to equipment failures.
    - Specific staffing requirements identified were as followed:
        - Administrative (Complete – position approved in March 2024)

  - Health and Safety (Complete – Divisional position approved in 2024 budget process)
  - Operational and Maintenance (In Progress – requested with 2025 budget). Specific request was three specialists to support capital projects, enhance work order development and asset management data analysis, improve succession planning by creating a pathway from union to management, provide enhanced administrative support for future growth of front-line operational staff, and alleviate on-call and Overall Responsible Operator (ORO) staffing restraints.
- Additional equipment, specifically equipment to support distribution system maintenance and repairs (service repairs, valve exercise, isolations, etc.). (In Progress – identified equipment costs requested with 2025 budget)
- Increased internal and external training hours due to staff turnover and retirements

**9) ACTION ITEMS**

**I. REVIEW/IMPLEMENT 2024 INTERNAL AND EXTERNAL AUDIT FINDINGS**

- Three (3) minor non-conformances identified.
- Four (4) opportunities for improvement were identified, implementation to be assessed and decided by management staff.

**Action:** QMS Team, O&M Supervisors

**Timeline:** Fall 2024

**II. PROVIDE QMS TRAINING TO THE DESIGN AND CONSTRUCTION AND ENGINEERING AND PLANNING GROUPS**

- Include Compliance requirements as well.

**Action:** Supervisor, Process and Compliance

**Timeline:** Spring 2024

**III. FINALIZE LETTER TO PROJECT MANAGERS CLARIFYING COMPLIANCE REQUIREMENTS, ASSOCIATED EXPECTATIONS AND POTENTIAL IMPLICATIONS FOR NON COMPLIANCE. LETTER TO BE DISTRIBUTED TO ALL PROJECT DELIVERY STAFF AND ASSOCIATED VENDORS.**

**Action:** Manager, O&M

**Timeline:** Winter 2025

**IV. SET UP MEETING WITH PUBLIC HEALTH TO REVIEW THE AWQI COMMUNICATION PROTOCOL**

**Action:** Supervisor, Process and Compliance

**Timeline:** Spring 2025

### V. Continue the Development and Provision of In-House Training Sessions to Assist with Achieving Required On the Job Training Hours

- Particularly beneficial for new staff and supervisors.

**Action:** QMS Team, O&M Supervisors

**Timeline:** 2025

## 10) Next Steps

- Prepare for External (NSF) Reaccreditation Audit, scheduled for January 6-7 and 22-24, 2025.
- Review and implement previous audit findings and staff suggestions as applicable.
- Continue development and provision of in-house training presentations.

## APPENDIX B – MECP INSPECTION COMPLIANCE RATINGS

| Drinking Water System | Water Works # | Inspection Period | Compliance Rating % |
|---|---|---|---|
| Ayr | 220004199 | Oct 1, 2023 to Sept 18, 2024 | 100 |
| Branchton | 260002538 | May 31, 2023 to May 13, 2024 | 100 |
| Cambridge | 220000166 | April 1, 2023 to March 31, 2024 | 97.02 |
| Integrated Urban Water Distribution System | 260097331 | September 13, 2023 to August 15, 2024 | 100 |
| Foxboro | 220009210 | October 1, 2023 to July 31, 2024 | 94.18 |
| Heidelberg | 220007310 | November 9, 2023 to November 14, 2024 | 100 |
| Kitchener | 220003092 | October 6, 2023 to October 17, 2024 | 100 |
| Linwood | 220000102 | January 1, 2024 to October 30, 2024 | 100 |
| Lloyd Brown | 260002759 | January 15, 2023 to January 31, 2024 (current report not received at time of issue) | 100 |
| Mannheim WTP | 220006981 | August 1, 2023 to August 7, 2024 | 100 |
| Mannheim Village | 260002668 | August 1, 2023 to June 30, 2024 | 99.10 |
| Maryhill | 220004171 | January 5, 2024 to December 16, 2024 | 100 |
| New Dundee | 220004180 | November 1, 2023 to October 31, 2024 | 100 |
| New Hamburg/Baden | 220000111 | September 1, 2023 to May 31, 2024 | 100 |
| Petersburg | 260006269 | N/A | |
| Roseville | 220007301 | July 16, 2023 to July 17, 2024 | 100 |
| Shingletown | 260002707 | November 1, 2023 to August 31, 2024 | 94.25 |
| St. Clements | 220005811 | December 16, 2022 to January 20, 2024 (current report not received at time of issue) | 100 |
| Waterloo | 220000157 | November 1, 2023 to September 30, 2024 | 100 |
| Wellesley | 220004215 | September 15, 2023 to October 15, 2024 | 97.70 |

## APPENDIX C – TREATED WATER FLOW DATA

The following tables summarize the flow rates for 2024, including MDWL Schedule C - Table 1 flow limits and treated water monthly average daily volumes.

| **Cambridge Drinking Water System –** Wells G4/G4A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1900 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 17.65 | 1477 | 1222 |
| February | 16.40 | 1383 | 1376 |
| March | 16.51 | 1388 | 1381 |
| April | 16.53 | 1392 | 1384 |
| May | 18.78 | 1395 | 1376 |
| June | 16.59 | 1388 | 1370 |
| July | 17.04 | 1383 | 1233 |
| August | 16.44 | 1371 | 1317 |
| September | 16.29 | 1375 | 1346 |
| October | 16.57 | 1386 | 1376 |
| November | 16.55 | 1435 | 1372 |
| December | 16.58 | 1385 | 1378 |
| **Average** | | | **1344** |
| **Maximum** | **18.78** | **1477** | |

| **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 | 16.57 | 1260 | 1215 |
| February | 17.66 | 1383 | 1338 |
| March | 19.35 | 1383 | 1369 |
| April | 16.77 | 1379 | 1317 |
| May | 17.22 | 1379 | 1379 |
| June | 16.93 | 1379 | 1376 |
| July | 16.73 | 1379 | 1288 |
| August | 16.86 | 1379 | 1353 |
| September | 16.90 | 1383 | 1378 |
| October | 17.95 | 1383 | 1296 |
| November | 18.31 | 1440 | 1381 |
| December | 17.31 | 1405 | 1376 |
| **Average** | | | **1339** |
| **Maximum** | **19.35** | **1440** | |

