S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Municipality of Wawa

Water / Wastewater Master Servicing Plan

Class Environmental Assessment

October 2023

SBA File No.: M22019

REPORT PREPARED BY:

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October 18, 2023

Municipality of Wawa
PO Box 500, 40 Broadway Avenue
Municipality of Wawa, ON P0S 1K0

Attn: Becca Weatherall, P.Eng., Assistant Director, Infrastructure Services

Re: Municipality of Wawa
Water & Wastewater Master Servicing Plan EA – For Public Review
SBA File No: M22019

Dear Becca,

S. Burnett & Associates Limited (SBA) is pleased to provide this Final Water & Wastewater Master Servicing Plan Environmental Assessment. This Environmental Assessment will create a plan for the Municipality of Wawa's infrastructure to ensure that it meets both current and future requirements. Our assessment followed Phases 1 and 2 of Municipal Engineers Association Municipal Class EA process, which are documented in this report.

With the completion of the Class EA process, the intent is to file a Notice of Completion to initiate the 30-day public and agency review period. If no comments or Part II Order requests are received during that time, the Municipality can then proceed to Phase 5: Implementation of the Municipal Class Environmental Assessment Process.

Thank you for the opportunity to work together on this important project. Should you have any questions, please do not hesitate to contact us.

Yours truly,

Ian Callum, M.Sc., PMP
Senior Environmental Project Manager
S. Burnett & Associates Limited

cc: Maury O'Neil, Municipality of Wawa, CAO – Deputy Clerk

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1. Background

The Municipality of Wawa (the "Municipality") is a small single-tier Municipality (Township) in the Algoma District of northwestern Ontario, just off the shores of Lake Superior. The Township is surrounded by Wawa Lake and the Magpie and Michipicoten rivers.

Wawa is located along the Trans-Canada Highway (Hwy 17), with the closest urban centre being Sault Ste. Marie, located 225 km to the south. With a population of 2,905 (Government of Canada, 2016), Wawa's population has decreased from approximately 5,000 in the late 1970's due to declines in the mining and forestry industry.

S. Burnett and Associates Limited (SBA) was retained to complete a Water & Wastewater Master Servicing Plan (WWMSP) to evaluate current and future water and wastewater requirements and to create a plan to ensure that infrastructure can meet those requirements. This Master Servicing Plan followed Phases 1, 2 and 5 of the Municipal Engineers' Class Environmental Assessment Process, which is shown in **Figure 1**.

The Problem / Opportunity addressed by this Class Environmental Assessment is:

The Municipality of Wawa requires a Master Servicing Plan to ensure that water and wastewater infrastructure is in place to meet the current and future needs of the Municipality.

The WWMPS uses a 10-year planning window, extending to 2032 and identified the need and justification for projects in a way that met Environmental Assessment Act requirements.

1.1 Provincial Policy Statement

The Provincial Policy Statement (Government of Ontario, 2020), under the *Planning Act*, sets out the policy foundation for regulating the development and use of land in Ontario. Under the Provincial Policy Statement (PPS), planning for water and wastewater services shall:

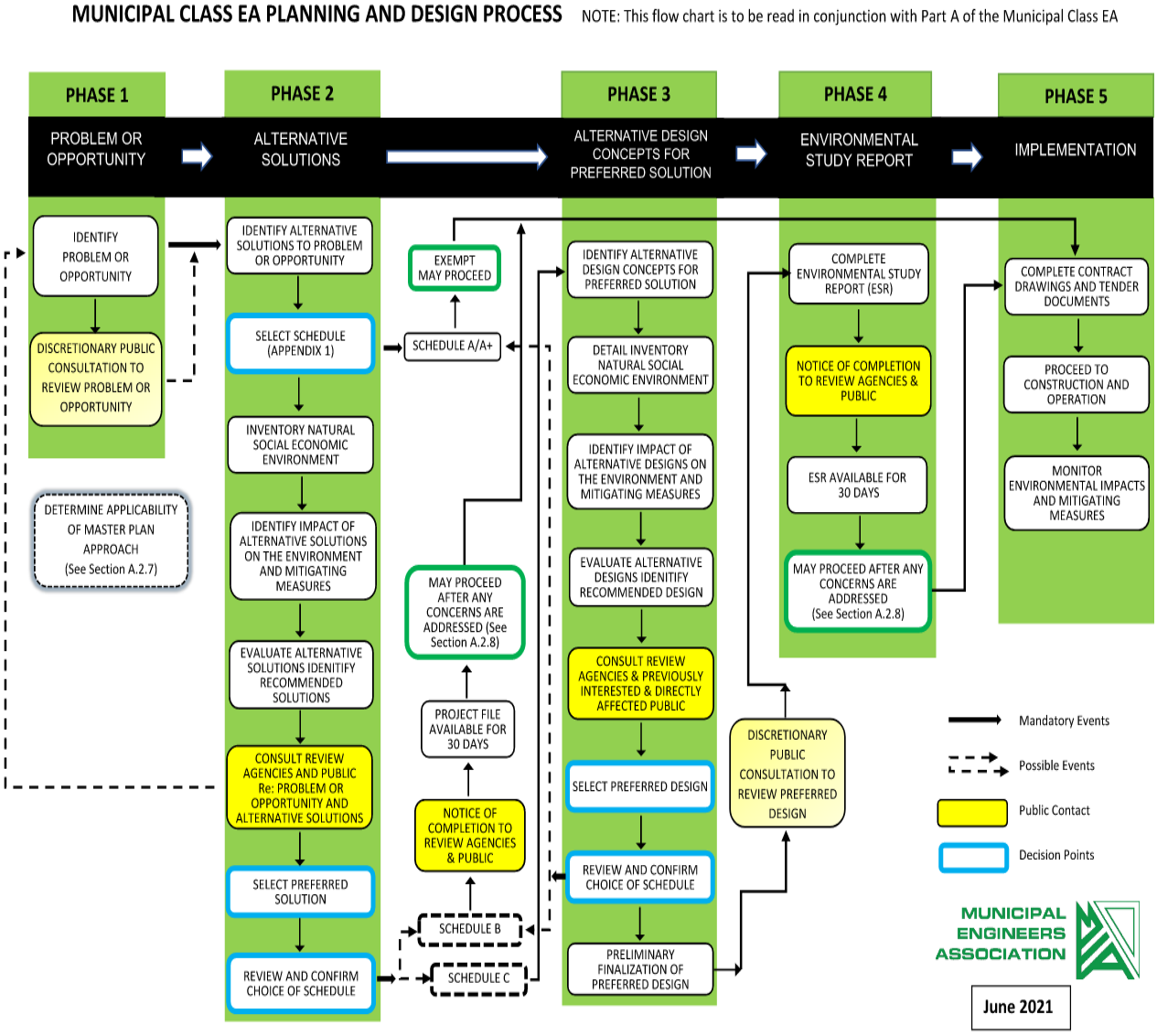
1. accommodate forecasted growth in a manner that promotes the efficient use and optimization of existing municipal sewage water services.
2. ensure that these systems are provided in a manner that:
    a) can be sustained by the water resources upon which such services rely.
    b) prepares for the impacts of a changing climate.
    c) is feasible and financially viable over their lifecycle; and
    d) protects human health and safety, and the natural environment.
3. promote water conservation and water use efficiency.
4. integrate servicing and land use considerations at all stages of the planning process; and

5. be in accordance with the servicing hierarchy outlined through policies.

Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they are:

a) financially viable over their life cycle, which may be demonstrated through asset management planning; and
b) available to meet current and projected needs.

Figure 1: Municipal Class Environmental Assessment Process (Municipal Engineers Association, 2021)



1.2 Notice of Commencement

A Notice of Commencement was published in the Wawa News on September 15, 2022, and a copy of this Notice is provided in **Appendix A**. A letter version of the Notice of Commencement was also provided to potential project stakeholders on September 15, 2022, and a copy of the letter and the stakeholder distribution list are provided in **Appendix A.** Upon receipt of the list from the Ministry of Environment, Conservation and Parks (MECP) of First Nations and Métis organizations to be contacted **(Appendix A)**, an additional letter was distributed on November 28, 2022, to communities and organizations not previously included.

The MECP also provided guidance for the Species at Risk requirements and Aboriginal Consultation for the Environmental Assessment.

2. Assessment of Existing Infrastructure

A Site Visit was completed on August 4, 2022, and August 17, 2022, by S. Burnett & Associates Limited and Municipality of Wawa staff. The condition of the following facilities and infrastructure was reviewed:

- Low Lift Pumping Station
- Water Treatment Plant
- Water Distribution System
- Booster Pump Station
- Elevated Storage Tower
- Sanitary Conveyance
- Sewage Lagoons.

In addition to reviewing the condition and operational concerns of the facilities listed above, functionality and operational concerns with gravity sewers, force mains, low-pressure systems and the water distribution system were reviewed in detail. The following sections detail the condition of the Municipality's water and wastewater infrastructure, operational concerns, and recommendations to support improved operation and / or equipment longevity.

2.1.1. Low Lift Station

The low lift pumping station (LLPS) facility was retrofitted as a part of the previous water treatment plant (WTP) upgrade project and is located on the shore of Wawa Lake. A 610 mm diameter cast iron pipe extends from the lake intake which meets a 610 mm diameter asbestos cement pipe that feeds the low lift wet well. Raw water passes through a sluice gate valve and course and fine bar screens. The wet well includes three (3) vertical turbine pumps (45.6 L/s, 16 m TDH, 15 hp, 3ϕ) each equipped with variable

frequency drives. The low-lift pumps (LLPs) operate in a lead / lag / standby configuration. Although operation is normally controlled through the WTP supervisory control and data acquisition (SCADA) system, local control can be provided through an on-site Allen-Bradley human-machine interface (HMI).

Wet well level, raw water turbidity, pH, and temperature are monitored at the facility with trending provided through the WTP SCADA system. Pre-treatment chlorine injection capability is present at the LLPS with chlorine feed provided via the WTP.

Water pumped from the LLPS is directed through a 300 mm diameter watermain that travels up Ganley Street to the WTP.

The following observations and / deficiencies were identified:

- Municipal staff have indicated that the existing lake intake crib is deteriorating. Replacement is scheduled to take place as part of the Intake Upgrade project. This will include replacement of the existing cast iron and asbestos cement piping.
- The existing sluice gate valve (SG-001) which isolates Wawa Lake from the wet well is inoperable. Although this valve is normally open, it does not allow for isolation of the wet well for maintenance. It is understood this valve is being replaced as part of the Intake Upgrade project.
- LLP-1401 is not operational and has been taken offline. This results in there being currently no standby capability within the low lift pumping system. Since this inspection, LLP-1401 has been repaired and is now operational.
- It is understood that the lead and lag pump are operated at a shared duty rating (50/50 operation) and often operating at the same time. Although the duty and lag pump are typically operated together, it is recommended that the lead, lag, and standby pumps are exercised at a 60/30/10 percentage point. This is intended to ensure pumps do not fail at the same time and shall allow a pump to be replaced while the lag and standby pumps become lead and lag, respectively.
- Pre-chlorination at the LLPS provides the capability to maintain a chlorine residual on the low-lift header (KMK Consultants Limited, 2006). Chemical feed is provided from the WTP, but the system has not been used since the plant was commissioned and the associated chemical feed panel has been salvaged for parts. It is recommended that, subject to agreement from MECP, the drinking water works permit be amended to allow the decommissioning and removal pre-chlorination.
- The low-lift station reservoir has never been cleaned. It is recommended that a wet well cleaning is scheduled and completed every five (5) years, at minimum.
- Bar screens are manually cleaned. It is recommended that automatic cleaning capability is provided to ensure regular and timely maintenance is completed to mitigate any hinderance in inlet flows from Wawa Lake.

- Instrumentation at the LLPS is operational and regular calibrations are maintained.

2.1.2. Water Treatment Plant

2.1.2.1 Filter / Pump Room

The WTP has been in service since 2006. Raw water enters the facility via a 300 mm diameter polyvinyl chloride (PVC) pipe. Critical process piping throughout the facility is 316L stainless steel, with some PVC piping for smaller diameter sections throughout the treatment and chemical systems. From the LLPS, raw water enters the WTP and is injected with aluminum sulphate solution (alum) prior to reaching an inline static mixer. Alum injection was installed in 2020 as a measure to support THM removal (Liard M. , 2021). Raw water is then sent to three (3) membrane treatment skids with equal capacity. On each skid, raw water is first directed to a feed tank. It is then pumped by a centrifugal feed pump (24.2 L/s, 30.5 m TDH, 20 hp, 3 ϕ) through a pre-membrane strainer to collect larger particulate prior to membrane filtration. Once strained, water is pumped to the Pall membranes, each skid having 30 modules and a capacity to treat 27.4 L/s for a combined filtration capacity of 82.1 L/s (7,093 m^3/d). Approximately 90% of filtrate proceeds downstream while 10% is recycled back to the feed tank (KMK Consultants Limited, 2006).

Permeate is chlorinated before entering the below-grade Chlorine Contact Cell No. 1 or No. 2, each with a volume of 253.5 m^3. Before discharging to Reservoir Cells No. 1 and No. 2 (total volume of 2,811 m^3), a sampling pump supplies AIT-5301 to provide a chlorine residual reading. Once through Reservoir Cells No. 1 and 2, water is directed to High-Lift Inlet Cell No. 1 and 2 (total volume of 48 m^3) and then the High-Lift Wet wells No. 1 and 2 (total volume of 486 m^3). The High-Lift Wet wells feed four (4) vertical turbine pumps (2-66.7 L/s, 53 m TDH, 60 hp, 3 ϕ; 2-102.8 L/s, 53 m TDH, 100 hp, 3 ϕ) which provide high-lift and emergency pumping capacity to the distribution network (KMK Consultants Limited, 2006). The distribution header includes one (1) pressure relief valve and has been designed to accommodate expansion to include two (2) additional HLPs. Chlorine is injected into the distribution line for touch-up leading to the distribution network. Sodium hydroxide injection is also available for pH control. A 400 mm diameter watermain connects to the distribution system.

During start-up procedures, a reverse filtration tank is also filled on the membrane skid. This tank is used to support enhanced flux maintenance (EFM) procedures, where a reverse filtration centrifugal pump (33.1 L/s, 18.3 m, 20 hp, 3ϕ) provides capacity to support air scrubbing and membrane maintenance operations. These maintenance procedures are also supported by two (2) air compressors, AC-1 and -2 (600V, 10 hp, 3 ϕ).

Periodically, clean-in-place cycles (CIP) are required when daily maintenance procedures are not adequate (KMK Consultants Limited, 2006). Operators can decide between caustic or acid washes. This process will mix hot water in T-80 (volume of 3,785 L) on the Hot Water / Enhanced Flux Maintenance Skid, with caustic and chlorine or citric acid to fill the feed tank. Once full, the feed pump forces the chemical mixture through the membranes on a recirculation loop to the feed tank. This water is eventually drained to the neutralization with CIP drain pumps, P-70A/B (2.8 L/s, 21.3 m TDH, 1 hp, 3 ϕ). Following the chemical circulation, a rinse cycle is initiated where cold water fills the feed tank and is circulated by the feed pump before draining and returning to regular processing.

The following observations and / deficiencies were identified:

- The facility is well maintained and in good condition with few deficiencies noted with equipment and overall operation.
- A leak is suspected at membrane feed check valve, LCV-1C, due to backflow experienced when forward processing was terminated. It is recommended that this is further investigated and replaced with the same make and model.
- Corrosion has been noted on various membrane skid manual valves. These valves are not at risk of failure, but replacement is recommended within future upgrade projects.
- The HLPs equipped with VFDs (HLP-6201 and HLP-6601) are the principal duty pumps supporting domestic demand. The HLPs not equipped with VFDs (HLP-6301 and HLP-6501) are rarely in operation and intended for use if emergency flows are required. It is recommended that the non-VFD pumps are upgraded to operate with VFDs to provide operational efficiency. It is further recommended that the larger HLPs (HLP-6301 and 6601) and smaller HLPs (HLP-6201 and 6501) are operated on a 70/30 percentage point. This is intended to ensure pumps do not fail at the same time and shall allow a pump to be replaced while the lag pumps become lead. Current operational hours are nearly equivalent on VFD pumps (HLP-6201 and HLP-6601) at over 48,000 hours of run time, while the non-VFD pumps, HLP-6301 and HLP-6501, have run times of approximately 7 hours and 58 hours, respectively.
- The Operators indicated that CIP cycles are completed approximately every six (6) months, while operational recommendations note this should be completed every three (3) – 12 weeks (KMK Consultants Limited, 2006). Although operational criteria (i.e., high transmembrane pressure, bubbling in membranes, etc.) does not indicate a requirement for additional maintenance, maintaining supplier operation and maintenance directives is recommended and therefore it is proposed that the supplier completes a membrane integrity testing program to confirm if revisions to standard CIP frequency recommendations are required.
- Alum injection is only included within the process when ice is off Wawa Lake (approximately May to November). Dosage adjustments are currently taking place to correlate their effect on trihalomethane (THM) levels. The Operator has indicated that adjustments in dosage have not resulted in fluctuations in THM concentrations to date. It is recommended that biweekly THM

sampling continues as alum injection takes place as it is understood that effects from changing water temperatures may be impacting these trends.

- The pressure relief valve (V-6802) of the distribution piping is suspected to leak. The Operators have advised they are not confident the upstream butterfly valve (V-6801) will hold to support maintenance and replacement of the pressure relief valve (PRV). It is recommended that a separate PRV and associated piping is installed on the distribution header to provide surge redundancy and allow for maintenance of the existing PRV.
- The membrane feed tanks experience cracks and fractures that cause significant leakage and the inability to operate the affected trains. The Operators have effectively repaired existing leaks with bracing and straps; however, this does not provide a long-term solution and requires repair to restore full functionality of the tanks. It is understood a contractor repairs the tanks every five (5) – six (6) years. It is recommended a regular maintenance schedule is upheld with the contractor to mitigate the impact of feed tank leakage. This issue was observed on all three (3) membrane skids. This issue has since been repaired, and no further actions are recommended.
- Throughout the facility, it is recommended that an LED lighting retrofit is completed to improve overall lighting efficiency and support long-term operational cost savings. It is understood that the Municipality has initiated a retrofit project. This issue has since been addressed, and no further actions are recommended.
- Throughout the facility, deterioration of the existing epoxy flooring has been noted. It is recommended that the floors throughout the facility be re-epoxied. This serves as a non-slip coating to protect Operators and visitors during regular operation. It also provides an additional barrier above the below-grade reservoirs to protect from debris passing through cracks.
- The existing I-Beams for pump removal and maintenance are in good condition; however, these beams shall be reviewed annually by a structural engineer. It is recommended that this inspection is included in the Municipality's annual maintenance program.
- The snow guards on the facility roof do not adequately protect snow falling from the facility's solar panel. As a result, a section of sidewalk around the facility is out of commission during winter months due to safety concerns. It is recommended that additional snow guard measures are installed to mitigate this safety concern.

2.1.2.2 Chemical Room

The Chemical Room has separate bays for chemical feed piping. Within the Chemical Room, the following chemical feed systems exist with associated chemical pump identification:

- Sodium hypochlorite for pre-chlorination
- Sodium hypochlorite for primary disinfection (MP-8101/8102)

- Sodium hypochlorite for touch-up chlorination (MP-8201/8202)
- Citric acid for the Membrane CIP Process (P-91A/91B)
- Sodium hydroxide for the Membrane CIP Process (P-92A/92B)
- Sodium hydroxide for distribution pH control (MP-9601/9602)
- Sodium bisulphite to maintain the wastewater oxidation-reduction potential (MP-9501/9502)
- Sodium bisulphite to dechlorinate water sent to the neutralization tank (P-93A/93B).

In a separate room, a hydrofluorosilicic acid chemical feed system is present for fluoridation (MP-8501/8502).

The following observations and/deficiencies were identified:

- The sodium hydroxide system for pH control has not been required since the plant began operation. It is recommended that this system is maintained in case of changes in water quality are experienced. Further, due to lack of use, the chemical is crystalizing. It is recommended that the solution is regularly mixed to avoid chemical crystallization.
- Pre-chlorination to the LLPS is not operational and the chemical feed equipment has been salvaged for parts. It is recommended that this system is fully decommissioned. Upon decommissioning it is recommended that this is removed from the Municipality's Drinking Water Works Permit pending approval from the MECP.
- Chemical feed equipment is regularly calibrated with certifications maintained on equipment.
- Sodium bisulphite is intended for injection into wastewater header for oxidation-reduction potential (ORP) maintenance and dichlorination. This was originally intended for use if wastewater was returned directly to the environment via storm sewers. Wastewater is sent to the sanitary sewer for treatment at the lagoon. Wastewater from the plant does not undergo dichlorination. It is recommended that standard operating procedures reflect this. Due to lack of use, this system also experiences crystallization. It is recommended that the solution is mixed regularly if the system remains commissioned.
- The standby fluoride pump is not operational and therefore no redundancy exists within fluoride dosing. It is recommended that the failed pump is replaced.
- The exhaust fan in the Fluoride Room is permanently on. Requirements for operation for adequate ventilation shall be reviewed to start / stop the exhaust fan.

2.1.3. Generator Room

The Generator Room houses a Kohler Power System 650 generator (680 kW, 600V, 3ϕ). Air compressors and receivers are also located within the Generator Room. This equipment provides compressed air for various systems within the water treatment plant including membrane maintenance, eye wash stations, and chemical feed equipment.

Within the Generator Room, a bulk water supply piping connects to an exterior fill station. Valving is currently closed, and this system is out of commission. Below the Generator Room are two (2) 50 m^3 wastewater equalization tanks each containing one (1) submersible pump (WWTP-3401/3501- (20.0 L/s, 8.4 m TDH, 5 hp, 3 ϕ) which discharges to the sanitary sewers.

The following observations and deficiencies were identified:

- Regular maintenance is completed on the generator and there are no concerns with operation or standby power capacity. Generator testing takes place each Friday.
- Corrosion exists on the exterior of generator coolant piping. It is recommended that this piping is replaced. This issue has since been addressed, and no further actions are recommended.
- The bulk water system is not functional. It is recommended that this system is recommissioned to support construction activities and tourism within the Municipality. A recirculation system is recommended for the bulk water station to eliminate stagnation of water in the line that is returning the water to the wet well. The Operators identified rust build-up as a concern within the bulk water piping and therefore this system should be flushed if it is recommissioned. All valving appeared to be in good condition.
- A level transmitter (LIT-3401) for the wastewater equalization tank sporadically indicates incorrect readings. Although readings appeared accurate during the site visit, the Operator advised that an error is sometimes experienced with this instrumentation. It is recommended that functionality is reviewed, and that recalibration takes place as necessary. This issue has since been repaired, and no further actions are recommended.
- WWTP-3401/3501 are configured with the capability to send wastewater to the stormwater sewers but have only sent wastewater to the sanitary sewers since process operation began. If wastewater is sent to storm sewers, the Operators must inject sodium bisulphite for dichlorination and ORP maintenance and sample the wastewater total suspended solids (TSS) concentration, ensuring it is below 25 mg/L (KMK Consultants Limited, 2006). It is recommended that this change is incorporated into standard operating procedures.

2.1.4. Electrical Room

The Electrical Room contains Motor Control Centres (MCC) #1 and #2, which house the variable frequency drives (VFDs) and soft starters for pumping equipment. Three (3) lighting panels (LP) A, B, and C, the main Pall membrane control panel, plant PLC and a control cubicle (ICP-01) are also contained in this room in addition to the plant auto dialler and security system.

The following observations and deficiencies were identified:

- Equipment is in good condition and well-maintained.
- The existing control cubicle (ICU-01) is a human machine interface (HMI) and is not functional. The Operators have not advised of concerns due to their ability to manipulate the system through the nearby SCADA system; however, it is recommended that this unit is serviced to restore full functionality.
- Power supply concerns have been identified with the existing auto dialler. Currently, the unit is only functional when in “Test” mode and does not function in “Auto”. It is recommended that this unit is serviced immediately to effectively restore emergency call-out.

2.1.5. Water Distribution System

The water distribution system consists of approximately 34.1 km of distribution watermain piping (Ministry of the Environment, Conservation and Parks, 2019). Infrastructure was visually reviewed with the Operations Staff who identified that distribution watermain is mostly PVC piping, with asbestos cement piping in older locations throughout the Municipality.

Piping diameters range from 50 mm diameter to 300 mm diameter. All locations throughout the Municipality have fire protection, with the majority of watermain piping at diameters of 150 mm diameter or greater. Locations with diameters less than 150 mm employ sprinkler systems within the facility.

The following observations and deficiencies were identified:

- Various locations within the distribution network have dead-end piping which limit effective flow of water and turnover in these sections of the distribution system (Ministry of the Environment, Conservation and Parks , 2008). Dead-end locations have been noted at Ross Street, Birch Street, Maple Street, Government Road, and Superior Avenue. It is recommended that the dead ends are looped to improve service pressures and distribution maintenance potential, reduce stagnation, and prevent freezing. It is understood that isolation valves are opened slightly in the winter to limit stagnation. It is recommended that all future distribution works limit dead ends and prioritize looping.

- Installation depths of watermain have been noted to be between 1.5 – 2.1 m (5–7 feet). In northern climates, watermain installation depths are recommended to be approximately 2.4 - 3.0 m (8–10 feet) to ensure infrastructure is below frost depths to mitigate freezing of watermains. Locations within the distribution system are understood to be above the frost line. It is recommended that all future watermain installations are below the frost line or properly insulated to limit the chance of freezing.
- Older areas of the distribution network use asbestos cement material piping. It is recommended that removal of this aged piping is prioritized and replaced with PVC. All areas that are replaced shall be installed with adequate frost protection as noted above.
- Water service line burial depth also exist within the frost line and have been reported at approximately 1.2 m (4 feet). Due to historic issues with water services freezing, the Municipality has installed bypasses before residential and commercial water meters to maintain flow of water within service piping and reduce the chance of water services freezing. This amounts to additional flow volumes experienced in the winter, with all bypass water directed to the sanitary sewer and not accounted for through residential and commercial flow metering. It is understood that some residences do not turn off the bypass during warmer months which generates annual losses in treated water. It is recommended future services are installed below the frost line. Additional investigation will be provided in subsequent reporting to estimate losses associated with bypass use.
- The Operators noted that isolation valves within the distribution are not exercised. Seized and inoperable valves exist throughout the distribution system and will limit effective maintenance. It is recommended that a regular valve exercise schedule is completed, with valves exercised annually at minimum. Through the process, it is recommended that Operators identify and record all seized and inoperable valve locations to ensure this equipment is included for maintenance or replacement on capital upgrade projects.
- The Operators have identified several hydrants as inoperable or difficult to operate. The age and make of hydrants throughout the Municipality varies. 16 hydrants were purchased in 2022 for installation in 2023. Annual purchasing and replacement of eight (8) hydrants per year will continue until all hydrants identified in critical condition are replaced. This replacement program is prioritizing installations with breakaway flanges.
- Within the Michipicoten River Village (MRV), the original pump station that serviced the area now houses a sample tap, with all other pumping and piping equipment out of commission. As this location is at the far end of the distribution system, it is recommended that a sample tap is maintained; however, all other equipment should be decommissioned and removed.

2.1.6. Booster Pump Station

The booster pump station is located on Highway 101 and provides pumping capacity to support fire protection in locations along Pinewood Drive and the MRV. One (1) booster pump (47.9 L/s, 21.9 m, 20 hp, 3ϕ) is located within the facility. One (1) hand / off / auto controller is present to operate the pump. Two (2) pressure gauges monitor inlet and discharge pressures into the pumping station.

The following observations and deficiencies were identified:

- The booster pump does not operate in automatic mode. When high volumes are required to support emergency flows and / or fire events, an Operator must travel to the booster pump station to manually operate the pump. It is recommended that automatic pumping operation is implemented to allow the booster pump to automatically respond to a low-pressure event in the distribution system. This shall be integrated to the WTP SCADA system and the auto dialer. This will monitor the occurrence of a low-pressure scenario and immediately advise operators when it occurs. This communication is critical to effectively support emergency flows within the community.
- There is no redundancy in booster pumping capacity. It is recommended that a second pump is installed as a standby unit if the duty pump fails.
- Piping and instrumentation within the booster station is aged. Pressure gauges on the pump discharge line require replacement due to inaccurate readings.

2.1.7. Elevated Storage Tank

The elevated storage tower is located on Hardy Avenue in the MRV and fed by a 150 mm diameter PVC watermain. The storage tower provides storage and emergency flows to residents and commercial facilities within the MRV. The facility was constructed in 2006 providing a total storage capacity of 460 m^3 (Rouleau, 2020). A daily volume of 392 m^3 was carried as a capacity allowance for the MRV and therefore it is assumed this volume is turned over approximately daily (Weatherall, Wawa Drinking Water System Annual and Summary Report 2021, 2022).

The following observations and / or deficiencies were identified:

- No structural concerns were identified. Piping and equipment within the Process Room appear aged, with some pumping components not functioning.
- The storage tower is affected by harsh winter temperatures and does not have adequate circulation or inline heating. As a result, ice build-up occurs annually which reduces the effective storage volume. It is recommended that recirculation measures and / or an inline heater are

installed to restore the effective storage volume. This will improve domestic demand capacity as well as emergency volumes.

- Chlorine sweetening takes place at the storage tower. A duty / standby chemical feed system exists at the storage tower; however, only one (1) pump works and therefore does not provide redundancy. It is recommended that the standby pump is replaced to provide adequate redundancy. This issue will be addressed this year and no further actions are recommended.
- Operations at the storage tower are not integrated to the WTP SCADA system. It is recommended that all equipment and instrumentation is integrated into the WTP SCADA to allow for flow, level, and chemical feed trending. It is recommended that storage tower flow and level are integrated into the existing WTP auto dialer to immediately advise operations staff of potential emergency events within the MRV.
- The storage tower does not have a standby power supply. Therefore, when a power outage occurs, chemical feed pumping does not occur which could affect adequate chlorine residual within the distribution system. It is recommended that a standby power is installed at the storage tower.

2.1.8. Sanitary Conveyance

The Municipality makes use of communal conveyance infrastructure within the Wawa Main Townsite area. The sanitary conveyance piping infrastructure consists of 200 mm diameter to 450 mm diameter gravity fed piping leading to the lagoon. As-Built drawings indicate that original sanitary conveyance infrastructure was installed in 1979 with various upgrades and expansions occurring since that time (Township of Michipicoten, 1979). Approximately 20 low-pressure 40 mm diameter and 65 mm diameter PVC force main systems directs sewage from residences on Government Road to Tamarack Avenue (Weatherall, Wawa Wastewater Performance Annual Report 2021, 2022). All residents of the MRV use septic systems.

The following observations and / or deficiencies were identified:

- It is understood that some gravity sewers pass below homes in locations near Toronto Street. This poses a health, safety, and logistical issue if maintenance is required in this location.
- Some sewer sections are shared within residences, with one (1) residence's effluent entering a neighbouring facility on Broadway before being discharged to the sewer main. It is recommended that all facilities have a dedicated sanitary service as this poses a health and safety concern to affected residences / facilities.
- The Operators identified Beck Avenue, Government Road, and Ganley Street sewers as requiring weekly flushing due to their distance from residents and low sewage flow experienced.

- George, Second, Third and Joliet Streets have inadequate sloping that do not provide sufficient cleansing velocities. It is recommended that adequate sloping is implemented during future maintenance projects.
- Residents on Government Road using low-pressure systems each have a grinder pump to carry waste to the force main. Solids are pumped out bi-annually by the Municipality as standard maintenance for these systems.
- Due to issues experienced with inadequate scouring velocity, suspected low flows through sanitary piping, and the age of existing infrastructure, it is recommended that all sanitary infrastructure undergoes a closed-circuit television (CCTV) review to adequately assess the state of all community sanitary piping.

2.1.9. Sewage Lagoons

The sewage treatment lagoons originally were commissioned in 1988 including two (2) aeration ponds and two (2) polishing ponds (Weatherall, Wawa Wastewater Performance Annual Report 2021, 2022).

All sanitary effluent flows to the sewage lagoons located on Golf Course Road. Sewage flows from a 375 mm diameter sewer and is directed to an inlet chamber containing a bar screen prior to discharging to aeration ponds with sand on a bentonite seal liner. The rated capacity of the sewage facility is 4,300 m^3/d (Euale, 2017). Aeration Pond No. 1 has a volume of 38,040 m^3 (Pannu, 2016) and 45 diffusers. Aeration Pond No. 1 discharges to Aeration Pond No. 2 (volume 36,600 m^3) with 20 diffusers. Fine bubble aeration is provided to both ponds by two (2) Kaeser positive displacement blowers (1,546 m^3/h, 57 kPa, 50 hp), equipped with VFDs, housed inside the Sewage Treatment Plant. The blowers have equal capacity and operate on a duty/standby configuration. The aeration ponds provide primary treatment and discharge to an effluent chamber containing a recirculation pump (22.6 L/s, 7.9 m, 6.5 hp, 3ϕ) which recycles effluent back to the inlet chamber via a 100 mm diameter force main. The effluent chamber also provides injection of aluminum sulphate which is intended to improve phosphorus removal. An Open Channel Monitor (OCM) is also present within the effluent chamber which provides flow readings of effluent passing to the polishing cells. Effluent then flows by gravity to Polishing Pond No. 1 and then Polishing Pond No. 2, each with an effective volume of approximately 113,400 m^3. Effluent is discharged to an outfall in the Magpie River. Sludge is removed from the cells on “as needed” basis and removed from the site (Euale, 2017). This is a series system where all sewage flows through each cell; however, all cells within the lagoon system can be bypassed. Flow manipulation for bypasses is provided via sluice gates.

Associated process equipment is located within the Sewage Treatment Plant including an MCC, blowers, alum storage and chemical feed equipment. An ozone generator is also present within the Sewage Treatment Plant; however, it is not in use. As this is not included in the Municipality’s Environmental Compliance Report. It is recommended that this is decommissioned and removed.

The following observations and / or deficiencies were identified:

- Operators take daily flow readings and weekly manual samples of effluent discharged to the Magpie River and monthly influent samples. It is recommended that sampling instrumentation is installed to allow automatic sampling and real-time monitoring. It is further recommended that this is integrated into the existing WTP SCADA system to allow for trending and immediately advise of operational abnormalities. This equipment shall be housed in an insulated structure at the lagoon outfall to provide ongoing effluent monitoring.
- Manual adjustment of blower output is completed by the Operations Team. It is recommended that dissolved oxygen (DO) instrumentation is installed to complete ongoing DO sampling. The results of these samples can be integrated in a feedback loop connected to the STP to automatically control the output of the blowers.
- The blowers operate with a shared duty rating (50/50 operation percentage). It is recommended that a duty / standby operating percentage is adjusted to 70/30 to vary the operating hours and ensure that the blowers do not fail at the same time.
- The blowers operate in a duty / standby configuration; however, the standby unit does not recover if the duty unit fails. It is recommended that this equipment is integrated to automatically recover if the duty unit fails. Status shall be integrated to the WTP SCADA system to ensure that duty status is provided, and alarms indicate equipment failure.
- The aluminum sulphate chemical feed system has one (1) operational pump, while the standby unit is not operational. Currently there is no redundancy in aluminum sulphate injection which may affect phosphorus removal efficiency if the duty pump fails. It is recommended to replace the existing standby pump. This issue has since been addressed through replacement of diaphragms and no further actions are recommended.
- The aluminum sulphate chemical feed pumps are currently operating in manual. It is recommended that pumps are integrated to operate in automatic mode. This will ensure that if the duty pump fails, the standby pump will automatically recover chemical feed operations.
- Power failures at the Sewage Treatment Plant are not logged and equipment must be manually reset when power failures occur. It is recommended that power failures are monitored via the WTP SCADA system at minimum. Ideally, it is recommended that standby power is installed at the Sewage Treatment Plant to maintain operation during power failures.
- It is understood that contractors and tourists dump septage at an unmetered septage receiving location. Abnormal effluent quality has been observed following large dumping events at the receiving location. It is recommended that flow metering is installed at the receiving location to anticipate potential fluctuations in effluent quality due to large volumes of septage added to the lagoons. This could also serve as a revenue stream if dumping is charged based on volume.

Appendix B summarizes priority projects for the Municipality with associated cost estimates and the Schedule of Class Environmental Assessment Required. This supporting document identifies capital, operational or maintenance projects based on immediate, high, medium, and low priority. It is recommended that immediate priority projects are completed as soon as possible. High priority projects shall be considered within a one (1) – two (2) year period. Both immediate and high priority items relate to health and safety, or emergency response concerns. Medium priority projects are recommended for completion within a two (2) – five (5) year timeframe and pertain to system functionality or operational efficiency recommendations. Finally, low priority projects are recommended for completion in the next five (5) - 10 years and based on operational and maintenance considerations. Please note general comments have not been included within cost estimates. Class D cost estimates have been provided where the project scope is generally defined. Items such as water service burial depth recommendations have not been quantified as the extent of this project scope is currently unknown. Further studies may be required to fully establish the scope of these recommendations.

3. Future Infrastructure Needs

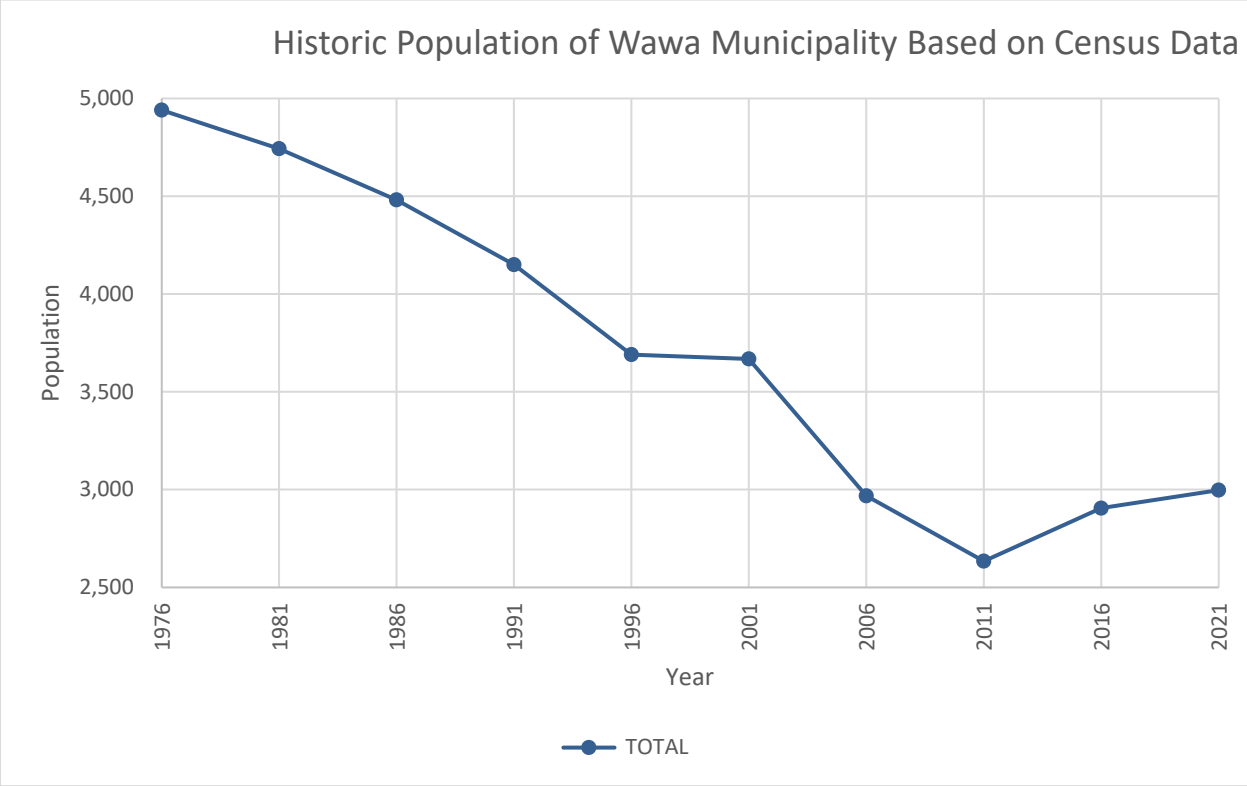
3.1 Population

3.1.1. Historic Population

Wawa's historic population, shown below in **Figure 2**, had a significant decline from its 1976 population of 4,940 to 3,960 in 1996. It then saw 5 years of little change in population after the opening of the Weyerhaeser Oriented Strand Board plant, followed by a further decline from 2001 to its 2011 population of 2,634. Between 2001 and 2006, Wawa saw an 18% decrease in employment (ARC Management Services and Harriman, 2017). Population then rose to 2,905 in 2016 and it has since declined again to 2,705 in 2021 (Statistics Canada, 2022).

Based on the 2021 Census, the average age in Wawa is 44.0, which is slightly older than the Ontario average of 41.8. The 0-14 years cohort represents 16.1% of Wawa's population, compared to the Ontario average of 15.8%.

Figure 2: Municipality of Wawa Historic Population



3.1.2. Population Projection

As a relatively remote community, Wawa's population was largely driven by economic activity, largely in the mining and forestry industry. To project future population, a scan of economic activity in these industries was conducted, which identified the following economic activities that could impact Wawa's future population:

- Wesdome is actively exploring the Eagle River Mine property, and recently increased production from 650 tonnes per day to 850 tonnes per day.
- Alamos expected to double workforce to 1,200 over construction of their expansion, concluding in 2026.
- Angus Gold and Red Pine Exploration currently investigating opportunities in the region.
- Wesdome Mishi Pit was mined out in 2021.
- Argonaut Gold in construction with production beginning in 2023.
- Wawa OSB Inc. project to create a reported 140 jobs.
- 2017 Housing Report indicated a need for at least 62 new units (not including opening of new mines and the Wawa OSB Inc. mill).

Based on consideration of historic population trends and discussions with Municipal staff, it was determined that Wawa could see an increase in population of 185 persons by 2032, which translates to an annual growth rate of 1.8%. Municipal staff felt it was likely that growth resulted from the increase in economic activity but noted some of these activities were of short duration, such as mine construction, and that recently some mining jobs were being filled remotely by workers that fly-in and out. It is unlikely that this growth rate will be exceeded, and therefore, using this rate as a basis for future planning will ensure that water and wastewater infrastructure meet the needs of the community. This growth rate also matches the growth rate seen from 2011 to 2016.

3.2 Industrial Areas

Based on communication with Municipal staff, it was determined that there are no areas currently planned for industrial growth and that additional lands are needed. Based on conversation with Municipal staff, it was determined that an area of between 10 ha to 50 ha is needed for industrial growth.

4. Water / Wastewater Capacity Assessment

This Capacity Assessment was completed to establish the current water and wastewater systems capacities and to assess the ability of the systems to accommodate future flows over the next 10 years.

4.1 Water System Review

As discussed in the following sections, a desktop review was completed to assess the capacity of the existing water system to meet both current and future demands. The findings in this section will provide recommendations to the Municipality for future upgrades and establish design parameters for the EPANET water hydraulic model.

4.1.1. Water Demand

4.1.1.1 Historical Water Flows

The existing water demands for Wawa were determined from the Drinking Water System Annual and Summary Reports and the Monthly Water Usage through Meters - 2019-2022 spreadsheet that were provided by the Municipality. This data was utilized to evaluate the capacity of the existing system to meet current needs. Future water demands were also estimated based on population projections and industrial development to assess the ability of the existing system to handle future flow requirements. The Drinking Water Annual and Summary Reports covered a seven (7) year period from 2015 to 2021, except for the water meter data, which only dated back to 2019 (2019 to 2021).

Daily water usage in the Municipality was calculated to determine the various demands needed to assess the water supply system. Definitions of the different demands used in the analysis are listed below:

- Average Day Demand (ADD): the average daily water consumption expected over the course of one (1) year.
- Maximum Day Demand (MDD): the highest consumption of water from the communal water systems on one day over the course of one (1) year.
- Maximum Day Factor (MDR): the ratio of the ADD to the MDD.
- Peak Hour Demand (PHD): the highest consumption of water from the communal water systems over one hour over the course of one (1) year.
- Peak Rate Factor (PRF): the ratio of the ADD to the PHD.

Normally, ADD and MDD are met by the supply source, while PHD and fire flows are met by water storage. If water storage is not provided, the PHD and fire flows must also be met by the supply source. A detailed summary of the historical water demand is provided in **Table 1** and overall water demand design parameters are shown in **Table 2.**

Table 1: Municipality of Wawa Historical Water Demand Summary (m^3/d)

	2015			2016			2017			2018		
	ADD	**MDD**	**MDR**	**ADD**	**MDD**	**MDR**	**ADD**	**MDD**	**MDR**	**ADD**	**MDD**	**MDR**
Jan	2463	2583	1.05	2558	2730	1.07	3293	3522	1.07	3777	4949	1.31
Feb	2616	3408	1.30	2654	2775	1.05	3427	3753	1.09	3675	3768	1.03
Mar	2857	2959	1.04	2613	2787	1.07	3534	3785	1.07	3624	3803	1.05
Apr	2762	2911	1.05	2438	2589	1.06	3362	3687	1.10	3519	3827	1.09
May	2142	2593	1.21	2015	2229	1.11	3081	3876	1.26	3329	5461	1.64
Jun	1874	2027	1.08	1866	2145	1.15	2953	3152	1.07	2653	3147	1.19
Jul	1855	2050	1.11	1754	1986	1.13	3043	3288	1.08	2362	2769	1.17
Aug	1865	1997	1.07	1779	2049	1.15	2292	3367	1.47	2291	2608	1.14
Sep	1842	2058	1.12	1641	2385	1.45	2187	2365	1.08	2144	2354	1.10
Oct	1814	2104	1.16	2227	2436	1.09	2218	2482	1.12	2285	2550	1.12
Nov	1970	2159	1.10	2284	2543	1.11	2493	3023	1.21	2747	3147	1.15
Dec	2138	2448	1.15	2946	3463	1.18	3326	4000	1.20	3215	3450	1.07
	2180	**3408**	**1.56**	**2231**	**3463**	**1.55**	**2932**	**4000**	**1.36**	**2965**	**5461**	**1.84**

	2019			2020			2021		
	ADD	**MDD**	**MDR**	**MDD**	**MDF**	**MDR**	**ADD**	**MDD**	**MDR**
Jan	3437	3739	1.09	3151	3368	1.07	2762	2989	1.08
Feb	3549	3731	1.05	3307	3603	1.09	2979	3199	1.07
Mar	3611	3810	1.06	3071	2904	0.95	2973	2320	0.78
Apr	3573	4263	1.19	2855	3117	1.09	2680	3212	1.20
May	3227	4381	1.36	2632	3186	1.21	2281	2635	1.15
Jun	2661	3044	1.14	2286	2711	1.19	1997	2202	1.10
Jul	2551	3137	1.23	2273	2994	1.32	1424	2310	1.62
Aug	2494	2757	1.11	2113	2471	1.17	2040	2186	1.07
Sep	2195	2364	1.08	1843	1983	1.08	1533	1902	1.24
Oct	1780	2321	1.30	1871	2077	1.11	1213	1873	1.54
Nov	2541	3011	1.18	1966	2370	1.21	1548	2090	1.35
Dec	2976	3258	1.09	2474	2778	1.12	2331	2768	1.19
	2879	**4381**	**1.52**	**2485**	**3603**	**1.45**	**2142**	**3212**	**1.50**

Table 2: Municipality of Wawa Water Demand Summary Statistics and Design Parameters

	2015	2016	2017	2018	2019	2020	2021	Average	Assume
ADD (m^3/d)	2180	2231	2932	2965	2879	2485	2142	2545	-
MDR	1.56	1.55	1.36	1.84	1.52	1.45	1.50	1.84[1]	-
Population	2972	2979	2967	2968	2995	2964	2997	-	-
Bulk ADD (L/cap/d)	733.6	748.8	988.2	998.9	961.3	838.4	714.8	854.9	1026

Notes:

1. *Value is the maximum MDR over the 7-year period. The MDD in 2018 was 5461 m^3/d.*
2. *20% safety factor considered for the Bulk ADD design*

4.1.1.2 Projected Water Demand

Based on the historical data, it was estimated that the bulk per capita ADD for Wawa is about 855 L/cap/d. Note this value includes residential demand (~27.1%, 225.9 L/cap/day), industrial commercial and institutional (ICI) demand (~14.7%), and unaccounted for water (UFW; ~58.2%), which in of itself, includes bypasses, watermain purging, unmetered water usage and other losses. A 20% factor of safety was added to the ADD for the current system and therefore a bulk design value of 1,026 L/cap/d was used. With an estimated population of 3,015 in 2022 this indicated that the current ADD is about 3,093 m^3/d.

For the MDD, historical data indicated that a MDR of 1.84 should be used. However, the Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems recommends that for water systems servicing an equivalent population of between 3,001 to 10,000 a MDR of 2.0 should be used (MECP, 2008). Since the latter number is more conservative it was used for the calculations for the current, 10-year residential and 10-year residential plus industrial growth scenarios.

For projecting the future water demand, it was assumed that residential flows would increase at a rate of 278.0 L/cap/day, which is 27.1% of the assumed bulk per capita design value. It was further assumed that the water consumption for new industrial facilities would be 45 m^3/ha/d, in accordance with the MECP guidelines (MECP, 2008). A summary of the water demand estimates under different growth scenarios is included in **Table 3** and a full analysis is provided in **Appendix F**.

Table 3: Summary of Projected Water Demands Under Future Growth Scenarios

Scenario		Population	Equivalent Population	ADD (m^3/d)				MDD (m^3/d)
				Residential	ICI	UFW	Total	Total
Current Year (2022)		3,015	4,647	838	454	1,801	3,093	6,186
10-Year (2032)	Residential	3,200	4,832	890	454	1,801	3,144	6,289
	Residential plus Industrial[1]	3,200	7,746	890	1,264	1,801	3,954	7,909

Notes

1. *Industrial is 18 hectares of new development.*

4.1.2. Design Criteria

Water pumping facilities are rated based on their 'firm' pumping capacity, which is defined in the MECP Guidelines for Drinking Water Systems (2008) as the "capacity of the raw water pumping station ability to supply the water treatment plant design capacity with the largest unit out of service". This provides redundancy and for the continuation of service if one of the pumps fails. Similarly, treated water and booster pumping stations are also rated on their firm capacity, defined as the capacity of the station with the largest pump out of service (MECP, 2008). In pressure zones that do not have adequate floating storage and the pumped treated water is the sole source of water supply then the firm capacity is defined as the capacity of the pumping station with the two largest units (including the fire pumps, if any) out of service (MECP, 2008).

Pumping stations or well systems are sized based on the MDD for areas with sufficient storage volume and on PHD for areas that do not have sufficient storage. Storage capacities are calculated based on the MECP Guidelines for Drinking Water Systems (2008). The total storage capacity requirements for a pressure zone are the sum of the equalization storage, fire storage and emergency storage volumes.

Furthermore, the MECP Guidelines (2008) state that the drinking water system including the WTP, and treated water storage should be designed to accommodate the greater of the following demands:

- MDD plus fire flow (where fire protection is to be provided); or,
- PHD.

From a hydraulic design perspective, the water distribution system was evaluated based on the current demand and the two (2) 10-year growth scenarios under MDD and MDD plus fire flow conditions.

For watermains, the MECP Guidelines (2008) recommends the following range of acceptable pressures within the distribution system:

- Under normal conditions (ADD to PHD) 275 kPa (40 psi) to 483 kPa (70 psi).
- During fire flow conditions, a minimum pressure of 140 kPa (20 psi).
- Maximum pressure of 690 kPa (100 psi).

4.1.3. Water Source

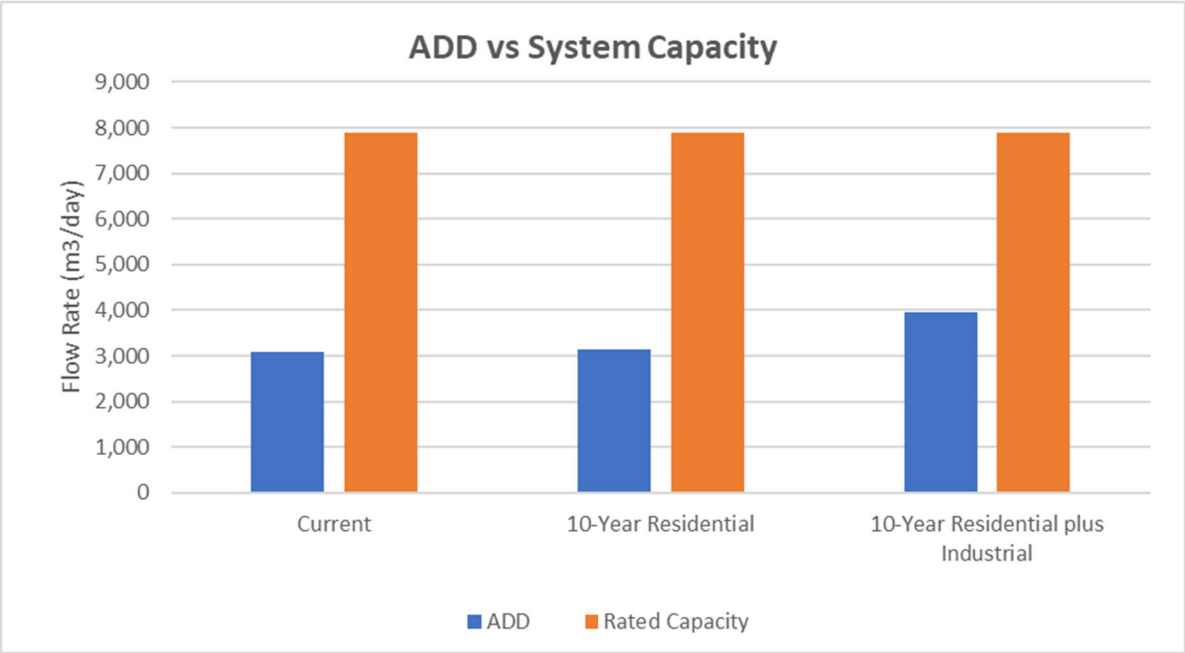
The Wawa WTP has been in service since 2006 and obtains raw water from Wawa Lake, which is a surface water source east of the town. Raw water enters the WTP from the low lift pumping station (LLPS) and is injected with alum prior to reaching an inline static mixer. Raw water is then distributed to three (3) membrane treatment skids each equipped with feed tanks, centrifugal feed pumps (24.2 L/s, 30.5 m TDH, 20 hp, 3 ϕ), strainers and Pall membranes, for a combined filtration capacity of 82.1 L/s (7,093 m^3/d).

The permeate is chlorinated before entering the below-grade Chlorine Contact Cell No. 1 or 2, with each unit having a volume of 253.5 m^3 before being discharged to Reservoir cells No. 1 and 2 with a total volume of 2,811 m^3. Water is then directed to the High Lift Inlet Cell No. 1 and 2 (total volume of 48 m^3) and then to the High-Lift Wet wells No. 1 and 2 (total volume of 486 m^3). This provides a total storage capacity of 3,345 m^3 (2,811 m^3 + 48 m^3 + 486 m^3) feeding the high lift pumps. The High-Lift Wetwells then feed four (4) vertical turbine pumps (2-66.7 L/s, 53 m TDH, 60 hp, 3 ϕ; 2-102.8 L/s, 53 m TDH, 100 hp, 3 ϕ) which provide high-lift and emergency pumping capacity to the distribution system (KMK Consultants Limited, 2006).

The WTP has an approved, rated treatment capacity of 7,880 m^3/d according to the 2021 Wawa Drinking Water System Annual and Summary Report (91.2 L/s; Weatherall, 2022). However, it is important to note that this does not confirm system sustainability and it is common for the rated capacity to never have been achieved or for the capacity to decrease over time. Although the confirmation of the system flow rates is an essential step in the water system evaluation process, it is outside the scope of this assessment and was not included. However, it is recommended that the plant capacity be tested before taking additional steps or performing any upgrades to the system. This may result in a revision to the associated permit to take water (PTTW) license if the tests confirm a variance in the treatment plant capacity.

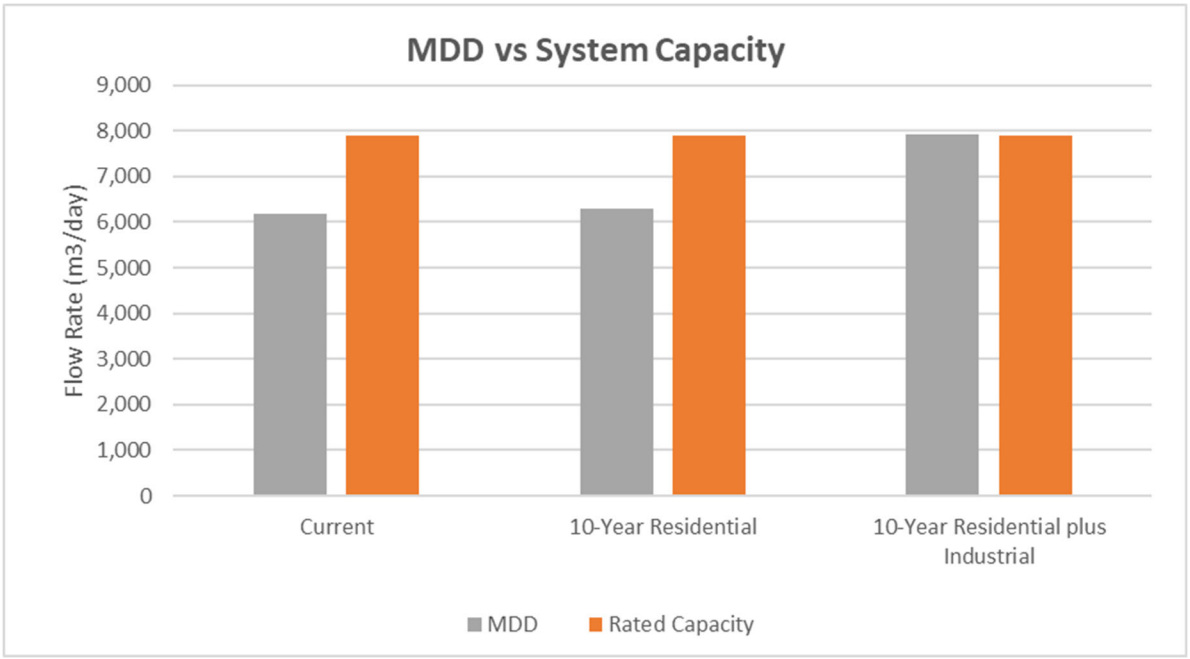
Figure 3 provides a graphical representation of the ADD versus the system capacity, which is assumed to be equal to the rated treatment capacity of 7,880 m^3/d. Under the ADD the WTP will have adequate capacity to meet the future design projections over the next 10 years, even with residential growth and 18 ha of industrial development.

Figure 3: ADD vs System Capacity



Under the MDD scenario shown in **Figure 4**, the system capacity (7,880 m^3/d) would be slightly exceeded under the residential plus industrial growth scenario (7,909 m^3/d). However, it is unlikely that the industrial development would require the full design MDD of 1,620 m^3/d so it is not anticipated that an expansion to the plant will be required within the next ten years.

Figure 4: MDD vs System Capacity



4.1.4. Treated Water Quality

In the past, there have been high concentrations of trihalomethanes (THMs) in the treated drinking water above the allowable concentration of 100 µg/L (Ontario, 2020). Thus, the Municipality had been placed under a drinking water advisory from 2014 to 2020 by Algoma Public Health (Liard M. , 2021). To address this issue, alum was added as a coagulant prior to membrane filtration to remove organic matter to reduce THM formation. No other water quality issues have been noted, and as of the 2021 Annual and Summary report there were no water quality exceedances in the drinking water system.

4.1.5. Fire Flow

The fire flow requirements for the Municipality were reviewed based on the methodology outlined in the MECP Design Guidelines for Drinking Water Systems (2008). This method recommends fire flow requirements based on the overall equivalent population serviced by the water system. This method aims to provide a level of protection for both residential and non-residential areas.

A summary of the projected fire flow requirements in the current year and two future growth scenarios is shown in **Table 4**. These parameters were used for the fire flow analysis for the EPANET hydraulic modelling discussed later.

Table 4: Fire Flow Requirements and Duration

Fire Flow Requirements and Duration			
Scenario	**Equivalent Population**	**Fire Flow (L/s)**	**Duration (hrs)**
Current (2022)	4,647	137.3	2.0
10-Year Residential (2032)	4,832	140.8	2.0
10-Year Residential plus Industrial (2032)	7,746	172.1	3.0

Notes

1. *Equivalent population was calculated as the residential plus ICI demand divided by the per capita residential demand (278.0 L/cap/day).*

4.1.6. Water Storage

Water storage is required to supplement supply during periods of peak demands and to provide for fire flows. MECP guidelines utilize the 'ABC' formula (i.e.: A + B + C) to determine the water storage requirements to size water storage reservoirs. The 'ABC' components are described below:

A = Fire Storage = Fire Flow x duration
B = Equalization Storage = MDD x 0.25
C = Emergency Storage = (A + B) x 0.25

Table 5 below shows the volume of storage required for the different growth scenarios using the "ABC" formula and the MECP fire flow requirements. The storage volumes are calculated based on the equivalent population and the MDD for the entire community. The detailed analysis for the water storage volumes including the fire flow calculations is included in **Appendix F**.

Table 5: Water Storage Requirements

Growth Scenario	Population	Equivalent Population	Water Storage Requirements (m^3)			
			A	B	C	Total
Current Year (2022)	3,015	4,647	989	1,546	634	3,169
10-Year Residential (2032)	3,200	4,832	1,014	1,572	646	3,232
10-Year Residential plus (2032)	3,200	7,746	1,859	1,977	959	4,795

Notes

1. *Current reservoir storage capacity is 3,345 m^3.*

The current storage at the WTP can meet both the current demand and future demand in the residential growth only scenario. However, the current storage is inadequate for the residential plus industrial growth scenario. It is estimated that the current reservoir is large enough to support an industrial development of only about 1 ha in addition to the assumed population increase. Thus, it is recommended that the Municipality consider increasing finished water storage if industrial development is to be pursued. A water tower was previously recommended by the MECP during an inspection of the drinking water system (Rouleau, 2022), the development of which would be subject to a Schedule B Class Environmental Assessment. The scope of this environmental assessment would include evaluation of different locations and storage options.

As mentioned previously, there is an elevated storage tower in the MRV. The water tower has a total storage capacity of 460 m^3 and the MRV has a daily capacity allowance of 392 m^3 (Weatherall, 2022). While a complete analysis of the MRV system was not completed as it is covered by the main system, it was determined that the tower is large enough to provide storage during a fire in this area. It can be estimated that fire storage of 274 m^3 for a fire flow of 38 L/s for 2 hours would be required, which is much less than the overall storage in the tower. However, according to the Municipality, the tower normally operates with storage of 180 m^3 to 220 m^3, which suggests storage may not be enough to meet the fire demand. Therefore, as suggested in the capacity assessment it is recommended that the Municipality reduces ice build-up to restore the effective storage volume of the tower.

4.1.7. Water Storage Residency Time

The retention time of water based on anticipated demand is an important consideration when reviewing communal drinking water storage time. If the reservoir is too small demands will not be met. These calculations were evaluated in Section 4.1.6.

Conversely, if the reservoir is too large and not equipped with a recirculation system, the water will sit stagnant in the reservoir for long periods of time leading to deterioration of water quality. Section 8.8.2 of the MECP Design Guidelines for Drinking Water Systems (2008) recommends referencing the American Water Works Association Research Foundation (AWWARF) report Maintaining Water Quality in Finished Water Storage Facilities (Project #254) to ensure a reservoir is sized to have sufficient turnover based on the ADD. The publication recommends a 3-to-5-day complete water turnover as a starting point for maintaining acceptable water quality in storage facilities (Kirmeyer, 1999). **Table 6** below provides a summary of the water storage residency time under current (2022) and the future ten-year (2032) growth scenarios.

Table 6: Water Storage Residency Time Under ADD

Growth Scenario	Reservoir Volume (m^3)	ADD (m^3/d)	Retention Time (d)
Current Year (2022)	3,345	3,093	1.08
10-Year Residential (2032)	3,345	3,144	1.06
10-Year Residential plus Industrial (2032)	3,345	3,954	0.85

In both the current system and two future storage scenarios, the storage retention time at the WTP is far less than 3 days (0.85-1.08). In fact, in the future scenario with residential plus industrial growth the retention time would be less than one day. Thus, water quality is not expected to deteriorate in storage at the WTP. Additionally, as the retention time is relatively small the Municipality would be able to increase storage capacity without significantly impacting water quality.

The residency time in the MRV water tower is currently acceptable. The net daily flow to the MRV averaged 80.5 m^3/d from 2015-21. As the effective storage volume is about 220 m^3 the current residency time is relatively low at 2.7 days. However, if the tank were completely full at 460 m^3 the residency time would be about 5.7 days which could pose issues with water quality. As it has been recommended that the Municipality restore the effective storage volume of the tower, adequate mixing will be essential to ensure good water quality within the tower.

4.1.8. Chlorine Contact Compliance

For a typical water system, the worst-case conditions for chlorine contact time (CT) would occur during a fire flow scenario in the winter. However, for the purposes of this assessment CT compliance was assessed based on the current and 10-year projected MDD flows.

According to the Municipal Drinking Water License for the Wawa Drinking Water System, the chlorine contact (CT) tank is required to provide 0.5-log removal or inactivation for Giardia cysts and 4-log removal or inactivation for viruses (Ahmed, 2016). This is achieved by providing a chlorine residual for a specified duration based on the MECP disinfection CT tables at an average winter temperature of 0.5˚C (minimum winter temperature) and a pH of 8 (MECP, 2006).

Reviewing daily logs from the Municipality for 2021, the average chlorine residual in the CT tanks was 0.88 mg/L and the minimum chlorine residual was 0.49 mg/L. For Giardia cysts, at the average chlorine residual the required CT is 51 mg/L and at the minimum chlorine residual is 48 mg/L. For viruses the required CT value is 12 mg/L. **Table 7** provides a summary of the calculated CT available in the current system and under the three growth scenarios. The detailed calculation summary is provided in **Appendix F**.

Table 7: Chlorine Contact Time (CT) Calculation

	CT – Average Chlorine Residual (0.88 mg/L)			CT – Minimum Chlorine Residual (0.49 mg/L)		
Scenario	**Available**	**Giardia (0.5-Log)[1]**	**Viruses (4-Log)[2]**	**Available**	**Giardia (0.5-Log)[3]**	**Viruses (4-Log)[2]**
Current (2022)	62.3	51	12	34.7	48	12
10-Year Residential (2032)	61.3	51	12	34.1	48	12
10-Year Residential plus Industrial (2032)	48.7	51	12	27.1	48	12

Notes

1. *From Procedure for Disinfection of Drinking Water in Ontario Table 1 for free chlorine concentration of 1.0 mg/L and pH of 8.0 (MECP, 2006).*
2. *From Procedure for Disinfection of Drinking Water in Ontario Table 7 for temperature of 0.5˚C and pH of 6 to 9 (MECP, 2006).*
3. *From Procedure for Disinfection of Drinking Water in Ontario Table 1 for free chlorine concentration of 0.6 mg/L and pH of 8.0 (MECP, 2006).*

In all cases, the required CT would be achieved for the inactivation of viruses. However, in all scenarios the available CT at the minimum chlorine residual is less than what is required for Giardia inactivation. Thus, the Municipality should continue to target chlorine concentrations close to the current average value (0.88 mg/L) to ensure compliance. Furthermore, if 18 ha industrial development is pursued in addition to residential development, the available CT value would be slightly less than the CT required. In fact, at the average chlorine residual of 0.88 mg/L, the largest industrial development to maintain a CT value of 51 under MDD would be about 14 ha. Therefore, if significant industrial development is pursued the capability of the CT tanks to meet disinfection requirements should be reviewed more thoroughly.

4.2 Wastewater System Review

4.2.1. Current Wastewater Lagoon

The wastewater lagoons are located on Golf Course Road and were commissioned in 1988. The overall capacity of the wastewater lagoons is 4,300 m^3/d and they receive and treat all the wastewater that is collected from the sanitary sewer system (Euale, 2017).

The wastewater flows from a 375 mm diameter sewer and is directed to an inlet chamber containing a bar screen prior to being discharged into the aeration ponds with a base of sand on a bentonite seal liner. Aeration Pond No. 1 has a volume of 38,040 m^3 and 45 diffusers. It discharges into Aeration Pond No. 2 which has a volume of 36,600 m^3 and 20 diffusers (Pannu, 2016). Fine bubble aeration is provided to the ponds by two Kaeser positive displacement blowers (1,546 m^3/h, 57 kPa, 50 hp) which are equipped with variable frequency drives (VFDs) located inside the Wastewater Treatment Plant building (Pannu, 2016). The aeration ponds provide primary treatment, and the effluent is discharged to an effluent chamber. The chamber is equipped with a recirculation pump (22.6 L/s, 7.9 m, 6.5 hp, 3ϕ) which recycles effluent back to the inlet chamber via a 100 mm diameter force main (Pannu, 2016). Aluminum sulphate is also injected in the effluent chamber to improve phosphorus removal. The effluent then flows into the two polishing ponds, each with a volume of 113,400 m3 (Pannu, 2016). The final effluent is then discharged to an outfall in the nearby Magpie River.

4.2.2. Wastewater System Review

4.2.2.1 Historical Data Analysis

The current wastewater demands in the community were established using historical data from the 2015 to 2021 Annual Sewage Performance Reports, which were provided by the Municipality. A summary of the data is shown below in **Table 8**.

Table 8: Municipality of Wawa Historical Wastewater Flow Rates (m^3/d)

	2015			2016			2017			2018		
	ADF	**MDF**	**Ratio**	**ADF**	**MDF**	**Ratio**	**ADF**	**MDF**	**Ratio**	**ADF**	**MDF**	**Ratio**
Jan	2903	3512	1.21	3298	3961	1.20	2334	2854	1.22	2636	3106	1.18
Feb	3187	4130	1.30	3442	4013	1.17	2492	3974	1.59	2650	3455	1.30
Mar	3423	4422	1.29	3499	4348	1.24	2431	2806	1.15	2607	2963	1.14
Apr	3489	4913	1.41	3150	3924	1.25	2225	2841	1.28	2604	3188	1.22
May	2587	3595	1.39	2364	3979	1.68	1718	2624	1.53	2025	4222	2.08
Jun	1994	3467	1.74	2102	3459	1.65	1423	2308	1.62	1504	2278	1.51
Jul	1891	2896	1.53	2227	2915	1.31	1552	2991	1.93	1581	4234	2.68
Aug	1877	2234	1.19	2156	2723	1.26	1422	2427	1.71	1433	1915	1.34
Sep	1929	3431	1.78	1632	2780	1.70	1357	2000	1.47	1878	3111	1.66
Oct	1881	2844	1.51	1822	3815	2.09	1487	2922	1.97	1821	4105	2.25
Nov	2209	2686	1.22	1374	2362	1.72	1546	2127	1.38	1900	3890	2.05
Dec	2701	3510	1.30	1840	2427	1.32	2274	3398	1.49	2327	3286	1.41
	2501	**4913**	**1.96**	**2407**	**4348**	**1.81**	**1852**	**3974**	**2.15**	**2077**	**4234**	**2.04**

	2019			2020			2021		
	ADF	**MDF**	**Ratio**	**ADF**	**MDF**	**Ratio**	**ADF**	**MDF**	**Ratio**
Jan	2481	2919	1.18	2454	2850	1.16	2179	2789	1.28
Feb	2617	3779	1.44	2565	3047	1.19	2473	2745	1.11
Mar	2751	3935	1.43	2591	4170	1.61	2605	3743	1.44
Apr	2790	3583	1.28	2353	2714	1.15	2250	2886	1.28
May	2205	2653	1.20	1850	2362	1.28	1805	3101	1.72
Jun	2466	2919	1.18	1411	1772	1.26	1528	2055	1.35
Jul	2201	5533	2.51	1444	2371	1.64	1382	2792	2.02
Aug	1517	2632	1.74	1306	2650	2.03	1680	2277	1.36
Sep	1599	2921	1.83	1374	2048	1.49	1513	2856	1.89
Oct	1508	2990	1.98	1430	2966	2.07	1488	3140	2.11
Nov	1919	2788	1.45	1445	2129	1.47	1517	1929	1.27
Dec	2184	3205	1.47	1858	2327	1.25	2355	4074	1.73
	2183	**5533**	**2.53**	**1838**	**4170**	**2.27**	**1895**	**4074**	**2.15**

To determine the average per capita wastewater flows, the population serviced by the wastewater collection system was estimated. This required an assumption that 156 people (5.2% of the population in 2022) lived in the Michipicoten River Village (MRV) and Pinewood areas which are not connected to the wastewater collection system and are on septic systems. Thus, it is estimated that the remaining 94.8% of the overall Municipality's population is connected to the wastewater collection system. The calculation of the average per capita wastewater production is shown in **Table 9**.

Table 9:Historical Wastewater Flow vs. Population

Year	Population[1]	ADF (m^3/d)	ADF (L/cap/d)	MDF (m^3/d)	MDF/ADF (Ratio)
2015	2,816	2501	888	4913	**1.96**
2016	2,823	2407	853	4348	**1.81**
2017	2,811	1852	659	3974	**2.15**
2018	2,812	2077	739	4234	**2.04**
2019	2,839	2183	769	5533	**2.53**
2020	2,808	1838	655	4170	**2.27**
2021	2,841	1895	667	4074	**2.15**
Average		**2108**	**747**		**2.13**

Notes

1. *Population excludes MRV and Pinewood population which uses septic systems and is not part of the wastewater collection system. In 2022 this population was estimated to be 156 people and it is assumed that this number has been relatively constant over the last several years.*

Based on the data analysis, the seven (7) year average bulk per capita wastewater flow for Wawa was 747 L/cap/day, ranging from 655 to 888 L/cap/day. Note, these bulk per capita numbers include ICI flows, extraneous flows, and bypasses and are not representative of actual domestic wastewater generation. The seven (7) year average maximum day factor is 2.13 and the maximum was 2.53.

4.2.2.2 Current and Future Flow Projections

A summary of the current wastewater flow estimates under different growth scenarios is included in **Table 10.** It was assumed that the population in the MRV on septic systems will remain constant at 156 over the next 10 years as the population growth is expected to be in-town. A current design value for the ADF was 896 L/cap/day, which is the average over the seven (7) years of historical data plus a 20% factor of safety. The residential and ICI wastewater flows were assumed to increase by the same amount as for the ADD for water, while (inflow and infiltration) I&I was assumed to increase by 90 L/cap/day as an equivalent population. The peak flow (PF) was calculated using a peaking factor (M) determined by the Harmon formula. A full breakdown of the wastewater flow distribution is provided in **Appendix F**.

Table 10: Summary of Projected Wastewater Flows

Growth Scenario	ADF (m^3/d)					PF	
	Residential[1]	ICI[1]	I&I[2]	Bypasses[3]	Total	M	PF (m3/d)
Current Year (2022)	795	370	377	1,021	2,563	3.46	8,867
10-Year Residential (2032)	846	370	394	1,021	2,631	3.44	9,042
10-Year Residential plus Industrial (2032)	846	1,180	656	1,021	3,703	3.44	12,727

Notes

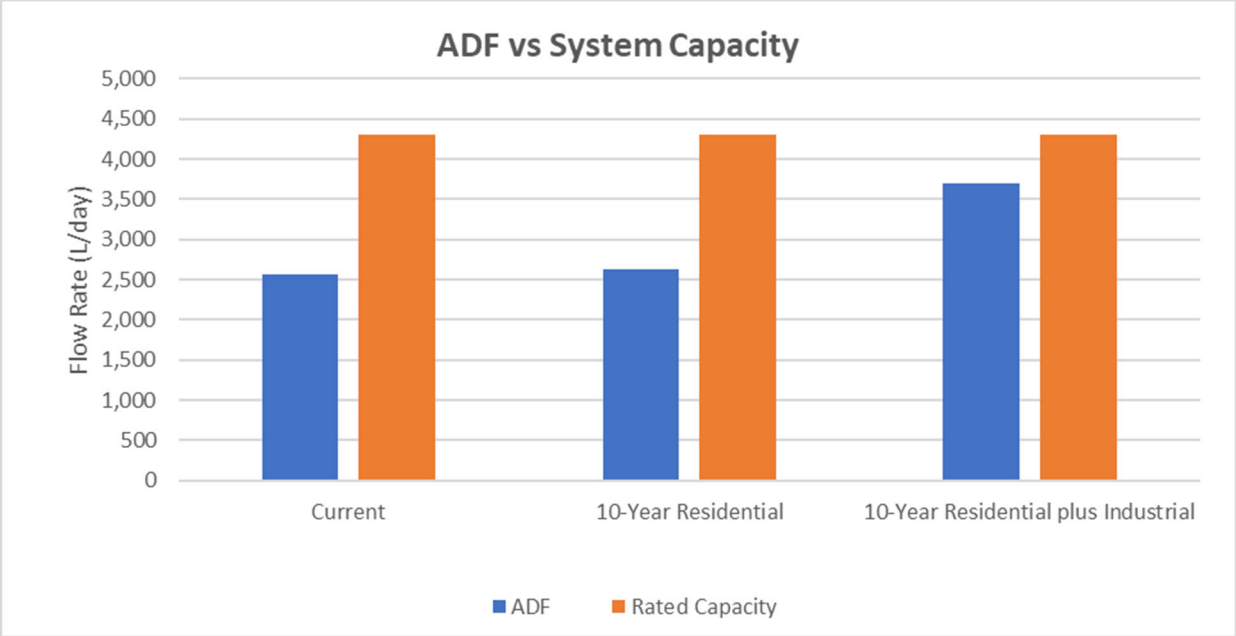
1. *Residential and ICI flows were assumed to increase by the same amount as the ADD for water.*
2. *I&I was assumed to be 90 L/cap/day for ADF based on the equivalent population serviced by the wastewater collection system.*
3. *Bypasses were calculated in the current year as the total ADF minus the residential, ICI and I&I flows. It was assumed to remain constant in the future growth scenarios.*

4.2.3. Wastewater Treatment Capacity

As previously mentioned, the wastewater lagoon has a rated capacity of 4,300 m^3/d (Euale, 2017). However, it is important to note that this does not confirm that the system can sustain this flow rate long term. It is also common for the capacity to decrease over time. The confirmation of the lagoon capacity is an essential step in an evaluation process and should be tested prior to any upgrades. However, it is not within the scope of this assessment. Any updates to the lagoon system may result in revisions to the environmental compliance approval (ECA).

Figure 5 provides a graphical representation of the ADF versus the system capacity, which is assumed to be equal to the rated treatment capacity of 4,300 m^3/d. Under the ADF the wastewater lagoon will have adequate capacity to meet both future growth scenarios. This suggests that major upgrades to the lagoons will not be required to accommodate future residential and industrial growth within the main town.

Figure 5: ADF vs System Capacity



4.2.3.1 BOD Loadings

Average and maximum BOD concentrations from 2015 to 2021 from monthly raw wastewater samples and from weekly final effluent samples are shown below in **Table 11**. The average BOD concentration in the raw wastewater was 65 mg/L and the maximum concentration measured was 113 mg/L (September 2021). The average final effluent BOD concentration was only 2.8 mg/L, and the maximum effluent concentration was 16.2 mg/L (Apr. 6, 2020). Therefore, the facility has consistently produced effluent below the concentration objective of 20 mg/L and concentration limit of 25 mg/L (Euale, 2017).

Table 11: BOD Concentrations (mg/L) in Wastewater from Annual Sewage Performance Reports

Year	Raw Wastewater		Final Effluent	
	Average	Maximum	Average	Maximum
2015	74	91	2.3	4.5
2016	62	99	2.6	5.7
2017	56	83	2.6	5.5
2018	67	86	3.1	8.7
2019	59	86	2.8	9.0
2020	63	109	3.9	16.2
2021	72	113	2.0	4.0
Total	**65**	**113**	**2.8**	**16.2**

Using the average and maximum BOD concentrations in **Table 11** above and the design wastewater flow rates, the current and future BOD loadings and oxygen requirements for the aerated lagoons were calculated as shown in **Table 12**, with full calculations provided in **Appendix F**. Based on literature reference (Boettcher & Viall, 2020), it is assumed the aerated lagoons can accommodate a BOD loading of about 84-112 kg BOD/ha/d (75-100 lbs BOD/acre/day). Therefore, it is anticipated that the aerated lagoons will be able to handle future flows with the average BOD concentration. At the maximum BOD concentration, especially in the future scenario with residential plus industrial growth, the lagoons would exceed these guidelines. However, this should not be an issue as the aerated lagoon effluent can be recirculated through the aeration lagoons and all the effluent passes through the polishing ponds for additional treatment prior to final discharge into the Magpie River. It is also expected that the blowers will be able to supply enough oxygen in all scenarios, with an estimated maximum production of about 2,000 kg/d. Therefore, it is expected that the wastewater treatment lagoon system will have sufficient capacity for the future wastewater BOD loadings.

Table 12: Current and Future BOD Loadings and Oxygen Requirements for Aerated Lagoons

	Wastewater Flow Rate (m^3/d)	Average BOD (65 mg/L)		Maximum BOD (113 mg/L)	
		BOD Loading (kg/ha/d)	Oxygen Required (kg/d)	BOD Loading (kg/ha/d)	Oxygen Required (kg/d)
Current Year (2022)	2,563	58.9	286	103	596
10-Year Residential (2032)	2,631	60.5	293	106	612
10-Year Residential plus Industrial (2032)	3,703	85.1	413	149	861

4.3 Water / Wastewater Capacity Conclusions

Information gathered for this capacity assessment suggests that upgrades to increase the WTP treatment capacity are unlikely to be required within the 10-year study period. Although the future scenario with residential plus industrial growth resulted in a MDD (7,909 m^3/d) slightly higher than the plant capacity (7,880 m^3/d), it is unlikely that this would be achieved. However, a concern is the relatively small storage volume available at the WTP. The capacity would be exceeded under the scenario of residential plus industrial growth. In fact, the plant storage is only sufficient for residential growth plus 1 ha of industrial development. Furthermore, in a situation with winter temperatures and MDD for the future scenario with residential plus industrial growth, the chlorine contact tanks would not provide the CT required for 0.5-log removal / inactivation of Giardia even with an average chlorine residual of 0.88 mg/L. Therefore, the Municipality should consider increasing the residence time in the chlorine contact tanks if significant (greater than approximately 14 ha) of industrial development is to be pursued.

The wastewater lagoon capacity is expected to be able to accommodate the ADFs in both future growth scenarios. Furthermore, the lagoons should be able to handle the BOD loadings required for both future scenarios. Hence, major upgrades to the WWTP to increase capacity should not be required over the next 10 years.

5. Baseline Modelling of Water and Wastewater Distribution Systems

Hydraulic modelling of both water and wastewater infrastructure was required to identify bottlenecks and operational issues within the existing water and wastewater systems. Baseline EPANET and Excel-based models were developed for water and wastewater modelling scenarios, respectively, which considered piping material, sizing, physical orientation as well as system flow demands. SBA then worked with Municipal Staff to corroborate outputs of the models. This validation step ensured that the models accurately reflected the hydraulic scenarios experienced by the Municipality's water and wastewater infrastructure.

Once the models were validated, the models were applied to proposed development scenarios to ensure that supporting water and wastewater infrastructure was able to accommodate future community demands while meeting relevant standards and guidelines. This assessment guided the recommendations for infrastructure upgrades, as well as infrastructure layouts, to support proposed development.

This will also provide the Municipality with a supplementary tool to evaluate concerns with capacity, or proposed development scenarios, which may occur outside of the Master Plan design horizon.

5.1 Water Hydraulic Modelling Procedure

As part of the hydraulic modelling procedure for the water distribution system, SBA utilized EPANET software to complete various hydraulic scenarios for the operation of the existing water distribution system in the Municipality of Wawa.

To commence, a map of the Municipality was used in conjunction with the as-built distribution information. The map was used as a backdrop to overlay nodes that will represent the existing locations of fire hydrants throughout the Municipality. Each node was connected by piping and modelled per the layout established in the GIS and as-built drawings. Major pumping and storage facilities were included, namely the water treatment plant and reservoir, the booster pump station, and the MRV elevated tower.

GIS and as-Built information was used to establish the elevation of hydrants and distribution piping as well as pipe material, diameter, and length. Various piping materials exist, and the age of the piping varies throughout the community. Based on GIS data, the distribution system is comprised mostly of polyvinyl chloride (PVC) piping and asbestos cement, the latter being predominant in older areas of the town. These two (2) piping materials have varying frictional losses, which will affect the Hazen-Williams coefficient, or C-Factor, of the associated piping. The Hazen-Williams coefficient is used to account for frictional losses

within piping. Smooth piping has the highest values, and rough or aged piping has lower C-Factor values. The following values were applied as identified in **Table 13**.

Table 13: Hazen-Williams Coefficients for Municipal Watermains

Watermain Material	C-Factor
Asbestos Cement	140
Copper	135
Galvanized Steel	120
PVC	150
Unknown[1]	140

Notes

1. *Piping with unknown material was assumed to have a C-Factor equal to Asbestos Cement.*

Based on the capacity assessment, average, maximum and peak flows were identified within the community based on data from 2015 – 2021. The Municipality also provided the current pumping factors to input into the pumping equipment modelled within the WTP. Also available is storage data information which was used to size the storage volume within the reservoir and the MRV elevated tower. With existing population data, and metered water usage provided by the Municipality, SBA applied flow demands to each hydrant relative to the flow demand associated with adjacent residences and facilities. The flow demand was the final input to create the baseline model. The model was run to establish pressure, and flow capacity at each node, and confirmed whether all flow demands were met throughout the Municipality.

Completion of this hydraulic model provided a baseline of pressure data across all nodes of the Municipality. SBA then reviewed existing pressure data from hydrant testing and confirmed that the model results were valid. It is noted that lower pressures during the hydrant testing were found in the downtown and Pinewood Drive areas, and it is recommended that the Municipality check these areas to ensure there are no obstructions resulting in pressure losses. Following the establishment and acceptance of the baseline model, SBA completed temporal modelling to establish areas at risk of chlorine decay due to water age.

The use of EPANET modelling ensures that the Municipality has full access and the ability to update and modify all files created as part of the project. SBA provided a summary of all model inputs and outputs with each file submitted. Input information provided a foundation and ensured that any changes to files can quickly be returned to their original settings.

5.2 Wastewater Hydraulic Modelling Procedure

As part of the hydraulic modelling procedure for the wastewater collection system, SBA utilized an Excel based model to assess the capacity of the existing wastewater collection system and its ability to accommodate potential future flow requirements.

To begin, a GIS map was referenced to separate the sewer system into sections for each major trunk sewer. Each of these trunk sewers had calculations completed on a separate tab in the Excel file. Furthermore, the capacity of each trunk sewer was assessed by separating it into segments between individual manholes. All the manholes were appropriately labelled in accordance with identifiers from the Municipal GIS database.

Available As Built / GIS information was used to determine sewer pipe slopes, materials, diameters, and lengths. Based on the Criteria and Needs Technical Memorandum, the collection system is composed primarily of 200 mm diameter to 450 mm diameter gravity fed piping. Furthermore, the As-Built drawings indicate that the current sanitary conveyance infrastructure was originally installed in 1979 with various upgrades and expansions occurring later.

Based on the water capacity assessment, the historical average daily per capita flow was identified for the overall community. Using the existing population data along with the average daily per capita flow, SBA determined the average domestic sewage flow rates for each trunk sewer segment. SBA calculated peaking factors using the Harmon formula as per the Ministry of the Environment, Conservation and Parks (MECP) design guidelines. The peaking factors were multiplied by the average design flow rates to obtain the peak domestic sewage flows.

SBA also calculated the peak extraneous flow of wastewater which is defined as stormwater and / or groundwater infiltration volumes affecting the sewer main. This assessment was based on an average extraneous flow per capita considered for the design of the sewer. The peak extraneous flow was determined by multiplying the average extraneous flow by the Harmon peak factor. The peak domestic sewage flow including extraneous flows was calculated by adding the peak domestic sewage flows and the peak extraneous flows.

The institutional, commercial, and industrial (ICI) wastewater flow rates were determined using MECP design guidelines for common sewage flow rates for commercial and institutional uses, information from the Municipality and other design guidelines. The average and peak ICI flow rates were determined and added to the average and peak domestic sewage flow rates to determine the total sewage flow from a particular area. Peak bypass flow was also added to the total sewage flows to certain sewer sections depending on the location of the bypasses.

The total sewage flows including bypass was compared with the total wastewater flows received at the lagoons to confirm the accuracy of the model. Once the current wastewater flow rate to the sewers was determined, the pipe diameter, slope and Manning's coefficient was used to determine the full pipe capacity of the sewer. Different piping materials will have varying frictional losses, which will affect the value of the Manning roughness coefficient, or Manning's *n value*, of the associated piping. Smoother pipe materials have lower Manning's *n* values while rough and aged pipes have higher values. However, as is often done for sewer design a Manning's *n* of 0.013 will be assumed. This will provide conservative estimates for the capacity of the sanitary sewers.

The model established the current design flow and calculated the remaining capacity and velocities for each trunk sewer segment. The velocities were checked against the design standards for minimum and maximum acceptable velocity which is typically between 0.6 m/s and 3.0 m/s, respectively. Similarly, a spreadsheet was developed for the future development and future design flows were established. The remaining capacity in each sewer segment and velocities based on future flows was determined and recommendations were made for infrastructure requirements to support future development and to ensure efficient operation of the system.

The wastewater collection system also contains approximately 20 low-pressure 40 mm diameter to 65 mm diameter PVC force main systems that convey wastewater from residences on Government Road to Tamarack Ave. The current and future velocities in the force mains were also reviewed.

Using Excel for the wastewater hydraulic modelling will allow the Municipality to have full access to all files developed as part of the project along with the ability to update and modify the calculations as desired. As previously mentioned, identification of all infrastructure is consistent with the Municipality's GIS identifiers for ease of reference. The Excel file will be easy to follow with detailed comments and explanations of the calculations that were completed. SBA will provide a summary of all the inputs and outputs in the Excel model. This will allow the Municipality to return the model to its original settings if required.

5.3 Water System Baseline Model Results

Hydraulic modelling was completed to evaluate the following:

- Pressures throughout the distribution system.
- Velocities throughout the distribution system.
- Ability to provide fire flows; and,
- Areas at risk of chlorine decay.

Modelling was completed using EPANET software. Topographic elevations, watermain sizes and community demands were inputted into the model to simulate the cases summarized in **Table 14** below. The basis indicated in **Table 14** was used to estimate the water demand from each lot/property connected to the existing distribution system. Full reports from EPANET can be found **Appendix D**.

Table 14: Basis for Water EPANET Hydraulic Model

Type		Flow Basis	MDF
Residential		278 L/cap/day (Based on historical data)	2.0
Institutional and Commercial	Water meter data available	Demand for each individual lot calculated from historical data	2.0
	Commercial – No water meter data available	86 persons/ha at 278 L/cap/day (Other Municipal Design Guidelines)	2.0
	Storage, Garages and Empty Buildings – No water meter data available	1 person per 46 m^2 at 75 L/cap/day (OBC Occupant Load, 40-hour per week occupancy)	2.0
Industrial	Water meter data available	Demand for each individual lot calculated from historical data	2.0
	No water meter data available	45 m^3/ha/day (MECP Design Guidelines)	2.0
UFW/Other	Bypasses	1,021 m^3/day (312 residences at 3,271 L/day)	2.0
	Watermain Purging and Open Taps	780 m^3/day (5 locations at 156,100 L/day)	2.0
	Extra Residential[1]	30 m^3/day (1,322 residences at 10 L/day)	2.0

Notes

1. *Extra residential demand was added to keep the domestic and total ADD the same in the EPANET model as in the capacity assessment. This was required as slightly less residences were identified in the community than were predicted based on population projections and housing density.*

Table 15: EPANET Hydraulic Modelling Cases Summary

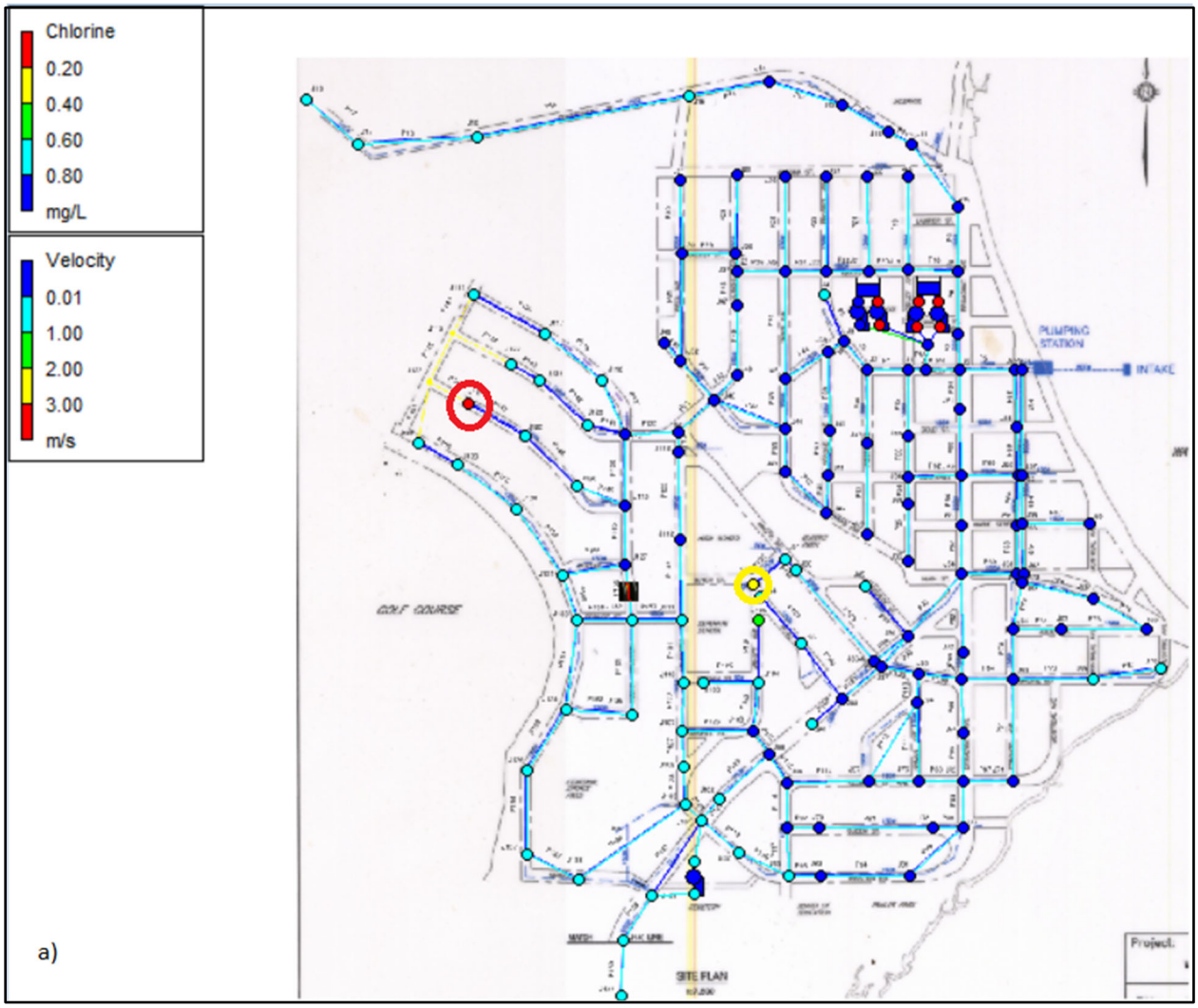
Parameter	Current (2022)	Current (2022) With Upgrades
Distribution System	Existing	Upgraded (WM Looping on Tamarack Ave., WM Extension on Tamarack Ave.)
Average Day Demand	3,093 m^3/d	3,093 m^3/d
Max Day Demand	6,186 m^3/d	6,186 m^3/d
Fire Flow Case 1	137.3 L/s 2 hours – Total 38 L/s – West End of Government Rd. 38 L/s – Tamarack Ave. and Regina Cres. 38 L/s – Beck Ave. and Algoma St. 23.3 L/s – St. Marie St. and Broadway Ave.	137.3 L/s 2 hours – Total 38 L/s – West End of Government Rd. 38 L/s – Tamarack Ave. and Regina Cres. 38 L/s – Beck Ave. and Algoma St. 23.3 L/s – St. Marie St. and Broadway Ave.
Fire Flow Case 2	137.3 L/s 2 hours – Total 23.3 L/s – St. Marie St. and Broadway Ave. 38 L/s – St. Marie St. and Montreal Ave. 38 L/s – Boyer St. and Arnott Ave. 38 L/s – Magpie Rd. and Gladstone Ave.	137.3 L/s 2 hours – Total 23.3 L/s – St. Marie St. and Broadway Ave. 38 L/s – St. Marie St. and Montreal Ave. 38 L/s – Boyer St. and Arnott Ave. 38 L/s – Magpie Rd. and Gladstone Ave.
Fire Flow Case 3	137.3 L/s 2 hours – Total 30.6 L/s – Boyer St. and Arnott Ave. 30.6 L/s – Magpie Rd. and Gladstone Ave. 38 L/s – Mills Dr. and White Dr. 38 L/s – North End of Superior Ave.	137.3 L/s 2 hours – Total 30.6 L/s – Boyer St. and Arnott Ave. 30.6 L/s – Magpie Rd. and Gladstone Ave. 38 L/s – Mills Dr. and White Dr. 38 L/s – North End of Superior Ave.
Chlorine Residual Entering Distribution System	0.86 mg/L	0.86 mg/L

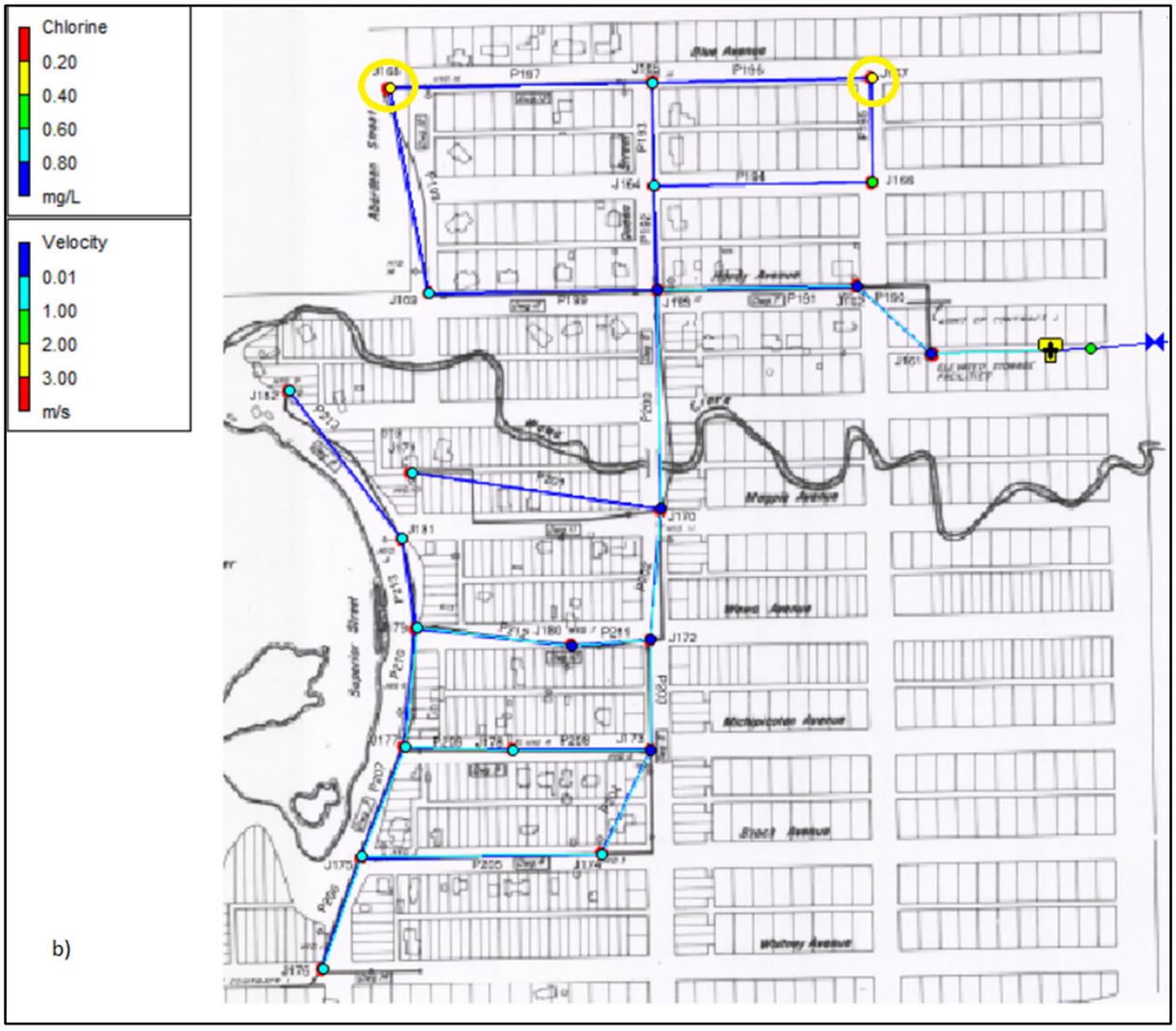
Current (2022)

The current (2022) model used the existing distribution system with an ADD equal to the design ADD for 2022 that was calculated in the capacity assessment. The model showed that water can be delivered throughout the Municipality at pressures between 57 and 89 psi (40 and 62 m) under ADD conditions and at pressures between 57 and 85 psi (40 to 60 m) under MDD conditions. All pipe velocities under ADD and MDD were acceptable and less than 1 m/s. It is noted that these outputs are for the assumed high-lift pump settings at the WTP and the water tower settings in the MRV. Changes to these inputs will alter the exact findings of the model, and this is true for all the EPANET hydraulic modelling.

Chlorine decay modelling was then completed to determine areas in the distribution system that are susceptible to low chlorine residuals, as shown in **Figure 6**. The simulation was for a period of 120-hours under ADD conditions. Only one node was found to have a chlorine residual less than the required 0.2 mg/L, which was the dead end on Birch St. This node had no demand assigned, so no water flowed through this pipe, explaining the finding. However, dead ends are more susceptible to lower chlorine residuals, for instance the dead end on Boyer St. which had a modelled residual of 0.23 mg/L. Another area with lower modelled chlorine residuals is on Blue Ave. and Blue Cres. in the MRV, with two nodes having modelled chlorine residuals less than 0.40 mg/L. Monitoring of chlorine residuals in these areas is recommended to ensure compliance.

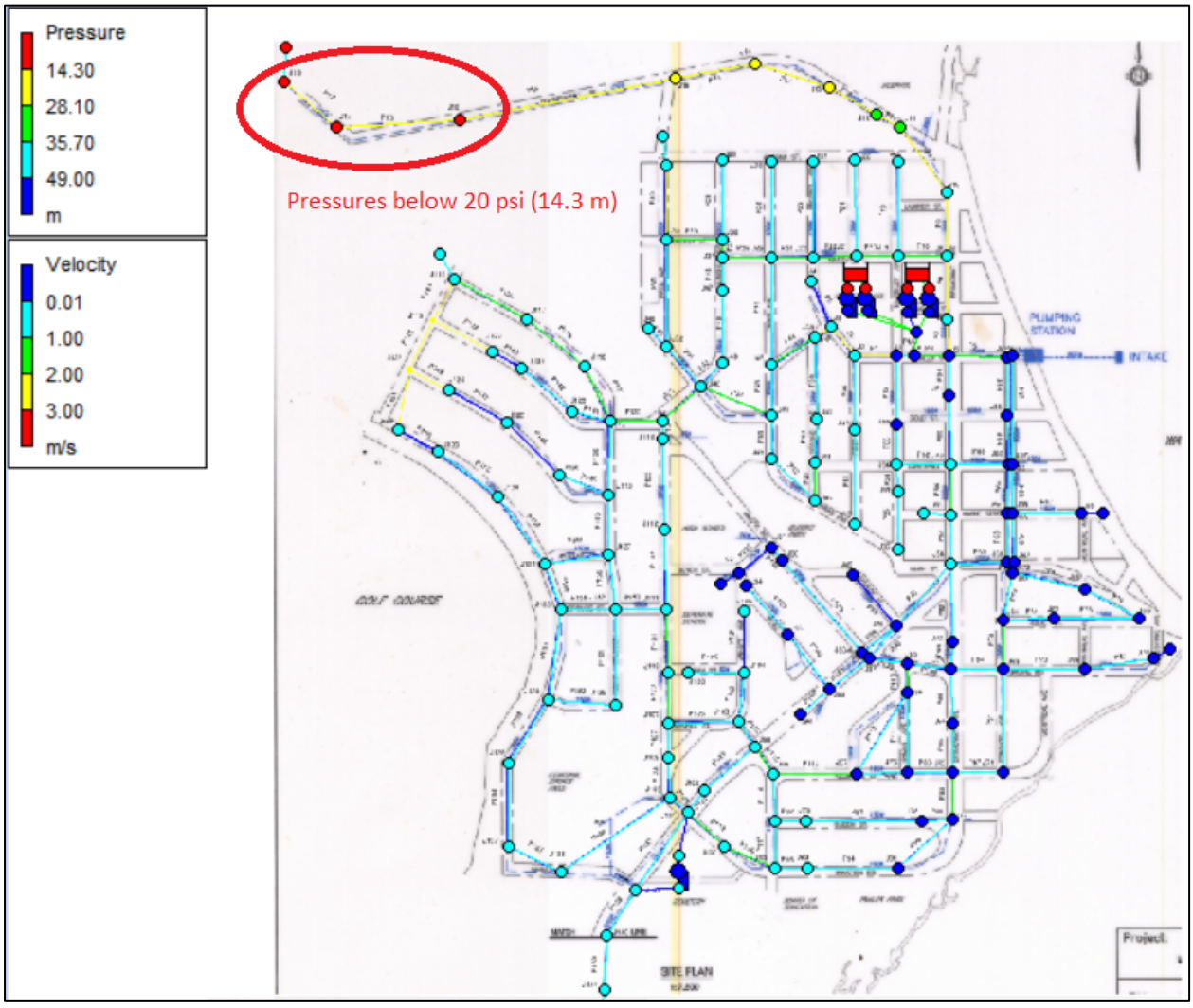
Figure 6: Current Water Distribution Chlorine Decay Modelling Map in a) Main Town and b) MRV.





The current system was unable to meet the fire flow demands in case 1. Several nodes had pressures below 20 psi (14 m) near the dead end on Government Rd. where one of the 38 L/s fire demands was placed, as shown in **Figure 7**. This was the case even when the water level in the WTP reservoir was at the maximum level (292.55 m). This is due to the long dead end 150 mm watermain on Government Rd. that runs from Mackey Street to the west end of the road. For this reason, it is recommended that infrastructure improvements, specifically watermain looping connecting the dead ends near Tamarack Ave. and a watermain extension on Tamarack Ave. from Regina Cres. to Government Rd. be completed to fix this issue. These improvements were added to the model in the following section. Nonetheless, all pipe velocities were acceptable (max = 2.57 m/s) and less than 3 m/s.

Figure 7: Current Water Distribution System Under Fire Flow Case 1.



Conversely, the current system was able to accommodate fire flow case 2, with a minimum service pressure in the main town of 58 psi (41 m) at the hydrant near the intersection of Magpie Rd. and Gladstone Ave. when the WTP reservoir was at the minimum level (287.05 m). Service pressures in the MRV were not affected and the overall system minimum pressure was still 57 psi (40 m). All pipe velocities were acceptable and under 3 m/s.

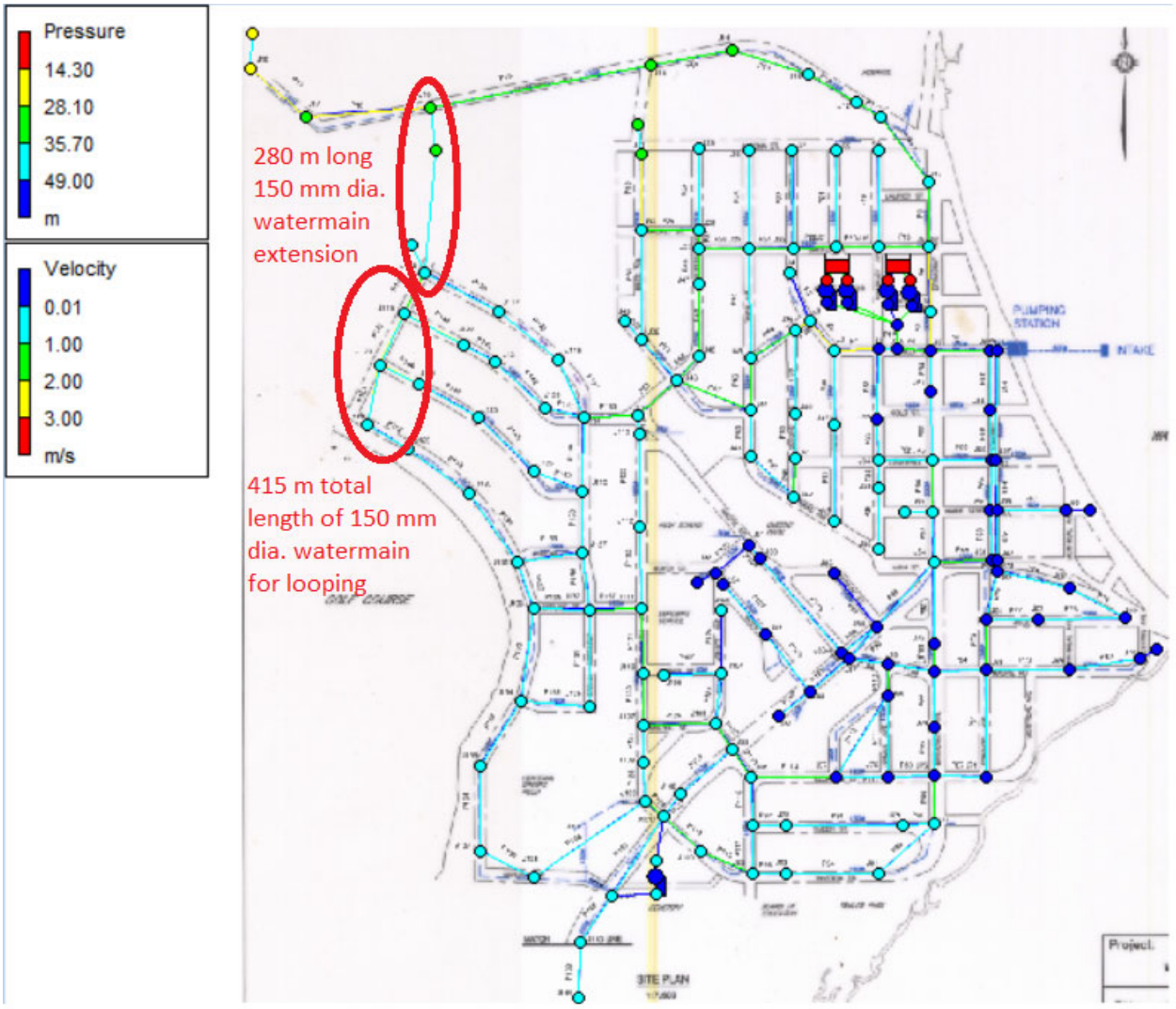
The current system was also able to accommodate fire flow case 3. The minimum pressure in the main town when the WTP reservoir was at the minimum level (287.05 m) was about 64 psi (45 m) on Mission Rd. upstream of the fire pump. Pressures were as high as 96 psi (67 m) in the Pinewood Dr. area due to the fire pump providing additional pressure to the system. Pressures in the MRV were above 30 psi (21 m) even when the tower water level was at its estimated minimum of 231.6 m, suggesting the entire storage can be used for fire protection. All pipe velocities were acceptable and under 2 m/s.

Current (2022) with Upgrades

The current (2022) model with upgrades was based on the initial current model with the addition of 150 mm watermains for the Tamarack Ave. looping project (total length 415 m) and a 150 mm watermain extension along Tamarack Avenue from Regina Crescent to Government Road (length of 280 m). The latter upgrade would significantly decrease the length of the dead end on Government Road. and would support future residential development on and around Tamarack Avenue. As expected under ADD and MDD, pressures were reliable throughout the system and were very similar to the model without upgrades. This was also true for fire flow cases 2 and 3. It is also noted that the chlorine decay simulation was similar to the current system without upgrades, but with notable increases in residuals at the current dead ends near Tamarack Avenue.

Repeating fire flow case 1 with the upgrades, there was a significant improvement in the pressures at the west end of Government Road, as shown in **Figure 8**. In this situation, even when the WTP reservoir was at its lowest level (287.05 m) the pressure at the west end of Government Road remained above 30 psi (21 m). As well, the maximum pipe velocity decreased slightly to 2.41 m/s. This suggests these upgrades will be sufficient to meet the current design requirements. However, as discussed later if further development is pursued at the end of Government Road further upgrades, namely upsizing of the watermain on Government Road will be required.

Figure 8: Upgraded Water Distribution System Under Fire Flow Case 1



5.4 Wastewater System Baseline Model Results

The wastewater collection system in Wawa consists of gravity fed piping leading to the lagoon. Approximately, 20 low-pressure 40 mm and 65 mm PVC force main systems directs sewage from the residences on Government Road to Tamarack Avenue. All residents of the MRV and Pinewood area use septic systems.

An excel based wastewater collection system model was developed to assess the capacity of the existing wastewater collection system and its ability to accommodate future flow requirements.

The wastewater collection system was divided into the following main trunk lines in the model for calculation purposes:

- Regina Crescent Trunk Line.
- North South Trunk Line.
- East West Trunk Line.
- Mission Road Trunk Line.

A map showing the trunk lines mentioned above is included in **Figure 9** below.

Figure 9: Wastewater Collection System Trunk Lines

The GIS sewer ID was used in the model to list the sewer sections on each trunk line. The wastewater flows to each section of the sewer was calculated based on the framework laid out in the model development procedure. The following basis indicated in **Table 16** was used to estimate the wastewater flow from a lot/property to the existing collection system.

Table 16: Basis for Sanitary Sewer Capacity Assessment

Type	Flow Basis	Inflow and Infiltration(I&I)	Peaking Factor
Residential	278 L/cap/day (Based on historical data)	90 L/cap/day	Harmon Formula
Institutional and Commercial	As listed in Table 5-3 – Common Sewage Flow Rates for Commercial and Institutional Uses of the MECP guidelines (2019)	0.28 L/ha/s	n/a
Other Institutional and Commercial	65 m^3/ha/day (typical assumed for institutional and commercial including I&I)	n/a	n/a
Industrial	35 m^3/ha/day (MECP Guidelines)	n/a	3.46

The excel based wastewater collection system model was calibrated based on historical data. The five (5) year max average wastewater flow measured at the lagoons was 2,501 m^3/day in 2015. Using the max average flowrate and a peak factor of 3.46 based on MECP guidelines, the max peak flow at the lagoons was calculated to be 8,666 m^3/day (100.3 L/s). The max peak flow calculated through the model was higher (approximately 12%) than the calculated max peak flow received at the lagoons in the last 5 years.

GIS information was used to determine sewer slopes, diameters, and lengths. Where GIS information was not available, as-built drawing information was used. The GIS information was assumed to be accurate and validating the GIS information with the as-built drawings is outside the scope of this project.

Some pipe slopes and diameters could not be confirmed with the GIS and as-built information and will need to be verified on site.

A list of such sewer pipe sections is included in **Table 17** below.

Table 17: Sewer Pipe Slope and Diameters

Trunk Line	Slope to be confirmed	Diameter to be confirmed
Regina Crescent Trunk Line	4, 148, 151,11	855
North South Trunk Line	768, 797	
East West Trunk Line	849, 722	
Sewer sections between the highway and the lagoon	910, 911, 912, 913, 914	910, 911, 912, 913, 914

Based on the wastewater collection system model, a summary of findings under existing conditions is included in **Table 18** below. The model calculations can be found in **Appendix E.**

Table 18: Wastewater Collection System Analysis (Existing)

Trunk Line	Sewer ID	Comment
Regina Crescent Trunk Line	153, 152, 160, 161, 162, 852, 853, 863, 875, 696	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
North South Trunk Line	679, 675, 694, 687, 686, 685	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
East West Trunk Line	834, 826, 700, 707, 708, Section between George St. and Magpie Rd on Mission Rd	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
Mission Road Trunk Line	95, 94, 93, 92, 90, 87, 86, 84, 83, 81, 79, 76	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)

Notes:
1. This table includes only the sewer sections that are a part of the trunk lines shown in **Figure 9**.
2. Calculations in the model were carried out for peak flows (worse-case scenario).
3. This table does not include sewer pipes whose slopes need to be confirmed.
4. Maps will be added showing the sections that have low velocity and capacity issues after slopes and diameters of the sewers mentioned above are confirmed.

Certain sections of sewer network in the wastewater collection system have low velocity issues especially the sections closer to the ends of the trunk lines. The slopes of some of the sewer pipes do not meet the typical design standards for slopes and hence low velocity could be an issue. Minimum slope for sewer pipes is typically 0.5% (1% for the first upstream leg). The slopes of majority of the sewer pipes in the Wawa wastewater collection system are below 0.5%. The Municipality has been flushing these sewers once a month to avoid stagnation of wastewater in the sewers.

Some of the sewer sections between the highway and the lagoon (section 910-914) mentioned in **Table 17** seem to be over capacity. Once the diameter and slopes of these pipes are confirmed and the CCTV investigation of the sewers is completed the sewer sections shall be checked to see if they need to be upsized.

Upsizing of some sewer pipes mentioned in **Table 17** may be required following further investigation of pipe slopes and diameters.

It is recommended that any of the sewer pipes that need to be replaced based on the CCTV investigation be designed with adequate slopes to avoid low velocity issues in the sewers in the future.

6. Evaluation of Alternatives

6.1 Identification of Alternatives

6.1.1. Residential

Alternative growth areas focussed on areas with at least three (3) lots, although it is acknowledged that a small portion of the projected 200 person increase in population could be filled with individual lots or by replacing derelict buildings with new residences. Additionally, a small number of lots could be available in the Mission, including:

- Properties on the north / east side of Blue Crescent that are owned by an Estate and there are no indications of if or when these properties will become available.
- Properties across from the water tower on Hardy Avenue are also owned by the Estate mentioned above.
- Two (2) properties on Michipicoten Avenue are privately owned but the additional two (2) houses that could go on those lots would have minimal affect on water demand and achieving development goals.
- Other streets indicated on the south end of Queen Street are on the fringe of the flood zone and are currently not being looked at for development opportunities.

For purposes of being conservative in our assessment, these smaller growth areas, some of whose development is outside the control of the Municipality, were not counted against the projected number of residencies required.

The potential residential growth was determined in consultation with Municipal Staff and these areas are shown in **Figure 10** and **Figure 11**. Residential Growth Area #8 was added based on a request for it to be considered, which was received during PIC#1. In addition, mapping for each of the potential growth areas showing lot divisions and associated Water and Wastewater services, is shown in **Figures 12-14**.

Figure 10: Potential Residential Growth Areas (1 of 2)

Figure 11: Potential Residential Growth Areas (2 of 2)

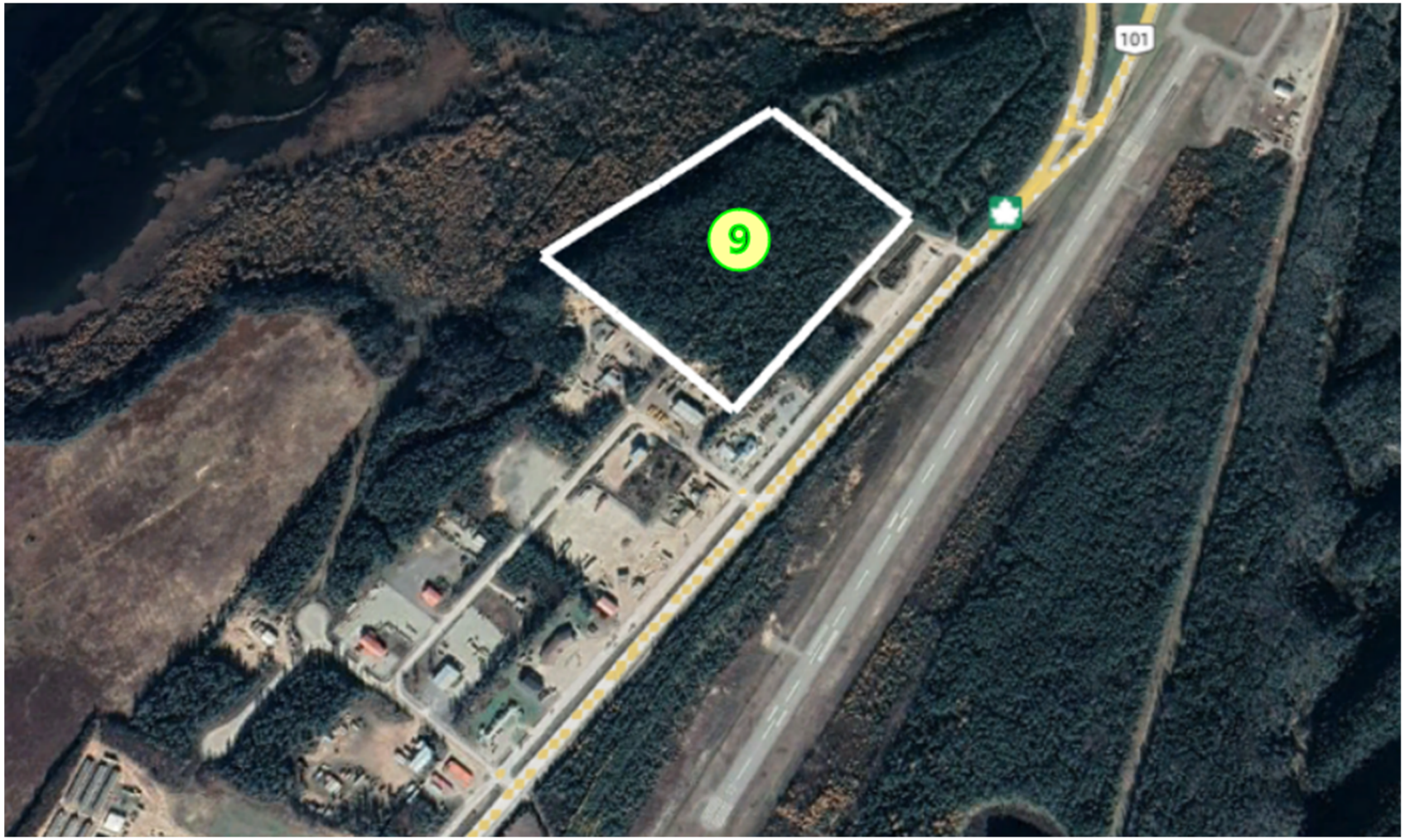


Figure 12: Residential Area Proposed Lots and Servicing (1 of 3)

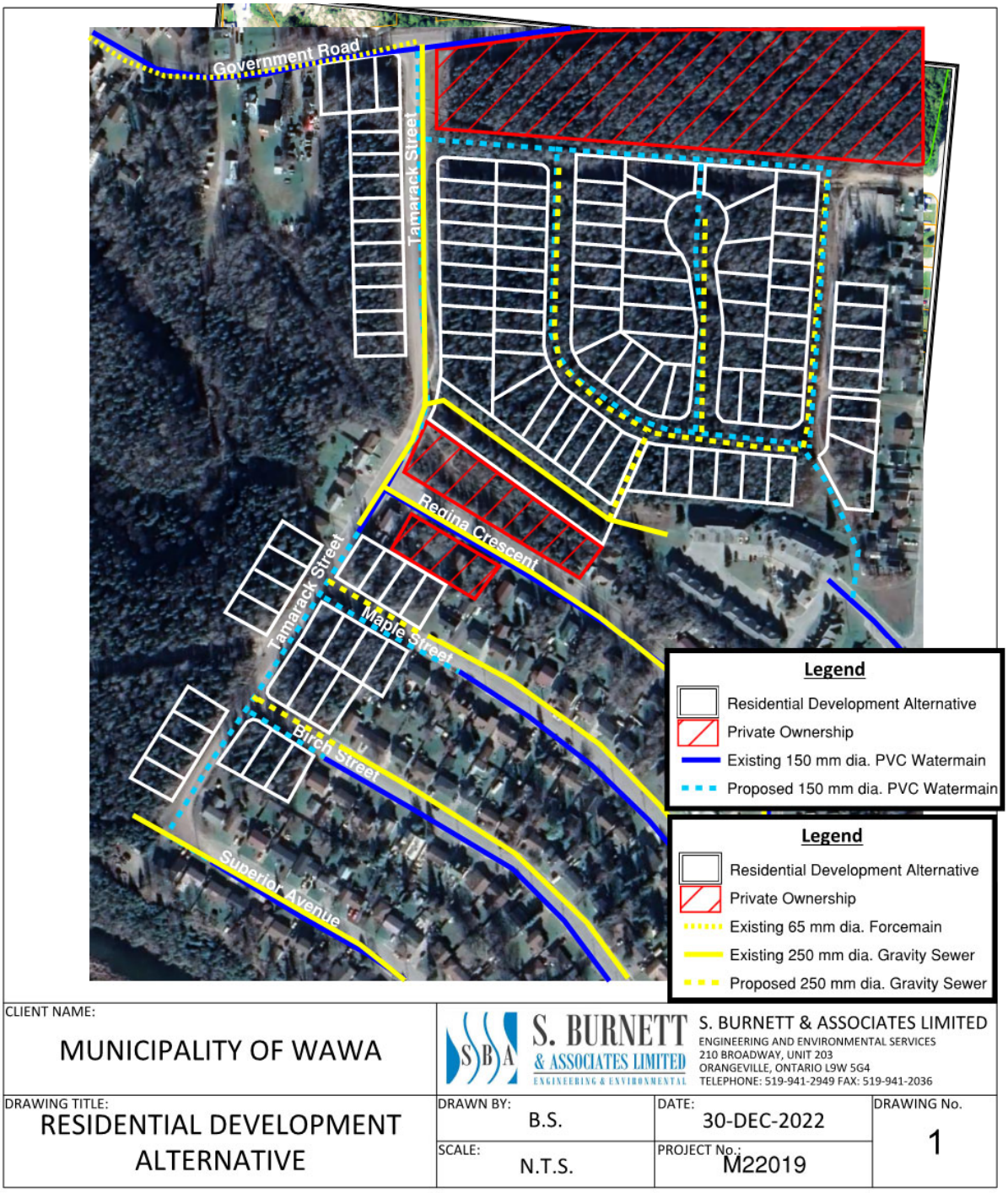


Figure 13: Residential Area Proposed Lots and Servicing (2 of 3)

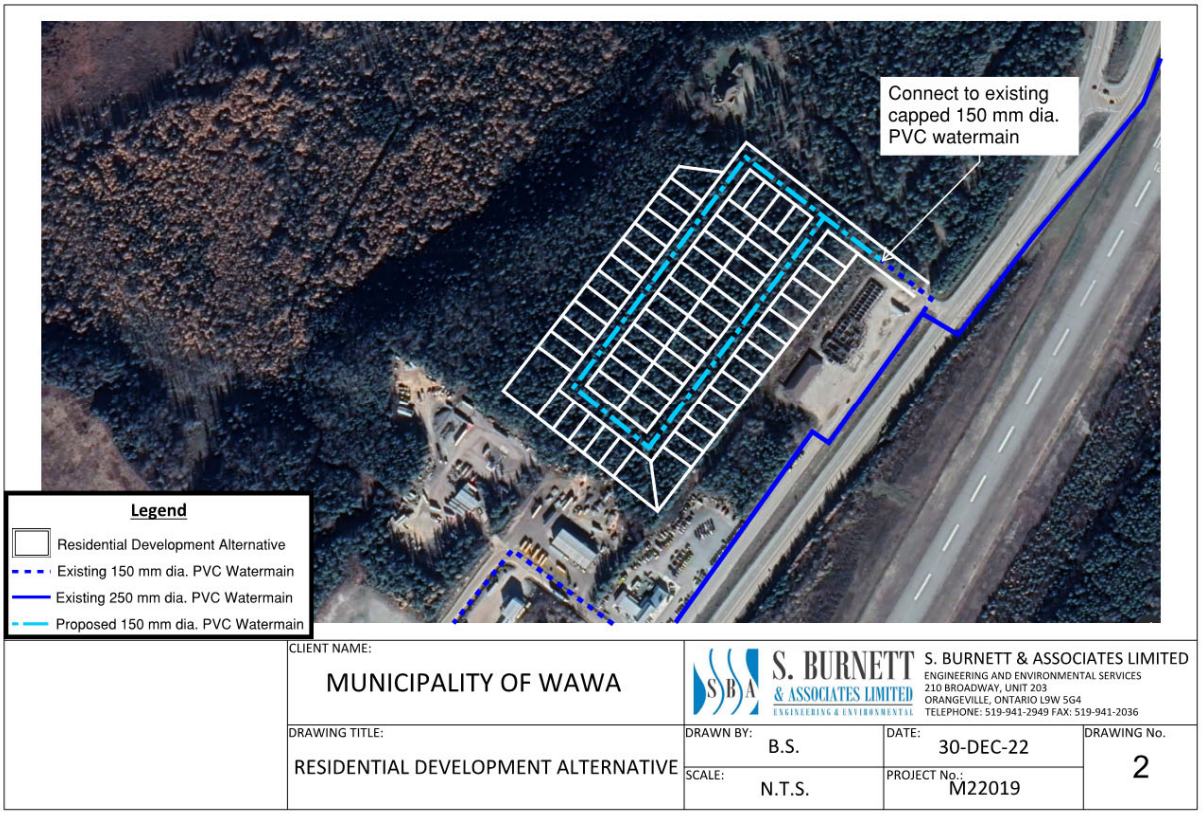
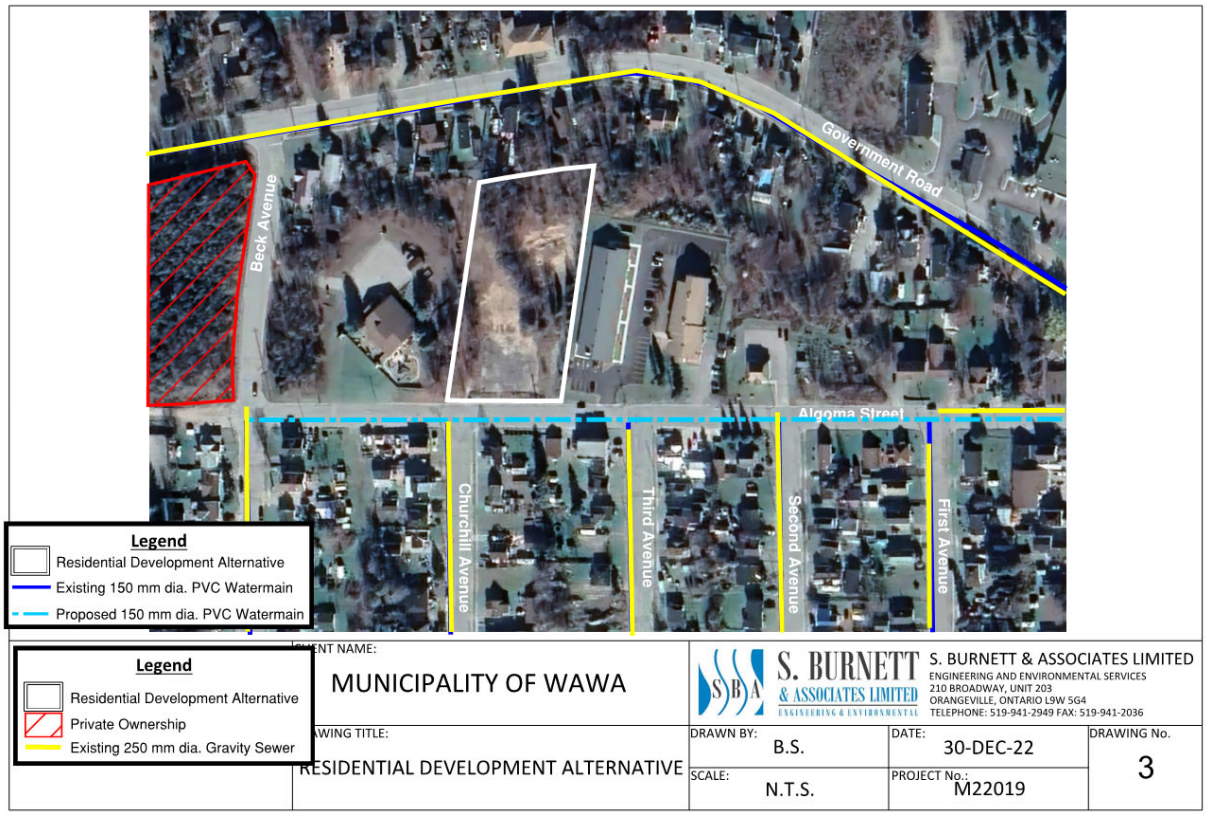


Figure 14: Residential Area Proposed Lots and Servicing (3 of 3)



6.1.2. Industrial

The potential residential growth areas were determined in consultation with Municipal Staff and these areas are shown in **Figure 15** and **Figure 16**.