| **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 | 20.28 | 1492 | 1431 |
| February | 19.05 | 1479 | 1434 |
| March | 18.66 | 1457 | 1394 |
| April | 18.70 | 1453 | 1370 |
| May | 18.60 | 1521 | 1378 |
| June | 18.17 | 1442 | 1372 |
| July | 18.19 | 1415 | 1334 |
| August | 21.13 | 1371 | 1316 |
| September | 18.29 | 1455 | 1343 |
| October | 19.38 | 1358 | 1260 |
| November | 17.44 | 1345 | 1214 |
| December | 17.26 | 1292 | 1214 |
| **Average** | | | **1338** |
| **Maximum** | **21.13** | **1521** | |

| **Cambridge Drinking Water System** – Well H3/H3A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1642 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 9.47 | 778 | 778 |
| February | 9.40 | 778 | 778 |
| March | 12.40 | 778 | 776 |
| April | 12.26 | 778 | 743 |
| May | 11.43 | 778 | 774 |
| June | 12.12 | 878 | 781 |
| July | 12.13 | 881 | 841 |
| August | 14.34 | 879 | 836 |
| September | 12.07 | 868 | 847 |
| October | 14.25 | 1019 | 840 |
| November | 12.28 | 1059 | 998 |
| December | 16.35 | 1037 | 761 |
| **Average** | | | **813** |
| **Maximum** | **16.35** | **1059** | |

| **Cambridge Drinking Water System –** Well H4A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 2074 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 12.84 | 1037 | 1023 |
| February | 12.86 | 1037 | 1034 |
| March | 16.91 | 1037 | 1023 |
| April | 12.77 | 1037 | 1037 |
| May | 12.89 | 1037 | 1031 |
| June | 14.72 | 1037 | 1029 |
| July | 12.81 | 1037 | 999 |
| August | 12.69 | 1037 | 999 |
| September | 14.93 | 1037 | 1035 |
| October | 12.73 | 1037 | 1036 |
| November | 12.84 | 1080 | 1038 |
| December | 12.99 | 1037 | 1037 |
| **Average** | | | **1027** |
| **Maximum** | **16.91** | **1080** | |

| **Cambridge Drinking Water System** – Well H5/H5A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1987 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 13.34 | 1037 | 1036 |
| February | 13.03 | 1037 | 1037 |
| March | 13.37 | 1037 | 1035 |
| April | 14.05 | 1037 | 905 |
| May | 12.35 | 864 | 851 |
| June | 12.16 | 864 | 864 |
| July | 12.13 | 864 | 837 |
| August | 11.82 | 864 | 848 |
| September | 12.13 | 864 | 863 |
| October | 12.02 | 864 | 807 |
| November | 10.78 | 900 | 865 |
| December | 10.73 | 864 | 864 |
| **Average** | | | **901** |
| **Maximum** | **14.05** | **1037** | |

| **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 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 397.97 | 23701 | 19500 |
| February | 397.81 | 21656 | 19911 |
| March | 397.85 | 20956 | 19313 |
| April | 397.56 | 23580 | 19830 |
| May | 398.67 | 24190 | 20747 |
| June | 396.36 | 21999 | 20291 |
| July | 305.88 | 23326 | 20680 |
| August | 303.75 | 21609 | 19830 |
| September | 358.43 | 23330 | 20248 |
| October | 343.48 | 22936 | 19921 |
| November | 330.83 | 20642 | 19569 |
| December | 309.81 | 22524 | 19969 |
| **Average** | | | **19984** |
| **Maximum** | **398.67** | **24190** | |

| **Cambridge Drinking Water System –** Pinebush Wells (P10A, P10B, P11, P17, P19) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 10368 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 57.83 | 3462 | 2429 |
| February | 83.04 | 3242 | 533 |
| March | 76.07 | 3811 | 1809 |
| April | 75.96 | 3687 | 2960 |
| May | 55.71 | 3364 | 2725 |
| June | 49.98 | 3364 | 2786 |
| July | 45.85 | 3113 | 2854 |
| August | 43.55 | 3109 | 2727 |
| September | 43.73 | 2760 | 2641 |
| October | 45.79 | 2930 | 2205 |
| November | 45.76 | 3106 | 2217 |
| December | 43.69 | 3109 | 2577 |
| **Average** | | | **2372** |
| **Maximum** | **83.04** | **3811** | |

| **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 | |

| **Cambridge Drinking Water System –** Well P9 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1728 $m^3$/day*) | **Monthly Average** ($m^3$/d) |
| January | 18.40 | 1556 | 1555 |
| February | 18.46 | 1556 | 1555 |
| March | 18.52 | 1556 | 1553 |
| April | 18.37 | 1556 | 1555 |
| May | 18.46 | 1556 | 1555 |
| June | 18.46 | 1556 | 1555 |
| July | 18.42 | 1556 | 1507 |
| August | 19.07 | 1556 | 1527 |
| September | 18.46 | 1556 | 1555 |
| October | 18.55 | 1556 | 1555 |
| November | 18.44 | 1601 | 1557 |
| December | 18.48 | 1556 | 1511 |
| **Average** | | | **1545** |
| **Maximum** | **19.07** | **1601** | |

| **Cambridge Drinking Water System –** Well P15A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1728 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 16.82 | 1383 | 1352 |
| February | 16.54 | 1383 | 1373 |
| March | 16.55 | 1383 | 1364 |
| April | 16.60 | 1383 | 1327 |
| May | 20.40 | 1728 | 1493 |
| June | 20.12 | 1728 | 1332 |
| July | 15.53 | 1297 | 1255 |
| August | 16.18 | 1297 | 1272 |
| September | 15.64 | 1296 | 1291 |
| October | 15.68 | 1296 | 1274 |
| November | 15.59 | 1334 | 1268 |
| December | 15.61 | 1297 | 1213 |
| **Average** | | | **1318** |
| **Maximum** | **20.40** | **1728** | |

| **Cambridge Drinking Water System –** Shades Mill Wells (G7, G8, G38, G39, G40) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 12960 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 102.36 | 6805 | 3352 |
| February | 101.57 | 4766 | 3548 |
| March | 100.55 | 4996 | 3440 |
| April | 101.42 | 4175 | 2808 |
| May | 102.38 | 7561 | 4391 |
| June | 102.18 | 7027 | 5432 |
| July | 104.17 | 6853 | 4882 |
| August | 103.69 | 6396 | 4857 |
| September | 103.03 | 6897 | 4626 |
| October | 102.78 | 5943 | 4006 |
| November | 102.59 | 5031 | 4367 |
| December | 102.00 | 7113 | 4867 |
| **Average** | | | **4215** |
| **Maximum** | **104.17** | **7561** | |

| **Cambridge Drinking Water System –** Turnbull Wells (G6, 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 | 104.13 | 4689 | 2838 |
| February | 104.19 | 5078 | 3719 |
| March | 127.16 | 4775 | 2927 |
| April | 121.91 | 5058 | 2818 |
| May | 103.54 | 5315 | 3170 |
| June | 101.66 | 5555 | 3565 |
| July | 105.99 | 4948 | 3311 |
| August | 105.00 | 5008 | 3355 |
| September | 104.52 | 6618 | 3529 |
| October | 88.79 | 4493 | 2322 |
| November | 92.55 | 3249 | 1706 |
| December | 91.86 | 3133 | 2077 |
| **Average** | | | **2945** |
| **Maximum** | **127.16** | **6618** | |

| **Kitchener Drinking Water System –** Greenbrook Wells (K1A, K2A, K4C, K5A, K8) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 12269 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 0 | 0 | 0 |
| February | 0 | 0 | 0 |
| March | 0 | 0 | 0 |
| April | 0 | 0 | 0 |
| May | 180.59 | 8554 | 7322 |
| June | 156.54 | 8086 | 7219 |
| July | 128.11 | 8788 | 7942 |
| August | 165.94 | 8393 | 7887 |
| September | 158.49 | 8085 | 7317 |
| October | 159.37 | 6460 | 6365 |
| November | 148.64 | 6670 | 6428 |
| December | 137.17 | 6460 | 6369 |
| **Average** | | | **7106** |
| **Maximum** | **180.59** | **8788** | |

| **Kitchener Drinking Water System –** Wells K34/K36 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 6868 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 59.74 | 3876 | 3442 |
| February | 56.36 | 3844 | 3209 |
| March | 57.59 | 3845 | 3661 |
| April | 50.56 | 3028 | 1940 |
| May | 58.13 | 3877 | 3448 |
| June | 57.20 | 3849 | 3655 |
| July | 56.79 | 3857 | 3704 |
| August | 56.21 | 3911 | 3655 |
| September | 56.43 | 3908 | 3654 |
| October | 56.67 | 3871 | 3562 |
| November | 55.58 | 3884 | 3596 |
| December | 57.17 | 3841 | 3060 |
| **Average** | | | **3382** |
| **Maximum** | **59.74** | **3911** | |

| **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 | 59.00 | 6110 | 4495 |
| February | 57.36 | 6829 | 4210 |
| March | 53.01 | 5787 | 4205 |
| April | 52.47 | 6163 | 4407 |
| May | 62.94 | 5537 | 4085 |
| June | 65.11 | 5701 | 4154 |
| July | 63.13 | 6596 | 4268 |
| August | 63.96 | 7489 | 4222 |
| September | 61.15 | 6550 | 3951 |
| October | 59.50 | 3449 | 250 |
| November | 0 | 0 | 0 |
| December | 0 | 0 | 0 |
| **Average** | | | **3825** |
| **Maximum** | **65.11** | **7489** | |

| **Kitchener Drinking Water System**<br>Strange St. Wells (K10A, K11A, K13B, K18, K19) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 15854 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 103.13 | 8214 | 8074 |
| February | 102.58 | 8236 | 7545 |
| March | 101.97 | 8231 | 6216 |
| April | 99.91 | 8098 | 5001 |
| May | 108.25 | 8108 | 7849 |
| June | 96.81 | 8041 | 7789 |
| July | 110.27 | 8787 | 8011 |
| August | 113.24 | 8801 | 8321 |
| September | 99.48 | 8143 | 6774 |
| October | 100.66 | 7921 | 7701 |
| November | 98.91 | 7904 | 7471 |
| December | 99.86 | 7412 | 7293 |
| **Average** | | | **7337** |
| **Maximum** | **113.24** | **8801** | |

| **Kitchener Drinking Water System** – Woolners Wells (K80, K81, K82) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 11146 $m^3$/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 | |

| **Mannheim WTP Drinking Water System** – Well K21 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 2765 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 27.95 | 2160 | 1589 |
| February | 25.49 | 2161 | 2159 |
| March | 25.60 | 2161 | 2147 |
| April | 28.90 | 2160 | 2155 |
| May | 26.75 | 2160 | 2149 |
| June | 27.00 | 2161 | 2147 |
| July | 25.47 | 2160 | 2145 |
| August | 25.47 | 2160 | 2134 |
| September | 25.25 | 2130 | 2090 |
| October | 25.62 | 2077 | 2033 |
| November | 25.05 | 2051 | 2009 |
| December | 25.12 | 2060 | 1983 |
| **Average** | | | **2062** |
| **Maximum** | **28.90** | **2161** | |

| **Mannheim WTP Drinking Water System –** Well K21A | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 2160 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 25.68 | 1728 | 1270 |
| February | 20.33 | 1729 | 1728 |
| March | 20.50 | 1728 | 1719 |
| April | 27.05 | 1728 | 1728 |
| May | 23.99 | 1728 | 1726 |
| June | 23.92 | 1729 | 1724 |
| July | 20.74 | 1728 | 1726 |
| August | 26.64 | 2091 | 1762 |
| September | 20.33 | 1729 | 1721 |
| October | 21.05 | 1729 | 1713 |
| November | 24.16 | 1951 | 1715 |
| December | 22.33 | 1729 | 1701 |
| **Average** | | | **1686** |
| **Maximum** | **27.05** | **2091** | |