6.2 Public Information Centre #1

Notification for Public Information Centre #1 was published in the Wawa News on November 30, 2022, and a copy of the Notice is provided in **Appendix A**. Additionally, a letter version of the Notice was also provided by email to potential project stakeholders on November 30, 2022, with the same distribution as the Notice of Commencement. A copy of this letter is also provided in **Appendix A**.

PIC#1 was held at 3 Maple Street in the IT Centre Board Room from 6:30 pm to 8:00 pm on December 12, 2022. There was also an opportunity to participate in the PIC virtually via Zoom. The PIC The PIC included a presentation that started at 6:45 pm and a copy of the presentation slides is provided in **Appendix A**. The PIC was attended in-person by eight (8) stakeholders, including Wawa staff, while two (2) stakeholders participated virtually. Based on input received at the PIC, an additional residential growth area (area #8) was included in our evaluation and some potential growth areas were refined.

A representative from the Red Sky Métis Independent Nation expressed interest in attending the PIC but could not attend. As a result, it was agreed that the presentation slides would be provided.

6.3 Environmental Inventory

Wawa lies in in the Boreal Shield ecozone, on the eastern border of the Ecoregion 3E: Lake Abitibi Ecoregion, Ecodistrict 3E-4: Tip Top Mountain Ecodistrict. Ecodistrict 3E-4 has a rugged and hilly landscape, with a vast amount of acidic bedrock that is either exposed or shallowly covered by glacial deposits or post-glacial soils (Morris, 2001). The vegetation is very variable, with mixed forests of conifer and deciduous and dense shrub undergrowth to single growth species (Ontario Ministry of Natural Resources and Forestry, 2018).

Wawa is included in the Forest Management Unit (FMU 615) Algoma Forest, a transitional area between the northern Boreal and southern Great Lake – St. Lawrence Forest Regions. As it is a transitional area, it contains aspects of both regions, such as northern conifer trees and southern hardwoods (Arbex Forest Resource Consultants Ltd., 2021).

Figure 15: Potential Industrial Growth Areas (1 of 2)

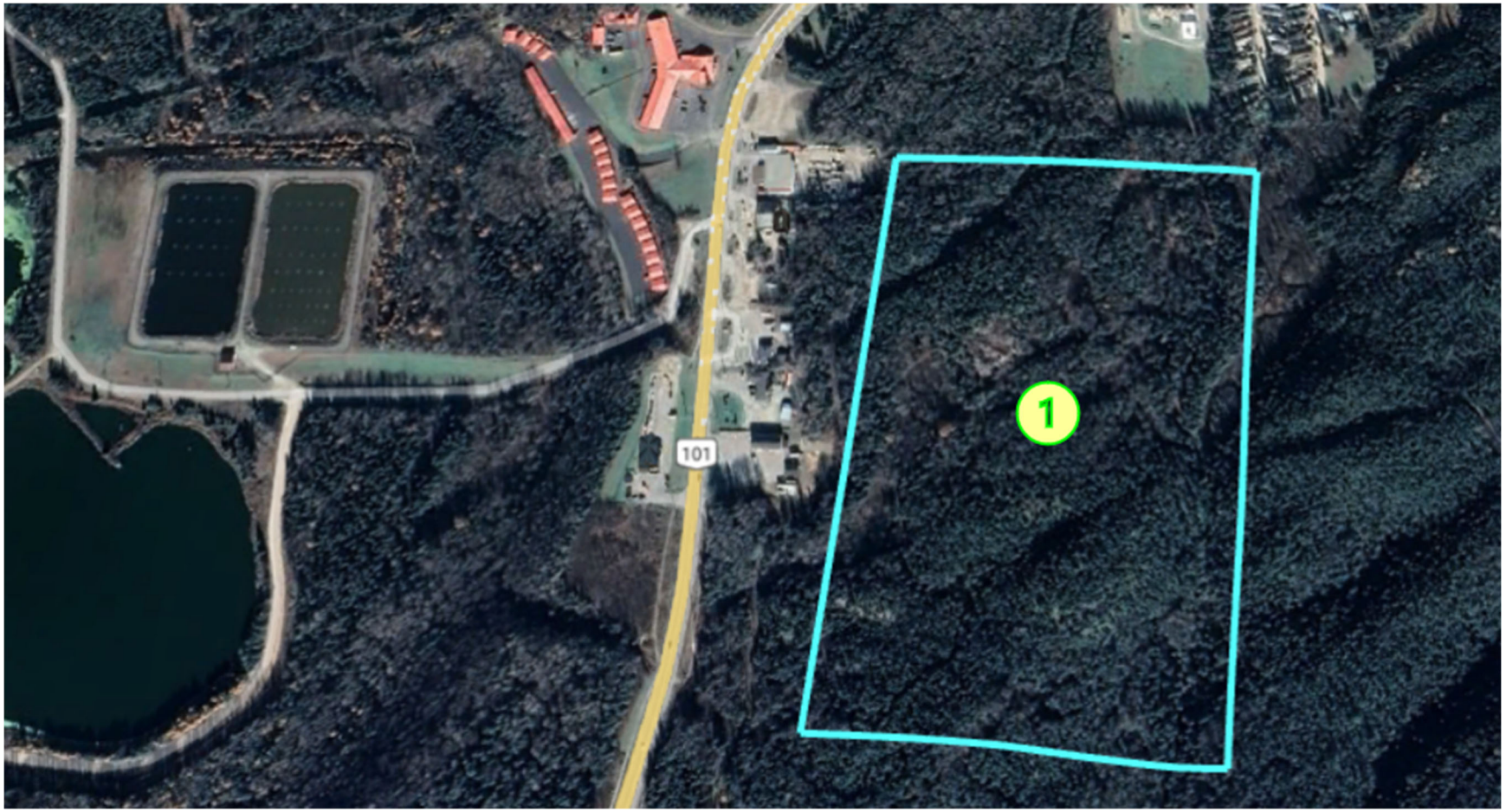


Figure 16: Potential Industrial Growth Areas (2 of 2)

6.3.1. Species at Risk

A desktop investigation was completed for the growth areas to establish the presence of species at risk within the area that could be impacted by development. The desktop investigation followed the Ontario Government's Ministry of the Environment, Conservation and Parks Species at Risk Branch's Guide to Preliminary Screening for Species at Risk. The sources that were reviewed include:

- Natural Heritage Information Centre (NHIC).
- Ontario Breeding Bird Atlas Bird Atlas (Birds Canada, 2005).
- The Toronto Entomologists' Association's (TEA) Butterfly Atlas.
- TEA Moth Atlas.
- The 2020-2030 Algoma Forest Management Plan.
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019).
- eBird.
- iNaturalist.

Many of these sources display data for a broad area (e.g., per 1 km or 10 km atlas square) and therefore only provide a general potential for species presence within our Study Area.

As part of the desktop investigation, the growth areas were first mapped on Natural Heritage Area Maps that displayed generalized species at risk occurrence data. Due to the large grid size (i.e., one (1) km square grid), alternative growth areas share the same generalized information, and further investigation would be needed to confirm the presence or absence of the species in the specific growth areas. The residential growth areas 1-8 are all within the same NHIC Map Square 16FU6518 that denotes an Area of Natural and Scientific Interest (ANSI).

The Ontario Breeding Bird Atlas, The Toronto Entomologists' Association's (TEA) Butterfly Atlas, TEA Moth Atlas, Ontario Reptile & Amphibian Atlas, the 2020-2030 Algoma Forest Management Plan, and the Ontario Tree Atlas were all used to find species that exist within the areas. These sources use large cross sections of areas, so the species are generalized over a 10 km square area, or northwestern Ontario in the case of the Tree Atlas. The sources were cross-referenced with the Species at Risk Public Registry and the SARO list to narrow down what species at risk have been or are known to be in the area. Bird Studies Canada's Monitoring the State of Ontario's Migratory Land birds was cross referenced with the Ontario Breeding bird Atlas to narrow down what migratory birds are seen in the area and may that be affected by development. Due to the terrestrial nature of the Growth Areas under consideration aquatic species at risk were excluded.
The results of the preliminary desktop screening were summarized in a memo that was provided to the Species at Risk Branch of the Ministry of the Environment, Conservation and Park on January 16, 2023

(**Appendix A).** A response was received on February 1, 2023, which confirmed species that have been identified at or near the site, or in the Project Area. These species are shown in **Table 19**.

Table 19: Species at Risk in the Wawa Area

Common Name	SARO Status	COSEWIC Status
Have been identified at or Near the Site		
Bank Swallow	Threatened	Threatened
Bobolink	Threatened	Threatened
Chimney Swift	Threatened	Threatened
Eastern Meadowlark	Threatened	Threatened
Eastern Whip-poor-will	Threatened	Threatened
Short-eared Owl	Threatened	Threatened
May be in the Project Area		
Little Brown Myotis	Endangered	Endangered
Northern Myotis	Endangered	Endangered
Eastern Small-footed Myotis	Endangered	—
Tri-colored Bat	Endangered	Endangered
Lesser Yellow Legs	Threatened	Threatened
Blanding's Turtle	Threatened	Endangered

Mammals

There are several species that are noted to be in and around Wawa, the following **Table 20**, notes the species at risk within Wawa. Within the smaller and more residential growth areas there is less change of the larger species being affected, but bat species and smaller mammals may have habitats within the areas.

Table 20: Species at Risk in the Wawa Area: Mammals

Common Name	Scientific Name	SARO Status	COSEWIC Status
Eastern Mountain Lion	*Puma concolor*	Endangered	Endangered
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	N/A
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered
Tri-Coloured Bat	*Perimyotis subflavus*	Endangered	Endangered
Woodland Caribou (Boreal)	*Rangifer tarandus*	Threatened	Threatened

Vegetation

The forest cover in the area is primarily made up of a mix of conifer and deciduous trees in the Algoma FMU. There are fewer trees near previously developed areas, however Residential Growth Areas 3 and 9 and Industrial Growth Area 1 are in heavily wooded areas. Residential Growth Area 3 is a more heavily wooded area as well, however there are several paths and clearings due to its proximity to the built of

areas of Wawa. Due to the variety of trees within the area, there is potential for the following species at risk in **Table 21** to be in the area.

Table 21: Species at Risk in the Wawa Area: Trees

Common Name	SARO Status	COSEWIC Status
American Chestnut	Endangered	Endangered
Black Ash	Endangered	Threatened
Blue Ash	Threatened	Threatened
Butternut	Endangered	Endangered
Common Hoptree	Special Concern	Special Concern
Kentucky Coffee-tree	Threatened	Threatened
Shumard Oak	Special Concern	Special Concern

Breeding Birds

By cross referencing the Breeding birds Atlas with the SARO and Species at Risk Public registry, the birds that are known to be in the general area of Wawa that are considered species at risk are as follows in **Table 22.**

Table 22: Species at Risk in the Wawa Area: Breeding Birds

Common Name	SARO Status	COSEWIC Status
Bank Swallow	Threatened	Threatened
Barn Swallow	Threatened	Threatened
Bobolink	Threatened	Threatened
Canada Warbler	Special Concern	Threatened
Chimney Swift	Threatened	Threatened
Common Nighthawk	Special Concern	Threatened
Eastern Meadowlark	Threatened	Threatened
Eastern Whip-poor-will	Threatened	Threatened
Olive-sided Flycatcher	Special Concern	Threatened
Short-eared Owl	Special Concern	Threatened
Wood Thrush	Special Concern	Threatened

Migratory Birds

Bird Studies Canada is a science-based bird conservation organization that has used volunteer monitoring programs and research to make note of bird populations and behaviours in Canada. There are several species of migratory land birds in Ontario, but there are a few, seen in **Table 23,** that Ontario has a higher conservation responsibility due to the habitat of the birds. This list was cross references with the Breeding Bird Atlas to confirm if they are common within the area.

Table 23: Species at Risk in the Wawa Area: Migratory Birds

Common Name	Ontario Conservation Responsibility
Bay-breasted Warbler	Very High
Blackburnian Warbler	High
Black-throated Green Warbler	Very High
Canada Warbler	Moderate
Chestnut-sided Warbler	Very High
Connecticut Warbler	Very High
Mourning Warbler	Very High
Ovenbird	High
Veery	High

Arthropods

Ontario is home to a large variety of insects and butterflies. Within the Wawa boundaries, the following at risk species in **Table 24** have been noted.

Table 24: Species at Risk in the Wawa Area: Arthropods

COSEWIC Common Name	Scientific Name	SARO Status	COSEWIC Status
Monarch	*Danaus plexippus*	Special Concern	Endangered
Yellow-banded Bumble Bee	*Bombus terricola*	Special Concern	Special Concern

6.3.2. Archaeology

All growth areas were assumed to have archaeological potential and will require Stage 1 Archaeological Assessment prior to any site preparation.

6.3.3. Site Specific Residential Environmental Conditions

6.3.3.1 Residential Growth Area 1

The Municipality owns this residential growth area, which is located inside the Wawa Settlement Area Boundary and is currently zoned as residential. Nearby properties in the Settlement Area are also zoned as Residential, and adjacent land use designations include Hazard Lands and Open Space to the southwest of the site. The area is currently wooded and is serviced with a 150 mm watermain on Government Road and an extension of the sewer on Tamarack Avenue.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.2 Residential Growth Area 2

This residential growth area is owned by the Municipality and is located inside the Wawa Settlement Area Boundary and is currently zoned as Residential. Nearby properties in the Settlement Area are also zoned as Residential, and adjacent land use designations include Hazard Lands and Open Space to the Southwest of the site. The area is currently wooded and is serviced via an existing 250 mm gravity sewer along Tamarack Street. A 150-mm diameter watermain is proposed along Tamarack Street, but there is currently no water servicing.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.3 Residential Growth Area 3

This residential growth area is owned by the Municipality and is located well inside the Wawa Settlement Area Boundary and is currently zoned for as Residential. The surrounding properties in the Settlement Area are also zoned as Residential. The area is currently wooded and not serviced. Water servicing for lots within this area would need to tie into the 150-mm diameter proposed watermain on Tamarack Street and the existing 150-mm watermain on Hillcrest Avenue. The lots would need to connect to the existing 250 mm sewer on Tamarack Street and the 250-mm watermain that runs parallel to Regina Street, approximately 50 m to the northeast.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.4 Residential Growth Area 4

This residential growth area is located well inside the Wawa Settlement Area Boundary and is currently zoned as Residential. Surrounding properties in the Settlement Area are also zoned as Residential. The area is wooded, with residential units to the north and east with Maple Street to the South and Tamarack Street to the west. The area is not serviced and would require the planned looping of the watermain and sewer by connecting services on Maple Street to those on Tamarack Street.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.5 Residential Growth Area 5

This residential growth area is owned by the Municipality and is located well inside the Wawa Settlement Area Boundary and is currently zoned as Residential. Surrounding properties in the Settlement Area are also zoned as Residential. The area is wooded with residential units to the east, Maple Street to the north, Tamarack Street to the west, and Birch Street to the south. The area is not serviced and would require the planned looping of the watermain and sewer by connecting services on Maple Street and Birch Street to those on Tamarack Street.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.6 Residential Growth Area 6

This residential growth area is owned by the Municipality and is located well inside the Wawa Settlement Area Boundary and is currently zoned as Residential. Surrounding properties in the Settlement Area are also zoned as Residential. The area is wooded, with residential units to the south and east with Birch Street to the north and Tamarack Street to the west. The area is not serviced and would require the planned looping of the watermain and sewer by connecting services on Birch Street to those on Tamarack Street.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.7 Residential Growth Area 7

This area is owned by the Municipality and is located well inside the Wawa Settlement Area Boundary and is currently zoned as Residential. Surrounding properties in the Settlement Area are also zoned as Residential. The area has been largely cleared and includes a concrete pad. The Superior Children Centre is located to the west and there is an apartment complex to the west and residential lots to the north. The area is not serviced and would require a new 150 mm watermain and a 250-mm diameter sewer along Algoma Street. The new sewer would also result in the looping of the sewers along Beck Avenue, Churchill Avenue, Third Avenue, Second Avenue and First Avenue, which is recommended from an operational perspective.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.8 Residential Growth Area 8

This residential growth area is not owned by the Municipality and is located at the border of and mostly inside the Wawa Settlement Area Boundary. This area is a former landfill site that is currently zoned as Residential. Surrounding properties in the Settlement Area are also zoned for Wawa Residential. Notably, part of the northern edge of the property may lie outside of the Wawa Settlement Area Boundary. The land to the west of this growth area (outside the Settlement Area Boundary) is designated as Open Space under Schedule A of the Wawa Official Plan.

A search of well records did not identity any adjacent wells (Ministry of the Environment, Conservation and Parks, 2021), nor any permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.3.9 Residential Growth Area 9

This residential growth area is not owned by the Municipality and is zoned as a residential growth area that is located outside of the Wawa Settlement Area Boundary and is designated as rural area. Nearby properties are zoned for Highway Commercial and Employment area. The area is not serviced but could connect to the caped 150-mm watermain that runs along Pinewood Drive. There is not nearby sewer, and this area would require construction of a new septic system to support residential lot development.

A search of well records identified several wells associated with businesses on Mills Drive (well id#1100780, 1101541, 1100782, 7163053, 110783) (Ministry of the Environment, Conservation and Parks, 2021). None of these wells have associated permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.3.4. Site Specific Industrial Environmental Conditions

As stated in Section 6.3, Wawa is in the Boreal Shield ecozone, on the eastern border of the Ecoregion 3E: Lake Abitibi Ecoregion, Ecodistrict 3E-4: Tip Top Mountain Ecodistrict. The area is characterized as a rugged and hilly landscape and bedrock that is often exposed or shallowly covered by soil. The area has variable vegetation, including mixed forests of conifer and deciduous and dense shrub undergrowth to single growth species (Ontario Ministry of Natural Resources and Forestry, 2018). Wawa falls in the (FMU 615) Algoma Forest, and it contains aspects of both regions, such as northern conifer trees and southern hardwoods (Arbex Forest Resource Consultants Ltd., 2021).

A desktop investigation was done for the Industrial Growth areas to establish environmental characteristics and species at risk within the areas that could be impacted by development. The desktop investigation followed the Ontario Government's Ministry of the Environment, Conservation and Parks Species at Risk Branch's Guide to Preliminary Screening for Species at Risk that was used in Section 6.3.1, Environmental Inventory for the Residential Growth Areas.

The Industrial Growth areas were first mapped on NHIC Natural Heritage Area Maps, which have a square grid size of 1 km, so the results are generalized. From the NIHC mapping, Industrial Site 2 in the NHIC 1 Km Grid squares 16FU6418 and 16FU6419 and Industrial Site 1 in the NHIC 1 Km Grid square 16FU6516. Due to the size of the grids, further investigation will be needed to confirm the presence or absence of species at risk within the growth areas.

The Ontario Breeding Bird Atlas, The Toronto Entomologists' Association's (TEA) Butterfly Atlas, TEA Moth Atlas, Ontario Reptile & Amphibian Atlas, the 2020-2030 Algoma Forest Management Plan, and the Ontario Tree Atlas were all used to find species that exist within the areas. These sources use large cross sections of areas, so the species are generalized over a 10 km square area, or northwestern Ontario in the case of the Tree Atlas. The sources were cross referenced with the Species at Risk Public Registry and the SARO list to narrow down what species at risk have been or are known to be in the area. Bird Studies Canada's Monitoring the State of Ontario's Migratory Land birds was cross referenced with the Ontario Breeding bird Atlas to narrow down what migratory birds are seen in the area and may that be affected by development.

Due to the 10 km square area, the species stated in Section 6.3.1 in the following tables may also be seen within the Industrial Growth Areas.

- Table 20: Species at Risk in the Wawa Area: Mammals ;
- Table 21: Species at Risk in the Wawa Area: Trees;
- Table 22: Species at Risk in the Wawa Area: Breeding Birds;
- Table 23: Species at Risk in the Wawa Area: Migratory Birds;
- Table 24: Species at Risk in the Wawa Area: Arthropods.

As the Industrial Growth Areas border the main built-up area of Wawa, there is a higher chance of the presence of the named species, due to less human intervention than the areas closer to the town. With the heavily forested Industrial Growth Area 1 there is a higher possibility of the previously mentioned vegetation appearing, and more habitat for mammals and birds to live in.

6.3.4.1 Industrial Growth Area 1

Industrial Growth Area 1 is an 18.4 ha-area located east of Mission Road and South of Winston Road, bordering the main built-up area of Wawa. It is a heavily forested site with natural topographic variation in intensity of vegetation, elevation (variation of ~20m), and land composition. It is also located adjacent to the Wawa Creek watercourse and wetland area, according to Ministry of Natural Resources and Forestry online mapping. The site also includes part of a section of hiking trail, as noted by the voyageur trail association and the Ministry of Natural Resources and Forestry online mapping.

This Growth Area is possibly entirely located outside of the Wawa Settlement Area Boundary and is adjacent to Highway Commercial, Employment, Institutional, Wawa Residential, and Open Space zoning according to Schedule A-1 of the Municipality of Wawa Official Plan. Schedule A of the Municipality of Wawa categorizes the land use designation for the site as Rural, but it borders both Open Space and Hazard Land Designations, in particular on the eastern edge where the site approaches the Wawa Creek watercourse and wetland area.

A provincially significant wetland overlaps with a small portion of the northwestern corner of Industrial Area #1. At this early stage of planning, it is assumed that no disturbance to this wetland area, or areas within 120 metres of the wetland would occur. Additionally, a survey of the wetland boundary by a qualified biologist would be required prior to development. The results of this wetland delineation and an assessment of potential impacts would be included as part of an Environmental Impact Statement, prior to site development.

A search of well records did not reveal any privately-owned wells adjacent to this growth area (Ministry of the Environment, Conservation and Parks, 2021).

6.3.4.2 Industrial Growth Area 2

Industrial Growth Area 2 is a 50 ha-area located at the Northwestern Terminus of Government Road, bordering the main built-up area of Wawa. It is a previously disturbed and cleared site including existing structures, with some natural topographic variation in intensity of vegetation, land composition with minimal changes in elevation. It is also located adjacent to the Magpie River, which is approximately 120 metres from its closest point.

Industrial Growth Area 2 is possibly entirely located outside of the Wawa Settlement Area Boundary and is adjacent to Wawa Residential according to Schedule A-1 of the Municipality of Wawa Official Plan. Schedule A of the Municipality of Wawa categorizes the land use designation for the site as Employment area, and it borders Open Space, Rural, Crown Land, and Hazard Land Designations. Although the entire site is located within Employment Lands, the western edge of the site borders hazard lands and the Magpie River.

A search of well records only revealed monitoring wells located just outside the southwestern extent of the growth area (Well tag #a163538, A180791, A180790), which are owned by Imperial Oil Ltd. (Ministry of the Environment, Conservation and Parks, 2021). None of these wells have associated permits to take water (Ministry of the Environment, Conservation and Parks, 2022).

6.4 Modelling of Alternatives

Prior to evaluating alternatives, each alternative was added to the water and wastewater baseline models to determine if any pressure or capacity issues would result from their addition, as this information was needed for consideration in the evaluation of alternatives.

RESIDENTIAL

Option	Water Upgrades Required	Wastewater Upgrades Required
1	No pressure or capacity issues.	No capacity issues
2	No pressure or capacity issues.	No capacity issues
3	No pressure or capacity issues.	No capacity issues
4	No pressure or capacity issues.	No capacity issues
5	No pressure or capacity issues.	No capacity issues
6	No pressure or capacity issues.	No capacity issues
7	No pressure or capacity issues.	No capacity issues
8	No pressure or capacity issues.	No capacity issues
9	No pressure or capacity issues.	No sewer

INDUSTRIAL

Option	Water Upgrades Required	Wastewater Upgrades Required
1	No pressure issues, additional fire pump may be required at booster station.	No capacity issues
2	Pressure and capacity issues on Government Rd. Watermain upsizing required.	Would require upsizing

6.5 Preliminary Screening of Alternative Solutions

SBA proposes to limit consideration of Alternative Solutions to those that are feasible, viable, and make efficient use of existing water/wastewater infrastructure, which are requirements of the Provincial Policy Statement. To do so, we propose screening Alternative Solutions against criteria adapted from the MECP's Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOE, 2009). Only Alternative Solutions meeting these criteria will be advanced for further comparison and consideration. If only one (1) option meets the criteria, this option will become the preferred option. An example of a preliminary screening of Alternative Solutions is presented in **Table 25**.

Table 25: Example of Preliminary Screening of Alternative Solutions

	Alternative		
Criteria	**1 "Do Nothing"**	**2**	**3**
Do they provide a viable solution to the problem?	No	No	Yes
Are they proven technologies?	Yes	Yes	Yes
Are they technically feasible?	Yes	Yes	Yes
Are they consistent with planning objectives?	No	No	Yes
Are they consistent with provincial government priority initiatives?	Yes	Yes	Yes
Do they avoid potential impacts to sensitive environmental features?	Yes	Yes	Yes
Are they practical, financially realistic, and economically viable?	Yes	Yes	Yes
Are they within the ability of the Town to implement?	Yes	Yes	Yes

In the above example, Options 1 and 2 would be "screened out", and Option 3 would be selected as the Preferred Solution. If multiple options remain after the preliminary screening, additional comparison of Alternative Solutions will be required.

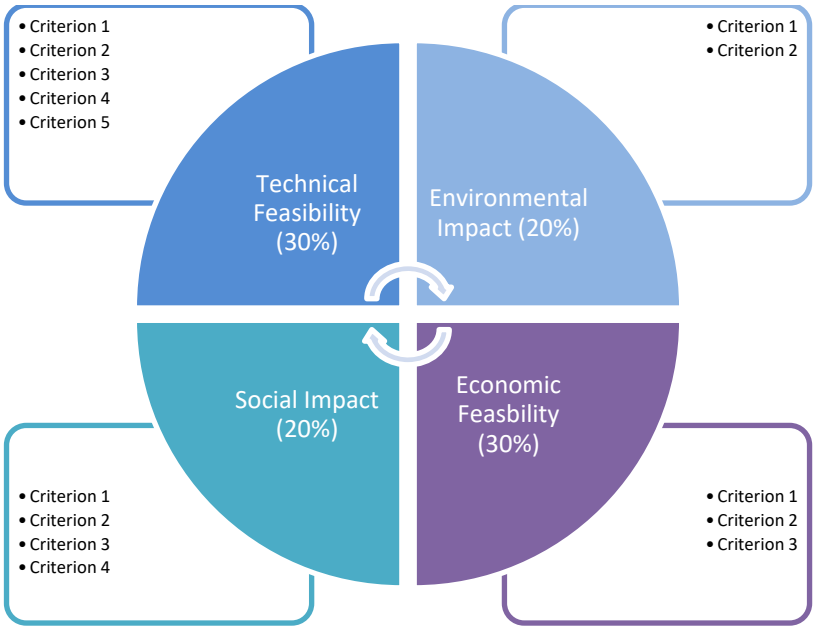
6.6 Evaluation of Alternative Solutions

Evaluating the alternatives for increasing current wastewater treatment capacity will be based on the following Evaluation Categories:

- Technical feasibility
- Environmental impact
- Economic feasibility
- Social impacts.

Before staring the evaluation of Alternative Solutions, SBA will consult with the Municipality to agree on a relative weighting of the Evaluation Categories, which in the example provided in **Figure 11** have been assigned an equal weighting totaling 100% (i.e., no category was deemed more important in selecting the preferred Alternative Solution). As illustrated in **Figure 11**, there may be different number of Evaluation Criteria for each Evaluation Category.

Figure 17: Example of Unequal Criterion Across Evaluation Categories



To account for the different number Criterion for each Evaluation Criteria, a Relative Criteria Weighting is calculated, as shown in **Table 26.**

For each Evaluation Criterion, a Criterion Importance Ranking will be assigned, based on environmental regulations, technical expertise, and input from the Municipality, including operations staff. Criterion Importance Rankings will be assigned as follows:

- **5** Is the most important criterion or is equally important.
- **2** Is slightly less important than the most important criterion.
- **1** Is significantly less important than the most important criterion.

Table 26: Example Showing How Relative Criteria Weighting is Calculated for Each Category

Criterion	Criterion Importance Ranking	Relative Criteria Weighting[1]
1	**5**	**5** ÷ 8 x 25% = 15.63%
2	**1**	**1** ÷ 8 x 25% = 3.12%
3	**2**	**2** ÷ 8 x 25% = 6.25%
Total	**8**	**25% (Criteria Category Total)**

In the above example, there are three (3) Criterion used to evaluate an Evaluation Category (e.g., Environmental, Technical, etc.). Each Criterion was assigned an importance of 5, 2 or 1, which were divided by the sum of all Criteria importance Rankings (i.e., "8"), and then multiplied by 25, the relative weighting of the Evaluation Category. In this example, each alternative evaluated would have a maximum score of 25.

Once the Relative Criterion Weighting is established, each Alternative Solution will be scored for each criterion according to the following scoring scheme:

- **1** Solution completely meets criterion, or Alternative Solution is not applicable to the criterion.
- **0.5** Solution partially meets criterion.
- **0** Solution does not meet criterion.

An example of how this scoring would be applied to two (2) alternative solutions is shown in **Table 27.**

Table 27: Example Showing Scoring of Two Alternative Solutions.

Criterion	Alternative Solution Scores			
	Option 1		Option 2	
	Score	Relative Score	Score	Relative Score
1	**1**	15.63% X **1** = 15.63%	**0.5**	15.63% x **0.5** = 7.82%
2	**1**	3.12% X **1** = 3.12%	**1**	3.12% x **1** = 3.12%
3	**0**	6.25% x **0** = 0%	**1**	6.25% x **1** = 6.25%
Total		15.63% + 3.12% + 0% = **18.75%**		7.82% + 3.12% + 6.25% = **17.19%**

The score will be multiplied by the Relative Criterion Weighting and summed to Total Score for each Alternative Solution. Given the relative weighting assigned in the example, each Alternative Solution can score up to 25% for each of the four (4) Evaluation Categories.

In the example in the table above, Alternative Solution "Option 1" received a total score of 18.75% out of a possible 25%, while Option 2 scored 17.19%. Therefore, Option 1 is the preferred Alternative Solution for this Evaluation Category (i.e., technical, environment, etc.).

For the "Economic Feasibility Evaluation Category", the lowest cost estimate will receive a "1" score, and the most expensive option was scored as a "0". Alternative Solutions within 30% of the lowest and highest scores received the same scores, respectively. All other costs will receive a score of "0.5".

A further example of how the evaluation of alternatives will appear in the Environmental Assessment Report is shown below in **Table 28.**

Table 28: Example of Evaluation of Alterative Solutions.

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1 "Name of Alternate Solution"	2 "Name of Alternate Solution"
Is easy to operate and maintain	2	3.12% (from example in Table 2)	1 (3.12%) Infrastructure will be relatively easy to operate and maintain, as it will have entirely new modern equipment.	0.5 (1.56%) Older equipment will be increasingly more difficult to operate and maintain as it ages.

The Total Score for each Evaluation Criteria (i.e., Environment, Cost, etc.) will be summarized in a table, and summed for an overall total that will determine the Preferred Alternative Solution. An example is provided below in **Table 29.**

Table 29: Example of Summary of Assessment of Alternative Solutions

Evaluation Category Score Total	Evaluation Category Weighted Percentage (%)	Alternative Solutions (%)			
		1 "Name of Alternate Solution"	2 "Name of Alternate Solution"	3 "Name of Alternate Solution"	4 "Name of Alternate Solution"
Technical	30	21.1	22.1	18.2	22
Environmental	20	24.0	24.0	18.8	18.8
Economic	30	25.0	19.8	7.3	4.2
Social	20	17.3	23.7	17.3	18.9
TOTALS	**100**	**87.4**	**89.6**	**61.6**	**63.9**

In the above example, Alternative Solution 2 would be selected as the Alternative Solution. The following sections list the technical, environmental, economic, and social criteria that will be used to evaluate the Alternative Solutions. Depending on the Alternative Solutions identified, additional criteria may be added during the evaluation process.

All stages of the evaluation, including value and percentage assignments will be completed in close consultation with the Municipality of Wawa staff.

The following sections outline a preliminary list of criteria that will be used to evaluate water, wastewater, and development options. This list will continue to be refined as the project progresses. Also, not all criteria listed will apply to the different types of alternatives being considered, for instance, not all development option criteria would apply to a wastewater project. The relevant criteria will be selected to evaluate each set of alternative solutions.

6.6.1. Technical Criteria

The following technical criteria will be considered in the evaluation of alternatives:

- Results in effluent that consistently meets effluent requirements.
- Is reliable and efficient.
- Is proven technology.
- Is easy to operate and maintain.
- Allow for easy connection to the existing system.

- Is flexible in terms of its ability to address unforeseen growth.
- Meets site-specific requirements (e.g., space requirements and geotechnical).
- Provides flexibility to adapt to climate change.
- Is simple in terms of construction.
- Implementation timeline.
- Site accessibility.
- Ease of connection with utilities.
- Grading requirements.

6.6.2. Environmental Criteria

The following environmental criteria will be considered in the evaluation of alternatives:

- Does not result in short-term impacts to water quality and aquatic life.
- Does not result in long-term impacts to water quality and aquatic life.
- Does not result in short-term impacts to terrestrial wildlife.
- Does not result in long-term impacts to terrestrial wildlife.
- Complies with environmental regulations.
- Does not impact species of special concern.
- Does not impact migratory birds.

6.6.3. Economic Criteria

The following economic criteria will be considered in the evaluation of alternatives:

- Capital and site-specific costs.
- Operation and maintenance costs.
- Life cycle costs.

6.6.4. Social Criteria

The following social criteria will be considered in the evaluation of alternatives:

- Conformity to local planning provisions.
- Impacts on quality of life.
- Financial implications for residents.
- Short-term impacts to adjacent land uses.
- Long-term impacts to adjacent land uses.
- Impacts to archaeological resources.
- Short-term impacts on local businesses.
- Long-term impacts on local businesses.
- Impacts on First Nations land rights or traditional land uses.

7. Evaluation of Growth Area Alternatives

The following sections evaluate the alternative solutions for residential and industrial growth to arrive at a preferred alternative solution.

7.1 Residential Growth Areas

7.1.1. Preliminary Screening of Residential Growth Alternatives

The Alternative Solutions outlined in Section 6 were screened against criteria adapted from the MECP's Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOE, 2009). The requirements for an Alternative Solution are that it is feasible, viable, and makes efficient use of existing water and wastewater treatment resources, which is a requirement of the PPS. Only Alternative Solutions meeting these criteria were advanced for further comparison and consideration. If only one (1) option meets the criteria, this option would become the preferred option. The screening of Alternative Solutions is presented in **Table 30** below.

Table 30: Preliminary Screening of Residential Growth Alternatives

Criteria	Alternative Growth Area Number									
	Do-Nothing	1	2	3	4	5	6	7	8	9
Do they provide a viable solution to the problem?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they technically feasible?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they consistent with planning objectives?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they consistent with provincial government priority initiatives?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Do they avoid potential impacts to sensitive environmental features?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they practical, financially realistic, and economically viable?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Are they within the ability of the Town to implement?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The Do-Nothing alternative does not represent a viable solution to the projected population growth in Wawa and the need for additional housing identified in the Housing Need and Demand Study (ARC Management Services and Harriman, 2017). Similarly, this option is not consistent with planning objectives to provide additional housing in Wawa. For these reasons, this alternative was screened out from further consideration.

Growth Area 8 was not considered practical, financially realistic, and economically viable due to the remediation efforts and associated costs that would be needed to convert this former landfill to a residential area. The associated remediation costs were considered cost prohibitive and not desirable for residents buying new homes. Additionally, the Municipality does not own this land, which further complicates development, creates price uncertainty, and extends development timeline. Another consideration in excluding this option from further consideration is that the road that divides this area is used by heavy equipment whose associated noise would represent a nuisance to residential homeowners.

7.1.2. Evaluation of Residential Growth Area Alternatives

The Alternative Solutions that were not “screened out” in the preliminary screening of alternatives are evaluated in the following sections.

7.1.2.1 Technical Assessment

Alternative Solutions were evaluated in terms of technical criteria to consider technical suitability and other engineering considerations. A summary of the evaluation is shown below in **Table 31.**

Table 31: Technical Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	9
Allows for easy connection to existing system	5	17%	1 (%) Can connect to existing water and wastewater services.	0 (%) Requires extension of watermain from Regina Cr. to Government Road along Tamarack Ave.	0 (%) Requires extension of water infrastructure.	0.5 Requires construction of planned looping of watermain between Regina Cr. And Maple St. No wastewater upgrades needed.	0.5 Requires construction of planned looping of watermain between Regina Cr. And Maple St. No wastewater upgrades needed.	0.5 Requires construction of planned looping of watermain between Regina Cr. And Maple St. No wastewater upgrades needed.	1 Although not essential, construction of planned looping of watermain along Algoma St. is recommended. No wastewater upgrades needed.	0 Requires extension of watermain and new septic system.
Is flexible in terms of its ability to address unforeseen growth	2	7%	0.5 Provides three (3) lots.	.5 Provides 11 lots.	1 Provides 83 lots, which can accommodate greater growth	.5 Provides four (4) lots.	.5 Provides seven (7) lots.	.5 Provides 3 lots.	1 Apartment best meets community need for one (1) – two (2) bedrooms and can be sized with up to three (3) floors to accommodate growth.	1 Provides 62 lots, which can accommodate greater growth.
Site preparation requirements	1	3%	.5 Site is relatively flat.	.5 Site is relatively flat.	0 Extensive grading and site preparation required.	.5 Site is relatively flat.	.5 Site is relatively flat.	.5 Site is relatively flat.	1 Lot is already cleared.	0 Extensive grading and site preparation required.
Implementation timeline	1	3%	1 Municipal ownership, existing services, and limited site preparation requirements would allow rapid construction, as needed.	.5 Municipal ownership, existing sewer, and limited site preparation requirements would allow rapid construction, as needed but watermain extension would extend the implementation	0.5 Municipal ownership and subdivision approval would shorten the implementation timeline. Construction could be phased to bring some units online quicker. Water and sewer services	0 Municipal ownership, existing sewer, and limited site preparation requirements would allow rapid construction, as needed but watermain extension would extend the	0 Municipal ownership, existing sewer, and limited site preparation requirements would allow rapid construction, as needed but watermain extension would extend the	0 Municipal ownership, existing sewer, and limited site preparation requirements would allow rapid construction, as needed but watermain extension would extend the	1 Municipal ownership, existing services, and limited site preparation requirements would allow rapid construction, as needed.	0 Don't own land, and site clearing / grading, new access.

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	9
				timeline. May require subdivision approval.	would need construction. Construction can be phased. May require subdivision approval.	implementation timeline. Town has legal agreement that these lots cannot be developed and sold until additional lots are developed along Regina Street by a private developer. May require subdivision approval.	implementation timeline. Town has legal agreement that these lots cannot be developed and sold until additional lots are developed along Regina Street by a private developer. May require subdivision approval.	implementation timeline. Town has legal agreement that these lots cannot be developed and sold until additional lots are developed along Regina Street by a private developer. May require subdivision approval.		

7.1.2.2 Environmental Assessment

Alternative Solutions were evaluated in terms of environmental criteria that consider potential impacts to aquatic and terrestrial wildlife and compliance with applicable regulations. A summary of the evaluation is shown below in A summary of the evaluation is shown below in **Table 32**.

Table 32: Environmental Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	8
Does not result in short-term impacts to water quality and aquatic life	2	2%	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.	1 No impacts expected as there are no watercourses within 120 metres of this growth area. Potential contamination of groundwater from spills to be managed through best management practices.
Does not result in long-term impacts to water quality and aquatic life	5	4%	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.	1 No impacts expected as there are no watercourses within 120 metres of this growth area.
Does not result in short-term impacts to terrestrial wildlife	2	2%	0.5 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife.	0.5 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife.	0 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife. The need for interior roads results in a greater area of impact per unit	1 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife. wildlife. The area is a relatively small natural area surrounded by	1 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife. The area is a relatively small natural area surrounded by	1 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife. The area is a relatively small natural area surrounded by	1 Given the disturbed condition of this area, impacts to wildlife will be limited to a minor noise disturbance during construction.	0 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife. The need for interior roads results in a greater area of impact per unit

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	8
					housing compared to other areas. Also, larger contiguous natural area.	roads or houses on all sides.	roads or houses on all sides.	roads or houses on all sides.		housing compared to other areas. Also, larger contiguous natural area.
Does not result in long-term impacts to terrestrial wildlife	5	4%	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.
Does not impact species of special concern	5	4%	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present	1 Due to the current state of land (previously developed), it is unlikely to impact species of special concern.	0.5 Due to the current state of land (Wooded, undeveloped), there is a potential for impact if present
Does not impact migratory birds	5	4%	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.

7.1.2.3 Economic Assessment

Alternative Solutions were evaluated in terms of economic criteria to consider their cost implications. A summary of the evaluation is shown below in **Table 33**.

Table 33. Economic Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	9
Capital cost of servicing	5	9%	0.5 Moderate capital cost	0 High capital cost	0 High capital cost	1 Low capital cost	0.5 Moderate capital cost	1 Lowest capital cost	1 Low capital cost	0 High capital cost
Operation and maintenance costs of servicing	2	4%	1 Limited additional O&M annual cost, if any.	0.5 Additional but low O&M annual cost. low annual cost per lot	0.5 Additional but moderate additional O&M annual cost. Low annual cost per lot	1 Limited additional O&M annual cost if any	1 Limited additional O&M annual cost if any	1 Limited additional O&M annual cost if any	1 Limited additional O&M annual cost if any	0 High additional O&M annual cost. highest annual cost per lot
Lifecycle costs of servicing	2	4%	1 Limited additional lifecycle cost if any	1 Low additional lifecycle cost	0.5 Moderate-to-High additional lifecycle cost	1 Limited additional lifecycle cost if any	1 Limited additional lifecycle cost if any	1 Limited additional lifecycle cost if any	1 Limited additional lifecycle cost if any	0 Highest additional lifecycle cost
Cost Per Lot (cost efficiency)	2	4%	1 Low/moderate cost per lot (moderate/high-cost efficiency)	0.5 High cost per lot (moderate-to-low-cost efficiency)	0.5 High cost per lot (moderate-to-low-cost efficiency)	1 Low cost per lot (high-cost efficiency)	1 Low cost per lot (high-cost efficiency)	1 Low cost per lot (high-cost efficiency)	1 Low cost per lot (high-cost efficiency)	0 High cost per lot (low-cost efficiency)
Ability for the Municipality to cover the costs	5	9%	1 Low overall cost	0.5 Moderate overall cost	0 High overall cost	1 Low overall cost	1 Low overall cost	1 Low overall cost	1 Low overall cost	0 High overall cost

7.1.2.4 Social Assessment

Alternative Solutions were evaluated in terms of social criteria to consider their implications on the residents of Wawa. A summary of the evaluation is shown below in **Table 34.**

Table 34. Social Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	9
Conformity to local planning provisions	5	3%	1 Currently zoned Residential, owned by Municipality, in Community Improvement Area	1 Currently zoned Residential, same MPAC parcel as Area #1, owned by Municipality, in Community Improvement Area	1 Currently zoned Residential, owned by Municipality / three (3) lots by Howorth Construction / Northern tract by Perkovich Lenore, in Community Improvement Area	1 Currently zoned Residential, owned by Municipality, in Community Improvement Area	1 Currently zoned Residential, owned by Municipality, in Community Improvement Area	1 Currently zoned Residential, owned by Municipality, in Community Improvement Area	1 Currently zoned Residential, owned by Municipality, in Community Improvement Area	0.5 Currently zoned Residential, owned by Municipality, is outside Settlement Area and would require an Official Plan and Zoning By-Law amendments.
Financial implications for residents	2	1%	0.5 Some additional costs to Municipality for servicing. Potential tax implications for residents	0.5 Some additional costs to Municipality for servicing. Potential tax implications for residents	0 High additional costs to Municipality for servicing. Certainty of tax implications for residents	1 limited to no additional cost for Municipality, limited tax implication for residents	1 limited to no additional cost for Municipality, limited tax implication for residents	1 limited to no additional cost for Municipality, limited tax implication for residents	1 limited to no additional cost for Municipality, limited tax implication for residents	0 High additional costs to Municipality for servicing. Certainty of tax implications for residents
Short-term impacts to adjacent land uses	2	1%	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.	0.5 Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures. No water supply wells located nearby.
Long-term impacts to adjacent land uses	5	3%	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.	1 No long-term impacts expected. No water supply wells located nearby.

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)							
			1	2	3	4	5	6	7	9
Impacts to archaeological resources	5	3%	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.	0.5 If archaeological resources are identified during Stage 1 Assessment, impacts will be mitigated through further assessment and implementation of site-specific mitigation measures.
Short-term impacts on local businesses	2	1%	1 There are no adjacent businesses.	1 There are no adjacent businesses.	1 There are no adjacent businesses.	1 There are no adjacent businesses.	1 There are no adjacent businesses.	1 There are no adjacent businesses.	0.5 Construction noise could be a nuisance to the adjacent Superior Children's Centre daycare. Watermain looping would result in traffic delays on Algoma Street.	1 Adjacent businesses not likely to be impacted with implementation of best management construction practices.
Long-term impacts on local businesses	5	3%	.5 Small population will have a positive effect on local businesses.	.5 Small population will have a positive effect on local businesses.	1 Moderate population will have a positive effect on local businesses.	.5 Small population will have a positive effect on local businesses.	.5 Small population will have a positive effect on local businesses.	.5 Small population will have a positive effect on local businesses.	1 Moderate population will have a positive effect on local businesses.	1 Moderate population will have a positive effect on local businesses.
Impacts on First Nations land rights or traditional land uses	5	3%	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.

7.1.3. Recommended Preferred Growth Area(s)

A Summary of the assessed Residential Growth Area Alternatives is created to highlight the total scoring potential and select a preferred Growth Area. This can be seen in **Table 35** below.

Table 35: Summary of Assessment of Residential Growth Area Alternatives

Evaluation Category Score Total	Evaluation Category Weighted Percentage (%)	Alternative Solutions (%)							
		1	2	3	4	5	6	7	9
Technical	30	25%	7%	8%	13%	13%	13%	30%	7%
Environmental	20	17%	17%	16%	18%	18%	18%	20%	16%
Economic	30	25%	12%	6%	30%	25%	30%	30%	0%
Social	20	15%	15%	16%	16%	16%	16%	17%	15%
TOTALS	**100**	**83%**	**51%**	**47%**	**77%**	**73%**	**77%**	**97%**	**38%**

7.1.4. Combination of Residential Growth Areas to Meet Growth Projections

Meeting the residential growth projection of 200 new Wawa Residents by 2032 will require development of several of the potential residential growth areas. Based on actual demand, the Municipality will develop these areas in based on the ranking of alternatives provided in **Table 36**. Currently the Municipality has an agreement with a private developer that Residential Growth Areas 4 to 6 cannot be developed before the development of 17 lots owned by the private developer. As the Municipality cannot control the timeline for the development of the lots owned by the private developer the following two (2) scenarios are included to outline how the Municipality will provide residential homes for 200 new persons by 2032, depending on whether the private developer-owned lots are developed. For each scenario, the growth areas are presented in the order in which they would be developed. To determine the number of persons housed per lot, a housing density of 2.0 was used, which is slightly lower than the current density of 2.2. This lower density was chosen to reflect the higher demand for one (1) – two (2) bedroom homes, as indicated in the 2017 housing report (ARC Management Services and Harriman, 2017)).

As Growth Area #3 has a potential 83 lots that could be developed, only a portion of this area would be developed under Scenario #1, whereas near full development would occur under Scenario#2.

Table 36: Growth Area Options to Accommodate Residential Growth.

Scenario #1 (Development of private-developer-owned lots)			Scenario #2 (No development of private developer-owned lots)		
Growth Area #	**# of lots**	**# of persons housed**	**Growth Area #**	**# of lots**	**# of persons housed**
7	10	20	7	10	20
Private Developer	17	34	1	3	6
4-6	14	28	2	11	22
1	3	6	3	76	152
2	11	22			
3	45	90			

7.2 Industrial Growth Alternatives

To accommodate the projected need for new industrial areas, a preferred industrial area needs to be identified so that water and wastewater servicing to these areas can be planned.

7.2.1. Preliminary Screening of Industrial Growth Alternatives

Alternative design concepts were evaluated in terms of preliminary considerations including viability, technical feasibility, consistency with planning and policy, environmental and economic viability and impact, and their ability for implementation by the town. This can be seen in **Table 37** below.

Table 37: Evaluation Criteria of Industrial Growth Alternatives

Criteria	Alternative Growth Area Number	
	1	2
Do they provide a viable solution to the problem?	Yes	Yes
Are they technically feasible?	Yes	Yes
Are they consistent with planning objectives?	Yes	Yes
Are they consistent with provincial government priority initiatives?	Yes	Yes
Do they avoid potential impacts to sensitive environmental features?	Yes	Yes
Are they practical, financially realistic, and economically viable?	Yes	Yes
Are they within the ability of the Town to implement?	Yes	Yes

7.2.2. Evaluation of Industrial Growth Area Alternatives

Alternative Growth Areas were evaluated in terms of technical criteria to consider technical suitability and other engineering considerations. This can be seen in **Table 38** below.

Table 38: Technical Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
Allows for easy connection to existing system	5	17%	1 Has sanitary connection and extension of watermain from existing business would be easy.	.5 Has water, caped, but can be reinstated. No sanitary.
Is flexible in terms of its ability to address unforeseen growth	2	7%	0.5 Would be generally flexible in terms of the types of business that would be appropriate for this area.	0.5 Would be generally flexible in terms of the types of business that would be appropriate for this area.
Site preparation requirements	1	3%	0.5 Clearing and grading would be required.	1 Extensive clearing and some grading already completed.
Implementation timeline	1	3%	0.5 Clearing and grading would be required.	1 Extensive clearing and some grading already completed.

Alternative Growth Area Solutions were evaluated in terms of environmental criteria to determine if one of the alternatives would provide more reliability in terms of meeting environmental considerations for growth. This can be seen in **Table 39** below.

Table 39: Environmental Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
Does not result in short-term impacts to water quality and aquatic life	2	2%	1 No impacts expected as development will not occur within 120 m of a significant wetland or within 30 metres of a waterbody. Potential contamination from spills or changes in water quality or quantity due to stormwater management to be avoided through best management practices.	1 No impacts expected as development will not occur within 120 m of a significant wetland or within 30 metres of a waterbody. Potential contamination from spills or changes in water quality or quantity due to stormwater management to be avoided through best management practices.
Does not result in long-term impacts to water quality and aquatic life	5	4%	1 No impacts expected as development will not occur within 120 m of a significant wetland or within 30 metres of a waterbody. Potential contamination from spills or changes in water quality or quantity due to stormwater management to be avoided through best management practices.	1 No impacts expected as development will not occur within 120 m of a significant wetland or within 30 metres of a waterbody. Potential contamination from spills or changes in water quality or quantity due to stormwater management to be avoided through best management practices.

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
Does not result in short-term impacts to terrestrial wildlife	2	2%	0.5 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife.	1 Construction will result in loss of natural habitat and limited mortality of individual terrestrial wildlife.
Does not result in long-term impacts to terrestrial wildlife	5	4%	1 Due the presence of adjacent large contiguous tracts of similar habitat, no long-term impacts to terrestrial wildlife are expected.	1 No expected impact to Terrestrial wildlife since the growth area is already disturbed.
Does not impact species of special concern	5	4%	0.5 Large undisturbed land. There is a potential to affect special concern species if they are present.	1 Large previously disturbed land. There is limited/no potential to affect special concern species.
Does not impact migratory birds	5	4%	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.	1 Avoiding construction during breeding bird nesting window will avoid impacts to migratory birds.

At this early stage of planning, it is assumed that no disturbance to the wetland area adjacent to Industrial Growth Area #1, or areas within 120 metres of the wetland would occur. A survey of the wetland boundary by a qualified biologist would be required prior to development and the results of this wetland delineation and an assessment of potential impacts would be included as part of an Environmental Impact Statement, prior to site development. Furthermore, potential impacts to water quality or quantity impacts to wetland areas, Wawa Creek, or Magpie River, resulting from storm water management within the

industrial site, would be identified, mitigated, and approved through the issuance of an Environmental Compliance Approval under Section 53 of the *Ontario Water Resources Act.*

Alternative Growth Area Solutions were evaluated in terms of economic criteria to determine if one of the alternatives would provide better capital costing, operation, maintenance, and lifecycle costing, and the ability of the Municipality to cover those costs. This can be seen in **Table 40** below.

Table 40: Economic Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
Capital cost of servicing	5	9%	1 Lower capital cost	0 Higher capital cost
Operation and maintenance costs of servicing	2	4%	1 Lower O&M	0 Higher O&M
Lifecycle costs of servicing	2	4%	1 Lower lifecycle costs	0 Higher lifecycle cost
Cost Per Lot (cost efficiency)	2	4%	1 Lower cost per lot (higher cost efficiency)	0 Higher cost per lot (lower cost efficiency)
Ability for the Municipality to cover the costs	5	9%	1 Lower overall cost	0 Higher overall cost

Social Criteria were evaluated for the Industrial Growth Area Alternatives for impact on life and business, conformity and consistency with planning, and First Nations land rights and traditional land use considerations. This can be seen in **Table 41** below.

Table 41: Social Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
Conformity to local planning provisions	5	3%	0.5 Currently zoned as rural. Similar to other Industrial/Commercial land use along Highway 101	1 The site is currently designated under Schedule A as Employment area and would exist on land previously used as employment area.
Impacts on quality of life	2	1%	0.5 Would replace natural heritage features and repurpose land currently being used for recreation Windmaps (Environment Canada) show the site is sometimes upwind of residential areas. No Traffic impacts through town due to proximity to highway	0.5 Would not affect natural heritage features and is located outside the built-up area. Windmaps show the site is persistently downwind of town. Possible Traffic impacts through town due to route to connect to highway
Short-term impacts to adjacent land uses	2	1%	0.5 The process of reforming the site for industrial use would create disruption to residences and businesses nearby. No water supply wells located nearby.	0.5 The process of reforming the site for industrial use would create disruption to residences nearby. No water supply wells located nearby.
Long-term impacts to adjacent land uses	5	3%	1 Already nearby an existing business area, so adjacent land uses	0 Greater number of existing residences along Government

Criterion	Criterion Importance Ranking	Relative Criterion Weighting	Alternative Solutions Scores (Relative Score)	
			1	2
			unlikely to be significantly affected. No water supply wells located nearby.	Road would be impacted by increased industrial traffic. No water supply wells located nearby.
Impacts to archaeological resources	5	3%	0.5 As an undisturbed site, there is an increased risk of impact to archaeological resources, but this could be managed through the archaeological assessment process.	1 As a previously disturbed site, there is less risk of impact to archaeological resources
Short-term impacts on local businesses	2	1%	1 No notable impact	1 No notable impact
Long-term impacts on local businesses	5	3%	.5 Increased workforce would have positive impact on local businesses.	.5 Increased workforce would have positive impact on local businesses.
Impacts on First Nations land rights or traditional land uses	5	3%	1 No concerns were identified through engagement with First Nations or Métis organizations.	1 No concerns were identified through engagement with First Nations or Métis organizations.

7.2.3. Selection of Preferred Growth Area

A Summary of the assessed Industrial Growth Area Alternatives is created to highlight the total scoring potential and select a preferred Growth Area. This can be seen in **Table 42** below.

Table 42: Summary of Assessment of Residential Growth Area Alternatives

Evaluation Category Score Total	Evaluation Category Weighted Percentage (%)	Alternative Solutions	
		1	2
Technical	30	23%	18%
Environmental	20	15%	19%
Economic	30	30%	0%
Social	20	14%	14%
TOTALS	**100**	**82%**	**51%**

7.3 Modelling of Combined Residential and Growth Preferred Alternatives

7.3.1. Water System Future Model Results

Hydraulic modelling was completed to evaluate the performance of the following criteria under future demands:

- Pressures throughout the distribution system.
- Velocities throughout the distribution system; and
- Ability to provide fire flows.

Modelling was completed using EPANET software. Topographic elevations, watermain sizes and community demands were inputted into the model to simulate the cases summarized in **Table 43** below. It is noted that the ADD and MDD for the future models are slightly higher than in the capacity assessment as 100 new residences were added to the model for a total population of 3,215 (worse case), which is a bit higher than the future projection of 3,200 (approximately 93 homes). As well, the upgrades to the current system along with the additional watermains required for residential area 3 were included in the future models.

Table 43: EPANET Hydraulic Modelling Cases Summary

Parameter	10-Year Residential (2032)	10-Year Residential plus Industrial (2032)
Distribution System	Existing with Upgrades	Existing with Upgrades
Average Day Demand	3,148 m^3/d	3,958 m^3/d
Max Day Demand	6,297 m^3/d	7,917 m^3/d
Fire Flow – Scenario 1	140.8 L/s 2 hours – Total 38 L/s – West End of Government Rd. 38 L/s – Tamarack Ave. and Regina Cres. 38 L/s – Beck Ave. and Algoma St. 26.8 L/s – St. Marie St. and Broadway Ave.	172.1 L/s 3 hours – Total 38 L/s – West End of Government Rd. 38 L/s – Tamarack Ave. and Regina Cres. 38 L/s – Beck Ave. and Algoma St. 38 L/s – St. Marie St. and Broadway Ave. 20.1 L/s – St. Marie St. and Montreal Ave.
Fire Flow – Scenario 2	140.8 L/s 2 hours – Total 26.8 L/s – St. Marie St. and Broadway Ave. 38 L/s – St. Marie St. and Montreal Ave. 38 L/s – Boyer St. and Arnott Ave. 38 L/s – Magpie Rd. and Gladstone Ave.	172.1 L/s 3 hours – Total 20.1 L/s – Tamarack Ave. and Regina Cres. 38 L/s – St. Marie St. and Broadway Ave. 38 L/s – St. Marie St. and Montreal Ave. 38 L/s – Boyer St. and Arnott Ave. 38 L/s – Magpie Rd. and Gladstone Ave.
Fire Flow – Scenario 3	140.8 L/s 2 hours – Total 32.4 L/s – Boyer St. and Arnott Ave. 32.4 L/s – Magpie Rd. and Gladstone Ave. 38 L/s – Mills Dr. and White Dr. 38 L/s – North End of Superior Ave.	172.1 L/s 3 hours – Total 20.1 L/s – St. Marie St. and Montreal Ave. 38 L/s – Boyer St. and Arnott Ave. 38 L/s – Magpie Rd. and Gladstone Ave. 38 L/s – Mills Dr. and White Dr. 38 L/s – North End of Superior Ave.
Chlorine Residual Entering Distribution System	0.86 mg/L	0.86 mg/L

10-Year Residential (2032)

Two (2) separate models were developed for the future scenario with residential growth only. One (1) model assumed that the 17 private lots and residential growth areas 4-6 can be developed while the other assumed that they cannot. Although the results were slightly different around the areas of new residential growth, in most of the distribution system the results were almost identical. As well, all the major findings regarding minimum pressures and maximum velocities were the same. For this reason, the following paragraphs in this section only discuss the results for the model that assumed the 17 private lots and residential growth areas 4-6 are developed. This model was also used as the basis for the future scenario with both residential and industrial growth discussed in the following section.

In all, the upgraded water distribution system was able to accommodate the future residential growth. Under both ADD and MDD, the minimum pressure in the main town was about 64 psi (45 m). Furthermore, all velocities were acceptable and under 1 m/s. The chlorine residuals from the temporal modelling showed minimal changes from the model of the current system with the distribution system upgrades.

The distribution system was also able to accommodate demands in all three (3) fire flow scenarios even when the WTP reservoir was at the lowest level (287.05 m). The lowest pressure of 35 psi (24 m) was found under fire flow scenario 1 at the west end of Government Rd. This simulation also had the highest velocity of 2.51 m/s, which is less than the maximum allowed velocity of 3 m/s. Therefore, it is expected that the water distribution system will be able to accommodate the proposed residential growth with the previously identified upgrades implemented.

10-Year Residential plus Industrial (2032)

The upgraded water distribution system would be able to accommodate an industrial development of 18 ha in industrial growth area 1 in addition to the residential growth. Under both ADD and MDD, the minimum pressure in the main town was about 63 psi (44 m). Furthermore, all velocities were acceptable with a maximum of 1.03 m/s under MDD. The chlorine decay modelling showed similar results to both the current system with upgrades and the future scenario with residential growth only.

The distribution system would also be able to accommodate the required demands under the three (3) fire flow scenarios that were modelled, even when the WTP reservoir is at the lowest level (287.05 m). As with the other scenarios, the lowest pressure of 32 psi (23 m) was under fire flow scenario 1 at the west end of Government Rd. The highest velocity of 2.71 m/s also occurred in this simulation, but this is still under the 3 m/s maximum. However, it is noted that the modelled flow through the fire pump on Mission Rd. was 73.3 L/s (12.1 m), which is well above its operating point (47.9 L/s, 21.9 m) and it is unclear what the actual pump performance would be at this flow rate. Therefore, it is recommended that upgrades to the booster station are completed to increase the capacity if development in industrial growth area 1 is pursued. In fact, installing a standby fire pump was suggested in the criteria and needs report and cost estimates have been provided to the Municipality.

7.3.2. Wastewater System Future Model Results

The basis indicated in **Table 13** for the existing residential and ICI flows was used to estimate the wastewater flow from the proposed future residential and industrial lots.

10-Year Residential (2032)

Like the water models, two (2) separate models were developed for the future scenario with residential growth only. One model assumed that the 17 private lots and residential growth areas 4-6 can be developed while the other assumed that they cannot. Under both scenarios, the sewers did not have any capacity issues except for the sewers whose slopes and diameters needed to be confirmed. The low velocity issues under current flows improved in certain areas along the Regina Crescent Trunk Line due to the additional flow from the proposed residential developments.

Table 44: Wastewater Collection System Analysis (Future Residential Both Options)

Trunk Line	Sewer ID	Comment
Regina Crescent Trunk Line	153, 152, 160, 161, 162, 852, 696	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
North South Trunk Line	679, 675, 694, 687, 686, 685	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
East West Trunk Line	834, 826, 700, 707, 708, Section between George St. and Magpie Rd on Mission Rd	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
Mission Road Trunk Line	95, 94, 93, 92, 90, 87, 86, 84, 83, 81, 79, 76	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)

Upsizing of some sewer pipes mentioned in **Table 14** may be required following further investigation of pipe slopes and diameters.

10-Year Residential plus Industrial (2032)

Under the 10-year residential plus industrial growth scenario, the sewers did not have any capacity issues except for the sewers whose slopes and diameters needed to be confirmed. The low velocity issues under current flows improved in certain areas along Regina Crescent and Mission Road Trunk Line due to the additional flow from the proposed residential and industrial developments.

Table 45: Wastewater Collection System Analysis (Future Residential + Industrial)

Trunk Line	Sewer ID	Comment
Regina Crescent Trunk Line	153, 152, 160, 161, 162, 852, 696	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
North South Trunk Line	679, 675, 694, 687, 686, 685	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
East West Trunk Line	834, 826, 700, 707, 708, Section between George St. and Magpie Rd on Mission Rd	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)
Mission Road Trunk Line	95, 94, 93, 92, 90, 87, 86, 84, 83	Low flow velocity (less than the minimum acceptable velocity of 0.6 m/s)

As mentioned in section 5.4, some of the sewer sections between the highway and the lagoon (section 910-914) seem to be over capacity under current and future flows. Once the diameter and slopes of these pipes are confirmed and the CCTV investigation of the sewers is completed the sewer sections shall be checked to see if they need to be upsized.

Upsizing of some other sewer pipes mentioned in **Table 14** may be required following further investigation of pipe slopes and diameters.

It is also recommended to update the model with more accurate wastewater flow basis for industrial developments prior to the development being approved when the Municipality understands the type of industries that are going to occupy the industrial area to ensure there is sufficient capacity in the sewers.

8. Selection of Preferred Growth Area

The recommended residential and industrial growth areas were presented at PIC#2 to obtain public feedback and to confirm that they should be advanced as the preferred alternative solutions.

8.1 Public Information Centre #2

Notification for Public Information Centre #2 (PIC#2) was published in the Wawa News on February 8, 2023, and a copy of the Notice is provided in **Appendix A**. Additionally, a letter version of the Notice was also provided by email to potential project stakeholders on the same day, with the same distribution as PIC#1. A copy of this letter is also provided in **Appendix A**.

PIC#2 was held from 6:30 pm to 8:00 pm on March 1, 2023, at the Michipicoten Memorial Community Centre Lounge, located at 3 Chris Simon Drive in Wawa. There was also an opportunity to participate in the PIC virtually via Zoom. The PIC The PIC included a presentation that started at 6:45 pm and a copy of the presentation slides is provided in **Appendix A**. The PIC was attended in-person by six (6) stakeholders, including Wawa staff, while one (1) stakeholder participated virtually.

The only feedback received was provided by a private developer who had concerns regarding the order in which residential growth areas would be developed. Municipal staff have had several previous conversations with the developer regarding their concerns, and although open to future conversations, they will not impact the residential growth area recommendations in this report.

8.2 Selection of Preferred Growth Areas

Based on the consideration of feedback received during PIC#2, the recommended residential and industrial growth areas described in **Section 7.1.3** and **Section 7.2.3** were selected as the preferred alternative solutions.

Prior to construction, archaeological assessment and species at risk surveys will be conducted and site-specific environmental mitigation measures developed to minimize environmental impacts.

For the preferred growth areas, the management of excess soil will be completed in accordance with O. Reg. 406/19 and the ministry's guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction will be disposed of in accordance with ministry requirements.

9. Mitigation Measures for Preferred Solution

A summary of the potential environmental effects associate with the preferred solution and their corresponding mitigation measures are shown in **Table 46**.

Table 46: Recommended Mitigation Measures

Potential Effects	Recommended Mitigation Measures
Erosion and sedimentation	• Prepare and implement and Erosion and Sediment Control (ESC) Plan. • Implement trenchless technology where appropriate (e.g., crossing watercourses). • Install heavy-duty ESC fencing prior to construction works. • Contract Administrator or Environmental Monitor to inspect ESC fencing until soils have stabilized. • Re-vegetation of all areas of bare soil within the construction area with a conservation-authority-approved seed mix within 30 days of area being left inactive. • Minimize potential for soil compaction. • Control vehicle and machinery access routes and avoid water bodies and wetlands wherever possible to minimize potential disturbance to riparian and bank vegetation. • Avoid clearing, grubbing, and grading activities during seasonally wet periods (i.e., spring). • Avoid work during high volume rain events (>20mm in 24hrs) or snow melts. • If deemed necessary through on-site monitoring, stabilize exposed soils / banks as soon as possible after construction disturbance (i.e., plantings, rock etc.). If insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as biodegradable erosion control blankets, fiber matting etc. should be applied to contain the site over the winter period. • Work in dry conditions (i.e., low flow period) or isolate in-water work area (if necessary) with use of a water containment structure. • No storage of equipment, materials or fill is to occur within natural areas.
Accidental contaminant spills	• Implement a Municipality-approved Spill Response Plan. • Keep machinery clean and refuel a minimum of 30 m away from any water body and wetlands. • Maintenance of machinery during construction should occur at a designated location away from natural areas on-site (30 m from watercourse, 10 m from woodland).

Potential Effects	Recommended Mitigation Measures
	• Fuel and other construction-related chemical must be stored securely away from water bodies and wetlands. • Any discharges to a water body must meet MOE Policy 2 standards (at or better water quality that than of the receiving water body). • Contract Administrator or Environmental Monitor to be on-site during any on-site directional drilling to monitor for frac-outs (where applicable).
Water quality/quantity impacts to wetland areas or Wawa Creek resulting from stormwater	• Potential impacts to water quality or quantity impacts to wetland areas or Wawa Creek from storm water management within the industrial site, would be identified, mitigated, and approved through the issuance of an Environmental Compliance Approval under Section 53 of the Ontario Water Resources Act. • A survey of the wetland boundary by a qualified biologist would be required prior to development and the results of this wetland delineation and an assessment of potential impacts would be included as part of an Environmental Impact Statement, prior to site development
Damage to/removal of trees and vegetation	• Install protective fencing at or 1m beyond drip line of trees. • Delineate limits of work zones with heavy-duty ESC fencing. • Control vehicle access routes to avoid areas of trees and vegetation. • Locate staging areas away from protected trees, wooded areas, and associated root zones (i.e., 10-20 m). • Complete a Butternut Health Assessment if construction activities are anticipated within 25 m of any Butternuts to inform setbacks, protection measures and compensation / authorization requirements. • Delineate natural areas of vegetation to be retained (e.g., Butternut individuals and communities). • Properly prune tree limbs accidentally damaged using arboricultural techniques. • Adhere to MBCA breeding bird timings windows for vegetation and tree removal to prevent the destruction of nesting birds. • Conduct nest searches within 'simple' habitats if construction must occur outside MBCA breeding bird timing windows. • Any vegetation removal, if required, is to occur outside of the core nesting period for migratory birds, as established by the Canadian Wildlife Service (CWS 2012), and SAR bats, as established under the *Endangered Species Act*. • Vegetation clearing should occur between November 1 and March 31.
Impacts to wildlife and their habitat	• Restrict daily timing of construction activities to between 7:00am and 7:00pm.

Potential Effects	Recommended Mitigation Measures
	• Lighting equipment associated with construction activities to be turned off following cessation of daily construction activities or turned away from natural features. • Moisten exposed soils / dry soil with water as needed during construction to reduce dust. • Any vegetation and tree removal should adhere to the applicable MBCA breeding bird timing windows to prevent the destruction of nesting birds. • Conduct nest searches within 'simple' habitats only where construction schedule will not allow for vegetation. • removal to be outside of MBCA timing window to confirm no nesting birds present prior to any removals. • Apply for an authorization under the *Endangered Species Act* if impacts to species at risk, or their habitat, cannot be avoided. The County will contact SAROntario@ontario.ca if impacts are anticipated, or if there is any uncertainty relating to impacts.
Debris entering a waterbody	• Stabilize construction debris away from water bodies and wetlands using equipment such as tarps. • Dispose of refuse and other material appropriately off-site. • Locate staging areas away from water bodies and wetlands (i.e., 30 m). • Locate drilling shafts away from water bodies and wetlands (i.e., 30 m).
Impact to Archaeological Resources	• Stage 2 archaeological assessment to be completed prior to construction and any recommendations from that assessment will be implemented.

In addition to the proposed mitigation measures, all waste generated during construction will be disposed of in accordance with ministry requirements, including the *Environmental Protection Act Regulation On-Site and Excess Soil Management (O. Reg. 406/19)* and the guidance document Management of Excess Soil – A Guide for Best Management Practices.

10. Notice of Completion

Once complete, the Municipality of Wawa will issue a Notice of Completion on their website, on the Wawa News website, and to all project stakeholders on our stakeholder list. The Municipality will also this report available at the Municipal Offices located at 40 Broadway Ave, Wawa Ontario for a period of 30 days for public, First Nation and Métis, and agency review.

During this period, members of the public, First Nations, or agencies can submit a Section 16(6) Order if they believe that this Water and Wastewater Master Servicing Plan may result in an adverse impact on constitutionally protected Aboriginal and treaty rights and that completing an Individual Environmental Assessment may prevent, mitigate, or remedy this impact.

To submit your Section 16(6) Order request, you should provide the following:

- Your name, address, and email address.
- Project name.
- Proponent name.
- What kind of Order is being requested?
- A request for additional conditions.
- A request for an individual environmental assessment.
- Details about your concerns about potential adverse impacts on constitutionally protected Aboriginal or treaty rights and how the proposed Order may prevent, mitigate, or remedy the identified adverse impacts.
- Whether you belong to, represent or have spoken with an Indigenous community who's constitutionally protected Aboriginal, or treaty rights may be adversely impacted by the proposed project.
- Whether you have raised your concerns with the proponent, the proponent's response (if any) and why the concerns could not be resolved with the proponent.
- Any other information to support your request.

Requests that are made after the 30-day review period, may not be considered by the Minister. Upon review of any Section 16 Orders, the Minster of the Environment, Conservation and Parks has the authority and discretion to require the proponent of a project to:

1. Deny the request;
2. Complete a more rigorous study, referred to as an Individual Environmental Assessment;
3. Fulfill additional conditions in addition to the Class EA that could include further study, monitoring; or,
4. Refer the matter to mediation.

In making their decision, the Minister will consider factors set out in Section 16(5) of the *Environmental Assessment Act*.

Members of the public having concerns about the potential environmental effects of a project, or the planning process being followed, have a responsibility to bring their concerns to the attention of the proponent early in the planning process.

Should no Part II requests be received, or if they are rejected by the Minister, then the project will have met all the requirements of the Schedule B Municipal Class EA process.

11. References

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s=1D2433&checkedLevels=&refPeriods=20010101,20210101&dimensionLayouts=layout3,layout2&vectorDisplay=false

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S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Appendix A

Consultation Material

CONTENTS

Municipality of Wawa, Water and Wastewater Servicing Master Plan, Notice of Commencement
Stakeholder Letter Notice - Issued September 15, 2022
Job No.: M22019

Name	Title	Company	Address	City	Province	Postal Code	Email	Email Sent	Comments	Read Receipt Received	Request to be Informed	Reminder Email
Municipalities												
First Nations and Métis												
Patricia Tangie	Gimaa Kwe	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	ptangie@michipicoten.com	15-Sep-22				
Chris Buckell	Supervisor Public Works	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	cbuckell@michipicoten.com	15-Sep-22		15-Sep-22		
Jason Gauthier	Chief	Missanabie Cree First Nation					jgauthier@missanabiecree.com	28-Nov-22				
Dean Sayers	Chief	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	chiefdeansayers@batchewana.ca	28-Nov-22				
Sandra Kenny	Council Secretary	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	councilsecretary@batchewana.ca	28-Nov-22				
Andy Rickard	Chief	Garden River First Nation					arickard@gardenriver.org	28-Nov-22				
		Métis Nation of Ontario Lands, Resources, and Consultations Branch	Suite 1100 -66 Slater Street	Ottawa	ON	K1P 5H1	consultations@metisnation.org	15-Sep-22				
		Red Sky Independent Metis Nation Consultation Office	406 East Victoria Avenue	Thunder Bay	ON	P7C 1A5	consultation@rsmin.ca	15-Sep-22				
Agencies/Regulators												
	General EA notification email	Ministry of Environment, Conservation and Parks					eanotification.nregion@ontario.ca	15-Sep-22	All project notices	15-Sep-22		
	Director, Environmental Assessment Branch	Ministry of Environment, Conservation and Parks	135 St. Clair Avenue West, 1st Floor	Toronto	ON	M4V 1P5			Only Notice of Completion			
Other Stakeholders												

September 15, 2022

Re: Municipality of Wawa
Water and Wastewater Master Plan Municipal Class Environmental Assessment

To Whom It May Concern,

The Municipality of Wawa is starting the development of a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met. Under this project, the Municipality will evaluate alternative means of providing safe, cost-effective, sustainable, and reliable water and wastewater services to support proposed development in the community. Through this process, a Municipal Class Environmental Assessment (MCEA) be initiated.

Public and First Nations and Métis input and comments are an important part of the MCEA process and are welcome at any time. When the study is further advanced, the Municipality will hold at least one (1) Public Information Centre (PIC) to present findings and receive comments. A notice will appear in this newspaper in advance of the PIC.

Please let me know if you would like to be kept informed or consulted as part of the Class EA. Also attached is a copy of the Notice of Commencement. The Notice of Commencement will appear in the Wawa News to formerly initiate the Class EA.

Yours truly,

Rebecca Weatherall, EIT
Assistant Director of Infrastructure Services
Municipality of Wawa
40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Incl.: Notice of Commencement

Notice of Study Commencement

Municipality of Wawa Water and Wastewater Master Plan

THE STUDY

The Municipality of Wawa is starting the development of a Water and Wastewater Master Plan (WWMP) to ensure that our current and future water and wastewater infrastructure needs are met. The resulting report will outline the Municipality's plan for providing safe, cost-effective, sustainable, and reliable water and wastewater services to ensure that planned growth and development in the community can be supported.

THE PROCESS

The WWMP update will be conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA), which is an approved process under the *Environmental Assessment Act*. This process ensures that various alternatives are evaluated to select a preferred development plan based on environmental, social, technical and economic criteria.

PUBLIC CONSULTATION

Public input and comments are an important part of the MCEA process and comments are welcome at any time. When the study is further advanced, the Municipality will hold at least one Public Information Centre (PIC) to present findings and receive comments. A notice will appear in this newspaper in advance of the PIC.

Upon completion of the MCEA, a Project File will be made available for public review and comment. Another notification will be published at that time, indicating where the report can be viewed.

CONTACT INFORMATION

Further information can be obtained from the Municipality or our consultant for this project.

Rebecca Weatherall, EIT
Assistant Director of Infrastructure Services
Municipality of Wawa
40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Ian Callum, M.Sc., PMP
S. Burnett & Associates Limited
210 Broadway, Unit 203
Orangeville, ON L9W 5G4
T: 519-941-2949

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. Except for personal information, all comments will become part of the public record.

This Notice was issued September 15, 2022 on the www.wawa-news.com website.

Notice of Study Commencement

Municipality of Wawa Water and Wastewater Master Plan

THE STUDY

The Municipality of Wawa is starting the development of a Water and Wastewater Master Plan (WWMP) to ensure that our current and future water and wastewater infrastructure needs are met. The resulting report will outline the Municipality's plan for providing safe, cost-effective, sustainable, and reliable water and wastewater services to ensure that planned growth and development in the community can be supported.

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Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. Except for personal information, all comments will become part of the public record.

This Notice was issued September 15, 2022 on the www.wawa-news.com website.

November 30, 2022

Re: Municipality of Wawa
Water and Wastewater Master Plan Municipal Class Environmental Assessment
Public Information Centre #1

To Whom It May Concern,

The Municipality of Wawa is starting the development of a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met. Under this project, the Municipality will evaluate alternative means of providing safe, cost-effective, sustainable, and reliable water and wastewater services to support proposed development in the community. Through this process, a Municipal Class Environmental Assessment (MCEA) was initiated.

Public, First Nations and Métis input and comments are an important part of the MCEA process, and our first of two (2) Public Information Centres (PICs) is an opportunity to learn about the WWMP process and to provide feedback. The PIC can be attended in-person or virtually. To attend virtually via Zoom video conferencing, contact our consultant Ian Callum, S. Burnett & Associates Limited at ian.callum@sbaengineering to register no later than 12:00 pm on Friday, December 9, 2022.

Public Information Centre #1
6:30 pm - 8:00 pm (presentation starts at 6:45 pm)
Monday, December 12, 2022
3 Maple Street, IT Centre Board Room, Wawa, Ontario
Zoom Video Conference (must register to receive link)

Yours truly,

Rebecca Weatherall, P.Eng.
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Notice of Public Information Centre #1

Municipality of Wawa Water and Wastewater Master Plan

THE STUDY

The Municipality of Wawa is developing a Water and Wastewater Master Plan (WWMP) to ensure that our current and future water and wastewater infrastructure needs are met. The resulting report will outline the Municipality's plan for providing safe, cost-effective, sustainable, and reliable water and wastewater services to ensure that planned growth and development in the community can be supported.

THE PROCESS

The WWMP update will be conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA), which is an approved process under the *Environmental Assessment Act*.

PUBLIC CONSULTATION

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In-person at 3 Maple Street, IT Board Room, Wawa
Zoom Video Conference (must register to receive link)

CONTACT INFORMATION

Further information may be obtained from the Municipality of Wawa or the Consultant for this project.

Rebecca Weatherall, P.Eng
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Ian Callum, M.Sc., PMP
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210 Broadway, Unit 203
Orangeville, ON L9W 5G4
T: 519-941-2949

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. Except for personal information, all comments will become part of the public record.

This Notice was issued November 28, 2022 on the www.wawa-news.com website.

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-845

November 1, 2022

Rebecca Weatherall
Assistant Director of Infrastructure Services
Municipality of Wawa

Ian Callum
Senior Environmental Project Manager
S. Burnett & Associates Limited
Ian.Callum@sbaengineering.com
info@sbaengineering.com

BY EMAIL ONLY

Re: **Municipality of Wawa Water and Wastewater Master Plan**
Municipality of Wawa
Municipal Class Environmental Assessment, Master Plan
Acknowledgement of Notice of Commencement

Dear Project Team,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Municipality of Wawa (proponent) has indicated that the study is following the approved environmental planning process for a Master Plan project under the Municipal Class Environmental Assessment (Class EA).

The **updated (August 2022)** attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project

schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Michipicoten First Nation
- Missanabie Cree First Nation
- Batchewana First Nation
- Garden River First Nation
- Métis Nation of Ontario – Region 4

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information, including the MECP's expectations for EA report documentation related to consultation with communities.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances after initial discussions with the communities identified by the MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
- Consultation with Indigenous communities or other stakeholders has reached an impasse; or
- A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

A draft copy of the report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.

Please also ensure a copy of the final notice is sent to the ministry's Northern Region EA notification email account (eanotification.nregion@ontario.ca) after the draft report is reviewed and finalized.

Should you or any members of your project team have any questions regarding the material above, please contact me at Erinn.Lee2@ontario.ca.

Sincerely,

Erinn Lee

Erinn Lee
Regional Environmental Planner
Project Review Unit, Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks

cc Ron Dorscht, Supervisor, Sault Ste Marie Area Office, MECP
Marnie Managhan, Water Compliance Supervisor, Sudbury District Office, MECP

Enclosed: Areas of Interest

Attached: Client's Guide to Preliminary Screening for Species at Risk

A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST (v. August 2022)

It is suggested that you check off each section after you have considered / addressed it.

☐ **Planning and Policy**

- Applicable plans and policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
    - Projects located in MECP Central, Eastern or West Central Region may be subject to **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)**.
    - Projects located in MECP Central or Eastern Region may be subject to the **Oak Ridges Moraine Conservation Plan (2017)** or the **Lake Simcoe Protection Plan (2014)**.
    - Projects located in MECP Central, Southwest or West Central Region may be subject to the **Niagara Escarpment Plan (2017)**.
    - Projects located in MECP Central, Eastern, Southwest or West Central Region may be subject to the **Greenbelt Plan (2017)**.
    - Projects located in MECP Northern Region may be subject to the **Growth Plan for Northern Ontario (2011).**

- The **Provincial Policy Statement (2020)** contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

☐ **Source Water Protection**

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e.

systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.

    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if this project is occurring within a vulnerable area, proponents can use Source Protection Information Atlas, which is an online mapping tool available to the public. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the “Map Legend” bar on the left. The

mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

☐ **Climate Change**

The document "Considering Climate Change in the Environmental Assessment Process" (Guide) is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

- **The MECP expects proponents of Class EA projects to:**

1. Consider during the assessment of alternative solutions and alternative designs, the following:
    a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
    b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern.

- If a quantitative Air Quality Impact Assessment is not required for the project, the MECP expects that the report contain a qualitative assessment which includes:

    - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
    - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
    - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
    - A discussion of potential mitigation measures.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* report prepared for Environment Canada. March 2005.

- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
  - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
  - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
  - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, for projects located in Central Region you may consider the provisions of the Rouge Park Management Plan if applicable.

Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at https://www.ontario.ca/page/species-risk.

- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.

- For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods.

- A Stormwater Management Plan prepared as part of the Class EA process should include:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

Excess Materials Management

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don't go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase

in effect on January 1, 2021. For more information, please visit https://www.ontario.ca/page/handling-excess-soil.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements

Contaminated Sites

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the MECP's D-4 guideline for land use considerations near landfills and dumps.
  - Resources available may include regional/local municipal official plans and data; provincial data on large landfill sites and small landfill sites; Environmental Compliance Approval information for waste disposal sites on Access Environment.

- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's website).

- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

Servicing, Utilities and Facilities

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.

- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the project.

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's environmental land use planning guides to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout

the planning process. The report should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

Class EA Process

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**

- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.

- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act*, 2019.

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and to reference any relevant information in the report.

Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020
Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address.

The public can request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

Therefore, the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project.

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister David Piccini
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Wawa Water/Wastewater MSP Class EA

Public Information Centre #1

December 2022

What is a Water/ Wastewater Master Servicing Plan?

- A Water/Wastewater Master Servicing Plan is a plan created to determine infrastructure and land use requirements to meet current and future demand

Municipal Class Environmental Process

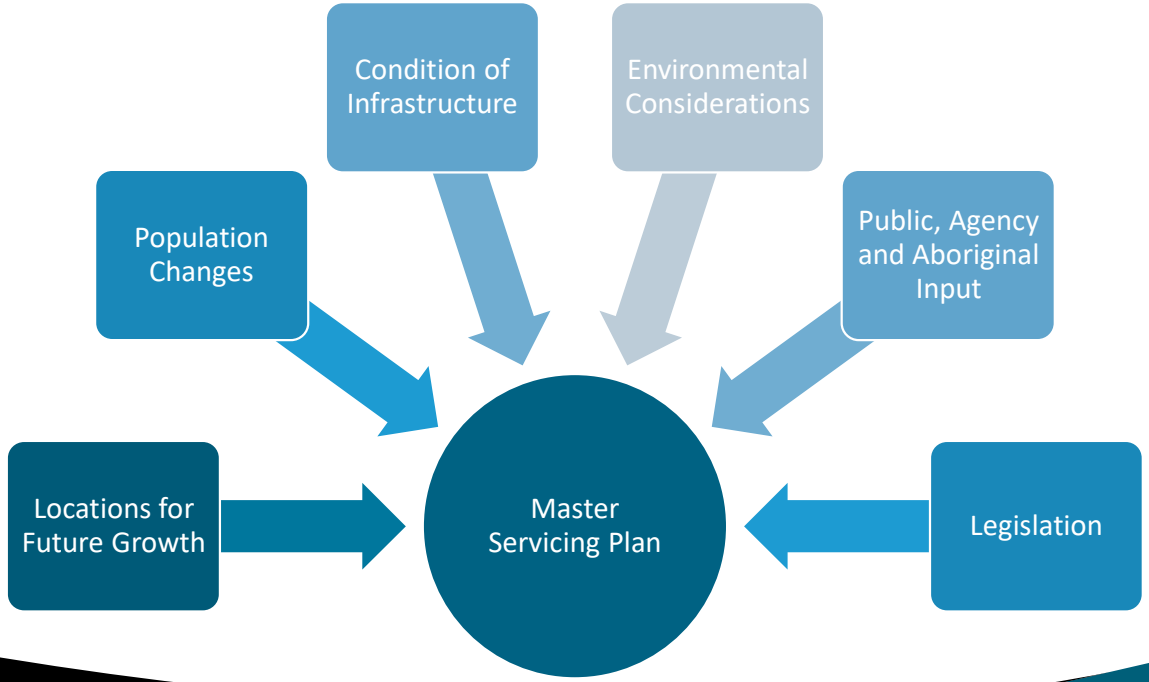
- The creation of this Master Servicing Plan will follow the Municipal Class Environmental Assessment (EA) Process
- Public consultation is an important part of the Class EA process

Class EA Process

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Problem or Opportunity	Alternative Solutions	Alternative Design Concepts for Preferred Solution	Environmental Study Report (ESR)	Implementation
Identify Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Complete Environmental Study Report (ESR)	Complete Contract Drawings and Tender Documents
Discretionary Public Consultation	Inventory Natural, Social Economic Environment	Detail Inventory of Natural, Social and Economic Environment	ESR Placed on public Record	Proceed to Construction and Operation
	Identify Impact of Alternative Solutions on the Environment, and Mitigating Measures	Identify Impact of Alternative Designs on Environment and Mitigating Measures	Notice of Completion to Review Agencies and Public	
	Evaluate Alternative Solutions: Identify Recommended Solutions	Evaluate Alternative Designs: Identify Recommended Solutions	Copy of Notice of Completion to MECP-EA Branch	
	Consult Review Agencies and Public re: Problem and Opportunity and Alternative Solutions	Consult Review Agencies and Previously Interested and Directly Affected Public	Opportunity to Request Minister Within 30 Days of Notification to Request an Order *	
	Select Preferred Solution	Select Preferred Design		
		Preliminary Finalization of Preferred Design		

We are here

What needs to be considered?



Steps in Our Assessment

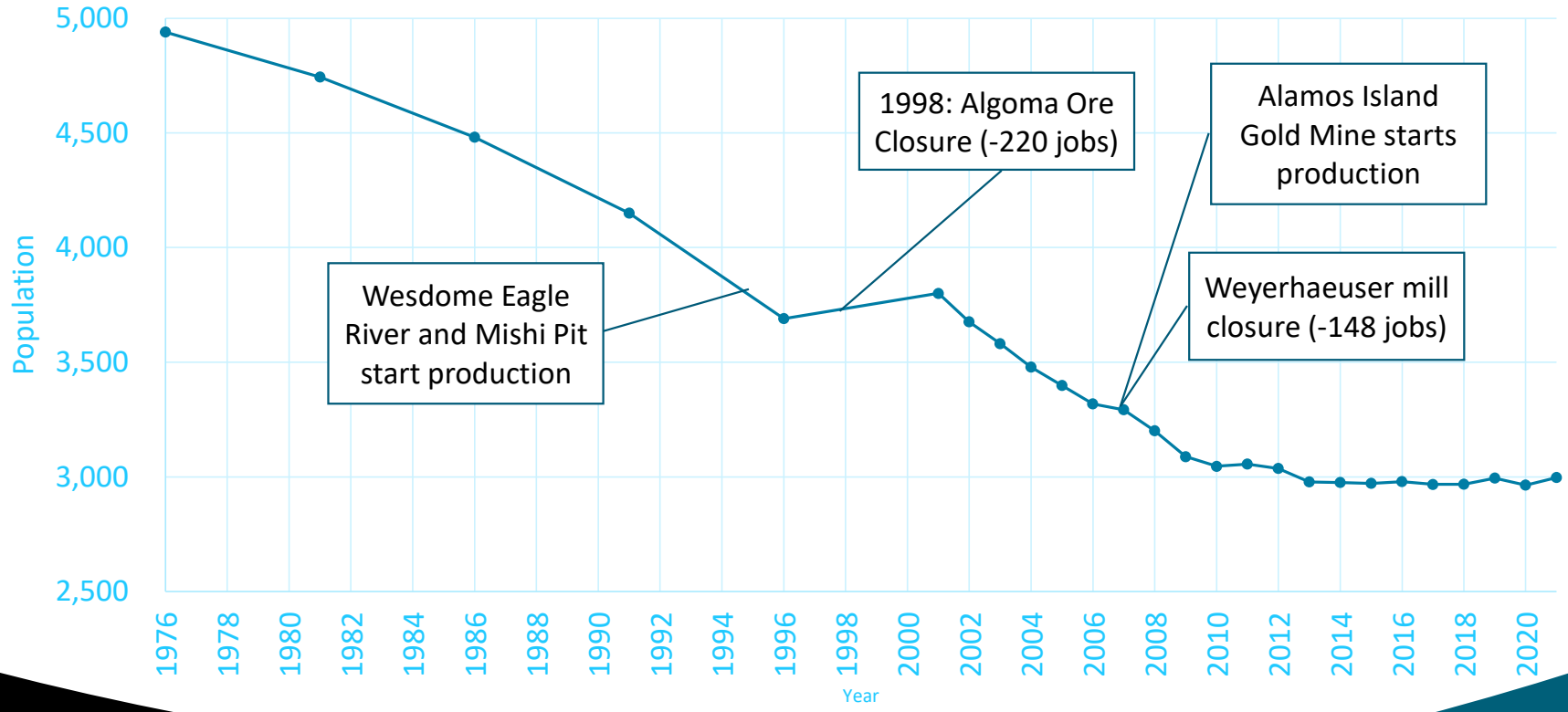
1. Assess current water and wastewater infrastructure
2. Project future infrastructure needs, including new housing
3. Identify alternative solutions to address current and future needs
4. Evaluate alternative solutions to select preferred solutions

CONSULTATION

Prioritizing Required Infrastructure Upgrades

Immediate / High	Medium	Low
Prioritizing: - Health & Safety - Emergency Response - Critical equipment redundancy	Improvements to: - System functionality - Operational Efficiency - Reduce operating costs	Recommendations for: - Operational best practices to improve equipment longevity - Annual maintenance considerations - Removal of unnecessary systems
Timeframe: 0 – 2 years	**Timeframe:** 2 – 5 years	**Timeframe:** 5+ years

Historic Population of Wawa



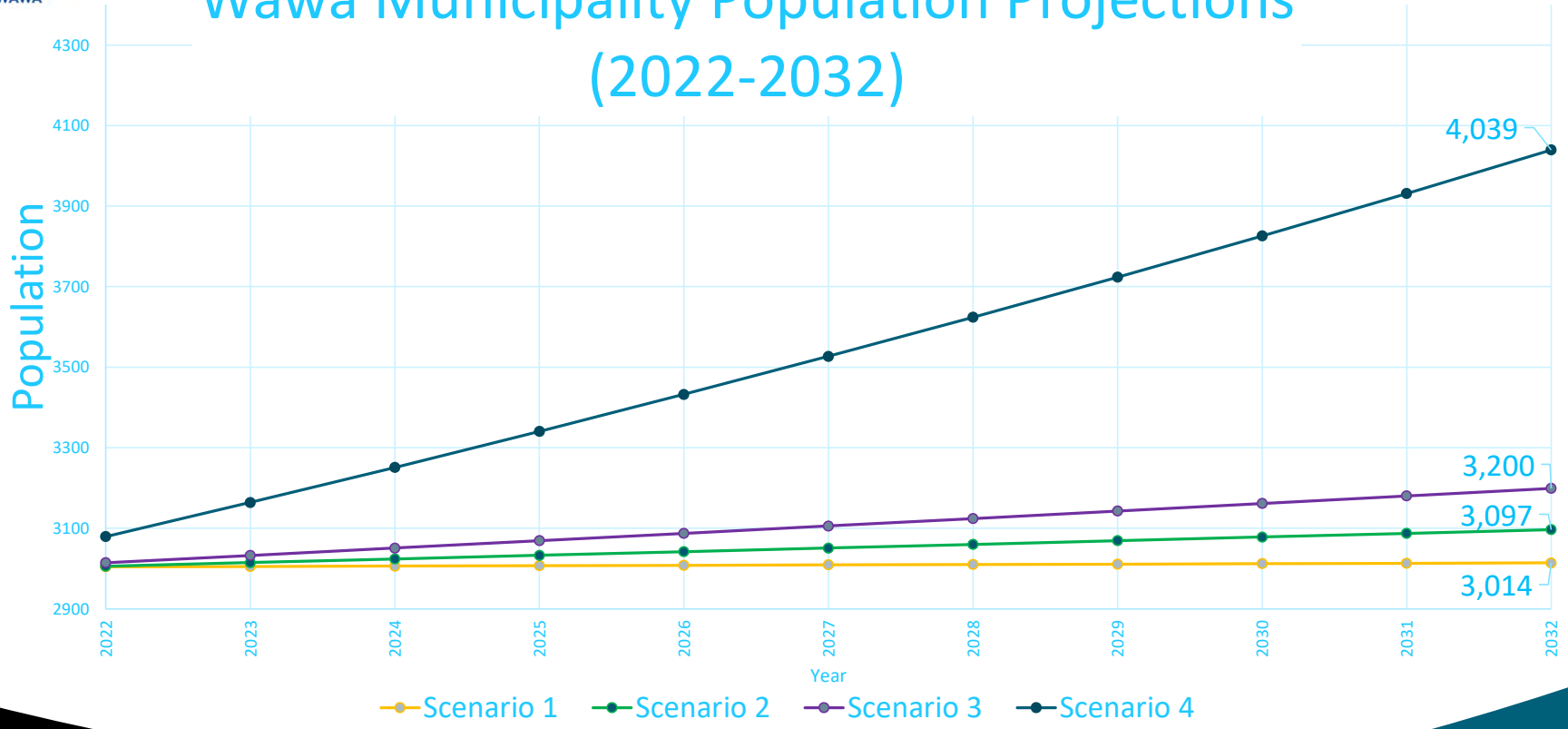
Future Considerations

- Wesdome is actively exploring the Eagle River Mine property, and recently increased production from 650 tonnes per day to 850 tonnes per day
- Alamos expected to double workforce to 1,200 over construction of their expansion, concluding in 2026.
- Angus Gold and Red Pine Exploration currently investigating opportunities in the region
- Wesdome Mishi Pit was mined out in 2021
- Argonaut Gold in construction with production beginning in 2023
- Wawa OSB Inc. project to create a reported 140 jobs
- 2017 Housing Report indicated a need for at least 62 new unit (not including opening of new mines and the Wawa OSB Inc. mill)

Projection Scenarios

1. **0.24% increase:** Based on Statistics Canada for 2021 and Ontario Ministry of Finance projections (Summer 2022) for Northern Region (2021-2046)
2. **0.30% increase:** Half the growth rate of Scenario 3.
3. **0.60% increase:** Growth rate seen from 1996 to 2001 after opening of Wesdome Eagle River and Mishi Pit
4. **2.75% increase:** increase at the same average annual decline rate seen from 2001 to 2010.

Wawa Municipality Population Projections (2022-2032)



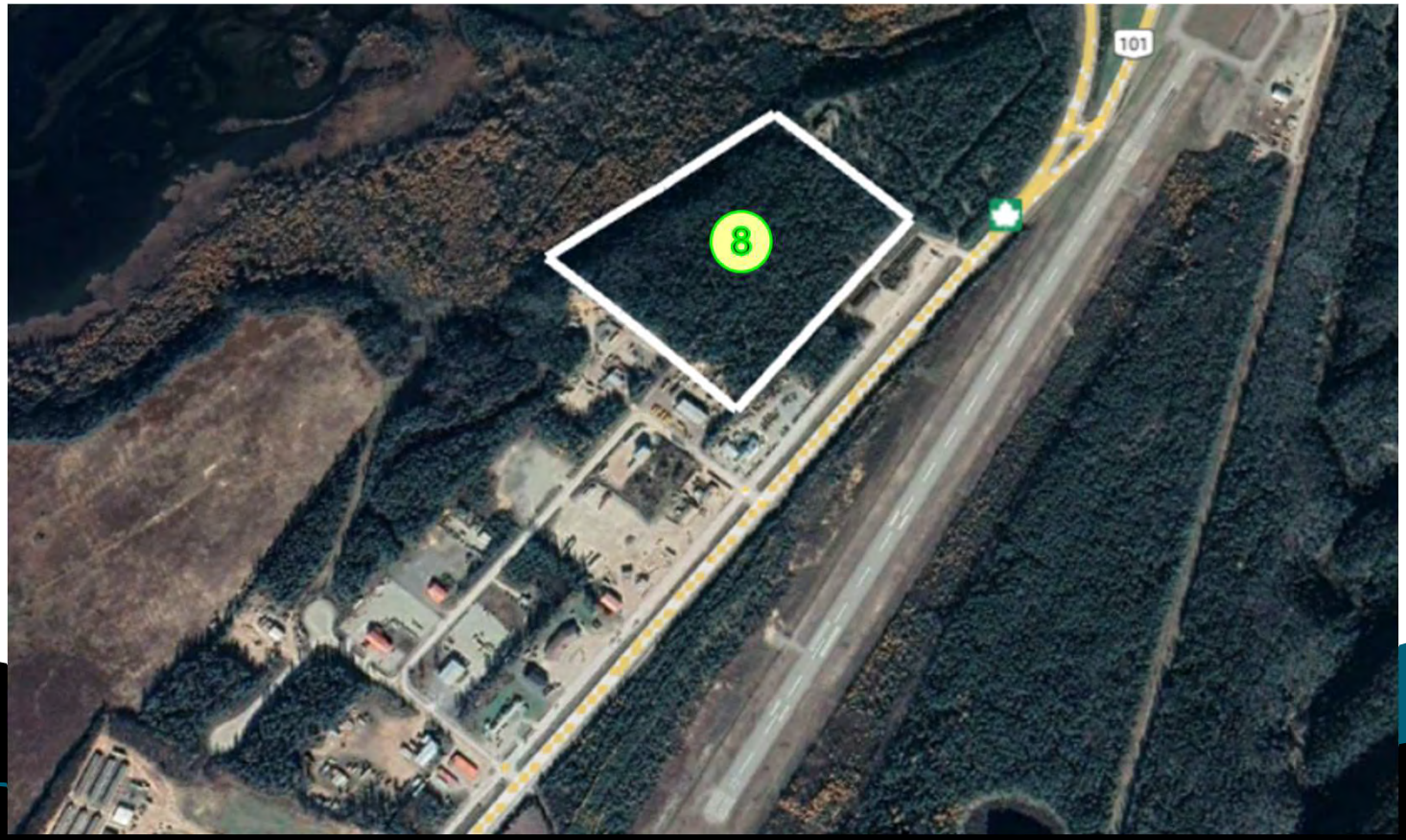
2017 Housing Report

Recommendations of report included:

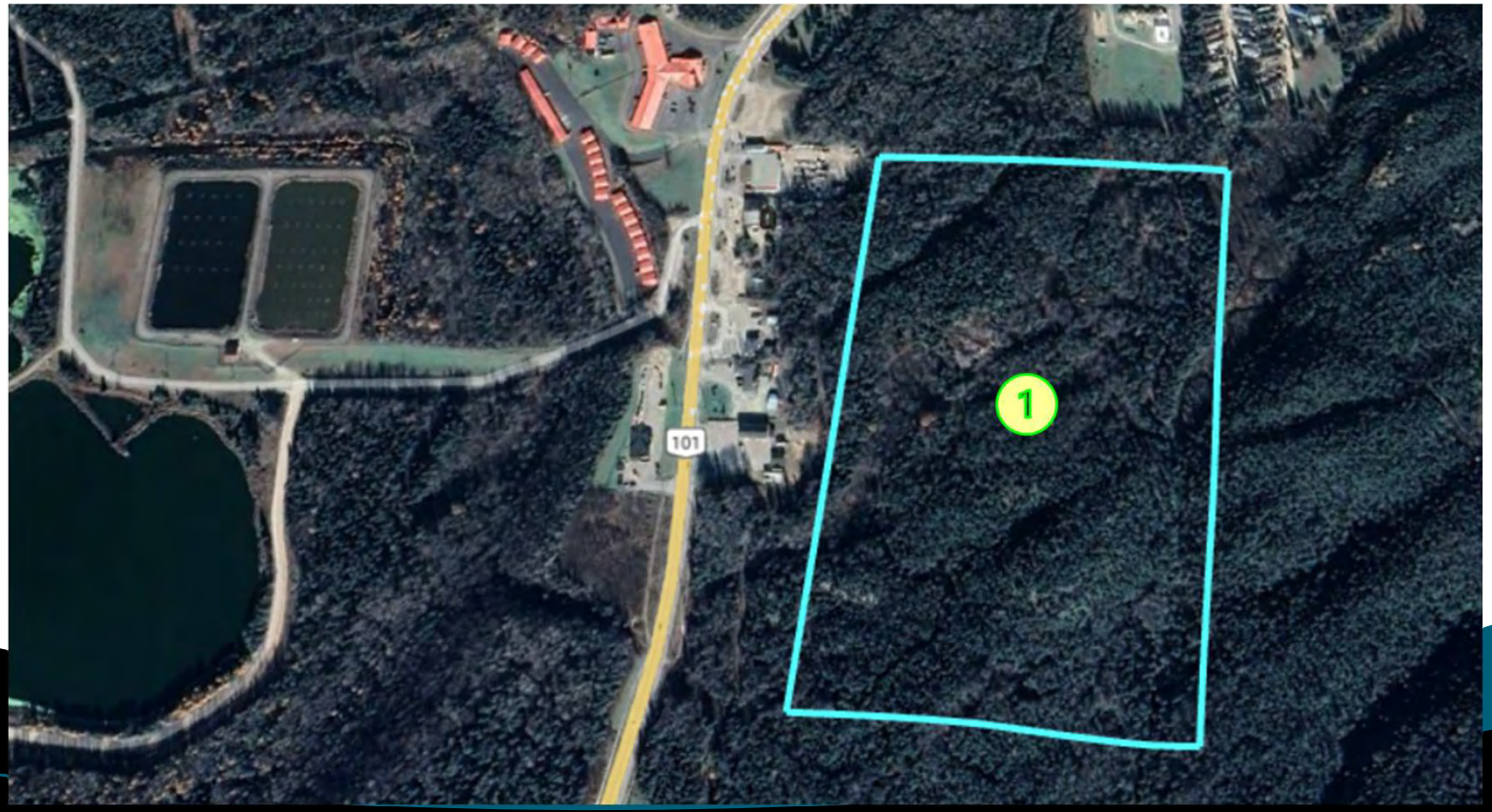
- There is a need for housing in Wawa due to an aging population and the emerging economy
- There will be a need for at least 62 units (without considering the impact of new mines)
- Where possible, demolish vacant properties and make lots available for sale
- There is a high population of 1 and 2 person households in the community
- The over 50 age cohort accounts for 41% of Wawa's population
- Ensure a greater diversity of housing mix by increasing number of 1 to 2-bedroom units for young families, single persons, and older persons
- At least 327 households pay >30% of their income on shelter

Potential Residential Growth Areas

Potential Residential Growth Areas

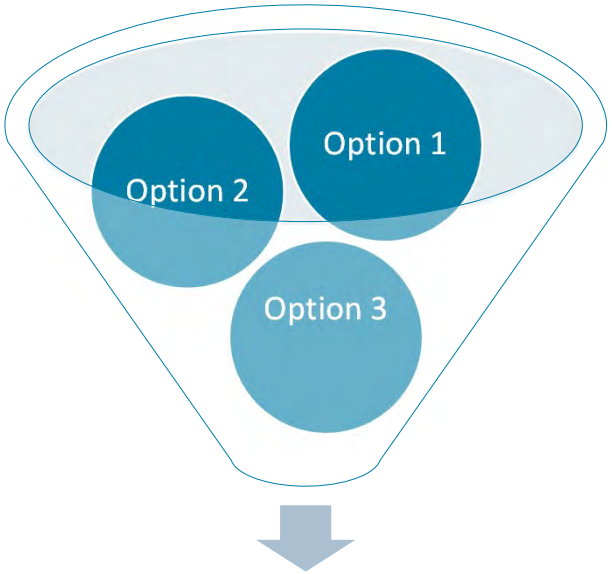


Potential Industrial Growth Areas



Potential Industrial Growth Areas

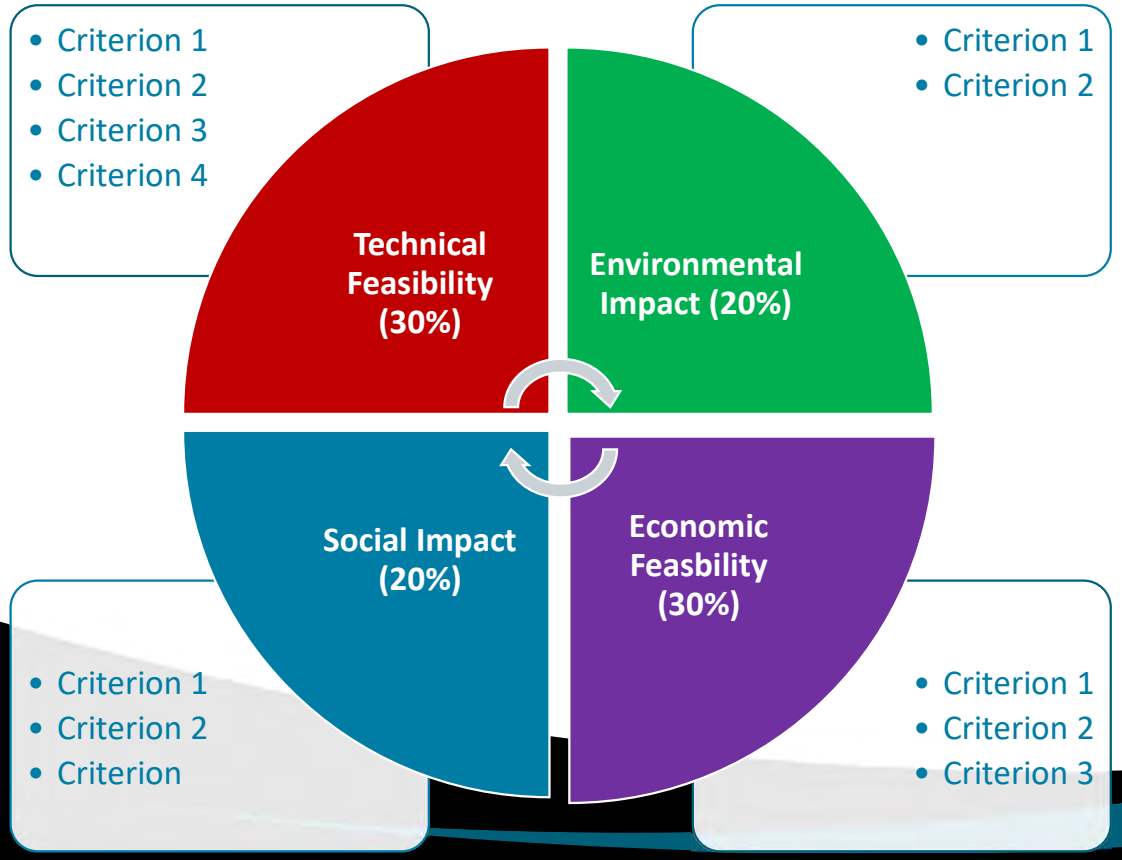
Preliminary Screening of Alternatives



Feasible alternatives for further consideration

- Does it provide a viable solution to the problem?
- Are they technically feasible?
- Are they consistent with planning objectives?
- Are they consistent with provincial priority initiatives?
- Do they avoid potential impacts to sensitive environmental features?
- Are they practical, financially realistic, and economically viable?
- Are they within the ability of the Municipality to implement?

Assessment of Screened Alternatives



- Feasible alternatives will be assessed based on environmental, technical, social and economic criteria
- Each criteria will receive a relative weighting based on importance
- Each alternative solution will be scored for each criterion
- The alternative with the overall highest score will be selected

Technical Criteria

- Results in effluent that consistently meets effluent requirements
- Is reliable and efficient
- Is proven technology
- Is easy to operate and maintain
- Allow for easy connection to the existing system
- Is flexible in terms of its ability to address unforeseen growth
- Meets site-specific requirements (e.g., space requirements and geotechnical)
- Provides flexibility to adapt to climate change
- Is simple in terms of construction
- Implementation timeline
- Site accessibility
- Ease of connection with utilities
- Grading requirements

Environmental Criteria

- Does not result in short-term impacts to water quality and aquatic life
- Does not result in long-term impacts to water quality and aquatic life
- Does not result in short-term impacts to terrestrial wildlife
- Does not result in long-term impacts to terrestrial wildlife
- Complies with environmental regulations
- Does not impact species of special concern
- Does not impact migratory birds

Environmental Criteria

- Does not result in short-term impacts to water quality and aquatic life
- Does not result in long-term impacts to water quality and aquatic life
- Does not result in short-term impacts to terrestrial wildlife
- Does not result in long-term impacts to terrestrial wildlife
- Complies with environmental regulations
- Does not impact species of special concern
- Does not impact migratory birds

Economic Criteria

- Capital and site-specific costs
- Operation and maintenance costs
- Life cycle costs
- Ability for the Town to cover the costs

Social Criteria

- Conformity to local planning provisions
- Impacts on quality of life
- Financial implications for residents
- Short-term impacts to adjacent land uses
- Long-term impacts to adjacent land uses
- Impacts to archaeological resources
- Short-term impacts on local businesses
- Long-term impacts on local businesses
- Impacts on First Nations land rights or traditional land uses

Questions & Comments

Your Input is Welcome

Online Survey

https://forms.office.com/r/ib0N7jrUTz

Project Contact

Rebecca Weatherall, Assistant Director of Infrastructure Services
T: 705-856-2244 Ext. 251

Ian Callum, Environmental Assessment Project Manager
T:519-941-2949

View results

Respondent

1 Anonymous

16:48

Time to complete

Use of Survey Information

The information you provide in this survey will help inform project decisions. Survey responses will be summarized in the environmental assessment report. No personal information, including your name or email address will be included in the report, nor circulated outside the project team.

General Questions

1. What was your main reason for attending this Public Information Centre?

I was unable to attend and was kindly sent the presentation

2. Did this Public Information Centre meet your information needs?

- ○ Yes
- ○ No
- ◉ Somewhat

Project-related questions

3. Do you have any concerns regarding any of the areas being considered for future residential development?

some environmental concerns - but only about possible "unknowns"

4. Do you have any concerns regarding any of the areas being considered for future industrial development?

It is treaty area, have consultations been held with Michipicoten First Nation?

5. Do you have any other comments you would like to share?

wish I had been able to attend

Contact Information

6. Please provide your name and email to receive future project updates. Your contact information will not be shared outside the project team nor linked with the feedback you provided in this survey.

[redacted]

Municipality of Wawa, Water and Wastewater Servicing Master Plan, Notice of Commencement
Stakeholder Letter Notice - Issued September 15, 2022
PIC Letter issued: November 30, 2022
Job No.: M22019

Name	Title	Company	Address	City	Province	Postal Code	Email	Email Sent	Phone	Comments	Read Receipt Received	Request to be Informed	Reminder Email
Municipalities													
First Nations and Métis													
Patricia Tangie	Gimaa Kwe	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	ptangie@michipicoten.com	30-Nov-22					
Chris Buckell	Supervisor Public Works	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	cbuckell@michipicoten.com	30-Nov-22					
Jason Gauthier	Chief	Missanabie Cree First Nation					jgauthier@missanabiecree.com	30-Nov-22					
Dean Sayers	Chief	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	chiefdeansayers@batchewana.ca	30-Nov-22					
Sandra Kenny	Council Secretary	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	councilsecretary@batchewana.ca	30-Nov-22					
Andy Rickard	Chief	Garden River First Nation					arickard@gardenriver.org	30-Nov-22					
		Métis Nation of Ontario Lands, Resources, and Consultations Branch	Suite 1100 -66 Slater Street	Ottawa	ON	K1P 5H1	consultations@metisnation.org	30-Nov-22					
		Red Sky Independent Metis Nation Consultation Office	406 East Victoria Avenue	Thunder Bay	ON	P7C 1A5	consultation@rsmin.ca	30-Nov-22	807-632-8329	Received phone message from Sandra Van Dong			
Agencies/Regulators													
	General EA notification email	Ministry of Environment, Conservation and Parks					eanotification.nregion@ontario.ca	30-Nov-22		All project notices			
	Director, Environmental Assessment Branch	Ministry of Environment, Conservation and Parks	135 St. Clair Avenue West, 1st Floor	Toronto	ON	M4V 1P5				Only Notice of Completion			
Other Stakeholders													

THE CORPORATION OF THE
MUNICIPALITY OF WAWA

November 30, 2022

Re: Municipality of Wawa
Water and Wastewater Master Plan Municipal Class Environmental Assessment
Public Information Centre #1

To Whom It May Concern,

The Municipality of Wawa is starting the development of a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met. Under this project, the Municipality will evaluate alternative means of providing safe, cost-effective, sustainable, and reliable water and wastewater services to support proposed development in the community. Through this process, a Municipal Class Environmental Assessment (MCEA) was initiated.

Public, First Nations and Métis input and comments are an important part of the MCEA process, and our first of two (2) Public Information Centres (PICs) is an opportunity to learn about the WWMP process and to provide feedback. The PIC can be attended in-person or virtually. To attend virtually via Zoom video conferencing, contact our consultant Ian Callum, S. Burnett & Associates Limited at ian.callum@sbaengineering to register no later than 12:00 pm on Friday, December 9, 2022.

Public Information Centre #1
6:30 pm - 8:00 pm (presentation starts at 6:45 pm)
Monday, December 12, 2022
3 Maple Street, IT Centre Board Room, Wawa, Ontario
Zoom Video Conference (must register to receive link)

Yours truly,

Rebecca Weatherall, P.Eng.
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Notice of Public Information Centre #1

Municipality of Wawa Water and Wastewater Master Plan

THE STUDY

The Municipality of Wawa is developing a Water and Wastewater Master Plan (WWMP) to ensure that our current and future water and wastewater infrastructure needs are met. The resulting report will outline the Municipality's plan for providing safe, cost-effective, sustainable, and reliable water and wastewater services to ensure that planned growth and development in the community can be supported.

THE PROCESS

The WWMP update will be conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA), which is an approved process under the *Environmental Assessment Act*.

PUBLIC CONSULTATION

The first of two (2) public information centres (PICs) is an opportunity to learn about the WWMP process and to provide feedback. The PIC can be attended in-person or virtually. To attend virtually via Zoom video conferencing, contact our consultant at ian.callum@sbaengineering to register no later than 12:00 pm on Friday, December 9th, 2022.

6:30 pm -8:00 pm (presentation starts at 6:45 pm)
Monday, December 12th, 2022
In-person at 3 Maple Street, IT Board Room, Wawa
Zoom Video Conference (must register to receive link)

CONTACT INFORMATION

Further information may be obtained from the Municipality of Wawa or the Consultant for this project.

Rebecca Weatherall, P.Eng
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Ian Callum, M.Sc., PMP
S. Burnett & Associates Limited
210 Broadway, Unit 203
Orangeville, ON L9W 5G4
T: 519-941-2949

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. Except for personal information, all comments will become part of the public record.

This Notice was issued November 28, 2022 on the www.wawa-news.com website.

Wawa Water/Wastewater MSP Class EA

Public Information Centre #1

December 2022

What is a Water/ Wastewater Master Servicing Plan?

- A Water/Wastewater Master Servicing Plan is a plan created to determine infrastructure and land use requirements to meet current and future demand

Municipal Class Environmental Process

- The creation of this Master Servicing Plan will follow the Municipal Class Environmental Assessment (EA) Process
- Public consultation is an important part of the Class EA process

Class EA Process

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Problem or Opportunity	Alternative Solutions	Alternative Design Concepts for Preferred Solution	Environmental Study Report (ESR)	Implementation
Identify Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Complete Environmental Study Report (ESR)	Complete Contract Drawings and Tender Documents
Discretionary Public Consultation	Inventory Natural, Social Economic Environment	Detail Inventory of Natural, Social and Economic Environment	ESR Placed on public Record	Proceed to Construction and Operation
	Identify Impact of Alternative Solutions on the Environment, and Mitigating Measures	Identify Impact of Alternative Designs on Environment and Mitigating Measures	Notice of Completion to Review Agencies and Public	
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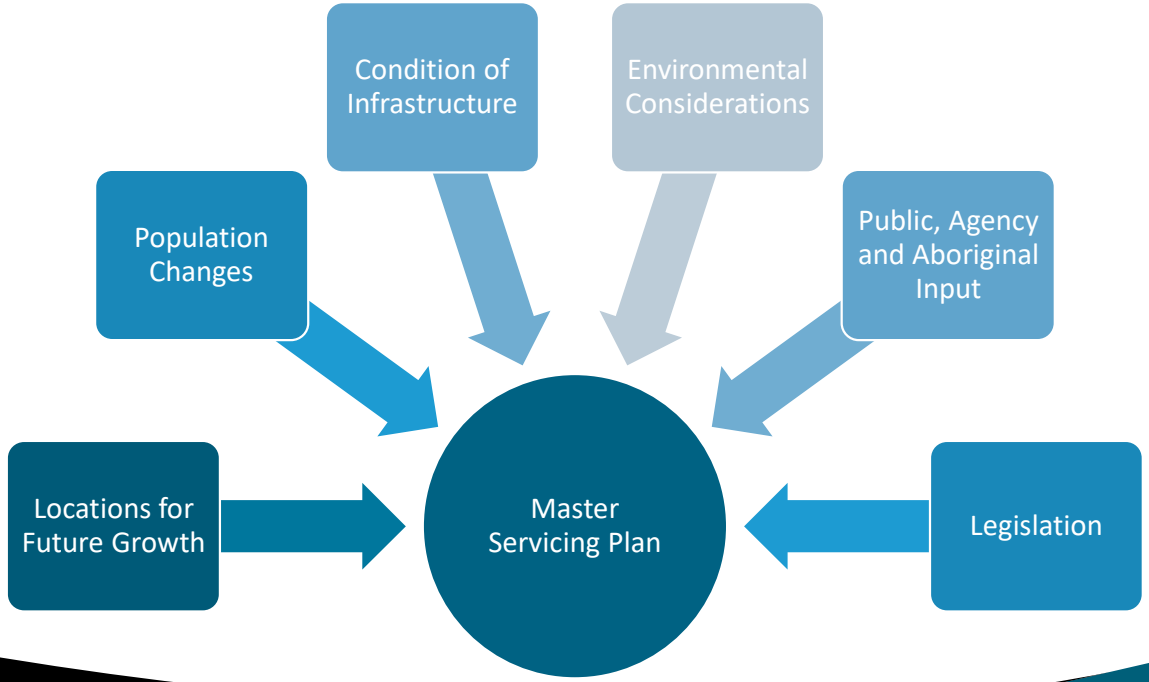
	Consult Review Agencies and Public re: Problem and Opportunity and Alternative Solutions	Consult Review Agencies and Previously Interested and Directly Affected Public	Opportunity to Request Minister Within 30 Days of Notification to Request an Order *	
	Select Preferred Solution	Select Preferred Design		
		Preliminary Finalization of Preferred Design		

We are here

What needs to be considered?



Steps in Our Assessment

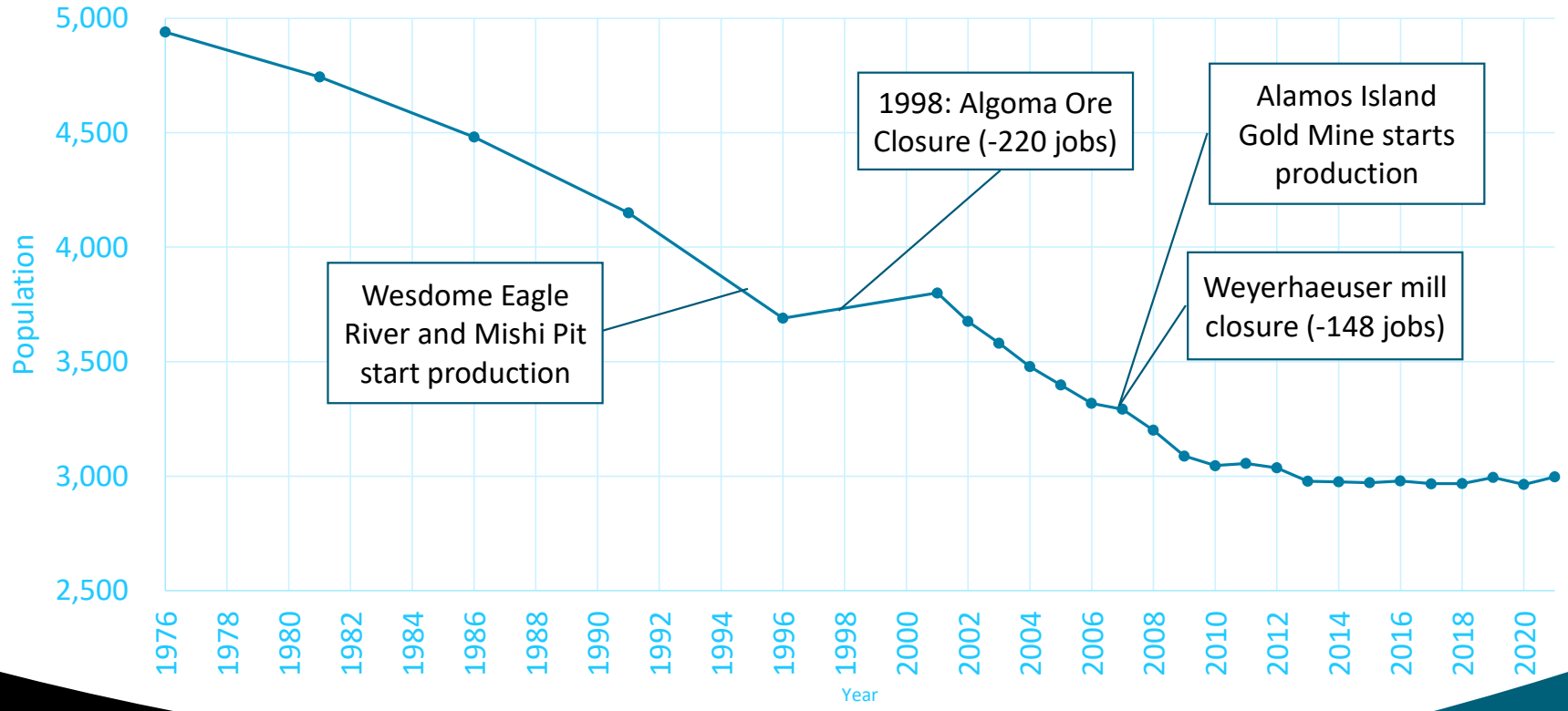
1. Assess current water and wastewater infrastructure
2. Project future infrastructure needs, including new housing
3. Identify alternative solutions to address current and future needs
4. Evaluate alternative solutions to select preferred solutions

CONSULTATION

Prioritizing Required Infrastructure Upgrades

Immediate / High	Medium	Low
Prioritizing: - Health & Safety - Emergency Response - Critical equipment redundancy	Improvements to: - System functionality - Operational Efficiency - Reduce operating costs	Recommendations for: - Operational best practices to improve equipment longevity - Annual maintenance considerations - Removal of unnecessary systems
Timeframe: 0 – 2 years	**Timeframe:** 2 – 5 years	**Timeframe:** 5+ years

Historic Population of Wawa



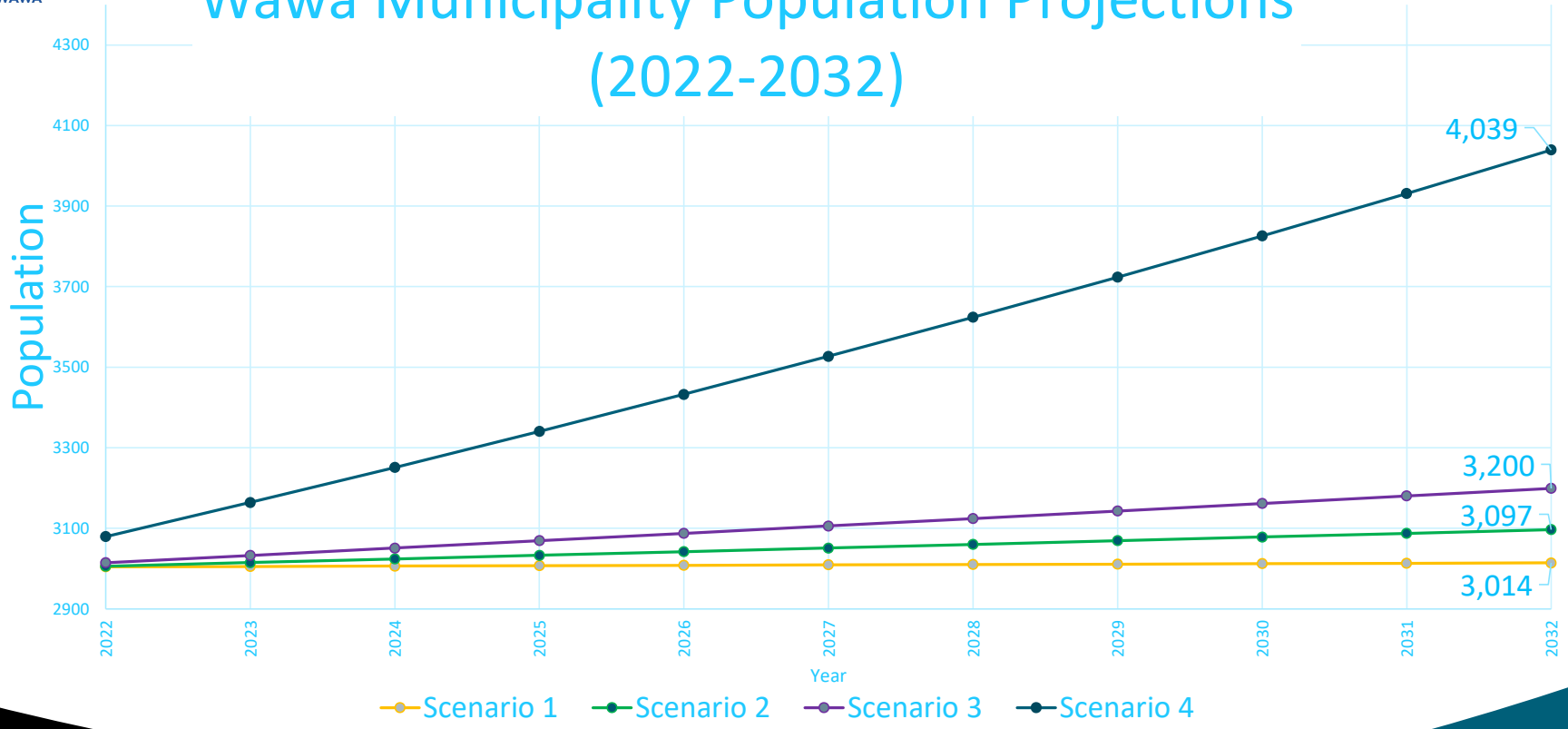
Future Considerations

- Wesdome is actively exploring the Eagle River Mine property, and recently increased production from 650 tonnes per day to 850 tonnes per day
- Alamos expected to double workforce to 1,200 over construction of their expansion, concluding in 2026.
- Angus Gold and Red Pine Exploration currently investigating opportunities in the region
- Wesdome Mishi Pit was mined out in 2021
- Argonaut Gold in construction with production beginning in 2023
- Wawa OSB Inc. project to create a reported 140 jobs
- 2017 Housing Report indicated a need for at least 62 new unit (not including opening of new mines and the Wawa OSB Inc. mill)

Projection Scenarios

1. **0.24% increase:** Based on Statistics Canada for 2021 and Ontario Ministry of Finance projections (Summer 2022) for Northern Region (2021-2046)
2. **0.30% increase:** Half the growth rate of Scenario 3.
3. **0.60% increase:** Growth rate seen from 1996 to 2001 after opening of Wesdome Eagle River and Mishi Pit
4. **2.75% increase:** increase at the same average annual decline rate seen from 2001 to 2010.