| **Mannheim WTP 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 | 64.35 | 5299 | 4293 |
| February | 56.10 | 4605 | 4515 |
| March | 56.68 | 4580 | 4509 |
| April | 60.02 | 4583 | 4538 |
| May | 77.91 | 5183 | 4562 |
| June | 50.42 | 3795 | 3699 |
| July | 52.50 | 3731 | 3702 |
| August | 51.69 | 3898 | 3725 |
| September | 62.05 | 4458 | 4006 |
| October | 64.38 | 4526 | 4331 |
| November | 63.98 | 4476 | 4425 |
| December | 60.04 | 4627 | 4433 |
| **Average** | | | **4228** |
| **Maximum** | **77.91** | **5299** | |

| **Mannheim WTP 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 | 61.13 | 4859 | 3545 |
| February | 58.86 | 3716 | 3572 |
| March | 59.27 | 3626 | 3549 |
| April | 56.23 | 3633 | 3547 |
| May | 58.37 | 3999 | 2740 |
| June | 58.96 | 4308 | 4119 |
| July | 52.91 | 4219 | 4018 |
| August | 57.47 | 4297 | 3948 |
| September | 59.45 | 4296 | 3924 |
| October | 57.91 | 3737 | 3571 |
| November | 59.38 | 3792 | 3694 |
| December | 54.49 | 3880 | 3573 |
| **Average** | | | **3650** |
| **Maximum** | **61.13** | **4859** | |

| **Mannheim WTP Drinking Water System** – ASR1 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 5010 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 16.06 | 410 | 27 |
| February | 9.49 | 541 | 90 |
| March | 7.53 | 316 | 18 |
| April | 8.31* | 0 | 0 |
| May | 11.36* | 0 | 0 |
| June | 14.08* | 0 | 0 |
| July | 12.54* | 0 | 0 |
| August | 0 | 0 | 0 |
| September | 0 | 0 | 0 |
| October | 0 | 0 | 0 |
| November | 0 | 0 | 0 |
| December | 0 | 0 | 0 |
| **Average** | | | **45** |
| **Maximum** | **16.06** | **541** | |

*Running to waste.

| **Mannheim WTP 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 | 13.38 | 658 | 50 |
| February | 14.76 | 1057 | 187 |
| March | 12.79 | 580 | 32 |
| April | 0 | 0 | 0 |
| May | 0 | 0 | 0 |
| June | 16.63 | 335 | 21 |
| July | 18.21 | 83 | 5 |
| August | 17.15 | 1049 | 98 |
| September | 17.08 | 1108 | 245 |
| October | 15.25 | 350 | 24 |
| November | 0 | 0 | 0 |
| December | 0 | 0 | 0 |
| **Average** | | | **83** |
| **Maximum** | **18.21** | **1108** | |

| **Mannheim WTP 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 | 0 | 0 | 0 |
| February | 0 | 0 | 0 |
| March | 0 | 0 | 0 |
| April | 6.17* | 0 | 0 |
| May | 0 | 0 | 0 |
| June | 12.11* | 0 | 0 |
| July | 13.70* | 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** | **13.70** | **10** | |

*Running to waste.

| **Mannheim WTP 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 | 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** | |

| **Mannheim WTP Drinking Water System –** ASR5 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 5504 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 29.00 | 1322 | 112 |
| February | 45.28 | 3888 | 621 |
| March | 45.23 | 3792 | 345 |
| April | 45.24 | 241 | 24 |
| May | 45.23 | 1399 | 71 |
| June | 45.94 | 3368 | 441 |
| July | 45.25 | 3738 | 282 |
| August | 45.25 | 3888 | 409 |
| September | 45.23 | 3888 | 878 |
| October | 45.27 | 1649 | 270 |
| November | 45.28 | 1871 | 443 |
| December | 45.26 | 3888 | 349 |
| **Average** | | | **354** |
| **Maximum** | **45.94** | **3888** | |

| **Mannheim WTP 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 | 37.72 | 1894 | 158 |
| February | 37.24 | 3024 | 557 |
| March | 34.97 | 2782 | 255 |
| April | 35.28 | 158 | 19 |
| May | 35.26 | 1025 | 48 |
| June | 34.77 | 2471 | 320 |
| July | 34.79 | 2718 | 205 |
| August | 35.14 | 2851 | 292 |
| September | 56.23 | 2852 | 642 |
| October | 35.30 | 1210 | 198 |
| November | 35.77 | 1373 | 325 |
| December | 34.58 | 2851 | 253 |
| **Average** | | | **273** |
| **Maximum** | **56.23** | **3024** | |

| **Mannheim WTP Drinking Water System –** RCW3 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 2592 $m^3$/day*) | **Monthly Average** ($m^3$/d) |
| January | 26.83 | 1355 | 114 |
| February | 28.71 | 2160 | 262 |
| March | 26.67 | 688 | 30 |
| April | 0 | 0 | 0 |
| May | 0 | 0 | 0 |
| June | 0 | 0 | 0 |
| July | 0 | 0 | 0 |
| August | 29.34 | 2160 | 195 |
| September | 30.23 | 2160 | 488 |
| October | 30.23 | 916 | 123 |
| November | 30.32 | 1039 | 246 |
| December | 29.94 | 2160 | 194 |
| **Average** | | | **207** |
| **Maximum** | **30.32** | **2160** | |

| **Mannheim WTP Drinking Water System –** RCW4 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 3888 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 40.24 | 2159 | 180 |
| February | 40.27 | 3024 | 572 |
| March | 35.96 | 2951 | 270 |
| April | 35.59 | 192 | 20 |
| May | 36.42 | 186 | 19 |
| June | 42.01 | 2619 | 344 |
| July | 36.16 | 2873 | 219 |
| August | 35.26 | 3024 | 318 |
| September | 36.97 | 3024 | 683 |
| October | 36.45 | 1283 | 206 |
| November | 37.52 | 1456 | 345 |
| December | 38.26 | 3024 | 272 |
| **Average** | | | **287** |
| **Maximum** | **42.01** | **3024** | |

| **Mannheim WTP Drinking Water System –** Well K91 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 4492 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 40.10 | 3310 | 2986 |
| February | 39.53 | 3322 | 2790 |
| March | 39.90 | 3292 | 1998 |
| April | 39.88 | 3280 | 2670 |
| May | 40.14 | 3289 | 1894 |
| June | 40.23 | 3279 | 1654 |
| July | 40.21 | 3277 | 1947 |
| August | 40.11 | 3288 | 2046 |
| September | 39.90 | 3294 | 2649 |
| October | 40.17 | 3268 | 1924 |
| November | 40.29 | 3317 | 882 |
| December | 39.32 | 3236 | 2251 |
| **Average** | | | **2141** |
| **Maximum** | **40.29** | **3322** | |

| **Mannheim WTP 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 | 41.96 | 3460 | 3071 |
| February | 41.94 | 3393 | 2858 |
| March | 42.72 | 3416 | 2084 |
| April | 41.61 | 3356 | 2697 |
| May | 41.99 | 3355 | 1938 |
| June | 42.54 | 3358 | 1718 |
| July | 42.46 | 3353 | 1988 |
| August | 42.44 | 3461 | 2126 |
| September | 42.32 | 3366 | 2706 |
| October | 44.08 | 3684 | 2131 |
| November | 45.09 | 3753 | 2653 |
| December | 42.18 | 3455 | 2300 |
| **Average** | | | **2356** |
| **Maximum** | **45.09** | **3753** | |

| **Mannheim WTP 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 | 44.40 | 3574 | 3057 |
| February | 43.34 | 3454 | 2896 |
| March | 50.36 | 3556 | 2264 |
| April | 49.87 | 3418 | 2754 |
| May | 46.45 | 3428 | 1970 |
| June | 49.48 | 3422 | 1768 |
| July | 46.41 | 3426 | 2041 |
| August | 45.11 | 3431 | 2147 |
| September | 52.15 | 3421 | 2758 |
| October | 45.18 | 3485 | 2240 |
| November | 44.17 | 3496 | 798 |
| December | 51.77 | 3433 | 2372 |
| **Average** | | | **2255** |
| **Maximum** | **52.15** | **3574** | |

| **Mannheim WTP 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 | 43.25 | 3423 | 2896 |
| February | 41.20 | 3411 | 2858 |
| March | 43.74 | 3546 | 2262 |
| April | 45.20 | 3455 | 2715 |
| May | 44.03 | 3364 | 1946 |
| June | 43.84 | 3396 | 1757 |
| July | 44.32 | 3332 | 1986 |
| August | 75.00 | 3489 | 2125 |
| September | 45.20 | 3367 | 2695 |
| October | 43.43 | 3511 | 2162 |
| November | 44.12 | 3697 | 2563 |
| December | 43.82 | 3429 | 2301 |
| **Average** | | | **2356** |
| **Maximum** | **75.00** | **3697** | |

| **Mannheim WTP 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 | 775.57 | 46543 | 39281 |
| February | 705.34 | 55113 | 36735 |
| March | 779.03 | 46573 | 35721 |
| April | 1000.00* | 43225 | 36371 |
| May | 683.28 | 41822 | 36163 |
| June | 729.10 | 48980 | 39139 |
| July | 573.89 | 45052 | 39115 |
| August | 476.49 | 44221 | 38275 |
| September | 1000.00* | 54580 | 43460 |
| October | 1000.00* | 47040 | 37771 |
| November | 817.94 | 43753 | 38805 |
| December | 704.37 | 55461 | 40121 |
| **Average** | | | **38413** |
| **Maximum** | **1000.00** | **55461** | |

*Less than 5 minute flow spike.

| **Mannheim Village 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** | |

| **Mannheim Village 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 | 28.02 | 2218 | 2122 |
| February | 29.02 | 2207 | 2150 |
| March | 32.50 | 2203 | 1710 |
| April | 25.29 | 1999 | 1803 |
| May | 23.85 | 1989 | 1958 |
| June | 25.69 | 1988 | 1941 |
| July | 26.46 | 1987 | 1980 |
| August | 23.70 | 1986 | 1970 |
| September | 25.01 | 1986 | 945 |
| October | 25.57 | 1905 | 1823 |
| November | 24.46 | 1983 | 1883 |
| December | 22.87 | 1905 | 1851 |
| **Average** | | | **1845** |
| **Maximum** | **32.50** | **2218** | |

| **Mannheim Village 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 | 34.58 | 2592 | 2586 |
| February | 51.76 | 3026 | 2795 |
| March | 43.61 | 3024 | 3000 |
| April | 46.38 | 3025 | 3022 |
| May | 39.25 | 3025 | 3022 |
| June | 39.10 | 3025 | 3019 |
| July | 43.21 | 3025 | 3024 |
| August | 40.27 | 3456 | 3013 |
| September | 38.62 | 3024 | 3010 |
| October | 45.66 | 3025 | 2972 |
| November | 42.49 | 3303 | 3035 |
| December | 46.80 | 3025 | 2984 |
| **Average** | | | **2957** |
| **Maximum** | **51.76** | **3456** | |

| **Mannheim Village Drinking Water System –** Well K26 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 9850 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 96.52 | 7777 | 6827 |
| February | 98.57 | 8468 | 6430 |
| March | 94.29 | 7604 | 5669 |
| April | 94.22 | 7604 | 5584 |
| May | 96.61 | 7604 | 4155 |
| June | 96.10 | 7604 | 4618 |
| July | 102.63 | 7604 | 3628 |
| August | 100.41 | 8640 | 4408 |
| September | 95.99 | 7604 | 6256 |
| October | 93.35 | 7603 | 5084 |
| November | 100.39 | 8275 | 5235 |
| December | 102.15 | 7604 | 4491 |
| **Average** | | | **5199** |
| **Maximum** | **102.63** | **8640** | |

| **Shingletown Drinking Water System –** Wells K50/K51 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 13651 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 145.57 | 11225 | 4889 |
| February | 139.57 | 11664 | 9019 |
| March | 138.48 | 11234 | 10641 |
| April | 138.69 | 11234 | 11193 |
| May | 139.43 | 11234 | 11166 |
| June | 139.68 | 11234 | 11213 |
| July | 139.53 | 11234 | 11198 |
| August | 163.14* | 11751 | 10332 |
| September | 73.58 | 6051 | 6047 |
| October | 148.45 | 11578 | 10750 |
| November | 140.99 | 11610 | 11234 |
| December | 140.27 | 11232 | 7419 |
| **Average** | | | **9592** |
| **Maximum** | **163.14** | **11751** | |