Wawa Municipality Population Projections (2022-2032)



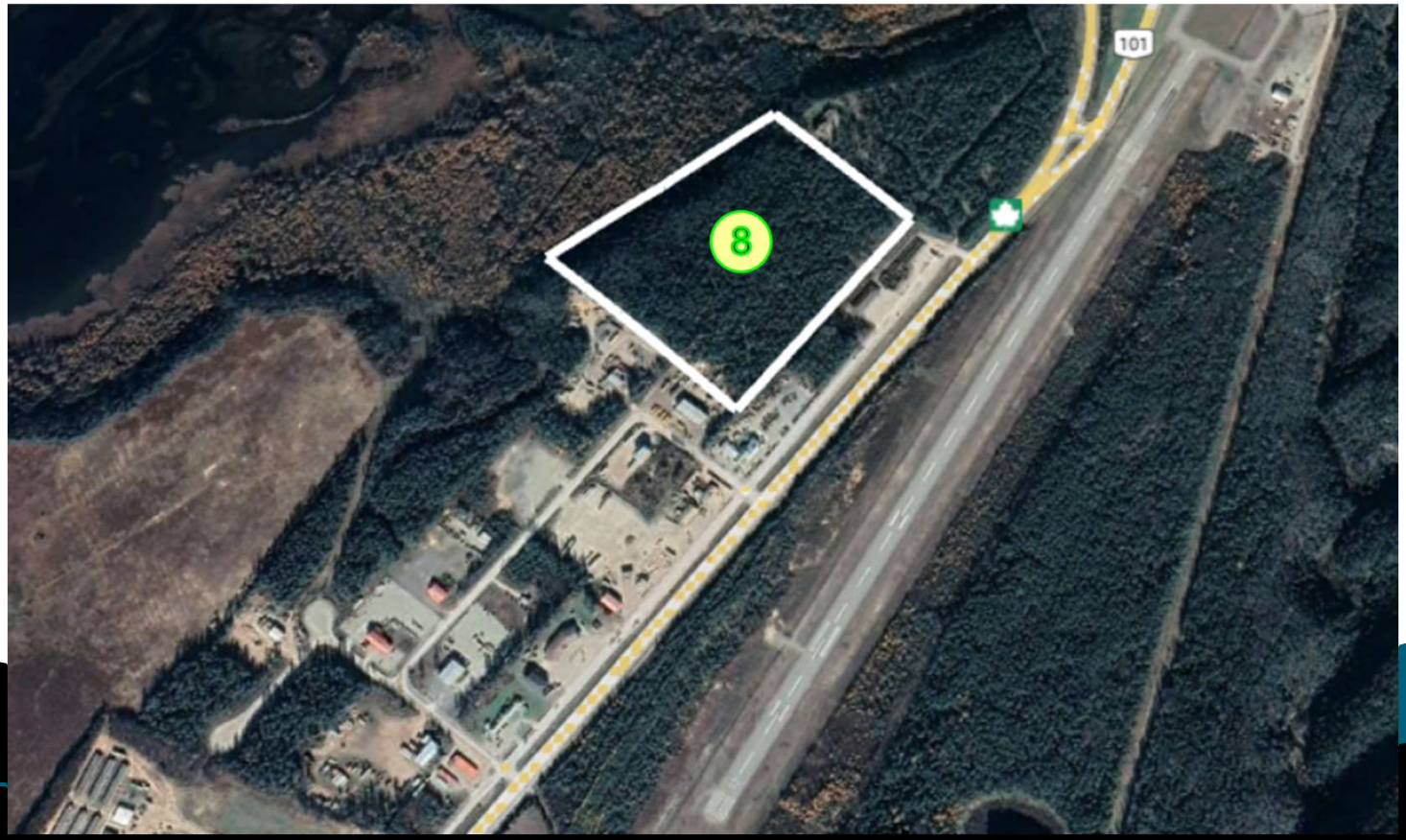
2017 Housing Report

Recommendations of report included:

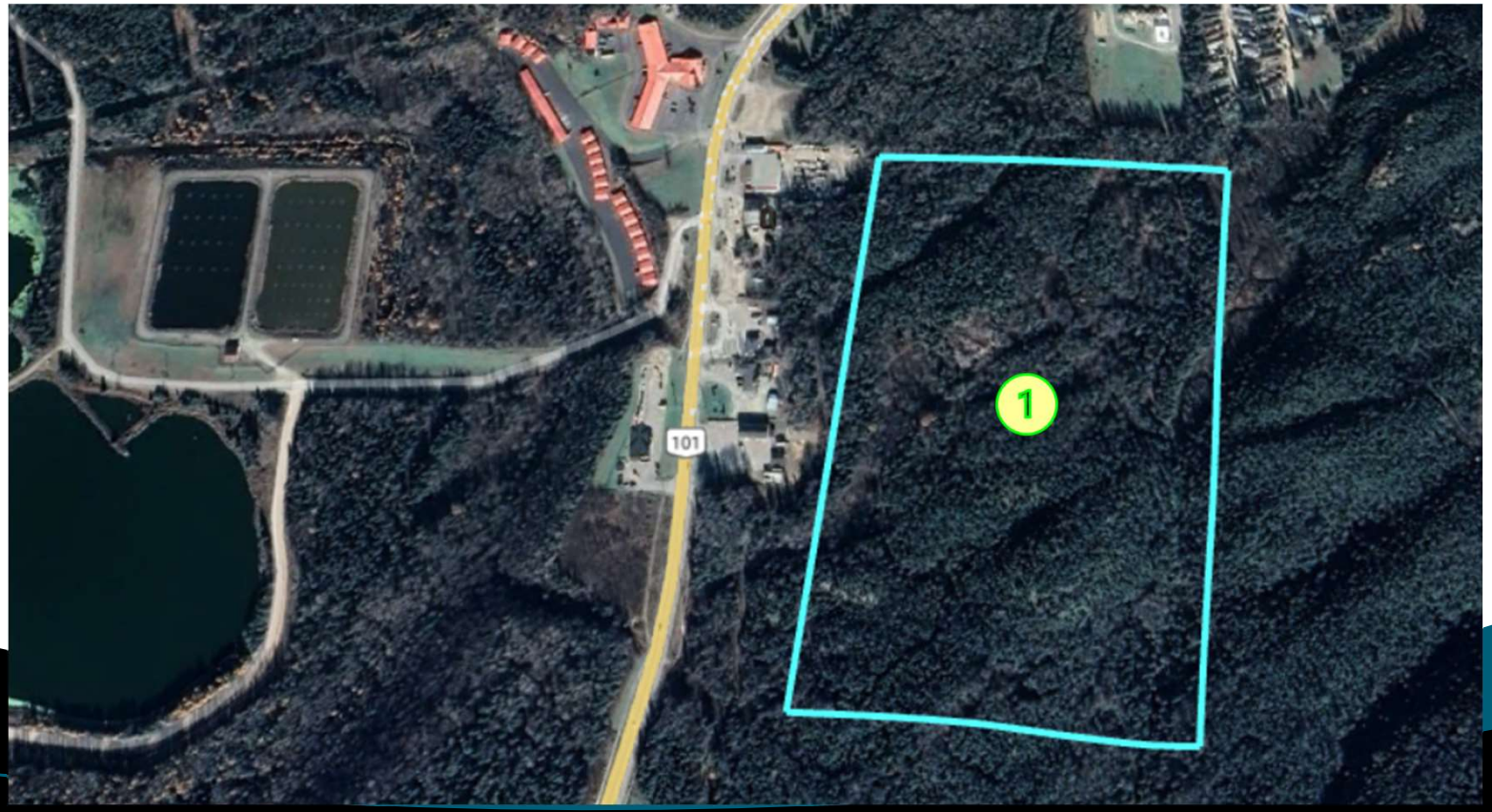
- There is a need for housing in Wawa due to an aging population and the emerging economy
- There will be a need for at least 62 units (without considering the impact of new mines)
- Where possible, demolish vacant properties and make lots available for sale
- There is a high population of 1 and 2 person households in the community
- The over 50 age cohort accounts for 41% of Wawa's population
- Ensure a greater diversity of housing mix by increasing number of 1 to 2-bedroom units for young families, single persons, and older persons
- At least 327 households pay >30% of their income on shelter

Potential Residential Growth Areas

Potential Residential Growth Areas

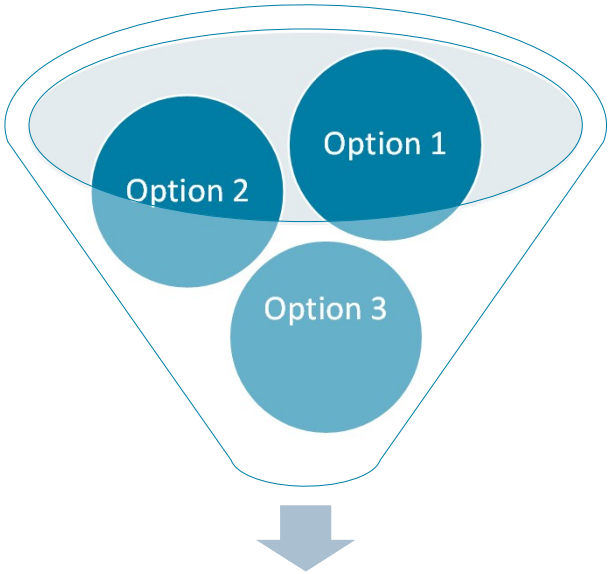


Potential Industrial Growth Areas



Potential Industrial Growth Areas

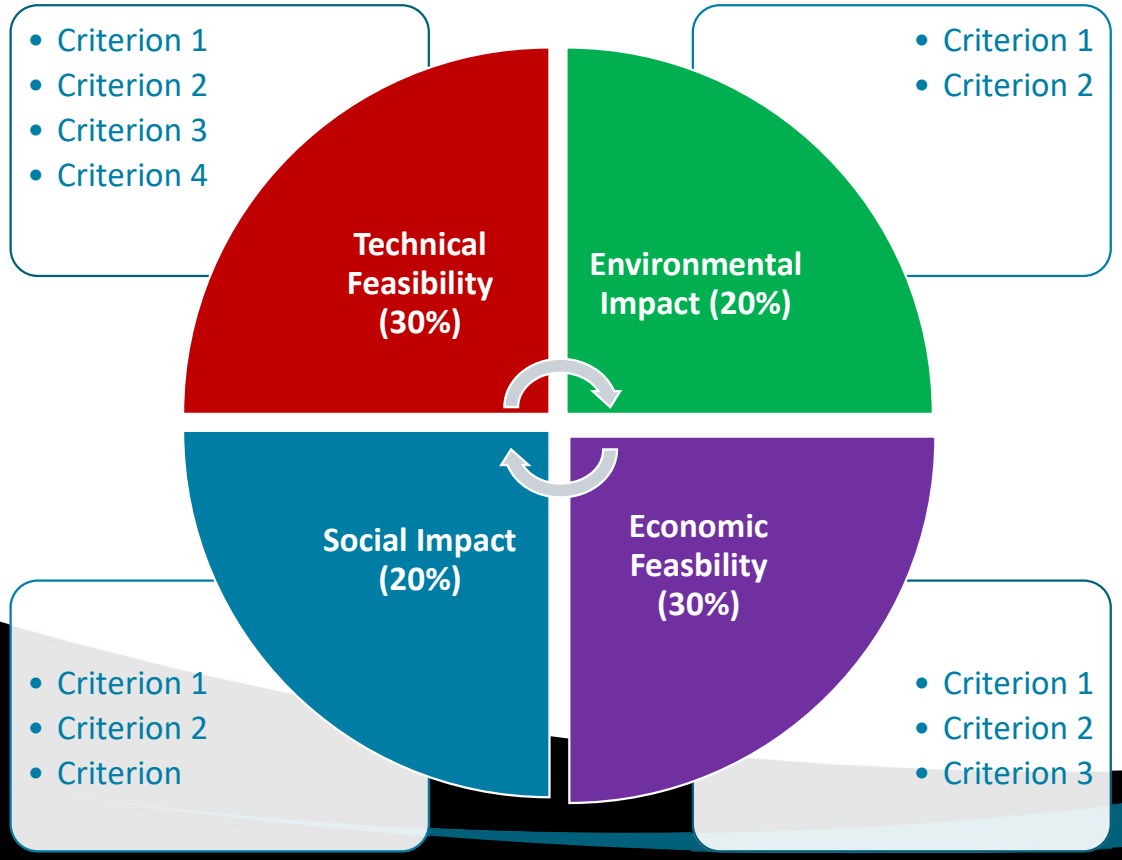
Preliminary Screening of Alternatives



Feasible alternatives for further consideration

- Does it provide a viable solution to the problem?
- Are they technically feasible?
- Are they consistent with planning objectives?
- Are they consistent with provincial priority initiatives?
- Do they avoid potential impacts to sensitive environmental features?
- Are they practical, financially realistic, and economically viable?
- Are they within the ability of the Municipality to implement?

Assessment of Screened Alternatives



- Feasible alternatives will be assessed based on environmental, technical, social and economic criteria
- Each criteria will receive a relative weighting based on importance
- Each alternative solution will be scored for each criterion
- The alternative with the overall highest score will be selected

Technical Criteria

- Results in effluent that consistently meets effluent requirements
- Is reliable and efficient
- Is proven technology
- Is easy to operate and maintain
- Allow for easy connection to the existing system
- Is flexible in terms of its ability to address unforeseen growth
- Meets site-specific requirements (e.g., space requirements and geotechnical)
- Provides flexibility to adapt to climate change
- Is simple in terms of construction
- Implementation timeline
- Site accessibility
- Ease of connection with utilities
- Grading requirements

Environmental Criteria

- Does not result in short-term impacts to water quality and aquatic life
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Economic Criteria

- Capital and site-specific costs
- Operation and maintenance costs
- Life cycle costs
- Ability for the Town to cover the costs

Social Criteria

- Conformity to local planning provisions
- Impacts on quality of life
- Financial implications for residents
- Short-term impacts to adjacent land uses
- Long-term impacts to adjacent land uses
- Impacts to archaeological resources
- Short-term impacts on local businesses
- Long-term impacts on local businesses
- Impacts on First Nations land rights or traditional land uses

Questions & Comments

Your Input is Welcome

Online Survey

https://forms.office.com/r/ib0N7jrUTz

Project Contact

Rebecca Weatherall, Assistant Director of Infrastructure Services
T: 705-856-2244 Ext. 251

Ian Callum, Environmental Assessment Project Manager
T:519-941-2949

Municipality of Wawa, Water and Wastewater Servicing Master Plan, Notice of Commencement Job No.: M22019

PIC#2 letter issued: Feburary 8, 2023

Job No.: M22019

Name	Title	Company	Address	City	Province	Postal Code	Email	Email Sent	Phone	Comments	Read Receipt Received	Request to be Informed	Reminder Email
Municipalities													
Cathy Cannon	Councillor	Municipality of Wawa					ccannon@wawa.cc						
Joe Opato	Councillor	Municipality of Wawa					jopato@wawa.cc						
Jim Hoffman	Councillor	Municipality of Wawa					jhoffmann@wawa.cc						
Mitch Hatfield	Councillor	Municipality of Wawa					mhatfield@wawa.cc						
Melanie Pilon	Mayor	Municipality of Wawa					mpilon@wawa.cc						
First Nations and Métis													
Patricia Tangie	Gimaa Kwe	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	ptangie@michipicoten.com						
Chris Buckell	Supervisor Public Works	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	cbuckell@michipicoten.com						
Jason Gauthier	Chief	Missanabie Cree First Nation					jgauthier@missanabiecree.com						
Dean Sayers	Chief	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	chiefdeansayers@batchewana.ca						
Sandra Kenny	Council Secretary	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	councilsecretary@batchewana.ca						
Andy Rickard	Chief	Garden River First Nation					arickard@gardenriver.org						
		Métis Nation of Ontario Lands, Resources, and Consultations Branch	Suite 1100 -66 Slater Street	Ottawa	ON	K1P 5H1	consultations@metisnation.org						
		Red Sky Independent Metis Nation Consultation Office	406 East Victoria Avenue	Thunder Bay	ON	P7C 1A5	consultation@rsmin.ca		807-632-8329	Received phone message from Sandra Van Dong			
Agencies/Regulators													
	General EA notification email	Ministry of Environment, Conservation and Parks					eanotification.nregion@ontario.ca			All project notices			
	Director, Environmental Assessment Branch	Ministry of Environment, Conservation and Parks	135 St. Clair Avenue West, 1st Floor	Toronto	ON	M4V 1P5				Only Notice of Completion			
Other Stakeholders													
Rene Dumont							renedumont@rocketmail.com						
Matthew Romer		Algoma District School Board					romerm@adsb.on.ca		705-856-4464 ext. 67188				

THE CORPORATION OF THE
MUNICIPALITY OF WAWA

February 8, 2022

Re: Municipality of Wawa
Water and Wastewater Master Plan Municipal Class Environmental Assessment
Public Information Centre #2

To Whom It May Concern,

Since August 2022, the Municipality of Wawa has been developing a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met. Under this project, the Municipality will evaluate alternative means of providing safe, cost-effective, sustainable, and reliable water and wastewater services to support proposed development in the community. Through this process, a Municipal Class Environmental Assessment (MCEA) was initiated.

Public, First Nations and Métis input and comments are an important part of the MCEA process, and in our second of two (2) Public Information Centres (PICs, the recommendations of our plan, including future residential and industrial grown areas, will be presented to obtain feedback and to confirm that they should be advanced as the preferred alternative solutions. The PIC can be attended in-person or virtually. To attend virtually via Zoom video conferencing, contact our consultant Ian Callum, S. Burnett & Associates Limited at ian.callum@sbaengineering to register no later than 12:00 pm on Monday, February 27th, 2023.

Public Information Centre #2
6:30 pm - 8:30 pm (presentation starts at 6:45 pm)
Wednesday, March 1st, 2023
In-person at the Michipicoten Memorial Community Centre, Lounge
3 Chris Simon Dr, Wawa, ON
Zoom Video Conference (must register to receive link)

Yours truly,

Rebecca Weatherall, P.Eng.
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Notice of Public Information Centre #2

Municipality of Wawa Water and Wastewater Master Plan

THE STUDY

The Municipality of Wawa is developing a Water and Wastewater Master Plan (WWMP) to ensure that our current and future water and wastewater infrastructure needs are met. The resulting report will outline the Municipality's plan for providing safe, cost-effective, sustainable, and reliable water and wastewater services to ensure that planned growth and development in the community can be supported.

THE PROCESS

The WWMP update will be conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA), which is an approved process under the *Environmental Assessment Act*.

PUBLIC CONSULTATION

This final public information centre (PIC) is an opportunity to learn about results and recommendations from work completed to date on the WWMP, and to provide feedback. The PIC can be attended in-person or virtually. To attend virtually via Zoom video conferencing, contact our consultant at ian.callum@sbaengineering to register no later than 12:00 pm on Monday, February 27th, 2023.

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CONTACT INFORMATION

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Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
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Ian Callum, M.Sc., PMP
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This Notice was issued February 8, 2023 on the www.wawa-news.com website.

Wawa Water/Wastewater MSP Class EA

Public Information Centre #2

March 2023

What is a Water/ Wastewater Master Servicing Plan?

- A Water/Wastewater Master Servicing Plan is a plan created to determine infrastructure and land use requirements to meet current and future demand

Municipal Class Environmental Process

- The creation of this Master Servicing Plan follows the Municipal Class Environmental Assessment (EA) Process
- Public consultation is an important part of the Class EA process

Class EA Process

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Problem or Opportunity	Alternative Solutions	Alternative Design Concepts for Preferred Solution	Environmental Study Report (ESR)	Implementation
Identify Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Complete Environmental Study Report (ESR)	Complete Contract Drawings and Tender Documents
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	Select Preferred Solution	Select Preferred Design		
		Preliminary Finalization of Preferred Design		

We are here

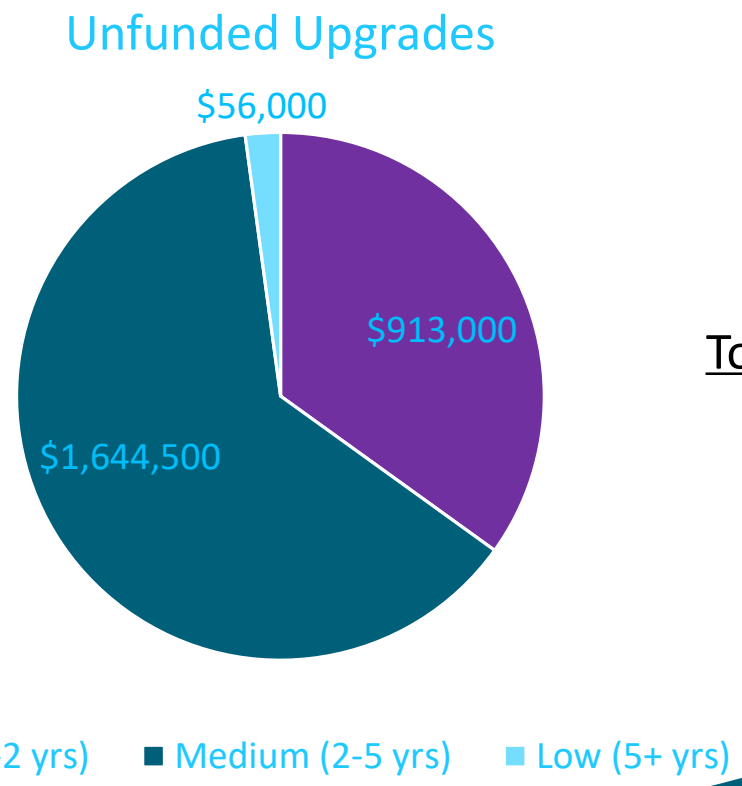
Steps in Our Assessment

1. Assess current water and wastewater infrastructure
2. Project future infrastructure needs, including new housing
3. Identify alternative solutions to address current and future needs
4. Evaluate alternative solutions to select preferred solutions

CONSULTATION

Assess Infrastructure

- 48 infrastructure upgrades recommended over the next 10 years
- Some are already funded, and some have since been resolved

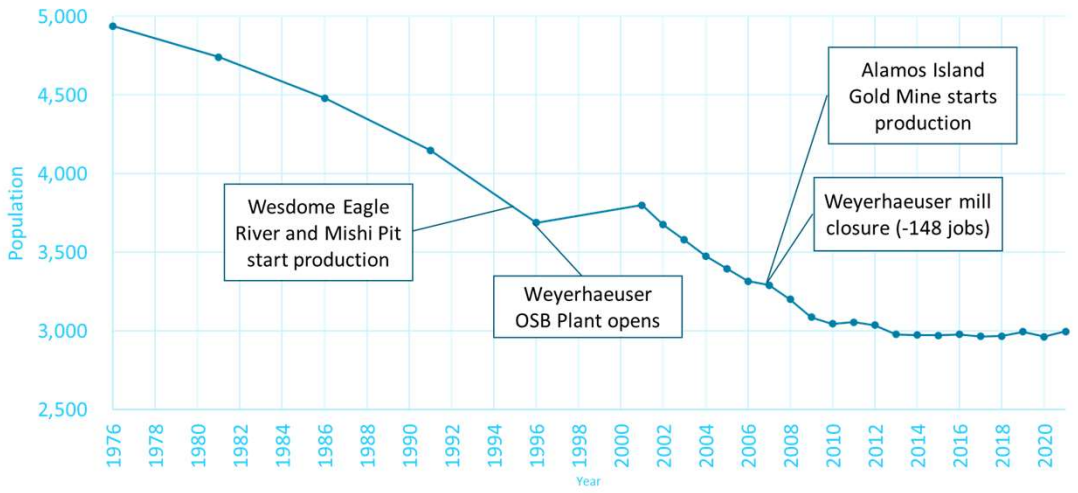


Total: $2.6 million

Key Infrastructure Upgrades

1. Looping of watermains (Government Rd., Regina Cr., Maple St., Birch St., Superior and along Algoma St.)
2. Addressing inadequate slope in wastewater system resulting in high maintenance/flushing (George, Second, Third and Joliet Streets)
3. Potential upsizing of sewer to the lagoon on Golf Course Rd., pending additional investigation (cost not included at this time)

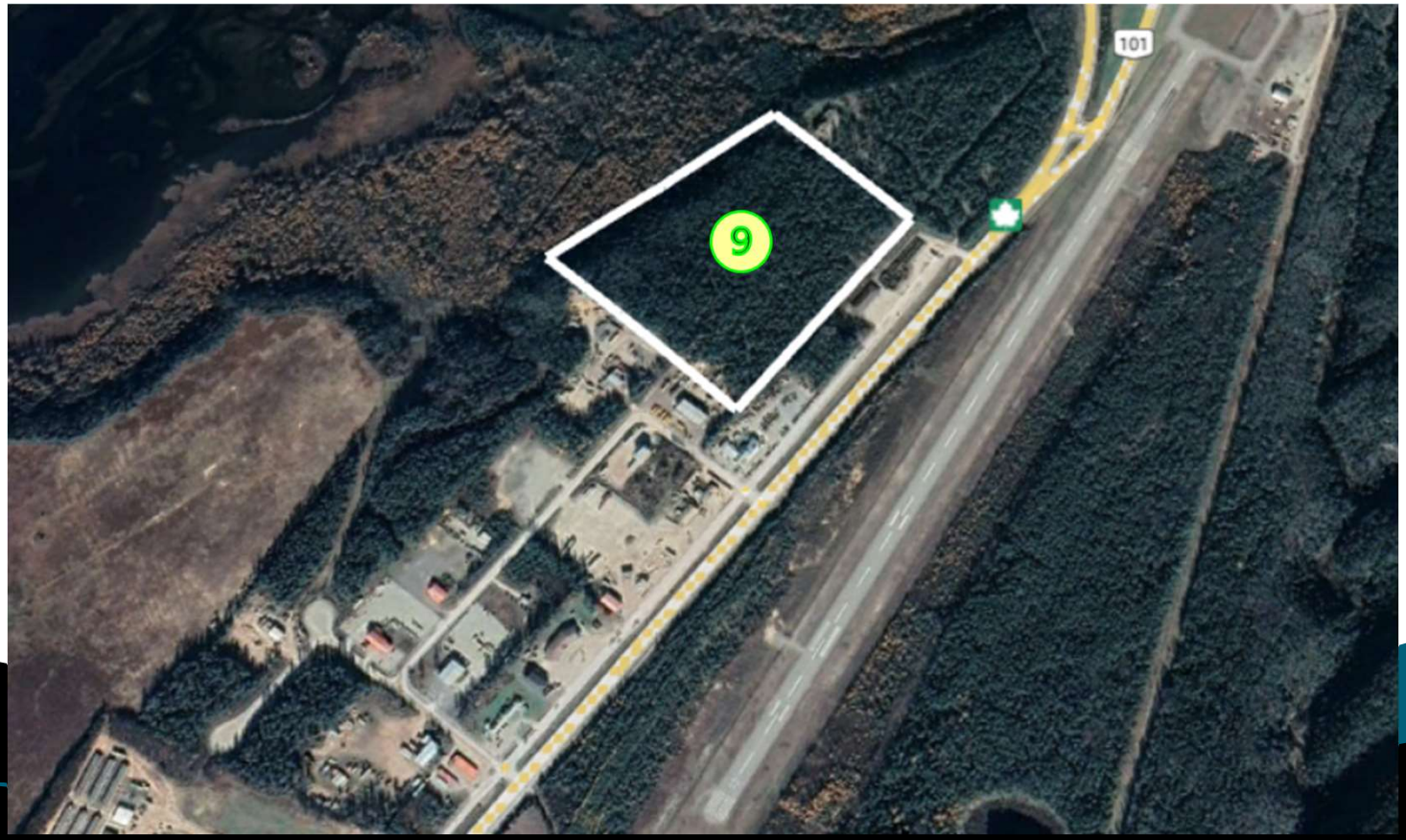
Project Future Needs



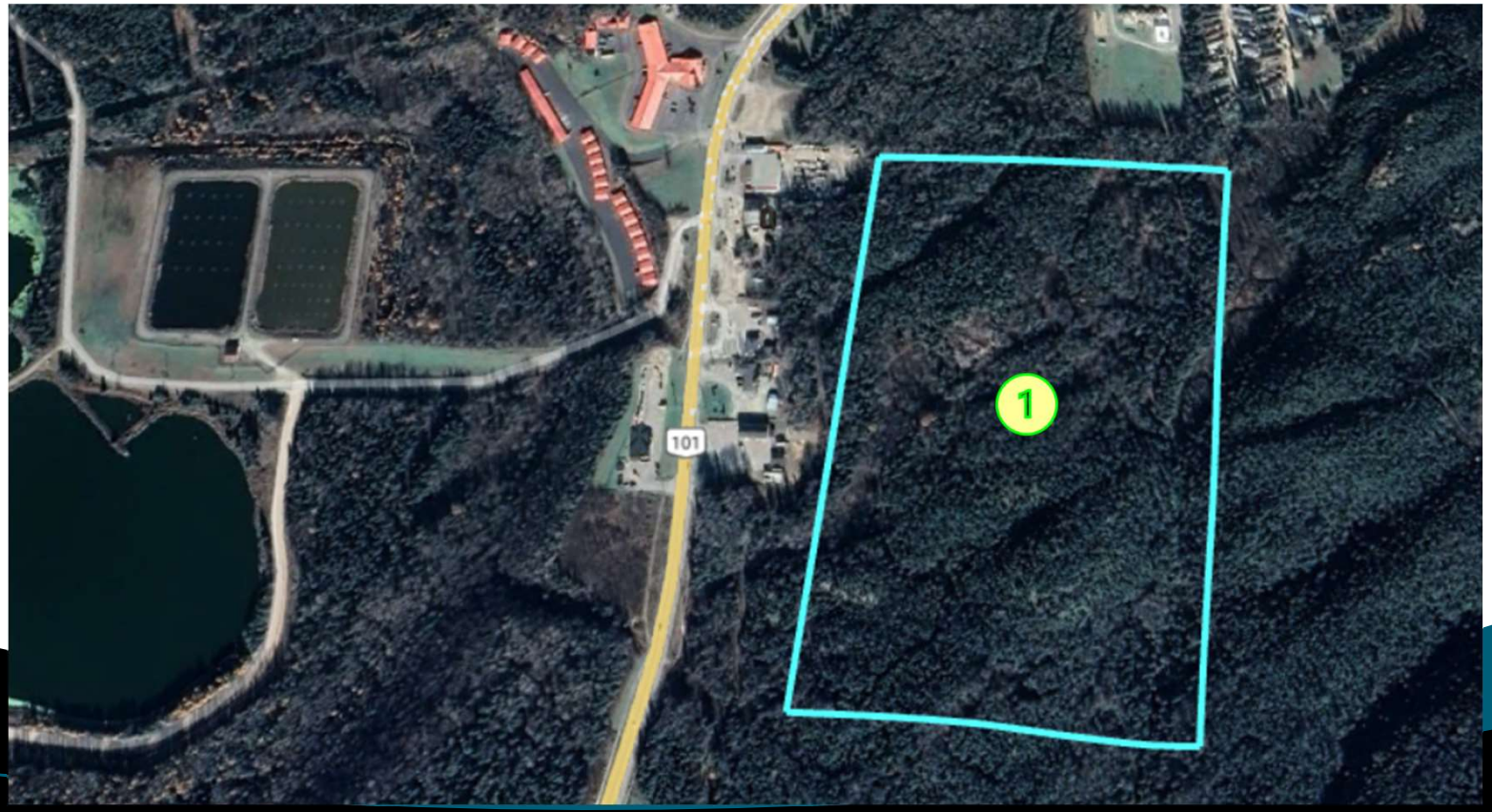
- Projected population growth from 3,015 (incl. MRV) to 3,200 from 2022 to 2032 Need for additional residential and industrial growth area

Potential Residential Growth Areas

Potential Residential Growth Areas

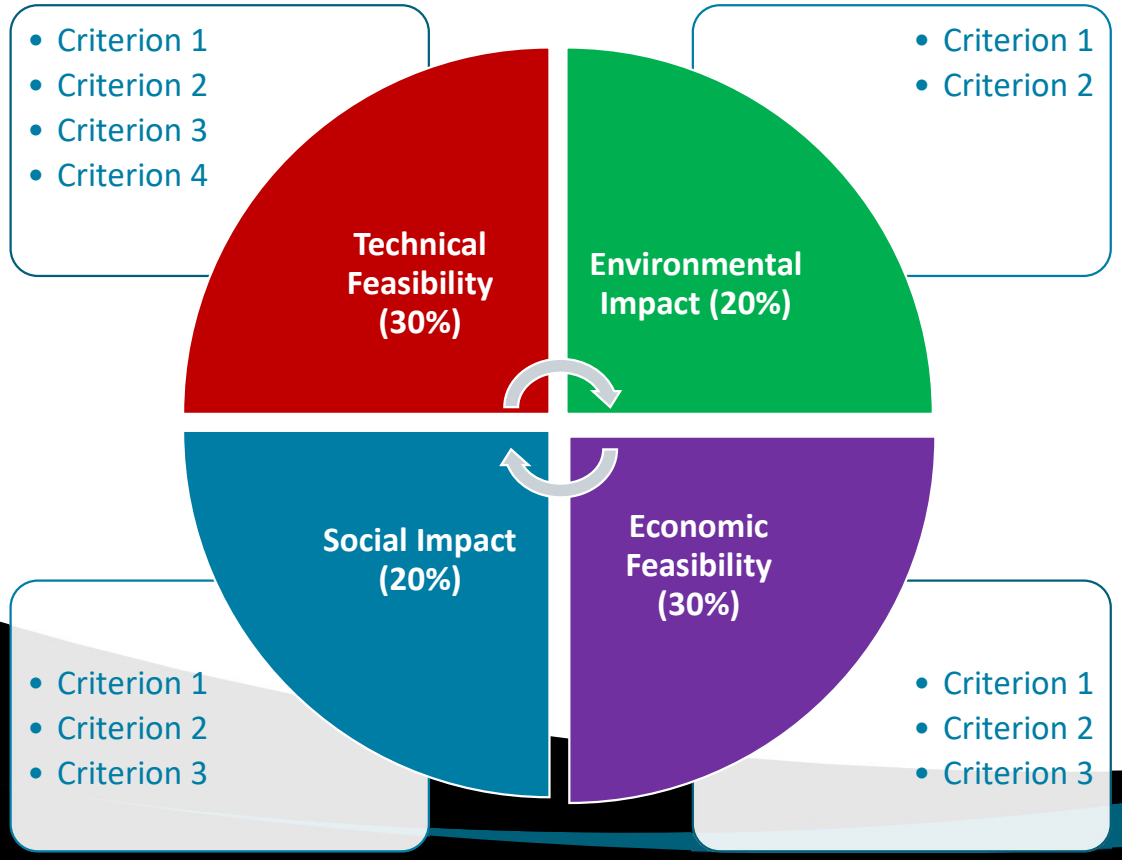


Potential Industrial Growth Areas



Potential Industrial Growth Areas

Assessment of Screened Alternatives



- Feasible alternatives will be assessed based on environmental, technical, social and economic criteria
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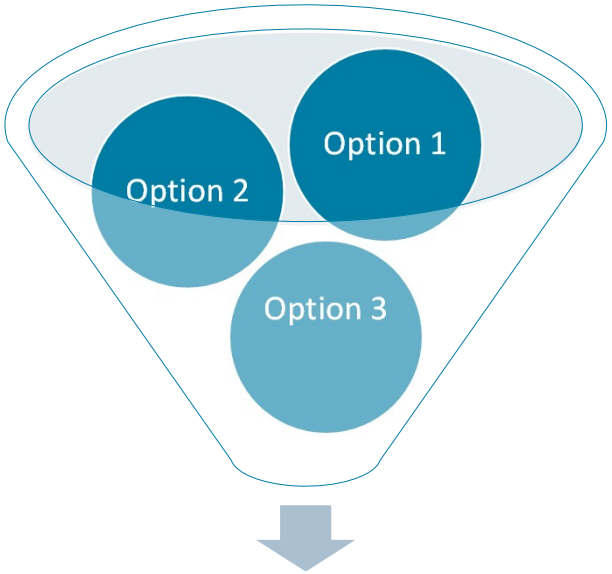
Preliminary Screening of Alternatives



Feasible alternatives for further consideration

- Does it provide a viable solution to the problem?
- Are they technically feasible?
- Are they consistent with planning objectives?
- Are they consistent with provincial priority initiatives?
- Do they avoid potential impacts to sensitive environmental features?
- Are they practical, financially realistic, and economically viable?
- Are they within the ability of the Municipality to implement?

Preliminary Screening of Alternatives

- The do-nothing alternative is not consistent with planning objectives.
- Growth Area 8 is not practical, financially realistic, and economically viable due to the remediation efforts and associated costs (former landfill).
- Additionally, the Municipality does not own this land,
- The road that divides this area is used by heavy equipment (noise).

Technical Criteria

- Results in effluent that consistently meets effluent requirements
- Is reliable and efficient
- Is proven technology
- Is easy to operate and maintain
- Allow for easy connection to the existing system
- Is flexible in terms of its ability to address unforeseen growth
- Meets site-specific requirements (e.g., space requirements and geotechnical)
- Provides flexibility to adapt to climate change
- Is simple in terms of construction
- Implementation timeline
- Site accessibility
- Ease of connection with utilities
- Grading requirements

Environmental Criteria

- Does not result in short-term impacts to water quality and aquatic life
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- Does not impact migratory birds

Economic Criteria

- Capital and site-specific costs
- Operation and maintenance costs
- Life cycle costs
- Ability for the Town to cover the costs

Social Criteria

- Conformity to local planning provisions
- Impacts on quality of life
- Financial implications for residents
- Short-term impacts to adjacent land uses
- Long-term impacts to adjacent land uses
- Impacts to archaeological resources
- Short-term impacts on local businesses
- Long-term impacts on local businesses
- Impacts on First Nations land rights or traditional land uses

Preferred Residential Areas

Ranking

1. Area 7: already disturbed, minor servicing, lowest cost, best environmental and social
2. Area 4-6: extend wastewater at same time as planned looping of watermain
3. Area 1: no sewer or watermain extensions required
4. Area 2: requires watermain extension
5. Area 3: up to 80 lots, more environmental impact, phasing possible
6. Area 9: highest cost, more environmental impact

To accommodate projected growth (200)

Scenario 1:

Area 7 – 20

Private Developer - 34

Areas 4-6 – 28

Area 1 – 6

Area 2 – 22

Area 3 - 90

Scenario 2:

Area 7 – 20

Area 1 – 6

Area 2 – 22

Area 3 - 152

Preferred Industrial Area

Criteria	Area 1 (Near Airport)	Area 2 (Government Road)
Technical	Preferred	Requires sewage pumping station and could impact downstream wastewater pipe capacities Would require upsizing of the watermain
Environmental	Extensive tree clearing	Preferred (disturbed area)
Cost	Preferred: lower cost	Higher cost
Social	Loss of recreational trails and upwind of downtown	Increased industrial traffic in residential areas along Government Road

Future Infrastructure Upgrades

	Residential Only	Residential + Industrial
Water Supply	Limited to previously identified items	Limited to previously identified items
Water Treatment	Limited to previously identified items	Minor upgrades
Water Storage/Fire Flow	Limited to previously identified items	Some expansion to water storage required (Schedule B EA)
Water Distribution	Limited to previously identified items	Upgrades to booster station
Wastewater Treatment	Limited to previously identified items	Limited to previously identified items
Wastewater Collection	Potential sewer pipe upgrades (pending further investigation)	Potential sewer pipe upgrades (pending further investigation)

Next Steps

- Incorporate feedback from this meeting into the Master Servicing Plan Report
- Submit a draft report to the Ministry of Environment and Climate Change (MECP) for review
- Incorporate MECP feedback and finalize the Master Servicing Plan
- Issue the Notice of Completion and make the report available for a 30-day public and agency review period.
- Complete Schedule B EA for additional water storage, proceed to design, develop site-specific mitigation measures, acquire permits

Questions & Comments

Your Input is Welcome

Project Contact

Rebecca Weatherall, Assistant Director of Infrastructure Services
T: 705-856-2244 Ext. 251
rweatherall@wawa.cc

Ian Callum, Environmental Assessment Project Manager
T:519-941-2949
Ian.callum@sbaengineering.com

Survey

https://forms.office.com/r/qA93RtU6pm

Wawa Water/Wastewater Municipal Servicing Plan
Environmental Assessment – Public Information Centre #2

Please take a moment to fill out this questionnaire. Comments will become part of the public record, except for personal information.

1. **What was your main reason for attending this Public Information Centre?**

2. **Did this Public Information Centre meet your information needs?**

☐ Yes ☐ No ☐ Somewhat

Please explain:

3. **Do you have any concerns regarding any of the areas being considered for future residential development?**

☐ Yes ☐ No

Please explain:

4. **Do you have any concerns regarding any of the areas being considered for future industrial development?**

☐ Yes ☐ No

Please explain:

5. **Please provide any other feedback.**

6. **Please provide your name and email to receive future project updates. Your contact information will not be shared outside the project team nor linked with the feedback you provided in this survey.**

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

TECHNICAL MEMORANDUM

Date:	January 16, 2023	**Project No:**	M22019
Project Name:	Wawa Water/Wasterwater Master Servicing Plan Environmental Assessment		
Re:	Species at Risk		
To:	Species at Risk Ontario		
Email:	SAROntario@ontario.ca		
Company:	Ministry of Natural Resources and Forestry		
From:	Ian Callum, Senior Environmental Project Manager		

1. Introduction

The Municipality of Wawa is currently undertaking a Municipal Class Environmental Assessment to plan water and wastewater infrastructure for the next 10 years. Part of this assessment includes identifying potential growth areas to accommodate projected residential and industrial growth and these potential areas are shown in Figures 1 to 4 at the end of this memo. The preferred growth area alternative locations will require vegetation removal, grading, servicing, and building construction, with the larger sites requiring interior roads.

Residential alternative areas 1-6 and 8-9 are wooded, although sites 4-6 are small areas that are surrounded by roads or residential lots. Alternative area 7 is similarly surrounded by roads and businesses and has also been cleared and is characterized as disturbed.

Industrial Area 1 is wooded, while Industrial Area 2 is almost entirely disturbed.

2. Species at Risk Records Review

As part of the evaluation of these alternative growth areas, a desktop species at risk study was completed. Many of these sources display data for a broad area (e.g., per 1 km or 10 km atlas square) and therefore only provide a general potential for species presence within our Study Area. The sources that were reviewed include:

- Natural Heritage Information Centre (NHIC)
- Ontario Breeding Bird Atlas Bird Atlas (Birds Canada, 2005)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)
- eBird

- iNaturalist

Our review of the above sources identified the following species at risk that are listed as Threatened or Endangered:

- Bank Swallow (COSEWIC: THR; SARO: THR)
- Barn Swallow (COSEWIC: THR; SARO: THR)
- Bobolink (COSEWIC: THR; SARO: THR)
- Canada Warbler (COSEWIC: THR; SARO: SC)
- Chimney Swift (COSEWIC: THR; SARO: THR)
- Common Nighthawk (COSEWIC: THR; SARO: SC)
- Eastern Meadowlark (COSEWIC: THR; SARO: THR)
- Eastern Whip-Poor-Will (COSEWIC: THR; SARO: THR)
- Olive-Sided Flycatcher (COSEWIC: THR; SARO: SC)
- Short-Eared Owl (COSEWIC: THR; SARO: SC)
- Wood Thrush (COSEWIC: THR; SARO: SC)

3. General Mitigation Measures

Due to the potential presence of species at risk and the known presence of migratory birds in the area, all vegetation clearing will be conducted outside the nesting period for the C5 Nesting Zone, meaning that no vegetation clearing would occur between late April and Late August. After the Environmental Assessment has identified preferred locations for residential and industrial growth areas, and prior to any site preparation, a qualified biologist will conduct a site investigation of the preferred areas to confirm the presence of any species at risk. The results of the investigation, along with proposed mitigation measures if species at risk are confirmed, will be reported to MNRF and next steps discussed.

4. Next Steps

The Municipality of Wawa will await guidance from the Ministry of Natural Resources and Forestry regarding the need to proceed to the Information Gathering phase. If you have any questions regarding the information in this memo, or regarding the Project in general, do not hesitate to contact me.

Ian Callum
Senior Environmental Project Manager
S. Burnett & Associates Limited

cc: Becca Weatherall, Assistant Director, Infrastructure Services, Municipality of Wawa

www.sbaengineering.com |
Tel (519) 941-2949 | Fax (519) 941-2036 | info@sbaengineering.com
210 Broadway, Unit 203 Orangeville, ON L9W 5G4

FIGURES

Figure 1. Potential Residential Growth Areas (1of 2)

Figure 2. Potential Residential Growth Areas (2of 2)

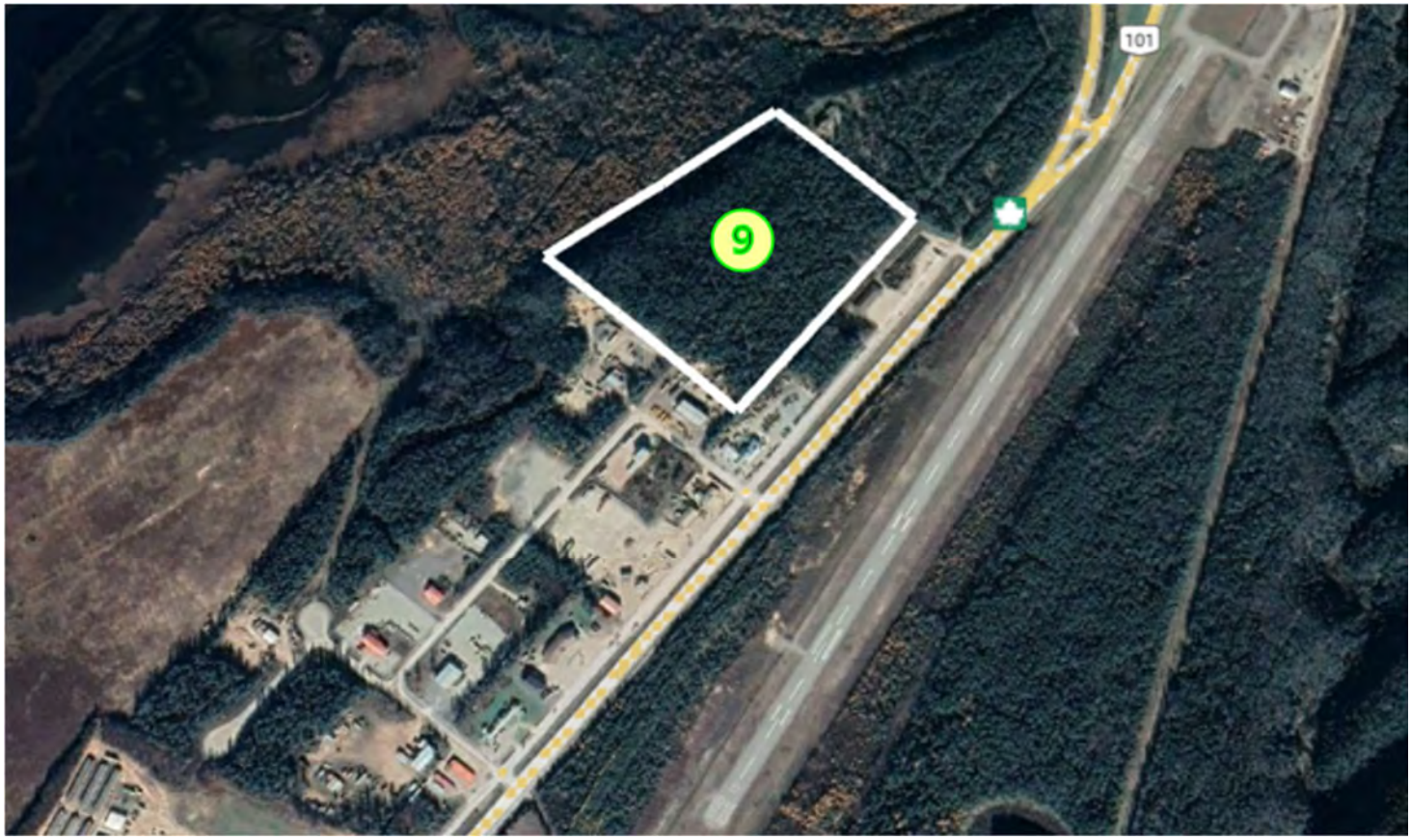

Figure 3. Potential Industrial Growth Areas (1of 2)

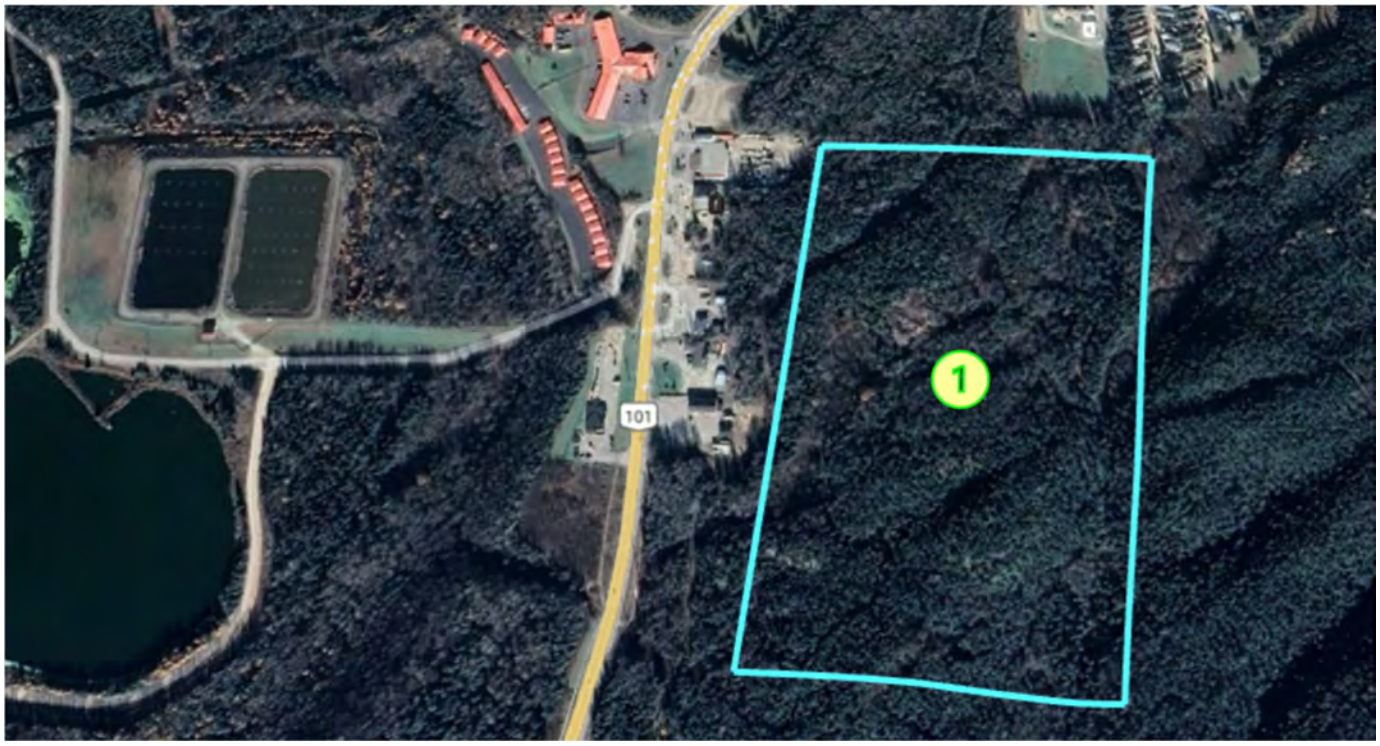

Figure 4. Potential Residential Growth Areas (2of 2)

Ian Callum

From: Ian Callum
Sent: July 14, 2023 2:17 PM
To: Lee, Erinn (MECP)
Cc: Dorscht, Ron (MECP); Managhan, Marnie (MECP); Ryan Kyle; Rebecca Weatherall; Maury O'Neill; Stephen Burnett; Nibhana Suvarna
Subject: Municipality of Wawa Water and Wastewater Master Plan - Draft for Review
Attachments: M22019_Wawa MSP_MECP Draft_V1_14Jul23.pdf

Good afternoon Erin,

On behalf of the Municipality of Wawa, please find attached the Draft Water and Wastewater Master Plan EA for your review. The appendices are provided separately due to file size considerations and can be accessed using the link below. If you have any questions during your review, don't hesitate to reach out to me directly.

https://www.dropbox.com/s/kq1prs3kwdgvfrp/M22019_Appendices%20Combined_DRAFT%20FINAL_14Jul23.pdf?dl=0

Kind regards,

Ian

From: Lee, Erinn (MECP) <Erinn.Lee2@ontario.ca>
Sent: Tuesday, November 1, 2022 5:41 PM
To: Ian Callum <ian.callum@sbaengineering.com>; Info @ SBA <info@sbaengineering.com>
Cc: Dorscht, Ron (MECP) <Ron.Dorscht@ontario.ca>; Managhan, Marnie (MECP) <Marnie.Managhan@ontario.ca>
Subject: MECP Response to Notice of Commencement - Municipality of Wawa Water and Wastewater Master Plan

Good evening,

Please find attached MECP's response to the Notice of Commencement for the Municipality of Wawa Water and Wastewater Master Plan. Please do not hesitate to contact me if you have any questions.

Thank you,

Erinn Lee (she/her)
Regional Environmental Planner | Ministry of the Environment, Conservation and Parks
Project Review Unit, Environmental Assessment Branch
135 St. Clair Ave W, Toronto, ON M4V 1P5
P : 1 (416) 357-1511 E: Erinn.Lee2@ontario.ca

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

August 14, 2023

Ian Callum
Senior Environmental Project Manager
S. Burnett & Associates Limited
Email: ian.callum@sbaengineering.com

Re: Water and Wastewater Servicing Master Plan – Draft
Municipality of Wawa
Municipal Class Environmental Assessment – Master Plan (Approach #2)
MECP Project Review Unit Comments – Draft Master Plan

Dear Ian Callum,

Thank you for providing the ministry with an opportunity to comment on the draft Master Plan Report (Report) for the above noted Class Environmental Assessment (EA) project. Our understanding is that the completion of the Master Plan will evaluate alternative means of providing safe, cost-effective, sustainable and reliable water and wastewater services to support planned growth and development in the Municipality of Wawa to meet current and future needs.

In order to accommodate the remote towns growth rate in the next 10 years, the Municipality of Wawa (the proponent) has determined to proceed with a list of infrastructure projects, categorized as Schedule A projects (that are exempt from the requirements of the *Environmental Assessment Act)*, and a Schedule B Class Environmental Assessment (for additional storage in the current reservoir). In addition, the Municipality has come up with preferred areas for residential and industrial growth. The Ministry of the Environment, Conservation and Parks (ministry) provides the following comments for your consideration.

Indigenous Consultation

1) If there are any substantial changes to the project/process or if the proponent is applying for subsequent permits from the ministry that may be of interest or concern to communities, we encourage you to continue with engagement. We recommend that the proponent include the record of consultation with any subsequent applications to the ministry to help in our review of those applications.

Public Consultation

2) Please note that Section *A.4.1* of the Municipal Class EA document (accessible online here: www.municipalclassea.ca/manual/page30.html) states, "*The Project File shall contain a complete record of all activities associated with the planning of the project and shall include… the public consultation program employed and how concerns raised have been addressed*." The ministry recommends that the proponent include a summary of any comments, questions or concerns received during public consultation and describe how they have been addressed through the planning process. If no comments were received, this should be stated in the Report.

Excess Materials and Waste

3) In December 2019, the ministry released a new regulation under the Environmental Protection Act, titled *On-Site and Excess Soil Management* (O. Reg. 406/19) to support improved management of excess construction soil. For more information, please visit www.ontario.ca/page/handling-excess-soil. The Report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the ministry's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction must be disposed of in accordance with ministry requirements.

Noise

4) In the sections of the Report in *Table 34: Social Criteria Scoring for Alternative Solutions* which describes the evaluations of alternatives, it is noted that some minor disruptions that include noise are anticipated to occur as a result of the preferred solutions. Construction mitigation plans should incorporate appropriate noise control measures to mitigate adverse noise impacts to nearby residential land uses within the study areas during construction activities.

Species at Risk

5) Further to the discussion in Section 6.3.1 of the Report, there is no need to share results of preliminary screenings with the Ministry of Natural Resources and Forestry, as the Species at Risk mandate lies with this ministry.

Surface Water

6) Assessment of surface water bodies, through a comprehensive study of their features and functions, is essential to prevent adverse impacts to existing and future water users including for recreational purposes. Hydrologically, it is reported that portions of the study area are in proximity to the Wawa Creek watercourse and wetland areas. Are there any water quantity and quality issues that may be experienced due to the proposed activities, both during construction and in the long-term? This is one of the major elements of assessing the natural environment and should be included in the report.

7) The ministry recommends that the proponent investigate the presence of private water supply wells and/or any water taking activities for agricultural or industrial purposes within the study area and how the recommended Schedule B project might affect such activities.

Approvals

8) The ministry agrees that revisions (an amendment) to the Environmental Compliance Approval for both the drinking water and the wastewater lagoon may be required. A pre-consultation on this process is also available upon request from the ministry's Technical Support Staff and Engineers from the Approvals and Permissions Branch.

Thank you for circulating this draft Master Plan for the ministry's consideration. Please document the provision of the draft to the ministry as well as this Project Review Unit Comments letter in the final report, and please provide an accompanying response letter to support our review of the final report. A copy of the final Notice should be sent to the ministry's Northern Region EA notification email account (eanotification.nregion@ontario.ca).

Should you or any members of your project team have any questions regarding the material above, please contact me at Mira.Majerovich@Ontario.ca.

Sincerely,

Mira Majerovich
Regional Environmental Planner
Project Review Unit, Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks

cc Rick Lalonde, District Supervisor, Sault Ste Marie District Office, MECP
Marnie Managhan, Water Compliance Supervisor, Sault Ste Marie District Office, MECP

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

September 25, 2023

Ministry of the Environment, Conservation and Parks
Environmental Assessment Branch
940 Watson Road South, RR 1
Puslinch, ON N0B 2J0

Attn: Mira Majerovich, Regional Environmental Planner

Re: Municipality of Wawa
Water & Wastewater Master Plant – Addressing EA Review Comments
SBA File No: M22019

Dear Mira,

This letter includes a Comment Disposition Table that explains how Ministry of the Environment, Conservation and Parks comments from review of the Municipality of Wawa Draft Water and Wastewater Master Plan were reflected in the updated report. This letter will be included with the revised report as part of the record of consultation.

#	Comment / Issue Identified	Resolution
1	If there are any substantial changes to the project / process or if the proponent is applying for subsequent permits from the Ministry that may be of interest or concern to communities, we encourage you to continue with engagement. We recommend that the proponent include the record of consultation with any subsequent applications to the Ministry to help in our review of those applications.	Noted, no action required at this time.
2	Please note that Section A.4.1 of the Municipal Class EA document (accessible online here: www.municipalclassea.ca/manual/page30.html) states, "The Project File shall contain a complete record of all activities associated with the planning of the project and shall include the public	Limited feedback was received at the two (2) Public Information Centres and this feedback and how it was addressed, is summarized in the Project File in Sections 6.2 and 8.2.

	consultation program employed and how concerns raised have been addressed." The Ministry recommends that the proponent include a summary of any comments, questions or concerns received during public consultation and describe how they have been addressed through the planning process. If no comments were received, this should be stated in the Report.	
3	In December 2019, the Ministry released a new regulation under the Environmental Protection Act, titled On-Site and Excess Soil Management (O. Reg. 406/19) to support improved management of excess construction soil. For more information, please visit www.ontario.ca/page/handling-excess-soil. The Report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the Ministry's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction must be disposed of in accordance with Ministry requirements.	New sentence added to Section 8.2 of report indicating that the preferred solutions will comply with O. Reg. 406/19 and Ministry requirements.
4	4) In the sections of the Report in Table 34: Social Criteria Scoring for Alternative Solutions which describes the evaluations of alternatives, it is noted that some minor disruptions that include noise are anticipated to occur because of the preferred solutions. Construction mitigation plans should incorporate appropriate noise control measures to mitigate adverse noise impacts to nearby residential land uses within the study areas during construction activities.	Sentence in Table 34 amended to "Minor impact to adjacent residences from construction noise and traffic after implementation of appropriate construction noise mitigation measures."

5	Further to the discussion in Section 6.3.1 of the Report, there is no need to share results of preliminary screenings with the Ministry of Natural Resources and Forestry, as the Species at Risk mandate lies with this Ministry.	Text in Section 6.3.1 that referred to sharing results with MNRF was removed.
6	Assessment of surface water bodies, through a comprehensive study of their features and functions, is essential to prevent adverse impacts to existing and future water users including for recreational purposes. Hydrologically, it is reported that portions of the study area are in proximity to the Wawa Creek watercourse and wetland areas. Are there any water quantity and quality issues that may be experienced due to the proposed activities, both during construction and in the long-term? This is one of the major elements of assessing the natural environment and should be included in the report.	Section 7.2.2 more clearly states that development will not occur within 120 metres of a significant wetland, or within 30 metres of a waterbody. Management of potential impacts resulting from accidental spills, erosion and sedimentation, and stormwater management will be managed through best management practices outlined in a new Section 9.
7	The Ministry recommends that the proponent investigate the presence of private water supply wells and / or any water taking activities for agricultural or industrial purposes within the study area and how the recommended Schedule B project might affect such activities.	MECP's online mapping was consulted to locate water supply wells and to confirm if identified wells have permits to take water. No wells with permits to take water were identified and the findings were updated in Sections 6.3.3 and 6.3.4. The evaluation of alternatives "Social Criteria Scoring" tables now include a reference to no anticipated impacts on short or long-term impacts to adjacent land uses, specifically due to the absence of any active water supply wells.

8	The Ministry agrees that revisions (an amendment) to the Environmental Compliance Approval for both the drinking water and the wastewater lagoon may be required. A pre-consultation on this process is also available upon request from the Ministry's Technical Support Staff and Engineers from the Approvals and Permissions Branch	Noted, no action required at this time.

If there is any aspect regarding how comments were addressed that could benefit from further discussion, I would be more than willing to do so on a call.

Yours truly,

Ian Callum
Senior Environmental Project Manager
S. Burnett & Associates Limited

Incl. Revised Wawa Water and Wastewater Master Plan Environmental Assessment

M22019_Wawa MSP_MECP Comments_V2_IRC_25Sep23

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

7th Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
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Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

7ème étage
135, avenue St. Clair Ouest
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Téléc. : 416 314-8452

»

September 28th, 2023

Ian Callum, M. Sc., PMP
Senior Environmental Project Manager
ian.callum@sbaengineering.com

BY EMAIL ONLY

Re: Municipality of Wawa Draft Water/ Wastewater Master Servicing Plan Class Environmental Assessment

Dear Ian Callum,

The ministry has reviewed the Draft Master Plan (draft report) for the Municipality of Wawa Draft Water/ Wastewater Master Servicing Plan dated September 2023, which follows the approved planning process for Draft Master Plan Class Environmental Assessment. We understand that the recommended residential and industrial growth areas described in Section 7.1.4 and Section 7.2.3 were selected as the preferred alternative solutions.

The MECP has reviewed the proponents' responses to the ministry's comments submitted on September 25th, 2023. The ministry would like to thank the proponent for considering our comments. We have no further comments at this time.

Thank you for the opportunity to review the draft report. Feel free to contact me directly at mira.majerovich@ontario.ca if you have any questions about the material above.

Sincerely,

Lilly Floerke on behalf of Mira Majerovich

Regional Environmental Planner
Project Review Unit

Cc
Gavin Battarino, Supervisor, Project Review Unit, MECP
Jason Scott, Manager, Sudbury District Office, MECP
Guowang Qiu, Air Quality Analyst, Northern Region, MECP

Notice of Completion

Municipality of Wawa Water and Wastewater Master Plan

The Municipality of Wawa has prepared a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met. The Municipality has completed this project through the Schedule B process in the Municipal Class Environmental Assessment 2023.

A Project File Report documenting the planning process undertaken, details of the study recommendations, potential impacts, and mitigation measures, was completed and is now available for public review. Subject to comments received following this Notice, the Municipality intends to move forward with the WWMP recommendations. The Project File is available on the Municipality webpage (https://www.wawa.cc/en/living-here/water-and-wastewater-reports.aspx) and at the following location during regular hours of operation:

Infrastructure Services, Municipality of Wawa
40 Broadway Avenue, Wawa, ON P0S 1K0

Please forward any comments to the Assistant Director of Infrastructure Services **by Friday November 17, 2023**. Thereafter, the WWMP will be reviewed and revised taking into consideration comments received from the public. The recommended WWMP will be presented to the Municipal Council for approval.

Rebecca Weatherall, P.Eng.
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Ian Callum, M.Sc., PMP
S. Burnett & Associates Limited
210 Broadway, Unit 203
Orangeville, ON L9W 5G4
T: 519-941-2949

In addition, a request to the Minister of the Environment, Conservation and Parks for an order imposing additional conditions or requiring an individual environmental assessment may be made on grounds that the requested order may prevent, mitigate, or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. These requests should include contact information, specify what kind of order is being requested, and explain how the order may prevent, mitigate, or remedy potential adverse impacts. Requests are to be sent in writing or by email to Rebecca Weatherall and to:

Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Minister of the Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Please visit https://www.ontario.ca/page/class-environmental-assessments-part-ii-order for information on request of orders under section 16 of the Environmental Assessment Act.

This Notice was issued October 18, 2023, on the www.wawa-news.com website.

THE CORPORATION OF THE
MUNICIPALITY OF WAWA

October 18, 2023

Re: Municipality of Wawa
Water and Wastewater Master Plan Municipal Class Environmental Assessment
Notice of Completion

To Whom It May Concern,

The Municipality of Wawa has prepared a Water and Wastewater Master Plan (WWMP) to ensure that its current and future water and wastewater infrastructure needs are met, following Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA).

A Project File Report documenting the planning process undertaken, details of the study recommendations, potential impacts, and mitigation measures, was completed and is now available for a 30-day public review period. Public, First Nations, and Métis input are an important part of the MCEA process, and this review period will provide an opportunity for feedback to be heard and reflected in the WWMP.

Details on how to provide feedback are provided in the attached Notice of Completion. The Notice also explains the process for submitting a Section 16(6) Order if a member of the public believes that this WWMP may result in an adverse impact on constitutionally protected Aboriginal and treaty rights and that completing an Individual Environmental Assessment may prevent, mitigate, or remedy this impact.

If you have any questions about the planning process for the project, or regarding the WWMP, please contact me anytime during the 30-day public review period.

Yours truly,

Rebecca Weatherall, P.Eng.
Assistant Director of Infrastructure Services
Municipality of Wawa, 40 Broadway Avenue
Wawa, ON P0S 1K0
T: 705-856-2244 Ext. 251

Municipality of Wawa, Water and Wastewater Servicing Master Plan, Notice of Completion Job No.: M22019
Stakeholder Letter Notice Issued: 18-Oct-23
Newspaper Notice Issued 18-Oct-23

Name	Title	Company	Address	City	Province	Postal Code	Email	Email Sent	Phone	Comments	Read Receipt Received	Request to be Informed	Reminder Email
Municipalities													
Cathy Cannon	Councillor	Municipality of Wawa					ccannon@wawa.cc						
Joe Opato	Councillor	Municipality of Wawa					jopato@wawa.cc						
Jim Hoffman	Councillor	Municipality of Wawa					jhoffmann@wawa.cc						
Mitch Hatfield	Councillor	Municipality of Wawa					mhatfield@wawa.cc						
Melanie Pilon	Mayor	Municipality of Wawa					mpilon@wawa.cc						
First Nations and Métis													
Patricia Tangie	Gimaa Kwe	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	ptangie@michipicoten.com						
Chris Buckell	Supervisor Public Works	Michipicoten First Nation	P.O. Box 1, Site 8, RR#1	Wawa	ON	P0S 1K0	cbuckell@michipicoten.com						
Jason Gauthier	Chief	Missanabie Cree First Nation					jgauthier@missanabiecree.com						
Dean Sayers	Chief	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	chiefdeansayers@batchewana.ca						
Sandra Kenny	Council Secretary	Batchewana First Nation	236 Frontenac Street / Rankin Reserve 15D	Batchewana First Nation	ON	P6A 6Z1	councilsecretary@batchewana.ca						
Andy Rickard	Chief	Garden River First Nation					arickard@gardenriver.org						
		Métis Nation of Ontario Lands, Resources, and Consultations Branch	Suite 1100 -66 Slater Street	Ottawa	ON	K1P 5H1	consultations@metisnation.org						
		Red Sky Independent Metis Nation Consultation Office	406 East Victoria Avenue	Thunder Bay	ON	P7C 1A5	consultation@rsmin.ca		807-632-8329	Received phone message from Sandra Van Dong			
Agencies/Regulators													
	General EA notification email	Ministry of Environment, Conservation and Parks					eanotification.nregion@ontario.ca			All project notices			
Erinn Lee	Regional Environmental Planner	Ministry of Environment, Conservation and Parks, Proje	135 St. Clair Avenue West, 1st Floor	Toronto	ON	M4V 1P5				Only Notice of Completion			
							Erinn.Lee2@ontario.ca						
Other Stakeholders													
Rene Dumont							renedumont@rocketmail.com						
Matthew Romer		Algoma District School Board					romerm@adsb.on.ca		705-856-4464 ext. 67188				

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Appendix B

Priority Infrastructure Project Recommendations

CONTENTS

Criteria & Needs Report
Prioritization List
Municipality of Wawa
SBA File No.: M22019

Item	Location	Description	Funded (y/n)	EA Schedule	Criteria	Priority	Cost Estimate
1	Low Lift Station	Municipal staff have indicated that the existing lake intake crib is deteriorating. Replacement is scheduled to take place as part of the Intake Upgrade project. This will include replacement of the existing cast iron and asbestos cement piping.	y	Schedule A	Maintenance	Low	$ 3,480,000.00
2	Low Lift Station	The existing sluice gate valve (SG-001) which isolates Wawa Lake from the wetwell is inoperable. Although this valve is normally open, it does not allow for isolation of the wet well for maintenance. It is understood this valve is being replaced as part of the Intake Upgrade project.	y	Schedule A	Maintenance	Low	
3	Low Lift Station	It is understood that the lead and lag pump are operated at a shared duty rating (50/50 operation) and often operating at the same time. Although the duty and lag pump are typically operated together, it is recommended that the lead, lag and standby pumps are exercised at a 60/30/10 percentage point. This is intended to ensure pumps do not fail at the same time and shall allow a pump to be replaced while the lag and standby pumps become lead and lag, respectively.	n	Schedule A	Operational	Medium	$ 2,500.00
4	Low Lift Station	Pre-chlorination at the LLPS provides the capability to maintain a chlorine residual on the low-lift header (KMK Consultants Limited, 2006). Chemical feed is provided from the WTP but the system has not been used since the plant was commissioned and the associated chemical feed panel has been salvaged for parts. It is recommended that this system is decommissioned.	n	Schedule A	Operational	Low	$ 1,000.00
5	Low Lift Station	The low-lift station reservoir has never been cleaned. It is recommended that a wetwell cleaning is scheduled and completed every 5 years, at minimum.	y	Schedule A	Maintenance	Medium	$ 10,000.00
6	Low Lift Station	Bar screens are manually cleaned. It is recommended that automatic cleaning capability is provided to ensure regular and timely maintenance is completed to mitigate any hinderance in inlet flows from Wawa Lake. **Please note that this recommendation is not required if the intake upgrades is completed in the short-term.**	n	Schedule A	Maintenance	Medium	$ 200,000.00
7	Filter / Pump Room	A leak is suspected at membrane feed check valve, LCV-1C, due to backflow experienced when forward processing was terminated. It is recommended that this is further investigated and replaced with the same make and model.	n	Schedule A	Maintenance	Medium	$ 2,500.00
8	Filter / Pump Room	Corrosion has been noted on various membrane skid manual valves. These valves are not at risk of failure, but replacement is recommended within future upgrade projects.	n	Schedule A	Maintenance	Medium	$ 20,000.00
9	Filter / Pump Room	The HLPs equipped with VFDs (HLP-6201 and HLP-6601) are the principal duty pumps supporting domestic demand. The HLPs not equipped with VFDs (HLP-6301 and HLP-6501) are rarely in operation and intended for use if emergency flows are required. It is recommended that the non-VFD pumps are upgraded to operate with VFDs to provide operational redundancy.	n	Schedule A	Capital	Medium	$ 25,000.00
10	Filter / Pump Room	It is further recommended that the larger HLPs (HLP-6301 and 6601) and smaller HLPs (HLP-6201 and 6501) are operated on a 70/30 percentage point. This is intended to ensure pumps do not fail at the same time and shall allow a pump to be replaced while the lag pumps become lead. Current operational hours are nearly equivalent on VFD pumps (HLP-6201 and HLP-6601) at over 48,000 hours of run time, while the non-VFD pumps, HLP-6301 and HLP-6501, have run times of approximately 7 hours and 58 hours, respectively.	n	Schedule A	Operational	Medium	$ 2,500.00
11	Filter / Pump Room	The pressure relief valve (V-6802) of the distribution piping is suspected to leak. The Operators have advised they are not confident the upstream butterfly valve (V-6801) will hold to support maintenance and replacement of the pressure relief valve (PRV). It is recommended that a separate PRV and associated piping is installed on the distribution header to provide surge redundancy and allow for maintenance of the existing PRV.	n	Schedule A	Maintenance	High	$ 10,000.00
12	Filter / Pump Room	Throughout the facility, deterioration of the existing epoxy flooring has been noted. It is recommended that the floors throughout the facility and reepoxied. This serves as a non-slip coating to protect Operators and visitors during regular operation. It also provides an additional barrier above the below-grade reservoirs to protect from debris passing through cracks. **Proposed costing identifies patching of existing epoxy floor and not completion of the entire facility.**	n	Schedule A	Maintenance	Low	$ 20,000.00
13	Filter / Pump Room	The existing I-Beams for pump removal and maintenance are in good condition; however, these beams shall be reviewed annually be a structural engineer. It is recommended that this inspection is included in municipal annual maintenance.	n	Schedule A	Maintenance	Low	$ 5,000.00
14	Filter / Pump Room	The snow guards on the facility roof do not adequately protect snow falling from the facility's solar panel. As a result, a section of sidewalk around the facility is out of commission during winter months due to safety concerns. It is recommended that additional snow guard measures are installed to mitigate this safety concern.	n	Schedule A	Capital	High	$ 10,000.00

15	Chemical Room	Sodium bisulphite is intended for injection into wastewater header for oxidation-reduction potential (ORP) maintenance and dichlorination. This was originally intended for use if wastewater was returned directly to the environment via storm sewers. Wastewater is sent to the sanitary sewer for treatment at the lagoon. Wastewater from the plant does not undergo dichlorination. It is recommended that standard operating procedures reflect this. Due to lack of use, this system also experiences crystallization. It is recommended that the solution is mixed regularly if the system remains commissioned.	n	Schedule A	Operational	Medium	$ 1,500.00
16	Chemical Room	The standby fluoride pump is not operational and therefore no redundancy exists within fluoride dosing. It is recommended that the failed pump is replaced.	n	Schedule A	Maintenance	High	$ 7,500.00
17	Chemical Room	The exhaust fan in the Fluoride Room is permanently on. Requirements for operation for adequate ventilation shall be reviewed to start/stop the exhaust fan.	n	Schedule A	Operational	Medium	$ 2,500.00
18	Generator Room	The bulk water system is not functional. It is recommended that this system is recommissioned to support construction activities and tourism within the Municipality. A recirculation system is recommended for the bulk water station to eliminate stagnation of water in this line, returning the water to the wetwell. The Operators identified rust build-up as a concern within the bulk water piping and therefore this system shall be flushed if it is recommissioned. All valving appeared to be in good condition.	n	Schedule A	Maintenance	Low	$ 15,000.00
19	Electrical Room	The existing control cubicle (ICU-01) is a human machine interface (HMI) and is not functional. The Operators have not advised of concerns due to their ability to manipulate the system through the nearby SCADA system; however, it is recommended that this unit is serviced to restore full functionality.	n	Schedule A	Maintenance	Medium	$ 2,500.00
20	Electrical Room	Power supply concerns have been identified with the existing autodialler. Currently, the unit is only functional when in “Test” mode and does not function in “Auto”. It is recommended that this unit is serviced immediately to effectively restore emergency call-out.	n	Schedule A	Maintenance	High	$ 2,500.00
21	Distribution	Various locations within the distribution network have deadend piping which limit effective flow of water and turnover in these sections of the distribution system (Ministry of the Environment, Conservation and Parks , 2008). Deadend locations have been noted at Ross, Birch, Maple Streets, Government Road, and Superior Avenue. It is recommended that the deadends are looped to improve service pressures and distribution maintenance potential, reduce stagnation and prevent freezing. It is understood that isolation valves are opened slightly in the winter to limit stagnation. It is recommended that all future distribution works limit deadends and prioritize looping. **Proposed cost estimate is based on As-Built Information of referenced streets only.**	n	Schedule A	Comment	High	$ 573,000.00
22	Distribution	The Operators noted that isolation valves within the distribution are not exercised. Seized and inoperable valves exist throughout the distribution system and will limit effective maintenance. It is recommended that a regular valve exercise schedule is completed, with valves exercised annually at minimum. Through the process, it is recommended that Operators identify and record all seized and inoperable valve locations to ensure this equipment is included for replacement on capital upgrade projects. **Proposed costs included Operator monitoring and recording.**	n	Schedule A	Operational	High	$ 5,000.00
23	Distribution	Within the MRV, the original pump station that serviced the area now houses a sample tap, with all other pumping and piping equipment out of commission. As this location is at the far end of the distribution system, it is recommended that a sample tap is maintained; however, all other equipment should be decommissioned and removed.	n	Schedule A	Capital	Low	$ 15,000.00
24	Booster Pump Station	The booster pump does not operate in automatic mode. When high volumes are required to support emergency flows and/or fire events, an Operator must travel to the booster pump station to manually operate the pump. It is recommended that automatic pumping operation is implemented to allow the booster pump to automatically respond to a low-pressure event in the distribution system. This shall be integrated to the WTP SCADA system and the autodialler. This will monitor the occurrence of a low-pressure scenario and immediately advise operators when it occurs. This communication is critical to effectively support emergency flows within the community.	n	Schedule A	Operational	High	$ 75,000.00
25	Booster Pump Station	There is no redundancy in booster pumping capacity. It is recommended that a second pump is installed as a standby unit in the event that the duty pump fails.	n	Schedule A	Capital	High	$ 25,000.00
26	Booster Pump Station	Piping and instrumentation within the booster station is aged. Pressure gauges on the pump discharge line require replacement due to inaccurate readings.	n	Schedule A	Maintenance	Medium	$ 1,000.00

27	Elevated Storage Tank	The storage tower is affected by harsh winter temperatures and does not have adequate circulation or inline heating. As a result, ice build-up occurs annually which reduces the effective storage volume. It is recommended that recirculation measures and/or an inline heater are installed to restore the effective storage volume. This will improve domestic demand capacity as well as emergency volumes. **Considers installation of recirculation equipment. Inline heating requirements will be in excess of $100,000.**	n	Schedule A	Capital	Medium	$ 50,000.00
28	Elevated Storage Tank	Operations at the storage tower are not integrated to the WTP SCADA system. It is recommended that all equipment and instrumentation is integrated into the WTP SCADA to allow for flow, level and chemical feed trending. It is recommended that storage tower flow and level are integrated into the existing WTP autodialler to immediately advise operations staff of potential emergency events within the MRV.	n	Schedule A	Operational	High	$ 25,000.00
29	Elevated Storage Tank	The storage tower does not have a standby power supply. Therefore, when a power outage occurs, chemical feed pumping does not occur which could affect adequate chlorine residual within storage volumes. It is recommended that a standby power is installed at the storage tower.	n	Schedule A	Capital	High	$ 50,000.00
30	Sanitary Conveyance	George, Second, Third and Joliet Streets have inadequate sloping that do not provide sufficient cleansing velocities. It is recommended that adequate sloping is implemented during future maintenance projects.	n	Schedule A	Comment	Medium	$ 1,237,000.00
31	Sanitary Conveyance	Due to issues experienced with inadequate scouring velocity, suspected low flows through sanitary piping, and the age of existing infrastructure, it is recommended that all sanitary infrastructure undergoes a closed-circuit television (CCTV) review to adequately assess the state of all community sanitary piping.	n	Schedule A	Maintenance	High	$ 25,000.00
32	Lagoons	Operators take daily flow readings and weekly manual samples of effluent discharged to the Magpie River and monthly influent samples. It is recommended that sampling instrumentation is installed to allow automatic sampling and real-time monitoring. It is further recommended that this is integrated into the existing WTP SCADA system to allow for trending and immediately advise of operational abnormalities. This equipment shall be housed in an insulated structure at the lagoon outfall to provide ongoing effluent monitoring.	n	Schedule A	Capital	Medium	$ 20,000.00
33	Lagoons	Manual adjustment of blower output is completed by the Operations Team. It is recommended that dissolved oxygen (DO) instrumentation is installed to complete ongoing DO sampling. The results of these samples can be integrated in a feedback loop to automatically control the output of the blowers.	n	Schedule A	Operational	Medium	$ 50,000.00
34	Lagoons	The blowers operate with a shared duty rating (50/50 operation percentage). It is recommended that a duty/standby operating percentage is adjusted to 70/30 to vary the operating hours and ensure that the blowers do not fail at the same time.	n	Schedule A	Operational	Medium	$ 2,500.00
35	Lagoons	The blowers operate in a duty/standby configuration; however, the standby unit does not recover if the duty unit fails. It is recommended that this equipment is integrated to automatically recover in the event that the duty unit fails. Status shall be integrated to the WTP SCADA system to ensure that duty status is provided and alarms indicate equipment failure.	n	Schedule A	Operational	High	$ 2,500.00
36	Lagoons	The aluminum sulphate chemical feed pumps are currently operating in manual. It is recommended that pumps are integrated to operate in automatic mode. This will ensure that if the duty pump fails, the standby pump will automatically recover chemical feed operations.	n	Schedule A	Operational	High	$ 2,500.00
37	Lagoons	Power failures at the Sewage Treatment Plant are not logged and equipment must be manually reset when power failures occur. It is recommended that power failures are monitored via the WTP SCADA system at minimum. Ideally, it is recommended that standby power is installed at the Sewage Treatment Plant to maintain operation during power failures.	n	Schedule A	Operational	High	$ 100,000.00
38	Lagoons	It is understood that contractors and tourists dump septage at an unmetered septage receiving location. Abnormal effluent quality has been observed following large dumping events at the receiving location. It is recommended that flow metering is installed at the receiving location to anticipate potential fluctuations in effluent quality due to large volumes of septage added to the lagoons. This could also serve as a revenue stream if dumping is charged based on volume.	n	Schedule A	Capital	Medium	$ 25,000.00

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Appendix C

EPANet Water Modelling Inputs

EPANet Current Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Existing EPA Net Model Basis
Existing Housing Density: 2.20

Existing Serviced Population (2022): 3,015
Existing Serviced Homes: 1322

Junction	*Junction Input for Elevation* Surface Elevation (m)	Invert Elevation (m)	Residential Homes (With Demand from this Junction)	Multi-Residential Units (With Demand from this Junction)	Housing Density	Population (With Demand From this Junction)	Per Capita Demand (L/cap/d)	Residential Demand - Houses (L/d)	Residential Demand - Extra (L/d)	Residential Demand - Total (L/d)	Non-Residential Buildings (With Demand from this Junction)	Non-Residential Demand (L/d)	Bypasses (L/s)	Watermain Purging (L/s)	Total Unaccounted for Water Demand (L/d)	Total ADD Junction Demand (L/d)	*Junction Input for Base Demand* Total ADD Junction Demand (L/s)	Max Day Factor	Total MDD Junction Demand (L/d)	Total MDD Junction Demand (L/s)	Peak Hour Factor	Object	Buildings	Reference Drawing	
1A	293.2	290.6	0	0	2.20	0	278.0	0	0	0	1	8226	0	0	0	8226	0.0952	2.00	16452	0.1904	3.00	-	Water Treatment Plant	2531-A-3	
1	293.24	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant	No demand	1277-29	
2	293.21	-	3	0	2.20	7	278.0	1835	67	1902	0	0	6542	0	6542	8444	0.0977	2.00	16888	0.1955	3.00	Hydrant 126	24, 26 and 28 Ganley St.	1277-29	
3	293.18	-	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	34 and 38 Ganley St.	1277-30	
4	293.12	-	5	0	2.20	11	278.0	3058	112	3170	0	0	3271	0	3271	6441	0.0745	2.00	12882	0.1491	3.00	-	44, 46, 48, 50 and 52 Ganley St.	1277-30	
5	292.57	-	0	0	2.20	0	278.0	0	0	0	6	5158	0	0	0	5158	0.0597	2.00	10317	0.1194	3.00	-	Commercial building with LCBO	1277-30	
6	291.09	-	8	0	2.20	18	278.0	4893	179	5072	1	223	3271	0	3271	8566	0.0991	2.00	17133	0.1983	3.00	Hydrant 102	7, 7 and 2 Ganley St., 28, 30 and 32 Toronto Ave., 26 and 26A Ontario St. 1 commercial (Garage behind bowling alley)	1277-29	
7	290.96	-	0	0	2.20	0	278.0	0	0	0	1	2772	0	0	0	2772	0.0321	2.00	5544	0.0642	3.00	-	Low Lift Pumping Station	1277-29	
8	293.35	-	0	0	2.20	0	278.0	0	0	0	11	9494	6542	0	6542	16036	0.1856	2.00	32071	0.3712	3.00	Hydrant 133	5 commercial buildings on east side of Broadway Ave. 3 Institutional buildings (Post office, municipal building) on west side of Broadway Ave. 1 institutional building on Ontario St. (Firehall).	1277-32	
9	293.66	-	4	0	2.20	9	278.0	2446	90	2536	7	19752	9813	0	9813	32101	0.3715	2.00	64201	0.7431	3.00	Hydrant 130	13 Ontario St. 31 McKinley Ave. 18 and 22 Wawa St. Lakeview hotel and 4 commercial buildings on east side of Broadway Ave.	1277-33	
10	292.73	-	1	0	2.20	2	278.0	612	22	634	5	23604	6542	0	6542	30779	0.3562	2.00	61559	0.7125	3.00	Hydrant 131	7 Broadway Ave. 4 commercial (Iris Place, Empty Building Trading Post, Canadian Red Cross), 1 institutional (public washrooms)	1277-36	
11	294.60	-	1	0	2.20	2	278.0	612	22	634	3	30301	0	0	0	30935	0.3580	2.00	61869	0.7161	3.00	Hydrant 118	14 Government Rd. 1 commercial (garage), 2 institutional (Calvary Penecostal Church Hospital, North East Community Care)	1277-52	
12	295.42	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 123	20 Government Rd.	1277-52	
13	295.38	-	4	0	2.20	9	278.0	2446	90	2536	2	875	0	0	0	3411	0.0395	2.00	6821	0.0790	3.00	Hydrant 107	4 residences (28 and 30 Government Rd., 2 others), 2 institutional (garage and EMS building)	1277-52	
14	296.72	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 108	40, 42, 50, 56, 43, 47, 55, ?, and ? Government Rd.	1277-53	
15	297.17	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 76	58, 60, 62, 63, 64(x2), 66, 68, 69, ?0, ?1, ? and ? Government Rd.	1277-53, 1277-54	
16	294.2	-	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	Hydrant ?5	79, 81, 83, 87 and 120 Government Rd.	1277-54, A1-9422-P2	
17	291.15	-	11	0	2.20	24	278.0	6728	246	6974	1	422	6542	0	6542	13938	0.1613	2.00	27875	0.3226	3.00	Hydrant 74	122, 124, 126, 127, 128, 132, 133, 134, 135, 137 and 139 Government Rd. 1 commercial (Leverington's Garden Centre.	A1-9422-P2	
18	293.02	-	14	0	2.20	31	278.0	8562	314	8876	2	833	19625	0	19625	29335	0.3395	2.00	58669	0.6790	3.00	Hydrant 136	141, 143, 144, 145, 146, 147, 148, 153, 155 and 157 Government Rd. 2, 4, 10 Government Ln. 1 Sinter Plant Rd. 2 commercial (Lloyd's of Wawa, Wagging Tails Kennel)	A1-9422-P1/P2/P3	
19	294.66	-	0	0	2.20	0	278.0	0	0	0	3	13248	3271	0	3271	16519	0.1912	2.00	33038	0.3824	3.00	Hydrant 40	Millette General Contractors, Wawa Handy Store, other commercial building at Mackey St. and McKinley Ave.	1277-33	
20	295.35	-	15	16	2.20	68	278.0	18960	695	19654	1	186	26167	0	26167	46007	0.5325	2.00	92014	1.0650	3.00	Hydrant 44	?, 18, 16, 14, 10, 8, 6, 3, 5, ?, 9 and ? McKinley Ave. 11 and 12 Laurier St. ? Algoma St. 1 multi-residential (6 Algoma St. assume 18 units). 1 commercial (United Supply Swish)	1277-41	
21	293.73	-	0	0	2.20	0	278.0	0	0	0	3	11986	0	0	0	11986	0.1387	2.00	23972	0.2775	3.00	-	2 commercial (Superior North Mobile Vetrinary Service, A Touch of Glass). 1 institutional (Sir James Dunn Public School)	1277-33	
22	295.43	-	19	6	2.20	55	278.0	15290	560	15850	0	0	32709	0	32709	48559	0.5620	2.00	97118	1.1240	3.00	Hydrant 47	19, 17, 16, 15, 14, 13, 12, 9, 8, ?, 6, 5, 4, 3, 2 and 1 First Ave. 19, 21 and 23 Algoma Ave. 1 multi-residential (20 First Ave. assume 6 units).	1277-43	
23	293.19	-	0	8	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	Hydrant 103	2 multi-residential (29 Mackey St. assume 4 units, 33 Mackey St. assume 4 units).	1277-33	
24	295.58	-	17	0	2.20	37	278.0	10397	381	10778	1	162	29438	0	29438	40378	0.4673	2.00	80755	0.9347	3.00	Hydrant 96	19, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, ?, 6, 5, 3, 2, and 1 Second Ave. 1 commercial building (Children's Aid Society of Algoma)	1277-31	
25	293.39	-	1	2	2.20	7	278.0	1835	67	1902	2	2299	0	0	0	4201	0.0486	2.00	8402	0.0972	3.00	Hydrant 98	44 Mackey St. 1 multi-residential (39 Mackey street, assuming 2 units). 2 commercial (Bell, Wawa Laundromat)	1277-34	
26	293.34	-	18	48	2.20	145	278.0	40366	1479	41845	0	0	42521	0	42521	84366	0.9765	2.00	168732	1.9529	3.00	Hydrant 97	22, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 7, 6, 5, 4, 3 and 1 Third Ave. 3 multi-residential (2 Third Ave. assume 4 units, 35 Algoma St. Mountainview assume 20 units, 37 Algoma St. newer development assume 24 units).	1277-47	
27	294.50	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	-	26b, 26 and 4 Mackey St.	1277-34	
28	294.21	-	2	4	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 110	21 and 19 Churchill Ave. 1 multi-residential (22 Churchill Ave., assume 4 units)	1277-59	
29	293.53	-	13	0	2.20	29	278.0	7951	291	8242	0	0	22896	0	22896	31138	0.3604	2.00	62276	0.7208	3.00	Hydrant ?	17, 15 (x2), 14, 12, 11, 8, ?, 6, 4, 3, 2 and 1 Churchill Ave.	1277-59	
30	295.05	-	2	6	2.20	18	278.0	4893	179	5072	1	375	6542	0	6542	11989	0.1388	2.00	23978	0.2775	3.00	Hydrant 62	57, 63 Mackey St. 1 commercial (old garage, assuming 66 Mackey St.). 2 multi-residential (58 Mackey St. assume 4 units, 59 Mackey St. assume 2 units).	1277-34	
31	293.76	-	16	6	2.20	48	278.0	13455	493	13948	1	910	19625	156100	175725	190584	2.2058	2.00	381167	4.4117	3.00	Hydrant 63	18, 16, 14, 13, 12, 11, 10, 9, 8, ?, 6, 5, 4, 3, 2 and 1 Beck Ave. 1 multi-residential at 67 Mackey St. (assuming 6 units). 1 institutional (Superior Children's Centre).	1277-50	
32	295.31	-	24	0	2.20	53	278.0	14678	538	15216	0	0	26167	0	26167	41383	0.4790	2.00	82766	0.9579	3.00	Hydrant 64	22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37 and 39 Beck Ave. 21, 22, 23, 24, 25, ?, 27, ?, 29, 32 Hillcrest Ave.	1277-50	
33	293.55	-	8	0	2.20	18	278.0	4893	179	5072	0	0	9813	0	9813	14885	0.1723	2.00	29769	0.3446	3.00	Hydrant 42	50, 54, 56, 57, 58, 59, 60 and 62 McKinley Ave.	1277-39	
34	294.96	-	11	0	2.20	24	278.0	6728	246	6974	2	1170	6542	0	6542	14686	0.1700	2.00	29371	0.3399	3.00	-	63, 64, 65, 66, 67, 68, 69, ?0, ?1 and ?2 McKinley Ave. 30 Caverhill St. 2 commercial (Paint + Glass and Creation Hairstyling)	1277-39	
35	295.83	-	3	0	2.20	7	278.0	1835	67	1902	1	398	0	0	0	2300	0.0266	2.00	4601	0.0532	3.00	Hydrant 43	76, ?7 and ?8 McKinley Ave. 1 commercial (?5 McKinley)	1277-39	
36	296.52	-	10	0	2.20	22	278.0	6116	224	6340	1	783	19625	0	19625	26748	0.3096	2.00	53496	0.6192	3.00	-	?9, 80, 81, 82, 86, 87, 89, 91, 93 and 95 McKinley Ave. 1 commercial (Sam's Place)	1277-39	
37	294.19	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 49	32, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 First Ave.	1277-42	
38	296.59	-	20	0	2.20	44	278.0	12232	448	12680	0	0	39250	0	39250	51931	0.6010	2.00	101861	1.2021	3.00	Hydrant 48	53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 69, ?0, ?1 and ?3 First Ave. 93, 95, 97, and 99 Third Ave.	1277-42	
39	293.22	-	1	0	2.20	2	278.0	612	22	634	0	0	3271	0	3271	3905	0.0452	2.00	7810	0.0904	3.00	-	1 A St.	1277-48	
40	294.51	-	13	0	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 46	7, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Second Ave.	1277-44	
41	295.90	-	10	0	2.20	22	278.0	6116	224	6340	1	178	9813	0	9813	16331	0.1889	2.00	32661	0.3778	3.00	-	57, 59, 60, 61, 62, 63, 64, 65, 66 and 67 Second Ave. 2 institutional (St. Paul's Anglican Church)	1277-44	
42	296.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	68, ?1, ?3 and ?5 Second Ave. ? and 87 Third Ave.	1277-44	
43	295.99	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 99	??, ??, ?5, ?3 and ?1 Third Ave.	1277-45	
44	295.89	-	20	0	2.20	44	278.0	12232	448	12680	0	0	45792	0	45792	58472	0.6768	2.00	116945	1.3535	3.00	Hydrant 45	72, ?0, 69, 68, 67, 66, 65, 64, 63, 61, 50, 52, 53, 54, 55, 56, 57, 58, 59 and 60 Third Ave.	1277-49	
45	294.65	-	20	12	2.20	70	278.0	19571	717	20288	0	0	35980	0	35980	56268	0.6512	2.00	112536	1.3025	3.00	Hydrant 100	3, 5A, 6, ?, 8 , 9, and 10 A St. ??, ?9, ?0, ?1, ?3, ?4, ?5, ?6, ?7, ?8, ?9 and 40 Third Ave. One multi-residential (44 Third Ave., assuming 12 units).	1277-48	
46	295.72	-	17	0	2.20	37	278.0	10397	381	10778	0	0	26167	0	26167	36945	0.4276	2.00	73890	0.8552	3.00	-	3, 4, 5, 6, 8, 12, 13, 14, 15, 16, 17 and 18 Hillcrest Ave. 44, 45, 47, ? and 49 Churchill Ave.	1277-49	
47	295.38	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 111	24, 25, 26, 27, 28 and 29 Churchill Ave.	1277-59	
48	295.71	-	13	0	2.20	29	278.0	7951	291	8242	0	0	16354	0	16354	24596	0.2847	2.00	49193	0.5694	3.00	Hydrant ?	30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 and 43 Churchill Ave.	1277-58	
49	295.2	-	2	40	2.20	92	278.0	25687	941	26628	1	1193	9813	0	9813	37634	0.4356	2.00	75268	0.8712	3.00	Hydrant 29	34, ?, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, ?0, ?1, ?2, ?3, ?4, ?5, ?6, ?7, ?8, ?9 and 80 Hillcrest Ave. 1 institutional (Michipicoten Non-Profit Housing 40 Hillcrest Ave.)	1277-49	
50	289.47	-	2	3	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	62 and 64 Churchill Ave. Multi-residential (68 Churchill Ave. assume 3 units)	1277-57	
51	292.57	-	0	0	2.20	0	278.0	0	0	0	6	35586	6542	0	6542	42128	0.4876	2.00	84256	0.9752	3.00	Hydrant ?	6 commercial buildings (Bowling Centre, Royal Canadian Legion, Canadian Tire, Dawson & Keenan, Sam's Foodline, Allemano & Fitzgerald, Wawa & Chapleau Radio)	-	Assumed same elevation of J5
52	293.83	-	1	0	2.20	2	278.0	612	22	634	17	17828	6542	156100	162642	181103	2.0961	2.00	362206	4.1922	3.00	Hydrant 128	22 Gold St. Commercial buildings (57, 59 Broadway Ave., The Bargain Shop, AJ's Pizza, the Best Start Hub, Regional Employement Health Centre Building, Chic N'Swell, North of 17 Restaurant, The Embassy Restaurant, Columbia Restaurant, RBC Bank, Wawa Dental Centre, Wawa Pharmacy, Wawa Goose Senior Centre, Barber Shop, U Wanna Cab, Guided Fishing Trips)	1277-26	
53	293.32	-	1	0	2.20	2	278.0	612	22	634	7	8425	3271	0	3271	12330	0.1427	2.00	24659	0.2854	3.00	Hydrant 127	25 St. Marie St. 5 commercial (Northern building, Parish of St. Monica, yellow building, Fenlon's Pharmacy, Algoma Family Services)	1277-25	
54	293.05	-	3	0	2.20	7	278.0	1835	67	1902	3	4020	13083	0	13083	19005	0.2200	2.00	38011	0.4399	3.00	-	90 Broadway Ave. 38 and 36 Main St. 2 commercial (Bangin Burger N'Chicken Shack, Economic Development Corporation of Wawa, Ijam FM building)	1277-38	
55	293.09	-	11	0	2.20	24	278.0	6728	246	6974	0	0	13083	0	13083	20058	0.2321	2.00	40115	0.4643	3.00	Hydrant 41	1, 3, 5, ?, 8, 9 and 11 Toronto Ave. ?, ?, 4, ? Gold St.	1277-20	
56	292.61	-	12	0	2.20	26	278.0	7339	269	7608	0	0	16354	0	16354	23962	0.2773	2.00	47925	0.5547	3.00	Hydrant 39	15, 16, 17, 18, 19, 20, ?1, 22, 23, 24, ?7 and 28 Toronto Ave. ?1 and 22 Caverhill St.	1277-19	
57	292.02	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	-	10, 9, 8, ?, 6 and 2 Caverhill St. 56 Wawa St.	1277-19	
58	293.46	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	?9, 30, 31, 32, 33, 34, ?5 and 36 Toronto Ave.	1277-19	
59	293.46	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19	

EPANet Current Model Inputs

60	291.23	-	18	0	2.20	40	278.0	11009	403	11412	0	0	13083	0	13083	24496	0.2835	2.00	48991	0.5670	3.00	Hydrant 104	14, 13, 12, 11, 10, 7, 8, 7 & St. Marie St. 6 and 7 Wawa St. 15, 16, 17, 18, 19, 20 and 7 Montreal Ave.	1277-24
61	292.45	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 105	7, 39, 7, 41, 43, 44, 45, 46 and 48 Toronto Ave.	1277-19
62	292.45	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19
63	291.93	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	-	32 Main St.	1277-38
64	289.77	-	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 7	53, 54, 55, 56, 57 and 58 Toronto Ave. 27, 29, 30, 31, 32 and 34 Joliet St.	1277-19
65	291.2	-	12	0	2.20	26	278.0	7339	269	7608	0	0	22896	0	22896	30504	0.3531	2.00	61008	0.7061	3.00	Hydrant 7	236, 30, 7, 26, 24, 23, 21, 243, 244, 245, 246 and 76 Main St.	1277-22
66	289.76	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	Hydrant 124	11, 247, 249, 251, 253 and 7 Main St. 7 And 10 Joliet St.	1277-12
67	290.37	-	9	0	2.20	20	278.0	5504	202	5706	0	0	6542	0	6542	12248	0.1418	2.00	24496	0.2835	3.00	Hydrant 7	14, 21, 23, 25, 26 and 28 Joliet St. 24, 25 and 36 Montreal St.	1277-12
68	288.29	-	12	0	2.20	26	278.0	7339	269	7608	0	0	6542	0	6542	14150	0.1638	2.00	28300	0.3275	3.00	Hydrant 114	60, 61, 62, 63, 64, 65, 66, 67 and 69 Toronto Ave. 39, 37 and 35 Maggie Rd.	1277-18
69	288.38	-	11	0	2.20	24	278.0	6728	246	6974	3	2259	6542	0	6542	15775	0.1826	2.00	31550	0.3652	3.00	Hydrant 116	33, 31, 29, 27 and 25 Maggie Rd. 32, 31, 30, 29, 28 and 27 Montreal Ave. 3 Institutional (Ontario Mine Rescue Algoma District, Large Garage, Municipality of Wawa Infrastructure Services Department)	1277-14
70	288.4	-	11	2	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 117	7, 17 and 15 Maggie St. 2, 5, 7, 7, 8 and 10 Gladstone Ave. 279-A and 279-B Highway 101. 1 multi-residential (13 Magpie St. assume 2 units).	1277-14
71	288.87	-	17	0	2.20	37	278.0	10397	381	10778	3	3792	22896	0	22896	37466	0.4336	2.00	74932	0.8673	3.00	Hydrant 115	73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88 and 89 Toronto Ave. 2 commercial (The Shop, Millete General Contractors). 1 institutional (The Ship Boy Scouts)	1277-18
72	288.92	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 91	101, 103, 105, 107, 109, 110 and 111 Broadway Ave.	1277-11
73	288.73	-	7	0	2.20	15	278.0	4281	157	4438	0	0	3271	0	3271	7709	0.0892	2.00	15418	0.1784	3.00	-	112, 113, 114, 116 and 117 Broadway Ave. 47 and 45 Maggie Rd.	1277-11
74	289.2	-	11	0	2.20	24	278.0	6728	246	6974	0	0	3271	0	3271	10245	0.1186	2.00	20490	0.2372	3.00	Hydrant 90	?, ?, 121, 123, 124, 125, 126, 127, 128, 129 and 130 Broadway Ave.	1277-10
75	289.18	-	8	0	2.20	18	278.0	4893	179	5072	1	286	0	0	0	5358	0.0620	2.00	10716	0.1240	3.00	-	131, 132, 133, 134, 135, 136, 137 and 138 Broadway Ave. 1 commercial (12 Klondike St.)	1277-10
76	289.61	-	17	0	2.20	37	278.0	10397	381	10778	0	0	6542	0	6542	17320	0.2005	2.00	34640	0.4009	3.00	-	14, 16, 18, 20 and 22 Klondike St. 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19 and 20 Nyman Ave.	1277-5
77	289.18	-	1	0	2.20	2	278.0	612	22	634	3	645	0	0	0	1279	0.0148	2.00	2557	0.0296	3.00	-	? Broadway Ave. 1 commercial (storage garage)	1277-10
78	289.61	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 82	15, 7, 17 and 18 Queen St.	1277-4
79	289.64	-	24	0	2.20	53	278.0	14678	538	15216	0	0	6542	0	6542	21758	0.2518	2.00	43516	0.5037	3.00	Hydrant 83	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 Queen St.	1277-4
80	289.84	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	-	43 and 44 Queen St. 1, 3, 5, 7 and 10 Centennial Ave.	1277-4
81	289.00	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	Hydrant 81	19, 21 and 23 Winston Rd. 2 commercial (storage garages)	1277-1
82	289.48	-	11	4	2.20	33	278.0	9174	336	9510	2	18899	6542	0	6542	34950	0.4045	2.00	69901	0.8090	3.00	Hydrant 80	25, 27, 29, 33, 33A, 35A, 35B, 37, 39, 41 and 43 Winston Rd. 34 Winston Rd. trailer park (23 trailers from water meter data). 1 institutional (Ecole Publique L'Escalade). 1 multi-residential (31 Winston Rd. assume 4 units).	1277-1
83	289.57	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	-	45 Winston Rd. 11, 12, 13, 14, 15, 16 and 18 Centennial Ave.	1277-7
84	289.11	-	0	0	2.20	0	278.0	0	0	0	1	26	0	0	0	26	0.0003	2.00	52	0.0006	3.00	-	1 institutional (First United Church)	1277-60
85	288.98	-	10	0	2.20	22	278.0	6116	224	6340	0	0	0	0	0	6340	0.0734	2.00	12680	0.1468	3.00	Hydrant 7	1, 3, 4, 5, 6, 7, 8, 9, 10 and 12 George St.	1277-60
86	289.22	-	0	0	2.20	0	278.0	0	0	0	3	813	0	0	0	813	0.0094	2.00	1626	0.0188	3.00	Hydrant 92	1 commercial building (Circle K, Northern Credit Union, Empty Store)	1277-16
87	289.22	-	0	0	2.20	0	278.0	0	0	0	1	1021	0	0	0	1021	0.0118	2.00	2042	0.0236	3.00	-	1 commercial building (Pine Portage Lodge Office)	1277-16
88	289.28	-	0	12	2.20	26	278.0	7339	269	7608	1	1972	0	0	0	9580	0.1109	2.00	19161	0.2218	3.00	-	1 multi-residential (158 Mission Rd. assuming 12 units). 1 commercial building (Big Bird Inn)	1277-61
89	289.56	-	0	12	2.20	26	278.0	7339	269	7608	5	8357	0	0	0	15965	0.1848	2.00	31930	0.3696	3.00	Hydrant 138	1 apartment building (guessing 12 units). 4 commercial buildings (Independent, Subway, Movie Gallery, Viking Restaurant, Polish Alliance of Canada)	1277-61 & 1277-6
90	289.35	-	16	0	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant ?	60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76 and 78 Maggie Rd. 14 George St.	1277-16
91	289.21	-	2	0	2.20	4	278.0	1223	45	1268	1	12392	3271	0	3271	16930	0.1960	2.00	33861	0.3919	3.00	-	80 and 82 Maggie Rd. 1 institutional (Michipicoten High School)	1277-16
92	289.4	-	0	0	2.20	0	278.0	0	0	0	1	704	0	0	0	704	0.0081	2.00	1408	0.0163	3.00	Hydrant 93	1 institutional (St. Augustine School)	1277-66
93	289.35	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 7	1, 2, 3, 4, 5, 6, 7 and 8 Ross St.	1277-61
94	289.16	-	10	0	2.20	22	278.0	6116	224	6340	0	0	3271	0	3271	9611	0.1112	2.00	19222	0.2225	3.00	-	10, 11, 13, 14, 15, 17, 19 and 21 Ross St. 9 and 23 Arnott Ave.	1277-61
95	288.94	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	-	49 and 54 Maggie Rd.	1277-15
96	289.15	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 89	1 and 5 Nyman Ave.	1277-9
97	289.64	-	19	0	2.20	42	278.0	11620	426	12046	0	0	3271	0	3271	15317	0.1773	2.00	30634	0.3546	3.00	Hydrant 88	24, 26, 28, 30 and 32 Klondike St. 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and ? Wood Ave.	1277-6
98	289.94	-	11	0	2.20	24	278.0	6728	246	6974	0	0	6542	0	6542	13516	0.1564	2.00	27032	0.3129	3.00	-	34, ?, 36, 37, 38, 39, 40, 41, 42, 43 and 44 Klondike St.	1277-6
99	289.89	-	0	0	2.20	0	278.0	0	0	0	1	6113	0	0	0	6113	0.0707	2.00	12225	0.1415	3.00	-	1 commercial (Outdoorsman Motel)	1277-6
100	289.98	-	3	10	2.20	29	278.0	7951	291	8242	2	547	6542	0	6542	15331	0.1774	2.00	30661	0.3549	3.00	Hydrant 121	55, 56 and 57 Winston Rd. 2 multi-residential (58 Winston Rd. assume 6 units, 59 Winston Rd. assume 4 units). 1 institutional (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-3
101	290.92	-	0	4	2.20	9	278.0	2446	90	2536	2	5168	6542	0	6542	14245	0.1649	2.00	28491	0.3298	3.00	-	1 multi-residential (61 Winston Rd. assume 4 units). 2 commercial (Garage, Gator's Steakhouse, Beaver Motel).	1277-3
102	290.31	-	0	0	2.20	0	278.0	0	0	0	2	5502	3271	0	3271	8773	0.1015	2.00	17546	0.2031	3.00		2 commercial (Beer Store, Cannabis)	P2
103	289.45	-	0	0	2.20	0	278.0	0	0	0	2	9226	3271	0	3271	12496	0.1446	2.00	24993	0.2893	3.00	Hydrant 94	2 commercial (Algoma Motel, Bristol Motel)	1277-62
104	290.03	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	18, 17, 16, 15, 14, 13, 12 and 11 Arnott Ave.	1277-62
105	289.02	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	9, 7, 5, 3 and 1 Arnott Ave.	1277-62
106	289.58	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	-	4, 6 and 8 Darwin St.	1277-65
107	289.78	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	-	3, 5 and 7 Parkhill St. 126 Churchill Ave. 1 multi-residential (2 Grace St. assume 12 units).	1277-55
108	290.2	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 65	128, 130, 132 and 134 Churchill Ave. 1 multi-residential (10 Grace St. assume 12 units).	1277-55
109	290.49	-	3	0	2.20	7	278.0	1835	67	1902	2	4850	0	0	0	6752	0.0781	2.00	13503	0.1563	3.00	-	134, 136 and 138 Churchill Ave. 2 commercial (Kerry Funeral Home, Beaver Motel)	1277-55
110	289.65	-	9	0	2.20	20	278.0	5504	202	5706	0	0	3271	0	3271	8977	0.1039	2.00	17954	0.2078	3.00	Hydrant 66	124, 123, 122, 121, 120, 119, 118, 117 and 116 Churchill Ave.	1277-55
111	290.03	-	6	0	2.20	13	278.0	3670	134	3804	1	2320	0	0	0	6124	0.0709	2.00	12249	0.1418	3.00	Hydrant 137	114, 112, 110, 108, 106 and 104 Churchill Ave. 1 institutional (Ecole St. Joseph).	1277-56
112	289.79	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 120	100, 98, 96, 94, 92, 90 and 88 Churchill Ave.	1277-56
113	289.49	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 119	86, 84, 82, 80, 78, 76, 74, 72, 70 and 76 Churchill Ave. 113, 111 and 107 Maggie Rd.	1277-57
114	289.44	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 61	No demand	1602-7
115	290.02	-	22	0	2.20	48	278.0	13455	493	13948	0	0	16354	0	16354	30303	0.3507	2.00	60605	0.7014	3.00	Hydrant 125	?, 125, ?, 123, 122, 121, 119, 117 and 115 Regina Cres. 16, 14, 13, 12, ?, 10, ?, 8, 6, ?, 4, ?, 2 Birch St.	1602-4
116	289.64	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant ?	127, 133, 135, 137, 139 and 145 Regina Cres.	1951-8
117	289.71	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	Hydrant ?	147, 148, 152, 153, 155, 156 and 160 Regina Cres.	1951-8
118	289.57	-	9	0	2.20	20	278.0	5504	202	5706	0	0	16354	0	16354	22060	0.2553	2.00	44121	0.5107	3.00	Hydrant 54	162, 166, 170 and 172 Regina Cres. 42 and 40 Tamarack Ave. 44, 46 and 48 Tamarack Ave.	1951-8
120	289.75	-	4	0	2.20	9	278.0	2446	90	2536	1	594	0	0	0	3130	0.0362	2.00	6261	0.0725	3.00	Hydrant 7	7, 6, 8, and 10 Maple St. 1 institutional (Confederation College Building)	1951-6
121	290.24	-	13	0	2.20	29	278.0	7951	291	8242	0	0	0	0	0	8242	0.0954	2.00	16484	0.1908	3.00	Hydrant 56	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 Maple St.	1951-6
122	290.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	25, 26, 27 and 28 Maple St. 29 and 30 Maple St.	1951-6
124	291.35	289.15	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00		No demand	1951-5
125	291.08	288.88	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 60	40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30 and 29 Birch St.	1951-5
126	290.52	-	13	0	2.20	29	278.0	7951	291	8242	0	0	3271	0	3271	11513	0.1333	2.00	23026	0.2665	3.00	Hydrant 55	28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17 and 15 Birch St.	1602-6
127	290.49	288.29	12	0	2.20	26	278.0	7339	269	7608	0	0	29438	0	29438	37046	0.4288	2.00	74092	0.8575	3.00	Hydrant 53	113, 111, 109, 107, 105 and 104 Regina Cres. 10, 8, 7, 6, 5 and 3 Poplar St.	1602-4
128	291.82	289.62	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	142 and 141 Superior Ave.	1951-2
129	292.01	289.81	8	0	2.20	18	278.0	4893	179	5072	0	0	0	156100	156100	161172	1.8654	2.00	322344	3.7308	3.00	Hydrant 50	140, 139, 138, 137, 136, 135, 134 and 133 Superior Ave.	1951-2
130	291.18	288.98	16	0	2.20	35	278.0	9786	359	10144	0	0	13083	0	13083	23228	0.2688	2.00	46455	0.5377	3.00	Hydrant 51	132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118 and 117 Superior Ave.	1602-2
131	290.68	288.48	14	0	2.20	31	278.0	8562	314	8876	0	0	32709	0	32709	41585	0.4813	2.00	83170	0.9626	3.00	Hydrant 52	116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104 and 103 Superior Ave.	1602-2
132	290.58	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	Hydrant 71	103, 102 and 101 Regina Cres. 1, 2, 3 and 4 Spruce St.	1602-4
133	290.84	-	18	0	2.20	40	278.0	11009	403	11412	0	0	3271	0	3271	14683	0.1699	2.00	29366	0.3399	3.00	Hydrant 72	7, 8A, 8B, 9, 9A, 9B, 10A, 10B, 11A, 11B, 13A, 13B, 15A and 15B Spruce St. 102, 100, 2, 4 and 6 Superior Ave.	1602-2
134	290.49	-	27	0	2.20	59	278.0	16513	605	17118	0	0	0	0	0	17118	0.1981	2.00	34236	0.3963	3.00	Hydrant 69	7A, 7B, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22 Superior Ave. 15, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 27 Regina Cres.	1277-69
135	290.22	-	12	0	2.20	26	278.0	7339	269	7608	0	0	13083	0	13083	20692	0.2395	2.00	41383	0.4790	3.00	Hydrant 70	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 Regina Cres.	1277-71
136	290.50	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 68	24, 26, ?, 28, 30, 32, 34 and 36 Superior Ave.	1277-68
137	289.10	-	7	0	2.20	15	278.0	4281	157	4438	1	103	3271	0	3271	7812	0.0904	2.00	15623	0.1808	3.00	Hydrant 67	38, 40, 42, 44, 46, 48 and 50 Superior Ave. 1 institutional (Lion's Club)	1277-68
138	289.79	-	2	0	2.20	4	278.0	1223	45	1268	2	58569	0	0	0	59837	0.6926	2.00	119673	1.3851	3.00	Hydrant 73	7, ? Superior Ave. 1 institutional (Michipicoten Memorial Community Centre). 1 commercial (Wawa Motor Inn)	1277-67
139	290.47	-	0	0	2.20	0	278.0	0	0	0	3	1194	6542	0	6542	7736	0.0895	2.00	15472	0.1791	3.00	Hydrant 85	3 commercial (Petro Canada, Northern Chiropractic Clinic, Krazy Fries)	B41
140	288.65	-	0	0	2.20	0	278.0	0	0	0	1	171	0	0	0	171	0.0020	2.00	342	0.0040	3.00	Hydrant 134	1 institutional (Small station)	B41
141	288.00	-	0	0	2.20	0	278.0	0	0	0	3	3072	6542	0	6542	9614	0.1113	2.00	19228	0.2225	3.00	Hydrant 84	3 commercial (Home Building Center Garage, Home Building Centre, Young's General Store)	P1
142	286.50	-	0	0	2.20	0	278.0	0	0	0	5	8997	3271	156100	159371	168368	1.9487	2.00	336736	3.8974	3.00	Hydrant 135	4 commercial (Canco Wawa, Wesdome Gold Mines, Garages, Tim Hortons). I institutional (Lagoon Building).	P2
143	286.28	-	0	0	2.20	0	278.0	0	0	0	7	12319	9813	0	9813	22132	0.2562	2.00	44263	0.5123	3.00	Hydrant 77	1 commercial (Mission Motors). 5 institutional (Service Ontario, Ontario Ministry of Natural Resources, Government Storage Garages x7, Wawa Municipal Airport, Tourist Information Centre)	3675-3
144	284.75	282.59	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 1	120 Pinewood Dr.	3675-5
145	284.57	282.45	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 2	No demand	3675-5
146	284.03	281.81	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 3	No demand	3675-6
147	283.90	281.47	0	0	2.20	0	278.0	0	0	0	1	1291	0	0	0	1291	0.0149	2.00	2583	0.0299	3.00	-	1 commercial (Trans Canada Chrysler)	3675-6

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148	283.20	281.08	0	0	2.20	0	278.0	0	0	0	2	1888	0	0	0	1888	0.0219	2.00	3776	0.0437	3.00	Hydrant 4	2 commercial (Fountain Tire, Family Kitchen Restaurant Building)	3675-6	
149	282.89	280.68	0	0	2.20	0	278.0	0	0	0	2	3696	0	0	0	3696	0.0428	2.00	7393	0.0856	3.00	Hydrant 5	2 commercial (Esso Gas Station, Davidson Fuels)	3675-7	
150	282.05	279.37	0	0	2.20	0	278.0	0	0	0	3	10584	0	0	0	10584	0.1225	2.00	21168	0.2450	3.00	Hydrant 6	2 commercial (Highway 17 Motel, Gardewine). 1 institutional (OPP)	3675-7	
151	284.40	-	0	0	2.20	0	278.0	0	0	0	2	441	0	0	0	441	0.0051	2.00	882	0.0102	3.00	Hydrant 10	2 commercial (Superior Truck Repair Centre, Lakehead Freightway/Manitoulin Transport)	C05	
152	282.95	-	0	0	2.20	0	278.0	0	0	0	1	356	0	0	0	356	0.0041	2.00	712	0.0082	3.00	Hydrant 11	1 commercial (U-Haul Dealer)	C04	
153	282.15	-	0	0	2.20	0	278.0	0	0	0	0	0	2.00	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 12	No demand	C04	
154	281.85	-	0	0	2.20	0	278.0	0	0	0	1	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 9	1 commercial (Martel Customs)	C04	
155	280.60	-	0	0	2.20	0	278.0	0	0	0	1	484	0	0	0	484	0.0056	2.00	967	0.0112	3.00	Hydrant 8	1 commercial (building with red roof)	C03	
156	281.85	-	0	0	2.20	0	278.0	0	0	0	4	52214	0	0	0	52214	0.6043	2.00	104428	1.2087	3.00	Hydrant 7	4 commercial (building with red roof, building on cul-de-sac, Northstar Fusion, Evoluqen)	C03	
157	281.5	-	0	0	2.20	0	278.0	0	0	0	1	11	0	0	0	11	0.0001	2.00	22	0.0003	3.00	Hydrant 34	1 commercial (Algoma Storage)	-	Don't know real elevation
158	280.3	277.8	0	0	2.20	0	278.0	0	0	0	1	458	0	0	0	458	0.0053	2.00	917	0.0106	3.00	Hydrant 33	1 industrial (Algoma Highlands Wild Blueberry Farm)	A1-2002-62-P5	
159A	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
159	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
160A	248.5	245.9	1	0	2.20	2	278.0	612	22	634	2	1952	0	0	0	2586	0.0299	2.00	5172	0.0599	3.00	PRV Chamber	1 house by storage area. 2 commercial (Jones Power Sports, High Falls Motel & Cabins)	A1-2002-62-P2	
160B	248.5	245.9	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P2	
160	205.1	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	MRV Water Tower	No demand	1443-A-7	
161	205.1	202.6	0	0	2.20	0	278.0	0	0	0	1	6300	0	0	0	6300	0.0729	2.00	12600	0.1458	3.00	MRV Water Tower	Water Tower and Pumping Station	1443-A-7	
162	205.4	202.9	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 18	?, ? Hardy Ave.	1443-A-7	
163	205.1	202.5	10	0	2.20	22	278.0	6116	224	6340	1	481	0	0	0	6821	0.0789	2.00	13642	0.1579	3.00	Hydrant 17	?, ?, ?, ?, ?, ?, ? 315, and 317 Hardy Ave. 1 commercial (Your Room is Ready!)	1443-A-7	
164	205.9	203.4	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	309, 308, 307 and ? Queen St.	1443-A-6	
165	206.6	204.1	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 15	303, 302 and 301 Queen St. ? Blue Ave.	1443-A-6	
166	206.5	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 13	?, ?, ?, ? and ? Blue Cres,	-	Don't know real elevation
167	206	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 14	?, ? Blue Cres. ? Blue Ave.	-	Don't know real elevation
168	204.9	202.3	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	Hydrant 2	318, ?, ?, 313, 312 and 310 Blue Ave.	1443-A-13	
169	206.7	204.2	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	Hydrant 16	303 and ? Aberdeen St.	1443-A-12	
170	197.0	194.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 19	No demand	1443-A-5	
171	200.0	197.3	6	0	2.20	13	278.0	3670	134	3804	1	32	3271	0	3271	7107	0.0823	2.00	14213	0.1645	3.00	Hydrant 79	?, ?, ?, ?, ? and 308 Maggie Ave. 1 institutional (Wood Land Masonic Lodge)	1443-A-11	
172	193.0	190.3	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	No demand	1443-A-5	
173	190.0	187.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 20	No demand	1443-A-5	
174	190.7	188.1	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 23	339 Queen St. 312 and 311 Brock Ave.	1443-A-4	
175	191.1	188.1	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 24	?, ?, ?, 306, ?, 303 and 335 Brock Ave. 1 institutional (Angel's Equestrian Centre).	1443-A-4	
176	189.0	186.4	0	0	2.20	0	278.0	0	0	0	3	3213	0	156100	156100	159313	1.8439	2.00	318625	3.6878	3.00	Hydrant 25	2 commercial (shed on Superior St., Buck's Marina) 1 institutional (small building on Superior St.)	1443-A-3	
177	192.7	190.2	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 28	?, ? Superior St. ?, ? and ? Michipicoten Ave.	1443-A-8	
178	191.9	189.3	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 7	?, ?, ?, ? and ? Michipicoten Ave.	1443-A-9	
179	192.1	189.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0734	3.00	-	? Superior St. ?, ?, and ? Wawa St	1443-A-8	
180	189.9	187.4	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0147	3.00	Hydrant 21	?, ? and ? Wawa St.	1443-A-10	
181	190.1	187.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0440	3.00	Hydrant 26	? Superior St.	1443-A-8	
182	194.5	192.0	2	0	2.20	4	278.0	1223	45	1268	0	6542	0	6542	0	7810	0.0904	2.00	15620	0.0147	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
TOTAL			1103	219		2908		808535	29625	838160	178	453716	1020511	780499	1801010	3092885	35.80		6185771	71.49					
					MRV Population	156					In-town	369366													

Pipe	Starting Junction	Ending Junction	*Pipe Input for Length* Length	*Pipe Input for Diameter* Diameter	Material	*Pipe Input for Roughness Coef.* HW Roughness Coefficient	Object	Notes	Reference Drawing
1A	J1A	J1	38.19	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
1	J1	J2	75.15	150	Unknown	140	Pipe 136		WAT_Watermain_Table
2	J2	J3	68.1	150	Unknown	140	Pipe 798	art of watermain from 1st Ave. t	F22019_WaterMap_NorthSat
3	J3	J4	101.75	150	Unknown	140	Pipe 798	art of watermain from A St. to de	WAT_Watermain_Table
4	J1A	J5	66.61	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
5	J5	J6	112.2	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameter of 250mm, GIS not clear	F22019_WaterMap_NorthSat
6	J6	J7	9.6	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diametert of 250mm, GIS not clear	F22019_WaterMap_NorthSat
7	J5	J8	74.1	200	Unknown	140	South of Pipe 909	rom McKinley Ave. to Hydrant 13	F22019_WaterMap_NorthSat
8	J8	J9	109.73	200	Unknown	140	Pipe 909		WAT_Watermain_Table
9	J9	J10	138.7	150	Unknown	140	Pipes 889 and 890	Pipe 889 and part of 890	F22019_WaterMap_NorthSat
10	J10	J11	148.9	150	Unknown	140	Pipes 890 and 361	Part of pipes 890 and 361	F22019_WaterMap_NorthSat
11	J11	J12	151.6	150	Unknown	140	Pipe 361	Part of pipe 361, possibly 356	F22019_WaterMap_NorthSat
12	J12	J13	73.4	150	Unknown	140	Pipe 356		F22019_WaterMap_NorthSat
13	J13	J14	140.3	150	Unknown	140	Pipe 356 and 125	Part of 356, pipe 125	F22019_WaterMap_NorthSat
14	J14	J15	152.5	150	Unknown	140	Pipe 355 and 336	Pipe 355 and part of 336	F22019_WaterMap_NorthSat
15	J15	J16	516.8	150	Unknown	140	Pipe 338 and 336	Pipe 338 and part of 336	F22019_WaterMap_NorthSat
16	J16	J17	187.63	150	Unknown	140	Pipe 339 and 329	Length for pipe 339 and 329	WAT_Watermain_Table
17	J17	J18	179.7	150	Unknown	140	Pipe 326 and 319	Pipe 326 and part of 319	F22019_WaterMap_NorthSat
18	J9	J19	91.1	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
19	J19	J20	121.16	150	Unknown	140	Pipe 864		WAT_Watermain_Table
20	J19	J21	81.5	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
21	J21	J22	110.2	150	Unknown	140	-	No pipe number on map, diameter from as-built drawing	F22019_WaterMap_NorthSat
22	J21	J23	80.5	200	Unknown	140	Pipe 849	Pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
23	J23	J24	139.76	150	Unknown	140	Pipe 843		WAT_Watermain_Table
24	J23	J25	81.5	200	Unknown	140	Pipe 787		WAT_Watermain_Table
25	J25	J26	100	150	Unknown	140	Pipe 777		WAT_Watermain_Table
26	J25	J27	96.3	200	Unknown	140	-	ume same pipe properties as pipe	F22019_WaterMap_NorthSat
27	J27	J28	37.18	150	Unknown	140	Pipe 756		WAT_Watermain_Table
28	J28	J29	105.27	150	Unknown	140	Pipe 763		WAT_Watermain_Table
29	J28	J30	111.1	150	Unknown	140	-	e same pipe properties as pipes	F22019_WaterMap_NorthSat
30	J30	J31	104.03	150	Unknown	140	Pipe 676		WAT_Watermain_Table
31	J31	J32	196.9	150	Unknown	140	Pipes 679 and 680		F22019_WaterMap_NorthSat
32	J1	J33	136.6	150	Unknown	140	Pipe 831		F22019_WaterMap_NorthSat
33	J33	J34	71.87	150	Unknown	140	Pipe 835		WAT_Watermain_Table
34	J34	J35	43.43	150	Unknown	140	Pipe 837		WAT_Watermain_Table
35	J35	J36	125.73	150	Unknown	140	Pipe 836		WAT_Watermain_Table
36	J2	J37	148.1	150	Unknown	140	-	ume same properties and nearby	F22019_WaterMap_NorthSat
37	J37	J38	139.7	150	Unknown	140	Pipe 814		F22019_WaterMap_NorthSat
38	J3	J39	32.6	150	Unknown	140	Pipe 795	Part of pipe 795	F22019_WaterMap_NorthSat
39	J39	J40	131.83	150	Unknown	140	Pipe 799		WAT_Watermain_Table
40	J40	J41	94.49	150	Unknown	140	Pipe 800		WAT_Watermain_Table
41	J41	J42	78.3	100	Unknown	140	Pipe 137	Pipe 137 plus smaller pipes	F22019_WaterMap_NorthSat
42	J42	J43	103.5	150	Unknown	140	-	Unknown pipes and diameter	F22019_WaterMap_NorthSat
43	J43	J44	87.64	150	Unknown	140	Pipe 769		WAT_Watermain_Table
44	J39	J45	75.64	150	Unknown	140	Pipe 795		WAT_Watermain_Table
45	J25	J45	192.7	150	Unknown	140	Pipe 767	Pipe 767 plus other pipe(s)	F22019_WaterMap_NorthSat
46	J45	J44	109	150	Unknown	140	Pipe 772	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
47	J44	J46	172	150	Unknown	140	Pipe 686	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
48	J27	J47	65.7	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
49	J47	J48	102.7	150	Unknown	140	Pipe 695 and 699	Parts of pipe 695 and 699	F22019_WaterMap_NorthSat
50	J48	J46	96	150	Unknown	140	-	Unknown pipes, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
51	J46	J32	106.6	150	Unknown	140	Pipe 34	Pipe 34 plus other pipe(s)	F22019_WaterMap_NorthSat
52	J32	J49	21	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
53	J46	J50	103.4	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
54	J5	J51	72	200	Unknown	140	Pipe 893	Pipe 893 plus other pipe(s)	F22019_WaterMap_NorthSat
55	J51	J52	133.35	200	Unknown	140	Pipe 912		WAT_Watermain_Table
56	J52	J53	101	200	Unknown	140	Pipe 731		WAT_Watermain_Table
57	J53	J54	82.6	200	Unknown	140	-	Assuming same diameter as pipe 731	F22019_WaterMap_NorthSat
58	J6	J55	97.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
59	J55	J56	103.7	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
60	J52	J56	111.1	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
61	J7	J57	190.86	300	Unknown	140	Pipe 744		WAT_Watermain_Table