*Less than 5 minute flow spike.

| **Waterloo Drinking Water System –** Erb Street Wells (W6B, W6C, W7, W8) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 24139 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 155.80 | 13448 | 12371 |
| February | 156.71 | 13634 | 12350 |
| March | 151.09 | 14021 | 12483 |
| April | 165.86 | 13994 | 12141 |
| May | 154.99 | 13305 | 11821 |
| June | 150.74 | 13880 | 12148 |
| July | 151.63 | 13196 | 12338 |
| August | 161.60 | 12985 | 10701 |
| September | 148.50 | 13736 | 11558 |
| October | 156.04 | 13191 | 12027 |
| November | 150.58 | 13146 | 10713 |
| December | 144.69 | 13500 | 11591 |
| **Average** | | | **11854** |
| **Maximum** | **165.86** | **14021** | |

| **Waterloo Drinking Water System –** William Street Wells (W1B, W1C, W2, W3) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 16753 $m^3$/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 | |

| **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 | 22.52 | 1901 | 1889 |
| February | 22.57 | 1901 | 1837 |
| March | 22.60 | 1901 | 1891 |
| April | 22.69 | 1901 | 1879 |
| May | 22.63 | 1901 | 1897 |
| June | 22.65 | 1901 | 1682 |
| July | 19.50 | 1556 | 1532 |
| August | 22.57 | 1901 | 1631 |
| September | 20.75 | 1728 | 1715 |
| October | 20.85 | 1728 | 1700 |
| November | 20.87 | 1800 | 1184 |
| December | 21.55 | 1728 | 1250 |
| **Average** | | | **1674** |
| **Maximum** | **22.69** | **1901** | |

| **Waterloo Drinking Water System** – Well W25 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 6,826 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 0 | 0 | 0 |
| February | 70.94* | 2536 | 352 |
| March | 66.94* | 4756 | 4151 |
| April | 62.74* | 4791 | 4644 |
| May | 59.04 | 4560 | 3995 |
| June | 57.84 | 4579 | 4511 |
| July | 72.49* | 4623 | 4472 |
| August | 57.83 | 4700 | 4501 |
| September | 65.48* | 4528 | 4300 |
| October | 69.45* | 4244 | 4011 |
| November | 66.00* | 4093 | 3841 |
| December | 73.66* | 3987 | 3413 |
| **Average** | | | **3836** |
| **Maximum** | **73.66** | **4791** | |

*Less than 5 minute flow spike.

| **New Hamburg/Baden Drinking Water System** – Wells (NH3, NH4) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 3542 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 45.95* | 1897 | 1739 |
| February | 44.24* | 1940 | 1726 |
| March | 43.22* | 1988 | 1763 |
| April | 44.27* | 1890 | 1787 |
| May | 48.72* | 2364 | 1962 |
| June | 42.93* | 2317 | 1978 |
| July | 42.25* | 2283 | 1977 |
| August | 40.37 | 2117 | 1865 |
| September | 39.79 | 2115 | 1910 |
| October | 35.74 | 2043 | 1807 |
| November | 40.04 | 1959 | 1733 |
| December | 43.90* | 2110 | 1818 |
| **Average** | | | **1839** |
| **Maximum** | **48.72** | **2364** | |

*Less than 5 minute flow spike.

| **Ayr Drinking Water System –** Wells (A1, A2, A3) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 5478 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 66.17 | 2421 | 2174 |
| February | 70.18 | 2664 | 2209 |
| March | 71.14 | 2404 | 2101 |
| April | 69.83 | 2280 | 2057 |
| May | 71.87 | 2982 | 2316 |
| June | 71.43 | 3086 | 2385 |
| July | 70.25 | 3112 | 2198 |
| August | 68.33 | 2863 | 2199 |
| September | 74.42 | 2910 | 2275 |
| October | 69.34 | 2261 | 1902 |
| November | 70.01 | 2124 | 1788 |
| December | 71.97 | 2143 | 1847 |
| **Average** | | | **2121** |
| **Maximum** | **74.42** | **3112** | |

| **Branchton Drinking Water System –** Wells (BM2, BM3) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 130 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 1.27 | 47 | 35 |
| February | 1.29 | 42 | 36 |
| March | 1.24 | 45 | 38 |
| April | 1.27 | 62 | 44 |
| May | 1.26 | 76 | 51 |
| June | 1.30 | 78 | 55 |
| July | 1.23 | 79 | 60 |
| August | 1.20 | 78 | 66 |
| September | 1.28 | 79 | 67 |
| October | 1.30 | 80 | 72 |
| November | 1.31 | 109 | 90 |
| December | 1.30 | 113 | 40 |
| **Average** | | | **54** |
| **Maximum** | **1.31** | **113** | |

| **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 | 4.18* | 60 | 42 |
| February | 3.49 | 48 | 41 |
| March | 3.48 | 50 | 41 |
| April | 3.44 | 60 | 44 |
| May | 3.43 | 76 | 57 |
| June | 3.38 | 93 | 64 |
| July | 3.41 | 111 | 69 |
| August | 3.38 | 84 | 69 |
| September | 3.39 | 87 | 65 |
| October | 3.39 | 73 | 54 |
| November | 3.42 | 79 | 51 |
| December | 3.36 | 54 | 45 |
| **Average** | | | **53** |
| **Maximum** | **4.18** | **111** | |

*Less than 5 minute flow spike.