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62	J52	J34	104.8	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
63	J57	J56	8.5	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
64	J56	J58	95.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
65	J57	J59	95.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
66	J58	J59	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
67	J59	J60	102.87	150	Galvanized Steel	120	Pipe 711		WAT_Watermain_Table
68	J58	J61	97.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
69	J61	J54	118.95	150	Unknown	140	Pipe 713		WAT_Watermain_Table
70	J59	J62	97.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
71	J61	J62	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
72	J62	J63	18	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
73	J63	J64	107	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
74	J63	J65	129.6	150	Unknown	140	Pipe 663	Pipe 663 plus other pipes	F22019_WaterMap_NorthSat
75	J65	J66	192.4	150	Unknown	140	Pipe 669	Pipe 669 plus other pipes	F22019_WaterMap_NorthSat
76	J66	J67	123.86	150	Unknown	140	Pipe 637		WAT_Watermain_Table
77	J67	J64	94.54	150	Unknown	140	Pipe 636		WAT_Watermain_Table
78	J64	J68	87.9	150	Unknown	140	Pipe 626	Pipe 626 plus other pipes	F22019_WaterMap_NorthSat
79	J68	J69	157.7	150	Unknown	140	Pipe 607	Pipe 607 plus other pipes	F22019_WaterMap_NorthSat
80	J69	J70	157.5	150	Unknown	140	Pipe 641	Pipe 641 plus other pipes	F22019_WaterMap_NorthSat
81	J68	J71	194.7	150	Unknown	140	Pipe 610	Pipe 610 plus other pipes	F22019_WaterMap_NorthSat
82	J54	J72	155.11	200	Asbestos Cement	140	Pipes 651 and 612	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
83	J72	J73	55.63	150	Unknown	140	Pipe 613		WAT_Watermain_Table
84	J73	J68	102.7	150	Unknown	140	Pipe 581	Pipe 581 plus other pipes	F22019_WaterMap_NorthSat
85	J73	J74	115.06	150	Unknown	140	Pipe 598		WAT_Watermain_Table
86	J74	J75	80.77	150	Unknown	140	Pipe 595		WAT_Watermain_Table
87	J71	J75	103.23	150	Unknown	140	Pipe 603		F22019_WaterMap_NorthSat
88	J75	J76	84.7	150	Unknown	140	-	Unknown pipe, nearby pipes and as-builts show diameter of 150 mm	F22019_WaterMap_NorthSat
89	J75	J77	96.2	150	Unknown	140	Pipe 554		WAT_Watermain_Table
90	J77	J78	56.6	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
91	J78	J79	232.98	150	Asbestos Cement	140	Pipe 570		WAT_Watermain_Table
92	J79	J80	56.1	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
93	J77	J81	163.41	150	Asbestos Cement	140	Pipe 134		WAT_Watermain_Table
94	J81	J82	178.69	150	Asbestos Cement	140	Pipe 563		WAT_Watermain_Table
95	J82	J83	48.7	150	Asbestos Cement	140	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
96	J54	J84	160.9	200	Asbestos Cement	140	Pipe 541	Pipe 541 plus other pipes	F22019_WaterMap_NorthSat
97	J84	J85	55.86	200	Asbestos Cement	140	Pipe 542	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
98	J84	J86	88.03	200	Asbestos Cement	140	Pipe 547		WAT_Watermain_Table
99	J84	J87	106.4	150	Asbestos Cement	140	-	ssume same properties as pipe 13	F22019_WaterMap_NorthSat
100	J86	J87	14.4	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
101	J87	J88	91.81	150	Asbestos Cement	140	Pipe 112		WAT_Watermain_Table
102	J88	J89	72.73	200	PVC	150	Pipe 941		WAT_Watermain_Table
103	J86	J90	210.34	200	Asbestos Cement	140	Pipe 535		WAT_Watermain_Table
104	J90	J91	41.91	200	Asbestos Cement	140	Pipe 533		WAT_Watermain_Table
105	J91	J92	88.39	150	Asbestos Cement	140	Pipe 498		WAT_Watermain_Table
106	J88	J93	132.00	150	Asbestos Cement	140	Pipe 520	Pipe 520 plus other pipes	F22019_WaterMap_NorthSat
107	J93	J94	127.25	150	Asbestos Cement	140	Pipe 524		WAT_Watermain_Table
108	J87	J95	79.3	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
109	J95	J73	90.0	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
110	J95	J96	43.4	150	Unknown	140	Pipe 577	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
111	J96	J76	141.91	150	Unknown	140	Pipe 594		WAT_Watermain_Table
112	J76	J97	94.2	150	Unknown	140	Pipe 583	Pipe 583 plus other pipes	F22019_WaterMap_NorthSat
113	J96	J97	189.8	150	Unknown	140	Pipe 577	Pipe 577 plus other pipes	F22019_WaterMap_NorthSat
114	J97	J98	159.9	150	Unknown	140	Pipe 589	Pipe 589 plus other pipes	F22019_WaterMap_NorthSat
115	J98	J99	68.82	150	PVC	150	Pipe 559		WAT_Watermain_Table
116	J98	J80	98.4	150	Asbestos Cement	140	Pipe 552	Pipe 552 plus other pipes	F22019_WaterMap_NorthSat
117	J80	J83	94.38	150	Asbestos Cement	140	Pipe 104		WAT_Watermain_Table
118	J83	J100	121.5	150	Asbestos Cement	140	Pipe 518	Part of pipe 518 and other pipes	F22019_WaterMap_NorthSat
119	J100	J101	99.6	150	Asbestos Cement	140	Pipe 518	Part of pipe 518	F22019_WaterMap_NorthSat
120	J99	J102	134.56	150	PVC	150	Pipe 661		WAT_Watermain_Table
121	J102	J101	67.06	150	PVC	150	Pipe 656		WAT_Watermain_Table
122	J99	J103	56.5	150	PVC	150	-	ssume same properties as pipe 55	F22019_WaterMap_NorthSat
123	J103	J104	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
124	J104	J105	94.2	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
125	J104	J106	105.32	50	PVC	150	Pipe 103		WAT_Watermain_Table
126	J103	J107	147.26	150	Asbestos Cement	140	Pipe 653		WAT_Watermain_Table
127	J107	J108	75.1	150	Unknown	140	Pipe 513	Part of pipe 513	F22019_WaterMap_NorthSat
128	J108	J109	69.9	150	Unknown	140	Pipe 513	Part of pipe 513 and other pipes	F22019_WaterMap_NorthSat
129	J109	J101	46.5	150	Unknown	140	-	ssume same properties as pipe 54	F22019_WaterMap_NorthSat
130	J107	J110	95.55	150	Unknown	140	Pipe 503		WAT_Watermain_Table
131	J110	J111	130.2	150	Unknown	140	Pipe 506	Pipe 506 plus other pipes	F22019_WaterMap_NorthSat
132	J111	J112	131.3	150	Unknown	140	Pipe 488	Part of pipe 488	F22019_WaterMap_NorthSat
133	J112	J113	178.9	150	Unknown	140	Pipe 488	Part of pipe 488 and other pipes	F22019_WaterMap_NorthSat
134	J113	J50	47.71	150	Unknown	140	Pipe 33		WAT_Watermain_Table
135	J50	J114	109.0	150	Asbestos Cement	140	Pipe 491	Pipe 491 plus other pipes	F22019_WaterMap_NorthSat
136	J114	J115	140.8	150	Asbestos Cement	140	Pipe 402	Pipe 402 plus other pipes	F22019_WaterMap_NorthSat
137	J114	J116	159.6	200	PVC	150	Pipe 24	Pipe 24 plus other pipes	F22019_WaterMap_NorthSat
138	J116	J117	143.1	200	PVC	150	Pipes 27 and 393	Pipes 27 and 392 plus other pipes	F22019_WaterMap_NorthSat
139	J117	J118	140.23	200	PVC	150	Pipe 385		WAT_Watermain_Table
141	J114	J120	92.0	150	Asbestos Cement	140	Pipe 26	Pipe 26 plus other pipes	F22019_WaterMap_NorthSat
142	J120	J121	144.2	150	Asbestos Cement	140	Pipes 369 and 25	Pipes 369 and 25 plus other pipes	F22019_WaterMap_NorthSat
143	J121	J122	49.9	150	Asbestos Cement	140	Pipe 379		WAT_Watermain_Table
147	J124	J125	137.16	150	Asbestos Cement	140	Pipe 28		WAT_Watermain_Table
148	J125	J126	137.16	150	Asbestos Cement	140	Pipes 29 and 410	As-built length for pipe 410	WAT_Watermain_Table
149	J126	J115	160.0	150	Asbestos Cement	140	Pipe 408	Pipe 408 plus other pipes	F22019_WaterMap_NorthSat
150	J115	J127	111.56	150	Asbestos Cement	140	Pipe 435		WAT_Watermain_Table
152	J128	J129	85.3	150	Asbestos Cement	140	Pipe 425	Part of pipe 425	F22019_WaterMap_NorthSat
153	J129	J130	149.7	150	Asbestos Cement	140	Pipes 423 and 418	Part of pipes 423 and 418	F22019_WaterMap_NorthSat
154	J130	J131	170.4	150	Asbestos Cement	140	Pipe 422	Pipe 422 plus other pipes	F22019_WaterMap_NorthSat
155	J131	J127	119.8	50	Asbestos Cement	140	Pipe 434	Pipe 434 plus other pipes, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
156	J127	J132	100.0	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
157	J111	J132	93.87	150	Asbestos Cement	140	Pipe 484		WAT_Watermain_Table
158	J132	J133	106.9	150	Asbestos Cement	140	Pipe 450	Pipe 450 plus other pipes	F22019_WaterMap_NorthSat
159	J131	J133	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 45	F22019_WaterMap_NorthSat
160	J133	J134	173.6	150	Asbestos Cement	140	Pipe 457	Pipe 457 plus other pipes	F22019_WaterMap_NorthSat
161	J132	J135	188.4	150	Asbestos Cement	140	Pipe 469	Pipe 469 plus other pipes	F22019_WaterMap_NorthSat
162	J135	J134	130.9	150	Asbestos Cement	140	Pipe 465	Pipe 465 plus other pipes	F22019_WaterMap_NorthSat
163	J134	J136	141.1	150	Asbestos Cement	140	Pipe 458		WAT_Watermain_Table
164	J136	J137	158.5	150	Asbestos Cement	140	Pipe 477		WAT_Watermain_Table
165	J137	J138	227.9	150	Asbestos Cement	140	Pipes 474 and 37		WAT_Watermain_Table
166	J138	J109	262.3	150	Asbestos Cement	140	Pipes 151 and 277	Pipes 151 and 277 plus other pipes	F22019_WaterMap_NorthSat
167	J101	J139	187.4	250	PVC	150	Pipe 551	Pipe 551 plus other pipes	F22019_WaterMap_NorthSat
168	J139	J140	140.13	250	PVC	150	Pipes 309 and 310		WAT_Watermain_Table
169	J140	J141	143.46	250	PVC	150	Pipe 930		WAT_Watermain_Table
170	J141	J142	569.8	250	PVC	150	Numerous	Assuming as-builts are correct, GIS shows some pipes as 37 mm	F22019_WaterMap_NorthSat; F22019_WaterMap_Mid
171	J142	J143	612.3	250	PVC	150	Pipes 330, 335 and 41	es 330, 335 and 41 plus other pi	F22019_WaterMap_Mid
172	J143	J144	745.0	250	PVC	150	Pipes 145, 146, 147, 44 and 46		WAT_Watermain_Table
173	J144	J145	172.3	250	PVC	150	Pipe 55	Pipe 55 plus other pipes	F22019_WaterMap_Mid
174	J145	J146	206.0	250	PVC	150	Pipe 58		WAT_Watermain_Table
175	J146	J147	75.4	250	PVC	150		ssume same properties as pipe 5	F22019_WaterMap_Mid
176	J147	J148	103.0	250	PVC	150	Pipe 68		WAT_Watermain_Table
177	J148	J149	150.0	250	PVC	150	Pipe 71		WAT_Watermain_Table
178	J149	J150	222.0	250	PVC	150	Pipe 75	Pipe 75 plus other pipes	F22019_WaterMap_Mid
179	J147	J151	123.73	150	PVC	150	Pipe 66		WAT_Watermain_Table
180	J151	J152	158.6	150	PVC	150	Pipes 96 and 99		WAT_Watermain_Table
181	J152	J153	137.00	150	PVC	150	Pipe 93		WAT_Watermain_Table
182	J153	J154	91.5	150	PVC	150	Pipe 100		WAT_Watermain_Table
183	J154	J155	93.25	150	PVC	150	Pipe 84		WAT_Watermain_Table

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184	J155	J156	129.0	150	PVC	150	Pipes 88 and 87		WAT_Watermain_Table	
185	J156	J150	103.0	150	PVC	150	Pipe 83		WAT_Watermain_Table	
186	J150	J157	161.1	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
187	J157	J158	185.0	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
188	J158	J159A	466.8	150	PVC	150	Pipe 279	Pipe 279 plus other pipes	F22019_WaterMap_South	
189	J159	J160A	1933.9	150	CU	135	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300 plus other pipes	F22019_WaterMap_South	Assumed CU is copper
189A	J160B	J160	929.5	150	CU	135	Pipes 301, 302, 315 and 313	Pipes 301, 302, 315 and 313 plus other pipes	F22019_WaterMap_South	
190	J161	J162	101.6	200	PVC	150	Pipe 196	Pipe 196 plus other pipes	F22019_WaterMap_South	
191	J162	J163	149.2	200	PVC	150	Pipe 312	Pipe 312 plus other pipes	F22019_WaterMap_South	
192	J163	J164	87.8	150	PVC	150	Pipe 199	Pipe 199 plus other pipes	F22019_WaterMap_South	
193	J164	J165	75.1	150	PVC	150	Pipe 197	Pipe 197 plus other pipes	F22019_WaterMap_South	
194	J164	J166	136.0	150	PVC	150	Pipe 153		WAT_Watermain_Table	
195	J166	J167	177.0	150	PVC	150	Pipe 156		F22019_WaterMap_South	
196	J167	J165	141.39	150	PVC	150	Pipes 165 and 166		WAT_Watermain_Table	
197	J165	J168	207.4	150	PVC	150	Pipes 311 and 175	Pipes 311 and 175 plus other pipes	F22019_WaterMap_South	
198	J168	J169	167.6	150	PVC	150	Pipes 177 and 178	Pipes 177 and 178 plus other pipes	F22019_WaterMap_South	
199	J169	J163	183.1	150	PVC	150	Pipe 182	Pipe 182 plus other pipes	F22019_WaterMap_South	
200	J163	J170	166.5	200	PVC	150	Pipe 255	Pipe 255 plus other pipes	F22019_WaterMap_South	
201	J170	J171	233.5	150	PVC	150	Pipes 275 and 276	Pipes 275 and 276 plus other pipes	F22019_WaterMap_South	
202	J170	J172	122.8	200	PVC	150	Pipe 263	Pipe 263 plus other pipes	F22019_WaterMap_South	
203	J172	J173	81.3	200	PVC	150	Pipe 267	Pipe 267 plus other pipes	F22019_WaterMap_South	
204	J173	J174	128.8	200	PVC	150	Pipe 273	Pipe 273 plus other pipes	F22019_WaterMap_South	
205	J174	J175	178.9	200	PVC	150	Pipe 216	Pipe 216 plus other pipes	F22019_WaterMap_South	
206	J175	J176	88.8	200	PVC	150	Pipe 222	Pipe 222 plus other pipes	F22019_WaterMap_South	
207	J175	J177	89.4	150	PVC	150	Pipe 235	Pipe 235 plus other pipes	F22019_WaterMap_South	
208	J173	J178	102.50	150	PVC	150	Pipe 207		WAT_Watermain_Table	
209	J178	J177	68.68	150	PVC	150	Pipe 210		WAT_Watermain_Table	
210	J177	J179	96.0	150	PVC	150	Pipe 242	Part of pipe 242 and other pipes	F22019_WaterMap_South	
211	J172	J180	59.5	150	PVC	150	-	ssume same properties as pipe 20	F22019_WaterMap_South	
212	J180	J179	116.3	150	PVC	150	Pipe 205		F22019_WaterMap_South	
213	J179	J181	72.78	150	PVC	150	Pipe 242		WAT_Watermain_Table	
214	J181	J182	148.8	150	PVC	150	Pipe 246	Pipe 235 plus other pipes	F22019_WaterMap_South	

Yellow cells are assumed values

EPANet Current Model Inputs

Wawa W&WW Master Plan
M22019
P. King

						Water Model Calculations				Flow Meter Data			
Water Model Node	**ICI Uses**	**Address**	**Type**	**Footprint (m2)**	**Footprint (ha)**	**Estimated Occupancy**	**Units**	**Flow Rate**	**ADD (L/day)**	**Average (L/day)**	**ADD (L/day)**	**Design ADD (L/day)**	**Notes**
J1A	Water Treatment Plant	40C Broadway Ae.	Industrial	1828	0.1828	-	m3/ha/d	45	8226			8226	
	LCBO		Commercial										
	Algoma Public Health	16 Ganley St.	Commercial - Office							4067	4881	4881	
J5	Home Town Wines		Commercial - Personal Service Shop	1262	0.1262	11	L/p/d	278.0	3017				
	Superior East Community Futures Development Corporation		Commercial - Office										
	Algoma District Services Administration Board	52 Broadway Ave.	Commercial - Office							0	0	0	
	North Algoma Literacy Colaition	50B Broadway Ave.	Commercial - Office							231	277	277	
J6	Garage Behind Bowling Alley	Ganley St.	Storage Garage	137	0.0137	3	L/p/d	75	223			223	
J7	Low Lift Pumping Station	-	Industrial	616	0.0616	-	m3/ha/d	45	2772			2772	
	The Thrift Barn	45 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	635	762	762	
	Square Three	43 Broadway Ave.	Commercial	494	0.0494	4	L/p/d	278.0	1181	60	72	72	
	The Brick	41 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	28	33	33	
	Sonia Video	39 Broadway Ave.	Commercial	497	0.0497	4	L/p/d	278.0	1189			1189	
	The Co-operators	37 Broadway Ave.	Commercial - Office	536	0.0536	5	L/p/d	278.0	1281	3068	3681	3681	
J8	Alzheimers Society		Commercial - Office										
	Canada Post Office	44 Broadway Ave.	Commercial	971	0.0971	8	L/p/d	278.0	2321	441	529	529	
	OPP Station	42 Broadway Ave.	Commercial - Office										
	Municipal Offices	40 Broadway Ave.	Commercial - Office	1389	0.1389	12	L/p/d	278.0	3321	2036	2443	2443	
	Public Library	40 Broadway Ave.	Commercial										
	Wawa Volunteer Fire Department	12 Ontario St.	Storage Garage	480	0.0480	10	L/p/d	75	783			783	
	March of Dimes Canada	31 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	757	908	908	
	Northern Vision Care	29 Broadway Ave.	Commercial - Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	600	720	720	
	Lai's Restaurant	27 Broadway Ave.	Commercial - Dining	460	0.046	4	L/p/d	278.0	1100	4066	4879	4879	
J9	Empty Building	25 Broadway Ave.	Storage	426	0.0426	9	L/p/d	75	695			695	
	SpikeMills Art Gallery	28 Broadway Ave.	Commercial	227	0.0227	2	L/p/d	278.0	543				
	Lakeview Hotel - Hotel Rooms	28 Broadway Ave.	Hotel	-	-	31	L/bed-space-day	225	6975	10459	12550	12550	7 one bed rooms, 7 double bed rooms, 5 apartment rooms (assuming 2 beds)
	Lakeview Hotel - Motel Rooms	28 Broadway Ave.	Motel	-	-	22	L/bed-space-day	175	3850				11 motel rooms (assuming 2 beds)
	Lakeview Restaurant	28 Broadway Ave.	Commercial - Dining	173	0.0173	1	L/p/d	278.0	414				Assuming second floor of part of the building
	Iris Place	21 Broadway Ave.	Commercial	552	0.0552	5	L/p/d	278.0	1320			1320	
	Empty Building	16 Broadway Ave.	Storage	150	0.015	3	L/p/d	75	245			245	
J10	Beachfront Trading Post	14 Broadway Ave.	Commercial	464	0.0464	4	L/p/d	278.0	1109	18032	21638	21638	
	Canadian Red Cross	4 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	67	81	81	
	Public Washrooms	15 Broadway Ave.	Commercial	897	0.0897	8	L/p/d	278.0	24937	267	321	321	
	Garage	2 Broadway Ave.	Storage Garage	193	0.0193	4	L/p/d	75	315	563	676	676	
J11	Calvary Penecostal Church	12 Government Rd.	Commercial - Fixed Seats	1410	0.141	31	L/p/d	278.0	8521	412	495	495	Included as commercial, measured with google earth as house on same lot
	Lady Dunn Health Centre	17 Government Rd.	Hospital	-	-	28	L/(bed-day)	1350	37800	24275	29130	29130	10 acute care beds, 2 respite beds, and 16 long term care beds
J13	Garage	17 Government Rd.	Storage Garage	202	0.0202	4	L/p/d	75	329	3	4	4	Assume this is the small meter for 17 Government Rd.
	Algoma District Paramedic Service	Government Rd.	Commercial Office	364	0.0364	3	L/p/d	278.0	871			871	
J17	Leverington's Garden Centre	130 Government Rd.	Industrial - Process Room	3923	0.3923	-	m3/ha/d	45	17654	351	422	422	Residential in water meter data
J18	Lloyd's of Wawa	165 Government Rd.	Storage Garage	477	0.0477	10	L/p/d	75	778	17	20	20	
	Wagging Tails Kennel	171 Government Rd.	Commercial	296	0.0296	3	L/p/d	278.0	708	677	813	813	
	Everything Floors Ltd.	9 Mackey St.	Commercial	575	0.0575	5	L/p/d	278.0	1375	950	1140	1140	
J19	Wawa Handy Store	19 Mackey St.	Commercial	456	0.0456	4	L/p/d	278.0	1090	9194	11033	11033	
	Empty Building	Mackey St.	Storage Garage	660	0.066	14	L/p/d	75	1076			1076	
J20	United Supply/Swish	4 McKinley Ave.	Commercial	688	0.0688	6	L/p/d	278.0	1645	155	186	186	
	Superior North Mobile Vetrinary Service	23 Mackey St.	Commerial - Personal Service Shop	464	0.0464	4	L/p/d	278.0	1110			1110	
J21	A Touch of Glass	25 Mackey St.	Commercial - Personal Service Shop	235	0.0235	2	L/p/d	278.0	562			562	
	Sir James Dunn Public School	36 McKinley Ave.	School	-	-	87	L/student/d	105	9135	8595	10314	10314	87 students and 21 staff
J24	Children's Aid Society of Algoma	31 Algoma St.	Commercial - Office	147	0.0147	1	L/p/d	278.0	351	135	162	162	
J25	Bell	56 Ganley St.	Commercial	930	0.093	8	L/p/d	278.0	2223	9	10	10	
	Wawa Laundromat	44 Mackey St.	Commercial	465	0.0465	4	L/p/d	278.0	1112	1907	2289	2289	
J30	Old Garage	62 Mackey St.	Storage Garage	230	0.0230	5	L/p/d	75	375			375	
J31	Superior Children's Centre	41 Algoma St.	Daycare	665	0.0665	6	L/p/d	278.0	1590	759	910	910	Assumed like commercial; Included as residential in water meter data
J34	Paint + Glass	Caverhill St.	Storage	275	0.0275	6	L/p/d	75	448			448	
	Creation Hairstyling	75A McKinley Ave.	Commercial-Personal Service Shop	232	0.0232	2	L/p/d	278.0	555	601	721	721	Assumed half of lot
J35	Home	75 McKinley Ave.	Commercial	232	0.0232	2	L/p/d	278.0	555	332	398	398	Assumed half of lot
J36	Sam's Place	84 McKinley Ave.	Commercial-Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	652	783	783	
J41	St. Paul's Anglican Church	60 Second Ave.	Commercial - Fixed Seats	930	0.0930	8	L/p/d	278.0	2223	148	178	178	
J49	Michipicoten Non-Profit Housing	40 Hillcrest Ave.	Commercial - Office	293	0.0293	3	L/p/d	278.0	701	994	1193	1193	Included as multi-residential in water meter data
	Canadian Tire	54 Broadway Ave.	Commercial	2524	0.2524	22	L/p/d	278.0	6034	6145	7374	7374	
	Dawson & Keenan	56 Broadway Ave.	Commercial - Office	465	0.0465	4	L/p/d	278.0	1112	8864	10637	10637	
J51	Roxy Bowling Centre	49 Broadway Ave.	Commercial	632	0.0632	5	L/p/d	278.0	1511	811	973	973	
	The Royal Canadian Legion	51 Broadway Ave.	Commercial	567	0.0567	5	L/p/d	278.0	1356	9272	11127	11127	Included as residential in water meter data
	Sam's Foodline	55 Broadway Ave.	Commercial	1990	0.1990	17	L/p/d	278.0	4757			4757	
	Allemano & Fitzgerald	55 Broadway Ave.	Commercial - Office	301	0.0301	3	L/p/d	278.0	719			719	
	Feifel, Broadbent and Gualazzi	57 Broadway Ave.	Commercial - Office	277	0.0277	2	L/p/d	278.0	662	1	1	1	
	Wawa Jewellers	59 Broadway Ave.	Commercial	376	0.0376	3	L/p/d	278.0	899	111	134	134	
	The Bargain! Shop	60 Broadway Ave.	Commercial	930	0.093	8	L/p/d	278.0	2223	242	290	290	
	AJ's Pizza & Wholesale	64 Broadway Ave.	Commercial - Kitchen	475	0.0475	4	L/p/d	278.0	1136	322	386	386	
	Best Start Hub	66 Broadway Ave.	Daycare	383	0.0383	3	L/p/d	278.0	916	673	807	807	Assumed like commercial; Included as residential in water meter data

EPANet Current Model Inputs

	North of 17 Restaurant	68 Broadway Ave.	Commercial - Dining	753	0.0753	6	L/p/d	278.0	1800	4002	4803	4803	
	Embassy Restaurant	70 Broadway Ave.	Commercial - Dining	486	0.0486	4	L/p/d	278.0	1162	1798	2158	2158	
	RBC Royal Bank	72 Broadway Ave.	Commercial - Personal Service Shop	480	0.048	4	L/p/d	278.0	1148	595	714	714	
J52	Wawa Dental Centre	27A Gold St.	Commercial - Personal Service Shop	1007	0.1007	9	L/p/d	278.0	2408	1982	2378	2378	
	Wawa Pharmacy		Commercial										
	Wawa Goose Senior Centre	63 Broadway Ave.	Commercial	460	0.0460	4	L/p/d	278.0	1100	676	812	812	
	Barber Shop		Commercial - Personal Service Shop										
	U Wanna Cab	65 Broadway Ave.	Commercial - Office	457	0.0457	4	L/p/d	278.0	1093	429	514	514	
	Regional Employment Help Centre		Commercial - Office										
	Chic'N Swell	67 Broadway Ave.	Commercial - Personal Service Shop	462	0.0462	4	L/p/d	278.0	1105	383	459	459	
	Guided Fishing Trips		Commercial - Office										
	Columbia Restaurant & Pizzeria	71 Broadway Ave.	Commercial - Dining	462	0.0462	4	L/p/d	278.0	1105	3642	4370	4370	
	Parish of St. Monica	78 Broadway Ave.	Commercial - Fixed Seats	1859	0.1859	16	L/p/d	278.0	4444	259	311	311	2 water meters for this address, assume both are for the Church
	The Algoma News Review	33 St. Marie St.	Commercial	833	0.0833	7	L/p/d	278.0	1992	478	573	573	
	ANP Office Supply		Commercial										
J53	Fenlon's Pharmacy	88 Broadway Ave.	Commercial	1298	0.1298	11	L/p/d	278.0	3103	1468	1761	1761	
	Northern	Broadway Ave.	Commercial	1407	0.1407	12	L/p/d	278.0	3363			3363	
	Yellow Building	Broadway Ave.	Storage	132	0.0132	3	L/p/d	75	215			215	
	Algoma Family Services	26 St. Marie St.	Commercial - Office	833	0.0833	7	L/p/d	278.0	1992	1835	2201	2201	2 water meters for this address
	Bangin Burger N Chicken Shack	92 Broadway Ave.	Commercial - Kitchen	465	0.0465	4	L/p/d	278.0	1112	182	219	219	
J54	Economic Development Corporation of Wawa	96 Broadway Ave.	Commercial - Office	930	0.0930	8	L/p/d	278.0	2223	3168	3801	3801	Assume 50% of building
	JJAM FM		Commercial - Office										Assume 50% of building
	Ontario Mine Rescue Algoma District Station	36 Montreal Ave.	Commercial - Office	1463	0.1463	13	L/p/d	278.0	3498	0	0	0	
J69	Garage	42 Montreal Ave.	Storage Garage	504	0.0504	11	L/p/d	75	822	40	49	49	Assuming this is 42, although streetview shows 40 and no 42
	Municipality of Wawa Infrastructure Services Department	26 Magpie Rd.	Commercial - Office	3503	0.3503	30	L/p/d	278.0	8375	1842	2211	2211	2 water meters for this address, assume both are for this building
	The Shop	46 Montreal Ave.	Commercial	1227	0.1227	11	L/p/d	278.0	2934	977	1172	1172	
J71	Millette General Contractors Ltd.	Montreal Ave.	Commercial	1040	0.1040	9	L/p/d	278.0	2487			2487	
	The Ship Boy Scouts Wawa Rotary Club	Montreal Ave.	Commercial - Office	55	0.0055	0	L/p/d	278.0	133			133	
J75	Home	12 Klondike St.	Commercial	138	0.0138	1	L/p/d	278.0	330	238	286	286	
	Garage		Storage Garage	289	0.0289	6	L/p/d	75	471				
J77	Garage	142 Broadway Ave.	Storage Garage	361	0.0361	8	L/p/d	75	589	537	645	645	
	Garage		Storage Garage	182	0.0182	4	L/p/d	75	297				
J82	Mobile Home Park	Trailer Park Rd.	Mobile Home Park	-	-	23	L/space/d	1000	23000	15505	18606	18606	
	Ecole Publique L'Escalade	52 Winston Rd.	School	-	-	10	L/student/d	105	1050	244	293	293	10 students and 5 staff
J84	First United Church	224 Mission Rd.	Commercial - Fixed Seats	2189	0.2189	19	L/p/d	278.0	5233	22	26	26	
	Circle K	208D Mission Rd.	Commercial							463	555	555	
J86	Northern Credit Union	208 Mission Rd.	Commercial - Personal Service Shop	2031	0.2031	17	L/p/d	278.0	4856	126	151	151	
	Empty Store	208 Mission Rd.	Commercial							89	107	107	
J87	Watson's Algoma Vacations Ltd.	195 Mission Rd.	Office	1041	0.1041	9	L/p/d	278.0	2489	851	1021	1021	
J88	Big Bird Inn	191 Mission Rd.	Hotel	-	-	90	L/bed-space-day	225	20250	1643	1972	1972	50 rooms, 40 double beds and 10 single beds
	Independent Grocery Store	186 Mission Rd.	Commercial	3291	0.3291	28	L/p/d	278.0	7868	1034	1240	1240	
J89	Subway	179 Mission Rd.	Commercial - Dining	2139	0.2139	18	L/p/d	278.0	5114	2980	3576	3576	
	Movie Gallery		Commercial										
	The Viking Restaurant	177 Mission Rd.	Commercial - Dining	1818	0.1818	16	L/p/d	278.0	4346	233	280	280	
	Polish Alliance of Canada	Mission Rd.	Commercial - Non-Fixed Seats and Tables	1364	0.13641583	12	L/p/d	278.0	3261			3261	
J91	Michipicoten High School	86 Magpie Rd.	School	-	-	100	L/student/d	105	10500	10326	12392	12392	120 people, guessing around 100 are students; 2 water meters for this address
J92	St. Augustine	2 Arnott Ave.	School	-	-	100	L/student/d	105	10500	587	704	704	Similar to Michipicoten High School
J99	Outdoorsman Motel	171 Mission Rd.	Motel	-	-	55	L/bed-space-day	175	9625	5094	6113	6113	37 rooms and 55 beds
J100	Kingdom Hall of Jehovah's Witness	54 Winston Rd.	Commercial - Fixed Seats	929	0.0929	8	L/p/d	278.0	2221	151	181	181	
	Wawa Rent-all and Repair	58 Winston Rd.	Commercial	1465	0.1465	13	L/p/d	278.0	3503	305	366	366	
J101	Garage	60 Winston Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331			331	
	Gator's Steakhouse Building	47 Mission Rd.	Commercial - Office	2023	0.2023	17	L/p/d	278.0	4837			4837	
J102	T Cannabis	152 Mission Rd.	Commercial	1302	0.1302	11	L/p/d	278.0	3113	1410	1692	1692	
	Beer Store	156 Mission Rd.	Commercial	1990	0.199	17	L/p/d	278.0	4758	3176	3811	3811	
J103	Algoma Motel	164 Mission Rd.	Motel	-	-	26	L/bed-space-day	175	4550	3124	3748	3748	https://www.algomamotel.com/#gallery (705-856-7010)
	Bristol Motel	170 Mission Rd.	Motel	-	-	32	L/bed-space-day	175	5600	4564	5477	5477	Can't get working phone number or email
J109	Kerry Funeral Home	140 Churchill Ave.	Commercial - Fixed Seats	651	0.0651	6	L/p/d	278.0	1556	925	1110	1110	
	Beaver Motel	148 Mission Rd.	Motel	-	-	25	L/bed-space-day	175	4375	3116	3740	3740	6 double rooms and 13 single rooms
J111	Ecole St. Joseph	101 Churchill Ave.	School	-	-	205	L/student/d	105	21525	1934	2320	2320	205 students and 32 staff
J120	Confederation College Building	3 Maple St.	Storage	964	0.0964	21	L/p/d	75	1572	495	594	594	2 water meters for this address
J137	Lion's Club	51 Superior Ave.	Commercial - Non-Fixed Seats and Tables	236	0.0236	2	L/p/d	278.0	564	85	103	103	Included as residential in water meter data
	Michipicoten Memorial Community Centre	3 Chris Simon Dr.	Space with Fixed Seats	5838	0.5838	50	L/p/d	278.0	13957	6454	7744	7744	
J138	Wawa Motor Inn	118 Mission Rd.	Motel	-	-	175	L/bed-space-day	175	30625	40407	48488	48488	Assumed higher flow rate for motel
	Wawa Motor Inn - Wawa Goose Bar & Grill	118 Mission Rd.	Commercial - Dining	615	0.0615	5	L/p/d	278.0	1470	1947	2336	2336	Assumed lower flow rate for restaurant
	Petro Canada	137 Mission Rd.	Commercial	2151	0.2151	18	L/p/d	278.0	5143	781	937	937	
J139	Northern Chiropractic	135 Mission Rd.	Commercial - Personal Service Shop	135	0.0135	1	L/p/d	278.0	323	142	170	170	
	Krazy Fries	135B Mission Rd.	Commercial - Kitchen	71	0.0071	1	L/p/d	278.0	170	73	88	88	
J140	Small Station	Mission Rd.	Industrial	38	0.0038	-	m3/ha/d	45	171			171	
	Home Building Centre Garage	109 Mission Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331				
J141	Home Building Centre		Commercial	885	0.0885	8	L/p/d	278.0	2116	98	118	118	
	Young's General Store	111 Mission Rd.	Commercial	2021	0.2021	17	L/p/d	278.0	4832	2462	2954	2954	
	Lagoon Building	Road to Golf Course	Industial	201	0.0201	-	m3/ha/d	45	905			905	A tap is used here to flush the line according to Municipality.
	Canco	125 Mission Rd.	Commercial	2083	0.2083	18	L/p/d	278.0	4980	1621	1946	1946	Think this address is Canco from online search although it doesn't match up with map
J142	Wesdome	93 Mission Rd.	Industrial	373	0.0373	-	m3/ha/d	45	1679	464	557	557	

EPANet Current Model Inputs

	Garages	89 Mission Rd.	Storage Garage	515	0.0515	11	L/p/d	75	840	151	181	181	
	Tim Hortons	92 Mission Rd.	Commercial - Dining	7977	0.7977	69	L/p/d	278.0	19071	4507	5409	5409	
	Mission Motors	61 Mission Rd.	Commercial	715	0.0715	6	L/p/d	278.0	1709	1425	1710	1710	
	Service Ontario	48 Mission Rd.	Commercial - Personal Service Shop	1204	0.1204	10	L/p/d	278.0	2879	947	1137	1137	Assume first 48 Mission road is Service Ontario
	Ontario Ministry of Natural Resources	48 Mission Rd.	Commercial - Office	394	0.0394	3	L/p/d	278.0	942	8	9	9	Assume second 48 Mission Road is OMNR
	Government Storage Garages (x7)	48 Mission Rd.	Storage Garage	2321	0.2321	50	L/p/d	75	3784	5911	7093	7093	Assume third 48 Mission Road is for other buildings
J143	Storage Sheds on Highway 17 W	Highway 17 W	Storage Garage	2506	0.2506	54	L/p/d	75	4086	792	950	950	Only facility on highway 17 that looks like it could have an in-town service connection
		27A Mission Rd.	Commercial	224	0.0224	2	L/p/d	278.0	536	577	692	692	Assume 27A is for the main building; has three water meters
	Wawa Municipal Airport	27B Mission Rd.	Storage Garage	192	0.0192	4	L/p/d	75	313	105	126	126	Assume 27B is for the garage and hanger
			Aircraft Hanger	555	0.0555	12	L/p/d	75	905				Assume 27B is for the garage and hanger
	Tourist Information Centre	Mission Rd.	Shopping Centre	334	0.0334	3	L/p/d	278.0	799	501	602	602	Added three meters on Mission roads without addresses here as it is furthest distance.
J147	Trans Canada Chrysler	74 Pinewood Dr.	Commercial	875	0.0875	8	L/p/d	278.0	2092	1076	1291	1291	
J148	Fountain Tire	70 Pinewood Dr.	Commercial	2708	0.2708	23	L/p/d	278.0	6474	1045	1254	1254	
	Family Kitchen Restaurant Building	Pinewood Dr.	Storage	389	0.0389	8	L/p/d	75	634			634	
J149	Esso Gas Station	54 Pinewood Dr.	Commercial	234	0.0234	2	L/p/d	278.0	559	354	425	425	Assume one of 54 Pinewood Dr. Buildings
	Davidson Fuels	54 Pinewood Dr.	Commercial	393	0.0393	3	L/p/d	278.0	940	2726	3272	3272	Assume one of 54 Pinewood Dr. Buildings
	Highway 17 Hotel	42 Pinewood Dr.	Hotel	-	-	76	L/bed-space-day	225	17100	8422	10106	10106	46 rooms and 76 beds
J150	OPP Station	34 Pinewood Dr.	Commerial - Office	674	0.0674	6	L/p/d	278.0	1611	327	392	392	
	Gardewine	100 Mills Dr.	Storage Garage	735	0.0735	16	L/p/d	75	1198	71	85	85	
J151	Superior Truck Repair Centre	167 Mills Dr.	Storage Garage	967	0.0967	21	L/p/d	75	1577	323	388	388	Assume one of 167 Mills Dr. Buildings
	Lakehead Freightway/Manitoulin Transport	167 Mills Dr.	Storage Garage	409	0.0409	9	L/p/d	75	667	44	53	53	Assume one of 167 Mills Dr. Buildings
J152	U-Haul Dealer	160 Mills Dr.	Commercial	496	0.0496	4	L/p/d	278.0	1186	297	356	356	Assuming U-Haul Dealer is the northeast building on Mills Dr., lot estimated with google ea
J154	Martel Customs	128 Mills Dr.	Industrial	83	0.0083	-	m3/ha/d	45	374	0	0	0	Assuming this is the small building on south side of Mills Dr.
J155	Red Roof Building	120 Mills Dr.	Storage Garage	377	0.0377	8	L/p/d	75	615	403	484	484	
	Red Roof Building #2	Mills Dr.	Storage Garage	488	0.0488	11	L/p/d	75	796			796	
J156	Building on cul-de-sac	White Dr.	Storage Garage	283	0.0283	6	L/p/d	75	461			461	Can't see on GIS imagery, looks about 3/4 the size of the smaller red roof building
	Northstar Fusion	16 White Dr.	Industrial	10500	1.0500	-	m3/ha/d	45	47250			47250	Measured with google earth, size of facility not sure if it is all building
	Evolugen	105 Mills Dr.	Industrial	835	0.0835	-	m3/ha/d	45	3758	3089	3707	3707	
J157	Algoma Storage	30 Pinewood Dr.	Storage	1086	0.1086	24	L/p/d	75	1771	9	11	11	
J158	Algoma Highlands Wild Blueberry Farm	1 Pinewood Dr.	Industrial - Process Room	3506	0.3506	-	m3/ha/d	45	15777	382	458	458	
J160A	Jones Power Sports	320 Highway 17	Commercial	362	0.0362	3	L/p/d	278.0	865	521	625	625	
	High Falls Motel & Cabins	280 Highway 17	Motel	-	-	18	L/bed-space-day	175	3150	1106	1327	1327	Two water meters for this address; info@highfallsmotelandcabins.com
J161	Water Tower and Pumping Station	Princess Ave.	Industrial	1400	0.14	-	m3/ha/d	45	6300			6300	Measured with google earth
J163	Your Room is Ready!	323 Hardy Ave.	Hotel	-	-	4	L/bed-space-day	225	900	401	481	481	https://yourroomisready.business.site/?utm_source=gmb&utm_medium=referral
J171	Wood Land Masonic Lodge	308 Magpie Rd.	Commercial - Fixed Seats	75	0.0075	1	L/p/d	278.0	179	27	32	32	Measured with google earth
	Shed on Superior St.	Superior St.	Storage Garage	86	0.0086	2	L/p/d	75	140			140	
J176	Buck's Marina	360 Superior St.	Commercial	348	0.0348	3	L/p/d	278.0	832			832	Measured with google earth
			Storage Garage	546	0.0546	12	L/p/d	75	890			890	
	Small Building on Superior St.	Superior St.	Industrial	300	0.03	-	m3/ha/d	45	1350			1350	Measured with google earth
							Total		626829	294992	353990	453716	
								In-town			329244	370316	

*Footprints highlighted orange use building size instead of lot size

EPANet Current Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Reserviors

Name	Elevation (m)	Notes	Source
Res1	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38
Res2	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38

Nodes

Name	Elevation (m)	Source
S1	294.3	2531A38
S2	294.3	2531A38
S3	294.3	2531A38
S4	294.3	2531A38
D1	294.3	2531A38
D2	294.3	2531A38
D3	294.3	2531A38
D4	294.3	2531A38
D5	294.3	2531A38

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PS1	RES1	S1	5	200	Stainless Steel	140
PS2	RES1	S2	5	250	Stainless Steel	140
PS3	RES2	S3	5	200	Stainless Steel	140
PS4	RES2	S4	5	250	Stainless Steel	140
PD1	D1	D5	5	200	Stainless Steel	140
PD2	D2	D5	5	250	Stainless Steel	140
PD3	D3	D5	5	200	Stainless Steel	140
PD4	D4	D5	5	250	Stainless Steel	140
PD5	D5	J1A	10	400	Stainless Steel	140

Pumps

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario 3	
Tag #	Name	Start	End	Curve	Status	Curve	Status	Curve	Status	Curve	Status	Curve	Status
HLP-6201	PUMP1	S1	D1	CURVE4	Open	CURVE1	Closed	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6301	PUMP2	S2	D2	CURVE2	Closed	CURVE2	Closed	CURVE2	Open	CURVE2	Open	CURVE2	Open
HLP-6501	PUMP3	S3	D3	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed
HLP-6601	PUMP4	S4	D4	CURVE5	Closed	CURVE6	Open	CURVE2	Open	CURVE2	Open	CURVE2	Open

Curves
CURVE1

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6201/6501	1185	0	225	0	68.58
		200	212	12.62	64.62
		400	204	25.24	62.18

EPANet Current Model Inputs

		600	196	37.85	59.74
		800	189	50.47	57.61
		1000	178	63.09	54.25
		1200	164	75.71	49.99
		1400	144	88.33	43.89
		1600	119	100.94	36.27

CURVE2

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6301/6601	1185	0	250	0	76.20
		200	240	12.62	73.15
		400	228	25.24	69.49
		600	216	37.85	65.84
		800	206	50.47	62.79
		1000	198	63.09	60.35
		1200	190	75.71	57.91
		1400	180	88.33	54.86
		1600	171	100.94	52.12
		1800	160	113.56	48.77
		2000	143	126.18	43.59
		2200	118	138.80	35.97

$$\frac{Q1}{Q2} = \frac{RPM1}{RPM2}$$

$$\frac{H1}{H2} = \frac{RPM1\text{^}2}{RPM2\text{^}2}$$

$$\frac{P1}{P2} = \frac{RPM1\text{^}3}{RPM2\text{^}3}$$

https://pharmaguides.in/affinity-law-for-centrifugal-pump-pump-affinity-laws/

CURVE4

Pump	RPM	Flow (LPS)	Head (m)
HLP-6201	1125	0.00	61.81
		11.98	58.24
		23.96	56.04
		35.94	53.84
		47.92	51.92
		59.90	48.90
		71.87	45.05
		83.85	39.56
		95.83	32.69

CURVE5

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1075	0	62.71
		11.45	60.20
		22.89	57.19
		34.34	54.18
		45.79	51.67
		57.23	49.67
		68.68	47.66
		80.13	45.15
		91.57	42.89
		103.02	40.13
		114.47	35.87
		125.91	29.60

EPANet Current Model Inputs

CURVE6

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1125	0.00	68.68
		11.98	65.93
		23.96	62.64
		35.94	59.34
		47.92	56.59
		59.90	54.39
		71.87	52.20
		83.85	49.45
		95.83	46.98
		107.81	43.95
		119.79	39.28
		131.77	32.42

EPANet Current Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Valves

Name	Start	End	Diameter (mm)	Type	Setting (m)	Drawing
VALVE1	J159A	J159	150	PRV	18.5975	A1-2002-62-P5
VALVE2	J160A	J160B	150	PRV	11.4650	A1-2002-62-P2

EPANet Current Model Inputs

Wawa W&WW Master Plan
M22019
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Nodes

Name	Elevation (m)	Source
FS	290.6	Between nodes J101 and J139
FD	290.6	Between nodes J101 and J139

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PFS	J101	FS	150	250	Stainless Steel	140
PFD	FD	J139	37.4	250	Stainless Steel	140

Pump

				ADD		MDD		FF Scenario 1		FF Scenario 2	
Name	**Start**	**End**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**
PUMP5	FS	FD	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed

Curves

Name	Flow (LPS)	Head (m)
CURVE3	47.9	21.9

EPANet Current Model Inputs

Wawa W&WW Master Plan
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Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PWT1	JFS	TANK1	4	50	Stainless Steel	140
PWT2	TANK1	J161	4	200	Stainless Steel	140

Tank

Name	Elevation	Initial Level	Minimum Level (m)	Maximum Level (m)	Diameter (m)	
TANK1	205.1	41.5	40	61	4.1203	*Municipality said normal levels are between 40 and 43m

Node

Name	Elevation (m)
FS	205.1

FV

Diameter	Setting	Status	
50	10	None	*Can be none or closed, will impact flow rate
			**If status is open then no flow restriction will occur

EPANet Current Model Inputs

Wawa W&WW Master Plan
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Nodes

Name	Elevation (m)	Scenario 1 Flow (L/s)	Scenario 2 Flow (L/s)	Scenario 3 Flow (L/s)
JFF1	293.02	38	0	0
JFF2	289.57	38	0	0
JFF3	293.32	23.29	23.29	0
JFF4	289.4	0	38	30.65
JFF5	288.4	0	38	30.65
JFF6	280.6	0	0	38
JFF7	194.5	0	0	38
JFF8	293.76	38	0	0
JFF9	291.23	0	38	0
		137.29	137.29	137.29

Pipes

Name	Start	End	Length (m)	Diameter (mm)	HW Roughness Coefficient
PIPEFF1	J18	JFF1	1	1000	200
PIPEFF2	J118	JFF2	1	1000	200
PIPEFF3	J53	JFF3	1	1000	200
PIPEFF4	J92	JFF4	1	1000	200
PIPEFF5	J70	JFF5	1	1000	200
PIPEFF6	J155	JFF6	1	1000	200
PIPEFF7	J169	JFF7	1	1000	200
PIPEFF8	J31	JFF8	1	1000	200
PIPEFF9	J60	JFF9	1	1000	200

EPANet Current Model Inputs

Wawa W&WW Master Plan
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Chlorine Sources

Node	Concentration (mg/L)
RES1	0.86
RES2	0.86
TANK1	0.86

Decay Coefficient

Global Bulk Coefficient	-0.5

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Existing EPA Net Model Basis
Existing Housing Density: 2.20

Existing Serviced Population (2022): 3,015
Existing Serviced Homes: 1322

Junction	*Junction Input for Elevation* Surface Elevation (m)	Invert Elevation (m)	Residential Homes (With Demand from this Junction)	Multi-Residential Units (With Demand from this Junction)	Housing Density	Population (With Demand From this Junction)	Per Capita Demand (L/cap/d)	Residential Demand - Houses (L/d)	Residential Demand - Extra (L/d)	Residential Demand - Total (L/d)	Non-Residential Buildings (With Demand from this Junction)	Non-Residential Demand (L/d)	Bypasses (L/d)	Watermain Purging (L/d)	Total Unaccounted for Water Demand (L/d)	Total ADD Junction Demand (L/d)	*Junction Input for Base Demand* Total ADD Junction Demand (L/s)	Max Day Factor	Total MDD Junction Demand (L/d)	Total MDD Junction Demand (L/s)	Peak Hour Factor	Object	Buildings	Reference Drawing	
1A	293.2	290.6	0	0	2.20	0	278.0	0	0	0	1	8226	0	0	0	8226	0.0952	2.00	16452	0.1904	3.00	-	Water Treatment Plant	2531-A-3	
1	293.24	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant	No demand	1277-29	
2	293.21	-	3	0	2.20	7	278.0	1835	67	1902	0	0	6542	0	6542	8444	0.0977	2.00	16888	0.1955	3.00	Hydrant 126	24, 26 and 28 Ganley St.	1277-29	
3	293.18	-	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	34 and 38 Ganley St.	1277-30	
4	293.12	-	5	0	2.20	11	278.0	3058	112	3170	0	0	3271	0	3271	6441	0.0745	2.00	12882	0.1491	3.00	-	44, 46, 48, 50 and 52 Ganley St.	1277-30	
5	292.57	-	0	0	2.20	0	278.0	0	0	0	6	5158	0	0	0	5158	0.0597	2.00	10317	0.1194	3.00	-	Commercial building with LCBO	1277-30	
6	291.09	-	8	0	2.20	18	278.0	4893	179	5072	1	223	3271	0	3271	8566	0.0991	2.00	17133	0.1983	3.00	Hydrant 102	7, 7 and 2 Ganley St., 28, 30 and 32 Toronto Ave., 26 and 26A Ontario St. 1 commercial (Garage behind bowling alley)	1277-29	
7	290.96	-	0	0	2.20	0	278.0	0	0	0	1	2772	0	0	0	2772	0.0321	2.00	5544	0.0642	3.00	-	Low Lift Pumping Station	1277-29	
8	293.35	-	0	0	2.20	0	278.0	0	0	0	11	9494	6542	0	6542	16036	0.1856	2.00	32071	0.3712	3.00	Hydrant 133	5 commercial buildings on east side of Broadway Ave. 3 Institutional buildings (Post office, municipal building) on west side of Broadway Ave. 1 institutional building on Ontario St. (Firehall).	1277-32	
9	293.66	-	4	0	2.20	9	278.0	2446	90	2536	7	19752	9813	0	9813	32101	0.3715	2.00	64201	0.7431	3.00	Hydrant 130	13 Ontario St. 31 McKinley Ave. 18 and 22 Wawa St. Lakeview hotel and 4 commercial buildings on east side of Broadway Ave.	1277-33	
10	292.73	-	1	0	2.20	2	278.0	612	22	634	5	23604	6542	0	6542	30779	0.3562	2.00	61559	0.7125	3.00	Hydrant 131	7 Broadway Ave. 4 commercial (Iris Place, Empty Building Trading Post, Canadian Red Cross), 1 institutional (public washrooms)	1277-36	
11	294.60	-	1	0	2.20	2	278.0	612	22	634	3	30301	0	0	0	30935	0.3580	2.00	61869	0.7161	3.00	Hydrant 118	14 Government Rd. 1 commercial (garage), 2 institutional (Calvary Penecostal Church Hospital, North East Community Care)	1277-52	
12	295.42	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 123	20 Government Rd.	1277-52	
13	295.38	-	4	0	2.20	9	278.0	2446	90	2536	2	875	0	0	0	3411	0.0395	2.00	6821	0.0790	3.00	Hydrant 107	4 residences (28 and 30 Government Rd., 2 others), 2 institutional (garage and EMS building)	1277-52	
14	296.72	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 108	40, 42, 50, 56, 43, 47, 55, 7, and 7 Government Rd.	1277-53	
15	297.17	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 76	58, 60, 62, 63, 64(x2), 66, 68, 69, 70, 71, 7 and 7 Government Rd.	1277-53, 1277-54	
16	294.2	-	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	Hydrant 75	79, 81, 83, 87 and 120 Government Rd.	1277-54, A1-9422-P2	
17	291.15	-	11	0	2.20	24	278.0	6728	246	6974	1	422	6542	0	6542	13938	0.1613	2.00	27875	0.3226	3.00	Hydrant 74	122, 124, 126, 127, 128, 132, 133, 134, 135, 137 and 139 Government Rd. 1 commercial (Leverington's Garden Centre.	A1-9422-P2	
18	293.02	-	14	0	2.20	31	278.0	8562	314	8876	2	833	19625	0	19625	29335	0.3395	2.00	58669	0.6790	3.00	Hydrant 136	141, 143, 144, 145, 146, 147, 148, 153, 155 and 157 Government Rd. 2, 4, 10 Government Ln. 1 Sinter Plant Rd. 2 commercial (Lloyd's of Wawa, Wagging Tails Kennel)	A1-9422-P1/P2/P3	
19	294.66	-	0	0	2.20	0	278.0	0	0	0	3	13248	3271	0	3271	16519	0.1912	2.00	33038	0.3824	3.00	Hydrant 40	Millette General Contractors, Wawa Handy Store, other commercial building at Mackey St. and McKinley Ave.	1277-33	
20	295.35	-	15	16	2.20	68	278.0	18960	695	19654	1	186	26167	0	26167	46007	0.5325	2.00	92014	1.0650	3.00	Hydrant 44	7, 18, 16, 14, 10, 8, 6, 3, 5, 7, 9 and 7 McKinley Ave. 11 and 12 Laurier St. 7 Algoma St. 1 multi-residential (6 Algoma St. assume 18 units). 1 commercial (United Supply Swish)	1277-41	
21	293.73	-	0	0	2.20	0	278.0	0	0	0	3	11986	0	0	0	11986	0.1387	2.00	23972	0.2775	3.00	-	2 commercial (Superior North Mobile Vetrinary Service, A Touch of Glass). 1 institutional (Sir James Dunn Public School)	1277-33	
22	295.43	-	19	6	2.20	55	278.0	15290	560	15850	0	0	32709	0	32709	48559	0.5620	2.00	97118	1.1240	3.00	Hydrant 47	19, 17, 16, 15, 14, 13, 12, 9, 8, 7, 6, 5, 4, 3, 2 and 1 First Ave. 19, 21 and 23 Algoma Ave. 1 multi-residential (20 First Ave. assume 6 units).	1277-43	
23	293.19	-	0	8	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	Hydrant 103	2 multi-residential (29 Mackey St. assume 4 units, 33 Mackey St. assume 4 units).	1277-33	
24	295.58	-	17	0	2.20	37	278.0	10397	381	10778	1	162	29438	0	29438	40378	0.4673	2.00	80755	0.9347	3.00	Hydrant 96	19, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 3, 2, and 1 Second Ave. 1 commercial building (Children's Aid Society of Algoma)	1277-31	
25	293.39	-	1	2	2.20	7	278.0	1835	67	1902	2	2299	0	0	0	4201	0.0486	2.00	8402	0.0972	3.00	Hydrant 98	44 Mackey St. 1 multi-residential (39 Mackey street, assuming 2 units). 2 commercial (Bell, Wawa Laundromat)	1277-34	
26	293.34	-	18	48	2.20	145	278.0	40366	1479	41845	0	0	42521	0	42521	84366	0.9765	2.00	168732	1.9529	3.00	Hydrant 97	22, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 7, 6, 5, 4, 3 and 1 Third Ave. 3 multi-residential (2 Third Ave. assume 4 units, 35 Algoma St. Mountainview assume 20 units, 37 Algoma St. newer development assume 24 units).	1277-47	
27	294.50	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	-	26b, 26 and 4 Mackey St.	1277-34	
28	294.21	-	2	4	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 110	21 and 19 Churchill Ave. 1 multi-residential (22 Churchill Ave., assume 4 units)	1277-59	
29	293.53	-	13	0	2.20	29	278.0	7951	291	8242	0	0	22896	0	22896	31138	0.3604	2.00	62276	0.7208	3.00	Hydrant 7	17, 15 (x2), 14, 12, 11, 8, 7, 6, 4, 3, 2 and 1 Churchill Ave.	1277-59	
30	295.05	-	2	6	2.20	18	278.0	4893	179	5072	1	375	6542	0	6542	11989	0.1388	2.00	23978	0.2775	3.00	Hydrant 62	57, 63 Mackey St. 1 commercial (old garage, assuming 66 Mackey St.). 2 multi-residential (58 Mackey St. assume 4 units, 59 Mackey St. assume 2 units).	1277-34	
31	293.76	-	16	6	2.20	48	278.0	13455	493	13948	1	910	19625	156100	175725	190584	2.2058	2.00	381167	4.4117	3.00	Hydrant 63	18, 16, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 Beck Ave. 1 multi-residential at 67 Mackey St. (assuming 6 units). 1 institutional (Superior Children's Centre).	1277-50	
32	295.31	-	24	0	2.20	53	278.0	14678	538	15216	0	0	26167	0	26167	41383	0.4790	2.00	82766	0.9579	3.00	Hydrant 64	22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37 and 39 Beck Ave. 21, 22, 23, 24, 25, 7, 27, 7, 29, 32 Hillcrest Ave.	1277-50	
33	293.55	-	8	0	2.20	18	278.0	4893	179	5072	0	0	9813	0	9813	14885	0.1723	2.00	29769	0.3446	3.00	Hydrant 42	50, 54, 56, 57, 58, 59, 60 and 62 McKinley Ave.	1277-39	
34	294.96	-	11	0	2.20	24	278.0	6728	246	6974	2	1170	6542	0	6542	14686	0.1700	2.00	29371	0.3399	3.00	-	63, 64, 65, 66, 67, 68, 69, 70, 71 and 72 McKinley Ave. 30 Caverhill St. 2 commercial (Paint + Glass and Creation Hairstyling)	1277-39	
35	295.83	-	3	0	2.20	7	278.0	1835	67	1902	1	398	0	0	0	2300	0.0266	2.00	4601	0.0532	3.00	Hydrant 43	76, 77 and 78 McKinley Ave. 1 commercial (75 McKinley)	1277-39	
36	296.52	-	10	0	2.20	22	278.0	6116	224	6340	1	783	19625	0	19625	26748	0.3096	2.00	53496	0.6192	3.00	-	79, 80, 81, 82, 86, 87, 89, 91, 93 and 95 McKinley Ave. 1 commercial (Sam's Place)	1277-39	
37	294.19	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 49	32, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 First Ave.	1277-42	
38	296.59	-	20	0	2.20	44	278.0	12232	448	12680	0	0	39250	0	39250	51931	0.6010	2.00	101861	1.2021	3.00	Hydrant 48	53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 69, 70, 71 and 73 First Ave. 93, 95, 97, and 99 Third Ave.	1277-42	
39	293.22	-	1	0	2.20	2	278.0	612	22	634	0	0	3271	0	3271	3905	0.0452	2.00	7810	0.0904	3.00	-	1 A St.	1277-48	
40	294.51	-	13	0	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 46	7, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Second Ave.	1277-44	
41	295.90	-	10	0	2.20	22	278.0	6116	224	6340	1	178	9813	0	9813	16331	0.1889	2.00	32661	0.3778	3.00	-	57, 59, 60, 61, 62, 63, 64, 65, 66 and 67 Second Ave. 2 institutional (St. Paul's Anglican Church)	1277-44	
42	296.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	68, 71, 73 and 75 Second Ave. 7 and 87 Third Ave.	1277-44	
43	295.99	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 99	79, 77, 75, 73 and 71 Third Ave.	1277-45	
44	295.89	-	20	0	2.20	44	278.0	12232	448	12680	0	0	45792	0	45792	58472	0.6768	2.00	116945	1.3535	3.00	Hydrant 45	72, 70, 69, 68, 67, 66, 65, 64, 63, 61, 50, 52, 53, 54, 55, 56, 57, 58, 59 and 60 Third Ave.	1277-49	
45	294.65	-	20	12	2.20	70	278.0	19571	717	20288	0	0	35980	0	35980	56268	0.6512	2.00	112536	1.3025	3.00	Hydrant 100	3, 5A, 6, 7, 8 , 9, and 10 A St. 27, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40 and 42 Third Ave. One multi-residential (44 Third Ave., assuming 12 units).	1277-48	
46	295.72	-	17	0	2.20	37	278.0	10397	381	10778	0	0	26167	0	26167	36945	0.4276	2.00	73890	0.8552	3.00	-	3, 4, 5, 6, 8, 12, 13, 14, 15, 16, 17 and 18 Hillcrest Ave. 44, 45, 47, 7 and 49 Churchill Ave.	1277-49	
47	295.38	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 111	24, 25, 26, 27, 28 and 29 Churchill Ave.	1277-59	
48	295.71	-	13	0	2.20	29	278.0	7951	291	8242	0	0	16354	0	16354	24596	0.2847	2.00	49193	0.5694	3.00	Hydrant 7	30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 and 43 Churchill Ave.	1277-58	
49	295.2	-	2	40	2.20	92	278.0	25687	941	26628	1	1193	9813	0	9813	37634	0.4356	2.00	75268	0.8712	3.00	Hydrant 29	34, 7, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 and 80 Hillcrest Ave. 1 institutional (Michipicoten Non-Profit Housing 40 Hillcrest Ave.)	1277-49	
50	289.47	-	2	3	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	62 and 64 Churchill Ave. Multi-residential (68 Churchill Ave. assume 3 units)	1277-57	
51	292.57	-	0	0	2.20	0	278.0	0	0	0	6	35586	6542	0	6542	42128	0.4876	2.00	84256	0.9752	3.00	Hydrant 7	6 commercial buildings (Bowling Centre, Royal Canadian Legion, Canadian Tire, Dawson & Keenan, Sam's Foodline, Allemano & Fitzgerald, Wawa & Chapleau Radio)	-	Assumed same elevation of J5
52	293.83	-	1	0	2.20	2	278.0	612	22	634	17	17828	6542	156100	162642	181103	2.0961	2.00	362206	4.1922	3.00	Hydrant 128	22 Gold St. Commercial buildings (57, 59 Broadway Ave., The Bargain Shop, AJ's Pizza, the Best Start Hub, Regional Employement Health Centre Building, Chic N'Swell, North of 17 Restaurant, The Embassy Restaurant, Columbia Restaurant, RBC Bank, Wawa Dental Centre, Wawa Pharmacy, Wawa Goose Senior Centre, Barber Shop, U Wanna Cab, Guided Fishing Trips)	1277-26	
53	293.32	-	1	0	2.20	2	278.0	612	22	634	7	8425	3271	0	3271	12330	0.1427	2.00	24659	0.2854	3.00	Hydrant 127	25 St. Marie St. 5 commercial (Northern building, Parish of St. Monica, yellow building, Fenlon's Pharmacy, Algoma Family Services)	1277-25	
54	293.05	-	3	0	2.20	7	278.0	1835	67	1902	3	4020	13083	0	13083	19005	0.2200	2.00	38011	0.4399	3.00	-	90 Broadway Ave. 38 and 36 Main St. 2 commercial (Bangin Burger N'Chicken Shack, Economic Development Corporation of Wawa, Ijam FM building)	1277-38	
55	293.09	-	11	0	2.20	24	278.0	6728	246	6974	0	0	13083	0	13083	20058	0.2321	2.00	40115	0.4643	3.00	Hydrant 41	1, 3, 5, 7, 8, 9 and 11 Toronto Ave. 7, 7, 4, 7 Gold St.	1277-20	
56	292.61	-	12	0	2.20	26	278.0	7339	269	7608	0	0	16354	0	16354	23962	0.2773	2.00	47925	0.5547	3.00	Hydrant 39	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 and 28 Toronto Ave. 21 and 22 Caverhill St.	1277-19	
57	292.02	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	-	10, 9, 8, 7, 6 and 2 Caverhill St. 56 Wawa St.	1277-19	
58	293.46	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	29, 30, 31, 32, 33, 34, 35 and 36 Toronto Ave.	1277-19	
59	293.46	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19	

EPANet Current Model with Upgrades Inputs

60	291.23	-	18	0	2.20	40	278.0	11009	403	11412	0	0	13083	0	13083	24496	0.2835	2.00	48991	0.5670	3.00	Hydrant 104	14, 13, 12, 11, 10, 7, 8, 7 & St. Marie St. 6 and 7 Wawa St.	1277-24
61	292.45	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 105	15, 16, 17, 18, 19, 20 and 7 Montreal Ave.	1277-19
62	292.45	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	7, 39, 7, 41, 43, 44, 45, 46 and 48 Toronto Ave.	1277-19
63	291.93	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	-	No demand	1277-19
64	289.77	-	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 7	32 Main St.	1277-38
65	291.2	-	12	0	2.20	26	278.0	7339	269	7608	0	0	22896	0	22896	30504	0.3531	2.00	61008	0.7061	3.00	Hydrant 7	53, 54, 55, 56, 57 and 58 Toronto Ave. 27, 29, 30, 31, 32 and 34 Joliet St.	1277-22
66	289.76	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	Hydrant 124	236, 30, 7, 26, 24, 23, 21, 243, 244, 245, 246 and 76 Main St.	1277-12
67	290.37	-	9	0	2.20	20	278.0	5504	202	5706	0	0	6542	0	6542	12248	0.1418	2.00	24496	0.2835	3.00	Hydrant 7	11, 247, 249, 251, 253 and 7 Main St. 7 And 10 Joliet St.	1277-12
68	288.29	-	12	0	2.20	26	278.0	7339	269	7608	0	0	6542	0	6542	14150	0.1638	2.00	28300	0.3275	3.00	Hydrant 114	14, 21, 23, 25, 26 and 28 Joliet St. 24, 25 and 36 Montreal St.	1277-12
69	288.38	-	11	0	2.20	24	278.0	6728	246	6974	3	2259	6542	0	6542	15775	0.1826	2.00	31550	0.3652	3.00	Hydrant 116	60, 61, 62, 63, 64, 65, 66, 67 and 69 Toronto Ave. 39, 37 and 35 Maggie Rd.	1277-18
70	288.4	-	11	2	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 117	33, 31, 29, 27 and 25 Maggie Rd. 32, 31, 30, 29, 28 and 27 Montreal Ave. 3 Institutional (Ontario Mine Rescue Algoma District, Large Garage, Municipality of Wawa Infrastructure Services Department)	1277-14
71	288.87	-	17	0	2.20	37	278.0	10397	381	10778	3	3792	22896	0	22896	37466	0.4336	2.00	74932	0.8673	3.00	Hydrant 115	7, 17 and 15 Maggie St. 2, 5, 7, 7, 8 and 10 Gladstone Ave. 279-A and 279-B Highway 101. 1 multi-residential (13 Magpie St. assume 2 units).	1277-14
72	288.92	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 91	73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88 and 89 Toronto Ave. 2 commercial (The Shop, Millete General Contractors). 1 institutional (The Ship Boy Scouts)	1277-18
73	288.73	-	7	0	2.20	15	278.0	4281	157	4438	0	0	3271	0	3271	7709	0.0892	2.00	15418	0.1784	3.00	-	101, 103, 105, 107, 109, 110 and 111 Broadway Ave.	1277-11
74	289.2	-	11	0	2.20	24	278.0	6728	246	6974	0	0	3271	0	3271	10245	0.1186	2.00	20490	0.2372	3.00	Hydrant 90	112, 113, 114, 116 and 117 Broadway Ave. 47 and 45 Maggie Rd.	1277-10
75	289.18	-	8	0	2.20	18	278.0	4893	179	5072	1	286	0	0	0	5358	0.0620	2.00	10716	0.1240	3.00	-	?, ?, 121, 123, 124, 125, 126, 127, 128, 129 and 130 Broadway Ave.	1277-10
76	289.61	-	17	0	2.20	37	278.0	10397	381	10778	0	0	6542	0	6542	17320	0.2005	2.00	34640	0.4009	3.00	-	131, 132, 133, 134, 135, 136, 137 and 138 Broadway Ave. 1 commercial (12 Klondike St.)	1277-5
77	289.18	-	1	0	2.20	2	278.0	612	22	634	3	645	0	0	0	1279	0.0148	2.00	2557	0.0296	3.00	-	14, 16, 18, 20 and 22 Klondike St. 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19 and 20 Nyman Ave.	1277-10
78	289.61	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 82	? Broadway Ave. 1 commercial (storage garage)	1277-10
79	289.64	-	24	0	2.20	53	278.0	14678	538	15216	0	0	6542	0	6542	21758	0.2518	2.00	43516	0.5037	3.00	Hydrant 83	15, ?, 17 and 18 Queen St.	1277-4
80	289.84	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	-	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 Queen St.	1277-4
81	289.00	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	Hydrant 81	43 and 44 Queen St. 1, 3, 5, 7 and 10 Centennial Ave.	1277-4
82	289.48	-	11	4	2.20	33	278.0	9174	336	9510	2	18899	6542	0	6542	34950	0.4045	2.00	69901	0.8090	3.00	Hydrant 80	19, 21 and 23 Winston Rd. 2 commercial (storage garages)	1277-1
83	289.57	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	-	25, 27, 29, 33, 33A, 35A, 35B, 37, 39, 41 and 43 Winston Rd. 34 Winston Rd. trailer park (23 trailers from water meter data). 1 institutional (Ecole Publique L'Escalade). 1 multi-residential (31 Winston Rd. assume 4 units).	1277-7
84	289.11	-	0	0	2.20	0	278.0	0	0	0	1	26	0	0	0	26	0.0003	2.00	52	0.0006	3.00	-	45 Winston Rd. 11, 12, 13, 14, 15, 16 and 18 Centennial Ave.	1277-60
85	288.98	-	10	0	2.20	22	278.0	6116	224	6340	0	0	0	0	0	6340	0.0734	2.00	12680	0.1468	3.00	Hydrant 7	1 institutional (First United Church)	1277-60
86	289.22	-	0	0	2.20	0	278.0	0	0	0	3	813	0	0	0	813	0.0094	2.00	1626	0.0188	3.00	Hydrant 92	1, 3, 4, 5, 6, 7, 8, 9, 10 and 12 George St.	1277-60
87	289.22	-	0	0	2.20	0	278.0	0	0	0	1	1021	0	0	0	1021	0.0118	2.00	2042	0.0236	3.00	-	1 commercial building (Circle K, Northern Credit Union, Empty Store)	1277-16
88	289.28	-	0	12	2.20	26	278.0	7339	269	7608	1	1972	0	0	0	9580	0.1109	2.00	19161	0.2218	3.00	-	1 commercial building (Pine Portage Lodge Office)	1277-16
89	289.56	-	0	12	2.20	26	278.0	7339	269	7608	5	8357	0	0	0	15965	0.1848	2.00	31930	0.3696	3.00	Hydrant 138	1 multi-residential (158 Mission Rd. assuming 12 units). 1 commercial building (Big Bird Inn)	1277-61
90	289.35	-	16	0	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 7	1 apartment building (guessing 12 units). 4 commercial buildings (Independent, Subway, Movie Gallery, Viking Restaurant, Polish Alliance of Canada)	1277-61 & 1277-6
91	289.21	-	2	0	2.20	4	278.0	1223	45	1268	1	12392	3271	0	3271	16930	0.1960	2.00	33861	0.3919	3.00	-	60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76 and 78 Maggie Rd. 14 George St.	1277-16
92	289.4	-	0	0	2.20	0	278.0	0	0	0	1	704	0	0	0	704	0.0081	2.00	1408	0.0163	3.00	Hydrant 93	80 and 82 Maggie Rd. 1 institutional (Michipicoten High School)	1277-16
93	289.35	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 7	1 institutional (St. Augustine School)	1277-66
94	289.16	-	10	0	2.20	22	278.0	6116	224	6340	0	0	3271	0	3271	9611	0.1112	2.00	19222	0.2225	3.00	-	1, 2, 3, 4, 5, 6, 7 and 8 Ross St.	1277-61
95	288.94	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	-	10, 11, 13, 14, 15, 17, 19 and 21 Ross St. 9 and 23 Arnott Ave.	1277-61
96	289.15	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 89	49 and 54 Maggie Rd. 1 and 5 Nyman Ave.	1277-15
97	289.64	-	19	0	2.20	42	278.0	11620	426	12046	0	0	3271	0	3271	15317	0.1773	2.00	30634	0.3546	3.00	Hydrant 88	1 and 5 Nyman Ave.	1277-9
98	289.94	-	11	0	2.20	24	278.0	6728	246	6974	0	0	6542	0	6542	13516	0.1564	2.00	27032	0.3129	3.00	-	24, 26, 28, 30 and 32 Klondike St. 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and ? Wood Ave.	1277-6
99	289.89	-	0	0	2.20	0	278.0	0	0	0	1	6113	0	0	0	6113	0.0707	2.00	12225	0.1415	3.00	-	34, ?, 36, 37, 38, 39, 40, 41, 42, 43 and 44 Klondike St.	1277-6
100	289.98	-	3	10	2.20	29	278.0	7951	291	8242	2	547	6542	0	6542	15331	0.1774	2.00	30661	0.3549	3.00	Hydrant 121	1 commercial (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-6
101	290.92	-	0	4	2.20	9	278.0	2446	90	2536	2	5168	6542	0	6542	14245	0.1649	2.00	28491	0.3298	3.00	-	55, 56 and 57 Winston Rd. 2 multi-residential (58 Winston Rd. assume 6 units, 59 Winston Rd. assume 4 units). 1 institutional (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-3
102	290.31	-	0	0	2.20	0	278.0	0	0	0	2	5502	3271	0	3271	8773	0.1015	2.00	17546	0.2031	3.00	-	1 multi-residential (61 Winston Rd. assume 4 units). 2 commercial (Garage, Gator's Steakhouse, Beaver Motel).	1277-3
103	289.45	-	0	0	2.20	0	278.0	0	0	0	2	9226	3271	0	3271	12496	0.1446	2.00	24993	0.2893	3.00	Hydrant 94	2 commercial (Algoma Motel, Bristol Motel)	P2
104	290.03	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	2 commercial (Algoma Motel, Bristol Motel)	1277-62
105	289.02	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	18, 17, 16, 15, 14, 13, 12 and 11 Arnott Ave.	1277-62
106	289.58	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	-	9, ?, 5, 3 and 1 Arnott Ave.	1277-62
107	289.78	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	-	4, 6 and 8 Darwin St.	1277-65
108	290.2	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 65	3, 5 and 7 Parkhill St. 126 Churchill Ave. 1 multi-residential (2 Grace St. assume 12 units).	1277-55
109	290.49	-	3	0	2.20	7	278.0	1835	67	1902	2	4850	0	0	0	6752	0.0781	2.00	13503	0.1563	3.00	-	128, 130, 132 and 134 Churchill Ave. 1 multi-residential (10 Grace St. assume 12 units).	1277-55
110	289.65	-	9	0	2.20	20	278.0	5504	202	5706	0	0	3271	0	3271	8977	0.1039	2.00	17954	0.2078	3.00	Hydrant 66	134, 136 and 138 Churchill Ave. 2 commercial (Kerry Funeral Home, Beaver Motel)	1277-55
111	290.03	-	6	0	2.20	13	278.0	3670	134	3804	1	2320	0	0	0	6124	0.0709	2.00	12249	0.1418	3.00	Hydrant 137	124, 123, 122, 121, 120, 119, 118, 117 and 116 Churchill Ave.	1277-56
112	289.79	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 120	114, 112, 110, 108, 106 and 104 Churchill Ave. 1 institutional (Ecole St. Joseph).	1277-56
113	289.49	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 119	100, 98, 96, 94, 92, 90 and 88 Churchill Ave.	1277-56
114	289.44	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 61	86, 84, 82, 80, 78, 76, 74, 72, 70 and 76 Churchill Ave. 113, 111 and 107 Maggie Rd.	1277-57
115	290.02	-	22	0	2.20	48	278.0	13455	493	13948	0	0	16354	0	16354	30303	0.3507	2.00	60605	0.7014	3.00	Hydrant 125	No demand	1602-7
116	289.64	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 7	?, 125, ?, 123, 122, 121, 119, 117 and 115 Regina Cres. 16, 14, 13, 12, ?, 10, ?, 8, 6, ?, 4, ?, 2 Birch St.	1602-4
117	289.71	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	Hydrant 7	127, 133, 135, 137, 139 and 145 Regina Cres.	1951-8
118	289.57	-	6	0	2.20	13	278.0	3670	134	3804	0	0	6542	0	6542	10346	0.1197	2.00	20692	0.2395	3.00	Hydrant 54	147, 148, 152, 153, 155, 156 and 160 Regina Cres.	1951-8
119	289.73	287.9	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	-	162, 166, 170 and 172 Regina Cres. 42 and 40 Tamarack Ave.	1951-8
120	289.75	-	4	0	2.20	9	278.0	2446	90	2536	1	594	0	0	0	3130	0.0362	2.00	6261	0.0725	3.00	Hydrant 7	44, 46 and 48 Tamarack Ave.	1951-3
121	290.24	-	13	0	2.20	29	278.0	7951	291	8242	0	0	0	0	0	8242	0.0954	2.00	16484	0.1908	3.00	Hydrant 56	7, 6, 8, and 10 Maple St. 1 institutional (Confederation College Building)	1951-6
122	290.14	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 Maple St.	1951-6
123	289.88	288.05	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	25, 26, 27 and 28 Maple St.	1951-6
124	291.35	289.15	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	29 and 30 Maple St.	1951-3
125	291.08	288.88	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 60	No demand	1951-5
126	290.52	-	13	0	2.20	29	278.0	7951	291	8242	0	0	3271	0	3271	11513	0.1333	2.00	23026	0.2665	3.00	Hydrant 55	40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30 and 29 Birch St.	1951-5
127	290.49	288.29	12	0	2.20	26	278.0	7339	269	7608	0	0	29438	0	29438	37046	0.4288	2.00	74092	0.8575	3.00	Hydrant 53	28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17 and 15 Birch St.	1602-6
128	291.82	289.62	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	113, 111, 109, 107, 105 and 104 Regina Cres. 10, 8, ?, 6, 5 and 3 Poplar St.	1602-4
129	292.01	289.81	8	0	2.20	18	278.0	4893	179	5072	0	0	0	156100	156100	161172	1.8654	2.00	322344	3.7308	3.00	Hydrant 50	142 and 141 Superior Ave.	1951-2
130	291.18	288.98	16	0	2.20	35	278.0	9786	359	10144	0	0	13083	0	13083	23228	0.2688	2.00	46455	0.5377	3.00	Hydrant 51	140, 139, 138, 137, 136, 135, 134 and 133 Superior Ave.	1951-2
131	290.68	288.48	14	0	2.20	31	278.0	8562	314	8876	0	0	32709	0	32709	41585	0.4813	2.00	83170	0.9626	3.00	Hydrant 52	132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118 and 117 Superior Ave.	1602-2
132	290.58	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	Hydrant 71	116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104 and 103 Superior Ave.	1602-2
133	290.84	-	18	0	2.20	40	278.0	11009	403	11412	0	0	3271	0	3271	14683	0.1699	2.00	29366	0.3399	3.00	Hydrant 72	103, 102 and 101 Regina Cres. 1, 2, 3 and 4 Spruce St.	1602-4
134	290.49	-	27	0	2.20	59	278.0	16513	605	17118	0	0	0	0	0	17118	0.1981	2.00	34236	0.3963	3.00	Hydrant 69	7, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 13A, 13B, 15A and 15B Spruce St. 102, 100, 2, 4 and 6 Superior Ave.	1602-2
135	290.22	-	12	0	2.20	26	278.0	7339	269	7608	0	0	13083	0	13083	20692	0.2395	2.00	41383	0.4790	3.00	Hydrant 70	7A, 7B, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22 Superior Ave. 15, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 27 Regina Cres.	1277-69
136	290.50	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 68	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 Regina Cres.	1277-71
137	289.10	-	7	0	2.20	15	278.0	4281	157	4438	1	103	3271	0	3271	7812	0.0904	2.00	15623	0.1808	3.00	Hydrant 67	24, 26, ?, 28, 30, 32, 34 and 36 Superior Ave.	1277-68
138	289.79	-	2	0	2.20	4	278.0	1223	45	1268	2	58569	0	0	0	59837	0.6926	2.00	119673	1.3851	3.00	Hydrant 73	38, 40, 42, 44, 46, 48 and 50 Superior Ave. 1 institutional (Lion's Club)	1277-68
139	290.47	-	0	0	2.20	0	278.0	0	0	0	3	1194	6542	0	6542	7736	0.0895	2.00	15472	0.1791	3.00	Hydrant 85	?, ? Superior Ave. 1 institutional (Michipicoten Memorial Community Centre). 1 commercial (Wawa Motor Inn)	1277-67
140	288.65	-	0	0	2.20	0	278.0	0	0	0	1	171	0	0	0	171	0.0020	2.00	342	0.0040	3.00	Hydrant 134	3 commercial (Petro Canada, Northern Chiropractic Clinic, Krazy Fries)	B41
141	288.00	-	0	0	2.20	0	278.0	0	0	0	3	3072	6542	0	6542	9614	0.1113	2.00	19228	0.2225	3.00	Hydrant 84	1 institutional (Small station)	B41
142	286.50	-	0	0	2.20	0	278.0	0	0	0	5	8997	3271	156100	159371	168368	1.9487	2.00	336736	3.8974	3.00	Hydrant 135	3 commercial (Home Building Center Garage, Home Building Centre, Young's General Store)	P1
143	286.28	-	0	0	2.20	0	278.0	0	0	0	7	12319	9813	0	9813	22132	0.2562	2.00	44263	0.5123	3.00	Hydrant 77	4 commercial (Canco Wawa, Wesdome Gold Mines, Garages, Tim Hortons). I institutional (Lagoon Building).	P2
144	284.75	282.59	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 1	1 commercial (Mission Motor). 5 institutional (Service Ontario, Ontario Ministry of Natural Resources, Government Storage Garages x7, Wawa Municipal Airport, Tourist Information Centre)	3675-3
145	284.57	282.45	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 2	120 Pinewood Dr.	3675-5
																							No demand	3675-5

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146	284.03	281.81	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 3	No demand	3675-6	
147	283.90	281.47	0	0	2.20	0	278.0	0	0	0	1	1291	0	0	0	1291	0.0149	2.00	2583	0.0299	3.00	-	1 commercial (Trans Canada Chrysler)	3675-6	
148	283.20	281.08	0	0	2.20	0	278.0	0	0	2	1888	0	0	0	1888	0.0219	2.00	3776	0.0437	3.00	Hydrant 4	2 commercial (Fountain Tire, Family Kitchen Restaurant Building)	3675-6	
149	282.89	280.68	0	0	2.20	0	278.0	0	0	2	3696	0	0	0	3696	0.0428	2.00	7393	0.0856	3.00	Hydrant 5	2 commercial (Esso Gas Station, Davidson Fuels)	3675-7	
150	282.05	279.37	0	0	2.20	0	278.0	0	0	3	10584	0	0	0	10584	0.1225	2.00	21168	0.2450	3.00	Hydrant 6	2 commercial (Highway 17 Motel, Gardewine). 1 institutional (OPP)	3675-7	
151	284.40	-	0	0	2.20	0	278.0	0	0	2	441	0	0	0	441	0.0051	2.00	882	0.0102	3.00	Hydrant 10	2 commercial (Superior Truck Repair Centre, Lakehead Freightway/Manitoulin Transport)	C05	
152	282.95	-	0	0	2.20	0	278.0	0	0	1	356	0	0	0	356	0.0041	2.00	712	0.0082	3.00	Hydrant 11	1 commercial (U-Haul Dealer)	C04	
153	282.15	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 12	No demand	C04	
154	281.85	-	0	0	2.20	0	278.0	0	0	1	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 9	1 commercial (Martel Customs)	C04	
155	280.60	-	0	0	2.20	0	278.0	0	0	1	484	0	0	0	484	0.0056	2.00	967	0.0112	3.00	Hydrant 8	1 commercial (building with red roof)	C03	
156	281.85	-	0	0	2.20	0	278.0	0	0	4	52214	0	0	0	52214	0.6043	2.00	104428	1.2087	3.00	Hydrant 7	4 commercial (building with red roof, building on cul-de-sac, Northstar Fusion, Evolugen)	C03	
157	281.5	-	0	0	2.20	0	278.0	0	0	1	11	0	0	0	11	0.0001	2.00	22	0.0003	3.00	Hydrant 34	1 commercial (Algoma Storage)	-	Don't know real elevation
158	280.3	277.8	0	0	2.20	0	278.0	0	0	1	458	0	0	0	458	0.0053	2.00	917	0.0106	3.00	Hydrant 33	1 industrial (Algoma Highlands Wild Blueberry Farm)	A1-2002-62-P5	
159A	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
159	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
160A	248.5	245.9	1	0	2.20	2	278.0	612	22	634	2	1952	0	0	0	2586	0.0299	2.00	5172	0.0599	3.00	PRV Chamber	1 house by storage area. 2 commercial (Jones Power Sports, High Falls Motel & Cabins)	A1-2002-62-P2	
160B	248.5	245.9	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P2	
160	205.1	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	MRV Water Tower	No demand	1443-A-7	
161	205.1	202.6	0	0	2.20	0	278.0	0	0	1	6300	0	0	0	6300	0.0729	2.00	12600	0.1458	3.00	MRV Water Tower	Water Tower and Pumping Station	1443-A-7	
162	205.4	202.9	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 18	?, ? Hardy Ave.	1443-A-7	
163	205.1	202.5	10	0	2.20	22	278.0	6116	224	6340	1	481	0	0	0	6821	0.0789	2.00	13642	0.1579	3.00	Hydrant 17	?, ?, ?, ?, ?, ?, ?, ? 315, and 317 Hardy Ave. 1 commercial (Your Room is Ready!)	1443-A-7	
164	205.9	203.4	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	309, 308, 307 and ? Queen St.	1443-A-6	
165	206.6	204.1	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 15	303, 302 and 301 Queen St. ? Blue Ave.	1443-A-6	
166	206.5	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 13	?, ?, ?, ? and ? Blue Cres.	-	Don't know real elevation
167	206	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 14	?, ? Blue Cres. ? Blue Ave.	-	Don't know real elevation
168	204.9	202.3	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	Hydrant 7	318, ?, ?, 313, 312 and 310 Blue Ave.	1443-A-13	
169	206.7	204.2	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	Hydrant 16	303 and ? Aberdeen St.	1443-A-12	
170	197.0	194.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 19	No demand	1443-A-5	
171	200.0	197.3	6	0	2.20	13	278.0	3670	134	3804	1	32	3271	0	3271	7107	0.0823	2.00	14213	0.1645	3.00	Hydrant 79	?, ?, ?, ?, ? and 308 Magpie Ave. 1 institutional (Wood Land Masonic Lodge)	1443-A-11	
172	193.0	190.3	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1443-A-5	
173	190.0	187.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 20	No demand	1443-A-5	
174	190.7	188.1	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 23	339 Queen St. 312 and 311 Brock Ave.	1443-A-4	
175	191.1	188.1	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 24	?, ?, ?, 306, ?, 303 and 335 Brock Ave. 1 institutional (Angel's Equestrian Centre).	1443-A-4	
176	189.0	186.4	0	0	2.20	0	278.0	0	0	0	3	3213	0	156100	156100	159313	1.8439	2.00	318625	3.6878	3.00	Hydrant 25	2 commercial (shed on Superior St., Buck's Marina) 1 institutional (small building on Superior St.)	1443-A-3	
177	192.7	190.2	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 28	?, ? Superior St., ?, ? and ? Michipicoten Ave.	1443-A-8	
178	191.9	189.3	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 7	?, ?, ?, ? and ? Michipicoten Ave.	1443-A-9	
179	192.1	189.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	6340	0.0734	3.00	-	? Superior St. ?, ?, and ? Wawa St	1443-A-8	
180	189.9	187.4	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	1268	0.0147	3.00	Hydrant 21	?, ? and ? Wawa St.	1443-A-10	
181	190.1	187.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	3804	0.0440	3.00	Hydrant 26	? Superior St.	1443-A-8	
182	194.5	192.0	2	0	2.20	4	278.0	1223	45	1268	0	0	6542	0	6542	7810	0.0904	2.00	3804	0.0440	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
183	292.97	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	1268	0.0147	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
TOTAL			1103	219		2908		808535	29625	838160	178	453716	1020511	780499	1801010	3092885	35.80								
					MRV Population	156					In-town	369366													

			Pipe Input for Length	*Pipe Input for Diameter*		*Pipe Input for Roughness Coef.*			
Pipe	**Starting Junction**	**Ending Junction**	**Length**	**Diameter**	**Material**	**HW Roughness Coefficient**	**Object**	**Notes**	**Reference Drawing**
1A	J1A	J1	38.19	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
1	J1	J2	75.15	150	Unknown	140	Pipe 136		WAT_Watermain_Table
2	J2	J3	68.1	150	Unknown	140	Pipe 798	art of watermain from 1st Ave. t	F22019_WaterMap_NorthSat
3	J3	J4	101.75	150	Unknown	140	Pipe 798	art of watermain from A St. to de	WAT_Watermain_Table
4	J1A	J5	66.61	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
5	J5	J6	112.2	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameter of 250mm, GIS not clear	F22019_WaterMap_NorthSat
6	J6	J7	9.6	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diametert of 250mm, GIS not clear	F22019_WaterMap_NorthSat
7	J5	J8	74.1	200	Unknown	140	South of Pipe 909	rom McKinley Ave. to Hydrant 13	F22019_WaterMap_NorthSat
8	J8	J9	109.73	200	Unknown	140	Pipe 909		WAT_Watermain_Table
9	J9	J10	138.7	150	Unknown	140	Pipes 889 and 890	Pipe 889 and part of 890	F22019_WaterMap_NorthSat
10	J10	J11	148.9	150	Unknown	140	Pipes 890 and 361	Part of pipes 890 and 361	F22019_WaterMap_NorthSat
11	J11	J12	151.6	150	Unknown	140	Pipe 361	Part of pipe 361, possibly 356	F22019_WaterMap_NorthSat
12	J12	J13	73.4	150	Unknown	140	Pipe 356		F22019_WaterMap_NorthSat
13	J13	J14	140.3	150	Unknown	140	Pipe 356 and 125	Part of 356, pipe 125	F22019_WaterMap_NorthSat
14	J14	J15	152.5	150	Unknown	140	Pipe 355 and 336	Pipe 355 and part of 336	F22019_WaterMap_NorthSat
15	J15	J16	516.8	150	Unknown	140	Pipe 338 and 336	Pipe 338 and part of 336	F22019_WaterMap_NorthSat
16	J16	J17	187.63	150	Unknown	140	Pipe 339 and 329	Length for pipe 339 and 329	WAT_Watermain_Table
17	J17	J18	179.7	150	Unknown	140	Pipe 326 and 319	Pipe 326 and part of 319	F22019_WaterMap_NorthSat
18	J9	J19	91.1	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
19	J19	J20	121.16	150	Unknown	140	Pipe 864		WAT_Watermain_Table
20	J19	J21	81.5	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
21	J21	J22	110.2	150	Unknown	140	-	No pipe number on map, diameter from as-built drawing	F22019_WaterMap_NorthSat
22	J21	J23	80.5	200	Unknown	140	Pipe 849	Pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
23	J23	J24	139.76	150	Unknown	140	Pipe 843		WAT_Watermain_Table
24	J23	J25	81.5	200	Unknown	140	Pipe 787		WAT_Watermain_Table
25	J25	J26	100	150	Unknown	140	Pipe 777		WAT_Watermain_Table
26	J25	J27	96.3	200	Unknown	140	-	ume same pipe properties as pipe	F22019_WaterMap_NorthSat
27	J27	J28	37.18	150	Unknown	140	Pipe 756		WAT_Watermain_Table
28	J28	J29	105.27	150	Unknown	140	Pipe 763		WAT_Watermain_Table
29	J28	J30	111.1	150	Unknown	140	-	e same pipe properties as pipes	F22019_WaterMap_NorthSat
30	J30	J31	104.03	150	Unknown	140	Pipe 676		WAT_Watermain_Table
31	J31	J32	196.9	150	Unknown	140	Pipes 679 and 680		F22019_WaterMap_NorthSat
32	J1	J33	136.6	150	Unknown	140	Pipe 831		F22019_WaterMap_NorthSat
33	J33	J34	71.87	150	Unknown	140	Pipe 835		WAT_Watermain_Table
34	J34	J35	43.43	150	Unknown	140	Pipe 837		WAT_Watermain_Table
35	J35	J36	125.73	150	Unknown	140	Pipe 836		WAT_Watermain_Table
36	J2	J37	148.1	150	Unknown	140	-	ume same properties and nearby	F22019_WaterMap_NorthSat
37	J37	J38	139.7	150	Unknown	140	Pipe 814		F22019_WaterMap_NorthSat
38	J3	J39	32.6	150	Unknown	140	Pipe 795	Part of pipe 795	F22019_WaterMap_NorthSat
39	J39	J40	131.83	150	Unknown	140	Pipe 799		WAT_Watermain_Table
40	J40	J41	94.49	150	Unknown	140	Pipe 800		WAT_Watermain_Table
41	J41	J42	78.3	100	Unknown	140	Pipe 137	Pipe 137 plus smaller pipes	F22019_WaterMap_NorthSat
42	J42	J43	103.5	150	Unknown	140		Unknown pipes and diameter	F22019_WaterMap_NorthSat
43	J43	J44	87.64	150	Unknown	140	Pipe 769		WAT_Watermain_Table
44	J39	J45	75.64	150	Unknown	140	Pipe 795		WAT_Watermain_Table
45	J25	J45	192.7	150	Unknown	140	Pipe 767	Pipe 767 plus other pipe(s)	F22019_WaterMap_NorthSat
46	J45	J44	109	150	Unknown	140	Pipe 772	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
47	J44	J46	172	150	Unknown	140	Pipe 686	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
48	J27	J47	65.7	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
49	J47	J48	102.7	150	Unknown	140	Pipe 695 and 699	Parts of pipe 695 and 699	F22019_WaterMap_NorthSat
50	J48	J46	96	150	Unknown	140	-	Unknown pipes, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
51	J46	J32	106.6	150	Unknown	140	Pipe 34	Pipe 34 plus other pipe(s)	F22019_WaterMap_NorthSat
52	J32	J49	21	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
53	J46	J50	103.4	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
54	J5	J51	72	200	Unknown	140	Pipe 893	Pipe 893 plus other pipe(s)	F22019_WaterMap_NorthSat
55	J51	J52	133.35	200	Unknown	140	Pipe 912		WAT_Watermain_Table
56	J52	J53	101	200	Unknown	140	Pipe 731		WAT_Watermain_Table
57	J53	J54	82.6	200	Unknown	140	-	Assuming same diameter as pipe 731	F22019_WaterMap_NorthSat
58	J6	J55	97.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
59	J55	J56	103.7	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
60	J52	J56	111.1	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat

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61	J7	J57	190.86	300	Unknown	140	Pipe 744		WAT_Watermain_Table
62	J52	J34	104.8	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
63	J57	J56	8.5	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
64	J56	J58	95.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
65	J57	J59	95.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
66	J58	J59	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
67	J59	J60	102.87	150	Galvanized Steel	120	Pipe 711		WAT_Watermain_Table
68	J58	J61	97.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
69	J61	J54	118.95	150	Unknown	140	Pipe 713		WAT_Watermain_Table
70	J59	J62	97.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
71	J61	J62	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
72	J62	J63	18	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
73	J63	J64	107	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
74	J63	J65	129.6	150	Unknown	140	Pipe 663	Pipe 663 plus other pipes	F22019_WaterMap_NorthSat
75	J65	J66	192.4	150	Unknown	140	Pipe 669	Pipe 669 plus other pipes	F22019_WaterMap_NorthSat
76	J66	J67	123.86	150	Unknown	140	Pipe 637		WAT_Watermain_Table
77	J67	J64	94.54	150	Unknown	140	Pipe 636		WAT_Watermain_Table
78	J64	J68	87.9	150	Unknown	140	Pipe 626	Pipe 626 plus other pipes	F22019_WaterMap_NorthSat
79	J68	J69	157.7	150	Unknown	140	Pipe 607	Pipe 607 plus other pipes	F22019_WaterMap_NorthSat
80	J69	J70	157.5	150	Unknown	140	Pipe 641	Pipe 641 plus other pipes	F22019_WaterMap_NorthSat
81	J68	J71	194.7	150	Unknown	140	Pipe 610	Pipe 610 plus other pipes	F22019_WaterMap_NorthSat
82	J54	J72	155.11	200	Asbestos Cement	140	Pipes 651 and 612	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
83	J72	J73	55.63	150	Unknown	140	Pipe 613		WAT_Watermain_Table
84	J73	J68	102.7	150	Unknown	140	Pipe 581	Pipe 581 plus other pipes	F22019_WaterMap_NorthSat
85	J73	J74	115.06	150	Unknown	140	Pipe 598		WAT_Watermain_Table
86	J74	J75	80.77	150	Unknown	140	Pipe 595		WAT_Watermain_Table
87	J71	J75	103.23	150	Unknown	140	Pipe 603		F22019_WaterMap_NorthSat
88	J75	J76	84.7	150	Unknown	140	-	Unknown pipe, nearby pipes and as-builts show diameter of 150 mm	F22019_WaterMap_NorthSat
89	J75	J77	96.2	150	Unknown	140	Pipe 554		WAT_Watermain_Table
90	J77	J78	56.6	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
91	J78	J79	232.98	150	Asbestos Cement	140	Pipe 570		WAT_Watermain_Table
92	J79	J80	56.1	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
93	J77	J81	163.41	150	Asbestos Cement	140	Pipe 134		WAT_Watermain_Table
94	J81	J82	178.69	150	Asbestos Cement	140	Pipe 563		WAT_Watermain_Table
95	J82	J83	48.7	150	Asbestos Cement	140	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
96	J54	J84	160.9	200	Asbestos Cement	140	Pipe 541	Pipe 541 plus other pipes	F22019_WaterMap_NorthSat
97	J84	J85	55.86	200	Asbestos Cement	140	Pipe 542	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
98	J84	J86	88.03	200	Asbestos Cement	140	Pipe 547		WAT_Watermain_Table
99	J84	J87	106.4	150	Asbestos Cement	140	-	ssume same properties as pipe 13	F22019_WaterMap_NorthSat
100	J86	J87	14.4	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
101	J87	J88	91.81	150	Asbestos Cement	140	Pipe 112		WAT_Watermain_Table
102	J88	J89	72.73	200	PVC	150	Pipe 941		WAT_Watermain_Table
103	J86	J90	210.34	200	Asbestos Cement	140	Pipe 535		WAT_Watermain_Table
104	J90	J91	41.91	200	Asbestos Cement	140	Pipe 533		WAT_Watermain_Table
105	J91	J92	88.39	150	Asbestos Cement	140	Pipe 498		WAT_Watermain_Table
106	J88	J93	132.00	150	Asbestos Cement	140	Pipe 520	Pipe 520 plus other pipes	F22019_WaterMap_NorthSat
107	J93	J94	127.25	150	Asbestos Cement	140	Pipe 524		WAT_Watermain_Table
108	J87	J95	79.3	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
109	J95	J73	90.0	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
110	J95	J96	43.4	150	Unknown	140	Pipe 577	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
111	J96	J76	141.91	150	Unknown	140	Pipe 594		WAT_Watermain_Table
112	J76	J97	94.2	150	Unknown	140	Pipe 583	Pipe 583 plus other pipes	F22019_WaterMap_NorthSat
113	J96	J97	189.8	150	Unknown	140	Pipe 577	Pipe 577 plus other pipes	F22019_WaterMap_NorthSat
114	J97	J98	159.9	150	Unknown	140	Pipe 589	Pipe 589 plus other pipes	F22019_WaterMap_NorthSat
115	J98	J99	68.82	150	PVC	150	Pipe 559		WAT_Watermain_Table
116	J98	J80	98.4	150	Asbestos Cement	140	Pipe 552	Pipe 552 plus other pipes	F22019_WaterMap_NorthSat
117	J80	J83	94.38	150	Asbestos Cement	140	Pipe 104		WAT_Watermain_Table
118	J83	J100	121.5	150	Asbestos Cement	140	Pipe 518	Part of pipe 518 and other pipes	F22019_WaterMap_NorthSat
119	J100	J101	99.6	150	Asbestos Cement	140	Pipe 518	Part of pipe 518	F22019_WaterMap_NorthSat
120	J99	J102	134.56	150	PVC	150	Pipe 661		WAT_Watermain_Table
121	J102	J101	67.06	150	PVC	150	Pipe 656		WAT_Watermain_Table
122	J99	J103	56.5	150	PVC	150	-	ssume same properties as pipe 55	F22019_WaterMap_NorthSat
123	J103	J104	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
124	J104	J105	94.2	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
125	J104	J106	105.32	50	PVC	150	Pipe 103		WAT_Watermain_Table
126	J103	J107	147.26	150	Asbestos Cement	140	Pipe 653		WAT_Watermain_Table
127	J107	J108	75.1	150	Unknown	140	Pipe 513	Part of pipe 513	F22019_WaterMap_NorthSat
128	J108	J109	69.9	150	Unknown	140	Pipe 513	Part of pipe 513 and other pipes	F22019_WaterMap_NorthSat
129	J109	J101	46.5	150	Unknown	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
130	J107	J110	95.55	150	Unknown	140	Pipe 503		WAT_Watermain_Table
131	J110	J111	130.2	150	Unknown	140	Pipe 506	Pipe 506 plus other pipes	F22019_WaterMap_NorthSat
132	J111	J112	131.3	150	Unknown	140	Pipe 488	Part of pipe 488	F22019_WaterMap_NorthSat
133	J112	J113	178.9	150	Unknown	140	Pipe 488	Part of pipe 488 and other pipes	F22019_WaterMap_NorthSat
134	J113	J50	47.71	150	Unknown	140	Pipe 33		WAT_Watermain_Table
135	J50	J114	109.0	150	Asbestos Cement	140	Pipe 491	Pipe 491 plus other pipes	F22019_WaterMap_NorthSat
136	J114	J115	140.8	150	Asbestos Cement	140	Pipe 402	Pipe 402 plus other pipes	F22019_WaterMap_NorthSat
137	J114	J116	159.6	200	PVC	150	Pipe 24	Pipe 24 plus other pipes	F22019_WaterMap_NorthSat
138	J116	J117	143.1	200	PVC	150	Pipes 27 and 393	Pipes 27 and 392 plus other pipes	F22019_WaterMap_NorthSat
139	J117	J118	140.23	200	PVC	150	Pipe 385		WAT_Watermain_Table
140	J118	J119	71.63	150	PVC	150	Pipe 384		WAT_Watermain_Table
141	J114	J120	92.0	150	Asbestos Cement	140	Pipe 26	Pipe 26 plus other pipes	F22019_WaterMap_NorthSat
142	J120	J121	144.2	150	Asbestos Cement	140	Pipes 369 and 25	Pipes 369 and 25 plus other pipes	F22019_WaterMap_NorthSat
143	J121	J122	49.9	150	Asbestos Cement	140	Pipe 379		WAT_Watermain_Table
144	J122	J119	96.0	150	PVC	150	Pipe 23		WAT_Watermain_Table
145	J119	J123	106.0	150	PVC	150	Pipe 15		F22019_WaterMap_NorthSat
146	J123	J124	41.15	150	PVC	150	Pipe 19		WAT_Watermain_Table
147	J124	J125	137.16	150	Asbestos Cement	140	Pipe 28		WAT_Watermain_Table
148	J125	J126	137.16	150	Asbestos Cement	140	Pipes 29 and 410	As-built length for pipe 410	WAT_Watermain_Table
149	J126	J115	160.0	150	Asbestos Cement	140	Pipe 408	Pipe 408 plus other pipes	F22019_WaterMap_NorthSat
150	J115	J127	111.56	150	Asbestos Cement	140	Pipe 435		WAT_Watermain_Table
151	J123	J128	126.8	150	PVC	150	Pipes 11, 8, 4 and 6		F22019_WaterMap_NorthSat
152	J128	J129	85.3	150	Asbestos Cement	140	Pipe 425	Part of pipe 425	F22019_WaterMap_NorthSat
153	J129	J130	149.7	150	Asbestos Cement	140	Pipes 423 and 418	Part of pipes 423 and 418	F22019_WaterMap_NorthSat
154	J130	J131	170.4	150	Asbestos Cement	140	Pipe 422	Pipe 422 plus other pipes	F22019_WaterMap_NorthSat
155	J131	J127	119.8	50	Asbestos Cement	140	Pipe 434	Pipe 434 plus other pipes, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
156	J127	J132	100.0	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
157	J111	J132	93.87	150	Asbestos Cement	140	Pipe 484		WAT_Watermain_Table
158	J132	J133	106.9	150	Asbestos Cement	140	Pipe 450	Pipe 450 plus other pipes	F22019_WaterMap_NorthSat
159	J131	J133	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 45	F22019_WaterMap_NorthSat
160	J133	J134	173.6	150	Asbestos Cement	140	Pipe 457	Pipe 457 plus other pipes	F22019_WaterMap_NorthSat
161	J132	J135	188.4	150	Asbestos Cement	140	Pipe 469	Pipe 469 plus other pipes	F22019_WaterMap_NorthSat
162	J135	J134	130.9	150	Asbestos Cement	140	Pipe 465	Pipe 465 plus other pipes	F22019_WaterMap_NorthSat
163	J134	J136	141.1	150	Asbestos Cement	140	Pipe 458		WAT_Watermain_Table
164	J136	J137	158.5	150	Asbestos Cement	140	Pipe 477		WAT_Watermain_Table
165	J137	J138	227.9	150	Asbestos Cement	140	Pipes 474 and 37		WAT_Watermain_Table
166	J138	J109	262.3	150	Asbestos Cement	140	Pipes 151 and 277	Pipes 151 and 277 plus other pipes	F22019_WaterMap_NorthSat
167	J101	J139	187.4	250	PVC	150	Pipe 551	Pipe 551 plus other pipes	F22019_WaterMap_NorthSat
168	J139	J140	140.13	250	PVC	150	Pipes 309 and 310		WAT_Watermain_Table
169	J140	J141	143.46	250	PVC	150	Pipe 930		WAT_Watermain_Table
170	J141	J142	569.8	250	PVC	150	Numerous	Assuming as-builts are correct, GIS shows some pipes as 37 mm	F22019_WaterMap_NorthSat F22019_WaterMap_Mid
171	J142	J143	612.3	250	PVC	150	Pipes 330, 335 and 41	es 330, 335 and 41 plus other pi	F22019_WaterMap_Mid
172	J143	J144	745.0	250	PVC	150	Pipes 145, 146, 147, 44 and 46		WAT_Watermain_Table
173	J144	J145	172.3	250	PVC	150	Pipe 55	Pipe 55 plus other pipes	F22019_WaterMap_Mid
174	J145	J146	206.0	250	PVC	150	Pipe 58		WAT_Watermain_Table
175	J146	J147	75.4	250	PVC	150	-	ssume same properties as pipe 5	F22019_WaterMap_Mid
176	J147	J148	103.0	250	PVC	150	Pipe 68		WAT_Watermain_Table
177	J148	J149	150.0	250	PVC	150	Pipe 71		WAT_Watermain_Table

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178	J149	J150	222.0	250	PVC	150	Pipe 75	Pipe 75 plus other pipes	F22019_WaterMap_Mid	
179	J147	J151	123.73	150	PVC	150	Pipe 66		WAT_Watermain_Table	
180	J151	J152	158.6	150	PVC	150	Pipes 96 and 99		WAT_Watermain_Table	
181	J152	J153	137.00	150	PVC	150	Pipe 93		WAT_Watermain_Table	
182	J153	J154	91.5	150	PVC	150	Pipe 100		WAT_Watermain_Table	
183	J154	J155	93.25	150	PVC	150	Pipe 84		WAT_Watermain_Table	
184	J155	J156	129.0	150	PVC	150	Pipes 88 and 87		WAT_Watermain_Table	
185	J156	J150	103.0	150	PVC	150	Pipe 83		WAT_Watermain_Table	
186	J150	J157	161.1	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
187	J157	J158	185.0	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
188	J158	J159A	466.8	150	PVC	150	Pipe 279	Pipe 279 plus other pipes	F22019_WaterMap_South	
189	J159	J160A	1933.9	150	CU	135	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300 plus other pipes	F22019_WaterMap_South	Assuming CU is copper
189A	J160B	J160	929.5	150	CU	135	Pipes 301, 302, 315 and 313	Pipes 301, 302, 315 and 313 plus other pipes	F22019_WaterMap_South	
190	J161	J162	101.6	200	PVC	150	Pipe 196	Pipe 196 plus other pipes	F22019_WaterMap_South	
191	J162	J163	149.2	200	PVC	150	Pipe 312	Pipe 312 plus other pipes	F22019_WaterMap_South	
192	J163	J164	87.8	150	PVC	150	Pipe 199	Pipe 199 plus other pipes	F22019_WaterMap_South	
193	J164	J165	75.1	150	PVC	150	Pipe 197	Pipe 197 plus other pipes	F22019_WaterMap_South	
194	J164	J166	136.0	150	PVC	150	Pipe 153		WAT_Watermain_Table	
195	J166	J167	177.0	150	PVC	150	Pipe 156		F22019_WaterMap_South	
196	J167	J165	141.39	150	PVC	150	Pipes 165 and 166		WAT_Watermain_Table	
197	J165	J168	207.4	150	PVC	150	Pipes 311 and 175	Pipes 311 and 175 plus other pipes	F22019_WaterMap_South	
198	J168	J169	167.6	150	PVC	150	Pipes 177 and 178	Pipes 177 and 178 plus other pipes	F22019_WaterMap_South	
199	J169	J163	183.1	150	PVC	150	Pipe 182	Pipe 182 plus other pipes	F22019_WaterMap_South	
200	J163	J170	166.5	200	PVC	150	Pipe 255	Pipe 255 plus other pipes	F22019_WaterMap_South	
201	J170	J171	233.5	150	PVC	150	Pipes 275 and 276	Pipes 275 and 276 plus other pipes	F22019_WaterMap_South	
202	J170	J172	122.8	200	PVC	150	Pipe 263	Pipe 263 plus other pipes	F22019_WaterMap_South	
203	J172	J173	81.3	200	PVC	150	Pipe 267	Pipe 267 plus other pipes	F22019_WaterMap_South	
204	J173	J174	128.8	200	PVC	150	Pipe 273	Pipe 273 plus other pipes	F22019_WaterMap_South	
205	J174	J175	178.9	200	PVC	150	Pipe 216	Pipe 216 plus other pipes	F22019_WaterMap_South	
206	J175	J176	88.8	200	PVC	150	Pipe 222	Pipe 222 plus other pipes	F22019_WaterMap_South	
207	J175	J177	89.4	150	PVC	150	Pipe 235	Pipe 235 plus other pipes	F22019_WaterMap_South	
208	J173	J178	102.50	150	PVC	150	Pipe 207		WAT_Watermain_Table	
209	J178	J177	68.68	150	PVC	150	Pipe 210		WAT_Watermain_Table	
210	J177	J179	96.0	150	PVC	150	Pipe 242	Part of pipe 242 and other pipes	F22019_WaterMap_South	
211	J172	J180	59.5	150	PVC	150		ssume same properties as pipe 20	F22019_WaterMap_South	
212	J180	J179	116.3	150	PVC	150	Pipe 205		F22019_WaterMap_South	
213	J179	J181	72.78	150	PVC	150	Pipe 242		WAT_Watermain_Table	
214	J181	J182	148.8	150	PVC	150	Pipe 246	Pipe 235 plus other pipes	F22019_WaterMap_South	
215	J118	J183	235	150	PVC	150	-	sting watermain plus part of WM	Google Earth estimate	
216	J183	J16	85	150	PVC	150	-	Part of WM extension	Google Earth estimate	

Yellow cells are assumed values

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
M22019
P. King

						Water Model Calculations				Flow Meter Data			
Water Model Node	**ICI Uses**	**Address**	**Type**	**Footprint (m2)**	**Footprint (ha)**	**Estimated Occupancy**	**Units**	**Flow Rate**	**ADD (L/day)**	**Average (L/day)**	**ADD (L/day)**	**Design ADD (L/day)**	**Notes**
J1A	Water Treatment Plant	40C Broadway Ae.	Industrial	1828	0.1828	-	m3/ha/d	45	8226			8226	
	LCBO		Commercial										
	Algoma Public Health	16 Ganley St.	Commercial - Office							4067	4881	4881	
J5	Home Town Wines		Commercial - Personal Service Shop	1262	0.1262	11	L/p/d	278.0	3017				
	Superior East Community Futures Development Corporation		Commercial - Office										
	Algoma District Services Administration Board	52 Broadway Ave.	Commercial - Office							0	0	0	
	North Algoma Literacy Colaition	50B Broadway Ave.	Commercial - Office							231	277	277	
J6	Garage Behind Bowling Alley	Ganley St.	Storage Garage	137	0.0137	3	L/p/d	75	223			223	
J7	Low Lift Pumping Station	-	Industrial	616	0.0616	-	m3/ha/d	45	2772			2772	
	The Thrift Barn	45 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	635	762	762	
	Square Three	43 Broadway Ave.	Commercial	494	0.0494	4	L/p/d	278.0	1181	60	72	72	
	The Brick	41 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	28	33	33	
	Sonia Video	39 Broadway Ave.	Commercial	497	0.0497	4	L/p/d	278.0	1189			1189	
	The Co-operators	37 Broadway Ave.	Commercial - Office	536	0.0536	5	L/p/d	278.0	1281	3068	3681	3681	
J8	Alzheimers Society		Commercial - Office										
	Canada Post Office	44 Broadway Ave.	Commercial	971	0.0971	8	L/p/d	278.0	2321	441	529	529	
	OPP Station	42 Broadway Ave.	Commercial - Office										
	Municipal Offices	40 Broadway Ave.	Commercial - Office	1389	0.1389	12	L/p/d	278.0	3321	2036	2443	2443	
	Public Library	40 Broadway Ave.	Commercial										
	Wawa Volunteer Fire Department	12 Ontario St.	Storage Garage	480	0.0480	10	L/p/d	75	783			783	
	March of Dimes Canada	31 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	757	908	908	
	Northern Vision Care	29 Broadway Ave.	Commercial - Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	600	720	720	
	Lai's Restaurant	27 Broadway Ave.	Commercial - Dining	460	0.046	4	L/p/d	278.0	1100	4066	4879	4879	
J9	Empty Building	25 Broadway Ave.	Storage	426	0.0426	9	L/p/d	75	695			695	
	SpikeMills Art Gallery	28 Broadway Ave.	Commercial	227	0.0227	2	L/p/d	278.0	543				
	Lakeview Hotel - Hotel Rooms	28 Broadway Ave.	Hotel	-	-	31	L/bed-space-day	225	6975	10459	12550	12550	7 one bed rooms, 7 double bed rooms, 5 apartment rooms (assuming 2 beds)
	Lakeview Hotel - Motel Rooms	28 Broadway Ave.	Motel	-	-	22	L/bed-space-day	175	3850				11 motel rooms (assuming 2 beds)
	Lakeview Restaurant	28 Broadway Ave.	Commercial - Dining	173	0.0173	1	L/p/d	278.0	414				Assuming second floor of part of the building
	Iris Place	21 Broadway Ave.	Commercial	552	0.0552	5	L/p/d	278.0	1320			1320	
	Empty Building	16 Broadway Ave.	Storage	150	0.015	3	L/p/d	75	245			245	
J10	Beachfront Trading Post	14 Broadway Ave.	Commercial	464	0.0464	4	L/p/d	278.0	1109	18032	21638	21638	
	Canadian Red Cross	4 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	67	81	81	
	Public Washrooms	15 Broadway Ave.	Commercial	897	0.0897	8	L/p/d	278.0	24937	267	321	321	
	Garage	2 Broadway Ave.	Storage Garage	193	0.0193	4	L/p/d	75	315	563	676	676	
J11	Calvary Penecostal Church	12 Government Rd.	Commercial - Fixed Seats	1410	0.141	31	L/p/d	278.0	8521	412	495	495	Included as commercial, measured with google earth as house on same lot
	Lady Dunn Health Centre	17 Government Rd.	Hospital	-	-	28	L/(bed-day)	1350	37800	24275	29130	29130	10 acute care beds, 2 respite beds, and 16 long term care beds
J13	Garage	17 Government Rd.	Storage Garage	202	0.0202	4	L/p/d	75	329	3	4	4	Assume this is the small meter for 17 Government Rd.
	Algoma District Paramedic Service	Government Rd.	Commercial Office	364	0.0364	3	L/p/d	278.0	871			871	
J17	Leverington's Garden Centre	130 Government Rd.	Industrial - Process Room	3923	0.3923	-	m3/ha/d	45	17654	351	422	422	Residential in water meter data
J18	Lloyd's of Wawa	165 Government Rd.	Storage Garage	477	0.0477	10	L/p/d	75	778	17	20	20	
	Wagging Tails Kennel	171 Government Rd.	Commercial	296	0.0296	3	L/p/d	278.0	708	677	813	813	
	Everything Floors Ltd.	9 Mackey St.	Commercial	575	0.0575	5	L/p/d	278.0	1375	950	1140	1140	
J19	Wawa Handy Store	19 Mackey St.	Commercial	456	0.0456	4	L/p/d	278.0	1090	9194	11033	11033	
	Empty Building	Mackey St.	Storage Garage	660	0.066	14	L/p/d	75	1076			1076	
J20	United Supply/Swish	4 McKinley Ave.	Commercial	688	0.0688	6	L/p/d	278.0	1645	155	186	186	
	Superior North Mobile Vetrinary Service	23 Mackey St.	Commerial - Personal Service Shop	464	0.0464	4	L/p/d	278.0	1110			1110	
J21	A Touch of Glass	25 Mackey St.	Commercial - Personal Service Shop	235	0.0235	2	L/p/d	278.0	562			562	
	Sir James Dunn Public School	36 McKinley Ave.	School	-	-	87	L/student/d	105	9135	8595	10314	10314	87 students and 21 staff
J24	Children's Aid Society of Algoma	31 Algoma St.	Commercial - Office	147	0.0147	1	L/p/d	278.0	351	135	162	162	
J25	Bell	56 Ganley St.	Commercial	930	0.093	8	L/p/d	278.0	2223	9	10	10	
	Wawa Laundromat	44 Mackey St.	Commercial	465	0.0465	4	L/p/d	278.0	1112	1907	2289	2289	
J30	Old Garage	62 Mackey St.	Storage Garage	230	0.0230	5	L/p/d	75	375			375	
J31	Superior Children's Centre	41 Algoma St.	Daycare	665	0.0665	6	L/p/d	278.0	1590	759	910	910	Assumed like commercial; Included as residential in water meter data
J34	Paint + Glass	Caverhill St.	Storage	275	0.0275	6	L/p/d	75	448			448	
	Creation Hairstyling	75A McKinley Ave.	Commercial-Personal Service Shop	232	0.0232	2	L/p/d	278.0	555	601	721	721	Assumed half of lot
J35	Home	75 McKinley Ave.	Commercial	232	0.0232	2	L/p/d	278.0	555	332	398	398	Assumed half of lot
J36	Sam's Place	84 McKinley Ave.	Commercial-Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	652	783	783	
J41	St. Paul's Anglican Church	60 Second Ave.	Commercial - Fixed Seats	930	0.0930	8	L/p/d	278.0	2223	148	178	178	
J49	Michipicoten Non-Profit Housing	40 Hillcrest Ave.	Commercial - Office	293	0.0293	3	L/p/d	278.0	701	994	1193	1193	Included as multi-residential in water meter data
	Canadian Tire	54 Broadway Ave.	Commercial	2524	0.2524	22	L/p/d	278.0	6034	6145	7374	7374	
	Dawson & Keenan	56 Broadway Ave.	Commercial - Office	465	0.0465	4	L/p/d	278.0	1112	8864	10637	10637	
J51	Roxy Bowling Centre	49 Broadway Ave.	Commercial	632	0.0632	5	L/p/d	278.0	1511	811	973	973	
	The Royal Canadian Legion	51 Broadway Ave.	Commercial	567	0.0567	5	L/p/d	278.0	1356	9272	11127	11127	Included as residential in water meter data
	Sam's Foodline	55 Broadway Ave.	Commercial	1990	0.1990	17	L/p/d	278.0	4757			4757	
	Allemano & Fitzgerald	55 Broadway Ave.	Commercial - Office	301	0.0301	3	L/p/d	278.0	719			719	
	Feifel, Broadbent and Gualazzi	57 Broadway Ave.	Commercial - Office	277	0.0277	2	L/p/d	278.0	662	1	1	1	
	Wawa Jewellers	59 Broadway Ave.	Commercial	376	0.0376	3	L/p/d	278.0	899	111	134	134	
	The Bargain! Shop	60 Broadway Ave.	Commercial	930	0.093	8	L/p/d	278.0	2223	242	290	290	
	AJ's Pizza & Wholesale	64 Broadway Ave.	Commercial - Kitchen	475	0.0475	4	L/p/d	278.0	1136	322	386	386	
	Best Start Hub	66 Broadway Ave.	Daycare	383	0.0383	3	L/p/d	278.0	916	673	807	807	Assumed like commercial; Included as residential in water meter data

EPANet Current Model with Upgrades Inputs

	North of 17 Restaurant	68 Broadway Ave.	Commercial - Dining	753	0.0753	6	L/p/d	278.0	1800	4002	4803	4803	
	Embassy Restaurant	70 Broadway Ave.	Commercial - Dining	486	0.0486	4	L/p/d	278.0	1162	1798	2158	2158	
	RBC Royal Bank	72 Broadway Ave.	Commercial - Personal Service Shop	480	0.048	4	L/p/d	278.0	1148	595	714	714	
J52	Wawa Dental Centre	27A Gold St.	Commercial - Personal Service Shop	1007	0.1007	9	L/p/d	278.0	2408	1982	2378	2378	
	Wawa Pharmacy		Commercial										
	Wawa Goose Senior Centre	63 Broadway Ave.	Commercial	460	0.0460	4	L/p/d	278.0	1100	676	812	812	
	Barber Shop		Commercial - Personal Service Shop										
	U Wanna Cab	65 Broadway Ave.	Commercial - Office	457	0.0457	4	L/p/d	278.0	1093	429	514	514	
	Regional Employment Help Centre		Commercial - Office										
	Chic'N Swell	67 Broadway Ave.	Commercial - Personal Service Shop	462	0.0462	4	L/p/d	278.0	1105	383	459	459	
	Guided Fishing Trips		Commercial - Office										
	Columbia Restaurant & Pizzeria	71 Broadway Ave.	Commercial - Dining	462	0.0462	4	L/p/d	278.0	1105	3642	4370	4370	
	Parish of St. Monica	78 Broadway Ave.	Commercial - Fixed Seats	1859	0.1859	16	L/p/d	278.0	4444	259	311	311	2 water meters for this address, assume both are for the Church
	The Algoma News Review	33 St. Marie St.	Commercial	833	0.0833	7	L/p/d	278.0	1992	478	573	573	
	ANP Office Supply		Commercial										
J53	Fenlon's Pharmacy	88 Broadway Ave.	Commercial	1298	0.1298	11	L/p/d	278.0	3103	1468	1761	1761	
	Northern	Broadway Ave.	Commercial	1407	0.1407	12	L/p/d	278.0	3363			3363	
	Yellow Building	Broadway Ave.	Storage	132	0.0132	3	L/p/d	75	215			215	
	Algoma Family Services	26 St. Marie St.	Commercial - Office	833	0.0833	7	L/p/d	278.0	1992	1835	2201	2201	2 water meters for this address
	Bangin Burger N Chicken Shack	92 Broadway Ave.	Commercial - Kitchen	465	0.0465	4	L/p/d	278.0	1112	182	219	219	
J54	Economic Development Corporation of Wawa	96 Broadway Ave.	Commercial - Office	930	0.0930	8	L/p/d	278.0	2223	3168	3801	3801	Assume 50% of building
	JJAM FM		Commercial - Office										Assume 50% of building
	Ontario Mine Rescue Algoma District Station	36 Montreal Ave.	Commercial - Office	1463	0.1463	13	L/p/d	278.0	3498	0	0	0	
J69	Garage	42 Montreal Ave.	Storage Garage	504	0.0504	11	L/p/d	75	822	40	49	49	Assuming this is 42, although streetview shows 40 and no 42
	Municipality of Wawa Infrastructure Services Department	26 Magpie Rd.	Commercial - Office	3503	0.3503	30	L/p/d	278.0	8375	1842	2211	2211	2 water meters for this address, assume both are for this building
	The Shop	46 Montreal Ave.	Commercial	1227	0.1227	11	L/p/d	278.0	2934	977	1172	1172	
J71	Millette General Contractors Ltd.	Montreal Ave.	Commercial	1040	0.1040	9	L/p/d	278.0	2487			2487	
	The Ship Boy Scouts Wawa Rotary Club	Montreal Ave.	Commercial - Office	55	0.0055	0	L/p/d	278.0	133			133	
J75	Home	12 Klondike St.	Commercial	138	0.0138	1	L/p/d	278.0	330	238	286	286	
	Garage		Storage Garage	289	0.0289	6	L/p/d	75	471				
J77	Garage	142 Broadway Ave.	Storage Garage	361	0.0361	8	L/p/d	75	589	537	645	645	
	Garage		Storage Garage	182	0.0182	4	L/p/d	75	297				
J82	Mobile Home Park	Trailer Park Rd.	Mobile Home Park	-	-	23	L/space/d	1000	23000	15505	18606	18606	
	Ecole Publique L'Escalade	52 Winston Rd.	School	-	-	10	L/student/d	105	1050	244	293	293	10 students and 5 staff
J84	First United Church	224 Mission Rd.	Commercial - Fixed Seats	2189	0.2189	19	L/p/d	278.0	5233	22	26	26	
	Circle K	208D Mission Rd.	Commercial							463	555	555	
J86	Northern Credit Union	208 Mission Rd.	Commercial - Personal Service Shop	2031	0.2031	17	L/p/d	278.0	4856	126	151	151	
	Empty Store	208 Mission Rd.	Commercial							89	107	107	
J87	Watson's Algoma Vacations Ltd.	195 Mission Rd.	Office	1041	0.1041	9	L/p/d	278.0	2489	851	1021	1021	
J88	Big Bird Inn	191 Mission Rd.	Hotel	-	-	90	L/bed-space-day	225	20250	1643	1972	1972	50 rooms, 40 double beds and 10 single beds
	Independent Grocery Store	186 Mission Rd.	Commercial	3291	0.3291	28	L/p/d	278.0	7868	1034	1240	1240	
	Subway	179 Mission Rd.	Commercial - Dining	2139	0.2139	18	L/p/d	278.0	5114	2980	3576	3576	
J89	Movie Gallery		Commercial										
	The Viking Restaurant	177 Mission Rd.	Commercial - Dining	1818	0.1818	16	L/p/d	278.0	4346	233	280	280	
	Polish Alliance of Canada	Mission Rd.	Commercial - Non-Fixed Seats and Tables	1364	0.13641583	12	L/p/d	278.0	3261			3261	
J91	Michipicoten High School	86 Magpie Rd.	School	-	-	100	L/student/d	105	10500	10326	12392	12392	120 people, guessing around 100 are students; 2 water meters for this address
J92	St. Augustine	2 Arnott Ave.	School	-	-	100	L/student/d	105	10500	587	704	704	Similar to Michipicoten High School
J99	Outdoorsman Motel	171 Mission Rd.	Motel	-	-	55	L/bed-space-day	175	9625	5094	6113	6113	37 rooms and 55 beds
J100	Kingdom Hall of Jehovah's Witness	54 Winston Rd.	Commercial - Fixed Seats	929	0.0929	8	L/p/d	278.0	2221	151	181	181	
	Wawa Rent-all and Repair	58 Winston Rd.	Commercial	1465	0.1465	13	L/p/d	278.0	3503	305	366	366	
J101	Garage	60 Winston Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331			331	
	Gator's Steakhouse Building	47 Mission Rd.	Commercial - Office	2023	0.2023	17	L/p/d	278.0	4837			4837	
J102	T Cannabis	152 Mission Rd.	Commercial	1302	0.1302	11	L/p/d	278.0	3113	1410	1692	1692	
	Beer Store	156 Mission Rd.	Commercial	1990	0.199	17	L/p/d	278.0	4758	3176	3811	3811	
J103	Algoma Motel	164 Mission Rd.	Motel	-	-	26	L/bed-space-day	175	4550	3124	3748	3748	https://www.algomamotel.com/#gallery (705-856-7010)
	Bristol Motel	170 Mission Rd.	Motel	-	-	32	L/bed-space-day	175	5600	4564	5477	5477	Can't get working phone number or email
J109	Kerry Funeral Home	140 Churchill Ave.	Commercial - Fixed Seats	651	0.0651	6	L/p/d	278.0	1556	925	1110	1110	
	Beaver Motel	148 Mission Rd.	Motel	-	-	25	L/bed-space-day	175	4375	3116	3740	3740	6 double rooms and 13 single rooms
J111	Ecole St. Joseph	101 Churchill Ave.	School	-	-	205	L/student/d	105	21525	1934	2320	2320	205 students and 32 staff
J120	Confederation College Building	3 Maple St.	Storage	964	0.0964	21	L/p/d	75	1572	495	594	594	2 water meters for this address
J137	Lion's Club	51 Superior Ave.	Commercial - Non-Fixed Seats and Tables	236	0.0236	2	L/p/d	278.0	564	85	103	103	Included as residential in water meter data
	Michipicoten Memorial Community Centre	3 Chris Simon Dr.	Space with Fixed Seats	5838	0.5838	50	L/p/d	278.0	13957	6454	7744	7744	
J138	Wawa Motor Inn	118 Mission Rd.	Motel	-	-	175	L/bed-space-day	175	30625	40407	48488	48488	Assumed higher flow rate for motel
	Wawa Motor Inn - Wawa Goose Bar & Grill	118 Mission Rd.	Commercial - Dining	615	0.0615	5	L/p/d	278.0	1470	1947	2336	2336	Assumed lower flow rate for restaurant
	Petro Canada	137 Mission Rd.	Commercial	2151	0.2151	18	L/p/d	278.0	5143	781	937	937	
J139	Northern Chiropractic	135 Mission Rd.	Commercial - Personal Service Shop	135	0.0135	1	L/p/d	278.0	323	142	170	170	
	Krazy Fries	135B Mission Rd.	Commercial - Kitchen	71	0.0071	1	L/p/d	278.0	170	73	88	88	
J140	Small Station	Mission Rd.	Industrial	38	0.0038	-	m3/ha/d	45	171			171	
	Home Building Centre Garage	109 Mission Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331				
J141	Home Building Centre		Commercial	885	0.0885	8	L/p/d	278.0	2116	98	118	118	
	Young's General Store	111 Mission Rd.	Commercial	2021	0.2021	17	L/p/d	278.0	4832	2462	2954	2954	
	Lagoon Building	Road to Golf Course	Industial	201	0.0201	-	m3/ha/d	45	905			905	A tap is used here to flush the line according to Municipality.
	Canco	125 Mission Rd.	Commercial	2083	0.2083	18	L/p/d	278.0	4980	1621	1946	1946	Think this address is Canco from online search although it doesn't match up with map
J142	Wesdome	93 Mission Rd.	Industrial	373	0.0373	-	m3/ha/d	45	1679	464	557	557	