| **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 | 9.35 | 177 | 146 |
| February | 9.28 | 164 | 143 |
| March | 9.10 | 178 | 141 |
| April | 8.92 | 174 | 148 |
| May | 8.92 | 222 | 172 |
| June | 9.02 | 264 | 187 |
| July | 8.69 | 260 | 184 |
| August | 8.84 | 212 | 171 |
| September | 8.88 | 237 | 189 |
| October | 8.87 | 193 | 160 |
| November | 8.92 | 201 | 59 |
| December | 0.00 | 0 | 0 |
| **Average** | | | **155** |
| **Maximum** | **9.35** | **264** | |

| **Maryhill Drinking Water System –** Maryhill WTP- Wells (MH1, MH2) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 157 $m^3$/day) | **Monthly Average** (m3/d) |
| January | 1.66 | 50 | 26 |
| February | 1.80 | 50 | 29 |
| March | 1.62 | 41 | 30 |
| April | 2.00* | 38 | 31 |
| May | 2.00* | 48 | 35 |
| June | 1.82* | 58 | 41 |
| July | 1.74 | 51 | 36 |
| August | 1.98* | 50 | 39 |
| September | 1.73 | 54 | 37 |
| October | 2.01* | 42 | 28 |
| November | 2.00* | 16 | 1 |
| December | 0 | 0 | 0 |
| **Average** | | | **30** |
| **Maximum** | **2.01** | **58** | |

*Less than 5 minute flow spike.

| **Maryhill Drinking Water System –** Maryhill Heights- Wells (MH4A, MH5) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 812 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 5.85 | 74 | 35 |
| February | 6.17 | 41 | 26 |
| March | 7.18 | 36 | 27 |
| April | 5.83 | 46 | 30 |
| May | 8.50 | 84 | 46 |
| June | 10.00 | 125 | 67 |
| July | 14.77 | 142 | 77 |
| August | 11.73 | 144 | 94 |
| September | 14.77 | 148 | 90 |
| October | 14.76 | 107 | 50 |
| November | 14.63 | 75 | 62 |
| December | 12.90 | 85 | 66 |
| **Average** | | | **56** |
| **Maximum** | **14.77** | **148** | |

| **Linwood Drinking Water System –** Wells (L1A, L2) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 604.8 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 7.58 | 273 | 252 |
| February | 7.56 | 285 | 267 |
| March | 7.48 | 350 | 312 |
| April | 7.58 | 402 | 342 |
| May | 7.57 | 315 | 254 |
| June | 7.62 | 292 | 251 |
| July | 7.60 | 272 | 231 |
| August | 7.55 | 223 | 207 |
| September | 9.73 | 263 | 214 |
| October | 10.00 | 202 | 182 |
| November | 11.26 | 196 | 171 |
| December | 7.59 | 192 | 169 |
| **Average** | | | **238** |
| **Maximum** | **11.26** | **402** | |

| **St. Clements Drinking Water System –** Wells (SC2, SC3, SC4) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 1771.2 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 16.46 | 234 | 203 |
| February | 16.41 | 221 | 203 |
| March | 16.58 | 232 | 199 |
| April | 27.50* | 237 | 208 |
| May | 29.96* | 304 | 242 |
| June | 16.79 | 364 | 262 |
| July | 16.61 | 115 | 223 |
| August | 16.83 | 198 | 135 |
| September | 17.13 | 311 | 194 |
| October | 16.55 | 306 | 132 |
| November | 16.57 | 340 | 217 |
| December | 16.62 | 409 | 328 |
| **Average** | | | **212** |
| **Maximum** | **29.96** | **409** | |

*Less than 5 minute flow spike.

| **Wellesley Drinking Water System –** Wells (WY1, WY5, WY6) | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 3006 $m^3$/day) | **Monthly Average** ($m^3$/d) |
| January | 20.21* | 698 | 596 |
| February | 20.99* | 690 | 595 |
| March | 20.74* | 724 | 599 |
| April | 20.85* | 709 | 601 |
| May | 20.97* | 776 | 643 |
| June | 21.09* | 859 | 686 |
| July | 20.68* | 782 | 664 |
| August | 21.23* | 675 | 590 |
| September | 21.26* | 701 | 624 |
| October | 20.98* | 777 | 630 |
| November | 21.26* | 663 | 596 |
| December | 20.76* | 726 | 635 |
| **Average** | | | **622** |
| **Maximum** | **21.26** | **859** | |

*Less than 5 minute flow spike.

| **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 | 2.64 | 83 | 73 |
| February | 2.52 | 91 | 67 |
| March | 2.45 | 84 | 67 |
| April | 6.12 | 83 | 70 |
| May | 3.76 | 87 | 76 |
| June | 4.39 | 83 | 73 |
| July | 2.30 | 82 | 70 |
| August | 2.60 | 82 | 72 |
| September | 2.12 | 92 | 80 |
| October | 2.73 | 95 | 82 |
| November | 2.38 | 102 | 82 |
| December | 2.19 | 114 | 92 |
| **Average** | | | **75** |
| **Maximum** | **6.12** | **114** | |

| **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 | 6.76 | 236 | 168 |
| February | 6.80 | 208 | 167 |
| March | 15.67* | 197 | 167 |
| April | 6.62 | 214 | 170 |
| May | 6.44 | 316 | 207 |
| June | 6.34 | 254 | 202 |
| July | 6.60 | 299 | 210 |
| August | 6.29 | 255 | 198 |
| September | 6.19 | 265 | 208 |
| October | 6.17 | 217 | 174 |
| November | 5.97 | 181 | 162 |
| December | 6.09 | 232 | 182 |
| **Average** | | | **185** |
| **Maximum** | **15.67** | **316** | |

*Less than 5 minute flow spike.

| **Petersburg Drinking Water System –** Well PE1 | | | |
|---|---|---|---|
| **Month** | **Raw Peak Flow Rate** (L/s) | **Treated – Max Day** (MDWL Limit= 288 $m^3$/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 | 1.93* | 77 | 25 |
| July | 6.37 | 80 | 58 |
| August | 4.02 | 78 | 53 |
| September | 4.02 | 66 | 43 |
| October | 4.00 | 56 | 37 |
| November | 3.99 | 73 | 37 |
| December | 3.99 | 35 | 27 |
| **Average** | | | **40** |
| **Maximum** | **6.37** | **80** | |

*Estimated based on average day. Facility commissioning in progress.