EPANet Current Model with Upgrades Inputs

	Garages	89 Mission Rd.	Storage Garage	515	0.0515	11	L/p/d	75	840	151	181	181	
	Tim Hortons	92 Mission Rd.	Commercial - Dining	7977	0.7977	69	L/p/d	278.0	19071	4507	5409	5409	
	Mission Motors	61 Mission Rd.	Commercial	715	0.0715	6	L/p/d	278.0	1709	1425	1710	1710	
	Service Ontario	48 Mission Rd.	Commercial - Personal Service Shop	1204	0.1204	10	L/p/d	278.0	2879	947	1137	1137	Assume first 48 Mission road is Service Ontario
	Ontario Ministry of Natural Resources	48 Mission Rd.	Commercial - Office	394	0.0394	3	L/p/d	278.0	942	8	9	9	Assume second 48 Mission Road is OMNR
	Government Storage Garages (x7)	48 Mission Rd.	Storage Garage	2321	0.2321	50	L/p/d	75	3784	5911	7093	7093	Assume third 48 Mission Road is for other buildings
J143	Storage Sheds on Highway 17 W	Highway 17 W	Storage Garage	2506	0.2506	54	L/p/d	75	4086	792	950	950	Only facility on highway 17 that looks like it could have an in-town service connection
	Wawa Municipal Airport	27A Mission Rd.	Commercial	224	0.0224	2	L/p/d	278.0	536	577	692	692	Assume 27A is for the main building; has three water meters
		27B Mission Rd.	Storage Garage	192	0.0192	4	L/p/d	75	313	105	126	126	Assume 27B is for the garage and hanger
			Aircraft Hanger	555	0.0555	12	L/p/d	75	905				Assume 27B is for the garage and hanger
	Tourist Information Centre	Mission Rd.	Shopping Centre	334	0.0334	3	L/p/d	278.0	799	501	602	602	Added three meters on Mission roads without addresses here as it is furthest distance.
J147	Trans Canada Chrysler	74 Pinewood Dr.	Commercial	875	0.0875	8	L/p/d	278.0	2092	1076	1291	1291	
J148	Fountain Tire	70 Pinewood Dr.	Commercial	2708	0.2708	23	L/p/d	278.0	6474	1045	1254	1254	
	Family Kitchen Restaurant Building	Pinewood Dr.	Storage	389	0.0389	8	L/p/d	75	634			634	
J149	Esso Gas Station	54 Pinewood Dr.	Commercial	234	0.0234	2	L/p/d	278.0	559	354	425	425	Assume one of 54 Pinewood Dr. Buildings
	Davidson Fuels	54 Pinewood Dr.	Commercial	393	0.0393	3	L/p/d	278.0	940	2726	3272	3272	Assume one of 54 Pinewood Dr. Buildings
	Highway 17 Hotel	42 Pinewood Dr.	Hotel	-	-	76	L/bed-space-day	225	17100	8422	10106	10106	46 rooms and 76 beds
J150	OPP Station	34 Pinewood Dr.	Commerial - Office	674	0.0674	6	L/p/d	278.0	1611	327	392	392	
	Gardewine	100 Mills Dr.	Storage Garage	735	0.0735	16	L/p/d	75	1198	71	85	85	
J151	Superior Truck Repair Centre	167 Mills Dr.	Storage Garage	967	0.0967	21	L/p/d	75	1577	323	388	388	Assume one of 167 Mills Dr. Buildings
	Lakehead Freightway/Manitoulin Transport	167 Mills Dr.	Storage Garage	409	0.0409	9	L/p/d	75	667	44	53	53	Assume one of 167 Mills Dr. Buildings
J152	U-Haul Dealer	160 Mills Dr.	Commercial	496	0.0496	4	L/p/d	278.0	1186	297	356	356	Assuming U-Haul Dealer is the northeast building on Mills Dr., lot estimated with google ea
J154	Martel Customs	128 Mills Dr.	Industrial	83	0.0083	-	m3/ha/d	45	374	0	0	0	Assuming this is the small building on south side of Mills Dr.
J155	Red Roof Building	120 Mills Dr.	Storage Garage	377	0.0377	8	L/p/d	75	615	403	484	484	
	Red Roof Building #2	Mills Dr.	Storage Garage	488	0.0488	11	L/p/d	75	796			796	
J156	Building on cul-de-sac	White Dr.	Storage Garage	283	0.0283	6	L/p/d	75	461			461	Can't see on GIS imagery, looks about 3/4 the size of the smaller red roof building
	Northstar Fusion	16 White Dr.	Industrial	10500	1.0500	-	m3/ha/d	45	47250			47250	Measured with google earth, size of facility not sure if it is all building
	Evolugen	105 Mills Dr.	Industrial	835	0.0835	-	m3/ha/d	45	3758	3089	3707	3707	
J157	Algoma Storage	30 Pinewood Dr.	Storage	1086	0.1086	24	L/p/d	75	1771	9	11	11	
J158	Algoma Highlands Wild Blueberry Farm	1 Pinewood Dr.	Industrial - Process Room	3506	0.3506	-	m3/ha/d	45	15777	382	458	458	
J160A	Jones Power Sports	320 Highway 17	Commercial	362	0.0362	3	L/p/d	278.0	865	521	625	625	
	High Falls Motel & Cabins	280 Highway 17	Motel	-	-	18	L/bed-space-day	175	3150	1106	1327	1327	Two water meters for this address; info@highfallsmotelandcabins.com
J161	Water Tower and Pumping Station	Princess Ave.	Industrial	1400	0.14	-	m3/ha/d	45	6300			6300	Measured with google earth
J163	Your Room is Ready!	323 Hardy Ave.	Hotel	-	-	4	L/bed-space-day	225	900	401	481	481	https://yourroomisready.business.site/?utm_source=gmb&utm_medium=referral
J171	Wood Land Masonic Lodge	308 Magpie Rd.	Commercial - Fixed Seats	75	0.0075	1	L/p/d	278.0	179	27	32	32	Measured with google earth
	Shed on Superior St.	Superior St.	Storage Garage	86	0.0086	2	L/p/d	75	140			140	
J176	Buck's Marina	360 Superior St.	Commercial	348	0.0348	3	L/p/d	278.0	832			832	Measured with google earth
			Storage Garage	546	0.0546	12	L/p/d	75	890			890	
	Small Building on Superior St.	Superior St.	Industrial	300	0.03	-	m3/ha/d	45	1350			1350	Measured with google earth
				Total	626829					294992	353990	453716	
										In-town		329244	370316

*Footprints highlighted orange use building size instead of lot size

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Reserviors

Name	Elevation (m)	Notes	Source
Res1	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38
Res2	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38

Nodes

Name	Elevation (m)	Source
S1	294.3	2531A38
S2	294.3	2531A38
S3	294.3	2531A38
S4	294.3	2531A38
D1	294.3	2531A38
D2	294.3	2531A38
D3	294.3	2531A38
D4	294.3	2531A38
D5	294.3	2531A38

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PS1	RES1	S1	5	200	Stainless Steel	140
PS2	RES1	S2	5	250	Stainless Steel	140
PS3	RES2	S3	5	200	Stainless Steel	140
PS4	RES2	S4	5	250	Stainless Steel	140
PD1	D1	D5	5	200	Stainless Steel	140
PD2	D2	D5	5	250	Stainless Steel	140
PD3	D3	D5	5	200	Stainless Steel	140
PD4	D4	D5	5	250	Stainless Steel	140
PD5	D5	J1A	10	400	Stainless Steel	140

Pumps

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario 3	
Tag #	Name	Start	End	Curve	Status	Curve	Status	Curve	Status	Curve	Status	Curve	Status
HLP-6201	PUMP1	S1	D1	CURVE4	Open	CURVE1	Closed	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6301	PUMP2	S2	D2	CURVE2	Closed	CURVE2	Closed	CURVE2	Open	CURVE2	Open	CURVE2	Open
HLP-6501	PUMP3	S3	D3	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed
HLP-6601	PUMP4	S4	D4	CURVE5	Closed	CURVE6	Open	CURVE2	Open	CURVE2	Open	CURVE2	Open

Curves
CURVE1

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6201/6501	1185	0	225	0	68.58
		200	212	12.62	64.62
		400	204	25.24	62.18

EPANet Current Model with Upgrades Inputs

		600	196	37.85	59.74
		800	189	50.47	57.61
		1000	178	63.09	54.25
		1200	164	75.71	49.99
		1400	144	88.33	43.89
		1600	119	100.94	36.27

CURVE2

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6301/6601	1185	0	250	0	76.20
		200	240	12.62	73.15
		400	228	25.24	69.49
		600	216	37.85	65.84
		800	206	50.47	62.79
		1000	198	63.09	60.35
		1200	190	75.71	57.91
		1400	180	88.33	54.86
		1600	171	100.94	52.12
		1800	160	113.56	48.77
		2000	143	126.18	43.59
		2200	118	138.80	35.97

$$\frac{Q1}{Q2} = \frac{RPM1}{RPM2}$$

$$\frac{H1}{H2} = \frac{RPM1^2}{RPM2^2}$$

$$\frac{P1}{P2} = \frac{RPM1^3}{RPM2^3}$$

-law-for-centrifugal-pump-pump-affinity-laws/

CURVE4

Pump	RPM	Flow (LPS)	Head (m)
HLP-6201	1125	0.00	61.81
		11.98	58.24
		23.96	56.04
		35.94	53.84
		47.92	51.92
		59.90	48.90
		71.87	45.05
		83.85	39.56
		95.83	32.69

CURVE5

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1075	0	62.71
		11.45	60.20
		22.89	57.19
		34.34	54.18
		45.79	51.67
		57.23	49.67
		68.68	47.66
		80.13	45.15
		91.57	42.89
		103.02	40.13
		114.47	35.87
		125.91	29.60

EPANet Current Model with Upgrades Inputs

CURVE6

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1125	0.00	68.68
		11.98	65.93
		23.96	62.64
		35.94	59.34
		47.92	56.59
		59.90	54.39
		71.87	52.20
		83.85	49.45
		95.83	46.98
		107.81	43.95
		119.79	39.28
		131.77	32.42

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Valves

Name	Start	End	Diameter (mm)	Type	Setting (m)	Drawing
VALVE1	J159A	J159	150	PRV	18.5975	A1-2002-62-P5
VALVE2	J160A	J160B	150	PRV	11.4650	A1-2002-62-P2

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Nodes

Name	Elevation (m)	Source
FS	290.6	Between nodes J101 and J139
FD	290.6	Between nodes J101 and J139

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PFS	J101	FS	150	250	Stainless Steel	140
PFD	FD	J139	37.4	250	Stainless Steel	140

Pump

			ADD		MDD		FF Scenario 1		FF Scenario 2	
Name	**Start**	**End**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**
PUMP5	FS	FD	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed

Curves

Name	Flow (LPS)	Head (m)
CURVE3	47.9	21.9

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PWT1	JFS	TANK1	4	50	Stainless Steel	140
PWT2	TANK1	J161	4	200	Stainless Steel	140

Tank

Name	Elevation	Initial Level	Minimum Level (m)	Maximum Level (m)	Diameter (m)	
TANK1	205.1	41.5	40	61	4.1203	*Municipality said normal levels are between 40 and 43m

Node

Name	Elevation (m)
FS	205.1

FV

Diameter	Setting	Status	
50	10	None	*Can be none or closed, will impact flow rate
			**If status is open then no flow restriction will occur

EPANet Current Model with Upgrades Inputs

Wawa W&WW Master Plan
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Nodes

Name	Elevation (m)	Scenario 1 Flow (L/s)	Scenario 2 Flow (L/s)	Scenario 3 Flow (L/s)
JFF1	293.02	38	0	0
JFF2	289.57	38	0	0
JFF3	293.32	23.29	23.29	0
JFF4	289.4	0	38	30.65
JFF5	288.4	0	38	30.65
JFF6	280.6	0	0	38
JFF7	194.5	0	0	38
JFF8	293.76	38	0	0
JFF9	291.23	0	38	0
		137.29	137.29	137.29

Pipes

Name	Start	End	Length (m)	Diameter (mm)	HW Roughness Coefficient
PIPEFF1	J18	JFF1	1	1000	200
PIPEFF2	J118	JFF2	1	1000	200
PIPEFF3	J53	JFF3	1	1000	200
PIPEFF4	J92	JFF4	1	1000	200
PIPEFF5	J70	JFF5	1	1000	200
PIPEFF6	J155	JFF6	1	1000	200
PIPEFF7	J169	JFF7	1	1000	200
PIPEFF8	J31	JFF8	1	1000	200
PIPEFF9	J60	JFF9	1	1000	200

EPANet Current Model with Upgrades Inputs

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Chlorine Sources

Node	Concentration (mg/L)
RES1	0.86
RES2	0.86
TANK1	0.86

Decay Coefficient

Global Bulk Coefficient	-0.5

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
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Existing EPA Net Model Basis
Existing Housing Density: 2.20

Future Serviced Population (2032): 3,215
Future Serviced Homes: 1422

Junction	*Junction Input for Elevation* Surface Elevation (m)	Invert Elevation (m)	Residential Homes (With Demand from this Junction)	Multi-Residential Units (With Demand from this Junction)	Housing Density	Population (With Demand From this Junction)	Per Capita Demand (L/cap/d)	Residential Demand - Houses (L/d)	Residential Demand - Extra (L/d)	Residential Demand - Total (L/d)	Non-Residential Buildings (With Demand from this Junction)	Non-Residential Demand (L/d)	Bypasses (L/d)	Watermain Purging (L/d)	Total Unaccounted for Water Demand (L/d)	Total ADD Junction Demand (L/d)	*Junction Input for Base Demand* Total ADD Junction Demand (L/s)	Max Day Factor	Total MDD Junction Demand (L/d)	Total MDD Junction Demand (L/s)	Peak Hour Factor	Object	Buildings	Reference Drawing	
1A	293.2	290.6	0	0	2.20	0	278.0	0	0	0	1	8226	0	0	0	8226	0.0952	2.00	16452	0.1904	3.00	-	Water Treatment Plant	2531-A-3	
1	293.24	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant	No demand	1277-29	
2	293.21	-	3	0	2.20	7	278.0	1835	67	1902	0	0	6542	0	6542	8444	0.0977	2.00	16888	0.1955	3.00	Hydrant 126	24, 26 and 28 Ganley St.	1277-29	
3	293.18	-	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	34 and 38 Ganley St.	1277-30	
4	293.12	-	5	0	2.20	11	278.0	3058	112	3170	0	0	3271	0	3271	6441	0.0745	2.00	12882	0.1491	3.00	-	44, 46, 48, 50 and 52 Ganley St.	1277-30	
5	292.57	-	0	0	2.20	0	278.0	0	0	0	6	5158	0	0	0	5158	0.0597	2.00	10317	0.1194	3.00	-	Commercial building with LCBO	1277-30	
6	291.09	-	8	0	2.20	18	278.0	4893	179	5072	1	223	3271	0	3271	8566	0.0991	2.00	17133	0.1983	3.00	Hydrant 102	7, 7 and 2 Ganley St., 28, 30 and 32 Toronto Ave., 26 and 26A Ontario St. 1 commercial (Garage behind bowling alley)	1277-29	
7	290.96	-	0	0	2.20	0	278.0	0	0	0	1	2772	0	0	0	2772	0.0321	2.00	5544	0.0642	3.00	-	Low Lift Pumping Station	1277-29	
8	293.35	-	0	0	2.20	0	278.0	0	0	0	11	9494	6542	0	6542	16036	0.1856	2.00	32071	0.3712	3.00	Hydrant 133	5 commercial buildings on east side of Broadway Ave. 3 Institutional buildings (Post office, municipal building) on west side of Broadway Ave. 1 institutional building on Ontario St. (Firehall).	1277-32	
9	293.66	-	4	0	2.20	9	278.0	2446	90	2536	7	19752	9813	0	9813	32101	0.3715	2.00	64201	0.7431	3.00	Hydrant 130	13 Ontario St. 31 McKinley Ave. 18 and 22 Wawa St. Lakeview hotel and 4 commercial buildings on east side of Broadway Ave.	1277-33	
10	292.73	-	1	0	2.20	2	278.0	612	22	634	5	23604	6542	0	6542	30779	0.3562	2.00	61559	0.7125	3.00	Hydrant 131	7 Broadway Ave. 4 commercial (Iris Place, Empty Building Trading Post, Canadian Red Cross), 1 institutional (public washrooms)	1277-36	
11	294.60	-	1	0	2.20	2	278.0	612	22	634	3	30301	0	0	0	30935	0.3580	2.00	61869	0.7161	3.00	Hydrant 118	14 Government Rd. 1 commercial (garage), 2 institutional (Calvary Penecostal Church Hospital, North East Community Care)	1277-52	
12	295.42	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 123	20 Government Rd.	1277-52	
13	295.38	-	4	0	2.20	9	278.0	2446	90	2536	2	875	0	0	0	3411	0.0395	2.00	6821	0.0789	3.00	Hydrant 107	4 residences (28 and 30 Government Rd., 2 others), 2 institutional (garage and EMS building)	1277-52	
14	296.72	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 108	40, 42, 50, 56, 43, 47, 55, 7, and 7 Government Rd.	1277-53	
15	297.17	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 76	58, 60, 62, 63, 64(x2). 66, 68, 69, 70, 71, 7 and 7 Government Rd.	1277-53, 1277-54	
16	294.2	-	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	Hydrant 75	79, 81, 83, 87 and 120 Government Rd.	1277-54, A1-9422-P2	
17	291.15	-	11	0	2.20	24	278.0	6728	246	6974	1	422	6542	0	6542	13938	0.1613	2.00	27875	0.3226	3.00	Hydrant 74	122, 124, 126, 127, 128, 132, 133, 134, 135, 137 and 139 Government Rd. 1 commercial (Leverington's Garden Centre.	A1-9422-P2	
18	293.02	-	14	0	2.20	31	278.0	8562	314	8876	2	833	19625	0	19625	29335	0.3395	2.00	58669	0.6790	3.00	Hydrant 136	141, 143, 144, 145, 146, 147, 148, 153, 155 and 157 Government Rd. 2, 4, 10 Government Ln. 1 Sinter Plant Rd. 2 commercial (Lloyd's of Wawa, Wagging Tails Kennel)	A1-9422-P1/P2/P3	
19	294.66	-	0	0	2.20	0	278.0	0	0	0	3	13248	3271	0	3271	16519	0.1912	2.00	33038	0.3824	3.00	Hydrant 40	Millette General Contractors, Wawa Handy Store, other commercial building at Mackey St. and McKinley Ave.	1277-33	
20	295.35	-	15	16	2.20	68	278.0	18960	695	19654	1	186	26167	0	26167	46007	0.5325	2.00	92014	1.0650	3.00	Hydrant 44	7, 18, 16, 14, 10, 8, 6, 3, 5, 7, 9 and 7 McKinley Ave. 11 and 12 Laurier St. 7 Algoma St. 1 multi-residential (6 Algoma St. assume 18 units). 1 commercial (United Supply Swish)	1277-41	
21	293.73	-	0	0	2.20	0	278.0	0	0	0	3	11986	0	0	0	11986	0.1387	2.00	23972	0.2775	3.00	-	2 commercial (Superior North Mobile Vetrinary Service, A Touch of Glass). 1 institutional (Sir James Dunn Public School)	1277-33	
22	295.43	-	19	6	2.20	55	278.0	15290	560	15850	0	0	32709	0	32709	48559	0.5620	2.00	97118	1.1240	3.00	Hydrant 47	19, 17, 16, 15, 14, 13, 12, 9, 8, 7, 6, 5, 4, 3, 2 and 1 First Ave. 19, 21 and 23 Algoma Ave. 1 multi-residential (20 First Ave. assume 6 units).	1277-43	
23	293.19	-	0	8	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	Hydrant 103	2 multi-residential (29 Mackey St. assume 4 units, 33 Mackey St. assume 4 units).	1277-33	
24	295.58	-	17	0	2.20	37	278.0	10397	381	10778	1	162	29438	0	29438	40378	0.4673	2.00	80755	0.9347	3.00	Hydrant 96	19, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 3, 2, and 1 Second Ave. 1 commercial building (Children's Aid Society of Algoma)	1277-31	
25	293.39	-	1	2	2.20	7	278.0	1835	67	1902	2	2299	0	0	0	4201	0.0486	2.00	8402	0.0972	3.00	Hydrant 98	44 Mackey St. 1 multi-residential (39 Mackey street, assuming 2 units). 2 commercial (Bell, Wawa Laundromat)	1277-34	
26	293.34	-	18	48	2.20	145	278.0	40366	1479	41845	0	0	42521	0	42521	84366	0.9765	2.00	168732	1.9529	3.00	Hydrant 97	22, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 7, 6, 5, 4, 3 and 1 Third Ave. 3 multi-residential (2 Third Ave. assume 4 units, 35 Algoma St. Mountainview assume 20 units, 37 Algoma St. newer development assume 24 units).	1277-47	
27	294.50	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	-	26b, 26 and 4 Mackey St.	1277-34	
28	294.21	-	2	4	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 110	21 and 19 Churchill Ave. 1 multi-residential (22 Churchill Ave., assume 4 units)	1277-59	
29	293.53	-	13	0	2.20	29	278.0	7951	291	8242	0	0	22896	0	22896	31138	0.3604	2.00	62276	0.7208	3.00	Hydrant 7	17, 15 (x2), 14, 12, 11, 8, 7, 6, 4, 3, 2 and 1 Churchill Ave.	1277-59	
30	295.05	-	2	6	2.20	18	278.0	4893	179	5072	1	375	6542	0	6542	11989	0.1388	2.00	23978	0.2775	3.00	Hydrant 62	57, 63 Mackey St. 1 commercial (old garage, assuming 66 Mackey St.). 2 multi-residential (58 Mackey St. assume 4 units, 59 Mackey St. assume 2 units).	1277-34	
31	293.76	-	16	6	2.20	48	278.0	13455	493	13948	1	910	19625	156100	175725	190583	2.2058	2.00	381167	4.4117	3.00	Hydrant 63	18, 16, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 Beck Ave. 1 multi-residential at 67 Mackey St. (assuming 6 units). 1 institutional (Superior Children's Centre).	1277-50	
32	295.31	-	24	0	2.20	53	278.0	14678	538	15216	0	0	26167	0	26167	41383	0.4790	2.00	82766	0.9579	3.00	Hydrant 64	22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37 and 39 Beck Ave. 21, 22, 23, 24, 25, 7, 27, 7, 29, 32 Hillcrest Ave.	1277-50	
33	293.55	-	8	0	2.20	18	278.0	4893	179	5072	0	0	9813	0	9813	14885	0.1723	2.00	29769	0.3446	3.00	Hydrant 42	50, 54, 56, 57, 58, 59, 60 and 62 McKinley Ave.	1277-39	
34	294.96	-	11	0	2.20	24	278.0	6728	246	6974	2	1170	6542	0	6542	14686	0.1700	2.00	29371	0.3399	3.00	-	63, 64, 65, 66, 67, 68, 69, 70, 71 and 72 McKinley Ave. 30 Caverhill St. 2 commercial (Paint + Glass and Creation Hairstyling)	1277-39	
35	295.83	-	3	0	2.20	7	278.0	1835	67	1902	1	398	0	0	0	2300	0.0266	2.00	4601	0.0532	3.00	Hydrant 43	76, 77 and 78 McKinley Ave. 1 commercial (75 McKinley)	1277-39	
36	296.52	-	10	0	2.20	22	278.0	6116	224	6340	1	783	19625	0	19625	26748	0.3096	2.00	53496	0.6192	3.00	-	79, 80, 81, 82, 86, 87, 89, 91, 93 and 95 McKinley Ave. 1 commercial (Sam's Place)	1277-39	
37	294.19	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 49	32, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 First Ave.	1277-42	
38	296.59	-	20	0	2.20	44	278.0	12232	448	12680	0	0	39250	0	39250	51931	0.6010	2.00	103861	1.2021	3.00	Hydrant 48	53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 69, 70, 71 and 73 First Ave. 93, 95, 97, and 99 Third Ave.	1277-42	
39	293.22	-	1	0	2.20	2	278.0	612	22	634	0	0	3271	0	3271	3905	0.0452	2.00	7810	0.0904	3.00	-	1 A St.	1277-48	
40	294.51	-	13	0	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 46	7, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Second Ave.	1277-44	
41	295.90	-	10	0	2.20	22	278.0	6116	224	6340	1	178	9813	0	9813	16331	0.1889	2.00	32661	0.3778	3.00	-	57, 59, 60, 61, 62, 63, 64, 65, 66 and 67 Second Ave. 2 institutional (St. Paul's Anglican Church)	1277-44	
42	296.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	68, 71, 73 and 75 Second Ave. 7 and 87 Third Ave.	1277-44	
43	295.99	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 99	79, 77, 75, 73 and 71 Third Ave.	1277-45	
44	295.89	-	20	0	2.20	44	278.0	12232	448	12680	0	0	45792	0	45792	58472	0.6768	2.00	116945	1.3535	3.00	Hydrant 45	72, 70, 69, 68, 67, 66, 65, 64, 63, 61, 50, 52, 53, 54, 55, 56, 57, 58, 59 and 60 Third Ave.	1277-49	
45	294.65	-	20	12	2.20	70	278.0	19571	717	20288	0	0	35980	0	35980	56268	0.6512	2.00	112536	1.3025	3.00	Hydrant 100	3, 5A, 6, 7, 8 , 9, and 10 A St. 27, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40 and 42 Third Ave. One multi-residential (44 Third Ave., assuming 12 units).	1277-48	
46	295.72	-	17	0	2.20	37	278.0	10397	381	10778	0	0	26167	0	26167	36945	0.4276	2.00	73890	0.8552	3.00	-	3, 4, 5, 6, 8, 12, 13, 14, 15, 16, 17 and 18 Hillcrest Ave. 44, 45, 47, ? and 49 Churchill Ave.	1277-49	
47	295.38	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 111	24, 25, 26, 27, 28 and 29 Churchill Ave.	1277-59	
48	295.71	-	13	0	2.20	29	278.0	7951	291	8242	0	0	16354	0	16354	24596	0.2847	2.00	49193	0.5694	3.00	Hydrant ?	30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 and 43 Churchill Ave.	1277-58	
49	295.2	-	2	40	2.20	92	278.0	25687	941	26628	1	1193	9813	0	9813	37634	0.4356	2.00	75268	0.8712	3.00	Hydrant 29	34, 7, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 and 80 Hillcrest Ave. 1 institutional (Michipicoten Non-Profit Housing 40 Hillcrest Ave.)	1277-49	
50	289.47	-	2	3	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	62 and 64 Churchill Ave. Multi-residential (68 Churchill Ave. assume 3 units)	1277-57	
51	292.57	-	0	0	2.20	0	278.0	0	0	0	6	35586	6542	0	6542	42128	0.4876	2.00	84256	0.9752	3.00	Hydrant ?	6 commercial buildings (Bowling Centre, Royal Canadian Legion, Canadian Tire, Dawson & Keenan, Sam's Foodline, Allemano & Fitzgerald, Wawa & Chapleau Radio)	-	Assumed same elevation of J5
52	293.83	-	1	0	2.20	2	278.0	612	22	634	17	17828	6542	156100	162642	181103	2.0961	2.00	362206	4.1922	3.00	Hydrant 128	22 Gold St. Commercial buildings (57, 59 Broadway Ave., The Bargain Shop, AJ's Pizza, the Best Start Hub, Regional Employement Health Centre Building, Chic N'Swell, North of 17 Restaurant, The Embassy Restaurant, Columbia Restaurant, RBC Bank, Wawa Dental Centre, Wawa Pharmacy, Wawa Goose Senior Centre, Barber Shop, U Wanna Cab, Guided Fishing Trips)	1277-26	
53	293.32	-	1	0	2.20	2	278.0	612	22	634	7	8425	3271	0	3271	12330	0.1427	2.00	24659	0.2854	3.00	Hydrant 127	25 St. Marie St. 5 commercial (Northern building, Parish of St. Monica, yellow building, Fenlon's Pharmacy, Algoma Family Services)	1277-25	
54	293.05	-	3	0	2.20	7	278.0	1835	67	1902	3	4020	13083	0	13083	19005	0.2200	2.00	38011	0.4399	3.00	-	90 Broadway Ave. 38 and 36 Main St. 2 commercial (Bangin Burger N'Chicken Shack, Economic Development Corporation of Wawa, Ijam FM building)	1277-38	
55	293.09	-	11	0	2.20	24	278.0	6728	246	6974	0	0	13083	0	13083	20058	0.2321	2.00	40115	0.4643	3.00	Hydrant 41	1, 3, 5, 7, 8, 9 and 11 Toronto Ave. ?, ?, 4, ? Gold St.	1277-20	
56	292.61	-	12	0	2.20	26	278.0	7339	269	7608	0	0	16354	0	16354	23962	0.2773	2.00	47925	0.5547	3.00	Hydrant 39	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 and 28 Toronto Ave. 21 and 22 Caverhill St.	1277-19	
57	292.02	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	-	10, 9, 8, 7, 6 and 2 Caverhill St. 56 Wawa St.	1277-19	
58	293.46	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	29, 30, 31, 32, 33, 34, 35 and 36 Toronto Ave.	1277-19	
59	293.46	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19	

EPANet Future Residential Only Model Inputs

60	291.23	-	18	0	2.20	40	278.0	11009	403	11412	0	0	13083	0	13083	24496	0.2835	2.00	48991	0.5670	3.00	Hydrant 104	14, 13, 12, 11, 10, 7, 8, 7, 6 St. Marie St. 6 and 7 Wawa St.	1277-24
61	292.45	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 105	15, 16, 17, 18, 19, 20 and 7 Montreal Ave.	1277-19
62	292.45	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	7, 39, 7, 41, 43, 44, 45, 46 and 48 Toronto Ave.	1277-19
63	291.93	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	-	No demand	1277-19
64	289.77	-	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 7	32 Main St. 53, 54, 55, 56, 57 and 58 Toronto Ave. 27, 29, 30, 31, 32 and 34 Joliet St.	1277-38 1277-19
65	291.2	-	12	0	2.20	26	278.0	7339	269	7608	0	0	22896	0	22896	30504	0.3531	2.00	61008	0.7061	3.00	Hydrant 7	236, 30, 7, 26, 24, 23, 21, 243, 244, 245, 246 and 76 Main St.	1277-22
66	289.76	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	Hydrant 124	11, 247, 249, 251, 253 and 7 Main St. 7 And 10 Joliet St.	1277-12
67	290.37	-	9	0	2.20	20	278.0	5504	202	5706	0	0	6542	0	6542	12248	0.1418	2.00	24496	0.2835	3.00	Hydrant 7	14, 21, 23, 25, 26 and 28 Joliet St. 24, 25 and 36 Montreal St.	1277-12
68	288.29	-	12	0	2.20	26	278.0	7339	269	7608	0	0	6542	0	6542	14150	0.1638	2.00	28300	0.3275	3.00	Hydrant 114	60, 61, 62, 63, 64, 65, 66, 67 and 69 Toronto Ave. 39, 37 and 35 Maggie Rd.	1277-18
69	288.38	-	11	0	2.20	24	278.0	6728	246	6974	3	2259	6542	0	6542	15775	0.1826	2.00	31550	0.3652	3.00	Hydrant 116	33, 31, 29, 27 and 25 Maggie Rd. 32, 31, 30, 29, 28 and 27 Montreal Ave. 3 Institutional (Ontario Mine Rescue Algoma District, Large Garage, Municipality of Wawa Infrastructure Services Department)	1277-14
70	288.4	-	11	2	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 117	7, 17 and 15 Maggie St. 2, 5, 7, 7, 8 and 10 Gladstone Ave. 279-A and 279-B Highway 101. 1 multi-residential (13 Magpie St. assume 2 units).	1277-14
71	288.87	-	17	0	2.20	37	278.0	10397	381	10778	3	3792	22896	0	22896	37466	0.4336	2.00	74932	0.8673	3.00	Hydrant 115	73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88 and 89 Toronto Ave. 2 commercial (The Shop, Millete General Contractors). 1 institutional (The Ship Boy Scouts)	1277-18
72	288.92	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 91	101, 103, 105, 107, 109, 110 and 111 Broadway Ave.	1277-11
73	288.73	-	7	0	2.20	15	278.0	4281	157	4438	0	0	3271	0	3271	7709	0.0892	2.00	15418	0.1784	3.00	-	112, 113, 114, 116 and 117 Broadway Ave. 47 and 45 Maggie Rd.	1277-11
74	289.2	-	11	0	2.20	24	278.0	6728	246	6974	0	0	3271	0	3271	10245	0.1186	2.00	20490	0.2372	3.00	Hydrant 90	?, ?, 121, 123, 124, 125, 126, 127, 128, 129 and 130 Broadway Ave.	1277-10
75	289.18	-	8	0	2.20	18	278.0	4893	179	5072	1	286	0	0	0	5358	0.0620	2.00	10716	0.1240	3.00	-	131, 132, 133, 134, 135, 136, 137 and 138 Broadway Ave. 1 commercial (12 Klondike St.)	1277-10
76	289.61	-	17	0	2.20	37	278.0	10397	381	10778	0	0	6542	0	6542	17320	0.2005	2.00	34640	0.4009	3.00	-	14, 16, 18, 20 and 22 Klondike St. 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19 and 20 Nyman Ave.	1277-5
77	289.18	-	1	0	2.20	2	278.0	612	22	634	3	645	0	0	0	1279	0.0148	2.00	2557	0.0296	3.00	-	? Broadway Ave. 1 commercial (storage garage)	1277-10
78	289.61	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 82	15, 7, 17 and 18 Queen St.	1277-4
79	289.64	-	24	0	2.20	53	278.0	14678	538	15216	0	0	6542	0	6542	21758	0.2518	2.00	43516	0.5037	3.00	Hydrant 83	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 Queen St.	1277-4
80	289.84	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	-	43 and 44 Queen St. 1, 3, 5, 7 and 10 Centennial Ave.	1277-4
81	289.00	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	Hydrant 81	19, 21 and 23 Winston Rd. 2 commercial (storage garages)	1277-1
82	289.48	-	11	4	2.20	33	278.0	9174	336	9510	2	18899	6542	0	6542	34950	0.4045	2.00	69901	0.8090	3.00	Hydrant 80	25, 27, 29, 33, 33A, 35A, 35B, 37, 39, 41 and 43 Winston Rd. 34 Winston Rd. trailer park (23 trailers from water meter data). 1 institutional (Ecole Publique L'Escalade). 1 multi-residential (31 Winston Rd. assume 4 units).	1277-1
83	289.57	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	-	45 Winston Rd. 11, 12, 13, 14, 15, 16 and 18 Centennial Ave.	1277-7
84	289.11	-	0	0	2.20	0	278.0	0	0	0	1	26	0	0	0	26	0.0003	2.00	52	0.0006	3.00	-	1 institutional (First United Church)	1277-60
85	288.98	-	10	0	2.20	22	278.0	6116	224	6340	0	0	0	0	0	6340	0.0734	2.00	12680	0.1468	3.00	Hydrant 7	1, 3, 4, 5, 6, 7, 8, 9, 10 and 12 George St.	1277-60
86	289.22	-	0	0	2.20	0	278.0	0	0	0	3	813	0	0	0	813	0.0094	2.00	1626	0.0188	3.00	Hydrant 92	1 commercial building (Circle K, Northern Credit Union, Empty Store)	1277-16
87	289.22	-	0	0	2.20	0	278.0	0	0	0	1	1021	0	0	0	1021	0.0118	2.00	2042	0.0236	3.00	-	1 commercial building (Pine Portage Lodge Office)	1277-16
88	289.28	-	0	12	2.20	26	278.0	7339	269	7608	1	1972	0	0	0	9580	0.1109	2.00	19161	0.2218	3.00	-	1 multi-residential (158 Mission Rd. assuming 12 units). 1 commercial building (Big Bird Inn)	1277-61
89	289.56	-	0	12	2.20	26	278.0	7339	269	7608	5	8357	0	0	0	15965	0.1848	2.00	31930	0.3696	3.00	Hydrant 138	1 apartment building (guessing 12 units). 4 commercial buildings (Independent, Subway, Movie Gallery, Viking Restaurant, Polish Alliance of Canada)	1277-61 & 1277-6
90	289.35	-	16	0	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant ?	60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76 and 78 Maggie Rd. 14 George St.	1277-16
91	289.21	-	2	0	2.20	4	278.0	1223	45	1268	1	12392	3271	0	3271	16930	0.1960	2.00	33861	0.3919	3.00	-	80 and 82 Maggie Rd. 1 institutional (Michipicoten High School)	1277-16
92	289.4	-	0	0	2.20	0	278.0	0	0	0	1	704	0	0	0	704	0.0081	2.00	1408	0.0163	3.00	Hydrant 93	1 institutional (St. Augustine School)	1277-66
93	289.35	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 7	1, 2, 3, 4, 5, 6, 7 and 8 Ross St.	1277-61
94	289.16	-	10	0	2.20	22	278.0	6116	224	6340	0	0	3271	0	3271	9611	0.1112	2.00	19222	0.2225	3.00	-	10, 11, 13, 14, 15, 17, 19 and 21 Ross St. 9 and 23 Arnott Ave.	1277-61
95	288.94	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	-	49 and 54 Maggie Rd.	1277-15
96	289.15	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 89	1 and 5 Nyman Ave.	1277-9
97	289.64	-	19	0	2.20	42	278.0	11620	426	12046	0	0	3271	0	3271	15317	0.1773	2.00	30634	0.3546	3.00	Hydrant 88	24, 26, 28, 30 and 32 Klondike St. 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and ? Wood Ave.	1277-6
98	289.94	-	11	0	2.20	24	278.0	6728	246	6974	0	0	6542	0	6542	13516	0.1564	2.00	27032	0.3129	3.00	-	34, ?, 36, 37, 38, 39, 40, 41, 42, 43 and 44 Klondike St.	1277-6
99	289.89	-	0	0	2.20	0	278.0	0	0	0	1	6113	0	0	0	6113	0.0707	2.00	12225	0.1415	3.00	-	1 commercial (Outdoorsman Motel)	1277-6
100	289.98	-	3	10	2.20	29	278.0	7951	291	8242	2	547	6542	0	6542	15331	0.1774	2.00	30661	0.3549	3.00	Hydrant 121	55, 56 and 57 Winston Rd. 2 multi-residential (58 Winston Rd. assume 6 units, 59 Winston Rd. assume 4 units). 1 institutional (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-3
101	290.92	-	0	4	2.20	9	278.0	2446	90	2536	2	5168	6542	0	6542	14245	0.1649	2.00	28491	0.3298	3.00	-	1 multi-residential (61 Winston Rd. assume 4 units). 2 commercial (Garage, Gator's Steakhouse, Beaver Motel).	1277-3
102	290.31	-	0	0	2.20	0	278.0	0	0	0	2	5502	3271	0	3271	8773	0.1015	2.00	17546	0.2031	3.00	-	2 commercial (Beer Store, Cannabis)	P2
103	289.45	-	0	0	2.20	0	278.0	0	0	0	2	9226	3271	0	3271	12496	0.1446	2.00	24993	0.2893	3.00	Hydrant 94	2 commercial (Algoma Motel, Bristol Motel)	1277-62
104	290.03	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	18, 17, 16, 15, 14, 13, 12 and 11 Arnott Ave.	1277-62
105	289.02	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	9, ?, 5, 3 and 1 Arnott Ave.	1277-62
106	289.58	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	-	4, 6 and 8 Darwin St.	1277-65
107	289.78	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	-	3, 5 and 7 Parkhill St. 126 Churchill Ave. 1 multi-residential (2 Grace St. assume 12 units).	1277-55
108	290.2	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 65	128, 130, 132 and 134 Churchill Ave. 1 multi-residential (10 Grace St. assume 12 units).	1277-55
109	290.49	-	3	0	2.20	7	278.0	1835	67	1902	2	4850	0	0	0	6752	0.0781	2.00	13503	0.1563	3.00	-	134, 136 and 138 Churchill Ave. 2 commercial (Kerry Funeral Home, Beaver Motel)	1277-55
110	289.65	-	9	0	2.20	20	278.0	5504	202	5706	0	0	3271	0	3271	8977	0.1039	2.00	17954	0.2078	3.00	Hydrant 66	124, 123, 122, 121, 120, 119, 118, 117 and 116 Churchill Ave.	1277-55
111	290.03	-	6	0	2.20	13	278.0	3670	134	3804	1	2320	0	0	0	6124	0.0709	2.00	12249	0.1418	3.00	Hydrant 137	114, 112, 110, 108, 106 and 104 Churchill Ave. 1 institutional (Ecole St. Joseph).	1277-56
112	289.79	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 120	100, 98, 96, 94, 92, 90 and 88 Churchill Ave.	1277-56
113	289.49	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 119	86, 84, 82, 80, 78, 76, 74, 72, 70 and 76 Churchill Ave. 113, 111 and 107 Maggie Rd.	1277-57
114	289.44	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 61	No demand	1602-7
115	290.02	-	22	0	2.20	48	278.0	13455	493	13948	0	0	16354	0	16354	30303	0.3507	2.00	60605	0.7014	3.00	Hydrant 125	?, 125, ?, 123, 122, 121, 119, 117 and 115 Regina Cres. 16, 14, 13, 12, ?, 10, ?, 8, 6, ?, 4, ?, 2 Birch St.	1602-4
116	289.64	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant ?	127, 133, 135, 137, 139 and 145 Regina Cres.	1951-8
117	289.71	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	Hydrant ?	147, 148, 152, 153, 155, 156 and 160 Regina Cres.	1951-8
118	289.57	-	6	0	2.20	13	278.0	3670	134	3804	0	0	6542	0	6542	10346	0.1197	2.00	20692	0.2395	3.00	Hydrant 54	162, 166, 170 and 172 Regina Cres. 42 and 40 Tamarack Ave.	1951-8
119	289.73	287.9	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	-	44, 46 and 48 Tamarack Ave.	1951-3
120	289.75	-	4	0	2.20	9	278.0	2446	90	2536	1	594	0	0	0	3130	0.0362	2.00	6261	0.0725	3.00	Hydrant 7	7, 6, 8, and 10 Maple St. 1 institutional (Confederation College Building)	1951-6
121	290.24	-	13	0	2.20	29	278.0	7951	291	8242	0	0	0	0	0	8242	0.0954	2.00	16484	0.1908	3.00	Hydrant 56	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 Maple St.	1951-6
122	290.14	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	25, 26, 27 and 28 Maple St.	1951-6
123	289.88	288.05	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	29 and 30 Maple St.	1951-3
124	291.35	289.15	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	No demand	1951-5
125	291.08	288.88	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 60	40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30 and 29 Birch St.	1951-5
126	290.52	-	13	0	2.20	29	278.0	7951	291	8242	0	0	3271	0	3271	11513	0.1333	2.00	23026	0.2665	3.00	Hydrant 55	28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17 and 15 Birch St.	1602-6
127	290.49	288.29	12	0	2.20	26	278.0	7339	269	7608	0	0	29438	0	29438	37046	0.4288	2.00	74092	0.8575	3.00	Hydrant 53	113, 111, 109, 107, 105 and 104 Regina Cres. 10, 8, 7, 6, 5 and 3 Poplar St.	1602-4
128	291.82	289.68	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	142 and 141 Superior Ave.	1951-2
129	292.01	289.81	8	0	2.20	18	278.0	4893	179	5072	0	0	0	156100	156100	161172	1.8654	2.00	322344	3.7308	3.00	Hydrant 50	140, 139, 138, 137, 136, 135, 134 and 133 Superior Ave.	1951-2
130	291.18	288.98	16	0	2.20	35	278.0	9786	359	10144	0	0	13083	0	13083	23228	0.2688	2.00	46455	0.5377	3.00	Hydrant 51	132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118 and 117 Superior Ave.	1602-2
131	290.68	288.48	14	0	2.20	31	278.0	8562	314	8876	0	0	32709	0	32709	41585	0.4813	2.00	83170	0.9626	3.00	Hydrant 52	116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104 and 103 Superior Ave.	1602-2
132	290.58	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	Hydrant 71	103, 102 and 101 Regina Cres. 1, 2, 3 and 4 Spruce St.	1602-4
133	290.84	-	18	0	2.20	40	278.0	11009	403	11412	0	0	3271	0	3271	14683	0.1699	2.00	29366	0.3399	3.00	Hydrant 72	7, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 13A, 13B, 15A and 15B Spruce St. 102, 100, 2, 4 and 6 Superior Ave.	1602-2
134	290.49	-	27	0	2.20	59	278.0	16513	605	17118	0	0	0	0	0	17118	0.1981	2.00	34236	0.3963	3.00	Hydrant 69	7A, 7B, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22 Superior Ave. 15, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 27 Regina Cres.	1277-69
135	290.22	-	12	0	2.20	26	278.0	7339	269	7608	0	0	13083	0	13083	20692	0.2395	2.00	41383	0.4790	3.00	Hydrant 70	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 Regina Cres.	1277-71
136	290.50	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 68	24, 26, ?, 28, 30, 32, 34 and 36 Superior Ave.	1277-68
137	289.10	-	7	0	2.20	15	278.0	4281	157	4438	1	103	3271	0	3271	7812	0.0904	2.00	15623	0.1808	3.00	Hydrant 67	38, 40, 42, 44, 46, 48 and 50 Superior Ave. 1 institutional (Lion's Club)	1277-68
138	289.79	-	2	0	2.20	4	278.0	1223	45	1268	2	58569	0	0	0	59837	0.6926	2.00	119673	1.3851	3.00	Hydrant 73	?, ? Superior Ave. 1 institutional (Michipicoten Memorial Community Centre). 1 commercial (Wawa Motor Inn)	1277-67
139	290.47	-	0	0	2.20	0	278.0	0	0	0	3	1194	6542	0	6542	7736	0.0895	2.00	15472	0.1791	3.00	Hydrant 85	3 commercial (Petro Canada, Northern Chiropractic Clinic, Krazy Fries)	B41
140	288.65	-	0	0	2.20	0	278.0	0	0	0	1	171	0	0	0	171	0.0020	2.00	342	0.0040	3.00	Hydrant 134	1 institutional (Small station)	B41
141	288.00	-	0	0	2.20	0	278.0	0	0	0	3	3072	6542	0	6542	9614	0.1113	2.00	19228	0.2225	3.00	Hydrant 84	3 commercial (Home Building Center Garage, Home Building Centre, Young's General Store)	P1
142	286.50	-	0	0	2.20	0	278.0	0	0	0	5	8997	3271	156100	159371	168368	1.9487	2.00	336736	3.8974	3.00	Hydrant 135	4 commercial (Canco Wawa, Wesdome Gold Mines, Garages, Tim Hortons). I institutional (Lagoon Building).	P2
143	286.28	-	0	0	2.20	0	278.0	0	0	0	7	12319	9813	0	9813	22132	0.2562	2.00	44263	0.5123	3.00	Hydrant 77	1 commercial (Mission Motors). 5 institutional (Service Ontario, Ontario Ministry of Natural Resources, Government Storage Garages x7, Wawa Municipal Airport, Tourist Information Centre)	3675-3
144	284.75	282.59	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 1	120 Pinewood Dr.	3675-5
145	284.57	282.45	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 2	No demand	3675-5

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146	284.03	281.81	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 3	No demand	3675-6	
147	283.90	281.47	0	0	2.20	0	278.0	0	0	0	1	1291	0	0	0	1291	0.0149	2.00	2583	0.0299	3.00	-	1 commercial (Trans Canada Chrysler)	3675-6
148	283.20	281.08	0	0	2.20	0	278.0	0	0	2	1888	0	0	0	1888	0.0219	2.00	3776	0.0437	3.00	Hydrant 4	2 commercial (Fountain Tire, Family Kitchen Restaurant Building)	3675-6	
149	282.89	280.68	0	0	2.20	0	278.0	0	0	2	3696	0	0	0	3696	0.0428	2.00	7393	0.0856	3.00	Hydrant 5	2 commercial (Esso Gas Station, Davidson Fuels)	3675-7	
150	282.05	279.37	0	0	2.20	0	278.0	0	0	3	10584	0	0	0	10584	0.1225	2.00	21168	0.2450	3.00	Hydrant 6	2 commercial (Highway 17 Motel, Gardewine). 1 institutional (OPP)	3675-7	
151	284.40	-	0	0	2.20	0	278.0	0	0	2	441	0	0	0	441	0.0051	2.00	882	0.0102	3.00	Hydrant 10	2 commercial (Superior Truck Repair Centre, Lakehead Freightway/Manitoulin Transport)	C05	
152	282.95	-	0	0	2.20	0	278.0	0	0	1	356	0	0	0	356	0.0041	2.00	712	0.0082	3.00	Hydrant 11	1 commercial (U-Haul Dealer)	C04	
153	282.15	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 12	No demand	C04	
154	281.85	-	0	0	2.20	0	278.0	0	0	1	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 9	1 commercial (Martel Customs)	C04	
155	280.60	-	0	0	2.20	0	278.0	0	0	1	484	0	0	0	484	0.0056	2.00	967	0.0112	3.00	Hydrant 8	1 commercial (building with red roof)	C03	
156	281.85	-	0	0	2.20	0	278.0	0	0	4	52214	0	0	0	52214	0.6043	2.00	104428	1.2087	3.00	Hydrant 7	4 commercial (building with red roof, building on cul-de-sac, Northstar Fusion, Evolugen)	C03	
157	281.5	-	0	0	2.20	0	278.0	0	0	1	11	0	0	0	11	0.0001	2.00	22	0.0003	3.00	Hydrant 34	1 commercial (Algoma Storage)	-	Don't know real elevation
158	280.3	277.8	0	0	2.20	0	278.0	0	0	1	458	0	0	0	458	0.0053	2.00	917	0.0106	3.00	Hydrant 33	1 industrial (Algoma Highlands Wild Blueberry Farm)	A1-2002-62-P5	
159A	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
159	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
160A	248.5	245.9	1	0	2.20	2	278.0	612	22	634	2	1952	0	0	0	2586	0.0299	2.00	5172	0.0599	3.00	PRV Chamber	1 house by storage area. 2 commercial (Jones Power Sports, High Falls Motel & Cabins)	A1-2002-62-P2	
160B	248.5	245.9	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P2	
160	205.1	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	MRV Water Tower	No demand	1443-A-7	
161	205.1	202.6	0	0	2.20	0	278.0	0	0	1	6300	0	0	0	6300	0.0729	2.00	12600	0.1458	3.00	MRV Water Tower	Water Tower and Pumping Station	1443-A-7	
162	205.4	202.9	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 18	?, ? Hardy Ave.	1443-A-7	
163	205.1	202.5	10	0	2.20	22	278.0	6116	224	6340	1	481	0	0	0	6821	0.0789	2.00	13642	0.1579	3.00	Hydrant 17	?, ?, ?, ?, ?, ?, ?, ? 315, and 317 Hardy Ave. 1 commercial (Your Room is Ready!)	1443-A-7	
164	205.9	203.4	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	309, 308, 307 and ? Queen St.	1443-A-6	
165	206.6	204.1	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 15	303, 302 and 301 Queen St. ? Blue Ave.	1443-A-6	
166	206.5	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 13	?, ?, ?, ? and ? Blue Cres.	-	Don't know real elevation
167	206	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 14	?, ? Blue Cres. ? Blue Ave.	-	Don't know real elevation
168	204.9	202.3	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	Hydrant 7	318, ?, ?, 313, 312 and 310 Blue Ave.	1443-A-13	
169	206.7	204.2	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	Hydrant 16	303 and ? Aberdeen St.	1443-A-12	
170	197.0	194.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 19	No demand	1443-A-5	
171	200.0	197.3	6	0	2.20	13	278.0	3670	134	3804	1	32	3271	0	3271	7107	0.0823	2.00	14213	0.1645	3.00	Hydrant 79	?, ?, ?, ?, ? and 308 Magpie Ave. 1 institutional (Wood Land Masonic Lodge)	1443-A-11	
172	193.0	190.3	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1443-A-5	
173	190.0	187.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 20	No demand	1443-A-5	
174	190.7	188.1	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 23	339 Queen St. 312 and 311 Brock Ave.	1443-A-4	
175	191.1	188.1	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 24	?, ?, ?, 306, ?, 303 and 335 Brock Ave. 1 institutional (Angel's Equestrian Centre).	1443-A-4	
176	189.0	186.4	0	0	2.20	0	278.0	0	0	0	3	3213	0	156100	156100	159313	1.8439	2.00	318625	3.6878	3.00	Hydrant 25	2 commercial (shed on Superior St., Buck's Marina) 1 institutional (small building on Superior St.)	1443-A-3	
177	192.7	190.2	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 28	?, ? Superior St., ?, ? and ? Michipicoten Ave.	1443-A-8	
178	191.9	189.3	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 7	?, ?, ?, ? and ? Michipicoten Ave.	1443-A-9	
179	192.1	189.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0734	3.00	-	? Superior St. ?, ?, and ? Wawa St	1443-A-8	
180	189.9	187.4	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0147	3.00	Hydrant 21	?, ? and ? Wawa St.	1443-A-10	
181	190.1	187.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0440	3.00	Hydrant 26	? Superior St.	1443-A-8	
182	194.5	192.0	2	0	2.20	4	278.0	1223	45	1268	0	0	6542	0	6542	7810	0.0904	2.00	15620	0.0440	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
183	292.97	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0147	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
16 (New)	294.2	-	4	0	2.00	8	278.0	2224	-	2224	0	0	0	0	0	2224	0.0257	2.00	4448	0.0515	3.00	Hydrant 75	3 new residences on Government Rd. 1 new residence on Tamarack Ave.	1277-54, A1-9422-P2	
29 (New)	293.53	-	0	10	2.00	20	278.0	5560	-	5560	0	0	0	0	0	5560	0.0644	2.00	11120	0.0147	3.00	Hydrant ?	1 new apartment building with 10 units	1277-59	
116 (New)	289.64	-	2	0	2.00	4	278.0	1112	-	1112	0	0	0	0	0	1112	0.0129	2.00	2224	0.0257	3.00	Hydrant ?	2 new residences on Regina Cres.	1951-8	
117 (New)	289.71	-	7	0	2.00	14	278.0	3892	-	3892	0	0	0	0	0	3892	0.0450	2.00	7784	0.0901	3.00	Hydrant 7	7 new residences on Regina Cres.	1951-8	
118 (New)	289.57	-	8	0	2.00	16	278.0	4448	-	4448	0	0	0	0	0	4448	0.0515	2.00	8896	0.1030	3.00	Hydrant 54	8 new residences on Regina Cres.	1951-8	
119 (New)	289.73	287.9	8	0	2.00	16	278.0	4448	-	4448	0	0	0	0	0	4448	0.0515	2.00	8896	0.1030	3.00	-	8 new residences on Maple St.	1951-3	
123 (New)	289.88	288.05	6	0	2.00	12	278.0	3336	-	3336	0	0	0	0	0	3336	0.0386	2.00	6672	0.0772	3.00	-	6 new residences on Birch St.	1951-3	
183 (New)	292.97	-	16	0	2.00	32	278.0	8896	-	8896	0	0	0	0	0	8896	0.1030	2.00	17792	0.2059	3.00	Hydrant 27	16 new residences on Tamarack Ave.	1443-A-8	
184	294.30	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	-	
185	292.94	-	4	0	2.00	8	278.0	2224	-	2224	0	0	0	0	0	2224	0.0257	2.00	4448	0.0515	3.00	-	4 new residences on new road	-	
186	293.18	-	18	0	2.00	36	278.0	10008	-	10008	0	0	0	0	0	10008	0.1158	2.00	20016	0.2317	3.00	-	18 new residences on new road	-	
187	293.60	-	10	0	2.00	20	278.0	5560	-	5560	0	0	0	0	0	5560	0.0644	2.00	11120	0.1287	3.00	-	10 new residences on new road	-	
188	293.39	-	7	0	2.00	14	278.0	3892	-	3892	0	0	0	0	0	3892	0.0450	2.00	7784	0.0901	3.00	-	7 new residences on new cul-de-sac	-	
TOTAL			1193	229		3108		864135	29624	893759	178	453716	1020511	780499	1801010	3148485	36.44		6296969					
					MRV Population	156						In-town	370316											

			Pipe Input for Length	*Pipe Input for Diameter*		*Pipe Input for Roughness Coef.*			
Pipe	**Starting Junction**	**Ending Junction**	**Length**	**Diameter**	**Material**	**HW Roughness Coefficient**	**Object**	**Notes**	**Reference Drawing**
1A	J1A	J1	38.19	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
1	J1	J2	75.15	150	Unknown	140	Pipe 136		WAT_Watermain_Table
2	J2	J3	68.1	150	Unknown	140	Pipe 798	art of watermain from 1st Ave. t	F22019_WaterMap_NorthSat
3	J3	J4	101.75	150	Unknown	140	Pipe 798	art of watermain from A St. to de	WAT_Watermain_Table
4	J1A	J5	66.61	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
5	J5	J6	112.2	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameter of 250mm, GIS not clear	F22019_WaterMap_NorthSat
6	J6	J7	9.6	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameterf of 250mm, GIS not clear	F22019_WaterMap_NorthSat
7	J5	J8	74.1	200	Unknown	140	South of Pipe 909	rom McKinley Ave. to Hydrant 13	F22019_WaterMap_NorthSat
8	J8	J9	109.73	200	Unknown	140	Pipe 909		WAT_Watermain_Table
9	J9	J10	138.7	150	Unknown	140	Pipes 889 and 890	Pipe 889 and part of 890	F22019_WaterMap_NorthSat
10	J10	J11	148.9	150	Unknown	140	Pipes 890 and 361	Part of pipes 890 and 361	F22019_WaterMap_NorthSat
11	J11	J12	151.6	150	Unknown	140	Pipe 361	Part of pipe 361, possibly 356	F22019_WaterMap_NorthSat
12	J12	J13	73.4	150	Unknown	140	Pipe 356		F22019_WaterMap_NorthSat
13	J13	J14	140.3	150	Unknown	140	Pipe 356 and 125	Part of 356, pipe 125	F22019_WaterMap_NorthSat
14	J14	J15	152.5	150	Unknown	140	Pipe 355 and 336	Pipe 355 and part of 336	F22019_WaterMap_NorthSat
15	J15	J16	516.8	150	Unknown	140	Pipe 338 and 336	Pipe 338 and part of 336	F22019_WaterMap_NorthSat
16	J16	J17	187.63	150	Unknown	140	Pipe 339 and 329	Length for pipe 339 and 329	WAT_Watermain_Table
17	J17	J18	179.7	150	Unknown	140	Pipe 326 and 319	Pipe 326 and part of 319	F22019_WaterMap_NorthSat
18	J9	J19	91.1	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
19	J19	J20	121.16	150	Unknown	140	Pipe 864		WAT_Watermain_Table
20	J19	J21	81.5	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
21	J21	J22	110.2	150	Unknown	140	-	No pipe number on map, diameter from as-built drawing	F22019_WaterMap_NorthSat
22	J21	J23	80.5	200	Unknown	140	Pipe 849	Pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
23	J23	J24	139.76	150	Unknown	140	Pipe 843		WAT_Watermain_Table
24	J23	J25	81.5	200	Unknown	140	Pipe 787		WAT_Watermain_Table
25	J25	J26	100	150	Unknown	140	Pipe 777		WAT_Watermain_Table
26	J25	J27	96.3	200	Unknown	140	ame same pipe properties as pipe		F22019_WaterMap_NorthSat
27	J27	J28	37.18	150	Unknown	140	Pipe 756		WAT_Watermain_Table
28	J28	J29	105.27	150	Unknown	140	Pipe 763		WAT_Watermain_Table
29	J28	J30	111.1	150	Unknown	140	-	e same pipe properties as pipes i	F22019_WaterMap_NorthSat
30	J30	J31	104.03	150	Unknown	140	Pipe 676		WAT_Watermain_Table
31	J31	J32	196.9	150	Unknown	140	Pipes 679 and 680		F22019_WaterMap_NorthSat
32	J1	J33	136.6	150	Unknown	140	Pipe 831		F22019_WaterMap_NorthSat
33	J33	J34	71.87	150	Unknown	140	Pipe 835		WAT_Watermain_Table
34	J34	J35	43.43	150	Unknown	140	Pipe 837		WAT_Watermain_Table
35	J35	J36	125.73	150	Unknown	140	Pipe 836		WAT_Watermain_Table
36	J2	J37	148.1	150	Unknown	140	-	ame same properties and nearby p	F22019_WaterMap_NorthSat
37	J37	J38	139.7	150	Unknown	140	Pipe 814		F22019_WaterMap_NorthSat
38	J3	J39	32.6	150	Unknown	140	Pipe 795	Part of pipe 795	F22019_WaterMap_NorthSat
39	J39	J40	131.83	150	Unknown	140	Pipe 799		WAT_Watermain_Table
40	J40	J41	94.49	150	Unknown	140	Pipe 800		WAT_Watermain_Table
41	J41	J42	78.3	100	Unknown	140	Pipe 137	Pipe 137 plus smaller pipes	F22019_WaterMap_NorthSat
42	J42	J43	103.5	150	Unknown	140	-	Unknown pipes and diameter	F22019_WaterMap_NorthSat
43	J43	J44	87.64	150	Unknown	140	Pipe 769		WAT_Watermain_Table
44	J39	J45	75.64	150	Unknown	140	Pipe 795		WAT_Watermain_Table
45	J25	J45	192.7	150	Unknown	140	Pipe 767	Pipe 767 plus other pipe(s)	F22019_WaterMap_NorthSat
46	J45	J44	109	150	Unknown	140	Pipe 772	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
47	J44	J46	172	150	Unknown	140	Pipe 686	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
48	J27	J47	65.7	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
49	J47	J48	102.7	150	Unknown	140	Pipe 695 and 699	Parts of pipe 695 and 699	F22019_WaterMap_NorthSat
50	J48	J46	96	150	Unknown	140	-	Unknown pipes, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
51	J46	J32	106.6	150	Unknown	140	Pipe 34	Pipe 34 plus other pipe(s)	F22019_WaterMap_NorthSat
52	J32	J49	21	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
53	J46	J50	103.4	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat

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54	J5	J51	72	200	Unknown	140	Pipe 893	Pipe 893 plus other pipe(s)	F22019_WaterMap_NorthSat
55	J51	J52	133.35	200	Unknown	140	Pipe 912		WAT_Watermain_Table
56	J52	J53	101	200	Unknown	140	Pipe 731		WAT_Watermain_Table
57	J53	J54	82.6	200	Unknown	140	-	Assuming same diameter as pipe 731	F22019_WaterMap_NorthSat
58	J6	J55	97.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
59	J55	J56	103.7	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
60	J52	J56	111.1	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
61	J7	J57	190.86	300	Unknown	140	Pipe 744		WAT_Watermain_Table
62	J52	J34	104.8	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
63	J57	J56	8.5	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
64	J56	J58	95.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
65	J57	J59	95.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
66	J58	J59	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
67	J59	J60	102.87	150	Galvanized Steel	120	Pipe 711		WAT_Watermain_Table
68	J58	J61	97.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
69	J61	J54	118.95	150	Unknown	140	Pipe 713		WAT_Watermain_Table
70	J59	J62	97.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
71	J61	J62	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
72	J62	J63	18	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
73	J63	J64	107	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
74	J63	J65	129.6	150	Unknown	140	Pipe 663	Pipe 663 plus other pipes	F22019_WaterMap_NorthSat
75	J65	J66	192.4	150	Unknown	140	Pipe 669	Pipe 669 plus other pipes	F22019_WaterMap_NorthSat
76	J66	J67	123.86	150	Unknown	140	Pipe 637		WAT_Watermain_Table
77	J67	J64	94.54	150	Unknown	140	Pipe 636		WAT_Watermain_Table
78	J64	J68	87.9	150	Unknown	140	Pipe 626	Pipe 626 plus other pipes	F22019_WaterMap_NorthSat
79	J68	J69	157.7	150	Unknown	140	Pipe 607	Pipe 607 plus other pipes	F22019_WaterMap_NorthSat
80	J69	J70	157.5	150	Unknown	140	Pipe 641	Pipe 641 plus other pipes	F22019_WaterMap_NorthSat
81	J68	J71	194.7	150	Unknown	140	Pipe 610	Pipe 610 plus other pipes	F22019_WaterMap_NorthSat
82	J54	J72	155.11	200	Asbestos Cement	140	Pipes 651 and 612	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
83	J72	J73	55.63	150	Unknown	140	Pipe 613		WAT_Watermain_Table
84	J73	J68	102.7	150	Unknown	140	Pipe 581	Pipe 581 plus other pipes	F22019_WaterMap_NorthSat
85	J73	J74	115.06	150	Unknown	140	Pipe 598		WAT_Watermain_Table
86	J74	J75	80.77	150	Unknown	140	Pipe 595		WAT_Watermain_Table
87	J71	J75	103.23	150	Unknown	140	Pipe 603		F22019_WaterMap_NorthSat
88	J75	J76	84.7	150	Unknown	140	-	Unknown pipe, nearby pipes and as-builts show diameter of 150 mm	F22019_WaterMap_NorthSat
89	J75	J77	96.2	150	Unknown	140	Pipe 554		WAT_Watermain_Table
90	J77	J78	56.6	150	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
91	J78	J79	232.98	150	Asbestos Cement	140	Pipe 570		WAT_Watermain_Table
92	J79	J80	56.1	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
93	J77	J81	163.41	150	Asbestos Cement	140	Pipe 134		WAT_Watermain_Table
94	J81	J82	178.69	150	Asbestos Cement	140	Pipe 563		WAT_Watermain_Table
95	J82	J83	48.7	150	Asbestos Cement	140	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
96	J54	J84	160.9	200	Asbestos Cement	140	Pipe 541	Pipe 541 plus other pipes	F22019_WaterMap_NorthSat
97	J84	J85	55.86	200	Asbestos Cement	140	Pipe 542	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
98	J84	J86	88.03	200	Asbestos Cement	140	Pipe 547		WAT_Watermain_Table
99	J84	J87	106.4	150	Asbestos Cement	140	-	ssume same properties as pipe 11	F22019_WaterMap_NorthSat
100	J86	J87	14.4	200	Asbestos Cement	140		ssume same properties as pipe 53	F22019_WaterMap_NorthSat
101	J87	J88	91.81	150	Asbestos Cement	140	Pipe 112		WAT_Watermain_Table
102	J88	J89	72.73	200	PVC	150	Pipe 941		WAT_Watermain_Table
103	J86	J90	210.34	200	Asbestos Cement	140	Pipe 535		WAT_Watermain_Table
104	J90	J91	41.91	200	Asbestos Cement	140	Pipe 533		WAT_Watermain_Table
105	J91	J92	88.39	150	Asbestos Cement	140	Pipe 498		WAT_Watermain_Table
106	J88	J93	132.00	150	Asbestos Cement	140	Pipe 520	Pipe 520 plus other pipes	F22019_WaterMap_NorthSat
107	J93	J94	127.25	150	Asbestos Cement	140	Pipe 524		WAT_Watermain_Table
108	J87	J95	79.3	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
109	J95	J73	90.0	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
110	J95	J96	43.4	150	Unknown	140	Pipe 577	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
111	J96	J76	141.91	150	Unknown	140	Pipe 594		WAT_Watermain_Table
112	J76	J97	94.2	150	Unknown	140	Pipe 583	Pipe 583 plus other pipes	F22019_WaterMap_NorthSat
113	J96	J97	189.8	150	Unknown	140	Pipe 577	Pipe 577 plus other pipes	F22019_WaterMap_NorthSat
114	J97	J98	159.9	150	Unknown	140	Pipe 589	Pipe 589 plus other pipes	F22019_WaterMap_NorthSat
115	J98	J99	68.82	150	PVC	150	Pipe 559		WAT_Watermain_Table
116	J98	J80	98.4	150	Asbestos Cement	140	Pipe 552	Pipe 552 plus other pipes	F22019_WaterMap_NorthSat
117	J80	J83	94.38	150	Asbestos Cement	140	Pipe 104		WAT_Watermain_Table
118	J83	J100	121.5	150	Asbestos Cement	140	Pipe 518	Part of pipe 518 and other pipes	F22019_WaterMap_NorthSat
119	J100	J101	99.6	150	Asbestos Cement	140	Pipe 518	Part of pipe 518	F22019_WaterMap_NorthSat
120	J99	J102	134.56	150	PVC	150	Pipe 661		WAT_Watermain_Table
121	J102	J101	67.06	150	PVC	150	Pipe 656		WAT_Watermain_Table
122	J99	J103	56.5	150	PVC	150	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
123	J103	J104	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
124	J104	J105	94.2	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
125	J104	J106	105.32	50	PVC	150	Pipe 103		WAT_Watermain_Table
126	J103	J107	147.26	150	Asbestos Cement	140	Pipe 653		WAT_Watermain_Table
127	J107	J108	75.1	150	Unknown	140	Pipe 513	Part of pipe 513	F22019_WaterMap_NorthSat
128	J108	J109	69.9	150	Unknown	140	Pipe 513	Part of pipe 513 and other pipes	F22019_WaterMap_NorthSat
129	J109	J101	46.5	150	Unknown	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
130	J107	J110	95.55	150	Unknown	140	Pipe 503		WAT_Watermain_Table
131	J110	J111	130.2	150	Unknown	140	Pipe 506	Pipe 506 plus other pipes	F22019_WaterMap_NorthSat
132	J111	J112	131.3	150	Unknown	140	Pipe 488	Part of pipe 488	F22019_WaterMap_NorthSat
133	J112	J113	178.9	150	Unknown	140	Pipe 488	Part of pipe 488 and other pipes	F22019_WaterMap_NorthSat
134	J113	J50	47.71	150	Unknown	140	Pipe 33		WAT_Watermain_Table
135	J50	J114	109.0	150	Asbestos Cement	140	Pipe 491	Pipe 491 plus other pipes	F22019_WaterMap_NorthSat
136	J114	J115	140.8	150	Asbestos Cement	140	Pipe 402	Pipe 402 plus other pipes	F22019_WaterMap_NorthSat
137	J114	J116	159.6	200	PVC	150	Pipe 24	Pipe 24 plus other pipes	F22019_WaterMap_NorthSat
138	J116	J117	143.1	200	PVC	150	Pipes 27 and 393	Pipes 27 and 392 plus other pipes	F22019_WaterMap_NorthSat
139	J117	J118	140.23	200	PVC	150	Pipe 385		WAT_Watermain_Table
140	J118	J119	71.63	150	PVC	150	Pipe 384		WAT_Watermain_Table
141	J114	J120	92.0	150	Asbestos Cement	140	Pipe 26	Pipe 26 plus other pipes	F22019_WaterMap_NorthSat
142	J120	J121	144.2	150	Asbestos Cement	140	Pipes 369 and 25	Pipes 369 and 25 plus other pipes	F22019_WaterMap_NorthSat
143	J121	J122	49.9	150	Asbestos Cement	140	Pipe 379		WAT_Watermain_Table
144	J122	J119	96.0	150	PVC	150	Pipe 23		WAT_Watermain_Table
145	J119	J123	106.0	150	PVC	150	Pipe 15		F22019_WaterMap_NorthSat
146	J123	J124	41.15	150	PVC	150	Pipe 19		WAT_Watermain_Table
147	J124	J125	137.16	150	Asbestos Cement	140	Pipe 28		WAT_Watermain_Table
148	J125	J126	137.16	150	Asbestos Cement	140	Pipes 29 and 410	As-built length for pipe 410	WAT_Watermain_Table
149	J126	J115	160.0	150	Asbestos Cement	140	Pipe 408	Pipe 408 plus other pipes	F22019_WaterMap_NorthSat
150	J115	J127	111.56	150	Asbestos Cement	140	Pipe 435		WAT_Watermain_Table
151	J123	J128	126.8	150	PVC	150	Pipes 11, 8, 4 and 6		F22019_WaterMap_NorthSat
152	J128	J129	85.3	150	Asbestos Cement	140	Pipe 425	Part of pipe 425	F22019_WaterMap_NorthSat
153	J129	J130	149.7	150	Asbestos Cement	140	Pipes 423 and 418	Part of pipes 423 and 418	F22019_WaterMap_NorthSat
154	J130	J131	170.4	150	Asbestos Cement	140	Pipe 422	Pipe 422 plus other pipes	F22019_WaterMap_NorthSat
155	J131	J127	119.8	50	Asbestos Cement	140	Pipe 434	Pipe 434 plus other pipes, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
156	J127	J132	100.0	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
157	J111	J132	93.87	150	Asbestos Cement	140	Pipe 484		WAT_Watermain_Table
158	J132	J133	106.9	150	Asbestos Cement	140	Pipe 450	Pipe 450 plus other pipes	F22019_WaterMap_NorthSat
159	J131	J133	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
160	J133	J134	173.6	150	Asbestos Cement	140	Pipe 457	Pipe 457 plus other pipes	F22019_WaterMap_NorthSat
161	J132	J135	188.4	150	Asbestos Cement	140	Pipe 469	Pipe 469 plus other pipes	F22019_WaterMap_NorthSat
162	J135	J134	130.9	150	Asbestos Cement	140	Pipe 465	Pipe 465 plus other pipes	F22019_WaterMap_NorthSat
163	J134	J136	141.1	150	Asbestos Cement	140	Pipe 458		WAT_Watermain_Table
164	J136	J137	158.5	150	Asbestos Cement	140	Pipe 477		WAT_Watermain_Table
165	J137	J138	227.9	150	Asbestos Cement	140	Pipes 474 and 37		WAT_Watermain_Table
166	J138	J109	262.3	150	Asbestos Cement	140	Pipes 151 and 277	Pipes 151 and 277 plus other pipes	F22019_WaterMap_NorthSat

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167	J101	J139	187.4	250	PVC	150	Pipe 551	Pipe 551 plus other pipes	F22019_WaterMap_NorthSat	
168	J139	J140	140.13	250	PVC	150	Pipes 309 and 310		WAT_Watermain_Table	
169	J140	J141	143.46	250	PVC	150	Pipe 930		WAT_Watermain_Table	
170	J141	J142	569.8	250	PVC	150	Numerous	Assuming as-builts are correct, GIS shows some pipes as 37 mm	F22019_WaterMap_NorthSa t F22019_WaterMap_Mid	
171	J142	J143	612.3	250	PVC	150	Pipes 330, 335 and 41	es 330, 335 and 41 plus other pi	F22019_WaterMap_Mid	
172	J143	J144	745.0	250	PVC	150	Pipes 145, 146, 147, 44 and 46		WAT_Watermain_Table	
173	J144	J145	172.3	250	PVC	150	Pipe 55	Pipe 55 plus other pipes	F22019_WaterMap_Mid	
174	J145	J146	206.0	250	PVC	150	Pipe 58		WAT_Watermain_Table	
175	J146	J147	75.4	250	PVC	150	-	ssume same properties as pipe 5	F22019_WaterMap_Mid	
176	J147	J148	103.0	250	PVC	150	Pipe 68		WAT_Watermain_Table	
177	J148	J149	150.0	250	PVC	150	Pipe 71		WAT_Watermain_Table	
178	J149	J150	222.0	250	PVC	150	Pipe 75	Pipe 75 plus other pipes	F22019_WaterMap_Mid	
179	J147	J151	123.73	150	PVC	150	Pipe 66		WAT_Watermain_Table	
180	J151	J152	158.6	150	PVC	150	Pipes 96 and 99		WAT_Watermain_Table	
181	J152	J153	137.00	150	PVC	150	Pipe 93		WAT_Watermain_Table	
182	J153	J154	91.5	150	PVC	150	Pipe 100		WAT_Watermain_Table	
183	J154	J155	93.25	150	PVC	150	Pipe 84		WAT_Watermain_Table	
184	J155	J156	129.0	150	PVC	150	Pipes 88 and 87		WAT_Watermain_Table	
185	J156	J150	103.0	150	PVC	150	Pipe 83		WAT_Watermain_Table	
186	J150	J157	161.1	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
187	J157	J158	185.0	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
188	J158	J159A	466.8	150	PVC	150	Pipe 279	Pipe 279 plus other pipes	F22019_WaterMap_South	
189	J159	J160A	1933.9	150	CU	135	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300 plus other pipes	F22019_WaterMap_South	Assuming CU is copper
189A	J160B	J160	929.5	150	CU	135	Pipes 301, 302, 315 and 313	Pipes 301, 302, 315 and 313 plus other pipes	F22019_WaterMap_South	
190	J161	J162	101.6	200	PVC	150	Pipe 196	Pipe 196 plus other pipes	F22019_WaterMap_South	
191	J162	J163	149.2	200	PVC	150	Pipe 312	Pipe 312 plus other pipes	F22019_WaterMap_South	
192	J163	J164	87.8	150	PVC	150	Pipe 199	Pipe 199 plus other pipes	F22019_WaterMap_South	
193	J164	J165	75.1	150	PVC	150	Pipe 197	Pipe 197 plus other pipes	F22019_WaterMap_South	
194	J164	J166	136.0	150	PVC	150	Pipe 153		WAT_Watermain_Table	
195	J166	J167	177.0	150	PVC	150	Pipe 156		F22019_WaterMap_South	
196	J167	J165	141.39	150	PVC	150	Pipes 165 and 166		WAT_Watermain_Table	
197	J165	J168	207.4	150	PVC	150	Pipes 311 and 175	Pipes 311 and 175 plus other pipe	F22019_WaterMap_South	
198	J168	J169	167.6	150	PVC	150	Pipes 177 and 178	Pipes 177 and 178 plus other pipe	F22019_WaterMap_South	
199	J169	J163	183.1	150	PVC	150	Pipe 182	Pipe 182 plus other pipes	F22019_WaterMap_South	
200	J163	J170	166.5	200	PVC	150	Pipe 255	Pipe 255 plus other pipes	F22019_WaterMap_South	
201	J170	J171	233.5	150	PVC	150	Pipes 275 and 276	Pipes 275 and 276 plus other pipe	F22019_WaterMap_South	
202	J170	J172	122.8	200	PVC	150	Pipe 263	Pipe 263 plus other pipes	F22019_WaterMap_South	
203	J172	J173	81.3	200	PVC	150	Pipe 267	Pipe 267 plus other pipes	F22019_WaterMap_South	
204	J173	J174	128.8	200	PVC	150	Pipe 273	Pipe 273 plus other pipes	F22019_WaterMap_South	
205	J174	J175	178.9	200	PVC	150	Pipe 216	Pipe 216 plus other pipes	F22019_WaterMap_South	
206	J175	J176	88.8	200	PVC	150	Pipe 222	Pipe 222 plus other pipes	F22019_WaterMap_South	
207	J175	J177	89.4	150	PVC	150	Pipe 235	Pipe 235 plus other pipes	F22019_WaterMap_South	
208	J173	J178	102.50	150	PVC	150	Pipe 207		WAT_Watermain_Table	
209	J178	J177	68.68	150	PVC	150	Pipe 210		WAT_Watermain_Table	
210	J177	J179	96.0	150	PVC	150	Pipe 242	Part of pipe 242 and other pipes	F22019_WaterMap_South	
211	J172	J180	59.5	150	PVC	150	-	ssume same properties as pipe 20	F22019_WaterMap_South	
212	J180	J179	116.3	150	PVC	150	Pipe 205		F22019_WaterMap_South	
213	J179	J181	72.78	150	PVC	150	Pipe 242		WAT_Watermain_Table	
214	J181	J182	148.8	150	PVC	150	Pipe 246	Pipe 235 plus other pipes	F22019_WaterMap_South	
215	J118	J183	235	150	PVC	150	-	sting watermain plus part of WM	Google Earth estimate	
216	J183	J16	85	150	PVC	150	-	Part of WM extension	Google Earth estimate	
217	J49	J184	152.5	150	PVC	150	-	New WM	Zoning map estimate	
218	J184	J185	73.5	150	PVC	150	-	New WM	Zoning map estimate	
219	J185	J186	281.2	150	PVC	150	-	New WM	Zoning map estimate	
220	J184	J187	203.4	150	PVC	150	-	New WM	Zoning map estimate	
221	J187	J188	98.2	150	PVC	150	-	New WM	Zoning map estimate	
222	J185	J188	206.4	150	PVC	150	-	New WM	Zoning map estimate	
223	J188	J186	102.1	150	PVC	150	-	New WM	Zoning map estimate	
224	J186	J183	103.8	150	PVC	150	-	New WM	Zoning map estimate	

Yellow cells are assumed values

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

						Water Model Calculations				Flow Meter Data			
Water Model Node	**ICI Uses**	**Address**	**Type**	**Footprint (m2)**	**Footprint (ha)**	**Estimated Occupancy**	**Units**	**Flow Rate**	**ADD (L/day)**	**Average (L/day)**	**ADD (L/day)**	**Design ADD (L/day)**	**Notes**
J1A	Water Treatment Plant	40C Broadway Ae.	Industrial	1828	0.1828	-	m3/ha/d	45	8226			8226	
	LCBO		Commercial										
	Algoma Public Health	16 Ganley St.	Commercial - Office							4067	4881	4881	
J5	Home Town Wines		Commercial - Personal Service Shop	1262	0.1262	11	L/p/d	278.0	3017				
	Superior East Community Futures Development Corporation		Commercial - Office										
	Algoma District Services Administration Board	52 Broadway Ave.	Commercial - Office							0	0	0	
	North Algoma Literacy Colaition	50B Broadway Ave.	Commercial - Office							231	277	277	
J6	Garage Behind Bowling Alley	Ganley St.	Storage Garage	137	0.0137	3	L/p/d	75	223			223	
J7	Low Lift Pumping Station	-	Industrial	616	0.0616	-	m3/ha/d	45	2772			2772	
	The Thrift Barn	45 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	635	762	762	
	Square Three	43 Broadway Ave.	Commercial	494	0.0494	4	L/p/d	278.0	1181	60	72	72	
	The Brick	41 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	28	33	33	
	Sonia Video	39 Broadway Ave.	Commercial	497	0.0497	4	L/p/d	278.0	1189			1189	
	The Co-operators	37 Broadway Ave.	Commercial - Office	536	0.0536	5	L/p/d	278.0	1281	3068	3681	3681	
J8	Alzheimers Society		Commercial - Office										
	Canada Post Office	44 Broadway Ave.	Commercial	971	0.0971	8	L/p/d	278.0	2321	441	529	529	
	OPP Station	42 Broadway Ave.	Commercial - Office										
	Municipal Offices	40 Broadway Ave.	Commercial - Office	1389	0.1389	12	L/p/d	278.0	3321	2036	2443	2443	
	Public Library	40 Broadway Ave.	Commercial										
	Wawa Volunteer Fire Department	12 Ontario St.	Storage Garage	480	0.0480	10	L/p/d	75	783			783	
	March of Dimes Canada	31 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	757	908	908	
	Northern Vision Care	29 Broadway Ave.	Commercial - Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	600	720	720	
	Lai's Restaurant	27 Broadway Ave.	Commercial - Dining	460	0.046	4	L/p/d	278.0	1100	4066	4879	4879	
J9	Empty Building	25 Broadway Ave.	Storage	426	0.0426	9	L/p/d	75	695			695	
	SpikeMills Art Gallery	28 Broadway Ave.	Commercial	227	0.0227	2	L/p/d	278.0	543				
	Lakeview Hotel - Hotel Rooms	28 Broadway Ave.	Hotel	-	-	31	L/bed-space-day	225	6975	10459	12550	12550	7 one bed rooms, 7 double bed rooms, 5 apartment rooms (assuming 2 beds)
	Lakeview Hotel - Motel Rooms	28 Broadway Ave.	Motel	-	-	22	L/bed-space-day	175	3850				11 motel rooms (assuming 2 beds)
	Lakeview Restaurant	28 Broadway Ave.	Commercial - Dining	173	0.0173	1	L/p/d	278.0	414				Assuming second floor of part of the building
	Iris Place	21 Broadway Ave.	Commercial	552	0.0552	5	L/p/d	278.0	1320			1320	
	Empty Building	16 Broadway Ave.	Storage	150	0.015	3	L/p/d	75	245			245	
J10	Beachfront Trading Post	14 Broadway Ave.	Commercial	464	0.0464	4	L/p/d	278.0	1109	18032	21638	21638	
	Canadian Red Cross	4 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	67	81	81	
	Public Washrooms	15 Broadway Ave.	Commercial	897	0.0897	8	L/p/d	278.0	24937	267	321	321	
	Garage	2 Broadway Ave.	Storage Garage	193	0.0193	4	L/p/d	75	315	563	676	676	
J11	Calvary Penecostal Church	12 Government Rd.	Commercial - Fixed Seats	1410	0.141	31	L/p/d	278.0	8521	412	495	495	Included as commercial, measured with google earth as house on same lot
	Lady Dunn Health Centre	17 Government Rd.	Hospital	-	-	28	L/(bed-day)	1350	37800	24275	29130	29130	10 acute care beds, 2 respite beds, and 16 long term care beds
J13	Garage	17 Government Rd.	Storage Garage	202	0.0202	4	L/p/d	75	329	3	4	4	Assume this is the small meter for 17 Government Rd.
	Algoma District Paramedic Service	Government Rd.	Commercial Office	364	0.0364	3	L/p/d	278.0	871			871	
J17	Leverington's Garden Centre	130 Government Rd.	Industrial - Process Room	3923	0.3923	-	m3/ha/d	45	17654	351	422	422	Residential in water meter data
J18	Lloyd's of Wawa	165 Government Rd.	Storage Garage	477	0.0477	10	L/p/d	75	778	17	20	20	
	Wagging Tails Kennel	171 Government Rd.	Commercial	296	0.0296	3	L/p/d	278.0	708	677	813	813	
	Everything Floors Ltd.	9 Mackey St.	Commercial	575	0.0575	5	L/p/d	278.0	1375	950	1140	1140	
J19	Wawa Handy Store	19 Mackey St.	Commercial	456	0.0456	4	L/p/d	278.0	1090	9194	11033	11033	
	Empty Building	Mackey St.	Storage Garage	660	0.066	14	L/p/d	75	1076			1076	
J20	United Supply/Swish	4 McKinley Ave.	Commercial	688	0.0688	6	L/p/d	278.0	1645	155	186	186	
	Superior North Mobile Vetrinary Service	23 Mackey St.	Commerial - Personal Service Shop	464	0.0464	4	L/p/d	278.0	1110			1110	
J21	A Touch of Glass	25 Mackey St.	Commercial - Personal Service Shop	235	0.0235	2	L/p/d	278.0	562			562	
	Sir James Dunn Public School	36 McKinley Ave.	School	-	-	87	L/student/d	105	9135	8595	10314	10314	87 students and 21 staff
J24	Children's Aid Society of Algoma	31 Algoma St.	Commercial - Office	147	0.0147	1	L/p/d	278.0	351	135	162	162	
J25	Bell	56 Ganley St.	Commercial	930	0.093	8	L/p/d	278.0	2223	9	10	10	
	Wawa Laundromat	44 Mackey St.	Commercial	465	0.0465	4	L/p/d	278.0	1112	1907	2289	2289	
J30	Old Garage	62 Mackey St.	Storage Garage	230	0.0230	5	L/p/d	75	375			375	
J31	Superior Children's Centre	41 Algoma St.	Daycare	665	0.0665	6	L/p/d	278.0	1590	759	910	910	Assumed like commercial; Included as residential in water meter data
J34	Paint + Glass	Caverhill St.	Storage	275	0.0275	6	L/p/d	75	448			448	
	Creation Hairstyling	75A McKinley Ave.	Commercial-Personal Service Shop	232	0.0232	2	L/p/d	278.0	555	601	721	721	Assumed half of lot
J35	Home	75 McKinley Ave.	Commercial	232	0.0232	2	L/p/d	278.0	555	332	398	398	Assumed half of lot
J36	Sam's Place	84 McKinley Ave.	Commercial-Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	652	783	783	
J41	St. Paul's Anglican Church	60 Second Ave.	Commercial - Fixed Seats	930	0.0930	8	L/p/d	278.0	2223	148	178	178	
J49	Michipicoten Non-Profit Housing	40 Hillcrest Ave.	Commercial - Office	293	0.0293	3	L/p/d	278.0	701	994	1193	1193	Included as multi-residential in water meter data
	Canadian Tire	54 Broadway Ave.	Commercial	2524	0.2524	22	L/p/d	278.0	6034	6145	7374	7374	
	Dawson & Keenan	56 Broadway Ave.	Commercial - Office	465	0.0465	4	L/p/d	278.0	1112	8864	10637	10637	
J51	Roxy Bowling Centre	49 Broadway Ave.	Commercial	632	0.0632	5	L/p/d	278.0	1511	811	973	973	
	The Royal Canadian Legion	51 Broadway Ave.	Commercial	567	0.0567	5	L/p/d	278.0	1356	9272	11127	11127	Included as residential in water meter data
	Sam's Foodline	55 Broadway Ave.	Commercial	1990	0.1990	17	L/p/d	278.0	4757			4757	
	Allemano & Fitzgerald	55 Broadway Ave.	Commercial - Office	301	0.0301	3	L/p/d	278.0	719			719	
	Feifel, Broadbent and Gualazzi	57 Broadway Ave.	Commercial - Office	277	0.0277	2	L/p/d	278.0	662	1	1	1	
	Wawa Jewellers	59 Broadway Ave.	Commercial	376	0.0376	3	L/p/d	278.0	899	111	134	134	
	The Bargain! Shop	60 Broadway Ave.	Commercial	930	0.093	8	L/p/d	278.0	2223	242	290	290	
	AJ's Pizza & Wholesale	64 Broadway Ave.	Commercial - Kitchen	475	0.0475	4	L/p/d	278.0	1136	322	386	386	
	Best Start Hub	66 Broadway Ave.	Daycare	383	0.0383	3	L/p/d	278.0	916	673	807	807	Assumed like commercial; Included as residential in water meter data

EPANet Future Residential Only Model Inputs

	North of 17 Restaurant	68 Broadway Ave.	Commercial - Dining	753	0.0753	6		L/p/d	278.0	1800	4002	4803	4803	
	Embassy Restaurant	70 Broadway Ave.	Commercial - Dining	486	0.0486	4		L/p/d	278.0	1162	1798	2158	2158	
	RBC Royal Bank	72 Broadway Ave.	Commercial - Personal Service Shop	480	0.048	4		L/p/d	278.0	1148	595	714	714	
J52	Wawa Dental Centre	27A Gold St.	Commercial - Personal Service Shop	1007	0.1007	9		L/p/d	278.0	2408	1982	2378	2378	
	Wawa Pharmacy		Commercial											
	Wawa Goose Senior Centre	63 Broadway Ave.	Commercial	460	0.0460	4		L/p/d	278.0	1100	676	812	812	
	Barber Shop		Commercial - Personal Service Shop											
	U Wanna Cab	65 Broadway Ave.	Commercial - Office	457	0.0457	4		L/p/d	278.0	1093	429	514	514	
	Regional Employment Help Centre		Commercial - Office											
	Chic'N Swell	67 Broadway Ave.	Commercial - Personal Service Shop	462	0.0462	4		L/p/d	278.0	1105	383	459	459	
	Guided Fishing Trips		Commercial - Office											
	Columbia Restaurant & Pizzeria	71 Broadway Ave.	Commercial - Dining	462	0.0462	4		L/p/d	278.0	1105	3642	4370	4370	
	Parish of St. Monica	78 Broadway Ave.	Commercial - Fixed Seats	1859	0.1859	16		L/p/d	278.0	4444	259	311	311	2 water meters for this address, assume both are for the Church
	The Algoma News Review	33 St. Marie St.	Commercial	833	0.0833	7		L/p/d	278.0	1992	478	573	573	
	ANP Office Supply		Commercial											
J53	Fenlon's Pharmacy	88 Broadway Ave.	Commercial	1298	0.1298	11		L/p/d	278.0	3103	1468	1761	1761	
	Northern	Broadway Ave.	Commercial	1407	0.1407	12		L/p/d	278.0	3363			3363	
	Yellow Building	Broadway Ave.	Storage	132	0.0132	3		L/p/d	75	215			215	
	Algoma Family Services	26 St. Marie St.	Commercial - Office	833	0.0833	7		L/p/d	278.0	1992	1835	2201	2201	2 water meters for this address
	Bangin Burger N Chicken Shack	92 Broadway Ave.	Commercial - Kitchen	465	0.0465	4		L/p/d	278.0	1112	182	219	219	
J54	Economic Development Corporation of Wawa	96 Broadway Ave.	Commercial - Office	930	0.0930	8		L/p/d	278.0	2223	3168	3801	3801	Assume 50% of building
	JJAM FM		Commercial - Office											Assume 50% of building
	Ontario Mine Rescue Algoma District Station	36 Montreal Ave.	Commercial - Office	1463	0.1463	13		L/p/d	278.0	3498	0	0	0	
J69	Garage	42 Montreal Ave.	Storage Garage	504	0.0504	11		L/p/d	75	822	40	49	49	Assuming this is 42, although streetview shows 40 and no 42
	Municipality of Wawa Infrastructure Services Department	26 Magpie Rd.	Commercial - Office	3503	0.3503	30		L/p/d	278.0	8375	1842	2211	2211	2 water meters for this address, assume both are for this building
	The Shop	46 Montreal Ave.	Commercial	1227	0.1227	11		L/p/d	278.0	2934	977	1172	1172	
J71	Millette General Contractors Ltd.	Montreal Ave.	Commercial	1040	0.1040	9		L/p/d	278.0	2487			2487	
	The Ship Boy Scouts Wawa Rotary Club	Montreal Ave.	Commercial - Office	55	0.0055	0		L/p/d	278.0	133			133	
J75	Home	12 Klondike St.	Commercial	138	0.0138	1		L/p/d	278.0	330	238	286	286	
	Garage		Storage Garage	289	0.0289	6		L/p/d	75	471				
J77	Garage	142 Broadway Ave.	Storage Garage	361	0.0361	8		L/p/d	75	589	537	645	645	
	Garage		Storage Garage	182	0.0182	4		L/p/d	75	297				
J82	Mobile Home Park	Trailer Park Rd.	Mobile Home Park	-	-	23		L/space/d	1000	23000	15505	18606	18606	
	Ecole Publique L'Escalade	52 Winston Rd.	School	-	-	10		L/student/d	105	1050	244	293	293	10 students and 5 staff
J84	First United Church	224 Mission Rd.	Commercial - Fixed Seats	2189	0.2189	19		L/p/d	278.0	5233	22	26	26	
	Circle K	208D Mission Rd.	Commercial								463	555	555	
J86	Northern Credit Union	208 Mission Rd.	Commercial - Personal Service Shop	2031	0.2031	17		L/p/d	278.0	4856	126	151	151	
	Empty Store	208 Mission Rd.	Commercial								89	107	107	
J87	Watson's Algoma Vacations Ltd.	195 Mission Rd.	Office	1041	0.1041	9		L/p/d	278.0	2489	851	1021	1021	
J88	Big Bird Inn	191 Mission Rd.	Hotel	-	-		90	L/bed-space-day	225	20250	1643	1972	1972	50 rooms, 40 double beds and 10 single beds
	Independent Grocery Store	186 Mission Rd.	Commercial	3291	0.3291	28		L/p/d	278.0	7868	1034	1240	1240	
	Subway	179 Mission Rd.	Commercial - Dining	2139	0.2139	18		L/p/d	278.0	5114	2980	3576	3576	
J89	Movie Gallery		Commercial											
	The Viking Restaurant	177 Mission Rd.	Commercial - Dining	1818	0.1818	16		L/p/d	278.0	4346	233	280	280	
	Polish Alliance of Canada	Mission Rd.	Commercial - Non-Fixed Seats and Tables	1364	0.13641583	12		L/p/d	278.0	3261			3261	
J91	Michipicoten High School	86 Magpie Rd.	School	-	-		100	L/student/d	105	10500	10326	12392	12392	120 people, guessing around 100 are students; 2 water meters for this address
J92	St. Augustine	2 Arnott Ave.	School	-	-		100	L/student/d	105	10500	587	704	704	Similar to Michipicoten High School
J99	Outdoorsman Motel	171 Mission Rd.	Motel	-	-		55	L/bed-space-day	175	9625	5094	6113	6113	37 rooms and 55 beds
J100	Kingdom Hall of Jehovah's Witness	54 Winston Rd.	Commercial - Fixed Seats	929	0.0929	8		L/p/d	278.0	2221	151	181	181	
	Wawa Rent-all and Repair	58 Winston Rd.	Commercial	1465	0.1465	13		L/p/d	278.0	3503	305	366	366	
J101	Garage	60 Winston Rd.	Storage Garage	203	0.0203	4		L/p/d	75	331			331	
	Gator's Steakhouse Building	47 Mission Rd.	Commercial - Office	2023	0.2023	17		L/p/d	278.0	4837			4837	
J102	T Cannabis	152 Mission Rd.	Commercial	1302	0.1302	11		L/p/d	278.0	3113	1410	1692	1692	
	Beer Store	156 Mission Rd.	Commercial	1990	0.199	17		L/p/d	278.0	4758	3176	3811	3811	
J103	Algoma Motel	164 Mission Rd.	Motel	-	-	26		L/bed-space-day	175	4550	3124	3748	3748	https://www.algomamotel.com/#gallery (705-856-7010)
	Bristol Motel	170 Mission Rd.	Motel	-	-	32		L/bed-space-day	175	5600	4564	5477	5477	Can't get working phone number or email
J109	Kerry Funeral Home	140 Churchill Ave.	Commercial - Fixed Seats	651	0.0651	6		L/p/d	278.0	1556	925	1110	1110	
	Beaver Motel	148 Mission Rd.	Motel	-	-	25		L/bed-space-day	175	4375	3116	3740	3740	6 double rooms and 13 single rooms
J111	Ecole St. Joseph	101 Churchill Ave.	School	-	-	205		L/student/d	105	21525	1934	2320	2320	205 students and 32 staff
J120	Confederation College Building	3 Maple St.	Storage	964	0.0964	21		L/p/d	75	1572	495	594	594	2 water meters for this address
J137	Lion's Club	51 Superior Ave.	Commercial - Non-Fixed Seats and Tables	236	0.0236	2		L/p/d	278.0	564	85	103	103	Included as residential in water meter data
	Michipicoten Memorial Community Centre	3 Chris Simon Dr.	Space with Fixed Seats	5838	0.5838	50		L/p/d	278.0	13957	6454	7744	7744	
J138	Wawa Motor Inn	118 Mission Rd.	Motel	-	-	175		L/bed-space-day	175	30625	40407	48488	48488	Assumed higher flow rate for motel
	Wawa Motor Inn - Wawa Goose Bar & Grill	118 Mission Rd.	Commercial - Dining	615	0.0615	5		L/p/d	278.0	1470	1947	2336	2336	Assumed lower flow rate for restaurant
	Petro Canada	137 Mission Rd.	Commercial	2151	0.2151	18		L/p/d	278.0	5143	781	937	937	
J139	Northern Chiropractic	135 Mission Rd.	Commercial - Personal Service Shop	135	0.0135	1		L/p/d	278.0	323	142	170	170	
	Krazy Fries	135B Mission Rd.	Commercial - Kitchen	71	0.0071	1		L/p/d	278.0	170	73	88	88	
J140	Small Station	Mission Rd.	Industrial	38	0.0038	-		m3/ha/d	45	171			171	
	Home Building Centre Garage	109 Mission Rd.	Storage Garage	203	0.0203	4		L/p/d	75	331				
J141	Home Building Centre		Commercial	885	0.0885	8		L/p/d	278.0	2116	98	118	118	
	Young's General Store	111 Mission Rd.	Commercial	2021	0.2021	17		L/p/d	278.0	4832	2462	2954	2954	
	Lagoon Building	Road to Golf Course	Industial	201	0.0201	-		m3/ha/d	45	905			905	A tap is used here to flush the line according to Municipality.
	Canco	125 Mission Rd.	Commercial	2083	0.2083	18		L/p/d	278.0	4980	1621	1946	1946	Think this address is Canco from online search although it doesn't match up with map
J142	Wesdome	93 Mission Rd.	Industrial	373	0.0373	-		m3/ha/d	45	1679	464	557	557	

EPANet Future Residential Only Model Inputs

	Garages	89 Mission Rd.	Storage Garage	515	0.0515	11	L/p/d	75	840	151	181	181	
	Tim Hortons	92 Mission Rd.	Commercial - Dining	7977	0.7977	69	L/p/d	278.0	19071	4507	5409	5409	
	Mission Motors	61 Mission Rd.	Commercial	715	0.0715	6	L/p/d	278.0	1709	1425	1710	1710	
	Service Ontario	48 Mission Rd.	Commercial - Personal Service Shop	1204	0.1204	10	L/p/d	278.0	2879	947	1137	1137	Assume first 48 Mission road is Service Ontario
	Ontario Ministry of Natural Resources	48 Mission Rd.	Commercial - Office	394	0.0394	3	L/p/d	278.0	942	8	9	9	Assume second 48 Mission Road is OMNR
	Government Storage Garages (x7)	48 Mission Rd.	Storage Garage	2321	0.2321	50	L/p/d	75	3784	5911	7093	7093	Assume third 48 Mission Road is for other buildings
J143	Storage Sheds on Highway 17 W	Highway 17 W	Storage Garage	2506	0.2506	54	L/p/d	75	4086	792	950	950	Only facility on highway 17 that looks like it could have an in-town service connection
	Wawa Municipal Airport	27A Mission Rd.	Commercial	224	0.0224	2	L/p/d	278.0	536	577	692	692	Assume 27A is for the main building; has three water meters
		27B Mission Rd.	Storage Garage	192	0.0192	4	L/p/d	75	313	105	126	126	Assume 27B is for the garage and hanger
			Aircraft Hanger	555	0.0555	12	L/p/d	75	905				Assume 27B is for the garage and hanger
	Tourist Information Centre	Mission Rd.	Shopping Centre	334	0.0334	3	L/p/d	278.0	799	501	602	602	Added three meters on Mission roads without addresses here as it is furthest distance.
J147	Trans Canada Chrysler	74 Pinewood Dr.	Commercial	875	0.0875	8	L/p/d	278.0	2092	1076	1291	1291	
J148	Fountain Tire	70 Pinewood Dr.	Commercial	2708	0.2708	23	L/p/d	278.0	6474	1045	1254	1254	
	Family Kitchen Restaurant Building	Pinewood Dr.	Storage	389	0.0389	8	L/p/d	75	634			634	
J149	Esso Gas Station	54 Pinewood Dr.	Commercial	234	0.0234	2	L/p/d	278.0	559	354	425	425	Assume one of 54 Pinewood Dr. Buildings
	Davidson Fuels	54 Pinewood Dr.	Commercial	393	0.0393	3	L/p/d	278.0	940	2726	3272	3272	Assume one of 54 Pinewood Dr. Buildings
	Highway 17 Hotel	42 Pinewood Dr.	Hotel	-	-	76	L/bed-space-day	225	17100	8422	10106	10106	46 rooms and 76 beds
J150	OPP Station	34 Pinewood Dr.	Commerial - Office	674	0.0674	6	L/p/d	278.0	1611	327	392	392	
	Gardewine	100 Mills Dr.	Storage Garage	735	0.0735	16	L/p/d	75	1198	71	85	85	
J151	Superior Truck Repair Centre	167 Mills Dr.	Storage Garage	967	0.0967	21	L/p/d	75	1577	323	388	388	Assume one of 167 Mills Dr. Buildings
	Lakehead Freightway/Manitoulin Transport	167 Mills Dr.	Storage Garage	409	0.0409	9	L/p/d	75	667	44	53	53	Assume one of 167 Mills Dr. Buildings
J152	U-Haul Dealer	160 Mills Dr.	Commercial	496	0.0496	4	L/p/d	278.0	1186	297	356	356	Assuming U-Haul Dealer is the northeast building on Mills Dr., lot estimated with google ea
J154	Martel Customs	128 Mills Dr.	Industrial	83	0.0083	-	m3/ha/d	45	374	0	0	0	Assuming this is the small building on south side of Mills Dr.
J155	Red Roof Building	120 Mills Dr.	Storage Garage	377	0.0377	8	L/p/d	75	615	403	484	484	
	Red Roof Building #2	Mills Dr.	Storage Garage	488	0.0488	11	L/p/d	75	796			796	
J156	Building on cul-de-sac	White Dr.	Storage Garage	283	0.0283	6	L/p/d	75	461			461	Can't see on GIS imagery, looks about 3/4 the size of the smaller red roof building
	Northstar Fusion	16 White Dr.	Industrial	10500	1.0500	-	m3/ha/d	45	47250			47250	Measured with google earth, size of facility not sure if it is all building
	Evolugen	105 Mills Dr.	Industrial	835	0.0835	-	m3/ha/d	45	3758	3089	3707	3707	
J157	Algoma Storage	30 Pinewood Dr.	Storage	1086	0.1086	24	L/p/d	75	1771	9	11	11	
J158	Algoma Highlands Wild Blueberry Farm	1 Pinewood Dr.	Industrial - Process Room	3506	0.3506	-	m3/ha/d	45	15777	382	458	458	
J160A	Jones Power Sports	320 Highway 17	Commercial	362	0.0362	3	L/p/d	278.0	865	521	625	625	
	High Falls Motel & Cabins	280 Highway 17	Motel	-	-	18	L/bed-space-day	175	3150	1106	1327	1327	Two water meters for this address; info@highfallsmotelandcabins.com
J161	Water Tower and Pumping Station	Princess Ave.	Industrial	1400	0.14	-	m3/ha/d	45	6300			6300	Measured with google earth
J163	Your Room is Ready!	323 Hardy Ave.	Hotel	-	-	4	L/bed-space-day	225	900	401	481	481	https://yourroomisready.business.site/?utm_source=gmb&utm_medium=referral
J171	Wood Land Masonic Lodge	308 Magpie Rd.	Commercial - Fixed Seats	75	0.0075	1	L/p/d	278.0	179	27	32	32	Measured with google earth
	Shed on Superior St.	Superior St.	Storage Garage	86	0.0086	2	L/p/d	75	140			140	
J176	Buck's Marina	360 Superior St.	Commercial	348	0.0348	3	L/p/d	278.0	832			832	Measured with google earth
			Storage Garage	546	0.0546	12	L/p/d	75	890			890	
	Small Building on Superior St.	Superior St.	Industrial	300	0.03	-	m3/ha/d	45	1350			1350	Measured with google earth

Total	626829	294992	353990	453716
	In-town		329244	370316

*Footprints highlighted orange use building size instead of lot size

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Reserviors

Name	Elevation (m)	Notes	Source
Res1	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38
Res2	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38

Nodes

Name	Elevation (m)	Source
S1	294.3	2531A38
S2	294.3	2531A38
S3	294.3	2531A38
S4	294.3	2531A38
D1	294.3	2531A38
D2	294.3	2531A38
D3	294.3	2531A38
D4	294.3	2531A38
D5	294.3	2531A38

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PS1	RES1	S1	5	200	Stainless Steel	140
PS2	RES1	S2	5	250	Stainless Steel	140
PS3	RES2	S3	5	200	Stainless Steel	140
PS4	RES2	S4	5	250	Stainless Steel	140
PD1	D1	D5	5	200	Stainless Steel	140
PD2	D2	D5	5	250	Stainless Steel	140
PD3	D3	D5	5	200	Stainless Steel	140
PD4	D4	D5	5	250	Stainless Steel	140
PD5	D5	J1A	10	400	Stainless Steel	140

Pumps

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario 3	
Tag #	Name	Start	End	Curve	Status	Curve	Status	Curve	Status	Curve	Status	Curve	Status
HLP-6201	PUMP1	S1	D1	CURVE4	Open	CURVE4	Open	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6301	PUMP2	S2	D2	CURVE2	Closed	CURVE2	Closed	CURVE2	Open	CURVE2	Open	CURVE2	Open
HLP-6501	PUMP3	S3	D3	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed
HLP-6601	PUMP4	S4	D4	CURVE5	Closed	CURVE5	Open	CURVE2	Open	CURVE2	Open	CURVE2	Open

Curves
CURVE1

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6201/6501	1185	0	225	0	68.58
		200	212	12.62	64.62
		400	204	25.24	62.18

EPANet Future Residential Only Model Inputs

		600	196	37.85	59.74
		800	189	50.47	57.61
		1000	178	63.09	54.25
		1200	164	75.71	49.99
		1400	144	88.33	43.89
		1600	119	100.94	36.27

CURVE2

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6301/6601	1185	0	250	0	76.20
		200	240	12.62	73.15
		400	228	25.24	69.49
		600	216	37.85	65.84
		800	206	50.47	62.79
		1000	198	63.09	60.35
		1200	190	75.71	57.91
		1400	180	88.33	54.86
		1600	171	100.94	52.12
		1800	160	113.56	48.77
		2000	143	126.18	43.59
		2200	118	138.80	35.97

$$\frac{Q1}{Q2} = \frac{RPM1}{RPM2}$$

$$\frac{H1}{H2} = \frac{RPM1^2}{RPM2^2}$$

$$\frac{P1}{P2} = \frac{RPM1^3}{RPM2^3}$$

-law-for-centrifugal-pump-pump-affinity-laws/

CURVE4

Pump	RPM	Flow (LPS)	Head (m)
HLP-6201	1125	0.00	61.81
		11.98	58.24
		23.96	56.04
		35.94	53.84
		47.92	51.92
		59.90	48.90
		71.87	45.05
		83.85	39.56
		95.83	32.69

CURVE5

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1075	0	62.71
		11.45	60.20
		22.89	57.19
		34.34	54.18
		45.79	51.67
		57.23	49.67
		68.68	47.66
		80.13	45.15
		91.57	42.89
		103.02	40.13
		114.47	35.87
		125.91	29.60

EPANet Future Residential Only Model Inputs

CURVE6

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1125	0.00	68.68
		11.98	65.93
		23.96	62.64
		35.94	59.34
		47.92	56.59
		59.90	54.39
		71.87	52.20
		83.85	49.45
		95.83	46.98
		107.81	43.95
		119.79	39.28
		131.77	32.42

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Valves

Name	Start	End	Diameter (mm)	Type	Setting (m)	Drawing
VALVE1	J159A	J159	150	PRV	18.5975	A1-2002-62-P5
VALVE2	J160A	J160B	150	PRV	11.4650	A1-2002-62-P2

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Nodes

Name	Elevation (m)	Source
FS	290.6	Between nodes J101 and J139
FD	290.6	Between nodes J101 and J139

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PFS	J101	FS	150	250	Stainless Steel	140
PFD	FD	J139	37.4	250	Stainless Steel	140

Pump

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario3	
Name	**Start**	**End**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**
PUMP5	FS	FD	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Open

Curves

Name	Flow (LPS)	Head (m)
CURVE3	47.9	21.9

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
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Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PWT1	JFS	TANK1	4	50	Stainless Steel	140
PWT2	TANK1	J161	4	200	Stainless Steel	140

Tank

Name	Elevation	Initial Level	Minimum Level (m)	Maximum Level (m)	Diameter (m)	
TANK1	205.1	41.5	40	61	4.1203	*Municipality said normal levels are between 40 and 43m

Node

Name	Elevation (m)
FS	205.1

FV

Diameter	Setting	Status	
50	10	None	*Can be none or closed, will impact flow rate
			**If status is open then no flow restriction will occur

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
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Nodes

Name	Elevation (m)	Scenario 1 Flow (L/s)	Scenario 2 Flow (L/s)	Scenario 3 Flow (L/s)
JFF1	293.02	38	0	0
JFF2	289.57	38	0	0
JFF3	293.32	26.81	26.81	0
JFF4	289.4	0	38	32.41
JFF5	288.4	0	38	32.41
JFF6	280.6	0	0	38
JFF7	194.5	0	0	38
JFF8	293.76	38	0	0
JFF9	291.23	0	38	0
		140.81	140.81	140.81

Pipes

Name	Start	End	Length (m)	Diameter (mm)	HW Roughness Coefficient
PIPEFF1	J18	JFF1	1	1000	200
PIPEFF2	J118	JFF2	1	1000	200
PIPEFF3	J53	JFF3	1	1000	200
PIPEFF4	J92	JFF4	1	1000	200
PIPEFF5	J70	JFF5	1	1000	200
PIPEFF6	J155	JFF6	1	1000	200
PIPEFF7	J169	JFF7	1	1000	200
PIPEFF8	J31	JFF8	1	1000	200
PIPEFF9	J60	JFF9	1	1000	200

EPANet Future Residential Only Model Inputs

Wawa W&WW Master Plan
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Chlorine Sources

Node	Concentration (mg/L)
RES1	0.86
RES2	0.86
TANK1	0.86

Decay Coefficient

Global Bulk Coefficient	-0.5

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
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Existing EPA Net Model Basis
Existing Housing Density: 2.20

Future Serviced Population (2032): 3,215
Future Serviced Homes: 1422

Junction	*Junction Input for Elevation* Surface Elevation (m)	Invert Elevation (m)	Residential Homes (With Demand from this Junction)	Multi-Residential Units (With Demand from this Junction)	Housing Density	Population (With Demand From this Junction)	Per Capita Demand (L/cap/d)	Residential Demand - Houses (L/d)	Residential Demand - Extra (L/d)	Residential Demand - Total (L/d)	Non-Residential Buildings (With Demand from this Junction)	Non-Residential Demand (L/d)	Bypasses (L/d)	Watermain Purging (L/d)	Total Unaccounted for Water Demand (L/d)	Total ADD Junction Demand (L/d)	*Junction Input for Base Demand* Total ADD Junction Demand (L/s)	Max Day Factor	Total MDD Junction Demand (L/d)	Total MDD Junction Demand (L/s)	Peak Hour Factor	Object	Buildings	Reference Drawing	
1A	293.2	290.6	0	0	2.20	0	278.0	0	0	0	1	8226	0	0	0	8226	0.0952	2.00	16452	0.1904	3.00	-	Water Treatment Plant	2531-A-3	
1	293.24	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant	No demand	1277-29	
2	293.21	-	3	0	2.20	7	278.0	1835	67	1902	0	0	6542	0	6542	8444	0.0977	2.00	16888	0.1955	3.00	Hydrant 126	24, 26 and 28 Ganley St.	1277-29	
3	293.18	-	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	34 and 38 Ganley St.	1277-30	
4	293.12	-	5	0	2.20	11	278.0	3058	112	3170	0	0	3271	0	3271	6441	0.0745	2.00	12882	0.1491	3.00	-	44, 46, 48, 50 and 52 Ganley St.	1277-30	
5	292.57	-	0	0	2.20	0	278.0	0	0	0	6	5158	0	0	0	5158	0.0597	2.00	10317	0.1194	3.00	-	Commercial building with LCBO	1277-30	
6	291.09	-	8	0	2.20	18	278.0	4893	179	5072	1	223	3271	0	3271	8566	0.0991	2.00	17133	0.1983	3.00	Hydrant 102	7, 7 and 2 Ganley St., 28, 30 and 32 Toronto Ave., 26 and 26A Ontario St. 1 commercial (Garage behind bowling alley)	1277-29	
7	290.96	-	0	0	2.20	0	278.0	0	0	0	1	2772	0	0	0	2772	0.0321	2.00	5544	0.0642	3.00	-	Low Lift Pumping Station	1277-29	
8	293.35	-	0	0	2.20	0	278.0	0	0	0	11	9494	6542	0	6542	16036	0.1856	2.00	32071	0.3712	3.00	Hydrant 133	5 commercial buildings on east side of Broadway Ave. 3 Institutional buildings (Post office, municipal building) on west side of Broadway Ave. 1 institutional building on Ontario St. (Firehall).	1277-32	
9	293.66	-	4	0	2.20	9	278.0	2446	90	2536	7	19752	9813	0	9813	32101	0.3715	2.00	64201	0.7431	3.00	Hydrant 130	13 Ontario St. 31 McKinley Ave. 18 and 22 Wawa St. Lakeview hotel and 4 commercial buildings on east side of Broadway Ave.	1277-33	
10	292.73	-	1	0	2.20	2	278.0	612	22	634	5	23604	6542	0	6542	30779	0.3562	2.00	61559	0.7125	3.00	Hydrant 131	7 Broadway Ave. 4 commercial (Iris Place, Empty Building Trading Post, Canadian Red Cross), 1 institutional (public washrooms)	1277-36	
11	294.60	-	1	0	2.20	2	278.0	612	22	634	3	30301	0	0	0	30935	0.3580	2.00	61869	0.7161	3.00	Hydrant 118	14 Government Rd. 1 commercial (garage), 2 institutional (Calvary Penecostal Church Hospital, North East Community Care)	1277-52	
12	295.42	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 123	20 Government Rd.	1277-52	
13	295.38	-	4	0	2.20	9	278.0	2446	90	2536	2	875	0	0	0	3411	0.0395	2.00	6821	0.0789	3.00	Hydrant 107	4 residences (28 and 30 Government Rd., 2 others), 2 institutional (garage and EMS building)	1277-52	
14	296.72	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 108	40, 42, 50, 56, 43, 47, 55, 7, and 7 Government Rd.	1277-53	
15	297.17	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 76	58, 60, 62, 63, 64(x2). 66, 68, 69, 70, 71, 7 and 7 Government Rd.	1277-53, 1277-54	
16	294.2	-	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	Hydrant 75	79, 81, 83, 87 and 120 Government Rd.	1277-54, A1-9422-P2	
17	291.15	-	11	0	2.20	24	278.0	6728	246	6974	1	422	6542	0	6542	13938	0.1613	2.00	27875	0.3226	3.00	Hydrant 74	122, 124, 126, 127, 128, 132, 133, 134, 135, 137 and 139 Government Rd. 1 commercial (Leverington's Garden Centre.	A1-9422-P2	
18	293.02	-	14	0	2.20	31	278.0	8562	314	8876	2	833	19625	0	19625	29335	0.3395	2.00	58669	0.6790	3.00	Hydrant 136	141, 143, 144, 145, 146, 147, 148, 153, 155 and 157 Government Rd. 2, 4, 10 Government Ln. 1 Sinter Plant Rd. 2 commercial (Lloyd's of Wawa, Wagging Tails Kennel)	A1-9422-P1/P2/P3	
19	294.66	-	0	0	2.20	0	278.0	0	0	0	3	13248	3271	0	3271	16519	0.1912	2.00	33038	0.3824	3.00	Hydrant 40	Millette General Contractors, Wawa Handy Store, other commercial building at Mackey St. and McKinley Ave.	1277-33	
20	295.35	-	15	16	2.20	68	278.0	18960	695	19654	1	186	26167	0	26167	46007	0.5325	2.00	92014	1.0650	3.00	Hydrant 44	7, 18, 16, 14, 10, 8, 6, 3, 5, 7, 9 and 7 McKinley Ave. 11 and 12 Laurier St. 7 Algoma St. 1 multi-residential (6 Algoma St. assume 18 units). 1 commercial (United Supply Swish)	1277-41	
21	293.73	-	0	0	2.20	0	278.0	0	0	0	3	11986	0	0	0	11986	0.1387	2.00	23972	0.2775	3.00	-	2 commercial (Superior North Mobile Vetrinary Service, A Touch of Glass). 1 institutional (Sir James Dunn Public School)	1277-33	
22	295.43	-	19	6	2.20	55	278.0	15290	560	15850	0	0	32709	0	32709	48559	0.5620	2.00	97118	1.1240	3.00	Hydrant 47	19, 17, 16, 15, 14, 13, 12, 9, 8, 7, 6, 5, 4, 3, 2 and 1 First Ave. 19, 21 and 23 Algoma Ave. 1 multi-residential (20 First Ave. assume 6 units).	1277-43	
23	293.19	-	0	8	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	Hydrant 103	2 multi-residential (29 Mackey St. assume 4 units, 33 Mackey St. assume 4 units).	1277-33	
24	295.58	-	17	0	2.20	37	278.0	10397	381	10778	1	162	29438	0	29438	40378	0.4673	2.00	80755	0.9347	3.00	Hydrant 96	19, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 3, 2, and 1 Second Ave. 1 commercial building (Children's Aid Society of Algoma)	1277-31	
25	293.39	-	1	2	2.20	7	278.0	1835	67	1902	2	2299	0	0	0	4201	0.0486	2.00	8402	0.0972	3.00	Hydrant 98	44 Mackey St. 1 multi-residential (39 Mackey street, assuming 2 units). 2 commercial (Bell, Wawa Laundromat)	1277-34	
26	293.34	-	18	48	2.20	145	278.0	40366	1479	41845	0	0	42521	0	42521	84366	0.9765	2.00	168732	1.9529	3.00	Hydrant 97	22, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 7, 6, 5, 4, 3 and 1 Third Ave. 3 multi-residential (2 Third Ave. assume 4 units, 35 Algoma St. Mountainview assume 20 units, 37 Algoma St. newer development assume 24 units).	1277-47	
27	294.50	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	-	26b, 26 and 4 Mackey St.	1277-34	
28	294.21	-	2	4	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 110	21 and 19 Churchill Ave. 1 multi-residential (22 Churchill Ave., assume 4 units)	1277-59	
29	293.53	-	13	0	2.20	29	278.0	7951	291	8242	0	0	22896	0	22896	31138	0.3604	2.00	62276	0.7208	3.00	Hydrant 7	17, 15 (x2), 14, 12, 11, 8, 7, 6, 4, 3, 2 and 1 Churchill Ave.	1277-59	
30	295.05	-	2	6	2.20	18	278.0	4893	179	5072	1	375	6542	0	6542	11989	0.1388	2.00	23978	0.2775	3.00	Hydrant 62	57, 63 Mackey St. 1 commercial (old garage, assuming 66 Mackey St.). 2 multi-residential (58 Mackey St. assume 4 units, 59 Mackey St. assume 2 units).	1277-34	
31	293.76	-	16	6	2.20	48	278.0	13455	493	13948	1	910	19625	156100	175725	190583	2.2058	2.00	381167	4.4117	3.00	Hydrant 63	18, 16, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 Beck Ave. 1 multi-residential at 67 Mackey St. (assuming 6 units). 1 institutional (Superior Children's Centre).	1277-50	
32	295.31	-	24	0	2.20	53	278.0	14678	538	15216	0	0	26167	0	26167	41383	0.4790	2.00	82766	0.9579	3.00	Hydrant 64	22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37 and 39 Beck Ave. 21, 22, 23, 24, 25, 7, 27, 7, 29, 32 Hillcrest Ave.	1277-50	
33	293.55	-	8	0	2.20	18	278.0	4893	179	5072	0	0	9813	0	9813	14885	0.1723	2.00	29769	0.3446	3.00	Hydrant 42	50, 54, 56, 57, 58, 59, 60 and 62 McKinley Ave.	1277-39	
34	294.96	-	11	0	2.20	24	278.0	6728	246	6974	2	1170	6542	0	6542	14686	0.1700	2.00	29371	0.3399	3.00	-	63, 64, 65, 66, 67, 68, 69, 70, 71 and 72 McKinley Ave. 30 Caverhill St. 2 commercial (Paint + Glass and Creation Hairstyling)	1277-39	
35	295.83	-	3	0	2.20	7	278.0	1835	67	1902	1	398	0	0	0	2300	0.0266	2.00	4601	0.0532	3.00	Hydrant 43	76, 77 and 78 McKinley Ave. 1 commercial (75 McKinley)	1277-39	
36	296.52	-	10	0	2.20	22	278.0	6116	224	6340	1	783	19625	0	19625	26748	0.3096	2.00	53496	0.6192	3.00	-	79, 80, 81, 82, 86, 87, 89, 91, 93 and 95 McKinley Ave. 1 commercial (Sam's Place)	1277-39	
37	294.19	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 49	32, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 First Ave.	1277-42	
38	296.59	-	20	0	2.20	44	278.0	12232	448	12680	0	0	39250	0	39250	51931	0.6010	2.00	101861	1.2021	3.00	Hydrant 48	53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 69, 70, 71 and 73 First Ave. 93, 95, 97, and 99 Third Ave.	1277-42	
39	293.22	-	1	0	2.20	2	278.0	612	22	634	0	0	3271	0	3271	3905	0.0452	2.00	7810	0.0904	3.00	-	1 A St.	1277-48	
40	294.51	-	13	0	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 46	7, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Second Ave.	1277-44	
41	295.90	-	10	0	2.20	22	278.0	6116	224	6340	1	178	9813	0	9813	16331	0.1889	2.00	32661	0.3778	3.00	-	57, 59, 60, 61, 62, 63, 64, 65, 66 and 67 Second Ave. 2 institutional (St. Paul's Anglican Church)	1277-44	
42	296.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	68, 71, 73 and 75 Second Ave. 7 and 87 Third Ave.	1277-44	
43	295.99	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 99	79, 77, 75, 73 and 71 Third Ave.	1277-45	
44	295.89	-	20	0	2.20	44	278.0	12232	448	12680	0	0	45792	0	45792	58472	0.6768	2.00	116945	1.3535	3.00	Hydrant 45	72, 70, 69, 68, 67, 66, 65, 64, 63, 61, 50, 52, 53, 54, 55, 56, 57, 58, 59 and 60 Third Ave.	1277-49	
45	294.65	-	20	12	2.20	70	278.0	19571	717	20288	0	0	35980	0	35980	56268	0.6512	2.00	112536	1.3025	3.00	Hydrant 100	3, 5A, 6, 7, 8 , 9, and 10 A St. 27, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40 and 42 Third Ave. One multi-residential (44 Third Ave., assuming 12 units).	1277-48	
46	295.72	-	17	0	2.20	37	278.0	10397	381	10778	0	0	26167	0	26167	36945	0.4276	2.00	73890	0.8552	3.00	-	3, 4, 5, 6, 8, 12, 13, 14, 15, 16, 17 and 18 Hillcrest Ave. 44, 45, 47, ? and 49 Churchill Ave.	1277-49	
47	295.38	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 111	24, 25, 26, 27, 28 and 29 Churchill Ave.	1277-59	
48	295.71	-	13	0	2.20	29	278.0	7951	291	8242	0	0	16354	0	16354	24596	0.2847	2.00	49193	0.5694	3.00	Hydrant ?	30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 and 43 Churchill Ave.	1277-58	
49	295.2	-	2	40	2.20	92	278.0	25687	941	26628	1	1193	9813	0	9813	37634	0.4356	2.00	75268	0.8712	3.00	Hydrant 29	34, 7, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 and 80 Hillcrest Ave. 1 institutional (Michipicoten Non-Profit Housing 40 Hillcrest Ave.)	1277-49	
50	289.47	-	2	3	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	62 and 64 Churchill Ave. Multi-residential (68 Churchill Ave. assume 3 units)	1277-57	
51	292.57	-	0	0	2.20	0	278.0	0	0	0	6	35586	6542	0	6542	42128	0.4876	2.00	84256	0.9752	3.00	Hydrant ?	6 commercial buildings (Bowling Centre, Royal Canadian Legion, Canadian Tire, Dawson & Keenan, Sam's Foodline, Allemano & Fitzgerald, Wawa & Chapleau Radio)	-	Assumed same elevation of J5
52	293.83	-	1	0	2.20	2	278.0	612	22	634	17	17828	6542	156100	162642	181103	2.0961	2.00	362206	4.1922	3.00	Hydrant 128	22 Gold St. Commercial buildings (57, 59 Broadway Ave., The Bargain Shop, AJ's Pizza, the Best Start Hub, Regional Employement Health Centre Building, Chic N'Swell, North of 17 Restaurant, The Embassy Restaurant, Columbia Restaurant, RBC Bank, Wawa Dental Centre, Wawa Pharmacy, Wawa Goose Senior Centre, Barber Shop, U Wanna Cab, Guided Fishing Trips)	1277-26	
53	293.32	-	1	0	2.20	2	278.0	612	22	634	7	8425	3271	0	3271	12330	0.1427	2.00	24659	0.2854	3.00	Hydrant 127	25 St. Marie St. 5 commercial (Northern building, Parish of St. Monica, yellow building, Fenlon's Pharmacy, Algoma Family Services)	1277-25	
54	293.05	-	3	0	2.20	7	278.0	1835	67	1902	3	4020	13083	0	13083	19005	0.2200	2.00	38011	0.4399	3.00	-	90 Broadway Ave. 38 and 36 Main St. 2 commercial (Bangin Burger N'Chicken Shack, Economic Development Corporation of Wawa, Ijam FM building)	1277-38	
55	293.09	-	11	0	2.20	24	278.0	6728	246	6974	0	0	13083	0	13083	20058	0.2321	2.00	40115	0.4643	3.00	Hydrant 41	1, 3, 5, 7, 8, 9 and 11 Toronto Ave. ?, ?, 4, ? Gold St.	1277-20	
56	292.61	-	12	0	2.20	26	278.0	7339	269	7608	0	0	16354	0	16354	23962	0.2773	2.00	47925	0.5547	3.00	Hydrant 39	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 and 28 Toronto Ave. 21 and 22 Caverhill St.	1277-19	
57	292.02	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	-	10, 9, 8, 7, 6 and 2 Caverhill St. 56 Wawa St.	1277-19	
58	293.46	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	29, 30, 31, 32, 33, 34, 35 and 36 Toronto Ave.	1277-19	
59	293.46	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19	

EPANet Future Residential 2 Only Model Inputs

60	291.23	-	18	0	2.20	40	278.0	11009	403	11412	0	0	13083	0	13083	24496	0.2835	2.00	48991	0.5670	3.00	Hydrant 104	14, 13, 12, 11, 10, 7, 8, 7 & St. Marie St. 6 and 7 Wawa St. 15, 16, 17, 18, 19, 20 and 7 Montreal Ave.	1277-24
61	292.45	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 105	7, 39, 7, 41, 43, 44, 45, 46 and 48 Toronto Ave.	1277-19
62	292.45	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19
63	291.93	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	-	32 Main St.	1277-38
64	289.77	-	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 7	53, 54, 55, 56, 57 and 58 Toronto Ave. 27, 29, 30, 31, 32 and 34 Joliet St.	1277-19
65	291.2	-	12	0	2.20	26	278.0	7339	269	7608	0	0	22896	0	22896	30504	0.3531	2.00	61008	0.7061	3.00	Hydrant 7	236, 30, 7, 26, 24, 23, 21, 243, 244, 245, 246 and 76 Main St.	1277-22
66	289.76	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	Hydrant 124	11, 247, 249, 251, 253 and 7 Main St. 7 And 10 Joliet St.	1277-12
67	290.37	-	9	0	2.20	20	278.0	5504	202	5706	0	0	6542	0	6542	12248	0.1418	2.00	24496	0.2835	3.00	Hydrant 7	14, 21, 23, 25, 26 and 28 Joliet St. 24, 25 and 36 Montreal St.	1277-12
68	288.29	-	12	0	2.20	26	278.0	7339	269	7608	0	0	6542	0	6542	14150	0.1638	2.00	28300	0.3275	3.00	Hydrant 114	60, 61, 62, 63, 64, 65, 66, 67 and 69 Toronto Ave. 39, 37 and 35 Maggie Rd.	1277-18
69	288.38	-	11	0	2.20	24	278.0	6728	246	6974	3	2259	6542	0	6542	15775	0.1826	2.00	31550	0.3652	3.00	Hydrant 116	33, 31, 29, 27 and 25 Maggie Rd. 32, 31, 30, 29, 28 and 27 Montreal Ave. 3 Institutional (Ontario Mine Rescue Algoma District, Large Garage, Municipality of Wawa Infrastructure Services Department)	1277-14
70	288.4	-	11	2	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 117	7, 17 and 15 Maggie St. 2, 5, 7, 7, 8 and 10 Gladstone Ave. 279-A and 279-B Highway 101. 1 multi-residential (13 Magpie St. assume 2 units).	1277-14
71	288.87	-	17	0	2.20	37	278.0	10397	381	10778	3	3792	22896	0	22896	37466	0.4336	2.00	74932	0.8673	3.00	Hydrant 115	73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88 and 89 Toronto Ave. 2 commercial (The Shop, Millete General Contractors). 1 institutional (The Ship Boy Scouts)	1277-18
72	288.92	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 91	101, 103, 105, 107, 109, 110 and 111 Broadway Ave.	1277-11
73	288.73	-	7	0	2.20	15	278.0	4281	157	4438	0	0	3271	0	3271	7709	0.0892	2.00	15418	0.1784	3.00	-	112, 113, 114, 116 and 117 Broadway Ave. 47 and 45 Maggie Rd.	1277-11
74	289.2	-	11	0	2.20	24	278.0	6728	246	6974	0	0	3271	0	3271	10245	0.1186	2.00	20490	0.2372	3.00	Hydrant 90	?, ?, 121, 123, 124, 125, 126, 127, 128, 129 and 130 Broadway Ave.	1277-10
75	289.18	-	8	0	2.20	18	278.0	4893	179	5072	1	286	0	0	0	5358	0.0620	2.00	10716	0.1240	3.00	-	131, 132, 133, 134, 135, 136, 137 and 138 Broadway Ave. 1 commercial (12 Klondike St.)	1277-10
76	289.61	-	17	0	2.20	37	278.0	10397	381	10778	0	0	6542	0	6542	17320	0.2005	2.00	34640	0.4009	3.00	-	14, 16, 18, 20 and 22 Klondike St. 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19 and 20 Nyman Ave.	1277-5
77	289.18	-	1	0	2.20	2	278.0	612	22	634	3	645	0	0	0	1279	0.0148	2.00	2557	0.0296	3.00	-	? Broadway Ave. 1 commercial (storage garage)	1277-10
78	289.61	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 82	15, 7, 17 and 18 Queen St.	1277-4
79	289.64	-	24	0	2.20	53	278.0	14678	538	15216	0	0	6542	0	6542	21758	0.2518	2.00	43516	0.5037	3.00	Hydrant 83	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 Queen St.	1277-4
80	289.84	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	-	43 and 44 Queen St. 1, 3, 5, 7 and 10 Centennial Ave.	1277-4
81	289.00	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	Hydrant 81	19, 21 and 23 Winston Rd. 2 commercial (storage garages)	1277-1
82	289.48	-	11	4	2.20	33	278.0	9174	336	9510	2	18899	6542	0	6542	34950	0.4045	2.00	69901	0.8090	3.00	Hydrant 80	25, 27, 29, 33, 33A, 35A, 35B, 37, 39, 41 and 43 Winston Rd. 34 Winston Rd. trailer park (23 trailers from water meter data). 1 institutional (Ecole Publique L'Escalade). 1 multi-residential (31 Winston Rd. assume 4 units).	1277-1
83	289.57	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	-	45 Winston Rd. 11, 12, 13, 14, 15, 16 and 18 Centennial Ave.	1277-7
84	289.11	-	0	0	2.20	0	278.0	0	0	0	1	26	0	0	0	26	0.0003	2.00	52	0.0006	3.00	-	1 institutional (First United Church)	1277-60
85	288.98	-	10	0	2.20	22	278.0	6116	224	6340	0	0	0	0	0	6340	0.0734	2.00	12680	0.1468	3.00	Hydrant 7	1, 3, 4, 5, 6, 7, 8, 9, 10 and 12 George St.	1277-60
86	289.22	-	0	0	2.20	0	278.0	0	0	0	3	813	0	0	0	813	0.0094	2.00	1626	0.0188	3.00	Hydrant 92	1 commercial building (Circle K, Northern Credit Union, Empty Store)	1277-16
87	289.22	-	0	0	2.20	0	278.0	0	0	0	1	1021	0	0	0	1021	0.0118	2.00	2042	0.0236	3.00	-	1 commercial building (Pine Portage Lodge Office)	1277-16
88	289.28	-	0	12	2.20	26	278.0	7339	269	7608	1	1972	0	0	0	9580	0.1109	2.00	19161	0.2218	3.00	-	1 multi-residential (158 Mission Rd. assuming 12 units). 1 commercial building (Big Bird Inn)	1277-61
89	289.56	-	0	12	2.20	26	278.0	7339	269	7608	5	8357	0	0	0	15965	0.1848	2.00	31930	0.3696	3.00	Hydrant 138	1 apartment building (guessing 12 units). 4 commercial buildings (Independent, Subway, Movie Gallery, Viking Restaurant, Polish Alliance of Canada)	1277-61 & 1277-6
90	289.35	-	16	0	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant ?	60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76 and 78 Maggie Rd. 14 George St.	1277-16
91	289.21	-	2	0	2.20	4	278.0	1223	45	1268	1	12392	3271	0	3271	16930	0.1960	2.00	33861	0.3919	3.00	-	80 and 82 Maggie Rd. 1 institutional (Michipicoten High School)	1277-16
92	289.4	-	0	0	2.20	0	278.0	0	0	0	1	704	0	0	0	704	0.0081	2.00	1408	0.0163	3.00	Hydrant 93	1 institutional (St. Augustine School)	1277-66
93	289.35	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 7	1, 2, 3, 4, 5, 6, 7 and 8 Ross St.	1277-61
94	289.16	-	10	0	2.20	22	278.0	6116	224	6340	0	0	3271	0	3271	9611	0.1112	2.00	19222	0.2225	3.00	-	10, 11, 13, 14, 15, 17, 19 and 21 Ross St. 9 and 23 Arnott Ave.	1277-61
95	288.94	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	-	49 and 54 Maggie Rd.	1277-15
96	289.15	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 89	1 and 5 Nyman Ave.	1277-9
97	289.64	-	19	0	2.20	42	278.0	11620	426	12046	0	0	3271	0	3271	15317	0.1773	2.00	30634	0.3546	3.00	Hydrant 88	24, 26, 28, 30 and 32 Klondike St. 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and ? Wood Ave.	1277-6
98	289.94	-	11	0	2.20	24	278.0	6728	246	6974	0	6542	0	6542	0	13516	0.1564	2.00	27032	0.3129	3.00	-	34, ?, 36, 37, 38, 39, 40, 41, 42, 43 and 44 Klondike St.	1277-6
99	289.89	-	0	0	2.20	0	278.0	0	0	0	1	6113	0	0	0	6113	0.0707	2.00	12225	0.1415	3.00	-	1 commercial (Outdoorsman Motel)	1277-6
100	289.98	-	3	10	2.20	29	278.0	7951	291	8242	2	547	6542	0	6542	15331	0.1774	2.00	30661	0.3549	3.00	Hydrant 121	55, 56 and 57 Winston Rd. 2 multi-residential (58 Winston Rd. assume 6 units, 59 Winston Rd. assume 4 units). 1 institutional (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-3
101	290.92	-	0	4	2.20	9	278.0	2446	90	2536	2	5168	6542	0	6542	14245	0.1649	2.00	28491	0.3298	3.00	-	1 multi-residential (61 Winston Rd. assume 4 units). 2 commercial (Garage, Gator's Steakhouse, Beaver Motel).	1277-3
102	290.31	-	0	0	2.20	0	278.0	0	0	0	2	5502	3271	0	3271	8773	0.1015	2.00	17546	0.2031	3.00		2 commercial (Beer Store, Cannabis)	P2
103	289.45	-	0	0	2.20	0	278.0	0	0	0	2	9226	3271	0	3271	12496	0.1446	2.00	24993	0.2893	3.00	Hydrant 94	2 commercial (Algoma Motel, Bristol Motel)	1277-62
104	290.03	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	18, 17, 16, 15, 14, 13, 12 and 11 Arnott Ave.	1277-62
105	289.02	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	9, ?, 5, 3 and 1 Arnott Ave.	1277-62
106	289.58	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	-	4, 6 and 8 Darwin St.	1277-65
107	289.78	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	-	3, 5 and 7 Parkhill St. 126 Churchill Ave. 1 multi-residential (2 Grace St. assume 12 units).	1277-55
108	290.2	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 65	128, 130, 132 and 134 Churchill Ave. 1 multi-residential (10 Grace St. assume 12 units).	1277-55
109	290.49	-	3	0	2.20	7	278.0	1835	67	1902	2	4850	0	0	0	6752	0.0781	2.00	13503	0.1563	3.00	-	134, 136 and 138 Churchill Ave. 2 commercial (Kerry Funeral Home, Beaver Motel)	1277-55
110	289.65	-	9	0	2.20	20	278.0	5504	202	5706	0	0	3271	0	3271	8977	0.1039	2.00	17954	0.2078	3.00	Hydrant 66	124, 123, 122, 121, 120, 119, 118, 117 and 116 Churchill Ave.	1277-55
111	290.03	-	6	0	2.20	13	278.0	3670	134	3804	1	2320	0	0	0	6124	0.0709	2.00	12249	0.1418	3.00	Hydrant 137	114, 112, 110, 108, 106 and 104 Churchill Ave. 1 institutional (Ecole St. Joseph).	1277-56
112	289.79	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 120	100, 98, 96, 94, 92, 90 and 88 Churchill Ave.	1277-56
113	289.49	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 119	86, 84, 82, 80, 78, 76, 74, 72, 70 and 76 Churchill Ave. 113, 111 and 107 Maggie Rd.	1277-57
114	289.44	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 61	No demand	1602-7
115	290.02	-	22	0	2.20	48	278.0	13455	493	13948	0	0	16354	0	16354	30303	0.3507	2.00	60605	0.7014	3.00	Hydrant 125	?, 125, ?, 123, 122, 121, 119, 117 and 115 Regina Cres. 16, 14, 13, 12, ?, 10, ?, 8, 6, ?, 4, ?, 2 Birch St.	1602-4
116	289.64	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant ?	127, 133, 135, 137, 139 and 145 Regina Cres.	1951-8
117	289.71	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	Hydrant ?	147, 148, 152, 153, 155, 156 and 160 Regina Cres.	1951-8
118	289.57	-	6	0	2.20	13	278.0	3670	134	3804	0	0	6542	0	6542	10346	0.1197	2.00	20692	0.2395	3.00	Hydrant 54	162, 166, 170 and 172 Regina Cres. 42 and 40 Tamarack Ave.	1951-8
119	289.73	287.9	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	-	44, 46 and 48 Tamarack Ave.	1951-3
120	289.75	-	4	0	2.20	9	278.0	2446	90	2536	1	594	0	0	0	3130	0.0362	2.00	6261	0.0725	3.00	Hydrant 7	7, 6, 8, and 10 Maple St. 1 institutional (Confederation College Building)	1951-6
121	290.24	-	13	0	2.20	29	278.0	7951	291	8242	0	0	0	0	0	8242	0.0954	2.00	16484	0.1908	3.00	Hydrant 56	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 Maple St.	1951-6
122	290.14	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	25, 26, 27 and 28 Maple St.	1951-6
123	289.88	288.05	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	29 and 30 Maple St.	1951-3
124	291.35	289.15	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	No demand	1951-5
125	291.08	288.88	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 60	40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30 and 29 Birch St.	1951-5
126	290.52	-	13	0	2.20	29	278.0	7951	291	8242	0	0	3271	0	3271	11513	0.1333	2.00	23026	0.2665	3.00	Hydrant 55	28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17 and 15 Birch St.	1602-6
127	290.49	288.29	12	0	2.20	26	278.0	7339	269	7608	0	0	29438	0	29438	37046	0.4288	2.00	74092	0.8575	3.00	Hydrant 53	113, 111, 109, 107, 105 and 104 Regina Cres. 10, 8, 7, 6, 5 and 3 Poplar St.	1602-4
128	291.82	289.68	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	142 and 141 Superior Ave.	1951-2
129	292.01	289.81	8	0	2.20	18	278.0	4893	179	5072	0	0	0	156100	156100	161172	1.8654	2.00	322344	3.7308	3.00	Hydrant 50	140, 139, 138, 137, 136, 135, 134 and 133 Superior Ave.	1951-2
130	291.18	288.98	16	0	2.20	35	278.0	9786	359	10144	0	0	13083	0	13083	23228	0.2688	2.00	46455	0.5377	3.00	Hydrant 51	132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118 and 117 Superior Ave.	1602-2
131	290.68	288.48	14	0	2.20	31	278.0	8562	314	8876	0	0	32709	0	32709	41585	0.4813	2.00	83170	0.9626	3.00	Hydrant 52	116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104 and 103 Superior Ave.	1602-2
132	290.58	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	Hydrant 71	103, 102 and 101 Regina Cres. 1, 2, 3 and 4 Spruce St.	1602-4
133	290.84	-	18	0	2.20	40	278.0	11009	403	11412	0	0	3271	0	3271	14683	0.1699	2.00	29366	0.3399	3.00	Hydrant 72	7, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 13A, 13B, 15A and 15B Spruce St. 102, 100, 2, 4 and 6 Superior Ave.	1602-2
134	290.49	-	27	0	2.20	59	278.0	16513	605	17118	0	0	0	0	0	17118	0.1981	2.00	34236	0.3963	3.00	Hydrant 69	7A, 7B, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22 Superior Ave. 15, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 27 Regina Cres.	1277-69
135	290.22	-	12	0	2.20	26	278.0	7339	269	7608	0	0	13083	0	13083	20692	0.2395	2.00	41383	0.4790	3.00	Hydrant 70	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 Regina Cres.	1277-71
136	290.50	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 68	24, 26, ?, 28, 30, 32, 34 and 36 Superior Ave.	1277-68
137	289.10	-	7	0	2.20	15	278.0	4281	157	4438	1	103	3271	0	3271	7812	0.0904	2.00	15623	0.1808	3.00	Hydrant 67	38, 40, 42, 44, 46, 48 and 50 Superior Ave. 1 institutional (Lion's Club)	1277-68
138	289.79	-	2	0	2.20	4	278.0	1223	45	1268	2	58569	0	0	0	59837	0.6926	2.00	119673	1.3851	3.00	Hydrant 73	?, ? Superior Ave. 1 institutional (Michipicoten Memorial Community Centre). 1 commercial (Wawa Motor Inn)	1277-67
139	290.47	-	0	0	2.20	0	278.0	0	0	0	3	1194	6542	0	6542	7736	0.0895	2.00	15472	0.1791	3.00	Hydrant 85	3 commercial (Petro Canada, Northern Chiropractic Clinic, Krazy Fries)	B41
140	288.65	-	0	0	2.20	0	278.0	0	0	0	1	171	0	0	0	171	0.0020	2.00	342	0.0040	3.00	Hydrant 134	1 institutional (Small station)	B41
141	288.00	-	0	0	2.20	0	278.0	0	0	0	3	3072	6542	0	6542	9614	0.1113	2.00	19228	0.2225	3.00	Hydrant 84	3 commercial (Home Building Center Garage, Home Building Centre, Young's General Store)	P1
142	286.50	-	0	0	2.20	0	278.0	0	0	0	5	8997	3271	156100	159371	168368	1.9487	2.00	336736	3.8974	3.00	Hydrant 135	4 commercial (Canco Wawa, Wesdome Gold Mines, Garages, Tim Hortons). I institutional (Lagoon Building).	P2
143	286.28	-	0	0	2.20	0	278.0	0	0	0	7	12319	9813	0	9813	22132	0.2562	2.00	44263	0.5123	3.00	Hydrant 77	1 commercial (Mission Motors). 5 institutional (Service Ontario, Ontario Ministry of Natural Resources, Government Storage Garages x7, Wawa Municipal Airport, Tourist Information Centre)	3675-3
144	284.75	282.59	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 1	120 Pinewood Dr.	3675-5
145	284.57	282.45	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 2	No demand	3675-5

EPANet Future Residential 2 Only Model Inputs

146	284.03	281.81	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 3	No demand	3675-6	
147	283.90	281.47	0	0	2.20	0	278.0	0	0	0	1	1291	0	0	0	1291	0.0149	2.00	2583	0.0299	3.00	-	1 commercial (Trans Canada Chrysler)	3675-6	
148	283.20	281.08	0	0	2.20	0	278.0	0	0	0	2	1888	0	0	0	1888	0.0219	2.00	3776	0.0437	3.00	Hydrant 4	2 commercial (Fountain Tire, Family Kitchen Restaurant Building)	3675-6	
149	282.89	280.68	0	0	2.20	0	278.0	0	0	0	2	3696	0	0	0	3696	0.0428	2.00	7393	0.0856	3.00	Hydrant 5	2 commercial (Esso Gas Station, Davidson Fuels)	3675-7	
150	282.05	279.37	0	0	2.20	0	278.0	0	0	0	3	10584	0	0	0	10584	0.1225	2.00	21168	0.2450	3.00	Hydrant 6	2 commercial (Highway 17 Motel, Gardewine). 1 institutional (OPP)	3675-7	
151	284.40	-	0	0	2.20	0	278.0	0	0	0	2	441	0	0	0	441	0.0051	2.00	882	0.0102	3.00	Hydrant 10	2 commercial (Superior Truck Repair Centre, Lakehead Freightway/Manitoulin Transport)	C05	
152	282.95	-	0	0	2.20	0	278.0	0	0	0	1	356	0	0	0	356	0.0041	2.00	712	0.0082	3.00	Hydrant 11	1 commercial (U-Haul Dealer)	C04	
153	282.15	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 12	No demand	C04	
154	281.85	-	0	0	2.20	0	278.0	0	0	0	1	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 9	1 commercial (Martel Customs)	C04	
155	280.60	-	0	0	2.20	0	278.0	0	0	0	1	484	0	0	0	484	0.0056	2.00	967	0.0112	3.00	Hydrant 8	1 commercial (building with red roof)	C03	
156	281.85	-	0	0	2.20	0	278.0	0	0	0	4	52214	0	0	0	52214	0.6043	2.00	104428	1.2087	3.00	Hydrant 7	4 commercial (building with red roof, building on cul-de-sac, Northstar Fusion, Evolugen)	C03	
157	281.5	-	0	0	2.20	0	278.0	0	0	0	1	11	0	0	0	11	0.0001	2.00	22	0.0003	3.00	Hydrant 34	1 commercial (Algoma Storage)	-	Don't know real elevation
158	280.3	277.8	0	0	2.20	0	278.0	0	0	0	1	458	0	0	0	458	0.0053	2.00	917	0.0106	3.00	Hydrant 33	1 industrial (Algoma Highlands Wild Blueberry Farm)	A1-2002-62-P5	
159A	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
159	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
160A	248.5	245.9	1	0	2.20	2	278.0	612	22	634	2	1952	0	0	0	2586	0.0299	2.00	5172	0.0599	3.00	PRV Chamber	1 house by storage area. 2 commercial (Jones Power Sports, High Falls Motel & Cabins)	A1-2002-62-P2	
160B	248.5	245.9	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P2	
160	205.1	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	MRV Water Tower	No demand	1443-A-7	
161	205.1	202.6	0	0	2.20	0	278.0	0	0	0	1	6300	0	0	0	6300	0.0729	2.00	12600	0.1458	3.00	MRV Water Tower	Water Tower and Pumping Station	1443-A-7	
162	205.4	202.9	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 18	?, ? Hardy Ave.	1443-A-7	
163	205.1	202.5	10	0	2.20	22	278.0	6116	224	6340	1	481	0	0	0	6821	0.0789	2.00	13642	0.1579	3.00	Hydrant 17	?, ?, ?, ?, ?, ?, ?, ? 315, and 317 Hardy Ave. 1 commercial (Your Room is Ready!)	1443-A-7	
164	205.9	203.4	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	309, 308, 307 and ? Queen St.	1443-A-6	
165	206.6	204.1	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 15	303, 302 and 301 Queen St. ? Blue Ave.	1443-A-6	
166	206.5	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 13	?, ?, ?, ? and ? Blue Cres.	-	Don't know real elevation
167	206	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 14	?, ? Blue Cres. ? Blue Ave.	-	Don't know real elevation
168	204.9	202.3	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	Hydrant 7	318, ?, ?, 313, 312 and 310 Blue Ave.	1443-A-13	
169	206.7	204.2	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	Hydrant 16	303 and ? Aberdeen St.	1443-A-12	
170	197.0	194.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 19	No demand	1443-A-5	
171	200.0	197.3	6	0	2.20	13	278.0	3670	134	3804	1	32	3271	0	3271	7107	0.0823	2.00	14213	0.1645	3.00	Hydrant 79	?, ?, ?, ?, ? and 308 Magpie Ave. 1 institutional (Wood Land Masonic Lodge)	1443-A-11	
172	193.0	190.3	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	No demand	1443-A-5	
173	190.0	187.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 20	No demand	1443-A-5	
174	190.7	188.1	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 23	339 Queen St. 312 and 311 Brock Ave.	1443-A-4	
175	191.1	188.1	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 24	?, ?, ?, 306, ?, 303 and 335 Brock Ave. 1 institutional (Angel's Equestrian Centre).	1443-A-4	
176	189.0	186.4	0	0	2.20	0	278.0	0	0	0	3	3213	0	156100	156100	159313	1.8439	2.00	318625	3.6878	3.00	Hydrant 25	2 commercial (shed on Superior St., Buck's Marina) 1 institutional (small building on Superior St.)	1443-A-3	
177	192.7	190.2	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 28	?, ? Superior St, ?, ? and ? Michipicoten Ave.	1443-A-8	
178	191.9	189.3	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 7	?, ?, ?, ? and ? Michipicoten Ave.	1443-A-9	
179	192.1	189.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	6340	0.0734	3.00	-	? Superior St. ?, ?, and ? Wawa St	1443-A-8	
180	189.9	187.4	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	1268	0.0147	3.00	Hydrant 21	?, ? and ? Wawa St.	1443-A-10	
181	190.1	187.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	3804	0.0440	3.00	Hydrant 26	? Superior St.	1443-A-8	
182	194.5	192.0	2	0	2.20	4	278.0	1223	45	1268	0	0	6542	0	6542	7810	0.0904	2.00	3804	0.0440	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
183	292.97	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	1268	0.0147	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
16 (New)	294.2	-	4	0	2.00	8	278.0	2224	-	2224	0	0	0	0	0	2224	0.0257	2.00	4448	0.0515	3.00	Hydrant 75	3 new residences on Government Rd. 1 new residence on Tamarack Ave.	1277-54, A1-9422-P2	
29 (New)	293.53	-	0	10	2.00	20	278.0	5560	-	5560	0	0	0	0	0	5560	0.0644	2.00	1268	0.0147	3.00	Hydrant 7	1 new apartment building with 10 units	1277-59	
116 (New)	289.64	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 7	2 new residences on Regina Cres.	1951-8	
117 (New)	289.71	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 7	7 new residences on Regina Cres.	1951-8	
118 (New)	289.57	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 54	8 new residences on Regina Cres.	1951-8	
119 (New)	289.73	287.9	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	8 new residences on Maple St.	1951-3	
123 (New)	289.88	288.05	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	6 new residences on Birch St.	1951-3	
183 (New)	292.97	-	20	0	2.00	40	278.0	11120	-	11120	0	0	0	0	0	11120	0.1287	2.00	22240	0.2574	3.00	Hydrant 27	16 new residences on Tamarack Ave.	1443-A-8	
184	294.30	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	-	
185	292.94	-	7	0	2.00	14	278.0	3892	-	3892	0	0	0	0	0	3892	0.0450	2.00	7784	0.0901	3.00	-	4 new residences on new road	-	
186	293.18	-	30	0	2.00	60	278.0	16680	-	16680	0	0	0	0	0	16680	0.1931	2.00	33360	0.3861	3.00	-	18 new residences on new road	-	
187	293.60	-	17	0	2.00	34	278.0	9452	-	9452	0	0	0	0	0	9452	0.1094	2.00	18904	0.2188	3.00	-	10 new residences on new road	-	
188	293.39	-	12	0	2.00	24	278.0	6672	-	6672	0	0	0	0	0	6672	0.0772	2.00	13344	0.1544	3.00	-	7 new residences on new cul-de-sac	-	
TOTAL			1193	229		3108		864135	29624	893759	178	453716	1020511	780499	1801010	3148485	36.44								
					MRV Population	156					In-town	370316													

			Pipe Input for Length	*Pipe Input for Diameter*		*Pipe Input for Roughness Coef.*			
Pipe	**Starting Junction**	**Ending Junction**	**Length**	**Diameter**	**Material**	**HW Roughness Coefficient**	**Object**	**Notes**	**Reference Drawing**
1A	J1A	J1	38.19	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
1	J1	J2	75.15	150	Unknown	140	Pipe 136		WAT_Watermain_Table
2	J2	J3	68.1	150	Unknown	140	Pipe 798	art of watermain from 1st Ave. t	F22019_WaterMap_NorthSat
3	J3	J4	101.75	150	Unknown	140	Pipe 798	art of watermain from A St. to de	WAT_Watermain_Table
4	J1A	J5	66.61	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3
5	J5	J6	112.2	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameter of 250mm, GIS not clear	F22019_WaterMap_NorthSat
6	J6	J7	9.6	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameterf of 250mm, GIS not clear	F22019_WaterMap_NorthSat
7	J5	J8	74.1	200	Unknown	140	South of Pipe 909	rom McKinley Ave. to Hydrant 13	F22019_WaterMap_NorthSat
8	J8	J9	109.73	200	Unknown	140	Pipe 909		WAT_Watermain_Table
9	J9	J10	138.7	150	Unknown	140	Pipes 889 and 890	Pipe 889 and part of 890	F22019_WaterMap_NorthSat
10	J10	J11	148.9	150	Unknown	140	Pipes 890 and 361	Part of pipes 890 and 361	F22019_WaterMap_NorthSat
11	J11	J12	151.6	150	Unknown	140	Pipe 361	Part of pipe 361, possibly 356	F22019_WaterMap_NorthSat
12	J12	J13	73.4	150	Unknown	140	Pipe 356		F22019_WaterMap_NorthSat
13	J13	J14	140.3	150	Unknown	140	Pipe 356 and 125	Part of 356, pipe 125	F22019_WaterMap_NorthSat
14	J14	J15	152.5	150	Unknown	140	Pipe 355 and 336	Pipe 355 and part of 336	F22019_WaterMap_NorthSat
15	J15	J16	516.8	150	Unknown	140	Pipe 338 and 336	Pipe 338 and part of 336	F22019_WaterMap_NorthSat
16	J16	J17	187.63	150	Unknown	140	Pipe 339 and 329	Length for pipe 339 and 329	WAT_Watermain_Table
17	J17	J18	179.7	150	Unknown	140	Pipe 326 and 319	Pipe 326 and part of 319	F22019_WaterMap_NorthSat
18	J9	J19	91.1	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
19	J19	J20	121.16	150	Unknown	140	Pipe 864		WAT_Watermain_Table
20	J19	J21	81.5	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
21	J21	J22	110.2	150	Unknown	140	-	No pipe number on map, diameter from as-built drawing	F22019_WaterMap_NorthSat
22	J21	J23	80.5	200	Unknown	140	Pipe 849	Pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat
23	J23	J24	139.76	150	Unknown	140	Pipe 843		WAT_Watermain_Table
24	J23	J25	81.5	200	Unknown	140	Pipe 787		WAT_Watermain_Table
25	J25	J26	100	150	Unknown	140	Pipe 777		WAT_Watermain_Table
26	J25	J27	96.3	200	Unknown	140	ame same pipe properties as pipe		F22019_WaterMap_NorthSat
27	J27	J28	37.18	150	Unknown	140	Pipe 756		WAT_Watermain_Table
28	J28	J29	105.27	150	Unknown	140	Pipe 763		WAT_Watermain_Table
29	J28	J30	111.1	150	Unknown	140	-	e same pipe properties as pipes i	F22019_WaterMap_NorthSat
30	J30	J31	104.03	150	Unknown	140	Pipe 676		WAT_Watermain_Table
31	J31	J32	196.9	150	Unknown	140	Pipes 679 and 680		F22019_WaterMap_NorthSat
32	J1	J33	136.6	150	Unknown	140	Pipe 831		F22019_WaterMap_NorthSat
33	J33	J34	71.87	150	Unknown	140	Pipe 835		WAT_Watermain_Table
34	J34	J35	43.43	150	Unknown	140	Pipe 837		WAT_Watermain_Table
35	J35	J36	125.73	150	Unknown	140	Pipe 836		WAT_Watermain_Table
36	J2	J37	148.1	150	Unknown	140	-	ame same properties and nearby p	F22019_WaterMap_NorthSat
37	J37	J38	139.7	150	Unknown	140	Pipe 814		F22019_WaterMap_NorthSat
38	J3	J39	32.6	150	Unknown	140	Pipe 795	Part of pipe 795	F22019_WaterMap_NorthSat
39	J39	J40	131.83	150	Unknown	140	Pipe 799		WAT_Watermain_Table
40	J40	J41	94.49	150	Unknown	140	Pipe 800		WAT_Watermain_Table
41	J41	J42	78.3	100	Unknown	140	Pipe 137	Pipe 137 plus smaller pipes	F22019_WaterMap_NorthSat
42	J42	J43	103.5	150	Unknown	140	-	Unknown pipes and diameter	F22019_WaterMap_NorthSat
43	J43	J44	87.64	150	Unknown	140	Pipe 769		WAT_Watermain_Table
44	J39	J45	75.64	150	Unknown	140	Pipe 795		WAT_Watermain_Table
45	J25	J45	192.7	150	Unknown	140	Pipe 767	Pipe 767 plus other pipe(s)	F22019_WaterMap_NorthSat
46	J45	J44	109	150	Unknown	140	Pipe 772	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
47	J44	J46	172	150	Unknown	140	Pipe 686	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat
48	J27	J47	65.7	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
49	J47	J48	102.7	150	Unknown	140	Pipe 695 and 699	Parts of pipe 695 and 699	F22019_WaterMap_NorthSat
50	J48	J46	96	150	Unknown	140	-	Unknown pipes, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
51	J46	J32	106.6	150	Unknown	140	Pipe 34	Pipe 34 plus other pipe(s)	F22019_WaterMap_NorthSat
52	J32	J49	21	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
53	J46	J50	103.4	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat

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54	J5	J51	72	200	Unknown	140	Pipe 893	Pipe 893 plus other pipe(s)	F22019_WaterMap_NorthSat
55	J51	J52	133.35	200	Unknown	140	Pipe 912		WAT_Watermain_Table
56	J52	J53	101	200	Unknown	140	Pipe 731		WAT_Watermain_Table
57	J53	J54	82.6	200	Unknown	140	-	Assuming same diameter as pipe 731	F22019_WaterMap_NorthSat
58	J6	J55	97.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
59	J55	J56	103.7	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
60	J52	J56	111.1	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
61	J7	J57	190.86	300	Unknown	140	Pipe 744		WAT_Watermain_Table
62	J52	J34	104.8	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
63	J57	J56	8.5	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
64	J56	J58	95.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
65	J57	J59	95.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
66	J58	J59	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
67	J59	J60	102.87	150	Galvanized Steel	120	Pipe 711		WAT_Watermain_Table
68	J58	J61	97.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
69	J61	J54	118.95	150	Unknown	140	Pipe 713		WAT_Watermain_Table
70	J59	J62	97.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
71	J61	J62	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
72	J62	J63	18	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
73	J63	J64	107	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
74	J63	J65	129.6	150	Unknown	140	Pipe 663	Pipe 663 plus other pipes	F22019_WaterMap_NorthSat
75	J65	J66	192.4	150	Unknown	140	Pipe 669	Pipe 669 plus other pipes	F22019_WaterMap_NorthSat
76	J66	J67	123.86	150	Unknown	140	Pipe 637		WAT_Watermain_Table
77	J67	J64	94.54	150	Unknown	140	Pipe 636		WAT_Watermain_Table
78	J64	J68	87.9	150	Unknown	140	Pipe 626	Pipe 626 plus other pipes	F22019_WaterMap_NorthSat
79	J68	J69	157.7	150	Unknown	140	Pipe 607	Pipe 607 plus other pipes	F22019_WaterMap_NorthSat
80	J69	J70	157.5	150	Unknown	140	Pipe 641	Pipe 641 plus other pipes	F22019_WaterMap_NorthSat
81	J68	J71	194.7	150	Unknown	140	Pipe 610	Pipe 610 plus other pipes	F22019_WaterMap_NorthSat
82	J54	J72	155.11	200	Asbestos Cement	140	Pipes 651 and 612	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
83	J72	J73	55.63	150	Unknown	140	Pipe 613		WAT_Watermain_Table
84	J73	J68	102.7	150	Unknown	140	Pipe 581	Pipe 581 plus other pipes	F22019_WaterMap_NorthSat
85	J73	J74	115.06	150	Unknown	140	Pipe 598		WAT_Watermain_Table
86	J74	J75	80.77	150	Unknown	140	Pipe 595		WAT_Watermain_Table
87	J71	J75	103.23	150	Unknown	140	Pipe 603		F22019_WaterMap_NorthSat
88	J75	J76	84.7	150	Unknown	140	-	Unknown pipe, nearby pipes and as-builts show diameter of 150 mm	F22019_WaterMap_NorthSat
89	J75	J77	96.2	150	Unknown	140	Pipe 554		WAT_Watermain_Table
90	J77	J78	56.6	150	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
91	J78	J79	232.98	150	Asbestos Cement	140	Pipe 570		WAT_Watermain_Table
92	J79	J80	56.1	150	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
93	J77	J81	163.41	150	Asbestos Cement	140	Pipe 134		WAT_Watermain_Table
94	J81	J82	178.69	150	Asbestos Cement	140	Pipe 563		WAT_Watermain_Table
95	J82	J83	48.7	150	Asbestos Cement	140	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
96	J54	J84	160.9	200	Asbestos Cement	140	Pipe 541	Pipe 541 plus other pipes	F22019_WaterMap_NorthSat
97	J84	J85	55.86	200	Asbestos Cement	140	Pipe 542	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
98	J84	J86	88.03	200	Asbestos Cement	140	Pipe 547		WAT_Watermain_Table
99	J84	J87	106.4	150	Asbestos Cement	140	-	ssume same properties as pipe 11	F22019_WaterMap_NorthSat
100	J86	J87	14.4	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
101	J87	J88	91.81	150	Asbestos Cement	140	Pipe 112		WAT_Watermain_Table
102	J88	J89	72.73	200	PVC	150	Pipe 941		WAT_Watermain_Table
103	J86	J90	210.34	200	Asbestos Cement	140	Pipe 535		WAT_Watermain_Table
104	J90	J91	41.91	200	Asbestos Cement	140	Pipe 533		WAT_Watermain_Table
105	J91	J92	88.39	150	Asbestos Cement	140	Pipe 498		WAT_Watermain_Table
106	J88	J93	132.00	150	Asbestos Cement	140	Pipe 520	Pipe 520 plus other pipes	F22019_WaterMap_NorthSat
107	J93	J94	127.25	150	Asbestos Cement	140	Pipe 524		WAT_Watermain_Table
108	J87	J95	79.3	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
109	J95	J73	90.0	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
110	J95	J96	43.4	150	Unknown	140	Pipe 577	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
111	J96	J76	141.91	150	Unknown	140	Pipe 594		WAT_Watermain_Table
112	J76	J97	94.2	150	Unknown	140	Pipe 583	Pipe 583 plus other pipes	F22019_WaterMap_NorthSat
113	J96	J97	189.8	150	Unknown	140	Pipe 577	Pipe 577 plus other pipes	F22019_WaterMap_NorthSat
114	J97	J98	159.9	150	Unknown	140	Pipe 589	Pipe 589 plus other pipes	F22019_WaterMap_NorthSat
115	J98	J99	68.82	150	PVC	150	Pipe 559		WAT_Watermain_Table
116	J98	J80	98.4	150	Asbestos Cement	140	Pipe 552	Pipe 552 plus other pipes	F22019_WaterMap_NorthSat
117	J80	J83	94.38	150	Asbestos Cement	140	Pipe 104		WAT_Watermain_Table
118	J83	J100	121.5	150	Asbestos Cement	140	Pipe 518	Part of pipe 518 and other pipes	F22019_WaterMap_NorthSat
119	J100	J101	99.6	150	Asbestos Cement	140	Pipe 518	Part of pipe 518	F22019_WaterMap_NorthSat
120	J99	J102	134.56	150	PVC	150	Pipe 661		WAT_Watermain_Table
121	J102	J101	67.06	150	PVC	150	Pipe 656		WAT_Watermain_Table
122	J99	J103	56.5	150	PVC	150	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
123	J103	J104	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
124	J104	J105	94.2	150	Asbestos Cement	140	-	ssume same properties as pipe 65	F22019_WaterMap_NorthSat
125	J104	J106	105.32	50	PVC	150	Pipe 103		WAT_Watermain_Table
126	J103	J107	147.26	150	Asbestos Cement	140	Pipe 653		WAT_Watermain_Table
127	J107	J108	75.1	150	Unknown	140	Pipe 513	Part of pipe 513	F22019_WaterMap_NorthSat
128	J108	J109	69.9	150	Unknown	140	Pipe 513	Part of pipe 513 and other pipes	F22019_WaterMap_NorthSat
129	J109	J101	46.5	150	Unknown	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
130	J107	J110	95.55	150	Unknown	140	Pipe 503		WAT_Watermain_Table
131	J110	J111	130.2	150	Unknown	140	Pipe 506	Pipe 506 plus other pipes	F22019_WaterMap_NorthSat
132	J111	J112	131.3	150	Unknown	140	Pipe 488	Part of pipe 488	F22019_WaterMap_NorthSat
133	J112	J113	178.9	150	Unknown	140	Pipe 488	Part of pipe 488 and other pipes	F22019_WaterMap_NorthSat
134	J113	J50	47.71	150	Unknown	140	Pipe 33		WAT_Watermain_Table
135	J50	J114	109.0	150	Asbestos Cement	140	Pipe 491	Pipe 491 plus other pipes	F22019_WaterMap_NorthSat
136	J114	J115	140.8	150	Asbestos Cement	140	Pipe 402	Pipe 402 plus other pipes	F22019_WaterMap_NorthSat
137	J114	J116	159.6	200	PVC	150	Pipe 24	Pipe 24 plus other pipes	F22019_WaterMap_NorthSat
138	J116	J117	143.1	200	PVC	150	Pipes 27 and 393	Pipes 27 and 392 plus other pipes	F22019_WaterMap_NorthSat
139	J117	J118	140.23	200	PVC	150	Pipe 385		WAT_Watermain_Table
140	J118	J119	71.63	150	PVC	150	Pipe 384		WAT_Watermain_Table
141	J114	J120	92.0	150	Asbestos Cement	140	Pipe 26	Pipe 26 plus other pipes	F22019_WaterMap_NorthSat
142	J120	J121	144.2	150	Asbestos Cement	140	Pipes 369 and 25	Pipes 369 and 25 plus other pipes	F22019_WaterMap_NorthSat
143	J121	J122	49.9	150	Asbestos Cement	140	Pipe 379		WAT_Watermain_Table
144	J122	J119	96.0	150	PVC	150	Pipe 23		WAT_Watermain_Table
145	J119	J123	106.0	150	PVC	150	Pipe 15		F22019_WaterMap_NorthSat
146	J123	J124	41.15	150	PVC	150	Pipe 19		WAT_Watermain_Table
147	J124	J125	137.16	150	Asbestos Cement	140	Pipe 28		WAT_Watermain_Table
148	J125	J126	137.16	150	Asbestos Cement	140	Pipes 29 and 410	As-built length for pipe 410	WAT_Watermain_Table
149	J126	J115	160.0	150	Asbestos Cement	140	Pipe 408	Pipe 408 plus other pipes	F22019_WaterMap_NorthSat
150	J115	J127	111.56	150	Asbestos Cement	140	Pipe 435		WAT_Watermain_Table
151	J123	J128	126.8	150	PVC	150	Pipes 11, 8, 4 and 6		F22019_WaterMap_NorthSat
152	J128	J129	85.3	150	Asbestos Cement	140	Pipe 425	Part of pipe 425	F22019_WaterMap_NorthSat
153	J129	J130	149.7	150	Asbestos Cement	140	Pipes 423 and 418	Part of pipes 423 and 418	F22019_WaterMap_NorthSat
154	J130	J131	170.4	150	Asbestos Cement	140	Pipe 422	Pipe 422 plus other pipes	F22019_WaterMap_NorthSat
155	J131	J127	119.8	50	Asbestos Cement	140	Pipe 434	Pipe 434 plus other pipes, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
156	J127	J132	100.0	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
157	J111	J132	93.87	150	Asbestos Cement	140	Pipe 484		WAT_Watermain_Table
158	J132	J133	106.9	150	Asbestos Cement	140	Pipe 450	Pipe 450 plus other pipes	F22019_WaterMap_NorthSat
159	J131	J133	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
160	J133	J134	173.6	150	Asbestos Cement	140	Pipe 457	Pipe 457 plus other pipes	F22019_WaterMap_NorthSat
161	J132	J135	188.4	150	Asbestos Cement	140	Pipe 469	Pipe 469 plus other pipes	F22019_WaterMap_NorthSat
162	J135	J134	130.9	150	Asbestos Cement	140	Pipe 465	Pipe 465 plus other pipes	F22019_WaterMap_NorthSat
163	J134	J136	141.1	150	Asbestos Cement	140	Pipe 458		WAT_Watermain_Table
164	J136	J137	158.5	150	Asbestos Cement	140	Pipe 477		WAT_Watermain_Table
165	J137	J138	227.9	150	Asbestos Cement	140	Pipes 474 and 37		WAT_Watermain_Table
166	J138	J109	262.3	150	Asbestos Cement	140	Pipes 151 and 277	Pipes 151 and 277 plus other pipes	F22019_WaterMap_NorthSat

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167	J101	J139	187.4	250	PVC	150	Pipe 551	Pipe 551 plus other pipes	F22019_WaterMap_NorthSat	
168	J139	J140	140.13	250	PVC	150	Pipes 309 and 310		WAT_Watermain_Table	
169	J140	J141	143.46	250	PVC	150	Pipe 930		WAT_Watermain_Table	
170	J141	J142	569.8	250	PVC	150	Numerous	Assuming as-builts are correct, GIS shows some pipes as 37 mm	F22019_WaterMap_NorthSa t F22019_WaterMap_Mid	
171	J142	J143	612.3	250	PVC	150	Pipes 330, 335 and 41	es 330, 335 and 41 plus other pi	F22019_WaterMap_Mid	
172	J143	J144	745.0	250	PVC	150	Pipes 145, 146, 147, 44 and 46		WAT_Watermain_Table	
173	J144	J145	172.3	250	PVC	150	Pipe 55	Pipe 55 plus other pipes	F22019_WaterMap_Mid	
174	J145	J146	206.0	250	PVC	150	Pipe 58		WAT_Watermain_Table	
175	J146	J147	75.4	250	PVC	150	-	ssume same properties as pipe 5	F22019_WaterMap_Mid	
176	J147	J148	103.0	250	PVC	150	Pipe 68		WAT_Watermain_Table	
177	J148	J149	150.0	250	PVC	150	Pipe 71		WAT_Watermain_Table	
178	J149	J150	222.0	250	PVC	150	Pipe 75	Pipe 75 plus other pipes	F22019_WaterMap_Mid	
179	J147	J151	123.73	150	PVC	150	Pipe 66		WAT_Watermain_Table	
180	J151	J152	158.6	150	PVC	150	Pipes 96 and 99		WAT_Watermain_Table	
181	J152	J153	137.00	150	PVC	150	Pipe 93		WAT_Watermain_Table	
182	J153	J154	91.5	150	PVC	150	Pipe 100		WAT_Watermain_Table	
183	J154	J155	93.25	150	PVC	150	Pipe 84		WAT_Watermain_Table	
184	J155	J156	129.0	150	PVC	150	Pipes 88 and 87		WAT_Watermain_Table	
185	J156	J150	103.0	150	PVC	150	Pipe 83		WAT_Watermain_Table	
186	J150	J157	161.1	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
187	J157	J158	185.0	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid	
188	J158	J159A	466.8	150	PVC	150	Pipe 279	Pipe 279 plus other pipes	F22019_WaterMap_South	
189	J159	J160A	1933.9	150	CU	135	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300 plus other pipes	F22019_WaterMap_South	Assuming CU is copper
189A	J160B	J160	929.5	150	CU	135	Pipes 301, 302, 315 and 313	Pipes 301, 302, 315 and 313 plus other pipes	F22019_WaterMap_South	
190	J161	J162	101.6	200	PVC	150	Pipe 196	Pipe 196 plus other pipes	F22019_WaterMap_South	
191	J162	J163	149.2	200	PVC	150	Pipe 312	Pipe 312 plus other pipes	F22019_WaterMap_South	
192	J163	J164	87.8	150	PVC	150	Pipe 199	Pipe 199 plus other pipes	F22019_WaterMap_South	
193	J164	J165	75.1	150	PVC	150	Pipe 197	Pipe 197 plus other pipes	F22019_WaterMap_South	
194	J164	J166	136.0	150	PVC	150	Pipe 153		WAT_Watermain_Table	
195	J166	J167	177.0	150	PVC	150	Pipe 156		F22019_WaterMap_South	
196	J167	J165	141.39	150	PVC	150	Pipes 165 and 166		WAT_Watermain_Table	
197	J165	J168	207.4	150	PVC	150	Pipes 311 and 175	Pipes 311 and 175 plus other pipe	F22019_WaterMap_South	
198	J168	J169	167.6	150	PVC	150	Pipes 177 and 178	Pipes 177 and 178 plus other pipe	F22019_WaterMap_South	
199	J169	J163	183.1	150	PVC	150	Pipe 182	Pipe 182 plus other pipes	F22019_WaterMap_South	
200	J163	J170	166.5	200	PVC	150	Pipe 255	Pipe 255 plus other pipes	F22019_WaterMap_South	
201	J170	J171	233.5	150	PVC	150	Pipes 275 and 276	Pipes 275 and 276 plus other pipe	F22019_WaterMap_South	
202	J170	J172	122.8	200	PVC	150	Pipe 263	Pipe 263 plus other pipes	F22019_WaterMap_South	
203	J172	J173	81.3	200	PVC	150	Pipe 267	Pipe 267 plus other pipes	F22019_WaterMap_South	
204	J173	J174	128.8	200	PVC	150	Pipe 273	Pipe 273 plus other pipes	F22019_WaterMap_South	
205	J174	J175	178.9	200	PVC	150	Pipe 216	Pipe 216 plus other pipes	F22019_WaterMap_South	
206	J175	J176	88.8	200	PVC	150	Pipe 222	Pipe 222 plus other pipes	F22019_WaterMap_South	
207	J175	J177	89.4	150	PVC	150	Pipe 235	Pipe 235 plus other pipes	F22019_WaterMap_South	
208	J173	J178	102.50	150	PVC	150	Pipe 207		WAT_Watermain_Table	
209	J178	J177	68.68	150	PVC	150	Pipe 210		WAT_Watermain_Table	
210	J177	J179	96.0	150	PVC	150	Pipe 242	Part of pipe 242 and other pipes	F22019_WaterMap_South	
211	J172	J180	59.5	150	PVC	150	-	ssume same properties as pipe 20	F22019_WaterMap_South	
212	J180	J179	116.3	150	PVC	150	Pipe 205		F22019_WaterMap_South	
213	J179	J181	72.78	150	PVC	150	Pipe 242		WAT_Watermain_Table	
214	J181	J182	148.8	150	PVC	150	Pipe 246	Pipe 235 plus other pipes	F22019_WaterMap_South	
215	J118	J183	235	150	PVC	150	-	sting watermain plus part of WM	Google Earth estimate	
216	J183	J16	85	150	PVC	150	-	Part of WM extension	Google Earth estimate	
217	J49	J184	152.5	150	PVC	150	-	New WM	Zoning map estimate	
218	J184	J185	73.5	150	PVC	150	-	New WM	Zoning map estimate	
219	J185	J186	281.2	150	PVC	150	-	New WM	Zoning map estimate	
220	J184	J187	203.4	150	PVC	150	-	New WM	Zoning map estimate	
221	J187	J188	98.2	150	PVC	150	-	New WM	Zoning map estimate	
222	J185	J188	206.4	150	PVC	150	-	New WM	Zoning map estimate	
223	J188	J186	102.1	150	PVC	150	-	New WM	Zoning map estimate	
224	J186	J183	103.8	150	PVC	150	-	New WM	Zoning map estimate	

Yellow cells are assumed values

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

						Water Model Calculations				Flow Meter Data			
Water Model Node	**ICI Uses**	**Address**	**Type**	**Footprint (m2)**	**Footprint (ha)**	**Estimated Occupancy**	**Units**	**Flow Rate**	**ADD (L/day)**	**Average (L/day)**	**ADD (L/day)**	**Design ADD (L/day)**	**Notes**
J1A	Water Treatment Plant	40C Broadway Ae.	Industrial	1828	0.1828	-	m3/ha/d	45	8226			8226	
	LCBO		Commercial										
	Algoma Public Health	16 Ganley St.	Commercial - Office							4067	4881	4881	
J5	Home Town Wines		Commercial - Personal Service Shop	1262	0.1262	11	L/p/d	278.0	3017				
	Superior East Community Futures Development Corporation		Commercial - Office										
	Algoma District Services Administration Board	52 Broadway Ave.	Commercial - Office							0	0	0	
	North Algoma Literacy Colaition	50B Broadway Ave.	Commercial - Office							231	277	277	
J6	Garage Behind Bowling Alley	Ganley St.	Storage Garage	137	0.0137	3	L/p/d	75	223			223	
J7	Low Lift Pumping Station	-	Industrial	616	0.0616	-	m3/ha/d	45	2772			2772	
	The Thrift Barn	45 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	635	762	762	
	Square Three	43 Broadway Ave.	Commercial	494	0.0494	4	L/p/d	278.0	1181	60	72	72	
	The Brick	41 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	28	33	33	
	Sonia Video	39 Broadway Ave.	Commercial	497	0.0497	4	L/p/d	278.0	1189			1189	
	The Co-operators	37 Broadway Ave.	Commercial - Office	536	0.0536	5	L/p/d	278.0	1281	3068	3681	3681	
J8	Alzheimers Society		Commercial - Office										
	Canada Post Office	44 Broadway Ave.	Commercial	971	0.0971	8	L/p/d	278.0	2321	441	529	529	
	OPP Station	42 Broadway Ave.	Commercial - Office										
	Municipal Offices	40 Broadway Ave.	Commercial - Office	1389	0.1389	12	L/p/d	278.0	3321	2036	2443	2443	
	Public Library	40 Broadway Ave.	Commercial										
	Wawa Volunteer Fire Department	12 Ontario St.	Storage Garage	480	0.0480	10	L/p/d	75	783			783	
	March of Dimes Canada	31 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	757	908	908	
	Northern Vision Care	29 Broadway Ave.	Commercial - Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	600	720	720	
	Lai's Restaurant	27 Broadway Ave.	Commercial - Dining	460	0.046	4	L/p/d	278.0	1100	4066	4879	4879	
J9	Empty Building	25 Broadway Ave.	Storage	426	0.0426	9	L/p/d	75	695			695	
	SpikeMills Art Gallery	28 Broadway Ave.	Commercial	227	0.0227	2	L/p/d	278.0	543				
	Lakeview Hotel - Hotel Rooms	28 Broadway Ave.	Hotel	-	-	31	L/bed-space-day	225	6975	10459	12550	12550	7 one bed rooms, 7 double bed rooms, 5 apartment rooms (assuming 2 beds)
	Lakeview Hotel - Motel Rooms	28 Broadway Ave.	Motel	-	-	22	L/bed-space-day	175	3850				11 motel rooms (assuming 2 beds)
	Lakeview Restaurant	28 Broadway Ave.	Commercial - Dining	173	0.0173	1	L/p/d	278.0	414				Assuming second floor of part of the building
	Iris Place	21 Broadway Ave.	Commercial	552	0.0552	5	L/p/d	278.0	1320			1320	
	Empty Building	16 Broadway Ave.	Storage	150	0.015	3	L/p/d	75	245			245	
J10	Beachfront Trading Post	14 Broadway Ave.	Commercial	464	0.0464	4	L/p/d	278.0	1109	18032	21638	21638	
	Canadian Red Cross	4 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	67	81	81	
	Public Washrooms	15 Broadway Ave.	Commercial	897	0.0897	8	L/p/d	278.0	24937	267	321	321	
	Garage	2 Broadway Ave.	Storage Garage	193	0.0193	4	L/p/d	75	315	563	676	676	
J11	Calvary Penecostal Church	12 Government Rd.	Commercial - Fixed Seats	1410	0.141	31	L/p/d	278.0	8521	412	495	495	Included as commercial, measured with google earth as house on same lot
	Lady Dunn Health Centre	17 Government Rd.	Hospital	-	-	28	L/(bed-day)	1350	37800	24275	29130	29130	10 acute care beds, 2 respite beds, and 16 long term care beds
J13	Garage	17 Government Rd.	Storage Garage	202	0.0202	4	L/p/d	75	329	3	4	4	Assume this is the small meter for 17 Government Rd.
	Algoma District Paramedic Service	Government Rd.	Commercial Office	364	0.0364	3	L/p/d	278.0	871			871	
J17	Leverington's Garden Centre	130 Government Rd.	Industrial - Process Room	3923	0.3923	-	m3/ha/d	45	17654	351	422	422	Residential in water meter data
J18	Lloyd's of Wawa	165 Government Rd.	Storage Garage	477	0.0477	10	L/p/d	75	778	17	20	20	
	Wagging Tails Kennel	171 Government Rd.	Commercial	296	0.0296	3	L/p/d	278.0	708	677	813	813	
	Everything Floors Ltd.	9 Mackey St.	Commercial	575	0.0575	5	L/p/d	278.0	1375	950	1140	1140	
J19	Wawa Handy Store	19 Mackey St.	Commercial	456	0.0456	4	L/p/d	278.0	1090	9194	11033	11033	
	Empty Building	Mackey St.	Storage Garage	660	0.066	14	L/p/d	75	1076			1076	
J20	United Supply/Swish	4 McKinley Ave.	Commercial	688	0.0688	6	L/p/d	278.0	1645	155	186	186	
	Superior North Mobile Vetrinary Service	23 Mackey St.	Commerial - Personal Service Shop	464	0.0464	4	L/p/d	278.0	1110			1110	
J21	A Touch of Glass	25 Mackey St.	Commercial - Personal Service Shop	235	0.0235	2	L/p/d	278.0	562			562	
	Sir James Dunn Public School	36 McKinley Ave.	School	-	-	87	L/student/d	105	9135	8595	10314	10314	87 students and 21 staff
J24	Children's Aid Society of Algoma	31 Algoma St.	Commercial - Office	147	0.0147	1	L/p/d	278.0	351	135	162	162	
J25	Bell	56 Ganley St.	Commercial	930	0.093	8	L/p/d	278.0	2223	9	10	10	
	Wawa Laundromat	44 Mackey St.	Commercial	465	0.0465	4	L/p/d	278.0	1112	1907	2289	2289	
J30	Old Garage	62 Mackey St.	Storage Garage	230	0.0230	5	L/p/d	75	375			375	
J31	Superior Children's Centre	41 Algoma St.	Daycare	665	0.0665	6	L/p/d	278.0	1590	759	910	910	Assumed like commercial; Included as residential in water meter data
J34	Paint + Glass	Caverhill St.	Storage	275	0.0275	6	L/p/d	75	448			448	
	Creation Hairstyling	75A McKinley Ave.	Commercial-Personal Service Shop	232	0.0232	2	L/p/d	278.0	555	601	721	721	Assumed half of lot
J35	Home	75 McKinley Ave.	Commercial	232	0.0232	2	L/p/d	278.0	555	332	398	398	Assumed half of lot
J36	Sam's Place	84 McKinley Ave.	Commercial-Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	652	783	783	
J41	St. Paul's Anglican Church	60 Second Ave.	Commercial - Fixed Seats	930	0.0930	8	L/p/d	278.0	2223	148	178	178	
J49	Michipicoten Non-Profit Housing	40 Hillcrest Ave.	Commercial - Office	293	0.0293	3	L/p/d	278.0	701	994	1193	1193	Included as multi-residential in water meter data
	Canadian Tire	54 Broadway Ave.	Commercial	2524	0.2524	22	L/p/d	278.0	6034	6145	7374	7374	
	Dawson & Keenan	56 Broadway Ave.	Commercial - Office	465	0.0465	4	L/p/d	278.0	1112	8864	10637	10637	
J51	Roxy Bowling Centre	49 Broadway Ave.	Commercial	632	0.0632	5	L/p/d	278.0	1511	811	973	973	
	The Royal Canadian Legion	51 Broadway Ave.	Commercial	567	0.0567	5	L/p/d	278.0	1356	9272	11127	11127	Included as residential in water meter data
	Sam's Foodline	55 Broadway Ave.	Commercial	1990	0.1990	17	L/p/d	278.0	4757			4757	
	Allemano & Fitzgerald	55 Broadway Ave.	Commercial - Office	301	0.0301	3	L/p/d	278.0	719			719	
	Feifel, Broadbent and Gualazzi	57 Broadway Ave.	Commercial - Office	277	0.0277	2	L/p/d	278.0	662	1	1	1	
	Wawa Jewellers	59 Broadway Ave.	Commercial	376	0.0376	3	L/p/d	278.0	899	111	134	134	
	The Bargain! Shop	60 Broadway Ave.	Commercial	930	0.093	8	L/p/d	278.0	2223	242	290	290	
	AJ's Pizza & Wholesale	64 Broadway Ave.	Commercial - Kitchen	475	0.0475	4	L/p/d	278.0	1136	322	386	386	
	Best Start Hub	66 Broadway Ave.	Daycare	383	0.0383	3	L/p/d	278.0	916	673	807	807	Assumed like commercial; Included as residential in water meter data

EPANet Future Residential 2 Only Model Inputs

	North of 17 Restaurant	68 Broadway Ave.	Commercial - Dining	753	0.0753	6	L/p/d	278.0	1800	4002	4803	4803	
	Embassy Restaurant	70 Broadway Ave.	Commercial - Dining	486	0.0486	4	L/p/d	278.0	1162	1798	2158	2158	
	RBC Royal Bank	72 Broadway Ave.	Commercial - Personal Service Shop	480	0.048	4	L/p/d	278.0	1148	595	714	714	
J52	Wawa Dental Centre	27A Gold St.	Commercial - Personal Service Shop	1007	0.1007	9	L/p/d	278.0	2408	1982	2378	2378	
	Wawa Pharmacy		Commercial										
	Wawa Goose Senior Centre	63 Broadway Ave.	Commercial	460	0.0460	4	L/p/d	278.0	1100	676	812	812	
	Barber Shop		Commercial - Personal Service Shop										
	U Wanna Cab	65 Broadway Ave.	Commercial - Office	457	0.0457	4	L/p/d	278.0	1093	429	514	514	
	Regional Employment Help Centre		Commercial - Office										
	Chic'N Swell	67 Broadway Ave.	Commercial - Personal Service Shop	462	0.0462	4	L/p/d	278.0	1105	383	459	459	
	Guided Fishing Trips		Commercial - Office										
	Columbia Restaurant & Pizzeria	71 Broadway Ave.	Commercial - Dining	462	0.0462	4	L/p/d	278.0	1105	3642	4370	4370	
	Parish of St. Monica	78 Broadway Ave.	Commercial - Fixed Seats	1859	0.1859	16	L/p/d	278.0	4444	259	311	311	2 water meters for this address, assume both are for the Church
	The Algoma News Review	33 St. Marie St.	Commercial	833	0.0833	7	L/p/d	278.0	1992	478	573	573	
	ANP Office Supply		Commercial										
J53	Fenlon's Pharmacy	88 Broadway Ave.	Commercial	1298	0.1298	11	L/p/d	278.0	3103	1468	1761	1761	
	Northern	Broadway Ave.	Commercial	1407	0.1407	12	L/p/d	278.0	3363			3363	
	Yellow Building	Broadway Ave.	Storage	132	0.0132	3	L/p/d	75	215			215	
	Algoma Family Services	26 St. Marie St.	Commercial - Office	833	0.0833	7	L/p/d	278.0	1992	1835	2201	2201	2 water meters for this address
	Bangin Burger N Chicken Shack	92 Broadway Ave.	Commercial - Kitchen	465	0.0465	4	L/p/d	278.0	1112	182	219	219	
J54	Economic Development Corporation of Wawa	96 Broadway Ave.	Commercial - Office	930	0.0930	8	L/p/d	278.0	2223	3168	3801	3801	Assume 50% of building
	JJAM FM		Commercial - Office										Assume 50% of building
	Ontario Mine Rescue Algoma District Station	36 Montreal Ave.	Commercial - Office	1463	0.1463	13	L/p/d	278.0	3498	0	0	0	
J69	Garage	42 Montreal Ave.	Storage Garage	504	0.0504	11	L/p/d	75	822	40	49	49	Assuming this is 42, although streetview shows 40 and no 42
	Municipality of Wawa Infrastructure Services Department	26 Magpie Rd.	Commercial - Office	3503	0.3503	30	L/p/d	278.0	8375	1842	2211	2211	2 water meters for this address, assume both are for this building
	The Shop	46 Montreal Ave.	Commercial	1227	0.1227	11	L/p/d	278.0	2934	977	1172	1172	
J71	Millette General Contractors Ltd.	Montreal Ave.	Commercial	1040	0.1040	9	L/p/d	278.0	2487			2487	
	The Ship Boy Scouts Wawa Rotary Club	Montreal Ave.	Commercial - Office	55	0.0055	0	L/p/d	278.0	133			133	
J75	Home	12 Klondike St.	Commercial	138	0.0138	1	L/p/d	278.0	330	238	286	286	
	Garage		Storage Garage	289	0.0289	6	L/p/d	75	471				
J77	Garage	142 Broadway Ave.	Storage Garage	361	0.0361	8	L/p/d	75	589	537	645	645	
	Garage		Storage Garage	182	0.0182	4	L/p/d	75	297				
J82	Mobile Home Park	Trailer Park Rd.	Mobile Home Park	-	-	23	L/space/d	1000	23000	15505	18606	18606	
	Ecole Publique L'Escalade	52 Winston Rd.	School	-	-	10	L/student/d	105	1050	244	293	293	10 students and 5 staff
J84	First United Church	224 Mission Rd.	Commercial - Fixed Seats	2189	0.2189	19	L/p/d	278.0	5233	22	26	26	
	Circle K	208D Mission Rd.	Commercial							463	555	555	
J86	Northern Credit Union	208 Mission Rd.	Commercial - Personal Service Shop	2031	0.2031	17	L/p/d	278.0	4856	126	151	151	
	Empty Store	208 Mission Rd.	Commercial							89	107	107	
J87	Watson's Algoma Vacations Ltd.	195 Mission Rd.	Office	1041	0.1041	9	L/p/d	278.0	2489	851	1021	1021	
J88	Big Bird Inn	191 Mission Rd.	Hotel	-	-	90	L/bed-space-day	225	20250	1643	1972	1972	50 rooms, 40 double beds and 10 single beds
	Independent Grocery Store	186 Mission Rd.	Commercial	3291	0.3291	28	L/p/d	278.0	7868	1034	1240	1240	
	Subway	179 Mission Rd.	Commercial - Dining	2139	0.2139	18	L/p/d	278.0	5114	2980	3576	3576	
J89	Movie Gallery		Commercial										
	The Viking Restaurant	177 Mission Rd.	Commercial - Dining	1818	0.1818	16	L/p/d	278.0	4346	233	280	280	
	Polish Alliance of Canada	Mission Rd.	Commercial - Non-Fixed Seats and Tables	1364	0.13641583	12	L/p/d	278.0	3261			3261	
J91	Michipicoten High School	86 Magpie Rd.	School	-	-	100	L/student/d	105	10500	10326	12392	12392	120 people, guessing around 100 are students; 2 water meters for this address
J92	St. Augustine	2 Arnott Ave.	School	-	-	100	L/student/d	105	10500	587	704	704	Similar to Michipicoten High School
J99	Outdoorsman Motel	171 Mission Rd.	Motel	-	-	55	L/bed-space-day	175	9625	5094	6113	6113	37 rooms and 55 beds
J100	Kingdom Hall of Jehovah's Witness	54 Winston Rd.	Commercial - Fixed Seats	929	0.0929	8	L/p/d	278.0	2221	151	181	181	
	Wawa Rent-all and Repair	58 Winston Rd.	Commercial	1465	0.1465	13	L/p/d	278.0	3503	305	366	366	
J101	Garage	60 Winston Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331			331	
	Gator's Steakhouse Building	47 Mission Rd.	Commercial - Office	2023	0.2023	17	L/p/d	278.0	4837			4837	
J102	T Cannabis	152 Mission Rd.	Commercial	1302	0.1302	11	L/p/d	278.0	3113	1410	1692	1692	
	Beer Store	156 Mission Rd.	Commercial	1990	0.199	17	L/p/d	278.0	4758	3176	3811	3811	
J103	Algoma Motel	164 Mission Rd.	Motel	-	-	26	L/bed-space-day	175	4550	3124	3748	3748	https://www.algomamotel.com/#gallery (705-856-7010)
	Bristol Motel	170 Mission Rd.	Motel	-	-	32	L/bed-space-day	175	5600	4564	5477	5477	Can't get working phone number or email
J109	Kerry Funeral Home	140 Churchill Ave.	Commercial - Fixed Seats	651	0.0651	6	L/p/d	278.0	1556	925	1110	1110	
	Beaver Motel	148 Mission Rd.	Motel	-	-	25	L/bed-space-day	175	4375	3116	3740	3740	6 double rooms and 13 single rooms
J111	Ecole St. Joseph	101 Churchill Ave.	School	-	-	205	L/student/d	105	21525	1934	2320	2320	205 students and 32 staff
J120	Confederation College Building	3 Maple St.	Storage	964	0.0964	21	L/p/d	75	1572	495	594	594	2 water meters for this address
J137	Lion's Club	51 Superior Ave.	Commercial - Non-Fixed Seats and Tables	236	0.0236	2	L/p/d	278.0	564	85	103	103	Included as residential in water meter data
	Michipicoten Memorial Community Centre	3 Chris Simon Dr.	Space with Fixed Seats	5838	0.5838	50	L/p/d	278.0	13957	6454	7744	7744	
J138	Wawa Motor Inn	118 Mission Rd.	Motel	-	-	175	L/bed-space-day	175	30625	40407	48488	48488	Assumed higher flow rate for motel
	Wawa Motor Inn - Wawa Goose Bar & Grill	118 Mission Rd.	Commercial - Dining	615	0.0615	5	L/p/d	278.0	1470	1947	2336	2336	Assumed lower flow rate for restaurant
	Petro Canada	137 Mission Rd.	Commercial	2151	0.2151	18	L/p/d	278.0	5143	781	937	937	
J139	Northern Chiropractic	135 Mission Rd.	Commercial - Personal Service Shop	135	0.0135	1	L/p/d	278.0	323	142	170	170	
	Krazy Fries	135B Mission Rd.	Commercial - Kitchen	71	0.0071	1	L/p/d	278.0	170	73	88	88	
J140	Small Station	Mission Rd.	Industrial	38	0.0038	-	m3/ha/d	45	171			171	
	Home Building Centre Garage	109 Mission Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331				
J141	Home Building Centre		Commercial	885	0.0885	8	L/p/d	278.0	2116	98	118	118	
	Young's General Store	111 Mission Rd.	Commercial	2021	0.2021	17	L/p/d	278.0	4832	2462	2954	2954	
	Lagoon Building	Road to Golf Course	Industial	201	0.0201	-	m3/ha/d	45	905			905	A tap is used here to flush the line according to Municipality.
	Canco	125 Mission Rd.	Commercial	2083	0.2083	18	L/p/d	278.0	4980	1621	1946	1946	Think this address is Canco from online search although it doesn't match up with map
J142	Wesdome	93 Mission Rd.	Industrial	373	0.0373	-	m3/ha/d	45	1679	464	557	557	

EPANet Future Residential 2 Only Model Inputs

	Garages	89 Mission Rd.	Storage Garage	515	0.0515	11	L/p/d	75	840	151	181	181	
	Tim Hortons	92 Mission Rd.	Commercial - Dining	7977	0.7977	69	L/p/d	278.0	19071	4507	5409	5409	
	Mission Motors	61 Mission Rd.	Commercial	715	0.0715	6	L/p/d	278.0	1709	1425	1710	1710	
	Service Ontario	48 Mission Rd.	Commercial - Personal Service Shop	1204	0.1204	10	L/p/d	278.0	2879	947	1137	1137	Assume first 48 Mission road is Service Ontario
	Ontario Ministry of Natural Resources	48 Mission Rd.	Commercial - Office	394	0.0394	3	L/p/d	278.0	942	8	9	9	Assume second 48 Mission Road is OMNR
	Government Storage Garages (x7)	48 Mission Rd.	Storage Garage	2321	0.2321	50	L/p/d	75	3784	5911	7093	7093	Assume third 48 Mission Road is for other buildings
J143	Storage Sheds on Highway 17 W	Highway 17 W	Storage Garage	2506	0.2506	54	L/p/d	75	4086	792	950	950	Only facility on highway 17 that looks like it could have an in-town service connection
	Wawa Municipal Airport	27A Mission Rd.	Commercial	224	0.0224	2	L/p/d	278.0	536	577	692	692	Assume 27A is for the main building; has three water meters
		27B Mission Rd.	Storage Garage	192	0.0192	4	L/p/d	75	313	105	126	126	Assume 27B is for the garage and hanger
			Aircraft Hanger	555	0.0555	12	L/p/d	75	905				Assume 27B is for the garage and hanger
	Tourist Information Centre	Mission Rd.	Shopping Centre	334	0.0334	3	L/p/d	278.0	799	501	602	602	Added three meters on Mission roads without addresses here as it is furthest distance.
J147	Trans Canada Chrysler	74 Pinewood Dr.	Commercial	875	0.0875	8	L/p/d	278.0	2092	1076	1291	1291	
J148	Fountain Tire	70 Pinewood Dr.	Commercial	2708	0.2708	23	L/p/d	278.0	6474	1045	1254	1254	
	Family Kitchen Restaurant Building	Pinewood Dr.	Storage	389	0.0389	8	L/p/d	75	634			634	
J149	Esso Gas Station	54 Pinewood Dr.	Commercial	234	0.0234	2	L/p/d	278.0	559	354	425	425	Assume one of 54 Pinewood Dr. Buildings
	Davidson Fuels	54 Pinewood Dr.	Commercial	393	0.0393	3	L/p/d	278.0	940	2726	3272	3272	Assume one of 54 Pinewood Dr. Buildings
	Highway 17 Hotel	42 Pinewood Dr.	Hotel	-	-	76	L/bed-space-day	225	17100	8422	10106	10106	46 rooms and 76 beds
J150	OPP Station	34 Pinewood Dr.	Commerial - Office	674	0.0674	6	L/p/d	278.0	1611	327	392	392	
	Gardewine	100 Mills Dr.	Storage Garage	735	0.0735	16	L/p/d	75	1198	71	85	85	
J151	Superior Truck Repair Centre	167 Mills Dr.	Storage Garage	967	0.0967	21	L/p/d	75	1577	323	388	388	Assume one of 167 Mills Dr. Buildings
	Lakehead Freightway/Manitoulin Transport	167 Mills Dr.	Storage Garage	409	0.0409	9	L/p/d	75	667	44	53	53	Assume one of 167 Mills Dr. Buildings
J152	U-Haul Dealer	160 Mills Dr.	Commercial	496	0.0496	4	L/p/d	278.0	1186	297	356	356	Assuming U-Haul Dealer is the northeast building on Mills Dr., lot estimated with google ea
J154	Martel Customs	128 Mills Dr.	Industrial	83	0.0083	-	m3/ha/d	45	374	0	0	0	Assuming this is the small building on south side of Mills Dr.
J155	Red Roof Building	120 Mills Dr.	Storage Garage	377	0.0377	8	L/p/d	75	615	403	484	484	
	Red Roof Building #2	Mills Dr.	Storage Garage	488	0.0488	11	L/p/d	75	796			796	
J156	Building on cul-de-sac	White Dr.	Storage Garage	283	0.0283	6	L/p/d	75	461			461	Can't see on GIS imagery, looks about 3/4 the size of the smaller red roof building
	Northstar Fusion	16 White Dr.	Industrial	10500	1.0500	-	m3/ha/d	45	47250			47250	Measured with google earth, size of facility not sure if it is all building
	Evolugen	105 Mills Dr.	Industrial	835	0.0835	-	m3/ha/d	45	3758	3089	3707	3707	
J157	Algoma Storage	30 Pinewood Dr.	Storage	1086	0.1086	24	L/p/d	75	1771	9	11	11	
J158	Algoma Highlands Wild Blueberry Farm	1 Pinewood Dr.	Industrial - Process Room	3506	0.3506	-	m3/ha/d	45	15777	382	458	458	
J160A	Jones Power Sports	320 Highway 17	Commercial	362	0.0362	3	L/p/d	278.0	865	521	625	625	
	High Falls Motel & Cabins	280 Highway 17	Motel	-	-	18	L/bed-space-day	175	3150	1106	1327	1327	Two water meters for this address; info@highfallsmotelandcabins.com
J161	Water Tower and Pumping Station	Princess Ave.	Industrial	1400	0.14	-	m3/ha/d	45	6300			6300	Measured with google earth
J163	Your Room is Ready!	323 Hardy Ave.	Hotel	-	-	4	L/bed-space-day	225	900	401	481	481	https://yourroomisready.business.site/?utm_source=gmb&utm_medium=referral
J171	Wood Land Masonic Lodge	308 Magpie Rd.	Commercial - Fixed Seats	75	0.0075	1	L/p/d	278.0	179	27	32	32	Measured with google earth
	Shed on Superior St.	Superior St.	Storage Garage	86	0.0086	2	L/p/d	75	140			140	
J176	Buck's Marina	360 Superior St.	Commercial	348	0.0348	3	L/p/d	278.0	832			832	Measured with google earth
			Storage Garage	546	0.0546	12	L/p/d	75	890			890	
	Small Building on Superior St.	Superior St.	Industrial	300	0.03	-	m3/ha/d	45	1350			1350	Measured with google earth
				Total	626829					294992	353990	453716	
										In-town		329244	370316

*Footprints highlighted orange use building size instead of lot size

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Reserviors

Name	Elevation (m)	Notes	Source
Res1	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38
Res2	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38

Nodes

Name	Elevation (m)	Source
S1	294.3	2531A38
S2	294.3	2531A38
S3	294.3	2531A38
S4	294.3	2531A38
D1	294.3	2531A38
D2	294.3	2531A38
D3	294.3	2531A38
D4	294.3	2531A38
D5	294.3	2531A38

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PS1	RES1	S1	5	200	Stainless Steel	140
PS2	RES1	S2	5	250	Stainless Steel	140
PS3	RES2	S3	5	200	Stainless Steel	140
PS4	RES2	S4	5	250	Stainless Steel	140
PD1	D1	D5	5	200	Stainless Steel	140
PD2	D2	D5	5	250	Stainless Steel	140
PD3	D3	D5	5	200	Stainless Steel	140
PD4	D4	D5	5	250	Stainless Steel	140
PD5	D5	J1A	10	400	Stainless Steel	140

Pumps

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario 3	
Tag #	Name	Start	End	Curve	Status	Curve	Status	Curve	Status	Curve	Status	Curve	Status
HLP-6201	PUMP1	S1	D1	CURVE4	Open	CURVE4	Open	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6301	PUMP2	S2	D2	CURVE2	Closed	CURVE2	Closed	CURVE2	Open	CURVE2	Open	CURVE2	Open
HLP-6501	PUMP3	S3	D3	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed	CURVE1	Closed
HLP-6601	PUMP4	S4	D4	CURVE5	Closed	CURVE5	Open	CURVE2	Open	CURVE2	Open	CURVE2	Open

Curves
CURVE1

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6201/6501	1185	0	225	0	68.58
		200	212	12.62	64.62
		400	204	25.24	62.18

EPANet Future Residential 2 Only Model Inputs

		600	196	37.85	59.74
		800	189	50.47	57.61
		1000	178	63.09	54.25
		1200	164	75.71	49.99
		1400	144	88.33	43.89
		1600	119	100.94	36.27

CURVE2

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6301/6601	1185	0	250	0	76.20
		200	240	12.62	73.15
		400	228	25.24	69.49
		600	216	37.85	65.84
		800	206	50.47	62.79
		1000	198	63.09	60.35
		1200	190	75.71	57.91
		1400	180	88.33	54.86
		1600	171	100.94	52.12
		1800	160	113.56	48.77
		2000	143	126.18	43.59
		2200	118	138.80	35.97

$$\frac{Q1}{Q2} = \frac{RPM1}{RPM2}$$

$$\frac{H1}{H2} = \frac{RPM1^2}{RPM2^2}$$

$$\frac{P1}{P2} = \frac{RPM1^3}{RPM2^3}$$

-law-for-centrifugal-pump-pump-affinity-laws/

CURVE4

Pump	RPM	Flow (LPS)	Head (m)
HLP-6201	1125	0.00	61.81
		11.98	58.24
		23.96	56.04
		35.94	53.84
		47.92	51.92
		59.90	48.90
		71.87	45.05
		83.85	39.56
		95.83	32.69

CURVE5

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1075	0	62.71
		11.45	60.20
		22.89	57.19
		34.34	54.18
		45.79	51.67
		57.23	49.67
		68.68	47.66
		80.13	45.15
		91.57	42.89
		103.02	40.13
		114.47	35.87
		125.91	29.60

EPANet Future Residential 2 Only Model Inputs

CURVE6

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1125	0.00	68.68
		11.98	65.93
		23.96	62.64
		35.94	59.34
		47.92	56.59
		59.90	54.39
		71.87	52.20
		83.85	49.45
		95.83	46.98
		107.81	43.95
		119.79	39.28
		131.77	32.42

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Valves

Name	Start	End	Diameter (mm)	Type	Setting (m)	Drawing
VALVE1	J159A	J159	150	PRV	18.5975	A1-2002-62-P5
VALVE2	J160A	J160B	150	PRV	11.4650	A1-2002-62-P2

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Nodes

Name	Elevation (m)	Source
FS	290.6	Between nodes J101 and J139
FD	290.6	Between nodes J101 and J139

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PFS	J101	FS	150	250	Stainless Steel	140
PFD	FD	J139	37.4	250	Stainless Steel	140

Pump

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario3	
Name	**Start**	**End**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**
PUMP5	FS	FD	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Open

Curves

Name	Flow (LPS)	Head (m)
CURVE3	47.9	21.9

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PWT1	JFS	TANK1	4	50	Stainless Steel	140
PWT2	TANK1	J161	4	200	Stainless Steel	140

Tank

Name	Elevation	Initial Level	Minimum Level (m)	Maximum Level (m)	Diameter (m)	
TANK1	205.1	41.5	40	61	4.1203	*Municipality said normal levels are between 40 and 43m

Node

Name	Elevation (m)
FS	205.1

FV

Diameter	Setting	Status	
50	10	None	*Can be none or closed, will impact flow rate
			**If status is open then no flow restriction will occur

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Nodes

Name	Elevation (m)	Scenario 1 Flow (L/s)	Scenario 2 Flow (L/s)	Scenario 3 Flow (L/s)
JFF1	293.02	38	0	0
JFF2	289.57	38	0	0
JFF3	293.32	26.81	26.81	0
JFF4	289.4	0	38	32.41
JFF5	288.4	0	38	32.41
JFF6	280.6	0	0	38
JFF7	194.5	0	0	38
JFF8	293.76	38	0	0
JFF9	291.23	0	38	0
		140.81	140.81	140.81

Pipes

Name	Start	End	Length (m)	Diameter (mm)	HW Roughness Coefficient
PIPEFF1	J18	JFF1	1	1000	200
PIPEFF2	J118	JFF2	1	1000	200
PIPEFF3	J53	JFF3	1	1000	200
PIPEFF4	J92	JFF4	1	1000	200
PIPEFF5	J70	JFF5	1	1000	200
PIPEFF6	J155	JFF6	1	1000	200
PIPEFF7	J169	JFF7	1	1000	200
PIPEFF8	J31	JFF8	1	1000	200
PIPEFF9	J60	JFF9	1	1000	200

EPANet Future Residential 2 Only Model Inputs

Wawa W&WW Master Plan
M22019
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Chlorine Sources

Node	Concentration (mg/L)
RES1	0.86
RES2	0.86
TANK1	0.86

Decay Coefficient

Global Bulk Coefficient	-0.5

EPANet Future Residential plus Industrial Model Inputs

Wawa W&WW Master Plan
M22019
P. King

Existing EPA Net Model Basis
Existing Housing Density: 2.20

Future Serviced Population (2032): 3,215
Future Serviced Homes: 1422

Junction	*Junction Input for Elevation* Surface Elevation (m)	Invert Elevation (m)	Residential Homes (With Demand from this Junction)	Multi-Residential Units (With Demand from this Junction)	Housing Density	Population (With Demand From this Junction)	Per Capita Demand (L/cap/d)	Residential Demand - Houses (L/d)	Residential Demand - Extra (L/d)	Residential Demand - Total (L/d)	Non-Residential Buildings (With Demand from this Junction)	Non-Residential Demand (L/d)	Bypasses (L/d)	Watermain Purging (L/d)	Total Unaccounted for Water Demand (L/d)	Total ADD Junction Demand (L/d)	*Junction Input for Base Demand* Total ADD Junction Demand (L/s)	Max Day Factor	Total MDD Junction Demand (L/d)	Total MDD Junction Demand (L/s)	Peak Hour Factor	Object	Buildings	Reference Drawing
1A	293.2	290.6	0	0	2.20	0	278.0	0	0	0	1	8226	0	0	0	8226	0.0952	2.00	16452	0.1904	3.00	-	Water Treatment Plant	2531-A-3
1	293.24	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant	No demand	1277-29
2	293.21	-	3	0	2.20	7	278.0	1835	67	1902	0	0	6542	0	6542	8444	0.0977	2.00	16888	0.1955	3.00	Hydrant 126	24, 26 and 28 Ganley St.	1277-29
3	293.18	-	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	34 and 38 Ganley St.	1277-30
4	293.12	-	5	0	2.20	11	278.0	3058	112	3170	0	0	3271	0	3271	6441	0.0745	2.00	12882	0.1491	3.00	-	44, 46, 48, 50 and 52 Ganley St.	1277-30
5	292.57	-	0	0	2.20	0	278.0	0	0	0	6	5158	0	0	0	5158	0.0597	2.00	10317	0.1194	3.00	-	Commercial building with LCBO	1277-30
6	291.09	-	8	0	2.20	18	278.0	4893	179	5072	1	223	3271	0	3271	8566	0.0991	2.00	17133	0.1983	3.00	Hydrant 102	7, 7 and 2 Ganley St., 28, 30 and 32 Toronto Ave., 26 and 26A Ontario St. 1 commercial (Garage behind bowling alley)	1277-29
7	290.96	-	0	0	2.20	0	278.0	0	0	0	1	2772	0	0	0	2772	0.0321	2.00	5544	0.0642	3.00	-	Low Lift Pumping Station	1277-29
8	293.35	-	0	0	2.20	0	278.0	0	0	0	11	9494	6542	0	6542	16036	0.1856	2.00	32071	0.3712	3.00	Hydrant 133	5 commercial buildings on east side of Broadway Ave. 3 Institutional buildings (Post office, municipal building) on west side of Broadway Ave. 1 institutional building on Ontario St. (Firehall).	1277-32
9	293.66	-	4	0	2.20	9	278.0	2446	90	2536	7	19752	9813	0	9813	32101	0.3715	2.00	64201	0.7431	3.00	Hydrant 130	13 Ontario St. 31 McKinley Ave. 18 and 22 Wawa St. Lakeview hotel and 4 commercial buildings on east side of Broadway Ave.	1277-33
10	292.73	-	1	0	2.20	2	278.0	612	22	634	5	23604	6542	0	6542	30779	0.3562	2.00	61559	0.7125	3.00	Hydrant 131	7 Broadway Ave. 4 commercial (Iris Place, Empty Building Trading Post, Canadian Red Cross), 1 institutional (public washrooms)	1277-36
11	294.60	-	1	0	2.20	2	278.0	612	22	634	3	30301	0	0	0	30935	0.3580	2.00	61869	0.7161	3.00	Hydrant 118	14 Government Rd. 1 commercial (garage), 2 institutional (Calvary Penecostal Church Hospital, North East Community Care)	1277-52
12	295.42	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 123	20 Government Rd.	1277-52
13	295.38	-	4	0	2.20	9	278.0	2446	90	2536	2	875	0	0	0	3411	0.0395	2.00	6821	0.0789	3.00	Hydrant 107	4 residences (28 and 30 Government Rd., 2 others), 2 institutional (garage and EMS building)	1277-52
14	296.72	9	0	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 108	40, 42, 50, 56, 43, 47, 55, ?, and ? Government Rd.	1277-53
15	297.17	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 76	58, 60, 62, 63, 64(x2), 66, 68, 69, 70, 71, ? and ? Government Rd.	1277-53, 1277-54
16	294.2	-	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	Hydrant 75	79, 81, 83, 87 and 120 Government Rd.	1277-54, A1-9422-P2
17	291.15	-	11	0	2.20	24	278.0	6728	246	6974	1	422	6542	0	6542	13938	0.1613	2.00	27875	0.3226	3.00	Hydrant 74	122, 124, 126, 127, 128, 132, 133, 134, 135, 137 and 139 Government Rd. 1 commercial (Leverington's Garden Centre.	A1-9422-P2
18	293.02	-	14	0	2.20	31	278.0	8562	314	8876	2	833	19625	0	19625	29335	0.3395	2.00	58669	0.6790	3.00	Hydrant 136	141, 143, 144, 145, 146, 147, 148, 153, 155 and 157 Government Rd. 2, 4, 10 Government Ln. 1 Sinter Plant Rd. 2 commercial (Lloyd's of Wawa, Wagging Tails Kennel)	A1-9422-P1/P2/P3
19	294.66	-	0	0	2.20	0	278.0	0	0	0	3	13248	3271	0	3271	16519	0.1912	2.00	33038	0.3824	3.00	Hydrant 40	Millette General Contractors, Wawa Handy Store, other commercial building at Mackey St. and McKinley Ave.	1277-33
20	295.35	-	15	16	2.20	68	278.0	18960	695	19654	1	186	26167	0	26167	46007	0.5325	2.00	92014	1.0650	3.00	Hydrant 44	7, 18, 16, 14, 10, 8, 6, 3, 5, 7, 9 and 7 McKinley Ave. 11 and 12 Laurier St. 7 Algoma St. 1 multi-residential (6 Algoma St. assume 18 units). 1 commercial (United Supply Swish)	1277-41
21	293.73	-	0	0	2.20	0	278.0	0	0	0	3	11986	0	0	0	11986	0.1387	2.00	23972	0.2775	3.00	-	2 commercial (Superior North Mobile Vetrinary Service, A Touch of Glass). 1 institutional (Sir James Dunn Public School)	1277-33
22	295.43	-	19	6	2.20	55	278.0	15290	560	15850	0	0	32709	0	32709	48559	0.5620	2.00	97118	1.1240	3.00	Hydrant 47	19, 17, 16, 15, 14, 13, 12, 9, 8, 7, 6, 5, 4, 3, 2 and 1 First Ave. 19, 21 and 23 Algoma Ave. 1 multi-residential (20 First Ave. assume 6 units).	1277-43
23	293.19	-	0	8	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	Hydrant 103	2 multi-residential (29 Mackey St. assume 4 units, 33 Mackey St. assume 4 units).	1277-33
24	295.58	-	17	0	2.20	37	278.0	10397	381	10778	1	162	29438	0	29438	40378	0.4673	2.00	80755	0.9347	3.00	Hydrant 96	19, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 3, 2, and 1 Second Ave. 1 commercial building (Children's Aid Society of Algoma)	1277-31
25	293.39	-	1	2	2.20	7	278.0	1835	67	1902	2	2299	0	0	0	4201	0.0486	2.00	8402	0.0972	3.00	Hydrant 98	44 Mackey St. 1 multi-residential (39 Mackey street, assuming 2 units). 2 commercial (Bell, Wawa Laundromat)	1277-34
26	293.34	-	18	48	2.20	145	278.0	40366	1479	41845	0	0	42521	0	42521	84366	0.9765	2.00	168732	1.9529	3.00	Hydrant 97	22, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 7, 6, 5, 4, 3 and 1 Third Ave. 3 multi-residential (2 Third Ave. assume 4 units, 35 Algoma St. Mountainview assume 20 units, 37 Algoma St. newer development assume 24 units).	1277-47
27	294.50	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	-	26b, 26 and 4 Mackey St.	1277-34
28	294.21	-	2	4	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 110	21 and 19 Churchill Ave. 1 multi-residential (22 Churchill Ave., assume 4 units)	1277-59
29	293.53	-	13	0	2.20	29	278.0	7951	291	8242	0	0	22896	0	22896	31138	0.3604	2.00	62276	0.7208	3.00	Hydrant ?	17, 15 (x2), 14, 12, 11, 8, 7, 6, 4, 3, 2 and 1 Churchill Ave.	1277-59
30	295.05	-	2	6	2.20	18	278.0	4893	179	5072	1	375	6542	0	6542	11989	0.1388	2.00	23978	0.2775	3.00	Hydrant 62	57, 63 Mackey St. 1 commercial (old garage, assuming 66 Mackey St.). 2 multi-residential (58 Mackey St. assume 4 units, 59 Mackey St. assume 2 units).	1277-34
31	293.76	-	16	6	2.20	48	278.0	13455	493	13948	1	910	19625	156100	175725	190583	2.2058	2.00	381167	4.4117	3.00	Hydrant 63	18, 16, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 Beck Ave. 1 multi-residential at 67 Mackey St. (assuming 6 units). 1 institutional (Superior Children's Centre).	1277-50
32	295.31	-	24	0	2.20	53	278.0	14678	538	15216	0	0	26167	0	26167	41383	0.4790	2.00	82766	0.9579	3.00	Hydrant 64	22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37 and 39 Beck Ave. 21, 22, 23, 24, 25, ?, 27, ?, 29, 32 Hillcrest Ave.	1277-50
33	293.55	-	8	0	2.20	18	278.0	4893	179	5072	0	0	9813	0	9813	14885	0.1723	2.00	29769	0.3446	3.00	Hydrant 42	50, 54, 56, 57, 58, 59, 60 and 62 McKinley Ave.	1277-39
34	294.96	-	11	0	2.20	24	278.0	6728	246	6974	2	1170	6542	0	6542	14686	0.1700	2.00	29371	0.3399	3.00	-	63, 64, 65, 66, 67, 68, 69, 70, 71 and ?2 McKinley Ave. 30 Caverhill St. 2 commercial (Paint + Glass and Creation Hairstyling)	1277-39
35	295.83	-	3	0	2.20	7	278.0	1835	67	1902	1	398	0	0	0	2300	0.0266	2.00	4601	0.0532	3.00	Hydrant 43	76, ?7 and ?8 McKinley Ave. 1 commercial (?5 McKinley)	1277-39
36	296.52	-	10	0	2.20	22	278.0	6116	224	6340	1	783	19625	0	19625	26748	0.3096	2.00	53496	0.6192	3.00	-	79, 80, 81, 82, 86, 87, 89, 91, 93 and 95 McKinley Ave. 1 commercial (Sam's Place)	1277-39
37	294.19	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 49	32, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 First Ave.	1277-42
38	296.59	-	20	0	2.20	44	278.0	12232	448	12680	0	0	39250	0	39250	51931	0.6010	2.00	101861	1.2021	3.00	Hydrant 48	53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 69, 70, 71 and 73 First Ave. 93, 95, 97, and 99 Third Ave.	1277-42
39	293.22	-	1	0	2.20	2	278.0	612	22	634	0	0	3271	0	3271	3905	0.0452	2.00	7810	0.0904	3.00	-	1 A St.	1277-48
40	294.51	-	13	0	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 46	7, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Second Ave.	1277-44
41	295.90	-	10	0	2.20	22	278.0	6116	224	6340	1	178	9813	0	9813	16331	0.1889	2.00	32661	0.3778	3.00	-	57, 59, 60, 61, 62, 63, 64, 65, 66 and 67 Second Ave. 2 institutional (St. Paul's Anglican Church)	1277-44
42	296.14	-	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	-	68, 71, 73 and ?5 Second Ave. ? and 87 Third Ave.	1277-44
43	295.99	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 99	??, ??, ?5, ?3 and ?1 Third Ave.	1277-45
44	295.89	-	20	0	2.20	44	278.0	12232	448	12680	0	0	45792	0	45792	58472	0.6768	2.00	116945	1.3535	3.00	Hydrant 45	72, ?0, 69, 68, 67, 66, 65, 64, 63, 61, 50, 52, 53, 54, 55, 56, 57, 58, 59 and 60 Third Ave.	1277-49
45	294.65	-	20	12	2.20	70	278.0	19571	717	20288	0	0	35980	0	35980	56268	0.6512	2.00	112536	1.3025	3.00	Hydrant 100	3, 5A, 6, ?, 8 , 9, and 10 A St. ??, ?9, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40 and 42 Third Ave. One multi-residential (44 Third Ave., assuming 12 units).	1277-48
46	295.72	-	17	0	2.20	37	278.0	10397	381	10778	0	0	26167	0	26167	36945	0.4276	2.00	73890	0.8552	3.00	-	3, 4, 5, 6, 8, 12, 13, 14, 15, 16, 17 and 18 Hillcrest Ave. 44, 45, 47, ? and 49 Churchill Ave.	1277-49
47	295.38	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 111	24, 25, 26, ??, 28 and 29 Churchill Ave.	1277-59
48	295.71	-	13	0	2.20	29	278.0	7951	291	8242	0	0	16354	0	16354	24596	0.2847	2.00	49193	0.5694	3.00	Hydrant ?	30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 and 43 Churchill Ave.	1277-58
49	295.2	-	2	40	2.20	92	278.0	25687	941	26628	1	1193	9813	0	9813	37634	0.4356	2.00	75268	0.8712	3.00	Hydrant 29	34, ?, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, ?0, ?1, ?2, ?3, ?4, ?5, ?6, ?7, ?8, ?9 and 80 Hillcrest Ave. 1 institutional (Michipicoten Non-Profit Housing 40 Hillcrest Ave.)	1277-49
50	289.47	-	2	3	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	62 and 64 Churchill Ave. Multi-residential (68 Churchill Ave. assume 3 units)	1277-57
51	292.57	-	0	0	2.20	0	278.0	0	0	0	6	35586	6542	0	6542	42128	0.4876	2.00	84256	0.9752	3.00	Hydrant ?	6 commercial buildings (Bowling Centre, Royal Canadian Legion, Canadian Tire, Dawson & Keenan, Sam's Foodline, Allemano & Fitzgerald, Wawa & Chapleau Radio)	-	Assumed same elevation of J5
52	293.83	-	1	0	2.20	2	278.0	612	22	634	17	17828	6542	156100	162642	181103	2.0961	2.00	362206	4.1922	3.00	Hydrant 128	22 Gold St. Commercial buildings (57, 59 Broadway Ave., The Bargain Shop, AJ's Pizza, the Best Start Hub, Regional Employement Health Centre Building, Chic N'Swell, North of 17 Restaurant, The Embassy Restaurant, Columbia Restaurant, RBC Bank, Wawa Dental Centre, Wawa Pharmacy, Wawa Goose Senior Centre, Barber Shop, U Wanna Cab, Guided Fishing Trips)	1277-26
53	293.32	-	1	0	2.20	2	278.0	612	22	634	7	8425	3271	0	3271	12330	0.1427	2.00	24659	0.2854	3.00	Hydrant 127	25 St. Marie St. 5 commercial (Northern building, Parish of St. Monica, yellow building, Fenlon's Pharmacy, Algoma Family Services)	1277-25
54	293.05	-	3	0	2.20	7	278.0	1835	67	1902	3	4020	13083	0	13083	19005	0.2200	2.00	38011	0.4399	3.00	-	90 Broadway Ave. 38 and 36 Main St. 2 commercial (Bangin Burger N'Chicken Shack, Economic Development Corporation of Wawa, Ijam FM building)	1277-38
55	293.09	-	11	0	2.20	24	278.0	6728	246	6974	0	0	13083	0	13083	20058	0.2321	2.00	40115	0.4643	3.00	Hydrant 41	1, 3, 5, ?, 8, 9 and 11 Toronto Ave. ?, ?, 4, ? Gold St.	1277-20
56	292.61	-	12	0	2.20	26	278.0	7339	269	7608	0	0	16354	0	16354	23962	0.2773	2.00	47925	0.5547	3.00	Hydrant 39	15, 16, 17, 18, 19, 20, ?1, 22, 23, 24, ?7 and 28 Toronto Ave. 21 and 22 Caverhill St.	1277-19
57	292.02	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	-	10, 9, 8, ?, 6 and 2 Caverhill St. 56 Wawa St.	1277-19
58	293.46	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	29, 30, 31, 32, 33, 34, 35 and 36 Toronto Ave.	1277-19
59	293.46	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1277-19

EPANet Future Residential plus Industrial Model Inputs

60	291.23	-	18	0	2.20	40	278.0	11009	403	11412	0	0	13083	0	13083	24496	0.2835	2.00	48991	0.5670	3.00	Hydrant 104	14, 13, 12, 11, 10, 7, 8, 7 & St. Marie St. 6 and 7 Wawa St.	1277-24
61	292.45	-	9	0	2.20	20	278.0	5504	202	5706	0	0	9813	0	9813	15519	0.1796	2.00	31037	0.3592	3.00	Hydrant 105	15, 16, 17, 18, 19, 20 and 7 Montreal Ave.	1277-19
62	292.45	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	7, 39, 7, 41, 43, 44, 45, 46 and 48 Toronto Ave.	1277-19
63	291.93	-	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	-	No demand	1277-19
64	289.77	-	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 7	32 Main St.	1277-38
65	291.2	-	12	0	2.20	26	278.0	7339	269	7608	0	0	22896	0	22896	30504	0.3531	2.00	61008	0.7061	3.00	Hydrant 7	53, 54, 55, 56, 57 and 58 Toronto Ave. 27, 29, 30, 31, 32 and 34 Joliet St.	1277-22
66	289.76	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	Hydrant 124	236, 30, 7, 26, 24, 23, 21, 243, 244, 245, 246 and 76 Main St.	1277-12
67	290.37	-	9	0	2.20	20	278.0	5504	202	5706	0	0	6542	0	6542	12248	0.1418	2.00	24496	0.2835	3.00	Hydrant 7	11, 247, 249, 251, 253 and 7 Main St. 7 And 10 Joliet St.	1277-12
68	288.29	-	12	0	2.20	26	278.0	7339	269	7608	0	0	6542	0	6542	14150	0.1638	2.00	28300	0.3275	3.00	Hydrant 114	14, 21, 23, 25, 26 and 28 Joliet St. 24, 25 and 36 Montreal St.	1277-12
69	288.38	-	11	0	2.20	24	278.0	6728	246	6974	3	2259	6542	0	6542	15775	0.1826	2.00	31550	0.3652	3.00	Hydrant 116	60, 61, 62, 63, 64, 65, 66, 67 and 69 Toronto Ave. 39, 37 and 35 Maggie Rd.	1277-18
70	288.4	-	11	2	2.20	29	278.0	7951	291	8242	0	0	9813	0	9813	18055	0.2090	2.00	36109	0.4179	3.00	Hydrant 117	33, 31, 29, 27 and 25 Maggie Rd. 32, 31, 30, 29, 28 and 27 Montreal Ave. 3 Institutional (Ontario Mine Rescue Algoma District, Large Garage, Municipality of Wawa Infrastructure Services Department)	1277-14
71	288.87	-	17	0	2.20	37	278.0	10397	381	10778	3	3792	22896	0	22896	37466	0.4336	2.00	74932	0.8673	3.00	Hydrant 115	7, 17 and 15 Maggie St. 2, 5, 7, 7, 8 and 10 Gladstone Ave. 279-A and 279-B Highway 101. 1 multi-residential (13 Magpie St. assume 2 units).	1277-14
72	288.92	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 91	73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88 and 89 Toronto Ave. 2 commercial (The Shop, Millete General Contractors). 1 institutional (The Ship Boy Scouts)	1277-18
73	288.73	-	7	0	2.20	15	278.0	4281	157	4438	0	0	3271	0	3271	7709	0.0892	2.00	15418	0.1784	3.00	-	101, 103, 105, 107, 109, 110 and 111 Broadway Ave.	1277-11
74	289.2	-	11	0	2.20	24	278.0	6728	246	6974	0	0	3271	0	3271	10245	0.1186	2.00	20490	0.2372	3.00	Hydrant 90	112, 113, 114, 116 and 117 Broadway Ave. 47 and 45 Maggie Rd.	1277-10
75	289.18	-	8	0	2.20	18	278.0	4893	179	5072	1	286	0	0	0	5358	0.0620	2.00	10716	0.1240	3.00	-	?, ?, 121, 123, 124, 125, 126, 127, 128, 129 and 130 Broadway Ave.	1277-10
76	289.61	-	17	0	2.20	37	278.0	10397	381	10778	0	0	6542	0	6542	17320	0.2005	2.00	34640	0.4009	3.00	-	131, 132, 133, 134, 135, 136, 137 and 138 Broadway Ave. 1 commercial (12 Klondike St.)	1277-5
77	289.18	-	1	0	2.20	2	278.0	612	22	634	3	645	0	0	0	1279	0.0148	2.00	2557	0.0296	3.00	-	14, 16, 18, 20 and 22 Klondike St. 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19 and 20 Nyman Ave.	1277-10
78	289.61	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 82	? Broadway Ave. 1 commercial (storage garage)	1277-10
79	289.64	-	24	0	2.20	53	278.0	14678	538	15216	0	0	6542	0	6542	21758	0.2518	2.00	43516	0.5037	3.00	Hydrant 83	15, 7, 17 and 18 Queen St.	1277-4
80	289.84	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	-	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 Queen St.	1277-4
81	289.00	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	Hydrant 81	43 and 44 Queen St. 1, 3, 5, 7 and 10 Centennial Ave.	1277-4
82	289.48	-	11	4	2.20	33	278.0	9174	336	9510	2	18899	6542	0	6542	34950	0.4045	2.00	69901	0.8090	3.00	Hydrant 80	19, 21 and 23 Winston Rd. 2 commercial (storage garages)	1277-1
83	289.57	-	8	0	2.20	18	278.0	4893	179	5072	0	0	6542	0	6542	11614	0.1344	2.00	23228	0.2688	3.00	-	25, 27, 29, 33, 33A, 35A, 35B, 37, 39, 41 and 43 Winston Rd. 34 Winston Rd. trailer park (23 trailers from water meter data). 1 institutional (Ecole Publique L'Escalade). 1 multi-residential (31 Winston Rd. assume 4 units).	1277-7
84	289.11	-	0	0	2.20	0	278.0	0	0	0	1	26	0	0	0	26	0.0003	2.00	52	0.0006	3.00	-	45 Winston Rd. 11, 12, 13, 14, 15, 16 and 18 Centennial Ave.	1277-60
85	288.98	-	10	0	2.20	22	278.0	6116	224	6340	0	0	0	0	0	6340	0.0734	2.00	12680	0.1468	3.00	Hydrant 7	1 institutional (First United Church)	1277-60
86	289.22	-	0	0	2.20	0	278.0	0	0	0	3	813	0	0	0	813	0.0094	2.00	1626	0.0188	3.00	Hydrant 92	1, 3, 4, 5, 6, 7, 8, 9, 10 and 12 George St.	1277-60
87	289.22	-	0	0	2.20	0	278.0	0	0	0	1	1021	0	0	0	1021	0.0118	2.00	2042	0.0236	3.00	-	1 commercial building (Circle K, Northern Credit Union, Empty Store)	1277-16
88	289.28	-	0	12	2.20	26	278.0	7339	269	7608	1	1972	0	0	0	9580	0.1109	2.00	19161	0.2218	3.00	-	1 commercial building (Pine Portage Lodge Office)	1277-16
89	289.56	-	0	12	2.20	26	278.0	7339	269	7608	5	8357	0	0	0	15965	0.1848	2.00	31930	0.3696	3.00	Hydrant 138	1 multi-residential (158 Mission Rd. assuming 12 units). 1 commercial building (Big Bird Inn)	1277-61
90	289.35	-	16	0	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 7	1 apartment building (guessing 12 units). 4 commercial buildings (Independent, Subway, Movie Gallery, Viking Restaurant, Polish Alliance of Canada)	1277-61 & 1277-6
91	289.21	-	2	0	2.20	4	278.0	1223	45	1268	1	12392	3271	0	3271	16930	0.1960	2.00	33861	0.3919	3.00	-	60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76 and 78 Maggie Rd. 14 George St.	1277-16
92	289.4	-	0	0	2.20	0	278.0	0	0	0	1	704	0	0	0	704	0.0081	2.00	1408	0.0163	3.00	Hydrant 93	80 and 82 Maggie Rd. 1 institutional (Michipicoten High School)	1277-16
93	289.35	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 7	1 institutional (St. Augustine School)	1277-66
94	289.16	-	10	0	2.20	22	278.0	6116	224	6340	0	0	3271	0	3271	9611	0.1112	2.00	19222	0.2225	3.00	-	1, 2, 3, 4, 5, 6, 7 and 8 Ross St.	1277-61
95	288.94	-	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	-	10, 11, 13, 14, 15, 17, 19 and 21 Ross St. 9 and 23 Arnott Ave.	1277-61
96	289.15	-	2	0	2.20	4	278.0	1223	45	1268	2	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 89	49 and 54 Maggie Rd. 1 and 5 Nyman Ave.	1277-15
97	289.64	-	19	0	2.20	42	278.0	11620	426	12046	0	0	3271	0	3271	15317	0.1773	2.00	30634	0.3546	3.00	Hydrant 88	1 and 5 Nyman Ave.	1277-9
98	289.94	-	11	0	2.20	24	278.0	6728	246	6974	0	0	6542	0	6542	13516	0.1564	2.00	27032	0.3129	3.00	-	24, 26, 28, 30 and 32 Klondike St. 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18 and ? Wood Ave.	1277-6
99	289.89	-	0	0	2.20	0	278.0	0	0	0	1	6113	0	0	0	6113	0.0707	2.00	12225	0.1415	3.00	-	34, 7, 36, 37, 38, 39, 40, 41, 42, 43 and 44 Klondike St.	1277-6
100	289.98	-	3	10	2.20	29	278.0	7951	291	8242	2	547	6542	0	6542	15331	0.1774	2.00	30661	0.3549	3.00	Hydrant 121	1 commercial (Kindalyn Motel)	1277-6
101	290.92	-	0	4	2.20	9	278.0	2446	90	2536	2	5168	6542	0	6542	14245	0.1649	2.00	28491	0.3298	3.00	-	55, 56 and 57 Winston Rd. 2 multi-residential (58 Winston Rd. assume 6 units, 59 Winston Rd. assume 4 units). 1 institutional (Kingdom Hall). 1 commercial (Wawa Rent-all & Repair)	1277-3
102	290.31	-	0	0	2.20	0	278.0	0	0	0	2	5502	3271	0	3271	8773	0.1015	2.00	17546	0.2031	3.00	-	1 multi-residential (61 Winston Rd. assume 4 units). 2 commercial (Garage, Gator's Steakhouse, Beaver Motel).	1277-3
103	289.45	-	0	0	2.20	0	278.0	0	0	0	2	9226	3271	0	3271	12496	0.1446	2.00	24993	0.2893	3.00	Hydrant 94	2 commercial (Algoma Motel, Bristol Motel)	P2
104	290.03	-	8	0	2.20	18	278.0	4893	179	5072	0	0	3271	0	3271	8343	0.0966	2.00	16686	0.1931	3.00	-	2 commercial (Algoma Motel, Bristol Motel)	1277-62
105	289.02	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	-	18, 17, 16, 15, 14, 13, 12 and 11 Arnott Ave.	1277-62
106	289.58	-	3	0	2.20	7	278.0	1835	67	1902	0	0	3271	0	3271	5173	0.0599	2.00	10346	0.1197	3.00	-	9, 7, 5, 3 and 1 Arnott Ave.	1277-62
107	289.78	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	-	4, 6 and 8 Darwin St.	1277-65
108	290.2	-	4	12	2.20	35	278.0	9786	359	10144	0	0	0	0	0	10144	0.1174	2.00	20288	0.2348	3.00	Hydrant 65	3, 5 and 7 Parkhill St. 126 Churchill Ave. 1 multi-residential (2 Grace St. assume 12 units).	1277-55
109	290.49	-	3	0	2.20	7	278.0	1835	67	1902	2	4850	0	0	0	6752	0.0781	2.00	13503	0.1563	3.00	-	128, 130, 132 and 134 Churchill Ave. 1 multi-residential (10 Grace St. assume 12 units).	1277-55
110	289.65	-	9	0	2.20	20	278.0	5504	202	5706	0	0	3271	0	3271	8977	0.1039	2.00	17954	0.2078	3.00	Hydrant 66	134, 136 and 138 Churchill Ave. 2 commercial (Kerry Funeral Home, Beaver Motel)	1277-55
111	290.03	-	6	0	2.20	13	278.0	3670	134	3804	1	2320	0	0	0	6124	0.0709	2.00	12249	0.1418	3.00	Hydrant 137	124, 123, 122, 121, 120, 119, 118, 117 and 116 Churchill Ave.	1277-56
112	289.79	-	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 120	114, 112, 110, 108, 106 and 104 Churchill Ave. 1 institutional (Ecole St. Joseph).	1277-56
113	289.49	-	13	0	2.20	29	278.0	7951	291	8242	0	0	6542	0	6542	14784	0.1711	2.00	29568	0.3422	3.00	Hydrant 119	100, 98, 96, 94, 92, 90 and 88 Churchill Ave.	1277-56
114	289.44	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	Hydrant 61	86, 84, 82, 80, 78, 76, 74, 72, 70 and 76 Churchill Ave. 113, 111 and 107 Maggie Rd.	1277-57
115	290.02	-	22	0	2.20	48	278.0	13455	493	13948	0	0	16354	0	16354	30303	0.3507	2.00	60605	0.7014	3.00	Hydrant 125	No demand	1602-7
116	289.64	-	6	0	2.20	13	278.0	3670	134	3804	0	0	3271	0	3271	7075	0.0819	2.00	14150	0.1638	3.00	Hydrant 7	?, 125, ?, 123, 122, 121, 119, 117 and 115 Regina Cres. 16, 14, 13, 12, ?, 10, ?, 8, 6, ?, 4, ?, 2 Birch St.	1602-4
117	289.71	-	7	0	2.20	15	278.0	4281	157	4438	0	0	13083	0	13083	17522	0.2028	2.00	35043	0.4056	3.00	Hydrant 7	127, 133, 135, 137, 139 and 145 Regina Cres.	1951-8
118	289.57	-	6	0	2.20	13	278.0	3670	134	3804	0	0	6542	0	6542	10346	0.1197	2.00	20692	0.2395	3.00	Hydrant 54	147, 148, 152, 153, 155, 156 and 160 Regina Cres.	1951-8
119	289.73	287.9	5	0	2.20	11	278.0	3058	112	3170	0	0	9813	0	9813	12983	0.1503	2.00	25965	0.3005	3.00	-	162, 166, 170 and 172 Regina Cres. 42 and 40 Tamarack Ave.	1951-3
120	289.75	-	4	0	2.20	9	278.0	2446	90	2536	1	594	0	0	0	3130	0.0362	2.00	6261	0.0725	3.00	Hydrant 7	44, 46 and 48 Tamarack Ave.	1951-6
121	290.24	-	13	0	2.20	29	278.0	7951	291	8242	0	0	0	0	0	8242	0.0954	2.00	16484	0.1908	3.00	Hydrant 56	7, 6, 8, and 10 Maple St. 1 institutional (Confederation College Building)	1951-6
122	290.14	-	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 Maple St.	1951-6
123	289.88	288.05	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	25, 26, 27 and 28 Maple St.	1951-6
124	291.35	289.15	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	-	29 and 30 Maple St.	1951-3
125	291.08	288.88	12	0	2.20	26	278.0	7339	269	7608	0	0	0	0	0	7608	0.0881	2.00	15216	0.1761	3.00	Hydrant 60	No demand	1951-5
126	290.52	-	13	0	2.20	29	278.0	7951	291	8242	0	0	3271	0	3271	11513	0.1333	2.00	23026	0.2665	3.00	Hydrant 55	40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30 and 29 Birch St.	1951-5
127	290.49	288.29	12	0	2.20	26	278.0	7339	269	7608	0	0	29438	0	29438	37046	0.4288	2.00	74092	0.8575	3.00	Hydrant 53	28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17 and 15 Birch St.	1602-6
128	291.82	289.62	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	-	113, 111, 109, 107, 105 and 104 Regina Cres. 10, 8, 7, 6, 5 and 3 Poplar St.	1602-4
129	292.01	289.81	8	0	2.20	18	278.0	4893	179	5072	0	0	0	156100	156100	161172	1.8654	2.00	322344	3.7308	3.00	Hydrant 50	142 and 141 Superior Ave.	1951-2
130	291.18	288.98	16	0	2.20	35	278.0	9786	359	10144	0	0	13083	0	13083	23228	0.2688	2.00	46455	0.5377	3.00	Hydrant 51	140, 139, 138, 137, 136, 135, 134 and 133 Superior Ave.	1951-2
131	290.68	288.48	14	0	2.20	31	278.0	8562	314	8876	0	0	32709	0	32709	41585	0.4813	2.00	83170	0.9626	3.00	Hydrant 52	132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118 and 117 Superior Ave.	1602-2
132	290.58	-	7	0	2.20	15	278.0	4281	157	4438	0	0	6542	0	6542	10980	0.1271	2.00	21960	0.2542	3.00	Hydrant 71	116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104 and 103 Superior Ave.	1602-2
133	290.84	-	18	0	2.20	40	278.0	11009	403	11412	0	0	3271	0	3271	14683	0.1699	2.00	29366	0.3399	3.00	Hydrant 72	103, 102 and 101 Regina Cres. 1, 2, 3 and 4 Spruce St.	1602-4
134	290.49	-	27	0	2.20	59	278.0	16513	605	17118	0	0	0	0	0	17118	0.1981	2.00	34236	0.3963	3.00	Hydrant 69	7, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 13A, 13B, 15A and 15B Spruce St. 102, 100, 2, 4 and 6 Superior Ave.	1602-2
135	290.22	-	12	0	2.20	26	278.0	7339	269	7608	0	0	13083	0	13083	20692	0.2395	2.00	41383	0.4790	3.00	Hydrant 70	7A, 7B, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22 Superior Ave. 15, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 27 Regina Cres.	1277-69
136	290.50	-	8	0	2.20	18	278.0	4893	179	5072	0	0	0	0	0	5072	0.0587	2.00	10144	0.1174	3.00	Hydrant 68	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 Regina Cres.	1277-71
137	289.10	-	7	0	2.20	15	278.0	4281	157	4438	1	103	3271	0	3271	7812	0.0904	2.00	15623	0.1808	3.00	Hydrant 67	24, 26, 7, 28, 30, 32, 34 and 36 Superior Ave.	1277-68
138	289.79	-	2	0	2.20	4	278.0	1223	45	1268	2	58569	0	0	0	59837	0.6926	2.00	119673	1.3851	3.00	Hydrant 73	38, 40, 42, 44, 46, 48 and 50 Superior Ave. 1 institutional (Lion's Club)	1277-68
139	290.47	-	0	0	2.20	0	278.0	0	0	0	3	1194	6542	0	6542	7736	0.0895	2.00	15472	0.1791	3.00	Hydrant 85	7, 7 Superior Ave. 1 institutional (Michipicoten Memorial Community Centre). 1 commercial (Wawa Motor Inn)	1277-67
140	288.65	-	0	0	2.20	0	278.0	0	0	0	1	171	0	0	0	171	0.0020	2.00	342	0.0040	3.00	Hydrant 134	3 commercial (Petro Canada, Northern Chiropractic Clinic, Krazy Fries)	B41
141	288.00	-	0	0	2.20	0	278.0	0	0	0	3	3072	6542	0	6542	9614	0.1113	2.00	19228	0.2225	3.00	Hydrant 84	1 institutional (Small station)	B41
142	286.50	-	0	0	2.20	0	278.0	0	0	0	5	8997	3271	156100	159371	168368	1.9487	2.00	336736	3.8974	3.00	Hydrant 135	3 commercial (Home Building Center Garage, Home Building Centre, Young's General Store)	P1
143	286.28	-	0	0	2.20	0	278.0	0	0	0	7	12319	9813	0	9813	22132	0.2562	2.00	44263	0.5123	3.00	Hydrant 77	4 commercial (Canco Wawa, Wesdome Gold Mines, Garages, Tim Hortons). I institutional (Lagoon Building).	P2
144	284.75	282.59	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0147	3.00	Hydrant 1	1 commercial (Mission Motor). 5 institutional (Service Ontario, Ontario Ministry of Natural Resources, Government Storage Garages x7, Wawa Municipal Airport, Tourist Information Centre)	3675-3
145	284.57	282.45	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 2	120 Pinewood Dr.	3675-5
																							No demand	3675-5

EPANet Future Residential plus Industrial Model Inputs

146	284.03	281.81	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 3	No demand	3675-6	
147	283.90	281.47	0	0	2.20	0	278.0	0	0	0	1	1291	0	0	0	1291	0.0149	2.00	2583	0.0299	3.00	-	1 commercial (Trans Canada Chrysler)	3675-6	
148	283.20	281.08	0	0	2.20	0	278.0	0	0	2	1888	0	0	0	1888	0.0219	2.00	3776	0.0437	3.00	Hydrant 4	2 commercial (Fountain Tire, Family Kitchen Restaurant Building)	3675-6	
149	282.89	280.68	0	0	2.20	0	278.0	0	0	2	3696	0	0	0	3696	0.0428	2.00	7393	0.0856	3.00	Hydrant 5	2 commercial (Esso Gas Station, Davidson Fuels)	3675-7	
150	282.05	279.37	0	0	2.20	0	278.0	0	0	3	10584	0	0	0	10584	0.1225	2.00	21168	0.2450	3.00	Hydrant 6	2 commercial (Highway 17 Motel, Gardewine). 1 institutional (OPP)	3675-7	
151	284.40	-	0	0	2.20	0	278.0	0	0	2	441	0	0	0	441	0.0051	2.00	882	0.0102	3.00	Hydrant 10	2 commercial (Superior Truck Repair Centre, Lakehead Freightway/Manitoulin Transport)	C05	
152	282.95	-	0	0	2.20	0	278.0	0	0	1	356	0	0	0	356	0.0041	2.00	712	0.0082	3.00	Hydrant 11	1 commercial (U-Haul Dealer)	C04	
153	282.15	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 12	No demand	C04	
154	281.85	-	0	0	2.20	0	278.0	0	0	1	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 9	1 commercial (Martel Customs)	C04	
155	280.60	-	0	0	2.20	0	278.0	0	0	1	484	0	0	0	484	0.0056	2.00	967	0.0112	3.00	Hydrant 8	1 commercial (building with red roof)	C03	
156	281.85	-	0	0	2.20	0	278.0	0	0	4	52214	0	0	0	52214	0.6043	2.00	104428	1.2087	3.00	Hydrant 7	4 commercial (building with red roof, building on cul-de-sac, Northstar Fusion, Evolugen)	C03	
157	281.5	-	0	0	2.20	0	278.0	0	0	1	11	0	0	0	11	0.0001	2.00	22	0.0003	3.00	Hydrant 34	1 commercial (Algoma Storage)	-	Don't know real elevation
158	280.3	277.8	0	0	2.20	0	278.0	0	0	1	458	0	0	0	458	0.0053	2.00	917	0.0106	3.00	Hydrant 33	1 industrial (Algoma Highlands Wild Blueberry Farm)	A1-2002-62-P5	
159A	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
159	279.5	277.0	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P5	
160A	248.5	245.9	1	0	2.20	2	278.0	612	22	634	2	1952	0	0	0	2586	0.0299	2.00	5172	0.0599	3.00	PRV Chamber	1 house by storage area. 2 commercial (Jones Power Sports, High Falls Motel & Cabins)	A1-2002-62-P2	
160B	248.5	245.9	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	PRV Chamber	No demand	A1-2002-62-P2	
160	205.1	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	MRV Water Tower	No demand	1443-A-7	
161	205.1	202.6	0	0	2.20	0	278.0	0	0	1	6300	0	0	0	6300	0.0729	2.00	12600	0.1458	3.00	MRV Water Tower	Water Tower and Pumping Station	1443-A-7	
162	205.4	202.9	2	0	2.20	4	278.0	1223	45	1268	0	0	0	0	1268	0.0147	2.00	2536	0.0294	3.00	Hydrant 18	?, ? Hardy Ave.	1443-A-7	
163	205.1	202.5	10	0	2.20	22	278.0	6116	224	6340	1	481	0	0	0	6821	0.0789	2.00	13642	0.1579	3.00	Hydrant 17	?, ?, ?, ?, ?, ?, ?, ? 315, and 317 Hardy Ave. 1 commercial (Your Room is Ready!)	1443-A-7	
164	205.9	203.4	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	-	309, 308, 307 and ? Queen St.	1443-A-6	
165	206.6	204.1	4	0	2.20	9	278.0	2446	90	2536	0	0	0	0	0	2536	0.0294	2.00	5072	0.0587	3.00	Hydrant 15	303, 302 and 301 Queen St. ? Blue Ave.	1443-A-6	
166	206.5	-	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 13	?, ?, ?, ? and ? Blue Cres.	-	Don't know real elevation
167	206	-	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 14	?, ? Blue Cres. ? Blue Ave.	-	Don't know real elevation
168	204.9	202.3	6	0	2.20	13	278.0	3670	134	3804	0	0	0	0	0	3804	0.0440	2.00	7608	0.0881	3.00	Hydrant 7	318, ?, ?, 313, 312 and 310 Blue Ave.	1443-A-13	
169	206.7	204.2	2	0	2.20	4	278.0	1223	45	1268	0	0	3271	0	3271	4539	0.0525	2.00	9078	0.1051	3.00	Hydrant 16	303 and ? Aberdeen St.	1443-A-12	
170	197.0	194.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 19	No demand	1443-A-5	
171	200.0	197.3	6	0	2.20	13	278.0	3670	134	3804	1	32	3271	0	3271	7107	0.0823	2.00	14213	0.1645	3.00	Hydrant 79	?, ?, ?, ?, ? and 308 Magpie Ave. 1 institutional (Wood Land Masonic Lodge)	1443-A-11	
172	193.0	190.3	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	1443-A-5	
173	190.0	187.4	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	Hydrant 20	No demand	1443-A-5	
174	190.7	188.1	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0440	3.00	Hydrant 23	339 Queen St. 312 and 311 Brock Ave.	1443-A-4	
175	191.1	188.1	7	0	2.20	15	278.0	4281	157	4438	0	0	0	0	0	4438	0.0514	2.00	8876	0.1027	3.00	Hydrant 24	?, ?, ?, 306, ?, 303 and 335 Brock Ave. 1 institutional (Angel's Equestrian Centre).	1443-A-4	
176	189.0	186.4	0	0	2.20	0	278.0	0	0	0	3	3213	0	156100	156100	159313	1.8439	2.00	318625	3.6878	3.00	Hydrant 25	2 commercial (shed on Superior St., Buck's Marina) 1 institutional (small building on Superior St.)	1443-A-3	
177	192.7	190.2	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 28	?, ? Superior St, ?, ? and ? Michipicoten Ave.	1443-A-8	
178	191.9	189.3	5	0	2.20	11	278.0	3058	112	3170	0	0	0	0	0	3170	0.0367	2.00	6340	0.0734	3.00	Hydrant 7	?, ?, ?, ? and ? Michipicoten Ave.	1443-A-9	
179	192.1	189.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0734	3.00	-	? Superior St. ?, ?, and ? Wawa St	1443-A-8	
180	189.9	187.4	3	0	2.20	7	278.0	1835	67	1902	0	0	0	0	0	1902	0.0220	2.00	3804	0.0147	3.00	Hydrant 21	?, ? and ? Wawa St.	1443-A-10	
181	190.1	187.5	1	0	2.20	2	278.0	612	22	634	0	0	0	0	0	634	0.0073	2.00	1268	0.0440	3.00	Hydrant 26	? Superior St.	1443-A-8	
182	194.5	192.0	2	0	2.20	4	278.0	1223	45	1268	0	0	6542	0	6542	7810	0.0904	2.00	15620	0.0440	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
183	292.97	-	0	0	2.20	0	278.0	0	0	0	0	0	0	0	0	0	0.0000	2.00	0	0.0147	3.00	Hydrant 27	? and ? Superior St.	1443-A-8	
16 (New)	294.2	-	4	0	2.00	8	278.0	2224	-	2224	0	0	0	0	0	2224	0.0257	2.00	4448	0.0515	3.00	Hydrant 75	3 new residences on Government Rd. 1 new residence on Tamarack Ave.	1277-54, A1-9422-P2	
29 (New)	293.53	-	0	10	2.00	20	278.0	5560	-	5560	0	0	0	0	0	5560	0.0644	2.00	11120	0.0147	3.00	Hydrant ?	1 new apartment building with 10 units	1277-59	
116 (New)	289.64	-	2	0	2.00	4	278.0	1112	-	1112	0	0	0	0	0	1112	0.0129	2.00	2224	0.0257	3.00	Hydrant ?	2 new residences on Regina Cres.	1951-8	
117 (New)	289.71	-	7	0	2.00	14	278.0	3892	-	3892	0	0	0	0	0	3892	0.0450	2.00	7784	0.0901	3.00	Hydrant 7	7 new residences on Regina Cres,	1951-8	
118 (New)	289.57	-	8	0	2.00	16	278.0	4448	-	4448	0	0	0	0	0	4448	0.0515	2.00	8896	0.1030	3.00	Hydrant 54	8 new residences on Regina Cres.	1951-8	
119 (New)	289.73	287.9	8	0	2.00	16	278.0	4448	-	4448	0	0	0	0	0	4448	0.0515	2.00	8896	0.1030	3.00	-	8 new residences on Maple St.,	1951-3	
123 (New)	289.88	288.05	6	0	2.00	12	278.0	3336	-	3336	0	0	0	0	0	3336	0.0386	2.00	6672	0.0772	3.00	-	6 new residences on Birch St.	1951-3	
183 (New)	292.97	-	16	0	2.00	32	278.0	8896	-	8896	0	0	0	0	0	8896	0.1030	2.00	17792	0.2059	3.00	Hydrant 27	16 new residences on Tamarack Ave.	1443-A-8	
184	294.30	-	0	0	2.00	0	278.0	0	-	0	0	0	0	0	0	0	0.0000	2.00	0	0.0000	3.00	-	No demand	-	
185	292.94	-	4	0	2.00	8	278.0	2224	-	2224	0	0	0	0	0	2224	0.0257	2.00	4448	0.0515	3.00	-	4 new residences on new road	-	
186	293.18	-	18	0	2.00	36	278.0	10008	-	10008	0	0	0	0	0	10008	0.1158	2.00	20016	0.2317	3.00	-	18 new residences on new road	-	
187	293.60	-	10	0	2.00	20	278.0	5560	-	5560	0	0	0	0	0	5560	0.0644	2.00	11120	0.1287	3.00	-	10 new residences on new road	-	
188	293.39	-	7	0	2.00	14	278.0	3892	-	3892	0	0	0	0	0	3892	0.0450	2.00	7784	0.0901	3.00	-	7 new residences on new cul-de-sac	-	
142 (New)	286.50	-	0	0	2.00	0	278.0	0	-	0	1	810000	0	0	0	810000	9.3750	2.00	1620000	18.7500	3.00	Hydrant 135	1 new industrial area east of Mission Rd.	P2	
TOTAL			1193	229		3108		864135	29624	893759	179	1263716	1020511	780499	1801010	3958485	45.82		7916969						
					MRV Population	156					In-town	370316													