## APPENDIX D – SYSTEM INFORMATION

| Municipality | Location | Water Source | MDWL# / DWWP# | PTTW # | Sub-System Class /Number | System Type |
|---|---|---|---|---|---|---|
| **Cambridge** Drinking Water Supply System (IUS) | Galt Wells | G4/G4A | 012-102 / 012-202 | P-300-2229080479 | WT Class III #8125 | Large |
| | | G5/G5A | | P-300-6117976847 | | |
| | | G9 | | Grandfathered | | |
| | Hespeler Wells | H3/H3A | | P-300-3214426699 | | |
| | | H4A | | 1008-BW6L62 | | |
| | | H5/H5A | | P-300-1161883172 | | |
| | Middleton WTP | G1, G1A, G2, G3, G14 | | 7214-AMGR5G | | |
| | | G15 | | 6132-AKURBN | | |
| | Pinebush WTP | P10, P10A, P10B, P11 P17, P19 | | 7858-BXUUUH | | |
| | Preston Wells | P16 | | 2004-AKXNEB | | |
| | Rahmans Wells | P9 P15/P15A | | 7600-A27N5B | | |
| | Shades Mill WTP | G7, G8, G38, G39, G40 | | 3004-A9GHYU | | |
| | Turnbull WTP | G6, G16, G17, G18, G19 | | 5552-BUKM94 | | |
| **Kitchener** Drinking Water Supply System (IUS) | Greenbrook WTP | K1A, K2A, K4C, K5A, K8 | 012-102 / 012-202 | 0071-BUKPU5 | WT Class III #8126 | Large |
| | K34 WTP | K34 K36 | | 6732-A3FJYA | | |
| | Parkway WTP | K31, K32 | | Grandfathered | | |
| | | K33 | | 3115-AMHHXH | | |

| Municipality | Location | Water Source | MDWL# / DWWP# | PTTW # | Sub-System Class /Number | System Type |
|---|---|---|---|---|---|---|
| | Strange Street WTP | K10A<br>K11A<br>K13B<br>K18, K19 | | P-300-6221899077 | | |
| | Woolners Wells | K80, K81, K82 | | 0288-BA8LR8 | | |
| **Mannheim** Drinking Water Supply System (IUS) | Mannheim WTP | Grand River | 012-102 / 012-202 | Hidden Valley 0366-AYCP5A (Mannheim WTP supply only)<br><br>Mannheim Consolidated P-300-3130244509 (Mannheim Wells, Peaking Wells and ASRs) | WT Class IV #1843 | Large |
| | ASR Wells | ASR1 ASR2 ASR3 ASR4 ASR5 RCW2 RCW3 RCW4 | | | | |
| | K90 Peaking Wells | K91<br>K92<br>K93<br>K94 | | | | |
| | Mannheim Wells | K21/K21A<br>K25<br>K29 | | | | |
| **Waterloo** Drinking Water Supply System (IUS) | Erb Street Wells | W6B W6C W7 W8 | 012-102 / 012-202 | 1541-AWGPZR | WT Class II #8127 | Large |
| | Waterloo Wells | W10<br>W25<br>W5A | | 0061-BLHQ45 | | |
| | William Street Wells | W1B<br>W2B<br>W2C<br>W3A | | P-300-5049623280 | | |

| Municipality | Location | Water Source | MDWL# / DWWP# | PTTW # | Sub-System Class /Number | System Type |
|---|---|---|---|---|---|---|
| **Integrated Urban Water Distribution System** | Cambridge, Kitchener, Waterloo, Wilmot and Woolwich | IUS Sources | 012-102 / 012-202 | N/A | WD Class IV #8128 | Large |
| **North Dumfries Township** Drinking Water Supply Systems | Ayr WTP | A1<br>A2<br>A3 | 012-113 / 012-213 | P-300-2094925631 | WT Class II #2591 & WD Class II #362 | Large |
| | Branchton WTP | BM1<br>BM2<br>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<br>R6 | 012-101 / 012-201 | P-300-3116859114 | Limited Groundwater | Small |
| **Wellesley Township** Drinking Water Supply Systems | Heidelberg WTP | HD1<br>HD2 | 012-104 / 012-204 | 2437-B8FR7E | WT Class II #3101 Class II WD 3610 | Large |
| | Linwood WTP | L1A<br>L2 | 012-108 / 012-208 | 2680-B8HT58 | WT Class II #3594 WD Class II #1951 | Large |
| | St. Clements WTP | SC2<br>SC3<br>SC4 | 012-110 / 012-210 | P-300-5118893858 | WT Class II #2598 WD Class II 1952 | Large |
| | Wellesley WTP | WY1<br>WY5<br>WY6 | 012-115 / 012-215 | P-300-4214409441 | WT Class II #2601 WD Class II 1953 | Large |

| Municipality | Location | Water Source | MDWL# / DWWP# | PTTW # | Sub-System Class /Number | System Type |
|---|---|---|---|---|---|---|
| **Wilmot Township** Drinking Water Supply Systems | Foxboro | FG1<br>FG2A<br>FG4 | 012-105 / 012-205 | 2544-BBHP4S | WT<br>Class I #2599 | Large |
| | Mannheim Village Wells | K23<br>K24<br>K26 | 012-102 / 012-202 | P-300-3130244509 | WT<br>Class I #3603 | Large |
| | New Dundee Wells | ND4<br>ND5 | 012-107 / 012-207 | 5581-B84PGT | WDS<br>Class I #3595 | Large |
| | New Hamburg WTP | NH3<br>NH4 | 012-102 / 012-202 | 7021-AQRK39 | WT<br>Class II #2930 | Large |
| | Shingletown Wells | K50<br>K51 | 012-102 / 012-202 | P-300-4271733410 | WDS<br>Class I #3593 | Large |
| | Petersburg | PE1 | N/A,<br>012-216 | 3478-D83LM9 | N/A | Non-Municipal Year-Round Residential |
| **Woolwich Township** Drinking Water Supply Systems | Maryhill Village Heights Wells | MH4A<br>MH5 | 012-106 / 012-206 | 1746-BBWLJR | WT<br>Class I #8867 | Large |
| | Maryhill WTP | MH1<br>MH2 | | 2613-BBKR76 | WT<br>Class I #8867 | Large |