			Pipe Input for Length	*Pipe Input for Diameter*		*Pipe Input for Roughness Coef.*				
Pipe	**Starting Junction**	**Ending Junction**	**Length**	**Diameter**	**Material**	**HW Roughness Coefficient**	**Object**	**Notes**	**Reference Drawing**	
1A	J1A	J1	38.19	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3	
1	J1	J2	75.15	150	Unknown	140	Pipe 136		WAT_Watermain_Table	
2	J2	J3	68.1	150	Unknown	140	Pipe 798	art of watermain from 1st Ave. t	F22019_WaterMap_NorthSat	
3	J3	J4	101.75	150	Unknown	140	Pipe 798	art of watermain from A St. to de	WAT_Watermain_Table	
4	J1A	J5	66.61	400	PVC	150	-	rom WTP drawings, GIS not corre	2531-A-3	
5	J5	J6	112.2	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameter of 250mm, GIS not clear	F22019_WaterMap_NorthSat	
6	J6	J7	9.6	250	Unknown	140	Pipe 878	Only part of watermain from Broadway Ave. to Hydrant 102, map shows diameterf of 250mm, GIS not clear	F22019_WaterMap_NorthSat	
7	J5	J8	74.1	200	Unknown	140	South of Pipe 909	rom McKinley Ave. to Hydrant 13	F22019_WaterMap_NorthSat	
8	J8	J9	109.73	200	Unknown	140	Pipe 909		WAT_Watermain_Table	
9	J9	J10	138.7	150	Unknown	140	Pipes 889 and 890	Pipe 889 and part of 890	F22019_WaterMap_NorthSat	
10	J10	J11	148.9	150	Unknown	140	Pipes 890 and 361	Part of pipes 890 and 361	F22019_WaterMap_NorthSat	
11	J11	J12	151.6	150	Unknown	140	Pipe 361	Part of pipe 361, possibly 356	F22019_WaterMap_NorthSat	
12	J12	J13	73.4	150	Unknown	140	Pipe 356		F22019_WaterMap_NorthSat	
13	J13	J14	140.3	150	Unknown	140	Pipe 356 and 125	Part of 356, pipe 125	F22019_WaterMap_NorthSat	
14	J14	J15	152.5	150	Unknown	140	Pipe 355 and 336	Pipe 355 and part of 336	F22019_WaterMap_NorthSat	
15	J15	J16	516.8	150	Unknown	140	Pipe 338 and 336	Pipe 338 and part of 336	F22019_WaterMap_NorthSat	
16	J16	J17	187.63	150	Unknown	140	Pipe 339 and 329	Length for pipe 339 and 329	WAT_Watermain_Table	
17	J17	J18	179.7	150	Unknown	140	Pipe 326 and 319	Pipe 326 and part of 319	F22019_WaterMap_NorthSat	
18	J9	J19	91.1	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat	
19	J19	J20	121.16	150	Unknown	140	Pipe 864		WAT_Watermain_Table	
20	J19	J21	81.5	200	Unknown	140	Pipe 849	Possibly part of pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat	
21	J21	J22	110.2	150	Unknown	140	-	No pipe number on map, diameter from as-built drawing	F22019_WaterMap_NorthSat	
22	J21	J23	80.5	200	Unknown	140	Pipe 849	Pipe 849, GIS shows diameter of 200 mm, as-built shows 150 mm	F22019_WaterMap_NorthSat	
23	J23	J24	139.76	150	Unknown	140	Pipe 843		WAT_Watermain_Table	
24	J23	J25	81.5	200	Unknown	140	Pipe 787		WAT_Watermain_Table	
25	J25	J26	100	150	Unknown	140	Pipe 777		WAT_Watermain_Table	
26	J25	J27	96.3	200	Unknown	140	ame same pipe properties as pipe		F22019_WaterMap_NorthSat	
27	J27	J28	37.18	150	Unknown	140	Pipe 756		WAT_Watermain_Table	
28	J28	J29	105.27	150	Unknown	140	Pipe 763		WAT_Watermain_Table	
29	J28	J30	111.1	150	Unknown	140	-	e same pipe properties as pipes i	F22019_WaterMap_NorthSat	
30	J30	J31	104.03	150	Unknown	140	Pipe 676		WAT_Watermain_Table	
31	J31	J32	196.9	150	Unknown	140	Pipes 679 and 680		F22019_WaterMap_NorthSat	
32	J1	J33	136.6	150	Unknown	140	Pipe 831		F22019_WaterMap_NorthSat	
33	J33	J34	71.87	150	Unknown	140	Pipe 835		WAT_Watermain_Table	
34	J34	J35	43.43	150	Unknown	140	Pipe 837		WAT_Watermain_Table	
35	J35	J36	125.73	150	Unknown	140	Pipe 836		WAT_Watermain_Table	
36	J2	J37	148.1	150	Unknown	140	-	ame same properties and nearby p	F22019_WaterMap_NorthSat	
37	J37	J38	139.7	150	Unknown	140	Pipe 814		F22019_WaterMap_NorthSat	
38	J3	J39	32.6	150	Unknown	140	Pipe 795	Part of pipe 795	F22019_WaterMap_NorthSat	
39	J39	J40	131.83	150	Unknown	140	Pipe 799		WAT_Watermain_Table	
40	J40	J41	94.49	150	Unknown	140	Pipe 800		WAT_Watermain_Table	
41	J41	J42	78.3	100	Unknown	140	Pipe 137	Pipe 137 plus smaller pipes	F22019_WaterMap_NorthSat	
42	J42	J43	103.5	150	Unknown	140	-	Unknown pipes and diameter	F22019_WaterMap_NorthSat	
43	J43	J44	87.64	150	Unknown	140	Pipe 769		WAT_Watermain_Table	
44	J39	J45	75.64	150	Unknown	140	Pipe 795		WAT_Watermain_Table	
45	J25	J45	192.7	150	Unknown	140	Pipe 767	Pipe 767 plus other pipe(s)	F22019_WaterMap_NorthSat	
46	J45	J44	109	150	Unknown	140	Pipe 772	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat	
47	J44	J46	172	150	Unknown	140	Pipe 686	Pipe 772 plus other pipe(s)	F22019_WaterMap_NorthSat	
48	J27	J47	65.7	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat	
49	J47	J48	102.7	150	Unknown	140	Pipe 695 and 699	Parts of pipe 695 and 699	F22019_WaterMap_NorthSat	
50	J48	J46	96	150	Unknown	140	-	Unknown pipes, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat	
51	J46	J32	106.6	150	Unknown	140	Pipe 34	Pipe 34 plus other pipe(s)	F22019_WaterMap_NorthSat	
52	J32	J49	21	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat	

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53	J46	J50	103.4	150	Unknown	140	-	Unknown pipe, assume diameter 150 mm like nearby pipes	F22019_WaterMap_NorthSat
54	J5	J51	72	200	Unknown	140	Pipe 893	Pipe 893 plus other pipe(s)	F22019_WaterMap_NorthSat
55	J51	J52	133.35	200	Unknown	140	Pipe 912		WAT_Watermain_Table
56	J52	J53	101	200	Unknown	140	Pipe 731		WAT_Watermain_Table
57	J53	J54	82.6	200	Unknown	140	-	Assuming same diameter as pipe 731	F22019_WaterMap_NorthSat
58	J6	J55	97.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
59	J55	J56	103.7	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
60	J52	J56	111.1	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
61	J7	J57	190.86	300	Unknown	140	Pipe 744		WAT_Watermain_Table
62	J52	J34	104.8	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
63	J57	J56	8.5	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
64	J56	J58	95.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
65	J57	J59	95.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
66	J58	J59	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
67	J59	J60	102.87	150	Galvanized Steel	120	Pipe 711		WAT_Watermain_Table
68	J58	J61	97.3	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
69	J61	J54	118.95	150	Unknown	140	Pipe 713		WAT_Watermain_Table
70	J59	J62	97.3	250	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 250 mm	F22019_WaterMap_NorthSat
71	J61	J62	8.5	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
72	J62	J63	18	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
73	J63	J64	107	150	Unknown	140	-	Unknown pipe, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
74	J63	J65	129.6	150	Unknown	140	Pipe 663	Pipe 663 plus other pipes	F22019_WaterMap_NorthSat
75	J65	J66	192.4	150	Unknown	140	Pipe 669	Pipe 669 plus other pipes	F22019_WaterMap_NorthSat
76	J66	J67	123.86	150	Unknown	140	Pipe 637		WAT_Watermain_Table
77	J67	J64	94.54	150	Unknown	140	Pipe 636		WAT_Watermain_Table
78	J64	J68	87.9	150	Unknown	140	Pipe 626	Pipe 626 plus other pipes	F22019_WaterMap_NorthSat
79	J68	J69	157.7	150	Unknown	140	Pipe 607	Pipe 607 plus other pipes	F22019_WaterMap_NorthSat
80	J69	J70	157.5	150	Unknown	140	Pipe 641	Pipe 641 plus other pipes	F22019_WaterMap_NorthSat
81	J68	J71	194.7	150	Unknown	140	Pipe 610	Pipe 610 plus other pipes	F22019_WaterMap_NorthSat
82	J54	J72	155.11	200	Asbestos Cement	140	Pipes 651 and 612	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
83	J72	J73	55.63	150	Unknown	140	Pipe 613		WAT_Watermain_Table
84	J73	J68	102.7	150	Unknown	140	Pipe 581	Pipe 581 plus other pipes	F22019_WaterMap_NorthSat
85	J73	J74	115.06	150	Unknown	140	Pipe 598		WAT_Watermain_Table
86	J74	J75	80.77	150	Unknown	140	Pipe 595		WAT_Watermain_Table
87	J71	J75	103.23	150	Unknown	140	Pipe 603		F22019_WaterMap_NorthSat
88	J75	J76	84.7	150	Unknown	140	-	Unknown pipe, nearby pipes and as-builts show diameter of 150 mm	F22019_WaterMap_NorthSat
89	J75	J77	96.2	150	Unknown	140	Pipe 554		WAT_Watermain_Table
90	J77	J78	56.6	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
91	J78	J79	232.98	150	Asbestos Cement	140	Pipe 570		WAT_Watermain_Table
92	J79	J80	56.1	150	Asbestos Cement	140	-	ssume same properties as pipe 57	F22019_WaterMap_NorthSat
93	J77	J81	163.41	150	Asbestos Cement	140	Pipe 134		WAT_Watermain_Table
94	J81	J82	178.69	150	Asbestos Cement	140	Pipe 563		WAT_Watermain_Table
95	J82	J83	48.7	150	Asbestos Cement	140	-	ssume same properties as pipe 56	F22019_WaterMap_NorthSat
96	J54	J84	160.9	200	Asbestos Cement	140	Pipe 541	Pipe 541 plus other pipes	F22019_WaterMap_NorthSat
97	J84	J85	55.86	200	Asbestos Cement	140	Pipe 542	As-built drawing only shows diameter of 150 mm	WAT_Watermain_Table
98	J84	J86	88.03	200	Asbestos Cement	140	Pipe 547		WAT_Watermain_Table
99	J84	J87	106.4	150	Asbestos Cement	140	-	ssume same properties as pipe 13	F22019_WaterMap_NorthSat
100	J86	J87	14.4	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
101	J87	J88	91.81	150	Asbestos Cement	140	Pipe 112		WAT_Watermain_Table
102	J88	J89	72.73	200	PVC	150	Pipe 941		WAT_Watermain_Table
103	J86	J90	210.34	200	Asbestos Cement	140	Pipe 535		WAT_Watermain_Table
104	J90	J91	41.91	200	Asbestos Cement	140	Pipe 533		WAT_Watermain_Table
105	J91	J92	88.39	150	Asbestos Cement	140	Pipe 498		WAT_Watermain_Table
106	J88	J93	132.00	150	Asbestos Cement	140	Pipe 520	Pipe 520 plus other pipes	F22019_WaterMap_NorthSat
107	J93	J94	127.25	150	Asbestos Cement	140	Pipe 524		WAT_Watermain_Table
108	J87	J95	79.3	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
109	J95	J73	90.0	200	Asbestos Cement	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
110	J95	J96	43.4	150	Unknown	140	Pipe 577	ssume same properties as pipe 58	F22019_WaterMap_NorthSat
111	J96	J76	141.91	150	Unknown	140	Pipe 594		WAT_Watermain_Table
112	J76	J97	94.2	150	Unknown	140	Pipe 583	Pipe 583 plus other pipes	F22019_WaterMap_NorthSat
113	J96	J97	189.8	150	Unknown	140	Pipe 577	Pipe 577 plus other pipes	F22019_WaterMap_NorthSat
114	J97	J98	159.9	150	Unknown	140	Pipe 589	Pipe 589 plus other pipes	F22019_WaterMap_NorthSat
115	J98	J99	68.82	150	PVC	150	Pipe 559		WAT_Watermain_Table
116	J98	J80	98.4	150	Asbestos Cement	140	Pipe 552	Pipe 552 plus other pipes	F22019_WaterMap_NorthSat
117	J80	J83	94.38	150	Asbestos Cement	140	Pipe 104		WAT_Watermain_Table
118	J83	J100	121.5	150	Asbestos Cement	140	Pipe 518	Part of pipe 518 and other pipes	F22019_WaterMap_NorthSat
119	J100	J101	99.6	150	Asbestos Cement	140	Pipe 518	Part of pipe 518	F22019_WaterMap_NorthSat
120	J99	J102	134.56	150	PVC	150	Pipe 661		WAT_Watermain_Table
121	J102	J101	67.06	150	PVC	150	Pipe 656		WAT_Watermain_Table
122	J99	J103	56.5	150	PVC	150	-	ssume same properties as pipe 55	F22019_WaterMap_NorthSat
123	J103	J104	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 63	F22019_WaterMap_NorthSat
124	J104	J105	94.2	150	Asbestos Cement	140	-	ssume same properties as pipe 62	F22019_WaterMap_NorthSat
125	J104	J106	105.32	50	PVC	150	Pipe 103		WAT_Watermain_Table
126	J103	J107	147.26	150	Asbestos Cement	140	Pipe 653		WAT_Watermain_Table
127	J107	J108	75.1	150	Unknown	140	Pipe 513	Part of pipe 513	F22019_WaterMap_NorthSat
128	J108	J109	69.9	150	Unknown	140	Pipe 513	Part of pipe 513 and other pipes	F22019_WaterMap_NorthSat
129	J109	J101	46.5	150	Unknown	140	-	ssume same properties as pipe 53	F22019_WaterMap_NorthSat
130	J107	J110	95.55	150	Unknown	140	Pipe 503		WAT_Watermain_Table
131	J110	J111	130.2	150	Unknown	140	Pipe 506	Pipe 506 plus other pipes	F22019_WaterMap_NorthSat
132	J111	J112	131.3	150	Unknown	140	Pipe 488	Part of pipe 488	F22019_WaterMap_NorthSat
133	J112	J113	178.9	150	Unknown	140	Pipe 488	Part of pipe 488 and other pipes	F22019_WaterMap_NorthSat
134	J113	J50	47.71	150	Unknown	140	Pipe 33		WAT_Watermain_Table
135	J50	J114	109.0	150	Asbestos Cement	140	Pipe 491	Pipe 491 plus other pipes	F22019_WaterMap_NorthSat
136	J114	J115	140.8	150	Asbestos Cement	140	Pipe 402	Pipe 402 plus other pipes	F22019_WaterMap_NorthSat
137	J114	J116	159.6	200	PVC	150	Pipe 24	Pipe 24 plus other pipes	F22019_WaterMap_NorthSat
138	J116	J117	143.1	200	PVC	150	Pipes 27 and 393	Pipes 27 and 392 plus other pipes	F22019_WaterMap_NorthSat
139	J117	J118	140.23	200	PVC	150	Pipe 385		WAT_Watermain_Table
140	J118	J119	71.63	150	PVC	150	Pipe 384		WAT_Watermain_Table
141	J114	J120	92.0	150	Asbestos Cement	140	Pipe 26	Pipe 26 plus other pipes	F22019_WaterMap_NorthSat
142	J120	J121	144.2	150	Asbestos Cement	140	Pipes 369 and 25	Pipes 369 and 25 plus other pipes	F22019_WaterMap_NorthSat
143	J121	J122	49.9	150	Asbestos Cement	140	Pipe 379		WAT_Watermain_Table
144	J122	J119	96.0	150	PVC	150	Pipe 23		WAT_Watermain_Table
145	J119	J123	106.0	150	PVC	150	Pipe 15		F22019_WaterMap_NorthSat
146	J123	J124	41.15	150	PVC	150	Pipe 19		WAT_Watermain_Table
147	J124	J125	137.16	150	Asbestos Cement	140	Pipe 28		WAT_Watermain_Table
148	J125	J126	137.16	150	Asbestos Cement	140	Pipes 29 and 410	As-built length for pipe 410	WAT_Watermain_Table
149	J126	J115	160.0	150	Asbestos Cement	140	Pipe 408	Pipe 408 plus other pipes	F22019_WaterMap_NorthSat
150	J115	J127	111.56	150	Asbestos Cement	140	Pipe 435		WAT_Watermain_Table
151	J123	J128	126.8	150	PVC	150	Pipes 11, 8, 4 and 6		F22019_WaterMap_NorthSat
152	J128	J129	85.3	150	Asbestos Cement	140	Pipe 425	Part of pipe 425	F22019_WaterMap_NorthSat
153	J129	J130	149.7	150	Asbestos Cement	140	Pipes 423 and 418	Part of pipes 423 and 418	F22019_WaterMap_NorthSat
154	J130	J131	170.4	150	Asbestos Cement	140	Pipe 422	Pipe 422 plus other pipes	F22019_WaterMap_NorthSat
155	J131	J127	119.8	50	Asbestos Cement	140	Pipe 434	Pipe 434 plus other pipes, as-built drawing shows diameter of 150 mm	F22019_WaterMap_NorthSat
156	J127	J132	100.0	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
157	J111	J132	93.87	150	Asbestos Cement	140	Pipe 484		WAT_Watermain_Table
158	J132	J133	106.9	150	Asbestos Cement	140	Pipe 450	Pipe 450 plus other pipes	F22019_WaterMap_NorthSat
159	J131	J133	99.1	150	Asbestos Cement	140	-	ssume same properties as pipe 43	F22019_WaterMap_NorthSat
160	J133	J134	173.6	150	Asbestos Cement	140	Pipe 457	Pipe 457 plus other pipes	F22019_WaterMap_NorthSat
161	J132	J135	188.4	150	Asbestos Cement	140	Pipe 469	Pipe 469 plus other pipes	F22019_WaterMap_NorthSat
162	J135	J134	130.9	150	Asbestos Cement	140	Pipe 465	Pipe 465 plus other pipes	F22019_WaterMap_NorthSat
163	J134	J136	141.1	150	Asbestos Cement	140	Pipe 458		WAT_Watermain_Table

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164	J136	J137	158.5	150	Asbestos Cement	140	Pipe 477		WAT_Watermain_Table
165	J137	J138	227.9	150	Asbestos Cement	140	Pipes 474 and 37		WAT_Watermain_Table
166	J138	J109	262.3	150	Asbestos Cement	140	Pipes 151 and 277	Pipes 151 and 277 plus other pipes	F22019_WaterMap_NorthSat
167	J101	J139	187.4	250	PVC	150	Pipe 551	Pipe 551 plus other pipes	F22019_WaterMap_NorthSat
168	J139	J140	140.13	250	PVC	150	Pipes 309 and 310		WAT_Watermain_Table
169	J140	J141	143.46	250	PVC	150	Pipe 930		WAT_Watermain_Table
170	J141	J142	569.8	250	PVC	150	Numerous	Assuming as-builts are correct, GIS shows some pipes as 37 mm	F22019_WaterMap_NorthSa t F22019_WaterMap_Mid
171	J142	J143	612.3	250	PVC	150	Pipes 330, 335 and 41	Pipes 330, 335 and 41 plus other pi	F22019_WaterMap_Mid
172	J143	J144	745.0	250	PVC	150	Pipes 145, 146, 147, 44 and 46		WAT_Watermain_Table
173	J144	J145	172.3	250	PVC	150	Pipe 55	Pipe 55 plus other pipes	F22019_WaterMap_Mid
174	J145	J146	206.0	250	PVC	150	Pipe 58		WAT_Watermain_Table
175	J146	J147	75.4	250	PVC	150	-	Assume same properties as pipe 5	F22019_WaterMap_Mid
176	J147	J148	103.0	250	PVC	150	Pipe 68		WAT_Watermain_Table
177	J148	J149	150.0	250	PVC	150	Pipe 71		WAT_Watermain_Table
178	J149	J150	222.0	250	PVC	150	Pipe 75	Pipe 75 plus other pipes	F22019_WaterMap_Mid
179	J147	J151	123.73	150	PVC	150	Pipe 66		WAT_Watermain_Table
180	J151	J152	158.6	150	PVC	150	Pipes 96 and 99		WAT_Watermain_Table
181	J152	J153	137.00	150	PVC	150	Pipe 93		WAT_Watermain_Table
182	J153	J154	91.5	150	PVC	150	Pipe 100		WAT_Watermain_Table
183	J154	J155	93.25	150	PVC	150	Pipe 84		WAT_Watermain_Table
184	J155	J156	129.0	150	PVC	150	Pipes 88 and 87		WAT_Watermain_Table
185	J156	J150	103.0	150	PVC	150	Pipe 83		WAT_Watermain_Table
186	J150	J157	161.1	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid
187	J157	J158	185.0	250	PVC	150	Pipe 316	Part of Pipe 316	F22019_WaterMap_Mid
188	J158	J159A	466.8	150	PVC	150	Pipe 279	Pipe 279 plus other pipes	F22019_WaterMap_South
189	J159	J160A	1933.9	150	CU	135	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300	Pipes 304, 306, 280, 281, 282, 285, 286, 288, 290, 291, 293, 295, 297, 298, 299 and 300 plus other pipes	F22019_WaterMap_South
189A	J160B	J160	929.5	150	CU	135	Pipes 301, 302, 315 and 313	Pipes 301, 302, 315 and 313 plus other pipes	F22019_WaterMap_South
190	J161	J162	101.6	200	PVC	150	Pipe 196	Pipe 196 plus other pipes	F22019_WaterMap_South
191	J162	J163	149.2	200	PVC	150	Pipe 312	Pipe 312 plus other pipes	F22019_WaterMap_South
192	J163	J164	87.8	150	PVC	150	Pipe 199	Pipe 199 plus other pipes	F22019_WaterMap_South
193	J164	J165	75.1	150	PVC	150	Pipe 197	Pipe 197 plus other pipes	F22019_WaterMap_South
194	J164	J166	136.0	150	PVC	150	Pipe 153		WAT_Watermain_Table
195	J166	J167	177.0	150	PVC	150	Pipe 156		F22019_WaterMap_South
196	J167	J165	141.39	150	PVC	150	Pipes 165 and 166		WAT_Watermain_Table
197	J165	J168	207.4	150	PVC	150	Pipes 311 and 175	Pipes 311 and 175 plus other pipes	F22019_WaterMap_South
198	J168	J169	167.6	150	PVC	150	Pipes 177 and 178	Pipes 177 and 178 plus other pipes	F22019_WaterMap_South
199	J169	J163	183.1	150	PVC	150	Pipe 182	Pipe 182 plus other pipes	F22019_WaterMap_South
200	J163	J170	166.5	200	PVC	150	Pipe 255	Pipe 255 plus other pipes	F22019_WaterMap_South
201	J170	J171	233.5	150	PVC	150	Pipes 275 and 276	Pipes 275 and 276 plus other pipes	F22019_WaterMap_South
202	J170	J172	122.8	200	PVC	150	Pipe 263	Pipe 263 plus other pipes	F22019_WaterMap_South
203	J172	J173	81.3	200	PVC	150	Pipe 267	Pipe 267 plus other pipes	F22019_WaterMap_South
204	J173	J174	128.8	200	PVC	150	Pipe 273	Pipe 273 plus other pipes	F22019_WaterMap_South
205	J174	J175	178.9	200	PVC	150	Pipe 216	Pipe 216 plus other pipes	F22019_WaterMap_South
206	J175	J176	88.8	200	PVC	150	Pipe 222	Pipe 222 plus other pipes	F22019_WaterMap_South
207	J175	J177	89.4	150	PVC	150	Pipe 235	Pipe 235 plus other pipes	F22019_WaterMap_South
208	J173	J178	102.50	150	PVC	150	Pipe 207		WAT_Watermain_Table
209	J178	J177	68.68	150	PVC	150	Pipe 210		WAT_Watermain_Table
210	J177	J179	96.0	150	PVC	150	Pipe 242	Part of pipe 242 and other pipes	F22019_WaterMap_South
211	J172	J180	59.5	150	PVC	150	-	Assume same properties as pipe 20	F22019_WaterMap_South
212	J180	J179	116.3	150	PVC	150	Pipe 205		F22019_WaterMap_South
213	J179	J181	72.78	150	PVC	150	Pipe 242		WAT_Watermain_Table
214	J181	J182	148.8	150	PVC	150	Pipe 246	Pipe 235 plus other pipes	F22019_WaterMap_South
215	J118	J183	235	150	PVC	150	-	Existing watermain plus part of WM	Google Earth estimate
216	J183	J16	85	150	PVC	150	-	Part of WM extension	Google Earth estimate
217	J49	J184	152.5	150	PVC	150	-	New WM	Zoning map estimate
218	J184	J185	73.5	150	PVC	150	-	New WM	Zoning map estimate
219	J185	J186	281.2	150	PVC	150	-	New WM	Zoning map estimate
220	J184	J187	203.4	150	PVC	150	-	New WM	Zoning map estimate
221	J187	J188	98.2	150	PVC	150	-	New WM	Zoning map estimate
222	J185	J188	206.4	150	PVC	150	-	New WM	Zoning map estimate
223	J188	J186	102.1	150	PVC	150	-	New WM	Zoning map estimate
224	J186	J183	103.8	150	PVC	150	-	New WM	Zoning map estimate

Assuming CU is copper

Yellow cells are assumed values

EPANet Future Residential plus Industrial Model Inputs

Wawa W&WW Master Plan
M22019
P. King

						Water Model Calculations				Flow Meter Data			
Water Model Node	**ICI Uses**	**Address**	**Type**	**Footprint (m2)**	**Footprint (ha)**	**Estimated Occupancy**	**Units**	**Flow Rate**	**ADD (L/day)**	**Average (L/day)**	**ADD (L/day)**	**Design ADD (L/day)**	**Notes**
J1A	Water Treatment Plant	40C Broadway Ae.	Industrial	1828	0.1828	-	m3/ha/d	45	8226			8226	
	LCBO		Commercial										
	Algoma Public Health	16 Ganley St.	Commercial - Office							4067	4881	4881	
J5	Home Town Wines		Commercial - Personal Service Shop	1262	0.1262	11	L/p/d	278.0	3017				
	Superior East Community Futures Development Corporation		Commercial - Office										
	Algoma District Services Administration Board	52 Broadway Ave.	Commercial - Office							0	0	0	
	North Algoma Literacy Colaition	50B Broadway Ave.	Commercial - Office							231	277	277	
J6	Garage Behind Bowling Alley	Ganley St.	Storage Garage	137	0.0137	3	L/p/d	75	223			223	
J7	Low Lift Pumping Station	-	Industrial	616	0.0616	-	m3/ha/d	45	2772			2772	
	The Thrift Barn	45 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	635	762	762	
	Square Three	43 Broadway Ave.	Commercial	494	0.0494	4	L/p/d	278.0	1181	60	72	72	
	The Brick	41 Broadway Ave.	Commercial	488	0.0488	4	L/p/d	278.0	1167	28	33	33	
	Sonia Video	39 Broadway Ave.	Commercial	497	0.0497	4	L/p/d	278.0	1189			1189	
	The Co-operators	37 Broadway Ave.	Commercial - Office	536	0.0536	5	L/p/d	278.0	1281	3068	3681	3681	
J8	Alzheimers Society		Commercial - Office										
	Canada Post Office	44 Broadway Ave.	Commercial	971	0.0971	8	L/p/d	278.0	2321	441	529	529	
	OPP Station	42 Broadway Ave.	Commercial - Office										
	Municipal Offices	40 Broadway Ave.	Commercial - Office	1389	0.1389	12	L/p/d	278.0	3321	2036	2443	2443	
	Public Library	40 Broadway Ave.	Commercial										
	Wawa Volunteer Fire Department	12 Ontario St.	Storage Garage	480	0.0480	10	L/p/d	75	783			783	
	March of Dimes Canada	31 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	757	908	908	
	Northern Vision Care	29 Broadway Ave.	Commercial - Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	600	720	720	
	Lai's Restaurant	27 Broadway Ave.	Commercial - Dining	460	0.046	4	L/p/d	278.0	1100	4066	4879	4879	
J9	Empty Building	25 Broadway Ave.	Storage	426	0.0426	9	L/p/d	75	695			695	
	SpikeMills Art Gallery	28 Broadway Ave.	Commercial	227	0.0227	2	L/p/d	278.0	543				
	Lakeview Hotel - Hotel Rooms	28 Broadway Ave.	Hotel	-	-	31	L/bed-space-day	225	6975	10459	12550	12550	7 one bed rooms, 7 double bed rooms, 5 apartment rooms (assuming 2 beds)
	Lakeview Hotel - Motel Rooms	28 Broadway Ave.	Motel	-	-	22	L/bed-space-day	175	3850				11 motel rooms (assuming 2 beds)
	Lakeview Restaurant	28 Broadway Ave.	Commercial - Dining	173	0.0173	1	L/p/d	278.0	414				Assuming second floor of part of the building
	Iris Place	21 Broadway Ave.	Commercial	552	0.0552	5	L/p/d	278.0	1320			1320	
	Empty Building	16 Broadway Ave.	Storage	150	0.015	3	L/p/d	75	245			245	
J10	Beachfront Trading Post	14 Broadway Ave.	Commercial	464	0.0464	4	L/p/d	278.0	1109	18032	21638	21638	
	Canadian Red Cross	4 Broadway Ave.	Commercial - Office	929	0.0929	8	L/p/d	278.0	2221	67	81	81	
	Public Washrooms	15 Broadway Ave.	Commercial	897	0.0897	8	L/p/d	278.0	24937	267	321	321	
	Garage	2 Broadway Ave.	Storage Garage	193	0.0193	4	L/p/d	75	315	563	676	676	
J11	Calvary Penecostal Church	12 Government Rd.	Commercial - Fixed Seats	1410	0.141	31	L/p/d	278.0	8521	412	495	495	Included as commercial, measured with google earth as house on same lot
	Lady Dunn Health Centre	17 Government Rd.	Hospital	-	-	28	L/(bed-day)	1350	37800	24275	29130	29130	10 acute care beds, 2 respite beds, and 16 long term care beds
J13	Garage	17 Government Rd.	Storage Garage	202	0.0202	4	L/p/d	75	329	3	4	4	Assume this is the small meter for 17 Government Rd.
	Algoma District Paramedic Service	Government Rd.	Commercial Office	364	0.0364	3	L/p/d	278.0	871			871	
J17	Leverington's Garden Centre	130 Government Rd.	Industrial - Process Room	3923	0.3923	-	m3/ha/d	45	17654	351	422	422	Residential in water meter data
J18	Lloyd's of Wawa	165 Government Rd.	Storage Garage	477	0.0477	10	L/p/d	75	778	17	20	20	
	Wagging Tails Kennel	171 Government Rd.	Commercial	296	0.0296	3	L/p/d	278.0	708	677	813	813	
	Everything Floors Ltd.	9 Mackey St.	Commercial	575	0.0575	5	L/p/d	278.0	1375	950	1140	1140	
J19	Wawa Handy Store	19 Mackey St.	Commercial	456	0.0456	4	L/p/d	278.0	1090	9194	11033	11033	
	Empty Building	Mackey St.	Storage Garage	660	0.066	14	L/p/d	75	1076			1076	
J20	United Supply/Swish	4 McKinley Ave.	Commercial	688	0.0688	6	L/p/d	278.0	1645	155	186	186	
	Superior North Mobile Vetrinary Service	23 Mackey St.	Commerial - Personal Service Shop	464	0.0464	4	L/p/d	278.0	1110			1110	
J21	A Touch of Glass	25 Mackey St.	Commercial - Personal Service Shop	235	0.0235	2	L/p/d	278.0	562			562	
	Sir James Dunn Public School	36 McKinley Ave.	School	-	-	87	L/student/d	105	9135	8595	10314	10314	87 students and 21 staff
J24	Children's Aid Society of Algoma	31 Algoma St.	Commercial - Office	147	0.0147	1	L/p/d	278.0	351	135	162	162	
J25	Bell	56 Ganley St.	Commercial	930	0.093	8	L/p/d	278.0	2223	9	10	10	
	Wawa Laundromat	44 Mackey St.	Commercial	465	0.0465	4	L/p/d	278.0	1112	1907	2289	2289	
J30	Old Garage	62 Mackey St.	Storage Garage	230	0.0230	5	L/p/d	75	375			375	
J31	Superior Children's Centre	41 Algoma St.	Daycare	665	0.0665	6	L/p/d	278.0	1590	759	910	910	Assumed like commercial; Included as residential in water meter data
J34	Paint + Glass	Caverhill St.	Storage	275	0.0275	6	L/p/d	75	448			448	
	Creation Hairstyling	75A McKinley Ave.	Commercial-Personal Service Shop	232	0.0232	2	L/p/d	278.0	555	601	721	721	Assumed half of lot
J35	Home	75 McKinley Ave.	Commercial	232	0.0232	2	L/p/d	278.0	555	332	398	398	Assumed half of lot
J36	Sam's Place	84 McKinley Ave.	Commercial-Personal Service Shop	465	0.0465	4	L/p/d	278.0	1112	652	783	783	
J41	St. Paul's Anglican Church	60 Second Ave.	Commercial - Fixed Seats	930	0.0930	8	L/p/d	278.0	2223	148	178	178	
J49	Michipicoten Non-Profit Housing	40 Hillcrest Ave.	Commercial - Office	293	0.0293	3	L/p/d	278.0	701	994	1193	1193	Included as multi-residential in water meter data
	Canadian Tire	54 Broadway Ave.	Commercial	2524	0.2524	22	L/p/d	278.0	6034	6145	7374	7374	
	Dawson & Keenan	56 Broadway Ave.	Commercial - Office	465	0.0465	4	L/p/d	278.0	1112	8864	10637	10637	
J51	Roxy Bowling Centre	49 Broadway Ave.	Commercial	632	0.0632	5	L/p/d	278.0	1511	811	973	973	
	The Royal Canadian Legion	51 Broadway Ave.	Commercial	567	0.0567	5	L/p/d	278.0	1356	9272	11127	11127	Included as residential in water meter data
	Sam's Foodline	55 Broadway Ave.	Commercial	1990	0.1990	17	L/p/d	278.0	4757			4757	
	Allemano & Fitzgerald	55 Broadway Ave.	Commercial - Office	301	0.0301	3	L/p/d	278.0	719			719	
	Feifel, Broadbent and Gualazzi	57 Broadway Ave.	Commercial - Office	277	0.0277	2	L/p/d	278.0	662	1	1	1	
	Wawa Jewellers	59 Broadway Ave.	Commercial	376	0.0376	3	L/p/d	278.0	899	111	134	134	
	The Bargain! Shop	60 Broadway Ave.	Commercial	930	0.093	8	L/p/d	278.0	2223	242	290	290	
	AJ's Pizza & Wholesale	64 Broadway Ave.	Commercial - Kitchen	475	0.0475	4	L/p/d	278.0	1136	322	386	386	
	Best Start Hub	66 Broadway Ave.	Daycare	383	0.0383	3	L/p/d	278.0	916	673	807	807	Assumed like commercial; Included as residential in water meter data

EPANet Future Residential plus Industrial Model Inputs

	North of 17 Restaurant	68 Broadway Ave.	Commercial - Dining	753	0.0753	6	L/p/d	278.0	1800	4002	4803	4803	
	Embassy Restaurant	70 Broadway Ave.	Commercial - Dining	486	0.0486	4	L/p/d	278.0	1162	1798	2158	2158	
	RBC Royal Bank	72 Broadway Ave.	Commercial - Personal Service Shop	480	0.048	4	L/p/d	278.0	1148	595	714	714	
J52	Wawa Dental Centre	27A Gold St.	Commercial - Personal Service Shop	1007	0.1007	9	L/p/d	278.0	2408	1982	2378	2378	
	Wawa Pharmacy		Commercial										
	Wawa Goose Senior Centre	63 Broadway Ave.	Commercial	460	0.0460	4	L/p/d	278.0	1100	676	812	812	
	Barber Shop		Commercial - Personal Service Shop										
	U Wanna Cab	65 Broadway Ave.	Commercial - Office	457	0.0457	4	L/p/d	278.0	1093	429	514	514	
	Regional Employment Help Centre		Commercial - Office										
	Chic'N Swell	67 Broadway Ave.	Commercial - Personal Service Shop	462	0.0462	4	L/p/d	278.0	1105	383	459	459	
	Guided Fishing Trips		Commercial - Office										
	Columbia Restaurant & Pizzeria	71 Broadway Ave.	Commercial - Dining	462	0.0462	4	L/p/d	278.0	1105	3642	4370	4370	
	Parish of St. Monica	78 Broadway Ave.	Commercial - Fixed Seats	1859	0.1859	16	L/p/d	278.0	4444	259	311	311	2 water meters for this address, assume both are for the Church
	The Algoma News Review	33 St. Marie St.	Commercial	833	0.0833	7	L/p/d	278.0	1992	478	573	573	
	ANP Office Supply		Commercial										
J53	Fenlon's Pharmacy	88 Broadway Ave.	Commercial	1298	0.1298	11	L/p/d	278.0	3103	1468	1761	1761	
	Northern	Broadway Ave.	Commercial	1407	0.1407	12	L/p/d	278.0	3363			3363	
	Yellow Building	Broadway Ave.	Storage	132	0.0132	3	L/p/d	75	215			215	
	Algoma Family Services	26 St. Marie St.	Commercial - Office	833	0.0833	7	L/p/d	278.0	1992	1835	2201	2201	2 water meters for this address
	Bangin Burger N Chicken Shack	92 Broadway Ave.	Commercial - Kitchen	465	0.0465	4	L/p/d	278.0	1112	182	219	219	
J54	Economic Development Corporation of Wawa	96 Broadway Ave.	Commercial - Office	930	0.0930	8	L/p/d	278.0	2223	3168	3801	3801	Assume 50% of building
	JJAM FM		Commercial - Office										Assume 50% of building
	Ontario Mine Rescue Algoma District Station	36 Montreal Ave.	Commercial - Office	1463	0.1463	13	L/p/d	278.0	3498	0	0	0	
J69	Garage	42 Montreal Ave.	Storage Garage	504	0.0504	11	L/p/d	75	822	40	49	49	Assuming this is 42, although streetview shows 40 and no 42
	Municipality of Wawa Infrastructure Services Department	26 Magpie Rd.	Commercial - Office	3503	0.3503	30	L/p/d	278.0	8375	1842	2211	2211	2 water meters for this address, assume both are for this building
	The Shop	46 Montreal Ave.	Commercial	1227	0.1227	11	L/p/d	278.0	2934	977	1172	1172	
J71	Millette General Contractors Ltd.	Montreal Ave.	Commercial	1040	0.1040	9	L/p/d	278.0	2487			2487	
	The Ship Boy Scouts Wawa Rotary Club	Montreal Ave.	Commercial - Office	55	0.0055	0	L/p/d	278.0	133			133	
J75	Home	12 Klondike St.	Commercial	138	0.0138	1	L/p/d	278.0	330	238	286	286	
	Garage		Storage Garage	289	0.0289	6	L/p/d	75	471				
J77	Garage	142 Broadway Ave.	Storage Garage	361	0.0361	8	L/p/d	75	589	537	645	645	
	Garage		Storage Garage	182	0.0182	4	L/p/d	75	297				
J82	Mobile Home Park	Trailer Park Rd.	Mobile Home Park	-	-	23	L/space/d	1000	23000	15505	18606	18606	
	Ecole Publique L'Escalade	52 Winston Rd.	School	-	-	10	L/student/d	105	1050	244	293	293	10 students and 5 staff
J84	First United Church	224 Mission Rd.	Commercial - Fixed Seats	2189	0.2189	19	L/p/d	278.0	5233	22	26	26	
	Circle K	208D Mission Rd.	Commercial							463	555	555	
J86	Northern Credit Union	208 Mission Rd.	Commercial - Personal Service Shop	2031	0.2031	17	L/p/d	278.0	4856	126	151	151	
	Empty Store	208 Mission Rd.	Commercial							89	107	107	
J87	Watson's Algoma Vacations Ltd.	195 Mission Rd.	Office	1041	0.1041	9	L/p/d	278.0	2489	851	1021	1021	
J88	Big Bird Inn	191 Mission Rd.	Hotel	-	-	90	L/bed-space-day	225	20250	1643	1972	1972	50 rooms, 40 double beds and 10 single beds
	Independent Grocery Store	186 Mission Rd.	Commercial	3291	0.3291	28	L/p/d	278.0	7868	1034	1240	1240	
	Subway	179 Mission Rd.	Commercial - Dining	2139	0.2139	18	L/p/d	278.0	5114	2980	3576	3576	
J89	Movie Gallery		Commercial										
	The Viking Restaurant	177 Mission Rd.	Commercial - Dining	1818	0.1818	16	L/p/d	278.0	4346	233	280	280	
	Polish Alliance of Canada	Mission Rd.	Commercial - Non-Fixed Seats and Tables	1364	0.13641583	12	L/p/d	278.0	3261			3261	
J91	Michipicoten High School	86 Magpie Rd.	School	-	-	100	L/student/d	105	10500	10326	12392	12392	120 people, guessing around 100 are students; 2 water meters for this address
J92	St. Augustine	2 Arnott Ave.	School	-	-	100	L/student/d	105	10500	587	704	704	Similar to Michipicoten High School
J99	Outdoorsman Motel	171 Mission Rd.	Motel	-	-	55	L/bed-space-day	175	9625	5094	6113	6113	37 rooms and 55 beds
J100	Kingdom Hall of Jehovah's Witness	54 Winston Rd.	Commercial - Fixed Seats	929	0.0929	8	L/p/d	278.0	2221	151	181	181	
	Wawa Rent-all and Repair	58 Winston Rd.	Commercial	1465	0.1465	13	L/p/d	278.0	3503	305	366	366	
J101	Garage	60 Winston Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331			331	
	Gator's Steakhouse Building	47 Mission Rd.	Commercial - Office	2023	0.2023	17	L/p/d	278.0	4837			4837	
J102	T Cannabis	152 Mission Rd.	Commercial	1302	0.1302	11	L/p/d	278.0	3113	1410	1692	1692	
	Beer Store	156 Mission Rd.	Commercial	1990	0.199	17	L/p/d	278.0	4758	3176	3811	3811	
J103	Algoma Motel	164 Mission Rd.	Motel	-	-	26	L/bed-space-day	175	4550	3124	3748	3748	https://www.algomamotel.com/#gallery (705-856-7010)
	Bristol Motel	170 Mission Rd.	Motel	-	-	32	L/bed-space-day	175	5600	4564	5477	5477	Can't get working phone number or email
J109	Kerry Funeral Home	140 Churchill Ave.	Commercial - Fixed Seats	651	0.0651	6	L/p/d	278.0	1556	925	1110	1110	
	Beaver Motel	148 Mission Rd.	Motel	-	-	25	L/bed-space-day	175	4375	3116	3740	3740	6 double rooms and 13 single rooms
J111	Ecole St. Joseph	101 Churchill Ave.	School	-	-	205	L/student/d	105	21525	1934	2320	2320	205 students and 32 staff
J120	Confederation College Building	3 Maple St.	Storage	964	0.0964	21	L/p/d	75	1572	495	594	594	2 water meters for this address
J137	Lion's Club	51 Superior Ave.	Commercial - Non-Fixed Seats and Tables	236	0.0236	2	L/p/d	278.0	564	85	103	103	Included as residential in water meter data
	Michipicoten Memorial Community Centre	3 Chris Simon Dr.	Space with Fixed Seats	5838	0.5838	50	L/p/d	278.0	13957	6454	7744	7744	
J138	Wawa Motor Inn	118 Mission Rd.	Motel	-	-	175	L/bed-space-day	175	30625	40407	48488	48488	Assumed higher flow rate for motel
	Wawa Motor Inn - Wawa Goose Bar & Grill	118 Mission Rd.	Commercial - Dining	615	0.0615	5	L/p/d	278.0	1470	1947	2336	2336	Assumed lower flow rate for restaurant
	Petro Canada	137 Mission Rd.	Commercial	2151	0.2151	18	L/p/d	278.0	5143	781	937	937	
J139	Northern Chiropractic	135 Mission Rd.	Commercial - Personal Service Shop	135	0.0135	1	L/p/d	278.0	323	142	170	170	
	Krazy Fries	135B Mission Rd.	Commercial - Kitchen	71	0.0071	1	L/p/d	278.0	170	73	88	88	
J140	Small Station	Mission Rd.	Industrial	38	0.0038	-	m3/ha/d	45	171			171	
	Home Building Centre Garage	109 Mission Rd.	Storage Garage	203	0.0203	4	L/p/d	75	331	98	118	118	
J141	Home Building Centre		Commercial	885	0.0885	8	L/p/d	278.0	2116				
	Young's General Store	111 Mission Rd.	Commercial	2021	0.2021	17	L/p/d	278.0	4832	2462	2954	2954	
	Lagoon Building	Road to Golf Course	Industial	201	0.0201	-	m3/ha/d	45	905			905	A tap is used here to flush the line according to Municipality.
	Canco	125 Mission Rd.	Commercial	2083	0.2083	18	L/p/d	278.0	4980	1621	1946	1946	Think this address is Canco from online search although it doesn't match up with map
J142	Wesdome	93 Mission Rd.	Industrial	373	0.0373	-	m3/ha/d	45	1679	464	557	557	

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J142	Garages	89 Mission Rd.	Storage Garage	515	0.0515	11	L/p/d	75	840	151	181	181	
	Tim Hortons	92 Mission Rd.	Commercial - Dining	7977	0.7977	69	L/p/d	278.0	19071	4507	5409	5409	
	New Industrial Area	East of Mission Rd.	Industrial	180000	18	-	m3/ha/d	45	810000			810000	
	Mission Motors	61 Mission Rd.	Commercial	715	0.0715	6	L/p/d	278.0	1709	1425	1710	1710	
	Service Ontario	48 Mission Rd.	Commercial - Personal Service Shop	1204	0.1204	10	L/p/d	278.0	2879	947	1137	1137	Assume first 48 Mission road is Service Ontario
	Ontario Ministry of Natural Resources	48 Mission Rd.	Commercial - Office	394	0.0394	3	L/p/d	278.0	942	8	9	9	Assume second 48 Mission Road is OMNR
	Government Storage Garages (x7)	48 Mission Rd.	Storage Garage	2321	0.2321	50	L/p/d	75	3784	5911	7093	7093	Assume third 48 Mission Road is for other buildings
J143	Storage Sheds on Highway 17 W	Highway 17 W	Storage Garage	2506	0.2506	54	L/p/d	75	4086	792	950	950	Only facility on highway 17 that looks like it could have an in-town service connection
	Wawa Municipal Airport	27A Mission Rd.	Commercial	224	0.0224	2	L/p/d	278.0	536	577	692	692	Assume 27A is for the main building; has three water meters
		27B Mission Rd.	Storage Garage	192	0.0192	4	L/p/d	75	313	105	126	126	Assume 27B is for the garage and hanger
			Aircraft Hanger	555	0.0555	12	L/p/d	75	905				Assume 27B is for the garage and hanger
	Tourist Information Centre	Mission Rd.	Shopping Centre	334	0.0334	3	L/p/d	278.0	799	501	602	602	Added three meters on Mission roads without addresses here as it is furthest distance.
J147	Trans Canada Chrysler	74 Pinewood Dr.	Commercial	875	0.0875	8	L/p/d	278.0	2092	1076	1291	1291	
J148	Fountain Tire	70 Pinewood Dr.	Commercial	2708	0.2708	23	L/p/d	278.0	6474	1045	1254	1254	
	Family Kitchen Restaurant Building	Pinewood Dr.	Storage	389	0.0389	8	L/p/d	75	634			634	
J149	Esso Gas Station	54 Pinewood Dr.	Commercial	234	0.0234	2	L/p/d	278.0	559	354	425	425	Assume one of 54 Pinewood Dr. Buildings
	Davidson Fuels	54 Pinewood Dr.	Commercial	393	0.0393	3	L/p/d	278.0	940	2726	3272	3272	Assume one of 54 Pinewood Dr. Buildings
	Highway 17 Hotel	42 Pinewood Dr.	Hotel	-	-	76	L/bed-space-day	225	17100	8422	10106	10106	46 rooms and 76 beds
J150	OPP Station	34 Pinewood Dr.	Commerial - Office	674	0.0674	6	L/p/d	278.0	1611	327	392	392	
	Gardewine	100 Mills Dr.	Storage Garage	735	0.0735	16	L/p/d	75	1198	71	85	85	
J151	Superior Truck Repair Centre	167 Mills Dr.	Storage Garage	967	0.0967	21	L/p/d	75	1577	323	388	388	Assume one of 167 Mills Dr. Buildings
	Lakehead Freightway/Manitoulin Transport	167 Mills Dr.	Storage Garage	409	0.0409	9	L/p/d	75	667	44	53	53	Assume one of 167 Mills Dr. Buildings
J152	U-Haul Dealer	160 Mills Dr.	Commercial	496	0.0496	4	L/p/d	278.0	1186	297	356	356	Assuming U-Haul Dealer is the northeast building on Mills Dr., lot estimated with google ea
J154	Martel Customs	128 Mills Dr.	Industrial	83	0.0083	-	m3/ha/d	45	374	0	0	0	Assuming this is the small building on south side of Mills Dr.
J155	Red Roof Building	120 Mills Dr.	Storage Garage	377	0.0377	8	L/p/d	75	615	403	484	484	
	Red Roof Building #2	Mills Dr.	Storage Garage	488	0.0488	11	L/p/d	75	796			796	
J156	Building on cul-de-sac	White Dr.	Storage Garage	283	0.0283	6	L/p/d	75	461			461	Can't see on GIS imagery, looks about 3/4 the size of the smaller red roof building
	Northstar Fusion	16 White Dr.	Industrial	10500	1.0500	-	m3/ha/d	45	47250			47250	Measured with google earth, size of facility not sure if it is all building
	Evolugen	105 Mills Dr.	Industrial	835	0.0835	-	m3/ha/d	45	3758	3089	3707	3707	
J157	Algoma Storage	30 Pinewood Dr.	Storage	1086	0.1086	24	L/p/d	75	1771	9	11	11	
J158	Algoma Highlands Wild Blueberry Farm	1 Pinewood Dr.	Industrial - Process Room	3506	0.3506	-	m3/ha/d	45	15777	382	458	458	
J160A	Jones Power Sports	320 Highway 17	Commercial	362	0.0362	3	L/p/d	278.0	865	521	625	625	
	High Falls Motel & Cabins	280 Highway 17	Motel	-	-	18	L/bed-space-day	175	3150	1106	1327	1327	Two water meters for this address; info@highfallsmotelandcabins.com
J161	Water Tower and Pumping Station	Princess Ave.	Industrial	1400	0.14	-	m3/ha/d	45	6300			6300	Measured with google earth
J163	Your Room is Ready!	323 Hardy Ave.	Hotel	-	-	4	L/bed-space-day	225	900	401	481	481	https://yourroomisready.business.site/?utm_source=gmb&utm_medium=referral
J171	Wood Land Masonic Lodge	308 Magpie Rd.	Commercial - Fixed Seats	75	0.0075	1	L/p/d	278.0	179	27	32	32	Measured with google earth
	Shed on Superior St.	Superior St.	Storage Garage	86	0.0086	2	L/p/d	75	140			140	
J176	Buck's Marina	360 Superior St.	Commercial	348	0.0348	3	L/p/d	278.0	832			832	Measured with google earth
			Storage Garage	546	0.0546	12	L/p/d	75	890			890	
	Small Building on Superior St.	Superior St.	Industrial	300	0.03	-	m3/ha/d	45	1350			1350	Measured with google earth
			Total	1436829						294992	353990	1263716	
									In-town		329244	1180316	

*Footprints highlighted orange use building size instead of lot size

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Reserviors

Name	Elevation (m)	Notes	Source
Res1	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38
Res2	291.5	HWL: 292.55 m, LWL: 287.05 m	2531A38

Nodes

Name	Elevation (m)	Source
S1	294.3	2531A38
S2	294.3	2531A38
S3	294.3	2531A38
S4	294.3	2531A38
D1	294.3	2531A38
D2	294.3	2531A38
D3	294.3	2531A38
D4	294.3	2531A38
D5	294.3	2531A38

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PS1	RES1	S1	5	200	Stainless Steel	140
PS2	RES1	S2	5	250	Stainless Steel	140
PS3	RES2	S3	5	200	Stainless Steel	140
PS4	RES2	S4	5	250	Stainless Steel	140
PD1	D1	D5	5	200	Stainless Steel	140
PD2	D2	D5	5	250	Stainless Steel	140
PD3	D3	D5	5	200	Stainless Steel	140
PD4	D4	D5	5	250	Stainless Steel	140
PD5	D5	J1A	10	400	Stainless Steel	140

Pumps

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario 3	
Tag #	Name	Start	End	Curve	Status	Curve	Status	Curve	Status	Curve	Status	Curve	Status
HLP-6201	PUMP1	S1	D1	CURVE4	Open	CURVE4	Open	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6301	PUMP2	S2	D2	CURVE2	Closed	CURVE2	Closed	CURVE2	Open	CURVE2	Open	CURVE2	Open
HLP-6501	PUMP3	S3	D3	CURVE1	Closed	CURVE1	Closed	CURVE1	Open	CURVE1	Open	CURVE1	Open
HLP-6601	PUMP4	S4	D4	CURVE5	Closed	CURVE6	Open	CURVE2	Open	CURVE2	Open	CURVE2	Open

Curves
CURVE1

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6201/6501	1185	0	225	0	68.58
		200	212	12.62	64.62
		400	204	25.24	62.18

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		600	196	37.85	59.74
		800	189	50.47	57.61
		1000	178	63.09	54.25
		1200	164	75.71	49.99
		1400	144	88.33	43.89
		1600	119	100.94	36.27

CURVE2

Pumps	RPM	Flow (GPM)	Head (Ft)	Flow (LPS)	Head (m)
HLP-6301/6601	1185	0	250	0	76.20
		200	240	12.62	73.15
		400	228	25.24	69.49
		600	216	37.85	65.84
		800	206	50.47	62.79
		1000	198	63.09	60.35
		1200	190	75.71	57.91
		1400	180	88.33	54.86
		1600	171	100.94	52.12
		1800	160	113.56	48.77
		2000	143	126.18	43.59
		2200	118	138.80	35.97

$$\frac{Q1}{Q2} = \frac{RPM1}{RPM2}$$

$$\frac{H1}{H2} = \frac{RPM1^2}{RPM2^2}$$

$$\frac{P1}{P2} = \frac{RPM1^3}{RPM2^3}$$

-law-for-centrifugal-pump-pump-affinity-laws/

CURVE4

Pump	RPM	Flow (LPS)	Head (m)
HLP-6201	1125	0.00	61.81
		11.98	58.24
		23.96	56.04
		35.94	53.84
		47.92	51.92
		59.90	48.90
		71.87	45.05
		83.85	39.56
		95.83	32.69

CURVE5

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1075	0	62.71
		11.45	60.20
		22.89	57.19
		34.34	54.18
		45.79	51.67
		57.23	49.67
		68.68	47.66
		80.13	45.15
		91.57	42.89
		103.02	40.13
		114.47	35.87
		125.91	29.60

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CURVE6

Pump	RPM	Flow (LPS)	Head (m)
HLP-6601	1125	0.00	68.68
		11.98	65.93
		23.96	62.64
		35.94	59.34
		47.92	56.59
		59.90	54.39
		71.87	52.20
		83.85	49.45
		95.83	46.98
		107.81	43.95
		119.79	39.28
		131.77	32.42

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Valves

Name	Start	End	Diameter (mm)	Type	Setting (m)	Drawing
VALVE1	J159A	J159	150	PRV	18.5975	A1-2002-62-P5
VALVE2	J160A	J160B	150	PRV	11.4650	A1-2002-62-P2

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Nodes

Name	Elevation (m)	Source
FS	290.6	Between nodes J101 and J139
FD	290.6	Between nodes J101 and J139

Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PFS	J101	FS	150	250	Stainless Steel	140
PFD	FD	J139	37.4	250	Stainless Steel	140

Pump

				ADD		MDD		FF Scenario 1		FF Scenario 2		FF Scenario3	
Name	**Start**	**End**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**	**Curve**	**Status**
PUMP5	FS	FD	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Closed	CURVE3	Open

Curves

Name	Flow (LPS)	Head (m)
CURVE3	47.9	21.9

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Pipes

Name	Start	End	Length (m)	Diameter (mm)	Material	HW Roughness Coefficient
PWT1	JFS	TANK1	4	50	Stainless Steel	140
PWT2	TANK1	J161	4	200	Stainless Steel	140

Tank

Name	Elevation	Initial Level	Minimum Level (m)	Maximum Level (m)	Diameter (m)	
TANK1	205.1	41.5	40	61	4.1203	*Municipality said normal levels are between 40 and 43m

Node

Name	Elevation (m)
FS	205.1

FV

Diameter	Setting	Status	
50	10	None	*Can be none or closed, will impact flow rate
			**If status is open then no flow restriction will occur

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Nodes

Name	Elevation (m)	Scenario 1 Flow (L/s)	Scenario 2 Flow (L/s)	Scenario 3 Flow (L/s)
JFF1	293.02	38	0	0
JFF2	289.57	38	20.10	0
JFF3	293.32	38	38	0
JFF4	289.4	0	38	38
JFF5	288.4	0	38	38
JFF6	280.6	0	0	38
JFF7	194.5	0	0	38
JFF8	293.76	38	0	0
JFF9	291.23	20.10	38	20.10
		172.10	172.10	172.10

Pipes

Name	Start	End	Length (m)	Diameter (mm)	HW Roughness Coefficient
PIPEFF1	J18	JFF1	1	1000	200
PIPEFF2	J118	JFF2	1	1000	200
PIPEFF3	J53	JFF3	1	1000	200
PIPEFF4	J92	JFF4	1	1000	200
PIPEFF5	J70	JFF5	1	1000	200
PIPEFF6	J155	JFF6	1	1000	200
PIPEFF7	J169	JFF7	1	1000	200
PIPEFF8	J31	JFF8	1	1000	200
PIPEFF9	J60	JFF9	1	1000	200

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Chlorine Sources

Node	Concentration (mg/L)
RES1	0.86
RES2	0.86
TANK1	0.86

Decay Coefficient

Global Bulk Coefficient	-0.5

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Appendix D

Water Modelling Results

EPANet Current ADD Model Results


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*************************************************************
*                          E P A N E T                      *
*                  Hydraulic and Water Quality              *
*                  Analysis for Pipe Networks               *
*                        Version 2.2                        *
*************************************************************
```

Input File: Wawa Water Hydraulic Model_Current ADD_V2_PK.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

EPANet Current ADD Model Results

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

EPANet Current ADD Model Results

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

EPANet Current ADD Model Results

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

EPANet Current ADD Model Results

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

EPANet Current ADD Model Results

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

EPANet Current ADD Model Results

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	29.75	29.75	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	344.13	49.83	0.00
D2	0.00	344.09	49.79	0.00
D3	0.00	344.09	49.79	0.00
D4	0.00	344.09	49.79	0.00
DH	0.00	344.09	49.79	0.00
J1A	0.10	344.09	50.89	0.00
J1	0.00	344.08	50.84	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J2	0.10	343.97	50.76	0.00
J3	0.05	343.88	50.70	0.00
J4	0.07	343.88	50.76	0.00
J5	0.06	344.08	51.51	0.00
J6	0.10	344.04	52.95	0.00
J7	0.03	344.04	53.08	0.00
J8	0.19	344.02	50.67	0.00
J9	0.37	343.93	50.27	0.00
J10	0.36	343.92	51.19	0.00
J11	0.36	343.91	49.31	0.00
J12	0.01	343.90	48.48	0.00
J13	0.04	343.90	48.52	0.00
J14	0.18	343.90	47.18	0.00

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J15	0.17	343.89	46.72	0.00
J16	0.15	343.89	49.69	0.00
J17	0.16	343.88	52.73	0.00
J18	0.34	343.88	50.86	0.00
J19	0.19	343.88	49.22	0.00
J20	0.53	343.88	48.53	0.00
J21	0.14	343.84	50.11	0.00
J22	0.56	343.84	48.41	0.00
J23	0.10	343.81	50.62	0.00
J24	0.47	343.81	48.23	0.00
J25	0.05	343.78	50.39	0.00
J26	0.98	343.78	50.44	0.00
J27	0.02	343.75	49.25	0.00
J28	0.08	343.73	49.52	0.00
J29	0.36	343.73	48.20	0.00
J30	0.14	343.69	48.64	0.00
J31	2.21	343.67	49.91	0.00
J32	0.48	343.67	48.36	0.00
J33	0.17	344.04	50.49	0.00
J34	0.17	344.02	49.06	0.00
J35	0.03	344.02	48.19	0.00
J36	0.31	344.02	47.50	0.00
J37	0.17	343.96	49.77	0.00
J38	0.60	343.96	47.37	0.00
J39	0.05	343.84	50.62	0.00
J40	0.21	343.82	49.31	0.00
J41	0.19	343.81	47.91	0.00
J42	0.04	343.77	47.63	0.00
J43	0.04	343.76	47.77	0.00
J44	0.68	343.75	47.86	0.00
J45	0.65	343.79	49.14	0.00
J46	0.43	343.67	47.95	0.00
J47	0.08	343.73	48.35	0.00
J48	0.28	343.70	47.99	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J49	0.44	343.67	48.47	0.00
J50	0.04	343.53	54.06	0.00
J51	0.49	344.06	51.49	0.00
J52	2.10	344.02	50.19	0.00
J53	0.14	343.98	50.66	0.00
J54	0.22	343.95	50.90	0.00
J55	0.23	344.03	50.94	0.00
J56	0.28	344.02	51.41	0.00

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J57	0.20	344.02	52.00	0.00
J58	0.10	344.01	50.55	0.00
J59	0.00	344.01	50.55	0.00
J60	0.28	344.01	52.78	0.00
J61	0.18	344.00	51.55	0.00
J62	0.00	344.00	51.55	0.00
J63	0.01	343.98	52.05	0.00
J64	0.09	343.94	54.17	0.00
J65	0.35	343.97	52.77	0.00
J66	0.13	343.95	54.19	0.00
J67	0.14	343.95	53.58	0.00
J68	0.16	343.88	55.59	0.00
J69	0.18	343.88	55.50	0.00
J70	0.21	343.88	55.48	0.00
J71	0.43	343.81	54.94	0.00
J72	0.05	343.92	55.00	0.00
J73	0.09	343.88	55.15	0.00
J74	0.12	343.82	54.62	0.00
J75	0.06	343.78	54.60	0.00
J76	0.20	343.78	54.17	0.00
J77	0.01	343.66	54.48	0.00
J78	0.03	343.64	54.03	0.00
J79	0.25	343.56	53.92	0.00
J80	0.13	343.54	53.70	0.00
J81	0.06	343.60	54.60	0.00
J82	0.40	343.54	54.06	0.00
J83	0.13	343.53	53.96	0.00
J84	0.00	343.91	54.80	0.00
J85	0.07	343.91	54.93	0.00
J86	0.01	343.90	54.68	0.00
J87	0.01	343.89	54.67	0.00
J88	0.11	343.89	54.61	0.00
J89	0.18	343.89	54.33	0.00
J90	0.12	343.90	54.55	0.00
J91	0.20	343.90	54.69	0.00
J92	0.01	343.90	54.50	0.00
J93	0.06	343.89	54.54	0.00
J94	0.11	343.89	54.73	0.00
J95	0.01	343.88	54.94	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J96	0.01	343.82	54.67	0.00
J97	0.18	343.75	54.11	0.00
J98	0.16	343.54	53.60	0.00

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J99	0.07	343.46	53.57	0.00
J100	0.18	343.43	53.45	0.00
J101	0.16	343.36	52.44	0.00
J102	0.10	343.39	53.08	0.00
J103	0.14	343.44	53.99	0.00
J104	0.10	343.44	53.41	0.00
J105	0.04	343.44	54.42	0.00
J106	0.06	343.44	53.86	0.00
J107	0.12	343.42	53.64	0.00
J108	0.12	343.39	53.19	0.00
J109	0.08	343.37	52.88	0.00
J110	0.10	343.42	53.77	0.00
J111	0.07	343.42	53.39	0.00
J112	0.05	343.46	53.67	0.00
J113	0.17	343.51	54.02	0.00
J114	0.00	343.48	54.04	0.00
J115	0.35	343.44	53.42	0.00
J116	0.08	343.48	53.84	0.00
J117	0.20	343.48	53.77	0.00
J118	0.26	343.48	53.91	0.00
J120	0.04	343.48	53.73	0.00
J121	0.10	343.48	53.24	0.00
J122	0.04	343.48	53.34	0.00
J124	0.00	343.44	52.09	0.00
J125	0.09	343.44	52.36	0.00
J126	0.13	343.44	52.92	0.00
J127	0.43	343.42	52.93	0.00
J128	0.05	343.33	51.51	0.00
J129	1.87	343.33	51.32	0.00
J130	0.27	343.35	52.17	0.00
J131	0.48	343.37	52.69	0.00
J132	0.13	343.41	52.83	0.00
J133	0.17	343.39	52.55	0.00
J134	0.20	343.39	52.90	0.00
J135	0.24	343.40	53.18	0.00
J136	0.06	343.38	52.88	0.00
J137	0.09	343.38	54.28	0.00
J138	0.69	343.37	53.58	0.00
J139	0.09	343.30	52.83	0.00
FS	0.00	343.34	52.74	0.00
FD	0.00	343.32	52.72	0.00
J140	0.00	343.26	54.61	0.00
J141	0.11	343.22	55.22	0.00
J142	1.95	343.07	56.57	0.00

Node Results: (continued)

Node	Demand	Head	Pressure	Quality

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ID	LPS	m	m	
J143	0.26	342.94	56.66	0.00
J144	0.01	342.79	58.04	0.00
J145	0.00	342.76	58.19	0.00
J146	0.00	342.72	58.69	0.00
J147	0.01	342.71	58.81	0.00
J148	0.02	342.69	59.49	0.00
J149	0.04	342.67	59.78	0.00
J150	0.12	342.64	60.59	0.00
J151	0.01	342.69	58.29	0.00
J152	0.00	342.68	59.73	0.00
J153	0.00	342.67	60.52	0.00
J154	0.00	342.66	60.81	0.00
J155	0.01	342.65	62.05	0.00
J156	0.60	342.64	60.79	0.00
J157	0.00	342.61	61.11	0.00
J158	0.01	342.58	62.28	0.00
J159A	0.00	341.63	62.13	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.03	293.30	44.80	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.07	246.60	41.50	0.00
J162	0.01	246.60	41.20	0.00
J163	0.08	246.59	41.49	0.00
J164	0.03	246.59	40.69	0.00
J165	0.03	246.59	39.99	0.00
J166	0.04	246.59	40.09	0.00
J167	0.02	246.59	40.59	0.00
J168	0.04	246.59	41.69	0.00
J169	0.05	246.59	39.89	0.00
J170	0.00	246.59	49.59	0.00
J171	0.08	246.59	46.59	0.00
J172	0.00	246.58	53.58	0.00
J173	0.00	246.58	56.58	0.00
J174	0.02	246.58	55.88	0.00
J175	0.05	246.58	55.48	0.00
J176	1.84	246.58	57.58	0.00
J177	0.04	246.58	53.88	0.00
J178	0.04	246.58	54.68	0.00
J179	0.01	246.58	54.48	0.00
J180	0.02	246.58	56.68	0.00
J181	0.01	246.58	56.48	0.00
J182	0.09	246.58	52.08	0.00
JFS	0.00	246.61	41.51	0.00
JFF1	0.00	343.88	50.86	0.00
JFF2	0.00	343.48	53.91	0.00
JFF3	0.00	343.98	50.66	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
JFF4	0.00	343.90	54.50	0.00	
JFF5	0.00	343.88	55.48	0.00	
JFF6	0.00	342.65	62.05	0.00	
JFF7	0.00	246.59	39.89	0.00	
JFF8	0.00	343.67	49.91	0.00	
JFF9	0.00	344.01	52.78	0.00	
RES1	-43.22	291.50	0.00	0.00	Reservoir
RES2	0.00	291.50	0.00	0.00	Reservoir
TANK1	7.42	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	43.22	1.38	8.54	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	43.22	1.38	8.54	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	43.22	0.34	0.29	Open
PIPE1A	11.47	0.09	0.02	Open
PIPE1	8.16	0.46	1.58	Open
PIPE2	7.29	0.41	1.28	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	31.65	0.25	0.14	Open
PIPE5	12.68	0.26	0.30	Open
PIPE6	10.68	0.22	0.22	Open
PIPE7	12.06	0.38	0.80	Open
PIPE8	11.88	0.38	0.78	Open
PIPE9	1.76	0.10	0.09	Open
PIPE10	1.41	0.08	0.06	Open
PIPE11	1.05	0.06	0.04	Open
PIPE12	1.04	0.06	0.03	Open
PIPE13	1.00	0.06	0.03	Open
PIPE14	0.82	0.05	0.02	Open
PIPE15	0.65	0.04	0.01	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	9.74	0.31	0.54	Open

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PIPE19	0.53	0.03	0.01	Open
PIPE20	9.02	0.29	0.47	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	8.32	0.26	0.40	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE23	0.47	0.03	0.01	Open
PIPE24	7.75	0.25	0.35	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	7.75	0.25	0.35	Open
PIPE27	4.30	0.24	0.48	Open
PIPE28	0.36	0.02	0.00	Open
PIPE29	3.85	0.22	0.39	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	1.51	0.09	0.07	Open
PIPE32	3.31	0.19	0.30	Open
PIPE33	3.14	0.18	0.27	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	7.16	0.41	1.24	Open
PIPE39	2.03	0.11	0.12	Open
PIPE40	1.82	0.10	0.10	Open
PIPE41	1.63	0.21	0.58	Open
PIPE42	1.58	0.09	0.08	Open
PIPE43	1.55	0.09	0.07	Open
PIPE44	5.09	0.29	0.66	Open
PIPE45	-1.02	0.06	0.03	Open
PIPE46	3.42	0.19	0.32	Open
PIPE47	4.29	0.24	0.48	Open
PIPE48	3.43	0.19	0.32	Open
PIPE49	3.35	0.19	0.30	Open
PIPE50	3.06	0.17	0.26	Open
PIPE51	-0.59	0.03	0.01	Open
PIPE52	0.44	0.02	0.01	Open
PIPE53	7.52	0.43	1.36	Open
PIPE54	6.85	0.22	0.28	Open
PIPE55	6.36	0.20	0.25	Open
PIPE56	8.38	0.27	0.41	Open
PIPE57	8.24	0.26	0.40	Open
PIPE58	1.90	0.11	0.11	Open
PIPE59	1.67	0.09	0.08	Open
PIPE60	-1.48	0.03	0.01	Open

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PIPE61	10.65	0.15	0.09	Open
PIPE62	-2.63	0.05	0.02	Open
PIPE63	2.22	0.05	0.01	Open
PIPE64	2.14	0.12	0.13	Open
PIPE65	8.22	0.17	0.13	Open
PIPE66	-0.10	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	2.14	0.12	0.13	Open
PIPE69	3.96	0.22	0.41	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE70	7.84	0.16	0.12	Open
PIPE71	-2.00	0.11	0.11	Open
PIPE72	5.84	0.33	0.85	Open
PIPE73	3.88	0.22	0.40	Open
PIPE74	1.95	0.11	0.11	Open
PIPE75	1.60	0.09	0.08	Open
PIPE76	1.47	0.08	0.07	Open
PIPE77	1.32	0.07	0.05	Open
PIPE78	5.12	0.29	0.67	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	3.73	0.21	0.37	Open
PIPE82	5.41	0.17	0.18	Open
PIPE83	5.36	0.30	0.73	Open
PIPE84	-0.83	0.05	0.02	Open
PIPE85	4.49	0.25	0.52	Open
PIPE86	4.37	0.25	0.50	Open
PIPE87	3.30	0.19	0.30	Open
PIPE88	0.39	0.02	0.01	Open
PIPE89	7.22	0.41	1.26	Open
PIPE90	3.57	0.20	0.34	Open
PIPE91	3.54	0.20	0.34	Open
PIPE92	3.29	0.19	0.29	Open
PIPE93	3.63	0.21	0.35	Open
PIPE94	3.57	0.20	0.34	Open
PIPE95	3.16	0.18	0.27	Open
PIPE96	6.56	0.21	0.26	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	4.46	0.14	0.13	Open
PIPE99	2.03	0.11	0.12	Open
PIPE100	4.13	0.13	0.11	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open

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PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	5.68	0.18	0.20	Open
PIPE109	-1.61	0.05	0.02	Open
PIPE110	7.27	0.41	1.28	Open
PIPE111	3.37	0.19	0.31	Open
PIPE112	3.57	0.20	0.34	Open
PIPE113	3.88	0.22	0.40	Open
PIPE114	7.27	0.41	1.28	Open
PIPE115	7.72	0.44	1.26	Open
PIPE116	-0.60	0.03	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE117	2.56	0.15	0.19	Open
PIPE118	5.60	0.32	0.79	Open
PIPE119	5.42	0.31	0.74	Open
PIPE120	4.69	0.27	0.50	Open
PIPE121	4.59	0.26	0.48	Open
PIPE122	2.96	0.17	0.21	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.62	0.15	0.19	Open
PIPE127	3.40	0.19	0.31	Open
PIPE128	3.28	0.19	0.29	Open
PIPE129	3.43	0.19	0.32	Open
PIPE130	-0.90	0.05	0.03	Open
PIPE131	-1.00	0.06	0.03	Open
PIPE132	-3.28	0.19	0.29	Open
PIPE133	-3.33	0.19	0.30	Open
PIPE134	-3.50	0.20	0.33	Open
PIPE135	3.98	0.23	0.42	Open
PIPE136	3.26	0.18	0.29	Open
PIPE137	0.54	0.02	0.00	Open
PIPE138	0.46	0.01	0.00	Open
PIPE139	0.26	0.01	0.00	Open
PIPE141	0.18	0.01	0.00	Open
PIPE142	0.14	0.01	0.00	Open
PIPE143	0.04	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.09	0.00	0.00	Open

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PIPE149	-0.22	0.01	0.00	Open
PIPE150	2.69	0.15	0.20	Open
PIPE152	-0.05	0.00	0.00	Open
PIPE153	-1.92	0.11	0.11	Open
PIPE154	-2.19	0.12	0.14	Open
PIPE155	-0.22	0.11	0.41	Open
PIPE156	2.04	0.12	0.12	Open
PIPE157	2.21	0.12	0.14	Open
PIPE158	2.59	0.15	0.19	Open
PIPE159	-2.45	0.14	0.17	Open
PIPE160	-0.02	0.00	0.00	Open
PIPE161	1.53	0.09	0.07	Open
PIPE162	1.29	0.07	0.05	Open
PIPE163	1.07	0.06	0.04	Open
PIPE164	1.01	0.06	0.03	Open
PIPE165	0.92	0.05	0.03	Open
PIPE166	0.23	0.01	0.00	Open
PIPE167	13.27	0.27	0.28	Open
PFS	0.00	0.00	0.00	Closed

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PFD	0.00	0.00	0.00	Closed
PIPE168	13.18	0.27	0.28	Open
PIPE169	13.18	0.27	0.28	Open
PIPE170	13.07	0.27	0.28	Open
PIPE171	11.12	0.23	0.21	Open
PIPE172	10.86	0.22	0.20	Open
PIPE173	10.86	0.22	0.20	Open
PIPE174	10.86	0.22	0.20	Open
PIPE175	10.86	0.22	0.20	Open
PIPE176	9.04	0.18	0.14	Open
PIPE177	9.02	0.18	0.14	Open
PIPE178	8.97	0.18	0.14	Open
PIPE179	1.80	0.10	0.09	Open
PIPE180	1.80	0.10	0.08	Open
PIPE181	1.79	0.10	0.08	Open
PIPE182	1.79	0.10	0.08	Open
PIPE183	1.79	0.10	0.08	Open
PIPE184	1.79	0.10	0.08	Open
PIPE185	1.18	0.07	0.04	Open
PIPE186	10.04	0.20	0.17	Open
PIPE187	10.04	0.20	0.17	Open
PIPE188	10.03	0.57	2.04	Open
PIPE189	10.03	0.57	2.48	Open

EPANet Current ADD Model Results

PIPE189A	10.00	0.57	2.47	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.17	0.01	0.00	Open
PIPE193	0.06	0.00	0.00	Open
PIPE194	0.08	0.00	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	0.02	0.00	0.00	Open
PIPE197	0.05	0.00	0.00	Open
PIPE198	0.01	0.00	0.00	Open
PIPE199	-0.05	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PUMP1	43.22	0.00	-52.67	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump

EPANet Current ADD Model Results

VALVE1	10.03	0.57	43.53	Active Valve
VALVE2	10.00	0.57	33.34	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD Model Results


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******************************************************************
*                          E P A N E T                           *
*                  Hydraulic and Water Quality                   *
*                  Analysis for Pipe Networks                    *
*                        Version 2.2                             *
******************************************************************
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Input File: Wawa Water Hydraulic Model_Current MDD_V2_PK.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

EPANet Current MDD Model Results

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

EPANet Current MDD Model Results

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

EPANet Current MDD Model Results

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

EPANet Current MDD Model Results

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

EPANet Current MDD Model Results

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

EPANet Current MDD Model Results

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	0.00	0.00	0.00	0.00	0.00	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.19	51.10	51.10	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.50	-2.80	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.46	-2.84	0.00
D1	0.00	342.57	48.27	0.00
D2	0.00	342.57	48.27	0.00
D3	0.00	342.57	48.27	0.00
D4	0.00	342.61	48.31	0.00
DH	0.00	342.57	48.27	0.00
J1A	0.19	342.56	49.36	0.00
J1	0.00	342.56	49.32	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J2	0.20	342.21	49.00	0.00
J3	0.10	341.96	48.78	0.00
J4	0.15	341.96	48.84	0.00
J5	0.12	342.53	49.96	0.00
J6	0.20	342.44	51.35	0.00
J7	0.06	342.44	51.48	0.00
J8	0.37	342.35	49.00	0.00
J9	0.74	342.10	48.44	0.00
J10	0.71	342.05	49.32	0.00
J11	0.72	342.02	47.42	0.00
J12	0.01	342.00	46.58	0.00
J13	0.08	341.99	46.61	0.00
J14	0.36	341.97	45.25	0.00

EPANet Current MDD Model Results

J15	0.34	341.96	44.79	0.00
J16	0.30	341.93	47.73	0.00
J17	0.32	341.93	50.78	0.00
J18	0.68	341.92	48.90	0.00
J19	0.38	341.95	47.29	0.00
J20	1.06	341.95	46.60	0.00
J21	0.28	341.85	48.12	0.00
J22	1.12	341.84	46.41	0.00
J23	0.19	341.76	48.57	0.00
J24	0.93	341.75	46.17	0.00
J25	0.10	341.68	48.29	0.00
J26	1.95	341.67	48.33	0.00
J27	0.04	341.59	47.09	0.00
J28	0.16	341.54	47.33	0.00
J29	0.72	341.54	46.01	0.00
J30	0.28	341.42	46.37	0.00
J31	4.41	341.37	47.61	0.00
J32	0.96	341.40	46.09	0.00
J33	0.34	342.45	48.90	0.00
J34	0.34	342.39	47.43	0.00
J35	0.05	342.39	46.56	0.00
J36	0.62	342.39	45.87	0.00
J37	0.34	342.20	48.01	0.00
J38	1.20	342.19	45.60	0.00
J39	0.09	341.84	48.62	0.00
J40	0.42	341.80	47.29	0.00
J41	0.38	341.77	45.87	0.00
J42	0.09	341.65	45.51	0.00
J43	0.07	341.63	45.64	0.00
J44	1.35	341.61	45.72	0.00
J45	1.30	341.70	47.05	0.00
J46	0.86	341.40	45.68	0.00
J47	0.16	341.54	46.16	0.00
J48	0.57	341.46	45.75	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J49	0.87	341.40	46.20	0.00
J50	0.07	341.11	51.64	0.00
J51	0.98	342.48	49.91	0.00
J52	4.19	342.39	48.56	0.00
J53	0.29	342.28	48.96	0.00
J54	0.44	342.20	49.15	0.00
J55	0.46	342.41	49.32	0.00
J56	0.55	342.39	49.78	0.00

EPANet Current MDD Model Results

Node ID	Demand LPS	Head m	Pressure m	Quality
J57	0.41	342.39	50.37	0.00
J58	0.19	342.36	48.90	0.00
J59	0.00	342.36	48.90	0.00
J60	0.57	342.36	51.13	0.00
J61	0.36	342.32	49.87	0.00
J62	0.00	342.33	49.88	0.00
J63	0.01	342.29	50.36	0.00
J64	0.18	342.18	52.41	0.00
J65	0.71	342.25	51.05	0.00
J66	0.27	342.21	52.45	0.00
J67	0.28	342.19	51.82	0.00
J68	0.33	342.03	53.74	0.00
J69	0.37	342.03	53.65	0.00
J70	0.42	342.03	53.63	0.00
J71	0.87	341.86	52.99	0.00
J72	0.10	342.13	53.21	0.00
J73	0.18	342.03	53.30	0.00
J74	0.24	341.88	52.68	0.00
J75	0.12	341.79	52.61	0.00
J76	0.40	341.78	52.17	0.00
J77	0.03	341.50	52.32	0.00
J78	0.06	341.46	51.85	0.00
J79	0.50	341.27	51.63	0.00
J80	0.25	341.24	51.40	0.00
J81	0.12	341.37	52.37	0.00
J82	0.81	341.23	51.75	0.00
J83	0.27	341.20	51.63	0.00
J84	0.00	342.09	52.98	0.00
J85	0.15	342.09	53.11	0.00
J86	0.02	342.06	52.84	0.00
J87	0.02	342.06	52.84	0.00
J88	0.22	342.06	52.78	0.00
J89	0.37	342.06	52.50	0.00
J90	0.23	342.06	52.71	0.00
J91	0.39	342.06	52.85	0.00
J92	0.02	342.06	52.66	0.00
J93	0.12	342.06	52.71	0.00
J94	0.22	342.06	52.90	0.00
J95	0.03	342.02	53.08	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J96	0.03	341.89	52.74	0.00
J97	0.35	341.71	52.07	0.00
J98	0.31	341.23	51.29	0.00

EPANet Current MDD Model Results

J99	0.14	341.03	51.14	0.00
J100	0.35	341.00	51.02	0.00
J101	0.33	340.84	49.92	0.00
J102	0.20	340.90	50.59	0.00
J103	0.29	341.00	51.55	0.00
J104	0.19	341.00	50.97	0.00
J105	0.07	341.00	51.98	0.00
J106	0.12	340.99	51.41	0.00
J107	0.23	340.92	51.14	0.00
J108	0.23	340.88	50.68	0.00
J109	0.16	340.85	50.36	0.00
J110	0.21	340.92	51.27	0.00
J111	0.14	340.92	50.89	0.00
J112	0.10	340.98	51.19	0.00
J113	0.34	341.08	51.59	0.00
J114	0.00	341.01	51.57	0.00
J115	0.70	340.93	50.91	0.00
J116	0.16	341.01	51.37	0.00
J117	0.41	341.01	51.30	0.00
J118	0.51	341.00	51.43	0.00
J120	0.07	341.01	51.26	0.00
J121	0.19	341.01	50.77	0.00
J122	0.09	341.01	50.87	0.00
J124	0.00	340.93	49.58	0.00
J125	0.18	340.93	49.85	0.00
J126	0.27	340.93	50.41	0.00
J127	0.86	340.89	50.40	0.00
J128	0.10	340.62	48.80	0.00
J129	3.73	340.62	48.61	0.00
J130	0.54	340.68	49.50	0.00
J131	0.96	340.76	50.08	0.00
J132	0.25	340.87	50.29	0.00
J133	0.34	340.82	49.98	0.00
J134	0.40	340.83	50.34	0.00
J135	0.48	340.84	50.62	0.00
J136	0.12	340.83	50.33	0.00
J137	0.18	340.83	51.73	0.00
J138	1.39	340.83	51.04	0.00
J139	0.18	340.76	50.29	0.00
FS	0.00	340.82	50.22	0.00
FD	0.00	340.79	50.19	0.00
J140	0.00	340.70	52.05	0.00
J141	0.22	340.64	52.64	0.00
J142	3.90	340.41	53.91	0.00

Node Results: (continued)

Node	Demand	Head	Pressure	Quality

EPANet Current MDD Model Results

ID	LPS	m	m	
J143	0.51	340.26	53.98	0.00
J144	0.01	340.09	55.34	0.00
J145	0.00	340.05	55.48	0.00
J146	0.00	340.01	55.98	0.00
J147	0.03	339.99	56.09	0.00
J148	0.04	339.97	56.77	0.00
J149	0.09	339.95	57.06	0.00
J150	0.24	339.92	57.87	0.00
J151	0.01	339.98	55.58	0.00
J152	0.01	339.96	57.01	0.00
J153	0.00	339.95	57.80	0.00
J154	0.00	339.94	58.09	0.00
J155	0.01	339.93	59.33	0.00
J156	1.21	339.92	58.07	0.00
J157	0.00	339.89	58.39	0.00
J158	0.01	339.86	59.56	0.00
J159A	0.00	338.90	59.40	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00
J176	3.69	246.51	57.51	0.00
J177	0.07	246.53	53.83	0.00
J178	0.07	246.53	54.63	0.00
J179	0.01	246.53	54.43	0.00
J180	0.04	246.53	56.63	0.00
J181	0.01	246.53	56.43	0.00
J182	0.18	246.53	52.03	0.00
JFS	0.00	246.61	41.51	0.00
JFF1	0.00	341.92	48.90	0.00
JFF2	0.00	341.00	51.43	0.00
JFF3	0.00	342.28	48.96	0.00

EPANet Current MDD Model Results

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
JFF4	0.00	342.06	52.66	0.00	
JFF5	0.00	342.03	53.63	0.00	
JFF6	0.00	339.93	59.33	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	341.37	47.61	0.00	
JFF9	0.00	342.36	51.13	0.00	
RES1	0.00	291.50	0.00	0.00	Reservoir
RES2	-76.43	291.50	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	0.00	0.00	0.00	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	76.43	1.56	8.27	Open
PD1	0.00	0.00	0.00	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	76.43	1.56	8.27	Open
PD5	76.43	0.61	0.84	Open
PIPE1A	20.40	0.16	0.06	Open
PIPE1	14.63	0.83	4.67	Open
PIPE2	12.90	0.73	3.69	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	55.85	0.44	0.41	Open
PIPE5	21.91	0.45	0.82	Open
PIPE6	18.41	0.37	0.59	Open
PIPE7	21.90	0.70	2.42	Open
PIPE8	21.52	0.69	2.35	Open
PIPE9	3.53	0.20	0.33	Open
PIPE10	2.81	0.16	0.22	Open
PIPE11	2.10	0.12	0.13	Open
PIPE12	2.08	0.12	0.13	Open
PIPE13	2.00	0.11	0.12	Open
PIPE14	1.64	0.09	0.08	Open
PIPE15	1.30	0.07	0.05	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	17.26	0.55	1.56	Open

EPANet Current MDD Model Results

PIPE19	1.06	0.06	0.04	Open
PIPE20	15.81	0.50	1.33	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	14.41	0.46	1.12	Open

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Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE23	0.93	0.05	0.03	Open
PIPE24	13.28	0.42	0.96	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	13.11	0.42	0.94	Open
PIPE27	7.45	0.42	1.34	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	6.57	0.37	1.06	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	1.88	0.11	0.10	Open
PIPE32	5.76	0.33	0.83	Open
PIPE33	5.42	0.31	0.74	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	12.64	0.72	3.56	Open
PIPE39	3.59	0.20	0.35	Open
PIPE40	3.18	0.18	0.28	Open
PIPE41	2.80	0.36	1.57	Open
PIPE42	2.71	0.15	0.21	Open
PIPE43	2.64	0.15	0.19	Open
PIPE44	8.96	0.51	1.88	Open
PIPE45	-1.89	0.11	0.10	Open
PIPE46	5.77	0.33	0.83	Open
PIPE47	7.05	0.40	1.21	Open
PIPE48	5.62	0.32	0.79	Open
PIPE49	5.45	0.31	0.75	Open
PIPE50	4.88	0.28	0.61	Open
PIPE51	-0.05	0.00	0.00	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	11.13	0.63	2.81	Open
PIPE54	11.92	0.38	0.79	Open
PIPE55	10.94	0.35	0.67	Open
PIPE56	13.93	0.44	1.05	Open
PIPE57	13.64	0.43	1.01	Open
PIPE58	3.31	0.19	0.30	Open
PIPE59	2.84	0.16	0.22	Open
PIPE60	-2.77	0.06	0.02	Open

EPANet Current MDD Model Results

PIPE61	18.34	0.26	0.24	Open
PIPE62	-4.41	0.09	0.04	Open
PIPE63	4.08	0.08	0.04	Open
PIPE64	3.60	0.20	0.35	Open
PIPE65	13.86	0.28	0.35	Open
PIPE66	-0.17	0.01	0.00	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	3.57	0.20	0.34	Open
PIPE69	6.54	0.37	1.05	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE70	13.12	0.27	0.32	Open
PIPE71	-3.32	0.19	0.30	Open
PIPE72	9.80	0.55	2.22	Open
PIPE73	6.44	0.36	1.02	Open
PIPE74	3.35	0.19	0.30	Open
PIPE75	2.64	0.15	0.20	Open
PIPE76	2.38	0.13	0.16	Open
PIPE77	2.09	0.12	0.13	Open
PIPE78	8.35	0.47	1.65	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	6.03	0.34	0.90	Open
PIPE82	8.89	0.28	0.46	Open
PIPE83	8.79	0.50	1.81	Open
PIPE84	-1.21	0.07	0.05	Open
PIPE85	7.22	0.41	1.26	Open
PIPE86	6.99	0.40	1.19	Open
PIPE87	5.16	0.29	0.68	Open
PIPE88	0.62	0.03	0.01	Open
PIPE89	11.41	0.65	2.94	Open
PIPE90	5.66	0.32	0.80	Open
PIPE91	5.60	0.32	0.79	Open
PIPE92	5.10	0.29	0.66	Open
PIPE93	5.72	0.32	0.82	Open
PIPE94	5.60	0.32	0.79	Open
PIPE95	4.79	0.27	0.59	Open
PIPE96	10.84	0.35	0.66	Open
PIPE97	0.15	0.00	0.00	Open
PIPE98	7.36	0.23	0.32	Open
PIPE99	3.34	0.19	0.30	Open
PIPE100	6.69	0.21	0.27	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

EPANet Current MDD Model Results

PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	9.08	0.29	0.47	Open
PIPE109	-2.60	0.08	0.05	Open
PIPE110	11.65	0.66	3.06	Open
PIPE111	5.42	0.31	0.74	Open
PIPE112	5.64	0.32	0.80	Open
PIPE113	6.20	0.35	0.95	Open
PIPE114	11.48	0.65	2.98	Open
PIPE115	12.14	0.69	2.90	Open
PIPE116	-0.97	0.06	0.03	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE117	3.87	0.22	0.40	Open
PIPE118	8.39	0.47	1.67	Open
PIPE119	8.04	0.45	1.54	Open
PIPE120	6.68	0.38	0.96	Open
PIPE121	6.48	0.37	0.91	Open
PIPE122	5.31	0.30	0.63	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	4.64	0.26	0.56	Open
PIPE127	4.26	0.24	0.48	Open
PIPE128	4.03	0.23	0.43	Open
PIPE129	2.35	0.13	0.16	Open
PIPE130	0.14	0.01	0.00	Open
PIPE131	-0.06	0.00	0.00	Open
PIPE132	-4.46	0.25	0.52	Open
PIPE133	-4.56	0.26	0.54	Open
PIPE134	-4.90	0.28	0.61	Open
PIPE135	6.16	0.35	0.94	Open
PIPE136	4.73	0.27	0.58	Open
PIPE137	1.08	0.03	0.01	Open
PIPE138	0.92	0.03	0.01	Open
PIPE139	0.51	0.02	0.00	Open
PIPE141	0.35	0.02	0.00	Open
PIPE142	0.28	0.02	0.00	Open
PIPE143	0.09	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.18	0.01	0.00	Open

EPANet Current MDD Model Results

PIPE149	-0.44	0.03	0.01	Open
PIPE150	3.58	0.20	0.34	Open
PIPE152	-0.10	0.01	0.00	Open
PIPE153	-3.84	0.22	0.39	Open
PIPE154	-4.37	0.25	0.50	Open
PIPE155	-0.36	0.19	1.05	Open
PIPE156	2.36	0.13	0.16	Open
PIPE157	4.25	0.24	0.47	Open
PIPE158	4.11	0.23	0.44	Open
PIPE159	-4.97	0.28	0.63	Open
PIPE160	-1.20	0.07	0.05	Open
PIPE161	2.25	0.13	0.15	Open
PIPE162	1.77	0.10	0.09	Open
PIPE163	0.17	0.01	0.00	Open
PIPE164	0.05	0.00	0.00	Open
PIPE165	-0.13	0.01	0.00	Open
PIPE166	-1.52	0.09	0.07	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.25	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open

EPANet Current MDD Model Results

PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PUMP1	0.00	0.00	0.00	Closed Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	76.43	0.00	-51.15	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump

EPANet Current MDD Model Results

VALVE1	10.06	0.57	40.80	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S1 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Current MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

EPANet Current MDD and FF S1 Model Results

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

EPANet Current MDD and FF S1 Model Results

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.61	39.61	0.00
PUMP2	100.00	75.00	0.21	59.57	59.57	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	59.57	59.57	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00

Demand Charge: 0.00
Total Cost: 0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.84	49.54	0.00
D2	0.00	343.83	49.53	0.00
D3	0.00	343.78	49.48	0.00
D4	0.00	343.83	49.53	0.00
DH	0.00	343.78	49.48	0.00
J1A	0.19	343.72	50.52	0.00
J1	0.00	343.71	50.47	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J2	0.20	341.33	48.12	0.00
J3	0.10	339.33	46.15	0.00
J4	0.15	339.33	46.21	0.00
J5	0.12	343.53	50.96	0.00
J6	0.20	343.10	52.01	0.00
J7	0.06	343.07	52.11	0.00
J8	0.37	341.52	48.17	0.00
J9	0.74	338.56	44.90	0.00
J10	0.71	334.09	41.36	0.00
J11	0.72	329.45	34.85	0.00
J12	0.01	324.87	29.45	0.00
J13	0.08	322.66	27.28	0.00
J14	0.36	318.45	21.73	0.00

EPANet Current MDD and FF S1 Model Results

J15	0.34	313.94	16.77	0.00
J16	0.30	298.91	4.71	0.00
J17	0.32	293.54	2.39	0.00
J18	0.68	288.46	-4.56	0.00
J19	0.38	337.94	43.28	0.00
J20	1.06	337.93	42.58	0.00
J21	0.28	337.42	43.69	0.00
J22	1.12	337.42	41.99	0.00
J23	0.19	336.95	43.76	0.00
J24	0.93	336.95	41.37	0.00
J25	0.10	336.50	43.11	0.00
J26	1.95	336.49	43.15	0.00
J27	0.04	335.65	41.15	0.00
J28	0.16	335.00	40.79	0.00
J29	0.72	335.00	39.47	0.00
J30	0.28	333.16	38.11	0.00
J31	4.41	329.67	35.91	0.00
J32	0.96	333.98	38.67	0.00
J33	0.34	343.14	49.59	0.00
J34	0.34	342.86	47.90	0.00
J35	0.05	342.86	47.03	0.00
J36	0.62	342.86	46.34	0.00
J37	0.34	341.31	47.12	0.00
J38	1.20	341.31	44.72	0.00
J39	0.09	338.39	45.17	0.00
J40	0.42	338.10	43.59	0.00
J41	0.38	337.90	42.00	0.00
J42	0.09	336.84	40.70	0.00
J43	0.07	336.65	40.66	0.00
J44	1.35	336.49	40.60	0.00
J45	1.30	337.11	42.46	0.00
J46	0.86	334.54	38.82	0.00
J47	0.16	335.36	39.98	0.00
J48	0.57	334.92	39.21	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J49	0.87	333.98	38.78	0.00
J50	0.07	333.63	44.16	0.00
J51	0.98	343.28	50.71	0.00
J52	4.19	342.83	49.00	0.00
J53	0.29	341.94	48.62	0.00
J54	0.44	341.77	48.72	0.00
J55	0.46	342.97	49.88	0.00
J56	0.55	342.85	50.24	0.00

EPANet Current MDD and FF S1 Model Results

J57	0.41	342.85	50.83	0.00
J58	0.19	342.70	49.24	0.00
J59	0.00	342.70	49.24	0.00
J60	0.57	342.70	51.47	0.00
J61	0.36	342.54	50.09	0.00
J62	0.00	342.56	50.11	0.00
J63	0.01	342.40	50.47	0.00
J64	0.18	341.94	52.17	0.00
J65	0.71	342.26	51.06	0.00
J66	0.27	342.10	52.34	0.00
J67	0.28	342.00	51.63	0.00
J68	0.33	341.26	52.97	0.00
J69	0.37	341.26	52.88	0.00
J70	0.42	341.26	52.86	0.00
J71	0.87	340.54	51.67	0.00
J72	0.10	341.53	52.61	0.00
J73	0.18	341.19	52.46	0.00
J74	0.24	340.61	51.41	0.00
J75	0.12	340.20	51.02	0.00
J76	0.40	340.20	50.59	0.00
J77	0.03	338.96	49.78	0.00
J78	0.06	338.75	49.14	0.00
J79	0.50	337.92	48.28	0.00
J80	0.25	337.74	47.90	0.00
J81	0.12	338.38	49.38	0.00
J82	0.81	337.75	48.27	0.00
J83	0.27	337.60	48.03	0.00
J84	0.00	341.42	52.31	0.00
J85	0.15	341.42	52.44	0.00
J86	0.02	341.33	52.11	0.00
J87	0.02	341.32	52.10	0.00
J88	0.22	341.31	52.03	0.00
J89	0.37	341.31	51.75	0.00
J90	0.23	341.33	51.98	0.00
J91	0.39	341.33	52.12	0.00
J92	0.02	341.33	51.93	0.00
J93	0.12	341.31	51.96	0.00
J94	0.22	341.31	52.15	0.00
J95	0.03	341.17	52.23	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J96	0.03	340.62	51.47	0.00
J97	0.35	339.85	50.21	0.00
J98	0.31	337.69	47.75	0.00

J99	0.14	336.64	46.75	0.00
J100	0.35	336.66	46.68	0.00
J101	0.33	335.91	44.99	0.00
J102	0.20	336.15	45.84	0.00
J103	0.29	336.36	46.91	0.00
J104	0.19	336.36	46.33	0.00
J105	0.07	336.36	47.34	0.00
J106	0.12	336.35	46.77	0.00
J107	0.23	335.62	45.84	0.00
J108	0.23	335.64	45.44	0.00
J109	0.16	335.67	45.18	0.00
J110	0.21	334.90	45.25	0.00
J111	0.14	333.95	43.92	0.00
J112	0.10	333.83	44.04	0.00
J113	0.34	333.67	44.18	0.00
J114	0.00	332.13	42.69	0.00
J115	0.70	332.67	42.65	0.00
J116	0.16	331.13	41.49	0.00
J117	0.41	330.25	40.54	0.00
J118	0.51	329.40	39.83	0.00
J120	0.07	332.13	42.38	0.00
J121	0.19	332.13	41.89	0.00
J122	0.09	332.13	41.99	0.00
J124	0.00	332.67	41.32	0.00
J125	0.18	332.67	41.59	0.00
J126	0.27	332.67	42.15	0.00
J127	0.86	333.17	42.68	0.00
J128	0.10	333.40	41.58	0.00
J129	3.73	333.40	41.39	0.00
J130	0.54	333.45	42.27	0.00
J131	0.96	333.54	42.86	0.00
J132	0.25	333.63	43.05	0.00
J133	0.34	333.63	42.79	0.00
J134	0.40	333.75	43.26	0.00
J135	0.48	333.69	43.47	0.00
J136	0.12	334.05	43.55	0.00
J137	0.18	334.40	45.30	0.00
J138	1.39	334.92	45.13	0.00
J139	0.18	335.83	45.36	0.00
FS	0.00	335.89	45.29	0.00
FD	0.00	335.86	45.26	0.00
J140	0.00	335.78	47.13	0.00
J141	0.22	335.72	47.72	0.00
J142	3.90	335.48	48.98	0.00

Node Results: (continued)

Node	Demand	Head	Pressure	Quality

EPANet Current MDD and FF S1 Model Results

ID	LPS	m	m	
J143	0.51	335.33	49.05	0.00
J144	0.01	335.16	50.41	0.00
J145	0.00	335.13	50.56	0.00
J146	0.00	335.08	51.05	0.00
J147	0.03	335.06	51.16	0.00
J148	0.04	335.05	51.85	0.00
J149	0.09	335.02	52.13	0.00
J150	0.24	334.99	52.94	0.00
J151	0.01	335.05	50.65	0.00
J152	0.01	335.03	52.08	0.00
J153	0.00	335.02	52.87	0.00
J154	0.00	335.01	53.16	0.00
J155	0.01	335.00	54.40	0.00
J156	1.21	334.99	53.14	0.00
J157	0.00	334.96	53.46	0.00
J158	0.01	334.93	54.63	0.00
J159A	0.00	333.97	54.47	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00
J176	3.69	246.51	57.51	0.00
J177	0.07	246.53	53.83	0.00
J178	0.07	246.53	54.63	0.00
J179	0.01	246.53	54.43	0.00
J180	0.04	246.53	56.63	0.00
J181	0.01	246.53	56.43	0.00
J182	0.18	246.53	52.03	0.00
JFS	0.00	246.61	41.51	0.00
JFF1	38.00	288.46	-4.56	0.00
JFF2	38.00	329.40	39.83	0.00
JFF3	23.29	341.94	48.62	0.00

EPANet Current MDD and FF S1 Model Results

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
JFF4	0.00	341.33	51.93	0.00	
JFF5	0.00	341.26	52.86	0.00	
JFF6	0.00	335.00	54.40	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	38.00	329.67	35.91	0.00	
JFF9	0.00	342.70	51.47	0.00	
RES1	-133.51	287.05	0.00	0.00	Reservoir
RES2	-80.21	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.30	1.70	12.59	Open
PS2	80.21	1.63	9.05	Open
PS3	0.00	0.00	0.00	Open
PS4	80.21	1.63	9.05	Open
PD1	53.30	1.70	12.58	Open
PD2	80.21	1.63	9.05	Open
PD3	0.00	0.00	0.00	Open
PD4	80.21	1.63	9.05	Open
PD5	213.72	1.70	5.63	Open
PIPE1A	54.92	0.44	0.40	Open
PIPE1	41.20	2.33	31.73	Open
PIPE2	39.46	2.23	29.29	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	158.61	1.26	2.85	Open
PIPE5	50.60	1.03	3.86	Open
PIPE6	42.97	0.88	2.85	Open
PIPE7	80.83	2.57	27.22	Open
PIPE8	80.46	2.56	26.99	Open
PIPE9	41.53	2.35	32.19	Open
PIPE10	40.81	2.31	31.18	Open
PIPE11	40.10	2.27	30.17	Open
PIPE12	40.08	2.27	30.15	Open
PIPE13	40.00	2.26	30.04	Open
PIPE14	39.64	2.24	29.55	Open
PIPE15	39.30	2.22	29.08	Open
PIPE16	39.00	2.21	28.66	Open
PIPE17	38.68	2.19	28.23	Open
PIPE18	38.19	1.22	6.79	Open

EPANet Current MDD and FF S1 Model Results

PIPE19	1.06	0.06	0.04	Open
PIPE20	36.74	1.17	6.32	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	35.34	1.12	5.88	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE23	0.93	0.05	0.03	Open
PIPE24	34.21	1.09	5.54	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	44.01	1.40	8.83	Open
PIPE27	29.84	1.69	17.45	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	28.95	1.64	16.51	Open
PIPE30	42.41	2.40	33.48	Open
PIPE31	-13.74	0.78	4.15	Open
PIPE32	13.73	0.78	4.14	Open
PIPE33	13.38	0.76	3.95	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	39.21	2.22	28.94	Open
PIPE39	9.76	0.55	2.20	Open
PIPE40	9.34	0.53	2.03	Open
PIPE41	8.96	1.14	13.56	Open
PIPE42	8.88	0.50	1.85	Open
PIPE43	8.80	0.50	1.82	Open
PIPE44	29.36	1.66	16.94	Open
PIPE45	-11.85	0.67	3.16	Open
PIPE46	16.20	0.92	5.63	Open
PIPE47	23.65	1.34	11.35	Open
PIPE48	14.13	0.80	4.37	Open
PIPE49	13.97	0.79	4.28	Open
PIPE50	13.40	0.76	3.96	Open
PIPE51	15.57	0.88	5.23	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	20.63	1.17	8.81	Open
PIPE54	27.06	0.86	3.59	Open
PIPE55	26.08	0.83	3.35	Open
PIPE56	43.93	1.40	8.80	Open
PIPE57	20.36	0.65	2.12	Open
PIPE58	7.44	0.42	1.33	Open
PIPE59	6.97	0.39	1.18	Open
PIPE60	-9.67	0.20	0.18	Open

EPANet Current MDD and FF S1 Model Results

PIPE61	42.90	0.61	1.17	Open
PIPE62	-12.37	0.25	0.28	Open
PIPE63	11.33	0.23	0.24	Open
PIPE64	8.07	0.46	1.55	Open
PIPE65	31.17	0.63	1.57	Open
PIPE66	-0.49	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	8.37	0.47	1.66	Open
PIPE69	17.52	0.99	6.51	Open

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Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE70	30.11	0.61	1.47	Open
PIPE71	-9.51	0.54	2.10	Open
PIPE72	20.60	1.17	8.79	Open
PIPE73	14.05	0.79	4.33	Open
PIPE74	6.54	0.37	1.05	Open
PIPE75	5.83	0.33	0.85	Open
PIPE76	5.57	0.31	0.78	Open
PIPE77	5.28	0.30	0.71	Open
PIPE78	19.15	1.08	7.68	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	12.93	0.73	3.71	Open
PIPE82	16.97	0.54	1.51	Open
PIPE83	16.86	0.95	6.07	Open
PIPE84	-5.11	0.29	0.67	Open
PIPE85	15.38	0.87	5.12	Open
PIPE86	15.14	0.86	4.97	Open
PIPE87	12.06	0.68	3.26	Open
PIPE88	1.68	0.09	0.08	Open
PIPE89	25.40	1.44	12.96	Open
PIPE90	12.72	0.72	3.60	Open
PIPE91	12.66	0.72	3.57	Open
PIPE92	12.16	0.69	3.31	Open
PIPE93	12.65	0.72	3.56	Open
PIPE94	12.53	0.71	3.50	Open
PIPE95	11.72	0.66	3.09	Open
PIPE96	20.47	0.65	2.14	Open
PIPE97	0.15	0.00	0.00	Open
PIPE98	13.95	0.44	1.05	Open
PIPE99	6.37	0.36	1.00	Open
PIPE100	13.29	0.42	0.96	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

EPANet Current MDD and FF S1 Model Results

PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	18.71	0.60	1.81	Open
PIPE109	-6.42	0.20	0.25	Open
PIPE110	25.10	1.42	12.67	Open
PIPE111	11.52	0.65	2.99	Open
PIPE112	12.80	0.72	3.64	Open
PIPE113	13.55	0.77	4.05	Open
PIPE114	25.99	1.47	13.52	Open
PIPE115	29.80	1.69	15.33	Open
PIPE116	-4.12	0.23	0.45	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE117	7.78	0.44	1.45	Open
PIPE118	19.23	1.09	7.74	Open
PIPE119	18.88	1.07	7.48	Open
PIPE120	13.67	0.77	3.62	Open
PIPE121	13.46	0.76	3.52	Open
PIPE122	15.99	0.91	4.84	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	15.32	0.87	5.08	Open
PIPE127	-3.77	0.21	0.38	Open
PIPE128	-4.01	0.23	0.42	Open
PIPE129	-15.47	0.88	5.17	Open
PIPE130	18.86	1.07	7.46	Open
PIPE131	18.65	1.06	7.31	Open
PIPE132	6.14	0.35	0.93	Open
PIPE133	6.03	0.34	0.90	Open
PIPE134	5.69	0.32	0.81	Open
PIPE135	26.25	1.49	13.77	Open
PIPE136	-13.18	0.75	3.85	Open
PIPE137	39.08	1.24	6.24	Open
PIPE138	38.92	1.24	6.19	Open
PIPE139	38.51	1.23	6.07	Open
PIPE141	0.35	0.02	0.00	Open
PIPE142	0.28	0.02	0.00	Open
PIPE143	0.09	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.18	0.01	0.00	Open

EPANet Current MDD and FF S1 Model Results

PIPE149	-0.44	0.03	0.01	Open
PIPE150	-14.33	0.81	4.49	Open
PIPE152	-0.10	0.01	0.00	Open
PIPE153	-3.84	0.22	0.39	Open
PIPE154	-4.37	0.25	0.50	Open
PIPE155	0.65	0.33	3.08	Open
PIPE156	-14.54	0.82	4.61	Open
PIPE157	12.37	0.70	3.42	Open
PIPE158	1.08	0.06	0.04	Open
PIPE159	-5.99	0.34	0.89	Open
PIPE160	-5.24	0.30	0.70	Open
PIPE161	-3.50	0.20	0.33	Open
PIPE162	-3.98	0.23	0.42	Open
PIPE163	-9.62	0.54	2.15	Open
PIPE164	-9.74	0.55	2.19	Open
PIPE165	-9.92	0.56	2.27	Open
PIPE166	-11.30	0.64	2.89	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open

PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	38.00	0.05	0.00	Open
PIPEFF2	38.00	0.05	0.00	Open
PIPEFF3	23.29	0.03	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	38.00	0.05	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PUMP1	53.30	0.00	-56.86	Open Pump
PUMP2	80.21	0.00	-56.82	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	80.21	0.00	-56.82	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump

EPANet Current MDD and FF S1 Model Results

VALVE1	10.06	0.57	35.87	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S2 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                    Hydraulic and Water Quality                    *
*                    Analysis for Pipe Networks                     *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Current MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

EPANet Current MDD and FF S2 Model Results

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

EPANet Current MDD and FF S2 Model Results

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

EPANet Current MDD and FF S2 Model Results

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

EPANet Current MDD and FF S2 Model Results

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

EPANet Current MDD and FF S2 Model Results

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

EPANet Current MDD and FF S2 Model Results

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.61	39.61	0.00
PUMP2	100.00	75.00	0.21	59.57	59.57	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	59.57	59.57	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.84	49.54	0.00
D2	0.00	343.83	49.53	0.00
D3	0.00	343.78	49.48	0.00
D4	0.00	343.83	49.53	0.00
DH	0.00	343.78	49.48	0.00
J1A	0.19	343.72	50.52	0.00
J1	0.00	343.71	50.47	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J2	0.20	343.00	49.79	0.00
J3	0.10	342.45	49.27	0.00
J4	0.15	342.45	49.33	0.00
J5	0.12	343.51	50.94	0.00
J6	0.20	342.21	51.12	0.00
J7	0.06	342.13	51.17	0.00
J8	0.37	343.19	49.84	0.00
J9	0.74	342.73	49.07	0.00
J10	0.71	342.69	49.96	0.00
J11	0.72	342.65	48.05	0.00
J12	0.01	342.63	47.21	0.00
J13	0.08	342.63	47.25	0.00
J14	0.36	342.61	45.89	0.00

EPANet Current MDD and FF S2 Model Results

J15	0.34	342.60	45.43	0.00
J16	0.30	342.57	48.37	0.00
J17	0.32	342.56	51.41	0.00
J18	0.68	342.56	49.54	0.00
J19	0.38	342.45	47.79	0.00
J20	1.06	342.44	47.09	0.00
J21	0.28	342.22	48.49	0.00
J22	1.12	342.21	46.78	0.00
J23	0.19	342.02	48.83	0.00
J24	0.93	342.01	46.43	0.00
J25	0.10	341.83	48.44	0.00
J26	1.95	341.82	48.48	0.00
J27	0.04	341.60	47.10	0.00
J28	0.16	341.49	47.28	0.00
J29	0.72	341.48	45.95	0.00
J30	0.28	341.20	46.15	0.00
J31	4.41	341.15	47.39	0.00
J32	0.96	341.03	45.72	0.00
J33	0.34	342.27	48.72	0.00
J34	0.34	341.53	46.57	0.00
J35	0.05	341.53	45.70	0.00
J36	0.62	341.53	45.01	0.00
J37	0.34	342.99	48.80	0.00
J38	1.20	342.99	46.40	0.00
J39	0.09	342.19	48.97	0.00
J40	0.42	342.10	47.59	0.00
J41	0.38	342.04	46.14	0.00
J42	0.09	341.73	45.59	0.00
J43	0.07	341.67	45.68	0.00
J44	1.35	341.63	45.74	0.00
J45	1.30	341.87	47.22	0.00
J46	0.86	340.98	45.26	0.00
J47	0.16	341.44	46.06	0.00
J48	0.57	341.19	45.48	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J49	0.87	341.03	45.83	0.00
J50	0.07	339.60	50.13	0.00
J51	0.98	342.77	50.20	0.00
J52	4.19	341.45	47.62	0.00
J53	0.29	339.76	46.44	0.00
J54	0.44	339.19	46.14	0.00
J55	0.46	341.83	48.74	0.00
J56	0.55	341.45	48.84	0.00

EPANet Current MDD and FF S2 Model Results

J57	0.41	341.45	49.43	0.00
J58	0.19	340.74	47.28	0.00
J59	0.00	340.73	47.27	0.00
J60	0.57	336.89	45.66	0.00
J61	0.36	340.44	47.99	0.00
J62	0.00	340.47	48.02	0.00
J63	0.01	340.16	48.23	0.00
J64	0.18	339.22	49.45	0.00
J65	0.71	339.90	48.70	0.00
J66	0.27	339.56	49.80	0.00
J67	0.28	339.36	48.99	0.00
J68	0.33	337.82	49.53	0.00
J69	0.37	333.34	44.96	0.00
J70	0.42	328.95	40.55	0.00
J71	0.87	337.84	48.97	0.00
J72	0.10	338.70	49.78	0.00
J73	0.18	338.01	49.28	0.00
J74	0.24	337.92	48.72	0.00
J75	0.12	337.86	48.68	0.00
J76	0.40	337.86	48.25	0.00
J77	0.03	337.81	48.63	0.00
J78	0.06	337.81	48.20	0.00
J79	0.50	337.79	48.15	0.00
J80	0.25	337.78	47.94	0.00
J81	0.12	337.79	48.79	0.00
J82	0.81	337.76	48.28	0.00
J83	0.27	337.76	48.19	0.00
J84	0.00	338.21	49.10	0.00
J85	0.15	338.21	49.23	0.00
J86	0.02	337.93	48.71	0.00
J87	0.02	337.94	48.72	0.00
J88	0.22	337.94	48.66	0.00
J89	0.37	337.94	48.38	0.00
J90	0.23	336.47	47.12	0.00
J91	0.39	336.18	46.97	0.00
J92	0.02	333.77	44.37	0.00
J93	0.12	337.94	48.59	0.00
J94	0.22	337.94	48.78	0.00
J95	0.03	337.95	49.01	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J96	0.03	337.91	48.76	0.00
J97	0.35	337.86	48.22	0.00
J98	0.31	337.79	47.85	0.00

J99	0.14	337.79	47.90	0.00
J100	0.35	337.71	47.73	0.00
J101	0.33	337.68	46.76	0.00
J102	0.20	337.71	47.40	0.00
J103	0.29	337.80	48.35	0.00
J104	0.19	337.80	47.77	0.00
J105	0.07	337.80	48.78	0.00
J106	0.12	337.79	48.21	0.00
J107	0.23	337.86	48.08	0.00
J108	0.23	337.80	47.60	0.00
J109	0.16	337.76	47.27	0.00
J110	0.21	338.06	48.41	0.00
J111	0.14	338.34	48.31	0.00
J112	0.10	338.80	49.01	0.00
J113	0.34	339.42	49.93	0.00
J114	0.00	339.20	49.76	0.00
J115	0.70	338.78	48.76	0.00
J116	0.16	339.20	49.56	0.00
J117	0.41	339.20	49.49	0.00
J118	0.51	339.20	49.63	0.00
J120	0.07	339.20	49.45	0.00
J121	0.19	339.20	48.96	0.00
J122	0.09	339.20	49.06	0.00
J124	0.00	338.78	47.43	0.00
J125	0.18	338.78	47.70	0.00
J126	0.27	338.78	48.26	0.00
J127	0.86	338.51	48.02	0.00
J128	0.10	338.01	46.19	0.00
J129	3.73	338.01	46.00	0.00
J130	0.54	338.06	46.88	0.00
J131	0.96	338.15	47.47	0.00
J132	0.25	338.33	47.75	0.00
J133	0.34	338.20	47.36	0.00
J134	0.40	338.19	47.70	0.00
J135	0.48	338.24	48.02	0.00
J136	0.12	338.09	47.59	0.00
J137	0.18	337.99	48.89	0.00
J138	1.39	337.84	48.05	0.00
J139	0.18	337.60	47.13	0.00
FS	0.00	337.65	47.05	0.00
FD	0.00	337.62	47.02	0.00
J140	0.00	337.54	48.89	0.00
J141	0.22	337.48	49.48	0.00
J142	3.90	337.24	50.74	0.00

Node Results: (continued)

Node	Demand	Head	Pressure	Quality

EPANet Current MDD and FF S2 Model Results

ID	LPS	m	m	
J143	0.51	337.09	50.81	0.00
J144	0.01	336.93	52.18	0.00
J145	0.00	336.89	52.32	0.00
J146	0.00	336.84	52.81	0.00
J147	0.03	336.82	52.92	0.00
J148	0.04	336.81	53.61	0.00
J149	0.09	336.78	53.89	0.00
J150	0.24	336.75	54.70	0.00
J151	0.01	336.81	52.41	0.00
J152	0.01	336.80	53.85	0.00
J153	0.00	336.78	54.63	0.00
J154	0.00	336.77	54.92	0.00
J155	0.01	336.76	56.16	0.00
J156	1.21	336.75	54.90	0.00
J157	0.00	336.72	55.22	0.00
J158	0.01	336.69	56.39	0.00
J159A	0.00	335.73	56.23	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00
J176	3.69	246.51	57.51	0.00
J177	0.07	246.53	53.83	0.00
J178	0.07	246.53	54.63	0.00
J179	0.01	246.53	54.43	0.00
J180	0.04	246.53	56.63	0.00
J181	0.01	246.53	56.43	0.00
J182	0.18	246.53	52.03	0.00
JFS	0.00	246.61	41.51	0.00
JFF1	0.00	342.56	49.54	0.00
JFF2	0.00	339.20	49.63	0.00
JFF3	23.29	339.76	46.44	0.00

EPANet Current MDD and FF S2 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
JFF4	38.00	333.77	44.37	0.00	
JFF5	38.00	328.95	40.55	0.00	
JFF6	0.00	336.76	56.16	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	341.15	47.39	0.00	
JFF9	38.00	336.89	45.66	0.00	
RES1	-133.51	287.05	0.00	0.00	Reservoir
RES2	-80.21	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.30	1.70	12.59	Open
PS2	80.21	1.63	9.05	Open
PS3	0.00	0.00	0.00	Open
PS4	80.21	1.63	9.05	Open
PD1	53.30	1.70	12.58	Open
PD2	80.21	1.63	9.05	Open
PD3	0.00	0.00	0.00	Open
PD4	80.21	1.63	9.05	Open
PD5	213.72	1.70	5.63	Open
PIPE1A	44.19	0.35	0.27	Open
PIPE1	21.44	1.21	9.47	Open
PIPE2	19.70	1.11	8.09	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	169.34	1.35	3.22	Open
PIPE5	91.66	1.87	11.59	Open
PIPE6	78.17	1.59	8.63	Open
PIPE7	29.80	0.95	4.29	Open
PIPE8	29.43	0.94	4.19	Open
PIPE9	3.53	0.20	0.33	Open
PIPE10	2.81	0.16	0.22	Open
PIPE11	2.10	0.12	0.13	Open
PIPE12	2.08	0.12	0.13	Open
PIPE13	2.00	0.11	0.12	Open
PIPE14	1.64	0.09	0.08	Open
PIPE15	1.30	0.07	0.05	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	25.16	0.80	3.13	Open

EPANet Current MDD and FF S2 Model Results

PIPE19	1.06	0.06	0.04	Open
PIPE20	23.71	0.75	2.81	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	22.31	0.71	2.51	Open

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Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE23	0.93	0.05	0.03	Open
PIPE24	21.18	0.67	2.28	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	21.89	0.70	2.42	Open
PIPE27	11.48	0.65	2.98	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	10.60	0.60	2.57	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	5.91	0.33	0.87	Open
PIPE32	22.75	1.29	10.56	Open
PIPE33	22.41	1.27	10.27	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	19.45	1.10	7.90	Open
PIPE39	5.41	0.31	0.74	Open
PIPE40	4.99	0.28	0.64	Open
PIPE41	4.62	0.59	3.97	Open
PIPE42	4.53	0.26	0.53	Open
PIPE43	4.45	0.25	0.52	Open
PIPE44	13.95	0.79	4.27	Open
PIPE45	-2.76	0.16	0.21	Open
PIPE46	9.88	0.56	2.25	Open
PIPE47	12.98	0.73	3.74	Open
PIPE48	10.37	0.59	2.46	Open
PIPE49	10.20	0.58	2.39	Open
PIPE50	9.63	0.55	2.15	Open
PIPE51	-4.08	0.23	0.44	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	25.84	1.46	13.37	Open
PIPE54	47.77	1.52	10.28	Open
PIPE55	46.79	1.49	9.89	Open
PIPE56	62.21	1.98	16.76	Open
PIPE57	38.64	1.23	6.94	Open
PIPE58	13.29	0.75	3.90	Open
PIPE59	12.83	0.73	3.66	Open
PIPE60	1.78	0.04	0.01	Open

EPANet Current MDD and FF S2 Model Results

PIPE61	78.10	1.10	3.54	Open
PIPE62	-21.39	0.44	0.78	Open
PIPE63	4.81	0.10	0.05	Open
PIPE64	18.86	1.07	7.47	Open
PIPE65	72.89	1.48	7.58	Open
PIPE66	7.08	0.40	1.22	Open
PIPE67	38.57	2.18	37.35	Open
PIPE68	11.59	0.66	3.03	Open
PIPE69	22.78	1.29	10.58	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE70	41.40	0.84	2.66	Open
PIPE71	-11.55	0.65	3.01	Open
PIPE72	29.85	1.69	17.47	Open
PIPE73	20.57	1.16	8.77	Open
PIPE74	9.27	0.52	2.00	Open
PIPE75	8.56	0.48	1.73	Open
PIPE76	8.29	0.47	1.63	Open
PIPE77	8.01	0.45	1.53	Open
PIPE78	28.41	1.61	15.94	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	-1.84	0.10	0.10	Open
PIPE82	25.05	0.80	3.11	Open
PIPE83	24.95	1.41	12.53	Open
PIPE84	8.87	0.50	1.84	Open
PIPE85	5.59	0.32	0.79	Open
PIPE86	5.35	0.30	0.72	Open
PIPE87	-2.71	0.15	0.20	Open
PIPE88	-1.66	0.09	0.08	Open
PIPE89	4.18	0.24	0.46	Open
PIPE90	1.85	0.10	0.10	Open
PIPE91	1.79	0.10	0.10	Open
PIPE92	1.29	0.07	0.05	Open
PIPE93	2.30	0.13	0.15	Open
PIPE94	2.18	0.12	0.14	Open
PIPE95	1.37	0.08	0.06	Open
PIPE96	35.92	1.14	6.06	Open
PIPE97	0.15	0.00	0.00	Open
PIPE98	25.34	0.81	3.18	Open
PIPE99	10.44	0.59	2.50	Open
PIPE100	-13.33	0.42	0.97	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	-3.84	0.12	0.10	Open
PIPE109	-10.31	0.33	0.60	Open
PIPE110	6.44	0.36	1.02	Open
PIPE111	3.36	0.19	0.31	Open
PIPE112	1.30	0.07	0.05	Open
PIPE113	3.05	0.17	0.26	Open
PIPE114	4.00	0.23	0.42	Open
PIPE115	1.88	0.11	0.09	Open
PIPE116	1.81	0.10	0.10	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE117	2.84	0.16	0.22	Open
PIPE118	3.94	0.22	0.41	Open
PIPE119	3.59	0.20	0.35	Open
PIPE120	4.96	0.28	0.55	Open
PIPE121	4.76	0.27	0.51	Open
PIPE122	-3.22	0.18	0.25	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-3.90	0.22	0.40	Open
PIPE127	5.39	0.30	0.73	Open
PIPE128	5.15	0.29	0.67	Open
PIPE129	8.53	0.48	1.72	Open
PIPE130	-9.52	0.54	2.10	Open
PIPE131	-9.73	0.55	2.19	Open
PIPE132	-12.44	0.70	3.45	Open
PIPE133	-12.54	0.71	3.50	Open
PIPE134	-12.88	0.73	3.68	Open
PIPE135	12.89	0.73	3.69	Open
PIPE136	11.45	0.65	2.96	Open
PIPE137	1.08	0.03	0.01	Open
PIPE138	0.92	0.03	0.01	Open
PIPE139	0.51	0.02	0.00	Open
PIPE141	0.35	0.02	0.00	Open
PIPE142	0.28	0.02	0.00	Open
PIPE143	0.09	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.18	0.01	0.00	Open

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PIPE149	-0.44	0.03	0.01	Open
PIPE150	10.31	0.58	2.44	Open
PIPE152	-0.10	0.01	0.00	Open
PIPE153	-3.84	0.22	0.39	Open
PIPE154	-4.37	0.25	0.50	Open
PIPE155	-0.64	0.33	3.01	Open
PIPE156	8.81	0.50	1.82	Open
PIPE157	2.57	0.15	0.19	Open
PIPE158	6.86	0.39	1.15	Open
PIPE159	-4.69	0.27	0.57	Open
PIPE160	1.82	0.10	0.10	Open
PIPE161	4.27	0.24	0.48	Open
PIPE162	3.79	0.21	0.38	Open
PIPE163	5.21	0.30	0.69	Open
PIPE164	5.10	0.29	0.66	Open
PIPE165	4.92	0.28	0.62	Open
PIPE166	3.53	0.20	0.34	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open

PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	23.29	0.03	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	38.00	0.05	0.00	Open
PUMP1	53.30	0.00	-56.86	Open Pump
PUMP2	80.21	0.00	-56.82	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	80.21	0.00	-56.82	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump

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VALVE1	10.06	0.57	37.63	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S3 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Current MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

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Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.22	30.90	30.90	0.00
PUMP2	100.00	75.00	0.22	52.78	52.78	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.22	52.78	52.78	0.00
PUMP5	100.00	75.00	0.07	14.07	14.07	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	287.01	-7.29	0.00
S2	0.00	287.02	-7.28	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.02	-7.28	0.00
D1	0.00	346.43	52.13	0.00
D2	0.00	346.42	52.12	0.00
D3	0.00	346.39	52.09	0.00
D4	0.00	346.42	52.12	0.00
DH	0.00	346.39	52.09	0.00
J1A	0.19	346.35	53.15	0.00
J1	0.00	346.34	53.10	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J2	0.20	345.49	52.28	0.00
J3	0.10	344.82	51.64	0.00
J4	0.15	344.82	51.70	0.00
J5	0.12	346.21	53.64	0.00
J6	0.20	345.49	54.40	0.00
J7	0.06	345.44	54.48	0.00
J8	0.37	345.82	52.47	0.00
J9	0.74	345.25	51.59	0.00
J10	0.71	345.21	52.48	0.00
J11	0.72	345.17	50.57	0.00
J12	0.01	345.15	49.73	0.00
J13	0.08	345.14	49.76	0.00
J14	0.36	345.13	48.41	0.00

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J15	0.34	345.12	47.95	0.00
J16	0.30	345.09	50.89	0.00
J17	0.32	345.08	53.93	0.00
J18	0.68	345.08	52.06	0.00
J19	0.38	344.89	50.23	0.00
J20	1.06	344.88	49.53	0.00
J21	0.28	344.59	50.86	0.00
J22	1.12	344.59	49.16	0.00
J23	0.19	344.33	51.14	0.00
J24	0.93	344.33	48.75	0.00
J25	0.10	344.08	50.69	0.00
J26	1.95	344.07	50.73	0.00
J27	0.04	343.78	49.28	0.00
J28	0.16	343.64	49.43	0.00
J29	0.72	343.64	48.11	0.00
J30	0.28	343.28	48.23	0.00
J31	4.41	343.22	49.46	0.00
J32	0.96	343.01	47.70	0.00
J33	0.34	345.52	51.97	0.00
J34	0.34	345.10	50.14	0.00
J35	0.05	345.10	49.27	0.00
J36	0.62	345.10	48.58	0.00
J37	0.34	345.48	51.29	0.00
J38	1.20	345.48	48.89	0.00
J39	0.09	344.51	51.29	0.00
J40	0.42	344.39	49.88	0.00
J41	0.38	344.32	48.42	0.00
J42	0.09	343.92	47.78	0.00
J43	0.07	343.85	47.86	0.00
J44	1.35	343.80	47.91	0.00
J45	1.30	344.12	49.47	0.00
J46	0.86	342.93	47.21	0.00
J47	0.16	343.56	48.18	0.00
J48	0.57	343.22	47.51	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J49	0.87	343.01	47.81	0.00
J50	0.07	340.94	51.47	0.00
J51	0.98	345.79	53.22	0.00
J52	4.19	345.06	51.23	0.00
J53	0.29	343.90	50.58	0.00
J54	0.44	342.96	49.91	0.00
J55	0.46	345.27	52.18	0.00
J56	0.55	345.07	52.46	0.00

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J57	0.41	345.07	53.05	0.00
J58	0.19	344.74	51.28	0.00
J59	0.00	344.74	51.28	0.00
J60	0.57	344.74	53.51	0.00
J61	0.36	344.40	51.95	0.00
J62	0.00	344.43	51.98	0.00
J63	0.01	344.03	52.10	0.00
J64	0.18	342.82	53.05	0.00
J65	0.71	343.70	52.50	0.00
J66	0.27	343.27	53.51	0.00
J67	0.28	343.01	52.64	0.00
J68	0.33	341.02	52.73	0.00
J69	0.37	337.99	49.61	0.00
J70	0.42	335.03	46.63	0.00
J71	0.87	340.64	51.77	0.00
J72	0.10	342.24	53.32	0.00
J73	0.18	341.19	52.46	0.00
J74	0.24	340.76	51.56	0.00
J75	0.12	340.47	51.29	0.00
J76	0.40	340.47	50.86	0.00
J77	0.03	339.65	50.47	0.00
J78	0.06	339.52	49.91	0.00
J79	0.50	339.00	49.36	0.00
J80	0.25	338.89	49.05	0.00
J81	0.12	339.25	50.25	0.00
J82	0.81	338.83	49.35	0.00
J83	0.27	338.73	49.16	0.00
J84	0.00	341.58	52.47	0.00
J85	0.15	341.58	52.60	0.00
J86	0.02	341.19	51.97	0.00
J87	0.02	341.19	51.97	0.00
J88	0.22	341.19	51.91	0.00
J89	0.37	341.19	51.63	0.00
J90	0.23	340.21	50.86	0.00
J91	0.39	340.01	50.80	0.00
J92	0.02	338.39	48.99	0.00
J93	0.12	341.19	51.84	0.00
J94	0.22	341.19	52.03	0.00
J95	0.03	341.14	52.20	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J96	0.03	340.77	51.62	0.00
J97	0.35	340.26	50.62	0.00
J98	0.31	338.89	48.95	0.00

J99	0.14	338.37	48.48	0.00
J100	0.35	337.91	47.93	0.00
J101	0.33	337.27	46.35	0.00
J102	0.20	337.63	47.32	0.00
J103	0.29	338.35	48.90	0.00
J104	0.19	338.35	48.32	0.00
J105	0.07	338.35	49.33	0.00
J106	0.12	338.34	48.76	0.00
J107	0.23	338.33	48.55	0.00
J108	0.23	337.99	47.79	0.00
J109	0.16	337.68	47.19	0.00
J110	0.21	338.64	48.99	0.00
J111	0.14	339.07	49.04	0.00
J112	0.10	339.75	49.96	0.00
J113	0.34	340.68	51.19	0.00
J114	0.00	340.37	50.93	0.00
J115	0.70	339.75	49.73	0.00
J116	0.16	340.37	50.73	0.00
J117	0.41	340.37	50.66	0.00
J118	0.51	340.37	50.80	0.00
J120	0.07	340.37	50.62	0.00
J121	0.19	340.37	50.13	0.00
J122	0.09	340.37	50.23	0.00
J124	0.00	339.75	48.40	0.00
J125	0.18	339.75	48.67	0.00
J126	0.27	339.75	49.23	0.00
J127	0.86	339.34	48.85	0.00
J128	0.10	338.67	46.85	0.00
J129	3.73	338.67	46.66	0.00
J130	0.54	338.73	47.55	0.00
J131	0.96	338.81	48.13	0.00
J132	0.25	339.05	48.47	0.00
J133	0.34	338.87	48.03	0.00
J134	0.40	338.81	48.32	0.00
J135	0.48	338.90	48.68	0.00
J136	0.12	338.58	48.08	0.00
J137	0.18	338.32	49.22	0.00
J138	1.39	337.97	48.18	0.00
J139	0.18	356.28	65.81	0.00
FS	0.00	336.69	46.09	0.00
FD	0.00	356.42	65.82	0.00
J140	0.00	355.74	67.09	0.00
J141	0.22	355.18	67.18	0.00
J142	3.90	352.99	66.49	0.00

Node Results: (continued)

Node	Demand	Head	Pressure	Quality

EPANet Current MDD and FF S3 Model Results

ID	LPS	m	m	
J143	0.51	350.94	64.66	0.00
J144	0.01	348.49	63.74	0.00
J145	0.00	347.92	63.35	0.00
J146	0.00	347.25	63.22	0.00
J147	0.03	347.00	63.10	0.00
J148	0.04	346.83	63.63	0.00
J149	0.09	346.59	63.70	0.00
J150	0.24	346.24	64.19	0.00
J151	0.01	346.41	62.01	0.00
J152	0.01	345.64	62.69	0.00
J153	0.00	344.99	62.84	0.00
J154	0.00	344.55	62.70	0.00
J155	0.01	344.10	63.50	0.00
J156	1.21	345.24	63.39	0.00
J157	0.00	346.21	64.71	0.00
J158	0.01	346.18	65.88	0.00
J159A	0.00	345.22	65.72	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	231.58	26.48	0.00
J162	0.03	230.82	25.42	0.00
J163	0.16	229.71	24.61	0.00
J164	0.06	229.37	23.47	0.00
J165	0.06	229.21	22.61	0.00
J166	0.07	229.32	22.82	0.00
J167	0.04	229.26	23.26	0.00
J168	0.09	228.43	23.53	0.00
J169	0.10	227.80	21.10	0.00
J170	0.00	229.69	32.69	0.00
J171	0.16	229.69	29.69	0.00
J172	0.00	229.68	36.68	0.00
J173	0.00	229.67	39.67	0.00
J174	0.04	229.67	38.97	0.00
J175	0.10	229.66	38.56	0.00
J176	3.69	229.66	40.66	0.00
J177	0.07	229.67	36.97	0.00
J178	0.07	229.67	37.77	0.00
J179	0.01	229.67	37.57	0.00
J180	0.04	229.68	39.78	0.00
J181	0.01	229.67	39.57	0.00
J182	0.18	229.67	35.17	0.00
JFS	0.00	231.62	26.52	0.00
JFF1	0.00	345.08	52.06	0.00
JFF2	0.00	340.37	50.80	0.00
JFF3	0.00	343.90	50.58	0.00

EPANet Current MDD and FF S3 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
JFF4	30.65	338.39	48.99	0.00	
JFF5	30.65	335.03	46.63	0.00	
JFF6	38.00	344.10	63.50	0.00	
JFF7	38.00	227.80	21.10	0.00	
JFF8	0.00	343.22	49.46	0.00	
JFF9	0.00	344.74	53.51	0.00	
RES1	-107.76	287.05	0.00	0.00	Reservoir
RES2	-67.97	287.05	0.00	0.00	Reservoir
TANK1	-33.16	231.61	26.51	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	39.79	1.27	7.33	Open
PS2	67.97	1.38	6.66	Open
PS3	0.00	0.00	0.00	Open
PS4	67.97	1.38	6.66	Open
PD1	39.79	1.27	7.33	Open
PD2	67.97	1.38	6.66	Open
PD3	0.00	0.00	0.00	Open
PD4	67.97	1.38	6.66	Open
PD5	175.73	1.40	3.92	Open
PIPE1A	40.38	0.32	0.23	Open
PIPE1	23.59	1.34	11.30	Open
PIPE2	21.85	1.24	9.80	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	135.17	1.08	2.12	Open
PIPE5	66.71	1.36	6.43	Open
PIPE6	56.78	1.16	4.77	Open
PIPE7	33.30	1.06	5.27	Open
PIPE8	32.92	1.05	5.16	Open
PIPE9	3.53	0.20	0.33	Open
PIPE10	2.81	0.16	0.22	Open
PIPE11	2.10	0.12	0.13	Open
PIPE12	2.08	0.12	0.13	Open
PIPE13	2.00	0.11	0.12	Open
PIPE14	1.64	0.09	0.08	Open
PIPE15	1.30	0.07	0.05	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	28.66	0.91	3.99	Open

PIPE19	1.06	0.06	0.04	Open
PIPE20	27.21	0.87	3.62	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	25.81	0.82	3.29	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE23	0.93	0.05	0.03	Open
PIPE24	24.68	0.79	3.02	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	25.29	0.81	3.17	Open
PIPE27	12.98	0.73	3.74	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	12.09	0.68	3.28	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	7.41	0.42	1.32	Open
PIPE32	16.79	0.95	6.01	Open
PIPE33	16.44	0.93	5.79	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	21.60	1.22	9.59	Open
PIPE39	6.04	0.34	0.91	Open
PIPE40	5.62	0.32	0.79	Open
PIPE41	5.25	0.67	5.03	Open
PIPE42	5.16	0.29	0.68	Open
PIPE43	5.09	0.29	0.66	Open
PIPE44	15.46	0.88	5.17	Open
PIPE45	-2.66	0.15	0.20	Open
PIPE46	11.50	0.65	2.99	Open
PIPE47	15.23	0.86	5.02	Open
PIPE48	12.27	0.69	3.37	Open
PIPE49	12.10	0.68	3.28	Open
PIPE50	11.54	0.65	3.00	Open
PIPE51	-5.58	0.32	0.78	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	31.49	1.78	19.28	Open
PIPE54	35.04	1.12	5.79	Open
PIPE55	34.07	1.08	5.50	Open
PIPE56	50.72	1.61	11.48	Open
PIPE57	50.44	1.61	11.37	Open
PIPE58	9.73	0.55	2.19	Open
PIPE59	9.27	0.52	2.00	Open
PIPE60	-5.42	0.11	0.06	Open

PIPE61	56.71	0.80	1.96	Open
PIPE62	-15.43	0.31	0.43	Open
PIPE63	9.02	0.18	0.16	Open
PIPE64	12.31	0.70	3.39	Open
PIPE65	47.29	0.96	3.40	Open
PIPE66	-0.51	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	12.63	0.71	3.55	Open
PIPE69	24.46	1.38	12.08	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE70	46.22	0.94	3.26	Open
PIPE71	-12.20	0.69	3.33	Open
PIPE72	34.02	1.93	22.26	Open
PIPE73	23.51	1.33	11.23	Open
PIPE74	10.49	0.59	2.52	Open
PIPE75	9.79	0.55	2.21	Open
PIPE76	9.52	0.54	2.10	Open
PIPE77	9.23	0.52	1.99	Open
PIPE78	32.57	1.84	20.53	Open
PIPE79	31.43	1.78	19.22	Open
PIPE80	31.07	1.76	18.81	Open
PIPE81	9.17	0.52	1.96	Open
PIPE82	31.19	0.99	4.67	Open
PIPE83	31.08	1.76	18.83	Open
PIPE84	8.36	0.47	1.65	Open
PIPE85	12.97	0.73	3.73	Open
PIPE86	12.73	0.72	3.60	Open
PIPE87	8.30	0.47	1.63	Open
PIPE88	0.68	0.04	0.02	Open
PIPE89	20.23	1.14	8.50	Open
PIPE90	9.88	0.56	2.25	Open
PIPE91	9.82	0.56	2.23	Open
PIPE92	9.32	0.53	2.02	Open
PIPE93	10.32	0.58	2.44	Open
PIPE94	10.20	0.58	2.39	Open
PIPE95	9.39	0.53	2.05	Open
PIPE96	43.27	1.38	8.56	Open
PIPE97	0.15	0.00	0.00	Open
PIPE98	30.29	0.96	4.42	Open
PIPE99	12.83	0.73	3.66	Open
PIPE100	-1.02	0.03	0.01	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

EPANet Current MDD and FF S3 Model Results

PIPE103	31.29	1.00	4.70	Open
PIPE104	31.06	0.99	4.63	Open
PIPE105	30.67	1.74	18.36	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	10.86	0.35	0.66	Open
PIPE109	-9.58	0.31	0.52	Open
PIPE110	20.41	1.16	8.64	Open
PIPE111	9.53	0.54	2.11	Open
PIPE112	9.81	0.55	2.22	Open
PIPE113	10.85	0.61	2.68	Open
PIPE114	20.30	1.15	8.56	Open
PIPE115	20.42	1.16	7.61	Open
PIPE116	-0.43	0.02	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE117	8.63	0.49	1.76	Open
PIPE118	17.75	1.00	6.67	Open
PIPE119	17.40	0.98	6.43	Open
PIPE120	17.06	0.97	5.46	Open
PIPE121	16.86	0.95	5.34	Open
PIPE122	3.22	0.18	0.25	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	2.54	0.14	0.18	Open
PIPE127	14.34	0.81	4.49	Open
PIPE128	14.10	0.80	4.36	Open
PIPE129	20.61	1.17	8.80	Open
PIPE130	-12.03	0.68	3.25	Open
PIPE131	-12.24	0.69	3.35	Open
PIPE132	-15.42	0.87	5.14	Open
PIPE133	-15.53	0.88	5.21	Open
PIPE134	-15.87	0.90	5.42	Open
PIPE135	15.54	0.88	5.22	Open
PIPE136	14.11	0.80	4.36	Open
PIPE137	1.08	0.03	0.01	Open
PIPE138	0.92	0.03	0.01	Open
PIPE139	0.51	0.02	0.00	Open
PIPE141	0.35	0.02	0.00	Open
PIPE142	0.28	0.02	0.00	Open
PIPE143	0.09	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.18	0.01	0.00	Open

EPANet Current MDD and FF S3 Model Results

PIPE149	-0.44	0.03	0.01	Open
PIPE150	12.97	0.73	3.73	Open
PIPE152	-0.10	0.01	0.00	Open
PIPE153	-3.84	0.22	0.39	Open
PIPE154	-4.37	0.25	0.50	Open
PIPE155	-0.79	0.40	4.38	Open
PIPE156	11.33	0.64	2.90	Open
PIPE157	3.04	0.17	0.25	Open
PIPE158	8.46	0.48	1.69	Open
PIPE159	-4.55	0.26	0.54	Open
PIPE160	3.57	0.20	0.34	Open
PIPE161	5.65	0.32	0.80	Open
PIPE162	5.18	0.29	0.68	Open
PIPE163	8.35	0.47	1.65	Open
PIPE164	8.23	0.47	1.61	Open
PIPE165	8.05	0.46	1.54	Open
PIPE166	6.67	0.38	1.09	Open
PIPE167	0.00	0.00	0.00	Closed
PFS	54.54	1.11	3.90	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PFD	54.54	1.11	3.90	Open
PIPE168	54.36	1.11	3.88	Open
PIPE169	54.36	1.11	3.88	Open
PIPE170	54.14	1.10	3.85	Open
PIPE171	50.24	1.02	3.35	Open
PIPE172	49.73	1.01	3.29	Open
PIPE173	49.71	1.01	3.28	Open
PIPE174	49.71	1.01	3.28	Open
PIPE175	49.71	1.01	3.28	Open
PIPE176	33.76	0.69	1.60	Open
PIPE177	33.71	0.69	1.60	Open
PIPE178	33.63	0.69	1.59	Open
PIPE179	15.93	0.90	4.80	Open
PIPE180	15.92	0.90	4.80	Open
PIPE181	15.91	0.90	4.79	Open
PIPE182	15.91	0.90	4.79	Open
PIPE183	15.91	0.90	4.79	Open
PIPE184	-22.10	1.25	8.81	Open
PIPE185	-23.31	1.32	9.73	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open

PIPE189A	10.00	0.57	2.47	Open
PWT2	43.16	1.37	8.52	Open
PIPE190	43.02	1.37	7.45	Open
PIPE191	42.99	1.37	7.44	Open
PIPE192	14.22	0.80	3.89	Open
PIPE193	10.23	0.58	2.12	Open
PIPE194	3.93	0.22	0.36	Open
PIPE195	3.86	0.22	0.35	Open
PIPE196	3.82	0.22	0.34	Open
PIPE197	13.99	0.79	3.78	Open
PIPE198	13.90	0.79	3.73	Open
PIPE199	-24.21	1.37	10.43	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	30.65	0.04	0.00	Open
PIPEFF5	30.65	0.04	0.00	Open
PIPEFF6	38.00	0.05	0.00	Open
PIPEFF7	38.00	0.05	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PUMP1	39.79	0.00	-59.41	Open Pump
PUMP2	67.97	0.00	-59.41	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	67.97	0.00	-59.41	Open Pump
PUMP5	54.54	0.00	-19.73	Open Pump

EPANet Current MDD and FF S3 Model Results

VALVE1	10.06	0.57	47.13	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	26.05	Active Valve

EPANet Current Chlorine Decay Model Results


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 ******************************************************************
 *                            E P A N E T                         *
 *                     Hydraulic and Water Quality                *
 *                     Analysis for Pipe Networks                 *
 *                           Version 2.2                          *
 ******************************************************************

 Input File: Wawa Water Hydraulic Model_Current Chlorine_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

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PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150	
PIPE194	J164	J166	136.0	150	
PIPE195	J166	J167	177.0	150	
PIPE196	J167	J165	141.39	150	
PIPE197	J165	J168	207.4	150	
PIPE198	J168	J169	167.6	150	
PIPE199	J169	J163	183.1	150	
PIPE200	J163	J170	166.5	200	
PIPE201	J170	J171	233.5	150	
PIPE202	J170	J172	122.8	200	
PIPE203	J172	J173	81.3	200	
PIPE204	J173	J174	128.8	200	
PIPE205	J174	J175	178.9	200	
PIPE206	J175	J176	88.8	200	
PIPE207	J175	J177	89.4	150	
PIPE208	J173	J178	102.50	150	
PIPE209	J178	J177	68.68	150	
PIPE210	J177	J179	96.0	150	
PIPE211	J172	J180	59.5	150	
PIPE212	J180	J179	116.3	150	
PIPE213	J179	J181	72.78	150	
PIPE214	J181	J182	148.8	150	
PWT1	JFS	TANK1	4	150	
PUMP1	S1	D1	#N/A	#N/A	Pump

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	25.17	29.75	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	100.00	75.00	0.11	2.20	4.97	0.00

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Demand Charge:	0.00
Total Cost:	0.00

Node Results at 120:00 Hrs:

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
S1	0.00	291.47	-2.83	0.86
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	345.81	51.51	0.86
D2	0.00	345.79	51.49	0.00
D3	0.00	345.79	51.49	0.00
D4	0.00	345.79	51.49	0.00
DH	0.00	345.79	51.49	0.86
J1A	0.10	345.79	52.59	0.86
J1	0.00	345.79	52.55	0.86
J2	0.10	345.71	52.50	0.86
J3	0.05	345.65	52.47	0.86
J4	0.07	345.65	52.53	0.74

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J5	0.06	345.78	53.21	0.86
J6	0.10	345.76	54.67	0.86
J7	0.03	345.76	54.80	0.85
J8	0.19	345.74	52.39	0.86
J9	0.37	345.68	52.02	0.86
J10	0.36	345.67	52.94	0.85
J11	0.36	345.66	51.06	0.83
J12	0.01	345.65	50.23	0.83
J13	0.04	345.65	50.27	0.83
J14	0.18	345.65	48.93	0.80
J15	0.17	345.64	48.47	0.79
J16	0.15	345.64	51.44	0.73
J17	0.16	345.63	54.48	0.70
J18	0.34	345.63	52.61	0.67
J19	0.19	345.65	50.99	0.85
J20	0.53	345.65	50.30	0.83
J21	0.14	345.63	51.90	0.85
J22	0.56	345.63	50.20	0.83
J23	0.10	345.61	52.42	0.85

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J24	0.47	345.61	50.03	0.82
J25	0.05	345.60	52.21	0.85
J26	0.98	345.59	52.25	0.84
J27	0.02	345.58	51.08	0.84
J28	0.08	345.57	51.36	0.84
J29	0.36	345.57	50.04	0.82
J30	0.14	345.55	50.50	0.84
J31	2.21	345.53	51.77	0.83
J32	0.48	345.54	50.23	0.81
J33	0.17	345.76	52.21	0.85
J34	0.17	345.75	50.79	0.85
J35	0.03	345.75	49.92	0.84
J36	0.31	345.75	49.23	0.80
J37	0.17	345.71	51.52	0.83
J38	0.60	345.70	49.11	0.82
J39	0.05	345.63	52.41	0.85
J40	0.21	345.62	51.11	0.85
J41	0.19	345.61	49.71	0.84
J42	0.04	345.59	49.45	0.84
J43	0.04	345.59	49.60	0.83
J44	0.68	345.58	49.69	0.84
J45	0.65	345.60	50.95	0.85
J46	0.43	345.55	49.83	0.83
J47	0.08	345.57	50.19	0.84
J48	0.28	345.56	49.85	0.84
J49	0.44	345.54	50.34	0.80
J50	0.04	345.51	56.04	0.83
J51	0.49	345.77	53.20	0.86

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J52	2.10	345.75	51.92	0.84
J53	0.14	345.73	52.41	0.84
J54	0.22	345.72	52.67	0.83
J55	0.23	345.76	52.67	0.85
J56	0.28	345.75	53.14	0.85
J57	0.20	345.75	53.73	0.85
J58	0.10	345.74	52.28	0.83
J59	0.00	345.74	52.28	0.83
J60	0.28	345.74	54.51	0.81
J61	0.18	345.74	53.29	0.83
J62	0.00	345.74	53.29	0.83
J63	0.01	345.73	53.80	0.83
J64	0.09	345.71	55.94	0.82
J65	0.35	345.72	54.52	0.83

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J66	0.13	345.72	55.96	0.81
J67	0.14	345.71	55.34	0.81
J68	0.16	345.69	57.40	0.82
J69	0.18	345.69	57.31	0.79
J70	0.21	345.69	57.29	0.72
J71	0.43	345.66	56.79	0.82
J72	0.05	345.70	56.78	0.83
J73	0.09	345.69	56.96	0.82
J74	0.12	345.66	56.46	0.82
J75	0.06	345.65	56.47	0.82
J76	0.20	345.65	56.04	0.81
J77	0.01	345.60	56.42	0.81
J78	0.03	345.59	55.98	0.81
J79	0.25	345.57	55.93	0.80
J80	0.13	345.56	55.72	0.80
J81	0.06	345.58	56.58	0.81
J82	0.40	345.56	56.08	0.80
J83	0.13	345.55	55.98	0.80
J84	0.00	345.70	56.59	0.83
J85	0.07	345.70	56.72	0.73
J86	0.01	345.69	56.47	0.83
J87	0.01	345.69	56.47	0.82
J88	0.11	345.69	56.41	0.81
J89	0.18	345.69	56.13	0.75
J90	0.12	345.69	56.34	0.73
J91	0.20	345.69	56.48	0.71
J92	0.01	345.69	56.29	0.23
J93	0.06	345.69	56.34	0.75
J94	0.11	345.69	56.53	0.66
J95	0.01	345.69	56.75	0.82
J96	0.01	345.66	56.51	0.82
J97	0.18	345.63	55.99	0.81
J98	0.16	345.56	55.62	0.81

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J99	0.07	345.53	55.64	0.80
J100	0.18	345.53	55.55	0.80
J101	0.16	345.51	54.59	0.80
J102	0.10	345.51	55.20	0.80
J103	0.14	345.52	56.07	0.80
J104	0.10	345.52	55.49	0.76
J105	0.04	345.52	56.50	0.60
J106	0.06	345.52	55.94	0.76
J107	0.12	345.51	55.73	0.80

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J108	0.12	345.51	55.31	0.79
J109	0.08	345.51	55.02	0.79
J110	0.10	345.50	55.85	0.79
J111	0.07	345.50	55.47	0.80
J112	0.05	345.50	55.71	0.81
J113	0.17	345.51	56.02	0.83
J114	0.00	345.50	56.06	0.83
J115	0.35	345.49	55.47	0.82
J116	0.08	345.49	55.85	0.78
J117	0.20	345.49	55.78	0.74
J118	0.26	345.49	55.92	0.68
J120	0.04	345.49	55.74	0.78
J121	0.10	345.49	55.25	0.71
J122	0.04	345.49	55.35	0.63
J124	0.00	345.48	54.13	0.00
J125	0.09	345.48	54.40	0.65
J126	0.13	345.48	54.96	0.76
J127	0.43	345.48	54.99	0.81
J128	0.05	345.41	53.59	0.66
J129	1.87	345.41	53.40	0.76
J130	0.27	345.43	54.25	0.76
J131	0.48	345.45	54.77	0.77
J132	0.13	345.48	54.90	0.79
J133	0.17	345.47	54.63	0.77
J134	0.20	345.48	54.99	0.72
J135	0.24	345.48	55.26	0.77
J136	0.06	345.48	54.98	0.71
J137	0.09	345.48	56.38	0.77
J138	0.69	345.49	55.70	0.78
J139	0.09	374.67	84.20	0.79
FS	0.00	345.50	54.90	0.79
FD	0.00	374.67	84.07	0.79
J140	0.00	374.67	86.02	0.78
J141	0.11	374.66	86.66	0.77
J142	1.95	374.65	88.15	0.74
J143	0.26	374.65	88.37	0.72
J144	0.01	374.65	89.90	0.67
J145	0.00	374.65	90.08	0.67

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J146	0.00	374.65	90.62	0.64
J147	0.01	374.65	90.75	0.64
J148	0.02	374.65	91.45	0.64
J149	0.04	374.65	91.76	0.64

J150	0.12	374.65	92.60	0.61	
J151	0.01	374.65	90.25	0.64	
J152	0.00	374.65	91.70	0.62	
J153	0.00	374.65	92.50	0.61	
J154	0.00	374.65	92.80	0.60	
J155	0.01	374.65	94.05	0.58	
J156	0.60	374.65	92.80	0.60	
J157	0.00	374.65	93.15	0.59	
J158	0.01	374.65	94.35	0.58	
J159A	0.00	374.65	95.15	0.56	
J159	0.00	298.10	18.60	0.56	
J160A	0.03	298.10	49.60	0.53	
J160B	0.00	259.96	11.47	0.53	
J160	0.00	259.96	54.87	0.51	
J161	0.07	245.88	40.78	0.86	
J162	0.01	245.87	40.47	0.85	
J163	0.08	245.87	40.77	0.85	
J164	0.03	245.87	39.97	0.80	
J165	0.03	245.87	39.27	0.69	
J166	0.04	245.87	39.37	0.58	
J167	0.02	245.87	39.87	0.20	
J168	0.04	245.87	40.97	0.34	
J169	0.05	245.87	39.17	0.69	
J170	0.00	245.86	48.86	0.83	
J171	0.08	245.86	45.86	0.62	
J172	0.00	245.86	52.86	0.83	
J173	0.00	245.86	55.86	0.83	
J174	0.02	245.86	55.16	0.80	
J175	0.05	245.86	54.76	0.77	
J176	1.84	245.85	56.85	0.77	
J177	0.04	245.86	53.16	0.77	
J178	0.04	245.86	53.96	0.80	
J179	0.01	245.86	53.76	0.80	
J180	0.02	245.86	55.96	0.82	
J181	0.01	245.86	55.76	0.74	
J182	0.09	245.86	51.36	0.62	
JFS	0.00	259.96	54.87	0.51	
RES1	-33.22	291.50	0.00	0.86	Reservoir
RES2	0.00	291.50	0.00	0.86	Reservoir
TANK1	-2.58	245.88	40.78	0.22	Tank

Link Results at 120:00 Hrs:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	33.22	1.06	5.24	Open

EPANet Current Chlorine Decay Model Results

PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	33.22	1.06	5.24	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	33.22	0.26	0.18	Open
PIPE1A	8.92	0.07	0.01	Open
PIPE1	6.47	0.37	1.03	Open
PIPE2	5.60	0.32	0.79	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	24.20	0.19	0.09	Open
PIPE5	9.25	0.19	0.17	Open
PIPE6	7.74	0.16	0.12	Open
PIPE7	9.81	0.31	0.55	Open
PIPE8	9.63	0.31	0.53	Open
PIPE9	1.76	0.10	0.09	Open
PIPE10	1.41	0.08	0.06	Open
PIPE11	1.05	0.06	0.04	Open
PIPE12	1.04	0.06	0.03	Open
PIPE13	1.00	0.06	0.03	Open
PIPE14	0.82	0.05	0.02	Open
PIPE15	0.65	0.04	0.01	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	7.49	0.24	0.33	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	6.77	0.22	0.28	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	6.07	0.19	0.23	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	5.51	0.18	0.19	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	5.34	0.17	0.18	Open
PIPE27	3.12	0.18	0.27	Open
PIPE28	0.36	0.02	0.00	Open
PIPE29	2.68	0.15	0.20	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	0.34	0.02	0.00	Open
PIPE32	2.45	0.14	0.17	Open
PIPE33	2.28	0.13	0.15	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open

EPANet Current Chlorine Decay Model Results

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE38	5.47	0.31	0.76	Open
PIPE39	1.57	0.09	0.07	Open
PIPE40	1.36	0.08	0.06	Open
PIPE41	1.17	0.15	0.31	Open
PIPE42	1.12	0.06	0.04	Open
PIPE43	1.09	0.06	0.04	Open
PIPE44	3.86	0.22	0.40	Open
PIPE45	-0.86	0.05	0.02	Open
PIPE46	2.35	0.13	0.16	Open
PIPE47	2.76	0.16	0.21	Open
PIPE48	2.19	0.12	0.14	Open
PIPE49	2.11	0.12	0.13	Open
PIPE50	1.83	0.10	0.10	Open
PIPE51	0.58	0.03	0.01	Open
PIPE52	0.44	0.02	0.01	Open
PIPE53	3.58	0.20	0.34	Open
PIPE54	5.08	0.16	0.16	Open
PIPE55	4.59	0.15	0.13	Open
PIPE56	5.56	0.18	0.19	Open
PIPE57	5.42	0.17	0.18	Open
PIPE58	1.41	0.08	0.06	Open
PIPE59	1.18	0.07	0.04	Open
PIPE60	-1.29	0.03	0.00	Open
PIPE61	7.71	0.11	0.05	Open
PIPE62	-1.77	0.04	0.01	Open
PIPE63	1.86	0.04	0.01	Open
PIPE64	1.47	0.08	0.07	Open
PIPE65	5.65	0.12	0.07	Open
PIPE66	-0.07	0.00	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	1.44	0.08	0.06	Open
PIPE69	2.59	0.15	0.19	Open
PIPE70	5.29	0.11	0.06	Open
PIPE71	-1.32	0.07	0.05	Open
PIPE72	3.97	0.22	0.42	Open
PIPE73	2.56	0.15	0.19	Open
PIPE74	1.40	0.08	0.06	Open
PIPE75	1.04	0.06	0.04	Open
PIPE76	0.91	0.05	0.03	Open
PIPE77	0.77	0.04	0.02	Open
PIPE78	3.24	0.18	0.29	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	2.30	0.13	0.15	Open
PIPE82	3.49	0.11	0.08	Open
PIPE83	3.44	0.19	0.32	Open

EPANet Current Chlorine Decay Model Results

PIPE84	-0.38	0.02	0.01	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE85	2.74	0.16	0.21	Open
PIPE86	2.62	0.15	0.19	Open
PIPE87	1.87	0.11	0.10	Open
PIPE88	0.22	0.01	0.00	Open
PIPE89	4.21	0.24	0.46	Open
PIPE90	2.09	0.12	0.13	Open
PIPE91	2.06	0.12	0.12	Open
PIPE92	1.81	0.10	0.10	Open
PIPE93	2.10	0.12	0.13	Open
PIPE94	2.04	0.12	0.12	Open
PIPE95	1.64	0.09	0.08	Open
PIPE96	4.29	0.14	0.12	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	2.90	0.09	0.06	Open
PIPE99	1.31	0.07	0.05	Open
PIPE100	2.57	0.08	0.04	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	3.41	0.11	0.08	Open
PIPE109	-0.99	0.03	0.01	Open
PIPE110	4.39	0.25	0.50	Open
PIPE111	2.05	0.12	0.12	Open
PIPE112	2.08	0.12	0.13	Open
PIPE113	2.32	0.13	0.15	Open
PIPE114	4.22	0.24	0.47	Open
PIPE115	4.40	0.25	0.44	Open
PIPE116	-0.34	0.02	0.00	Open
PIPE117	1.35	0.08	0.06	Open
PIPE118	2.85	0.16	0.23	Open
PIPE119	2.67	0.15	0.20	Open
PIPE120	2.08	0.12	0.11	Open
PIPE121	1.98	0.11	0.10	Open
PIPE122	2.24	0.13	0.13	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open

EPANet Current Chlorine Decay Model Results

PIPE126	1.91	0.11	0.11	Open
PIPE127	0.48	0.03	0.01	Open
PIPE128	0.36	0.02	0.01	Open
PIPE129	-1.22	0.07	0.05	Open
PIPE130	1.31	0.07	0.05	Open
PIPE131	1.20	0.07	0.05	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE132	-1.10	0.06	0.04	Open
PIPE133	-1.16	0.07	0.04	Open
PIPE134	-1.33	0.08	0.05	Open
PIPE135	2.22	0.13	0.14	Open
PIPE136	1.50	0.09	0.07	Open
PIPE137	0.54	0.02	0.00	Open
PIPE138	0.46	0.01	0.00	Open
PIPE139	0.26	0.01	0.00	Open
PIPE141	0.18	0.01	0.00	Open
PIPE142	0.14	0.01	0.00	Open
PIPE143	0.04	0.00	0.00	Open
PIPE147	0.00	0.00	0.00	Open
PIPE148	-0.09	0.00	0.00	Open
PIPE149	-0.22	0.01	0.00	Open
PIPE150	0.93	0.05	0.03	Open
PIPE152	-0.05	0.00	0.00	Open
PIPE153	-1.92	0.11	0.11	Open
PIPE154	-2.19	0.12	0.14	Open
PIPE155	-0.16	0.08	0.23	Open
PIPE156	0.34	0.02	0.00	Open
PIPE157	2.24	0.13	0.14	Open
PIPE158	1.73	0.10	0.09	Open
PIPE159	-2.51	0.14	0.18	Open
PIPE160	-0.95	0.05	0.03	Open
PIPE161	0.72	0.04	0.02	Open
PIPE162	0.48	0.03	0.01	Open
PIPE163	-0.66	0.04	0.02	Open
PIPE164	-0.72	0.04	0.02	Open
PIPE165	-0.81	0.05	0.02	Open
PIPE166	-1.50	0.09	0.07	Open
PIPE167	0.00	0.00	0.00	Closed
PFS	3.27	0.07	0.02	Open
PFD	3.27	0.07	0.02	Open
PIPE168	3.18	0.06	0.02	Open
PIPE169	3.18	0.06	0.02	Open
PIPE170	3.07	0.06	0.02	Open

EPANet Current Chlorine Decay Model Results

PIPE171	1.12	0.02	0.00	Open
PIPE172	0.86	0.02	0.00	Open
PIPE173	0.86	0.02	0.00	Open
PIPE174	0.86	0.02	0.00	Open
PIPE175	0.86	0.02	0.00	Open
PIPE176	0.64	0.01	0.00	Open
PIPE177	0.62	0.01	0.00	Open
PIPE178	0.57	0.01	0.00	Open
PIPE179	0.20	0.01	0.00	Open
PIPE180	0.20	0.01	0.00	Open
PIPE181	0.19	0.01	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE182	0.19	0.01	0.00	Open
PIPE183	0.19	0.01	0.00	Open
PIPE184	0.19	0.01	0.00	Open
PIPE185	-0.42	0.02	0.01	Open
PIPE186	0.04	0.00	0.00	Open
PIPE187	0.04	0.00	0.00	Open
PIPE188	0.03	0.00	0.00	Open
PIPE189	0.03	0.00	0.00	Open
PIPE189A	0.00	0.00	0.00	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.13	0.01	0.00	Open
PIPE193	0.05	0.00	0.00	Open
PIPE194	0.04	0.00	0.00	Open
PIPE195	0.01	0.00	0.00	Open
PIPE196	-0.02	0.00	0.00	Open
PIPE197	0.01	0.00	0.00	Open
PIPE198	-0.03	0.00	0.00	Open
PIPE199	-0.09	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.00	Open
PIPE210	-0.44	0.02	0.01	Open

EPANet Current Chlorine Decay Model Results

PIPE211	0.56	0.03	0.01	Open	
PIPE212	0.54	0.03	0.01	Open	
PIPE213	0.10	0.01	0.00	Open	
PIPE214	0.09	0.01	0.00	Open	
PWT1	0.00	0.00	0.00	Closed	
PUMP1	33.22	0.00	-54.34	Open	Pump
PUMP2	0.00	0.00	0.00	Closed	Pump
PUMP3	0.00	0.00	0.00	Closed	Pump
PUMP4	0.00	0.00	0.00	Closed	Pump
PUMP5	3.27	0.00	-29.17	Open	Pump
VALVE1	0.03	0.00	76.55	Active	Valve
VALVE2	0.00	0.00	38.13	Active	Valve
VALVE3	0.00	0.00	0.00	Open	Valve

EPANet Current ADD with Upgrades Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************
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Input File: Wawa Water Hydraulic Model_Current with Upgrades ADD_V2_PK.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

EPANet Current ADD with Upgrades Model Results

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

EPANet Current ADD with Upgrades Model Results

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PIPE140	J118	J119	71.63	150	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump

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PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	29.75	29.75	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	344.13	49.83	0.00
D2	0.00	344.09	49.79	0.00
D3	0.00	344.09	49.79	0.00
D4	0.00	344.09	49.79	0.00
DH	0.00	344.09	49.79	0.00
J1A	0.10	344.09	50.89	0.00
J1	0.00	344.08	50.84	0.00
J2	0.10	343.97	50.76	0.00
J3	0.05	343.88	50.70	0.00
J4	0.07	343.88	50.76	0.00
J5	0.06	344.08	51.51	0.00
J6	0.10	344.05	52.96	0.00
J7	0.03	344.04	53.08	0.00
J8	0.19	344.01	50.66	0.00
J9	0.37	343.91	50.25	0.00
J10	0.36	343.85	51.12	0.00
J11	0.36	343.81	49.21	0.00
J12	0.01	343.77	48.35	0.00

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J13	0.04	343.75	48.37	0.00
J14	0.18	343.72	47.00	0.00
J15	0.17	343.68	46.51	0.00
J16	0.15	343.58	49.38	0.00
J17	0.16	343.58	52.43	0.00
J18	0.34	343.58	50.56	0.00
J19	0.19	343.86	49.20	0.00
J20	0.53	343.86	48.51	0.00
J21	0.14	343.83	50.10	0.00
J22	0.56	343.83	48.40	0.00
J23	0.10	343.81	50.62	0.00
J24	0.47	343.81	48.23	0.00
J25	0.05	343.78	50.39	0.00
J26	0.98	343.78	50.44	0.00
J27	0.02	343.76	49.26	0.00
J28	0.08	343.74	49.53	0.00
J29	0.36	343.74	48.21	0.00
J30	0.14	343.70	48.65	0.00
J31	2.21	343.69	49.93	0.00
J32	0.48	343.69	48.38	0.00
J33	0.17	344.05	50.50	0.00
J34	0.17	344.03	49.07	0.00
J35	0.03	344.03	48.20	0.00
J36	0.31	344.03	47.51	0.00
J37	0.17	343.97	49.78	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	0.60	343.96	47.37	0.00
J39	0.05	343.84	50.62	0.00
J40	0.21	343.83	49.32	0.00
J41	0.19	343.82	47.92	0.00
J42	0.04	343.78	47.64	0.00
J43	0.04	343.77	47.78	0.00
J44	0.68	343.77	47.88	0.00
J45	0.65	343.79	49.14	0.00
J46	0.43	343.69	47.97	0.00
J47	0.08	343.74	48.36	0.00
J48	0.28	343.71	48.00	0.00
J49	0.44	343.69	48.49	0.00
J50	0.04	343.59	54.12	0.00
J51	0.49	344.06	51.49	0.00
J52	2.10	344.03	50.20	0.00
J53	0.14	343.99	50.67	0.00
J54	0.22	343.96	50.91	0.00

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J55	0.23	344.04	50.95	0.00
J56	0.28	344.03	51.42	0.00
J57	0.20	344.03	52.01	0.00
J58	0.10	344.02	50.56	0.00
J59	0.00	344.02	50.56	0.00
J60	0.28	344.02	52.79	0.00
J61	0.18	344.00	51.55	0.00
J62	0.00	344.01	51.56	0.00
J63	0.01	343.99	52.06	0.00
J64	0.09	343.95	54.18	0.00
J65	0.35	343.98	52.78	0.00
J66	0.13	343.96	54.20	0.00
J67	0.14	343.96	53.59	0.00
J68	0.16	343.90	55.61	0.00
J69	0.18	343.90	55.52	0.00
J70	0.21	343.90	55.50	0.00
J71	0.43	343.84	54.97	0.00
J72	0.05	343.93	55.01	0.00
J73	0.09	343.90	55.17	0.00
J74	0.12	343.84	54.64	0.00
J75	0.06	343.81	54.63	0.00
J76	0.20	343.81	54.20	0.00
J77	0.01	343.70	54.52	0.00
J78	0.03	343.69	54.08	0.00
J79	0.25	343.62	53.98	0.00
J80	0.13	343.60	53.76	0.00
J81	0.06	343.65	54.65	0.00
J82	0.40	343.60	54.12	0.00
J83	0.13	343.59	54.02	0.00
J84	0.00	343.92	54.81	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.07	343.92	54.94	0.00
J86	0.01	343.91	54.69	0.00
J87	0.01	343.91	54.69	0.00
J88	0.11	343.91	54.63	0.00
J89	0.18	343.91	54.35	0.00
J90	0.12	343.91	54.56	0.00
J91	0.20	343.91	54.70	0.00
J92	0.01	343.91	54.51	0.00
J93	0.06	343.91	54.56	0.00
J94	0.11	343.91	54.75	0.00
J95	0.01	343.90	54.96	0.00
J96	0.01	343.85	54.70	0.00

J97	0.18	343.78	54.14	0.00
J98	0.16	343.60	53.66	0.00
J99	0.07	343.53	53.64	0.00
J100	0.18	343.50	53.52	0.00
J101	0.16	343.43	52.51	0.00
J102	0.10	343.46	53.15	0.00
J103	0.14	343.52	54.07	0.00
J104	0.10	343.52	53.49	0.00
J105	0.04	343.52	54.50	0.00
J106	0.06	343.51	53.93	0.00
J107	0.12	343.50	53.72	0.00
J108	0.12	343.47	53.27	0.00
J109	0.08	343.45	52.96	0.00
J110	0.10	343.50	53.85	0.00
J111	0.07	343.51	53.48	0.00
J112	0.05	343.54	53.75	0.00
J113	0.17	343.58	54.09	0.00
J114	0.00	343.55	54.11	0.00
J115	0.35	343.53	53.51	0.00
J116	0.08	343.55	53.91	0.00
J117	0.20	343.55	53.84	0.00
J118	0.12	343.55	53.98	0.00
J120	0.04	343.55	53.80	0.00
J121	0.10	343.55	53.31	0.00
J122	0.03	343.54	53.40	0.00
J124	0.00	343.53	52.18	0.00
J125	0.09	343.53	52.45	0.00
J126	0.13	343.53	53.01	0.00
J127	0.43	343.51	53.02	0.00
J128	0.05	343.51	51.69	0.00
J129	1.87	343.50	51.49	0.00
J130	0.27	343.50	52.32	0.00
J131	0.48	343.50	52.82	0.00
J132	0.13	343.51	52.93	0.00
J133	0.17	343.50	52.66	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J134	0.20	343.50	53.01	0.00
J135	0.24	343.50	53.28	0.00
J136	0.06	343.49	52.99	0.00
J137	0.09	343.47	54.37	0.00
J138	0.69	343.46	53.67	0.00
J139	0.09	343.38	52.91	0.00
FS	0.00	343.42	52.82	0.00

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FD	0.00	343.40	52.80	0.00
J140	0.00	343.34	54.69	0.00
J141	0.11	343.30	55.30	0.00
J142	1.95	343.14	56.64	0.00
J143	0.26	343.02	56.74	0.00
J144	0.01	342.87	58.12	0.00
J145	0.00	342.84	58.27	0.00
J146	0.00	342.80	58.77	0.00
J147	0.01	342.78	58.88	0.00
J148	0.02	342.77	59.57	0.00
J149	0.04	342.75	59.86	0.00
J150	0.12	342.72	60.67	0.00
J151	0.01	342.77	58.37	0.00
J152	0.00	342.76	59.81	0.00
J153	0.00	342.75	60.60	0.00
J154	0.00	342.74	60.89	0.00
J155	0.01	342.73	62.13	0.00
J156	0.60	342.72	60.87	0.00
J157	0.00	342.69	61.19	0.00
J158	0.01	342.66	62.36	0.00
J159A	0.00	341.71	62.21	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.03	293.30	44.80	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.07	246.60	41.50	0.00
J162	0.01	246.60	41.20	0.00
J163	0.08	246.59	41.49	0.00
J164	0.03	246.59	40.69	0.00
J165	0.03	246.59	39.99	0.00
J166	0.04	246.59	40.09	0.00
J167	0.02	246.59	40.59	0.00
J168	0.04	246.59	41.69	0.00
J169	0.05	246.59	39.89	0.00
J170	0.00	246.59	49.59	0.00
J171	0.08	246.59	46.59	0.00
J172	0.00	246.58	53.58	0.00
J173	0.00	246.58	56.58	0.00
J174	0.02	246.58	55.88	0.00
J175	0.05	246.58	55.48	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J176	1.84	246.58	57.58	0.00
J177	0.04	246.58	53.88	0.00

J178	0.04	246.58	54.68	0.00	
J179	0.01	246.58	54.48	0.00	
J180	0.02	246.58	56.68	0.00	
J181	0.01	246.58	56.48	0.00	
J182	0.09	246.58	52.08	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.58	50.56	0.00	
JFF2	0.00	343.55	53.98	0.00	
JFF3	0.00	343.99	50.67	0.00	
JFF4	0.00	343.91	54.51	0.00	
JFF5	0.00	343.90	55.50	0.00	
JFF6	0.00	342.73	62.13	0.00	
JFF7	0.00	246.59	39.89	0.00	
JFF8	0.00	343.69	49.93	0.00	
JFF9	0.00	344.02	52.79	0.00	
J119	0.15	343.54	53.81	0.00	
J123	0.00	343.53	53.65	0.00	
J183	0.00	343.57	50.60	0.00	
RES1	-43.22	291.50	0.00	0.00	Reservoir
RES2	0.00	291.50	0.00	0.00	Reservoir
TANK1	7.42	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	43.22	1.38	8.54	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	43.22	1.38	8.54	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	43.22	0.34	0.29	Open
PIPE1A	11.26	0.09	0.02	Open
PIPE1	8.06	0.46	1.55	Open
PIPE2	7.19	0.41	1.25	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	31.87	0.25	0.15	Open
PIPE5	12.13	0.25	0.27	Open
PIPE6	10.20	0.21	0.20	Open
PIPE7	13.12	0.42	0.94	Open
PIPE8	12.93	0.41	0.91	Open

Link Results: (continued)

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Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE9	3.75	0.21	0.37	Open
PIPE10	3.39	0.19	0.31	Open
PIPE11	3.03	0.17	0.25	Open
PIPE12	3.02	0.17	0.25	Open
PIPE13	2.98	0.17	0.25	Open
PIPE14	2.81	0.16	0.22	Open
PIPE15	2.63	0.15	0.19	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	8.82	0.28	0.45	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	8.09	0.26	0.38	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	7.39	0.24	0.32	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	6.83	0.22	0.28	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	7.07	0.22	0.30	Open
PIPE27	3.97	0.22	0.42	Open
PIPE28	0.36	0.02	0.00	Open
PIPE29	3.53	0.20	0.34	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	1.19	0.07	0.04	Open
PIPE32	3.20	0.18	0.28	Open
PIPE33	3.02	0.17	0.25	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	7.06	0.40	1.21	Open
PIPE39	1.96	0.11	0.11	Open
PIPE40	1.75	0.10	0.09	Open
PIPE41	1.57	0.20	0.54	Open
PIPE42	1.52	0.09	0.07	Open
PIPE43	1.48	0.08	0.07	Open
PIPE44	5.06	0.29	0.65	Open
PIPE45	-1.26	0.07	0.05	Open
PIPE46	3.14	0.18	0.27	Open
PIPE47	3.95	0.22	0.41	Open
PIPE48	3.07	0.17	0.26	Open
PIPE49	2.99	0.17	0.25	Open
PIPE50	2.70	0.15	0.20	Open
PIPE51	-0.27	0.02	0.00	Open
PIPE52	0.44	0.02	0.01	Open
PIPE53	6.50	0.37	1.04	Open
PIPE54	6.56	0.21	0.26	Open
PIPE55	6.07	0.19	0.23	Open

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Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE56	7.93	0.25	0.37	Open
PIPE57	7.79	0.25	0.36	Open
PIPE58	1.82	0.10	0.10	Open
PIPE59	1.59	0.09	0.08	Open
PIPE60	-1.44	0.03	0.01	Open
PIPE61	10.17	0.14	0.08	Open
PIPE62	-2.52	0.05	0.01	Open
PIPE63	2.16	0.04	0.01	Open
PIPE64	2.03	0.11	0.12	Open
PIPE65	7.81	0.16	0.12	Open
PIPE66	-0.09	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	2.03	0.11	0.12	Open
PIPE69	3.74	0.21	0.37	Open
PIPE70	7.44	0.15	0.11	Open
PIPE71	-1.89	0.11	0.11	Open
PIPE72	5.54	0.31	0.77	Open
PIPE73	3.67	0.21	0.36	Open
PIPE74	1.87	0.11	0.10	Open
PIPE75	1.51	0.09	0.07	Open
PIPE76	1.38	0.08	0.06	Open
PIPE77	1.24	0.07	0.05	Open
PIPE78	4.82	0.27	0.60	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	3.51	0.20	0.33	Open
PIPE82	5.11	0.16	0.16	Open
PIPE83	5.06	0.29	0.65	Open
PIPE84	-0.76	0.04	0.02	Open
PIPE85	4.22	0.24	0.47	Open
PIPE86	4.10	0.23	0.44	Open
PIPE87	3.07	0.17	0.26	Open
PIPE88	0.36	0.02	0.00	Open
PIPE89	6.75	0.38	1.11	Open
PIPE90	3.33	0.19	0.30	Open
PIPE91	3.30	0.19	0.30	Open
PIPE92	3.05	0.17	0.26	Open
PIPE93	3.40	0.19	0.31	Open
PIPE94	3.34	0.19	0.30	Open
PIPE95	2.93	0.17	0.24	Open
PIPE96	6.20	0.20	0.23	Open
PIPE97	0.07	0.00	0.00	Open

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PIPE98	4.21	0.13	0.11	Open
PIPE99	1.92	0.11	0.11	Open
PIPE100	3.88	0.12	0.10	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	5.32	0.17	0.18	Open
PIPE109	-1.51	0.05	0.02	Open
PIPE110	6.82	0.39	1.13	Open
PIPE111	3.17	0.18	0.27	Open
PIPE112	3.33	0.19	0.30	Open
PIPE113	3.63	0.21	0.35	Open
PIPE114	6.78	0.38	1.12	Open
PIPE115	7.09	0.40	1.07	Open
PIPE116	-0.47	0.03	0.01	Open
PIPE117	2.46	0.14	0.17	Open
PIPE118	5.26	0.30	0.70	Open
PIPE119	5.08	0.29	0.66	Open
PIPE120	4.51	0.25	0.46	Open
PIPE121	4.40	0.25	0.44	Open
PIPE122	2.52	0.14	0.16	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.18	0.12	0.14	Open
PIPE127	3.39	0.19	0.31	Open
PIPE128	3.28	0.19	0.29	Open
PIPE129	3.95	0.22	0.41	Open
PIPE130	-1.33	0.08	0.06	Open
PIPE131	-1.43	0.08	0.06	Open
PIPE132	-2.70	0.15	0.20	Open
PIPE133	-2.75	0.16	0.21	Open
PIPE134	-2.92	0.17	0.24	Open
PIPE135	3.54	0.20	0.34	Open
PIPE136	2.39	0.14	0.16	Open
PIPE137	0.34	0.01	0.00	Open
PIPE138	0.25	0.01	0.00	Open
PIPE139	0.05	0.00	0.00	Open

EPANet Current ADD with Upgrades Model Results

PIPE141	0.81	0.05	0.02	Open
PIPE142	0.78	0.04	0.02	Open
PIPE143	0.68	0.04	0.02	Open
PIPE147	0.21	0.01	0.00	Open
PIPE148	0.12	0.01	0.00	Open
PIPE149	-0.01	0.00	0.00	Open
PIPE150	2.03	0.11	0.12	Open
PIPE152	2.16	0.12	0.13	Open
PIPE153	0.29	0.02	0.00	Open
PIPE154	0.02	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE155	-0.11	0.06	0.12	Open
PIPE156	1.49	0.08	0.07	Open
PIPE157	1.19	0.07	0.04	Open
PIPE158	1.42	0.08	0.06	Open
PIPE159	-0.35	0.02	0.00	Open
PIPE160	0.90	0.05	0.03	Open
PIPE161	1.14	0.06	0.04	Open
PIPE162	0.90	0.05	0.03	Open
PIPE163	1.60	0.09	0.08	Open
PIPE164	1.54	0.09	0.07	Open
PIPE165	1.45	0.08	0.06	Open
PIPE166	0.75	0.04	0.02	Open
PIPE167	13.27	0.27	0.28	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	13.18	0.27	0.28	Open
PIPE169	13.18	0.27	0.28	Open
PIPE170	13.07	0.27	0.28	Open
PIPE171	11.12	0.23	0.21	Open
PIPE172	10.86	0.22	0.20	Open
PIPE173	10.86	0.22	0.20	Open
PIPE174	10.86	0.22	0.20	Open
PIPE175	10.86	0.22	0.20	Open
PIPE176	9.04	0.18	0.14	Open
PIPE177	9.02	0.18	0.14	Open
PIPE178	8.97	0.18	0.14	Open
PIPE179	1.80	0.10	0.08	Open
PIPE180	1.80	0.10	0.08	Open
PIPE181	1.79	0.10	0.08	Open
PIPE182	1.79	0.10	0.08	Open
PIPE183	1.79	0.10	0.08	Open
PIPE184	1.79	0.10	0.08	Open

EPANet Current ADD with Upgrades Model Results

PIPE185	1.18	0.07	0.04	Open
PIPE186	10.04	0.20	0.17	Open
PIPE187	10.04	0.20	0.17	Open
PIPE188	10.03	0.57	2.04	Open
PIPE189	10.03	0.57	2.48	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.17	0.01	0.00	Open
PIPE193	0.06	0.00	0.00	Open
PIPE194	0.08	0.00	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	0.02	0.00	0.00	Open
PIPE197	0.05	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE198	0.01	0.00	0.00	Open
PIPE199	-0.05	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open

EPANet Current ADD with Upgrades Model Results

PIPE140	1.91	0.11	0.10	Open
PIPE144	0.65	0.04	0.01	Open
PIPE145	2.42	0.14	0.15	Open
PIPE146	0.21	0.01	0.00	Open
PIPE151	2.21	0.12	0.12	Open
PIPE215	-1.98	0.11	0.10	Open
PIPE216	-1.98	0.11	0.10	Open
PUMP1	43.22	0.00	-52.67	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.03	0.57	43.61	Active Valve
VALVE2	10.00	0.57	33.34	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD with Upgrades Model Results


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******************************************************************
*                          E P A N E T                           *
*                  Hydraulic and Water Quality                   *
*                  Analysis for Pipe Networks                    *
*                        Version 2.2                             *
******************************************************************

Input File: Wawa Water Hydraulic Model_Current with Upgrades MDD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

EPANet Current MDD with Upgrades Model Results

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

EPANet Current MDD with Upgrades Model Results

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PIPE140	J118	J119	71.63	150	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump

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PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	0.00	0.00	0.00	0.00	0.00	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.19	51.10	51.10	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.50	-2.80	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.46	-2.84	0.00
D1	0.00	342.57	48.27	0.00
D2	0.00	342.57	48.27	0.00
D3	0.00	342.57	48.27	0.00
D4	0.00	342.61	48.31	0.00
DH	0.00	342.57	48.27	0.00
J1A	0.19	342.56	49.36	0.00
J1	0.00	342.56	49.32	0.00
J2	0.20	342.21	49.00	0.00
J3	0.10	341.97	48.79	0.00
J4	0.15	341.97	48.85	0.00
J5	0.12	342.53	49.96	0.00
J6	0.20	342.45	51.36	0.00
J7	0.06	342.44	51.48	0.00
J8	0.37	342.33	48.98	0.00
J9	0.74	342.04	48.38	0.00
J10	0.71	341.89	49.16	0.00
J11	0.72	341.77	47.17	0.00
J12	0.01	341.67	46.25	0.00

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J13	0.08	341.62	46.24	0.00
J14	0.36	341.54	44.82	0.00
J15	0.34	341.45	44.28	0.00
J16	0.30	341.21	47.01	0.00
J17	0.32	341.21	50.06	0.00
J18	0.68	341.20	48.18	0.00
J19	0.38	341.91	47.25	0.00
J20	1.06	341.91	46.56	0.00
J21	0.28	341.82	48.09	0.00
J22	1.12	341.82	46.39	0.00
J23	0.19	341.75	48.56	0.00
J24	0.93	341.74	46.16	0.00
J25	0.10	341.68	48.29	0.00
J26	1.95	341.67	48.33	0.00
J27	0.04	341.61	47.11	0.00
J28	0.16	341.56	47.35	0.00
J29	0.72	341.56	46.03	0.00
J30	0.28	341.46	46.41	0.00
J31	4.41	341.41	47.65	0.00
J32	0.96	341.45	46.14	0.00
J33	0.34	342.45	48.90	0.00
J34	0.34	342.40	47.44	0.00
J35	0.05	342.40	46.57	0.00
J36	0.62	342.40	45.88	0.00
J37	0.34	342.20	48.01	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	342.20	45.61	0.00
J39	0.09	341.85	48.63	0.00
J40	0.42	341.81	47.30	0.00
J41	0.38	341.78	45.88	0.00
J42	0.09	341.67	45.53	0.00
J43	0.07	341.65	45.66	0.00
J44	1.35	341.63	45.74	0.00
J45	1.30	341.71	47.06	0.00
J46	0.86	341.45	45.73	0.00
J47	0.16	341.56	46.18	0.00
J48	0.57	341.50	45.79	0.00
J49	0.87	341.45	46.25	0.00
J50	0.07	341.23	51.76	0.00
J51	0.98	342.48	49.91	0.00
J52	4.19	342.40	48.57	0.00
J53	0.29	342.30	48.98	0.00
J54	0.44	342.23	49.18	0.00

J55	0.46	342.42	49.33	0.00
J56	0.55	342.40	49.79	0.00
J57	0.41	342.40	50.38	0.00
J58	0.19	342.37	48.91	0.00
J59	0.00	342.37	48.91	0.00
J60	0.57	342.37	51.14	0.00
J61	0.36	342.34	49.89	0.00
J62	0.00	342.34	49.89	0.00
J63	0.01	342.30	50.37	0.00
J64	0.18	342.20	52.43	0.00
J65	0.71	342.27	51.07	0.00
J66	0.27	342.23	52.47	0.00
J67	0.28	342.22	51.85	0.00
J68	0.33	342.07	53.78	0.00
J69	0.37	342.07	53.69	0.00
J70	0.42	342.07	53.67	0.00
J71	0.87	341.92	53.05	0.00
J72	0.10	342.16	53.24	0.00
J73	0.18	342.07	53.34	0.00
J74	0.24	341.94	52.74	0.00
J75	0.12	341.85	52.67	0.00
J76	0.40	341.85	52.24	0.00
J77	0.03	341.60	52.42	0.00
J78	0.06	341.56	51.95	0.00
J79	0.50	341.40	51.76	0.00
J80	0.25	341.37	51.53	0.00
J81	0.12	341.48	52.48	0.00
J82	0.81	341.36	51.88	0.00
J83	0.27	341.33	51.76	0.00
J84	0.00	342.13	53.02	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	342.13	53.15	0.00
J86	0.02	342.10	52.88	0.00
J87	0.02	342.10	52.88	0.00
J88	0.22	342.10	52.82	0.00
J89	0.37	342.10	52.54	0.00
J90	0.23	342.10	52.75	0.00
J91	0.39	342.10	52.89	0.00
J92	0.02	342.10	52.70	0.00
J93	0.12	342.10	52.75	0.00
J94	0.22	342.10	52.94	0.00
J95	0.03	342.07	53.13	0.00
J96	0.03	341.95	52.80	0.00

J97	0.35	341.79	52.15	0.00
J98	0.31	341.36	51.42	0.00
J99	0.14	341.19	51.30	0.00
J100	0.35	341.15	51.17	0.00
J101	0.33	341.02	50.10	0.00
J102	0.20	341.08	50.77	0.00
J103	0.29	341.16	51.71	0.00
J104	0.19	341.16	51.13	0.00
J105	0.07	341.16	52.14	0.00
J106	0.12	341.15	51.57	0.00
J107	0.23	341.10	51.32	0.00
J108	0.23	341.06	50.86	0.00
J109	0.16	341.03	50.54	0.00
J110	0.21	341.10	51.45	0.00
J111	0.14	341.10	51.07	0.00
J112	0.10	341.14	51.35	0.00
J113	0.34	341.21	51.72	0.00
J114	0.00	341.15	51.71	0.00
J115	0.70	341.10	51.08	0.00
J116	0.16	341.14	51.50	0.00
J117	0.41	341.14	51.43	0.00
J118	0.24	341.14	51.57	0.00
J120	0.07	341.14	51.39	0.00
J121	0.19	341.13	50.89	0.00
J122	0.06	341.13	50.99	0.00
J124	0.00	341.10	49.75	0.00
J125	0.18	341.10	50.02	0.00
J126	0.27	341.10	50.58	0.00
J127	0.86	341.08	50.59	0.00
J128	0.10	341.06	49.24	0.00
J129	3.73	341.04	49.03	0.00
J130	0.54	341.04	49.86	0.00
J131	0.96	341.04	50.36	0.00
J132	0.25	341.07	50.49	0.00
J133	0.34	341.05	50.21	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J134	0.40	341.05	50.56	0.00
J135	0.48	341.06	50.84	0.00
J136	0.12	341.05	50.55	0.00
J137	0.18	341.04	51.94	0.00
J138	1.39	341.03	51.24	0.00
J139	0.18	340.94	50.47	0.00
FS	0.00	340.99	50.39	0.00

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FD	0.00	340.97	50.37	0.00
J140	0.00	340.88	52.23	0.00
J141	0.22	340.82	52.82	0.00
J142	3.90	340.59	54.09	0.00
J143	0.51	340.44	54.16	0.00
J144	0.01	340.27	55.52	0.00
J145	0.00	340.23	55.66	0.00
J146	0.00	340.18	56.15	0.00
J147	0.03	340.17	56.27	0.00
J148	0.04	340.15	56.95	0.00
J149	0.09	340.13	57.24	0.00
J150	0.24	340.09	58.04	0.00
J151	0.01	340.16	55.76	0.00
J152	0.01	340.14	57.19	0.00
J153	0.00	340.13	57.98	0.00
J154	0.00	340.12	58.27	0.00
J155	0.01	340.11	59.51	0.00
J156	1.21	340.09	58.24	0.00
J157	0.00	340.07	58.57	0.00
J158	0.01	340.03	59.73	0.00
J159A	0.00	339.08	59.58	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J176	3.69	246.51	57.51	0.00
J177	0.07	246.53	53.83	0.00

J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	341.20	48.18	0.00	
JFF2	0.00	341.14	51.57	0.00	
JFF3	0.00	342.30	48.98	0.00	
JFF4	0.00	342.10	52.70	0.00	
JFF5	0.00	342.07	53.67	0.00	
JFF6	0.00	340.11	59.51	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	341.41	47.65	0.00	
JFF9	0.00	342.37	51.14	0.00	
J119	0.30	341.13	51.40	0.00	
J123	0.00	341.10	51.22	0.00	
J183	0.00	341.19	48.22	0.00	
RES1	0.00	291.50	0.00	0.00	Reservoir
RES2	-76.43	291.50	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	0.00	0.00	0.00	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	76.43	1.56	8.27	Open
PD1	0.00	0.00	0.00	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	76.43	1.56	8.27	Open
PD5	76.43	0.61	0.84	Open
PIPE1A	20.09	0.16	0.06	Open
PIPE1	14.51	0.82	4.59	Open
PIPE2	12.77	0.72	3.62	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	56.15	0.45	0.42	Open
PIPE5	21.08	0.43	0.76	Open
PIPE6	17.69	0.36	0.55	Open
PIPE7	23.46	0.75	2.75	Open
PIPE8	23.09	0.73	2.67	Open

Link Results: (continued)

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Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE9	6.46	0.37	1.03	Open
PIPE10	5.75	0.33	0.83	Open
PIPE11	5.04	0.28	0.65	Open
PIPE12	5.02	0.28	0.64	Open
PIPE13	4.94	0.28	0.62	Open
PIPE14	4.58	0.26	0.54	Open
PIPE15	4.24	0.24	0.47	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	15.88	0.51	1.34	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	14.44	0.46	1.12	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	13.03	0.41	0.93	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	11.91	0.38	0.78	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	12.10	0.39	0.81	Open
PIPE27	6.95	0.39	1.17	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	6.06	0.34	0.91	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	1.37	0.08	0.06	Open
PIPE32	5.59	0.32	0.78	Open
PIPE33	5.24	0.30	0.70	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	12.51	0.71	3.49	Open
PIPE39	3.51	0.20	0.33	Open
PIPE40	3.09	0.17	0.26	Open
PIPE41	2.71	0.35	1.48	Open
PIPE42	2.62	0.15	0.19	Open
PIPE43	2.55	0.14	0.18	Open
PIPE44	8.92	0.50	1.86	Open
PIPE45	-2.24	0.13	0.14	Open
PIPE46	5.37	0.30	0.73	Open
PIPE47	6.57	0.37	1.06	Open
PIPE48	5.11	0.29	0.66	Open
PIPE49	4.94	0.28	0.63	Open
PIPE50	4.37	0.25	0.50	Open
PIPE51	0.46	0.03	0.01	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	9.63	0.55	2.15	Open
PIPE54	11.49	0.37	0.73	Open
PIPE55	10.51	0.33	0.62	Open

EPANet Current MDD with Upgrades Model Results

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE56	13.26	0.42	0.96	Open
PIPE57	12.97	0.41	0.92	Open
PIPE58	3.19	0.18	0.28	Open
PIPE59	2.72	0.15	0.21	Open
PIPE60	-2.70	0.06	0.02	Open
PIPE61	17.63	0.25	0.22	Open
PIPE62	-4.23	0.09	0.04	Open
PIPE63	3.98	0.08	0.04	Open
PIPE64	3.44	0.19	0.32	Open
PIPE65	13.25	0.27	0.32	Open
PIPE66	-0.16	0.01	0.00	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	3.41	0.19	0.31	Open
PIPE69	6.21	0.35	0.95	Open
PIPE70	12.52	0.26	0.29	Open
PIPE71	-3.16	0.18	0.27	Open
PIPE72	9.36	0.53	2.04	Open
PIPE73	6.13	0.35	0.93	Open
PIPE74	3.22	0.18	0.28	Open
PIPE75	2.51	0.14	0.18	Open
PIPE76	2.24	0.13	0.14	Open
PIPE77	1.96	0.11	0.11	Open
PIPE78	7.91	0.45	1.49	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	5.69	0.32	0.81	Open
PIPE82	8.43	0.27	0.41	Open
PIPE83	8.33	0.47	1.64	Open
PIPE84	-1.11	0.06	0.04	Open
PIPE85	6.81	0.39	1.13	Open
PIPE86	6.57	0.37	1.06	Open
PIPE87	4.82	0.27	0.60	Open
PIPE88	0.57	0.03	0.01	Open
PIPE89	10.70	0.61	2.61	Open
PIPE90	5.30	0.30	0.71	Open
PIPE91	5.24	0.30	0.70	Open
PIPE92	4.74	0.27	0.58	Open
PIPE93	5.37	0.30	0.73	Open
PIPE94	5.25	0.30	0.70	Open
PIPE95	4.44	0.25	0.51	Open
PIPE96	10.31	0.33	0.60	Open
PIPE97	0.15	0.00	0.00	Open

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PIPE98	6.99	0.22	0.29	Open
PIPE99	3.17	0.18	0.27	Open
PIPE100	6.33	0.20	0.25	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	8.54	0.27	0.42	Open
PIPE109	-2.45	0.08	0.04	Open
PIPE110	10.96	0.62	2.73	Open
PIPE111	5.11	0.29	0.66	Open
PIPE112	5.28	0.30	0.71	Open
PIPE113	5.82	0.33	0.85	Open
PIPE114	10.75	0.61	2.63	Open
PIPE115	11.25	0.64	2.52	Open
PIPE116	-0.82	0.05	0.02	Open
PIPE117	3.67	0.21	0.36	Open
PIPE118	7.84	0.44	1.47	Open
PIPE119	7.48	0.42	1.35	Open
PIPE120	6.31	0.36	0.86	Open
PIPE121	6.10	0.35	0.81	Open
PIPE122	4.81	0.27	0.52	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	4.13	0.23	0.45	Open
PIPE127	4.12	0.23	0.45	Open
PIPE128	3.89	0.22	0.40	Open
PIPE129	3.29	0.19	0.29	Open
PIPE130	-0.22	0.01	0.00	Open
PIPE131	-0.43	0.02	0.01	Open
PIPE132	-3.60	0.20	0.35	Open
PIPE133	-3.70	0.21	0.37	Open
PIPE134	-4.04	0.23	0.43	Open
PIPE135	5.51	0.31	0.76	Open
PIPE136	3.49	0.20	0.33	Open
PIPE137	0.74	0.02	0.00	Open
PIPE138	0.58	0.02	0.00	Open
PIPE139	0.17	0.01	0.00	Open

EPANet Current MDD with Upgrades Model Results

PIPE141	1.28	0.07	0.05	Open
PIPE142	1.21	0.07	0.05	Open
PIPE143	1.01	0.06	0.03	Open
PIPE147	0.13	0.01	0.00	Open
PIPE148	-0.05	0.00	0.00	Open
PIPE149	-0.32	0.02	0.00	Open
PIPE150	2.47	0.14	0.17	Open
PIPE152	3.30	0.19	0.30	Open
PIPE153	-0.43	0.02	0.01	Open
PIPE154	-0.97	0.05	0.03	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE155	-0.18	0.09	0.29	Open
PIPE156	1.43	0.08	0.06	Open
PIPE157	3.03	0.17	0.25	Open
PIPE158	2.56	0.14	0.18	Open
PIPE159	-1.75	0.10	0.09	Open
PIPE160	0.47	0.03	0.01	Open
PIPE161	1.65	0.09	0.08	Open
PIPE162	1.17	0.07	0.04	Open
PIPE163	1.24	0.07	0.05	Open
PIPE164	1.12	0.06	0.04	Open
PIPE165	0.94	0.05	0.03	Open
PIPE166	-0.44	0.03	0.01	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.25	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open

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PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.26	0.01	0.00	Open
PIPE193	0.09	0.01	0.00	Open
PIPE194	0.11	0.01	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	-0.01	0.00	0.00	Open
PIPE197	0.03	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE198	-0.06	0.00	0.00	Open
PIPE199	-0.17	0.01	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open

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PIPE140	2.87	0.16	0.20	Open
PIPE144	0.96	0.05	0.03	Open
PIPE145	3.53	0.20	0.29	Open
PIPE146	0.13	0.01	0.00	Open
PIPE151	3.40	0.19	0.28	Open
PIPE215	-2.94	0.17	0.21	Open
PIPE216	-2.94	0.17	0.21	Open
PUMP1	0.00	0.00	0.00	Closed Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	76.43	0.00	-51.15	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	40.98	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S1 with Upgrades Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Current with Upgrades MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PIPE140	J118	J119	71.63	150	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump

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PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.61	39.61	0.00
PUMP2	100.00	75.00	0.21	59.57	59.57	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	59.57	59.57	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.84	49.54	0.00
D2	0.00	343.83	49.53	0.00
D3	0.00	343.78	49.48	0.00
D4	0.00	343.83	49.53	0.00
DH	0.00	343.78	49.48	0.00
J1A	0.19	343.72	50.52	0.00
J1	0.00	343.71	50.47	0.00
J2	0.20	341.17	47.96	0.00
J3	0.10	339.05	45.87	0.00
J4	0.15	339.05	45.93	0.00
J5	0.12	343.54	50.97	0.00
J6	0.20	343.04	51.95	0.00
J7	0.06	343.01	52.05	0.00
J8	0.37	341.88	48.53	0.00
J9	0.74	339.44	45.78	0.00
J10	0.71	337.79	45.06	0.00
J11	0.72	336.12	41.52	0.00
J12	0.01	334.51	39.09	0.00

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J13	0.08	333.73	38.35	0.00
J14	0.36	332.25	35.53	0.00
J15	0.34	330.69	33.52	0.00
J16	0.30	325.55	31.35	0.00
J17	0.32	320.17	29.02	0.00
J18	0.68	315.09	22.07	0.00
J19	0.38	338.51	43.85	0.00
J20	1.06	338.51	43.16	0.00
J21	0.28	337.73	44.00	0.00
J22	1.12	337.73	42.30	0.00
J23	0.19	337.00	43.81	0.00
J24	0.93	337.00	41.42	0.00
J25	0.10	336.30	42.91	0.00
J26	1.95	336.29	42.95	0.00
J27	0.04	335.19	40.69	0.00
J28	0.16	334.44	40.23	0.00
J29	0.72	334.44	38.91	0.00
J30	0.28	332.32	37.27	0.00
J31	4.41	328.83	35.07	0.00
J32	0.96	332.90	37.59	0.00
J33	0.34	343.08	49.53	0.00
J34	0.34	342.77	47.81	0.00
J35	0.05	342.77	46.94	0.00
J36	0.62	342.76	46.24	0.00
J37	0.34	341.16	46.97	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	341.16	44.57	0.00
J39	0.09	338.04	44.82	0.00
J40	0.42	337.71	43.20	0.00
J41	0.38	337.49	41.59	0.00
J42	0.09	336.27	40.13	0.00
J43	0.07	336.05	40.06	0.00
J44	1.35	335.87	39.98	0.00
J45	1.30	336.71	42.06	0.00
J46	0.86	333.31	37.59	0.00
J47	0.16	334.70	39.32	0.00
J48	0.57	333.96	38.25	0.00
J49	0.87	332.90	37.70	0.00
J50	0.07	331.34	41.87	0.00
J51	0.98	343.25	50.68	0.00
J52	4.19	342.73	48.90	0.00
J53	0.29	341.72	48.40	0.00
J54	0.44	341.49	48.44	0.00

J55	0.46	342.90	49.81	0.00
J56	0.55	342.75	50.14	0.00
J57	0.41	342.76	50.74	0.00
J58	0.19	342.58	49.12	0.00
J59	0.00	342.58	49.12	0.00
J60	0.57	342.58	51.35	0.00
J61	0.36	342.39	49.94	0.00
J62	0.00	342.41	49.96	0.00
J63	0.01	342.22	50.29	0.00
J64	0.18	341.67	51.90	0.00
J65	0.71	342.07	50.87	0.00
J66	0.27	341.87	52.11	0.00
J67	0.28	341.75	51.38	0.00
J68	0.33	340.86	52.57	0.00
J69	0.37	340.86	52.48	0.00
J70	0.42	340.86	52.46	0.00
J71	0.87	339.97	51.10	0.00
J72	0.10	341.20	52.28	0.00
J73	0.18	340.78	52.05	0.00
J74	0.24	340.05	50.85	0.00
J75	0.12	339.55	50.37	0.00
J76	0.40	339.54	49.93	0.00
J77	0.03	337.99	48.81	0.00
J78	0.06	337.74	48.13	0.00
J79	0.50	336.69	47.05	0.00
J80	0.25	336.46	46.62	0.00
J81	0.12	337.26	48.26	0.00
J82	0.81	336.48	47.00	0.00
J83	0.27	336.29	46.72	0.00
J84	0.00	341.07	51.96	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	341.07	52.09	0.00
J86	0.02	340.95	51.73	0.00
J87	0.02	340.93	51.71	0.00
J88	0.22	340.93	51.65	0.00
J89	0.37	340.93	51.37	0.00
J90	0.23	340.95	51.60	0.00
J91	0.39	340.95	51.74	0.00
J92	0.02	340.95	51.55	0.00
J93	0.12	340.93	51.58	0.00
J94	0.22	340.93	51.77	0.00
J95	0.03	340.75	51.81	0.00
J96	0.03	340.07	50.92	0.00

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J97	0.35	339.11	49.47	0.00
J98	0.31	336.40	46.46	0.00
J99	0.14	335.06	45.17	0.00
J100	0.35	335.11	45.13	0.00
J101	0.33	334.17	43.25	0.00
J102	0.20	334.46	44.15	0.00
J103	0.29	334.70	45.25	0.00
J104	0.19	334.70	44.67	0.00
J105	0.07	334.70	45.68	0.00
J106	0.12	334.68	45.10	0.00
J107	0.23	333.70	43.92	0.00
J108	0.23	333.75	43.55	0.00
J109	0.16	333.80	43.31	0.00
J110	0.21	332.71	43.06	0.00
J111	0.14	331.38	41.35	0.00
J112	0.10	331.36	41.57	0.00
J113	0.34	331.34	41.85	0.00
J114	0.00	329.06	39.62	0.00
J115	0.70	329.29	39.27	0.00
J116	0.16	328.43	38.79	0.00
J117	0.41	327.87	38.16	0.00
J118	0.24	327.33	37.76	0.00
J120	0.07	328.83	39.08	0.00
J121	0.19	328.47	38.23	0.00
J122	0.06	328.35	38.21	0.00
J124	0.00	328.69	37.34	0.00
J125	0.18	328.87	37.79	0.00
J126	0.27	329.06	38.54	0.00
J127	0.86	329.96	39.47	0.00
J128	0.10	328.82	37.00	0.00
J129	3.73	328.97	36.96	0.00
J130	0.54	329.46	38.28	0.00
J131	0.96	330.06	39.38	0.00
J132	0.25	330.59	40.01	0.00
J133	0.34	330.48	39.64	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J134	0.40	330.73	40.24	0.00
J135	0.48	330.67	40.45	0.00
J136	0.12	331.23	40.73	0.00
J137	0.18	331.80	42.70	0.00
J138	1.39	332.63	42.84	0.00
J139	0.18	334.09	43.62	0.00
FS	0.00	334.14	43.54	0.00

FD	0.00	334.12	43.52	0.00
J140	0.00	334.03	45.38	0.00
J141	0.22	333.97	45.97	0.00
J142	3.90	333.74	47.24	0.00
J143	0.51	333.59	47.31	0.00
J144	0.01	333.42	48.67	0.00
J145	0.00	333.38	48.81	0.00
J146	0.00	333.33	49.30	0.00
J147	0.03	333.32	49.42	0.00
J148	0.04	333.30	50.10	0.00
J149	0.09	333.28	50.39	0.00
J150	0.24	333.24	51.19	0.00
J151	0.01	333.31	48.91	0.00
J152	0.01	333.29	50.34	0.00
J153	0.00	333.28	51.13	0.00
J154	0.00	333.27	51.42	0.00
J155	0.01	333.26	52.66	0.00
J156	1.21	333.24	51.39	0.00
J157	0.00	333.22	51.72	0.00
J158	0.01	333.18	52.88	0.00
J159A	0.00	332.23	52.73	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J176	3.69	246.51	57.51	0.00
J177	0.07	246.53	53.83	0.00

J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	38.00	315.09	22.07	0.00	
JFF2	38.00	327.33	37.76	0.00	
JFF3	23.29	341.72	48.40	0.00	
JFF4	0.00	340.95	51.55	0.00	
JFF5	0.00	340.86	52.46	0.00	
JFF6	0.00	333.26	52.66	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	38.00	328.83	35.07	0.00	
JFF9	0.00	342.58	51.35	0.00	
J119	0.30	328.15	38.42	0.00	
J123	0.00	328.64	38.76	0.00	
J183	0.00	326.02	33.05	0.00	
RES1	-133.51	287.05	0.00	0.00	Reservoir
RES2	-80.21	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	53.30	1.70	12.59	Open
PS2	80.21	1.63	9.05	Open
PS3	0.00	0.00	0.00	Open
PS4	80.21	1.63	9.05	Open
PD1	53.30	1.70	12.59	Open
PD2	80.21	1.63	9.05	Open
PD3	0.00	0.00	0.00	Open
PD4	80.21	1.63	9.05	Open
PD5	213.72	1.70	5.63	Open
PIPE1A	57.08	0.45	0.43	Open
PIPE1	42.58	2.41	33.72	Open
PIPE2	40.84	2.31	31.22	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	156.45	1.24	2.78	Open
PIPE5	54.47	1.11	4.42	Open
PIPE6	46.28	0.94	3.27	Open
PIPE7	72.81	2.32	22.43	Open
PIPE8	72.44	2.31	22.22	Open

Link Results: (continued)

EPANet Current MDD and FF S1 with Upgrades Model Results

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE9	24.25	1.37	11.89	Open
PIPE10	23.54	1.33	11.25	Open
PIPE11	22.82	1.29	10.62	Open
PIPE12	22.80	1.29	10.61	Open
PIPE13	22.73	1.29	10.54	Open
PIPE14	22.37	1.27	10.24	Open
PIPE15	22.02	1.25	9.95	Open
PIPE16	39.00	2.21	28.66	Open
PIPE17	38.68	2.19	28.23	Open
PIPE18	47.45	1.51	10.15	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	46.00	1.46	9.58	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	44.60	1.42	9.05	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	43.47	1.38	8.63	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	50.94	1.62	11.58	Open
PIPE27	32.20	1.82	20.10	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	31.31	1.77	19.08	Open
PIPE30	42.41	2.40	33.48	Open
PIPE31	-11.38	0.64	2.93	Open
PIPE32	14.50	0.82	4.59	Open
PIPE33	14.16	0.80	4.39	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	40.58	2.30	30.86	Open
PIPE39	10.47	0.59	2.51	Open
PIPE40	10.05	0.57	2.33	Open
PIPE41	9.67	1.23	15.61	Open
PIPE42	9.58	0.54	2.13	Open
PIPE43	9.51	0.54	2.10	Open
PIPE44	30.03	1.70	17.66	Open
PIPE45	-9.52	0.54	2.10	Open
PIPE46	19.21	1.09	7.72	Open
PIPE47	27.37	1.55	14.87	Open
PIPE48	18.70	1.06	7.35	Open
PIPE49	18.53	1.05	7.23	Open
PIPE50	17.97	1.02	6.82	Open
PIPE51	13.21	0.75	3.86	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	31.27	1.77	19.04	Open
PIPE54	29.05	0.92	4.09	Open
PIPE55	28.08	0.89	3.84	Open

EPANet Current MDD and FF S1 with Upgrades Model Results

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE56	47.10	1.50	10.01	Open
PIPE57	23.52	0.75	2.77	Open
PIPE58	7.99	0.45	1.52	Open
PIPE59	7.53	0.43	1.36	Open
PIPE60	-10.06	0.20	0.19	Open
PIPE61	46.21	0.65	1.34	Open
PIPE62	-13.15	0.27	0.32	Open
PIPE63	11.88	0.24	0.27	Open
PIPE64	8.79	0.50	1.82	Open
PIPE65	33.92	0.69	1.84	Open
PIPE66	-0.51	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	9.11	0.52	1.94	Open
PIPE69	18.99	1.07	7.56	Open
PIPE70	32.84	0.67	1.73	Open
PIPE71	-10.24	0.58	2.40	Open
PIPE72	22.61	1.28	10.44	Open
PIPE73	15.46	0.87	5.17	Open
PIPE74	7.13	0.40	1.23	Open
PIPE75	6.42	0.36	1.02	Open
PIPE76	6.16	0.35	0.94	Open
PIPE77	5.87	0.33	0.86	Open
PIPE78	21.16	1.20	9.23	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	14.48	0.82	4.58	Open
PIPE82	19.10	0.61	1.88	Open
PIPE83	19.00	1.07	7.56	Open
PIPE84	-5.56	0.31	0.78	Open
PIPE85	17.30	0.98	6.36	Open
PIPE86	17.06	0.97	6.20	Open
PIPE87	13.61	0.77	4.08	Open
PIPE88	1.89	0.11	0.11	Open
PIPE89	28.65	1.62	16.20	Open
PIPE90	14.37	0.81	4.51	Open
PIPE91	14.31	0.81	4.47	Open
PIPE92	13.80	0.78	4.19	Open
PIPE93	14.26	0.81	4.45	Open
PIPE94	14.14	0.80	4.38	Open
PIPE95	13.33	0.75	3.93	Open
PIPE96	22.97	0.73	2.65	Open
PIPE97	0.15	0.00	0.00	Open

PIPE98	15.67	0.50	1.30	Open
PIPE99	7.16	0.41	1.24	Open
PIPE100	15.01	0.48	1.20	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

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Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	21.21	0.68	2.28	Open
PIPE109	-7.08	0.23	0.30	Open
PIPE110	28.27	1.60	15.79	Open
PIPE111	12.96	0.73	3.73	Open
PIPE112	14.46	0.82	4.56	Open
PIPE113	15.27	0.86	5.05	Open
PIPE114	29.38	1.66	16.96	Open
PIPE115	33.93	1.92	19.49	Open
PIPE116	-4.86	0.28	0.61	Open
PIPE117	8.69	0.49	1.78	Open
PIPE118	21.75	1.23	9.72	Open
PIPE119	21.39	1.21	9.43	Open
PIPE120	15.25	0.86	4.43	Open
PIPE121	15.05	0.85	4.32	Open
PIPE122	18.53	1.05	6.36	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	17.86	1.01	6.74	Open
PIPE127	-4.93	0.28	0.62	Open
PIPE128	-5.17	0.29	0.68	Open
PIPE129	-19.57	1.11	7.99	Open
PIPE130	22.55	1.28	10.40	Open
PIPE131	22.35	1.26	10.22	Open
PIPE132	2.11	0.12	0.13	Open
PIPE133	2.01	0.11	0.12	Open
PIPE134	1.66	0.09	0.08	Open
PIPE135	32.86	1.86	20.87	Open
PIPE136	-8.24	0.47	1.61	Open
PIPE137	30.61	0.97	3.97	Open
PIPE138	30.44	0.97	3.93	Open
PIPE139	30.04	0.96	3.83	Open

PIPE141	10.49	0.59	2.52	Open
PIPE142	10.42	0.59	2.49	Open
PIPE143	10.22	0.58	2.40	Open
PIPE147	-7.36	0.42	1.31	Open
PIPE148	-7.54	0.43	1.36	Open
PIPE149	-7.80	0.44	1.46	Open
PIPE150	-16.74	0.95	5.99	Open
PIPE152	-8.36	0.47	1.65	Open
PIPE153	-12.09	0.68	3.28	Open
PIPE154	-12.63	0.71	3.55	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE155	0.33	0.17	0.86	Open
PIPE156	-17.27	0.98	6.34	Open
PIPE157	20.10	1.14	8.40	Open
PIPE158	6.47	0.37	1.03	Open
PIPE159	-13.92	0.79	4.25	Open
PIPE160	-7.78	0.44	1.45	Open
PIPE161	-3.90	0.22	0.40	Open
PIPE162	-4.38	0.25	0.50	Open
PIPE163	-12.56	0.71	3.52	Open
PIPE164	-12.68	0.72	3.58	Open
PIPE165	-12.86	0.73	3.67	Open
PIPE166	-14.25	0.81	4.44	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open

PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	38.00	0.05	0.00	Open
PIPEFF2	38.00	0.05	0.00	Open
PIPEFF3	23.29	0.03	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	38.00	0.05	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open

EPANet Current MDD and FF S1 with Upgrades Model Results

PIPE140	-25.48	1.44	11.47	Open
PIPE144	10.17	0.58	2.09	Open
PIPE145	-15.61	0.88	4.63	Open
PIPE146	-7.36	0.42	1.15	Open
PIPE151	-8.26	0.47	1.42	Open
PIPE215	17.28	0.98	5.58	Open
PIPE216	17.28	0.98	5.58	Open
PUMP1	53.30	0.00	-56.86	Open Pump
PUMP2	80.21	0.00	-56.82	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	80.21	0.00	-56.82	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	34.13	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S2 with Upgrades Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

  Input File: Wawa Water Hydraulic Model_Current with Upgrades MDD and FF
S1_Report_V2_PK.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200

PIPE23	J23	J24	139.76	150
PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150

PIPE65	J57	J59	95.3	250
PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150

PIPE107	J93	J94	127.25	150
PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150

PIPE154	J130	J131	170.4	150
PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200

PIPE192	J163	J164	87.8	150
PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PIPE140	J118	J119	71.63	150	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump

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PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.61	39.61	0.00
PUMP2	100.00	75.00	0.21	59.57	59.57	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	59.57	59.57	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.84	49.54	0.00
D2	0.00	343.83	49.53	0.00
D3	0.00	343.78	49.48	0.00
D4	0.00	343.83	49.53	0.00
DH	0.00	343.78	49.48	0.00
J1A	0.19	343.72	50.52	0.00
J1	0.00	343.71	50.47	0.00
J2	0.20	343.01	49.80	0.00
J3	0.10	342.47	49.29	0.00
J4	0.15	342.47	49.35	0.00
J5	0.12	343.51	50.94	0.00
J6	0.20	342.27	51.18	0.00
J7	0.06	342.19	51.23	0.00
J8	0.37	343.11	49.76	0.00
J9	0.74	342.52	48.86	0.00
J10	0.71	342.17	49.44	0.00
J11	0.72	341.84	47.24	0.00

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J12	0.01	341.55	46.13	0.00
J13	0.08	341.41	46.03	0.00
J14	0.36	341.14	44.42	0.00
J15	0.34	340.88	43.71	0.00
J16	0.30	340.03	45.83	0.00
J17	0.32	340.03	48.88	0.00
J18	0.68	340.03	47.01	0.00
J19	0.38	342.30	47.64	0.00
J20	1.06	342.29	46.94	0.00
J21	0.28	342.12	48.39	0.00
J22	1.12	342.11	46.68	0.00
J23	0.19	341.96	48.77	0.00
J24	0.93	341.96	46.38	0.00
J25	0.10	341.82	48.43	0.00
J26	1.95	341.81	48.47	0.00
J27	0.04	341.62	47.12	0.00
J28	0.16	341.53	47.32	0.00
J29	0.72	341.53	46.00	0.00
J30	0.28	341.29	46.24	0.00
J31	4.41	341.23	47.47	0.00
J32	0.96	341.16	45.85	0.00
J33	0.34	342.33	48.78	0.00
J34	0.34	341.62	46.66	0.00
J35	0.05	341.62	45.79	0.00
J36	0.62	341.62	45.10	0.00
J37	0.34	343.00	48.81	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	342.99	46.40	0.00
J39	0.09	342.21	48.99	0.00
J40	0.42	342.12	47.61	0.00
J41	0.38	342.07	46.17	0.00
J42	0.09	341.78	45.64	0.00
J43	0.07	341.72	45.73	0.00
J44	1.35	341.68	45.79	0.00
J45	1.30	341.89	47.24	0.00
J46	0.86	341.13	45.41	0.00
J47	0.16	341.49	46.11	0.00
J48	0.57	341.30	45.59	0.00
J49	0.87	341.16	45.96	0.00
J50	0.07	340.04	50.57	0.00
J51	0.98	342.80	50.23	0.00
J52	4.19	341.54	47.71	0.00
J53	0.29	339.94	46.62	0.00

J54	0.44	339.42	46.37	0.00
J55	0.46	341.90	48.81	0.00
J56	0.55	341.54	48.93	0.00
J57	0.41	341.54	49.52	0.00
J58	0.19	340.86	47.40	0.00
J59	0.00	340.85	47.39	0.00
J60	0.57	337.01	45.78	0.00
J61	0.36	340.59	48.14	0.00
J62	0.00	340.61	48.16	0.00
J63	0.01	340.32	48.39	0.00
J64	0.18	339.45	49.68	0.00
J65	0.71	340.08	48.88	0.00
J66	0.27	339.77	50.01	0.00
J67	0.28	339.58	49.21	0.00
J68	0.33	338.15	49.86	0.00
J69	0.37	333.68	45.30	0.00
J70	0.42	329.29	40.89	0.00
J71	0.87	338.20	49.33	0.00
J72	0.10	338.98	50.06	0.00
J73	0.18	338.34	49.61	0.00
J74	0.24	338.28	49.08	0.00
J75	0.12	338.24	49.06	0.00
J76	0.40	338.25	48.64	0.00
J77	0.03	338.22	49.04	0.00
J78	0.06	338.22	48.61	0.00
J79	0.50	338.21	48.57	0.00
J80	0.25	338.21	48.37	0.00
J81	0.12	338.21	49.21	0.00
J82	0.81	338.20	48.72	0.00
J83	0.27	338.20	48.63	0.00
J84	0.00	338.52	49.41	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	338.52	49.54	0.00
J86	0.02	338.26	49.04	0.00
J87	0.02	338.28	49.06	0.00
J88	0.22	338.27	48.99	0.00
J89	0.37	338.27	48.71	0.00
J90	0.23	336.80	47.45	0.00
J91	0.39	336.51	47.30	0.00
J92	0.02	334.10	44.70	0.00
J93	0.12	338.27	48.92	0.00
J94	0.22	338.27	49.11	0.00
J95	0.03	338.29	49.35	0.00

J96	0.03	338.27	49.12	0.00
J97	0.35	338.25	48.61	0.00
J98	0.31	338.23	48.29	0.00
J99	0.14	338.23	48.34	0.00
J100	0.35	338.17	48.19	0.00
J101	0.33	338.15	47.23	0.00
J102	0.20	338.18	47.87	0.00
J103	0.29	338.26	48.81	0.00
J104	0.19	338.26	48.23	0.00
J105	0.07	338.26	49.24	0.00
J106	0.12	338.25	48.67	0.00
J107	0.23	338.39	48.61	0.00
J108	0.23	338.33	48.13	0.00
J109	0.16	338.27	47.78	0.00
J110	0.21	338.69	49.04	0.00
J111	0.14	339.11	49.08	0.00
J112	0.10	339.44	49.65	0.00
J113	0.34	339.91	50.42	0.00
J114	0.00	339.70	50.26	0.00
J115	0.70	339.45	49.43	0.00
J116	0.16	339.70	50.06	0.00
J117	0.41	339.70	49.99	0.00
J118	0.24	339.70	50.13	0.00
J120	0.07	339.68	49.93	0.00
J121	0.19	339.66	49.42	0.00
J122	0.06	339.65	49.51	0.00
J124	0.00	339.47	48.12	0.00
J125	0.18	339.46	48.38	0.00
J126	0.27	339.46	48.94	0.00
J127	0.86	339.25	48.76	0.00
J128	0.10	339.32	47.50	0.00
J129	3.73	339.21	47.20	0.00
J130	0.54	339.16	47.98	0.00
J131	0.96	339.12	48.44	0.00
J132	0.25	339.12	48.54	0.00
J133	0.34	339.10	48.26	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J134	0.40	339.02	48.53	0.00
J135	0.48	339.06	48.84	0.00
J136	0.12	338.86	48.36	0.00
J137	0.18	338.69	49.59	0.00
J138	1.39	338.45	48.66	0.00
J139	0.18	338.07	47.60	0.00

FS	0.00	338.13	47.53	0.00
FD	0.00	338.10	47.50	0.00
J140	0.00	338.02	49.37	0.00
J141	0.22	337.95	49.95	0.00
J142	3.90	337.72	51.22	0.00
J143	0.51	337.57	51.29	0.00
J144	0.01	337.40	52.65	0.00
J145	0.00	337.36	52.79	0.00
J146	0.00	337.32	53.29	0.00
J147	0.03	337.30	53.40	0.00
J148	0.04	337.28	54.08	0.00
J149	0.09	337.26	54.37	0.00
J150	0.24	337.23	55.18	0.00
J151	0.01	337.29	52.89	0.00
J152	0.01	337.27	54.32	0.00
J153	0.00	337.26	55.11	0.00
J154	0.00	337.25	55.40	0.00
J155	0.01	337.24	56.64	0.00
J156	1.21	337.23	55.38	0.00
J157	0.00	337.20	55.70	0.00
J158	0.01	337.17	56.87	0.00
J159A	0.00	336.21	56.71	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J176	3.69	246.51	57.51	0.00

J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	340.03	47.01	0.00	
JFF2	0.00	339.70	50.13	0.00	
JFF3	23.29	339.94	46.62	0.00	
JFF4	38.00	334.10	44.70	0.00	
JFF5	38.00	329.29	40.89	0.00	
JFF6	0.00	337.24	56.64	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	341.23	47.47	0.00	
JFF9	38.00	337.01	45.78	0.00	
J119	0.30	339.63	49.90	0.00	
J123	0.00	339.47	49.59	0.00	
J183	0.00	339.95	46.98	0.00	
RES1	-133.51	287.05	0.00	0.00	Reservoir
RES2	-80.21	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.30	1.70	12.59	Open
PS2	80.21	1.63	9.05	Open
PS3	0.00	0.00	0.00	Open
PS4	80.21	1.63	9.05	Open
PD1	53.30	1.70	12.59	Open
PD2	80.21	1.63	9.06	Open
PD3	0.00	0.00	0.00	Open
PD4	80.21	1.63	9.06	Open
PD5	213.72	1.70	5.63	Open
PIPE1A	43.56	0.35	0.26	Open
PIPE1	21.31	1.21	9.35	Open
PIPE2	19.57	1.11	7.99	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	169.97	1.35	3.24	Open
PIPE5	89.40	1.82	11.06	Open
PIPE6	76.23	1.55	8.24	Open
PIPE7	33.85	1.08	5.43	Open
PIPE8	33.48	1.07	5.32	Open

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Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE9	10.51	0.59	2.53	Open
PIPE10	9.80	0.55	2.22	Open
PIPE11	9.08	0.51	1.93	Open
PIPE12	9.07	0.51	1.92	Open
PIPE13	8.99	0.51	1.89	Open
PIPE14	8.63	0.49	1.75	Open
PIPE15	8.29	0.47	1.63	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	22.23	0.71	2.49	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	20.78	0.66	2.20	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	19.38	0.62	1.93	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	18.25	0.58	1.73	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	19.87	0.63	2.02	Open
PIPE27	10.58	0.60	2.56	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	9.70	0.55	2.18	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	5.01	0.28	0.64	Open
PIPE32	22.25	1.26	10.14	Open
PIPE33	21.91	1.24	9.85	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	19.31	1.09	7.80	Open
PIPE39	5.24	0.30	0.70	Open
PIPE40	4.82	0.27	0.60	Open
PIPE41	4.45	0.57	3.70	Open
PIPE42	4.36	0.25	0.49	Open
PIPE43	4.28	0.24	0.48	Open
PIPE44	13.98	0.79	4.29	Open
PIPE45	-3.67	0.21	0.36	Open
PIPE46	9.01	0.51	1.90	Open
PIPE47	11.94	0.68	3.20	Open
PIPE48	9.24	0.52	1.99	Open
PIPE49	9.08	0.51	1.93	Open
PIPE50	8.51	0.48	1.71	Open
PIPE51	-3.18	0.18	0.28	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	22.77	1.29	10.58	Open
PIPE54	46.60	1.48	9.82	Open

PIPE55	45.63	1.45	9.44	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE56	60.37	1.92	15.85	Open
PIPE57	36.79	1.17	6.34	Open
PIPE58	12.97	0.73	3.73	Open
PIPE59	12.50	0.71	3.49	Open
PIPE60	1.97	0.04	0.01	Open
PIPE61	76.17	1.08	3.38	Open
PIPE62	-20.90	0.43	0.75	Open
PIPE63	4.52	0.09	0.04	Open
PIPE64	18.43	1.04	7.15	Open
PIPE65	71.25	1.45	7.27	Open
PIPE66	7.09	0.40	1.22	Open
PIPE67	38.57	2.18	37.35	Open
PIPE68	11.15	0.63	2.82	Open
PIPE69	21.86	1.24	9.81	Open
PIPE70	39.77	0.81	2.47	Open
PIPE71	-11.08	0.63	2.79	Open
PIPE72	28.70	1.62	16.24	Open
PIPE73	19.76	1.12	8.13	Open
PIPE74	8.93	0.51	1.87	Open
PIPE75	8.22	0.47	1.60	Open
PIPE76	7.95	0.45	1.51	Open
PIPE77	7.67	0.43	1.41	Open
PIPE78	27.25	1.54	14.75	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	-2.93	0.17	0.24	Open
PIPE82	23.85	0.76	2.84	Open
PIPE83	23.74	1.34	11.43	Open
PIPE84	8.93	0.51	1.87	Open
PIPE85	4.68	0.26	0.56	Open
PIPE86	4.44	0.25	0.51	Open
PIPE87	-3.80	0.21	0.38	Open
PIPE88	-1.91	0.11	0.11	Open
PIPE89	2.43	0.14	0.17	Open
PIPE90	0.87	0.05	0.02	Open
PIPE91	0.82	0.05	0.02	Open
PIPE92	0.31	0.02	0.00	Open
PIPE93	1.53	0.09	0.07	Open
PIPE94	1.41	0.08	0.06	Open
PIPE95	0.60	0.03	0.01	Open
PIPE96	34.37	1.09	5.59	Open

PIPE97	0.15	0.00	0.00	Open
PIPE98	24.28	0.77	2.94	Open
PIPE99	9.94	0.56	2.28	Open
PIPE100	-14.38	0.46	1.11	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	-5.39	0.17	0.18	Open
PIPE109	-9.95	0.32	0.56	Open
PIPE110	4.53	0.26	0.53	Open
PIPE111	2.42	0.14	0.17	Open
PIPE112	0.11	0.01	0.00	Open
PIPE113	2.08	0.12	0.13	Open
PIPE114	1.83	0.10	0.10	Open
PIPE115	-0.88	0.05	0.02	Open
PIPE116	2.40	0.14	0.16	Open
PIPE117	2.45	0.14	0.17	Open
PIPE118	2.79	0.16	0.22	Open
PIPE119	2.43	0.14	0.17	Open
PIPE120	4.12	0.23	0.39	Open
PIPE121	3.91	0.22	0.36	Open
PIPE122	-5.14	0.29	0.59	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-5.81	0.33	0.84	Open
PIPE127	5.77	0.33	0.83	Open
PIPE128	5.53	0.31	0.77	Open
PIPE129	10.53	0.60	2.54	Open
PIPE130	-11.82	0.67	3.14	Open
PIPE131	-12.02	0.68	3.24	Open
PIPE132	-10.54	0.60	2.54	Open
PIPE133	-10.64	0.60	2.59	Open
PIPE134	-10.98	0.62	2.74	Open
PIPE135	11.71	0.66	3.09	Open
PIPE136	8.64	0.49	1.76	Open
PIPE137	0.41	0.01	0.00	Open
PIPE138	0.24	0.01	0.00	Open

PIPE139	-0.16	0.01	0.00	Open
PIPE141	2.67	0.15	0.20	Open
PIPE142	2.60	0.15	0.19	Open
PIPE143	2.41	0.14	0.16	Open
PIPE147	1.24	0.07	0.05	Open
PIPE148	1.06	0.06	0.04	Open
PIPE149	0.80	0.05	0.02	Open
PIPE150	8.73	0.49	1.79	Open
PIPE152	7.28	0.41	1.28	Open
PIPE153	3.55	0.20	0.34	Open
PIPE154	3.02	0.17	0.25	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE155	-0.37	0.19	1.11	Open
PIPE156	7.50	0.42	1.35	Open
PIPE157	-1.63	0.09	0.08	Open
PIPE158	2.13	0.12	0.13	Open
PIPE159	2.43	0.14	0.17	Open
PIPE160	4.21	0.24	0.47	Open
PIPE161	3.50	0.20	0.33	Open
PIPE162	3.02	0.17	0.25	Open
PIPE163	6.83	0.39	1.14	Open
PIPE164	6.72	0.38	1.10	Open
PIPE165	6.54	0.37	1.05	Open
PIPE166	5.15	0.29	0.67	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open
PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open

PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	23.29	0.03	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.04	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open

EPANet Current MDD and FF S2 with Upgrades Model Results

PIPEFF9	38.00	0.05	0.00	Open
PIPE140	6.58	0.37	0.93	Open
PIPE144	2.35	0.13	0.14	Open
PIPE145	8.63	0.49	1.54	Open
PIPE146	1.24	0.07	0.04	Open
PIPE151	7.39	0.42	1.16	Open
PIPE215	-6.98	0.40	1.04	Open
PIPE216	-6.98	0.40	1.04	Open
PUMP1	53.30	0.00	-56.86	Open Pump
PUMP2	80.21	0.00	-56.82	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	80.21	0.00	-56.82	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	38.11	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current MDD and FF S3 with Upgrades Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Current with Upgrades MDD and FF_V2_PK.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPEFF2	J118	JFF2	1	1000	
PIPEFF3	J53	JFF3	1	1000	
PIPEFF4	J92	JFF4	1	1000	
PIPEFF5	J70	JFF5	1	1000	
PIPEFF6	J155	JFF6	1	1000	
PIPEFF7	J169	JFF7	1	1000	
PIPEFF8	J31	JFF8	1	1000	
PIPEFF9	J60	JFF9	1	1000	
PIPE140	J118	J119	71.63	150	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump

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PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.22	30.90	30.90	0.00
PUMP2	100.00	75.00	0.22	52.78	52.78	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.22	52.78	52.78	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	287.01	-7.29	0.00
S2	0.00	287.02	-7.28	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.02	-7.28	0.00
D1	0.00	346.43	52.13	0.00
D2	0.00	346.42	52.12	0.00
D3	0.00	346.39	52.09	0.00
D4	0.00	346.42	52.12	0.00
DH	0.00	346.39	52.09	0.00
J1A	0.19	346.35	53.15	0.00
J1	0.00	346.34	53.10	0.00
J2	0.20	345.52	52.31	0.00
J3	0.10	344.88	51.70	0.00
J4	0.15	344.88	51.76	0.00
J5	0.12	346.21	53.64	0.00
J6	0.20	345.53	54.44	0.00
J7	0.06	345.49	54.53	0.00
J8	0.37	345.71	52.36	0.00
J9	0.74	344.99	51.33	0.00
J10	0.71	344.55	51.82	0.00
J11	0.72	344.12	49.52	0.00
J12	0.01	343.74	48.32	0.00

J13	0.08	343.55	48.17	0.00
J14	0.36	343.20	46.48	0.00
J15	0.34	342.84	45.67	0.00
J16	0.30	341.71	47.51	0.00
J17	0.32	341.70	50.55	0.00
J18	0.68	341.70	48.68	0.00
J19	0.38	344.71	50.05	0.00
J20	1.06	344.71	49.36	0.00
J21	0.28	344.49	50.76	0.00
J22	1.12	344.49	49.06	0.00
J23	0.19	344.30	51.11	0.00
J24	0.93	344.29	48.71	0.00
J25	0.10	344.12	50.73	0.00
J26	1.95	344.10	50.76	0.00
J27	0.04	343.87	49.37	0.00
J28	0.16	343.75	49.54	0.00
J29	0.72	343.75	48.22	0.00
J30	0.28	343.45	48.40	0.00
J31	4.41	343.40	49.64	0.00
J32	0.96	343.27	47.96	0.00
J33	0.34	345.57	52.02	0.00
J34	0.34	345.17	50.21	0.00
J35	0.05	345.17	49.34	0.00
J36	0.62	345.17	48.65	0.00
J37	0.34	345.51	51.32	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	345.50	48.91	0.00
J39	0.09	344.57	51.35	0.00
J40	0.42	344.46	49.95	0.00
J41	0.38	344.40	48.50	0.00
J42	0.09	344.04	47.90	0.00
J43	0.07	343.98	47.99	0.00
J44	1.35	343.93	48.04	0.00
J45	1.30	344.19	49.54	0.00
J46	0.86	343.21	47.49	0.00
J47	0.16	343.70	48.32	0.00
J48	0.57	343.44	47.73	0.00
J49	0.87	343.27	48.07	0.00
J50	0.07	341.69	52.22	0.00
J51	0.98	345.82	53.25	0.00
J52	4.19	345.13	51.30	0.00
J53	0.29	344.05	50.73	0.00
J54	0.44	343.18	50.13	0.00

J55	0.46	345.33	52.24	0.00
J56	0.55	345.14	52.53	0.00
J57	0.41	345.14	53.12	0.00
J58	0.19	344.84	51.38	0.00
J59	0.00	344.84	51.38	0.00
J60	0.57	344.84	53.61	0.00
J61	0.36	344.52	52.07	0.00
J62	0.00	344.54	52.09	0.00
J63	0.01	344.17	52.24	0.00
J64	0.18	343.05	53.28	0.00
J65	0.71	343.86	52.66	0.00
J66	0.27	343.47	53.71	0.00
J67	0.28	343.22	52.85	0.00
J68	0.33	341.37	53.08	0.00
J69	0.37	338.34	49.96	0.00
J70	0.42	335.37	46.97	0.00
J71	0.87	341.07	52.20	0.00
J72	0.10	342.51	53.59	0.00
J73	0.18	341.54	52.81	0.00
J74	0.24	341.18	51.98	0.00
J75	0.12	340.94	51.76	0.00
J76	0.40	340.94	51.33	0.00
J77	0.03	340.26	51.08	0.00
J78	0.06	340.16	50.55	0.00
J79	0.50	339.74	50.10	0.00
J80	0.25	339.65	49.81	0.00
J81	0.12	339.93	50.93	0.00
J82	0.81	339.57	50.09	0.00
J83	0.27	339.49	49.92	0.00
J84	0.00	341.90	52.79	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	341.90	52.92	0.00
J86	0.02	341.54	52.32	0.00
J87	0.02	341.54	52.32	0.00
J88	0.22	341.54	52.26	0.00
J89	0.37	341.54	51.98	0.00
J90	0.23	340.55	51.20	0.00
J91	0.39	340.36	51.15	0.00
J92	0.02	338.73	49.33	0.00
J93	0.12	341.53	52.18	0.00
J94	0.22	341.53	52.37	0.00
J95	0.03	341.50	52.56	0.00
J96	0.03	341.19	52.04	0.00

J97	0.35	340.77	51.13	0.00
J98	0.31	339.65	49.71	0.00
J99	0.14	339.27	49.38	0.00
J100	0.35	338.77	48.79	0.00
J101	0.33	338.19	47.27	0.00
J102	0.20	338.55	48.24	0.00
J103	0.29	339.27	49.82	0.00
J104	0.19	339.27	49.24	0.00
J105	0.07	339.27	50.25	0.00
J106	0.12	339.26	49.68	0.00
J107	0.23	339.27	49.49	0.00
J108	0.23	338.94	48.74	0.00
J109	0.16	338.65	48.16	0.00
J110	0.21	339.72	50.07	0.00
J111	0.14	340.35	50.32	0.00
J112	0.10	340.84	51.05	0.00
J113	0.34	341.51	52.02	0.00
J114	0.00	341.24	51.80	0.00
J115	0.70	340.88	50.86	0.00
J116	0.16	341.24	51.60	0.00
J117	0.41	341.24	51.53	0.00
J118	0.24	341.24	51.67	0.00
J120	0.07	341.21	51.46	0.00
J121	0.19	341.17	50.93	0.00
J122	0.06	341.16	51.02	0.00
J124	0.00	340.91	49.56	0.00
J125	0.18	340.90	49.82	0.00
J126	0.27	340.89	50.37	0.00
J127	0.86	340.58	50.09	0.00
J128	0.10	340.71	48.89	0.00
J129	3.73	340.56	48.55	0.00
J130	0.54	340.47	49.29	0.00
J131	0.96	340.39	49.71	0.00
J132	0.25	340.37	49.79	0.00
J133	0.34	340.35	49.51	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J134	0.40	340.20	49.71	0.00
J135	0.48	340.26	50.04	0.00
J136	0.12	339.88	49.38	0.00
J137	0.18	339.54	50.44	0.00
J138	1.39	339.06	49.27	0.00
J139	0.18	337.46	46.99	0.00
FS	0.00	337.95	47.35	0.00

FD	0.00	337.71	47.11	0.00
J140	0.00	336.92	48.27	0.00
J141	0.22	336.36	48.36	0.00
J142	3.90	334.17	47.67	0.00
J143	0.51	332.12	45.84	0.00
J144	0.01	329.67	44.92	0.00
J145	0.00	329.11	44.54	0.00
J146	0.00	328.43	44.40	0.00
J147	0.03	328.18	44.28	0.00
J148	0.04	328.02	44.82	0.00
J149	0.09	327.78	44.89	0.00
J150	0.24	327.43	45.38	0.00
J151	0.01	327.59	43.19	0.00
J152	0.01	326.83	43.88	0.00
J153	0.00	326.17	44.02	0.00
J154	0.00	325.73	43.88	0.00
J155	0.01	325.29	44.69	0.00
J156	1.21	326.42	44.57	0.00
J157	0.00	327.40	45.90	0.00
J158	0.01	327.37	47.07	0.00
J159A	0.00	326.41	46.91	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.57	41.47	0.00
J162	0.03	245.81	40.41	0.00
J163	0.16	244.70	39.60	0.00
J164	0.06	244.36	38.46	0.00
J165	0.06	244.20	37.60	0.00
J166	0.07	244.31	37.81	0.00
J167	0.04	244.25	38.25	0.00
J168	0.09	243.42	38.52	0.00
J169	0.10	242.79	36.09	0.00
J170	0.00	244.68	47.68	0.00
J171	0.16	244.68	44.68	0.00
J172	0.00	244.67	51.67	0.00
J173	0.00	244.66	54.66	0.00
J174	0.04	244.66	53.96	0.00
J175	0.10	244.65	53.55	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J176	3.69	244.65	55.65	0.00
J177	0.07	244.66	51.96	0.00

J178	0.07	244.66	52.76	0.00	
J179	0.01	244.66	52.56	0.00	
J180	0.04	244.67	54.77	0.00	
J181	0.01	244.66	54.56	0.00	
J182	0.18	244.66	50.16	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	341.70	48.68	0.00	
JFF2	0.00	341.24	51.67	0.00	
JFF3	0.00	344.05	50.73	0.00	
JFF4	30.65	338.73	49.33	0.00	
JFF5	30.65	335.37	46.97	0.00	
JFF6	38.00	325.29	44.69	0.00	
JFF7	38.00	242.79	36.09	0.00	
JFF8	0.00	343.40	49.64	0.00	
JFF9	0.00	344.84	53.61	0.00	
J119	0.30	341.14	51.41	0.00	
J123	0.00	340.91	51.03	0.00	
J183	0.00	341.58	48.61	0.00	
RES1	-107.76	287.05	0.00	0.00	Reservoir
RES2	-67.97	287.05	0.00	0.00	Reservoir
TANK1	-33.16	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	39.79	1.27	7.33	Open
PS2	67.97	1.38	6.66	Open
PS3	0.00	0.00	0.00	Open
PS4	67.97	1.38	6.66	Open
PD1	39.79	1.27	7.32	Open
PD2	67.97	1.38	6.66	Open
PD3	0.00	0.00	0.00	Open
PD4	67.97	1.38	6.66	Open
PD5	175.73	1.40	3.92	Open
PIPE1A	39.45	0.31	0.22	Open
PIPE1	23.18	1.31	10.94	Open
PIPE2	21.44	1.21	9.47	Open
PIPE3	0.15	0.01	0.00	Open
PIPE4	136.10	1.08	2.15	Open
PIPE5	64.31	1.31	6.01	Open
PIPE6	54.72	1.11	4.46	Open
PIPE7	37.87	1.21	6.68	Open
PIPE8	37.49	1.19	6.56	Open

Link Results: (continued)

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Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE9	11.96	0.68	3.21	Open
PIPE10	11.25	0.64	2.87	Open
PIPE11	10.53	0.60	2.54	Open
PIPE12	10.52	0.60	2.53	Open
PIPE13	10.44	0.59	2.50	Open
PIPE14	10.08	0.57	2.34	Open
PIPE15	9.74	0.55	2.19	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	24.79	0.79	3.05	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	23.34	0.74	2.73	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	21.94	0.70	2.43	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	20.82	0.66	2.21	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	22.54	0.72	2.56	Open
PIPE27	11.77	0.67	3.12	Open
PIPE28	0.72	0.04	0.02	Open
PIPE29	10.88	0.62	2.70	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	6.19	0.35	0.95	Open
PIPE32	16.26	0.92	5.67	Open
PIPE33	15.92	0.90	5.45	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	21.19	1.20	9.26	Open
PIPE39	5.76	0.33	0.83	Open
PIPE40	5.34	0.30	0.72	Open
PIPE41	4.96	0.63	4.54	Open
PIPE42	4.88	0.28	0.61	Open
PIPE43	4.80	0.27	0.59	Open
PIPE44	15.34	0.87	5.09	Open
PIPE45	-3.77	0.21	0.38	Open
PIPE46	10.26	0.58	2.42	Open
PIPE47	13.71	0.78	4.13	Open
PIPE48	10.73	0.61	2.62	Open
PIPE49	10.56	0.60	2.55	Open
PIPE50	9.99	0.57	2.30	Open
PIPE51	-4.37	0.25	0.50	Open
PIPE52	0.87	0.05	0.02	Open
PIPE53	27.21	1.54	14.72	Open
PIPE54	33.80	1.08	5.42	Open
PIPE55	32.83	1.04	5.13	Open

EPANet Current MDD and FF S3 with Upgrades Model Results

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE56	48.76	1.55	10.68	Open
PIPE57	48.48	1.54	10.56	Open
PIPE58	9.39	0.53	2.05	Open
PIPE59	8.92	0.50	1.87	Open
PIPE60	-5.22	0.11	0.06	Open
PIPE61	54.66	0.77	1.83	Open
PIPE62	-14.91	0.30	0.40	Open
PIPE63	8.71	0.18	0.15	Open
PIPE64	11.86	0.67	3.16	Open
PIPE65	45.54	0.93	3.17	Open
PIPE66	-0.49	0.03	0.01	Open
PIPE67	0.57	0.03	0.01	Open
PIPE68	12.15	0.69	3.31	Open
PIPE69	23.50	1.33	11.22	Open
PIPE70	44.49	0.91	3.04	Open
PIPE71	-11.71	0.66	3.09	Open
PIPE72	32.78	1.86	20.78	Open
PIPE73	22.64	1.28	10.47	Open
PIPE74	10.13	0.57	2.36	Open
PIPE75	9.42	0.53	2.06	Open
PIPE76	9.15	0.52	1.96	Open
PIPE77	8.87	0.50	1.85	Open
PIPE78	31.33	1.77	19.11	Open
PIPE79	31.43	1.78	19.22	Open
PIPE80	31.07	1.76	18.81	Open
PIPE81	8.07	0.46	1.55	Open
PIPE82	29.90	0.95	4.32	Open
PIPE83	29.80	1.69	17.41	Open
PIPE84	8.50	0.48	1.71	Open
PIPE85	11.83	0.67	3.15	Open
PIPE86	11.59	0.66	3.03	Open
PIPE87	7.21	0.41	1.26	Open
PIPE88	0.47	0.03	0.01	Open
PIPE89	18.21	1.03	6.99	Open
PIPE90	8.80	0.50	1.82	Open
PIPE91	8.74	0.49	1.80	Open
PIPE92	8.24	0.47	1.61	Open
PIPE93	9.38	0.53	2.05	Open
PIPE94	9.26	0.52	2.00	Open
PIPE95	8.45	0.48	1.69	Open
PIPE96	41.64	1.33	7.97	Open
PIPE97	0.15	0.00	0.00	Open

PIPE98	29.15	0.93	4.12	Open
PIPE99	12.34	0.70	3.40	Open
PIPE100	-2.16	0.07	0.03	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE103	31.29	1.00	4.70	Open
PIPE104	31.06	0.99	4.63	Open
PIPE105	30.67	1.74	18.36	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	9.22	0.29	0.49	Open
PIPE109	-9.29	0.30	0.49	Open
PIPE110	18.48	1.05	7.19	Open
PIPE111	8.67	0.49	1.77	Open
PIPE112	8.74	0.49	1.80	Open
PIPE113	9.78	0.55	2.21	Open
PIPE114	18.17	1.03	6.96	Open
PIPE115	17.30	0.98	5.60	Open
PIPE116	0.55	0.03	0.01	Open
PIPE117	8.53	0.48	1.72	Open
PIPE118	16.71	0.95	5.97	Open
PIPE119	16.36	0.93	5.73	Open
PIPE120	16.91	0.96	5.37	Open
PIPE121	16.71	0.95	5.25	Open
PIPE122	0.25	0.01	0.00	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-0.42	0.02	0.01	Open
PIPE127	14.08	0.80	4.34	Open
PIPE128	13.85	0.78	4.21	Open
PIPE129	21.81	1.23	9.77	Open
PIPE130	-14.74	0.83	4.73	Open
PIPE131	-14.95	0.85	4.85	Open
PIPE132	-12.88	0.73	3.68	Open
PIPE133	-12.99	0.73	3.74	Open
PIPE134	-13.33	0.75	3.92	Open
PIPE135	13.81	0.78	4.19	Open
PIPE136	10.45	0.59	2.50	Open
PIPE137	0.22	0.01	0.00	Open
PIPE138	0.05	0.00	0.00	Open
PIPE139	-0.35	0.01	0.00	Open

PIPE141	3.15	0.18	0.27	Open
PIPE142	3.07	0.17	0.26	Open
PIPE143	2.88	0.16	0.23	Open
PIPE147	1.63	0.09	0.08	Open
PIPE148	1.45	0.08	0.06	Open
PIPE149	1.19	0.07	0.04	Open
PIPE150	10.93	0.62	2.72	Open
PIPE152	8.63	0.49	1.75	Open
PIPE153	4.90	0.28	0.61	Open
PIPE154	4.36	0.25	0.50	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE155	-0.46	0.23	1.61	Open
PIPE156	9.62	0.54	2.14	Open
PIPE157	-2.21	0.12	0.14	Open
PIPE158	2.43	0.14	0.17	Open
PIPE159	3.86	0.22	0.40	Open
PIPE160	5.94	0.34	0.88	Open
PIPE161	4.73	0.27	0.58	Open
PIPE162	4.25	0.24	0.47	Open
PIPE163	9.80	0.55	2.22	Open
PIPE164	9.68	0.55	2.17	Open
PIPE165	9.50	0.54	2.10	Open
PIPE166	8.12	0.46	1.57	Open
PIPE167	54.54	1.11	3.90	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	54.36	1.11	3.88	Open
PIPE169	54.36	1.11	3.88	Open
PIPE170	54.14	1.10	3.85	Open
PIPE171	50.24	1.02	3.35	Open
PIPE172	49.73	1.01	3.29	Open
PIPE173	49.71	1.01	3.28	Open
PIPE174	49.71	1.01	3.28	Open
PIPE175	49.71	1.01	3.28	Open
PIPE176	33.76	0.69	1.60	Open
PIPE177	33.71	0.69	1.60	Open
PIPE178	33.63	0.69	1.59	Open
PIPE179	15.93	0.90	4.80	Open
PIPE180	15.92	0.90	4.80	Open
PIPE181	15.91	0.90	4.79	Open
PIPE182	15.91	0.90	4.79	Open
PIPE183	15.91	0.90	4.79	Open
PIPE184	-22.10	1.25	8.81	Open

PIPE185	-23.31	1.32	9.73	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	43.16	1.37	8.52	Open
PIPE190	43.02	1.37	7.45	Open
PIPE191	42.99	1.37	7.44	Open
PIPE192	14.22	0.80	3.89	Open
PIPE193	10.23	0.58	2.12	Open
PIPE194	3.93	0.22	0.36	Open
PIPE195	3.86	0.22	0.35	Open
PIPE196	3.82	0.22	0.34	Open
PIPE197	13.99	0.79	3.78	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE198	13.90	0.79	3.73	Open
PIPE199	-24.21	1.37	10.43	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open
PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	30.65	0.04	0.00	Open
PIPEFF5	30.65	0.04	0.00	Open
PIPEFF6	38.00	0.05	0.00	Open
PIPEFF7	38.00	0.05	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open

EPANet Current MDD and FF S3 with Upgrades Model Results

PIPE140	7.84	0.44	1.29	Open
PIPE144	2.82	0.16	0.19	Open
PIPE145	10.36	0.59	2.17	Open
PIPE146	1.63	0.09	0.07	Open
PIPE151	8.73	0.49	1.58	Open
PIPE215	-8.43	0.48	1.48	Open
PIPE216	-8.43	0.48	1.48	Open
PUMP1	39.79	0.00	-59.41	Open Pump
PUMP2	67.97	0.00	-59.41	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	67.97	0.00	-59.41	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	28.31	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Current Chlorine Decay with Upgrades Model Results


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  ******************************************************************
  *                            E P A N E T                         *
  *                     Hydraulic and Water Quality                *
  *                     Analysis for Pipe Networks                 *
  *                           Version 2.2                          *
  ******************************************************************

  Input File: Wawa Water Hydraulic Model_Current with Upgrades Chlorine_V2_PK.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPE140	J118	J119	71.63	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump
PUMP5	FS	FD	#N/A	#N/A	Pump
VALVE1	J159A	J159	#N/A	150	Valve
VALVE2	J160A	J160B	#N/A	150	Valve
VALVE3	J160	JFS	#N/A	50	Valve

Energy Usage:

	Usage	Avg.	Kw-hr	Avg.	Peak	Cost

Pump	Factor	Effic.	/m3	Kw	Kw	/day
PUMP1	100.00	75.00	0.20	25.17	29.75	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00

Demand Charge: 0.00
Total Cost: 0.00

Node Results at 120:00 Hrs:

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
S1	0.00	291.47	-2.83	0.86
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	345.81	51.51	0.86
D2	0.00	345.79	51.49	0.00
D3	0.00	345.79	51.49	0.00
D4	0.00	345.79	51.49	0.00
DH	0.00	345.79	51.49	0.86
J1A	0.10	345.79	52.59	0.86
J1	0.00	345.79	52.55	0.86
J2	0.10	345.71	52.50	0.86
J3	0.05	345.66	52.48	0.85
J4	0.07	345.66	52.54	0.74
J5	0.06	345.78	53.21	0.86
J6	0.10	345.76	54.67	0.86
J7	0.03	345.76	54.80	0.85
J8	0.19	345.74	52.39	0.86
J9	0.37	345.67	52.01	0.86
J10	0.36	345.64	52.91	0.85
J11	0.36	345.62	51.02	0.85
J12	0.01	345.60	50.18	0.84
J13	0.04	345.59	50.21	0.84
J14	0.18	345.58	48.86	0.83

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J15	0.17	345.56	48.39	0.82
J16	0.15	345.52	51.32	0.79

J17	0.16	345.52	54.37	0.77
J18	0.34	345.52	52.50	0.72
J19	0.19	345.65	50.99	0.85
J20	0.53	345.64	50.29	0.83
J21	0.14	345.63	51.90	0.85
J22	0.56	345.62	50.19	0.84
J23	0.10	345.61	52.42	0.85
J24	0.47	345.61	50.03	0.83
J25	0.05	345.60	52.21	0.84
J26	0.98	345.59	52.25	0.84
J27	0.02	345.58	51.08	0.84
J28	0.08	345.57	51.36	0.84
J29	0.36	345.57	50.04	0.82
J30	0.14	345.55	50.50	0.84
J31	2.21	345.54	51.78	0.83
J32	0.48	345.55	50.24	0.82
J33	0.17	345.76	52.21	0.85
J34	0.17	345.75	50.79	0.85
J35	0.03	345.75	49.92	0.84
J36	0.31	345.75	49.23	0.80
J37	0.17	345.71	51.52	0.83
J38	0.60	345.70	49.11	0.82
J39	0.05	345.63	52.41	0.85
J40	0.21	345.62	51.11	0.85
J41	0.19	345.62	49.72	0.84
J42	0.04	345.59	49.45	0.84
J43	0.04	345.59	49.60	0.83
J44	0.68	345.59	49.70	0.84
J45	0.65	345.60	50.95	0.85
J46	0.43	345.56	49.84	0.83
J47	0.08	345.57	50.19	0.84
J48	0.28	345.56	49.85	0.83
J49	0.44	345.55	50.35	0.81
J50	0.04	345.53	56.06	0.83
J51	0.49	345.77	53.20	0.86
J52	2.10	345.75	51.92	0.84
J53	0.14	345.73	52.41	0.84
J54	0.22	345.72	52.67	0.84
J55	0.23	345.76	52.67	0.85
J56	0.28	345.75	53.14	0.84
J57	0.20	345.75	53.73	0.85
J58	0.10	345.75	52.29	0.84
J59	0.00	345.75	52.29	0.84
J60	0.28	345.75	54.52	0.81
J61	0.18	345.74	53.29	0.84

Node Results at 120:00 Hrs: (continued)

EPANet Current Chlorine Decay with Upgrades Model Results

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J62	0.00	345.74	53.29	0.84
J63	0.01	345.73	53.80	0.84
J64	0.09	345.72	55.95	0.83
J65	0.35	345.73	54.53	0.84
J66	0.13	345.72	55.96	0.81
J67	0.14	345.72	55.35	0.81
J68	0.16	345.69	57.40	0.83
J69	0.18	345.69	57.31	0.79
J70	0.21	345.69	57.29	0.74
J71	0.43	345.66	56.79	0.81
J72	0.05	345.71	56.79	0.82
J73	0.09	345.69	56.96	0.82
J74	0.12	345.67	56.47	0.82
J75	0.06	345.65	56.47	0.81
J76	0.20	345.65	56.04	0.81
J77	0.01	345.61	56.43	0.81
J78	0.03	345.61	56.00	0.81
J79	0.25	345.58	55.94	0.80
J80	0.13	345.58	55.74	0.80
J81	0.06	345.59	56.59	0.81
J82	0.40	345.58	56.10	0.80
J83	0.13	345.57	56.00	0.80
J84	0.00	345.70	56.59	0.82
J85	0.07	345.70	56.72	0.73
J86	0.01	345.70	56.48	0.82
J87	0.01	345.70	56.48	0.82
J88	0.11	345.70	56.42	0.81
J89	0.18	345.70	56.14	0.75
J90	0.12	345.70	56.35	0.73
J91	0.20	345.70	56.49	0.71
J92	0.01	345.70	56.30	0.23
J93	0.06	345.70	56.35	0.75
J94	0.11	345.70	56.54	0.66
J95	0.01	345.69	56.75	0.82
J96	0.01	345.67	56.52	0.82
J97	0.18	345.64	56.00	0.81
J98	0.16	345.58	55.64	0.80
J99	0.07	345.55	55.66	0.80
J100	0.18	345.55	55.57	0.79
J101	0.16	345.53	54.61	0.79
J102	0.10	345.54	55.23	0.80
J103	0.14	345.54	56.09	0.80
J104	0.10	345.54	55.51	0.76
J105	0.04	345.54	56.52	0.60
J106	0.06	345.54	55.96	0.75
J107	0.12	345.53	55.75	0.80
J108	0.12	345.53	55.33	0.79

EPANet Current Chlorine Decay with Upgrades Model Results

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J109	0.08	345.53	55.04	0.79
J110	0.10	345.52	55.87	0.79
J111	0.07	345.52	55.49	0.79
J112	0.05	345.52	55.73	0.82
J113	0.17	345.53	56.04	0.83
J114	0.00	345.52	56.08	0.83
J115	0.35	345.51	55.49	0.82
J116	0.08	345.52	55.88	0.78
J117	0.20	345.52	55.81	0.71
J118	0.12	345.52	55.95	0.75
J120	0.04	345.52	55.77	0.82
J121	0.10	345.51	55.27	0.78
J122	0.03	345.51	55.37	0.78
J124	0.00	345.51	54.16	0.64
J125	0.09	345.51	54.43	0.72
J126	0.13	345.51	54.99	0.78
J127	0.43	345.51	55.02	0.78
J128	0.05	345.50	53.68	0.72
J129	1.87	345.50	53.49	0.73
J130	0.27	345.50	54.32	0.75
J131	0.48	345.50	54.82	0.75
J132	0.13	345.51	54.93	0.79
J133	0.17	345.51	54.67	0.75
J134	0.20	345.51	55.02	0.68
J135	0.24	345.51	55.29	0.77
J136	0.06	345.51	55.01	0.57
J137	0.09	345.51	56.41	0.74
J138	0.69	345.51	55.72	0.77
J139	0.09	345.53	55.06	0.79
FS	0.00	345.53	54.93	0.00
FD	0.00	345.53	54.93	0.00
J140	0.00	345.52	56.87	0.78
J141	0.11	345.52	57.52	0.78
J142	1.95	345.51	59.01	0.74
J143	0.26	345.51	59.23	0.72
J144	0.01	345.51	60.76	0.66
J145	0.00	345.51	60.94	0.66
J146	0.00	345.50	61.47	0.64
J147	0.01	345.50	61.60	0.64
J148	0.02	345.50	62.30	0.64
J149	0.04	345.50	62.61	0.63
J150	0.12	345.50	63.45	0.62

J151	0.01	345.50	61.10	0.64
J152	0.00	345.50	62.55	0.62
J153	0.00	345.50	63.35	0.61
J154	0.00	345.50	63.65	0.58
J155	0.01	345.50	64.90	0.58

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L	
J156	0.60	345.50	63.65	0.60	
J157	0.00	345.50	64.00	0.58	
J158	0.01	345.50	65.20	0.58	
J159A	0.00	345.50	66.00	0.56	
J159	0.00	298.10	18.60	0.56	
J160A	0.03	298.10	49.60	0.51	
J160B	0.00	259.96	11.47	0.51	
J160	0.00	259.96	54.87	0.51	
J161	0.07	245.88	40.78	0.86	
J162	0.01	245.87	40.47	0.85	
J163	0.08	245.87	40.77	0.85	
J164	0.03	245.87	39.97	0.80	
J165	0.03	245.87	39.27	0.69	
J166	0.04	245.87	39.37	0.58	
J167	0.02	245.87	39.87	0.20	
J168	0.04	245.87	40.97	0.34	
J169	0.05	245.87	39.17	0.69	
J170	0.00	245.86	48.86	0.83	
J171	0.08	245.86	45.86	0.62	
J172	0.00	245.86	52.86	0.83	
J173	0.00	245.86	55.86	0.83	
J174	0.02	245.86	55.16	0.80	
J175	0.05	245.86	54.76	0.77	
J176	1.84	245.85	56.85	0.77	
J177	0.04	245.86	53.16	0.77	
J178	0.04	245.86	53.96	0.80	
J179	0.01	245.86	53.76	0.80	
J180	0.02	245.86	55.96	0.82	
J181	0.01	245.86	55.76	0.74	
J182	0.09	245.86	51.36	0.62	
JFS	0.00	259.96	54.87	0.51	
J119	0.15	345.51	55.78	0.75	
J123	0.00	345.51	55.63	0.73	
J183	0.00	345.52	52.55	0.79	
RES1	-33.22	291.50	0.00	0.86	Reservoir
RES2	0.00	291.50	0.00	0.86	Reservoir
TANK1	-2.58	245.88	40.78	0.22	Tank

EPANet Current Chlorine Decay with Upgrades Model Results

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Link Results at 120:00 Hrs:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	33.22	1.06	5.24	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	33.22	1.06	5.25	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	33.22	0.26	0.18	Open
PIPE1A	8.81	0.07	0.01	Open
PIPE1	6.41	0.36	1.01	Open
PIPE2	5.54	0.31	0.77	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	24.31	0.19	0.09	Open
PIPE5	9.01	0.18	0.16	Open
PIPE6	7.54	0.15	0.12	Open
PIPE7	10.28	0.33	0.60	Open
PIPE8	10.10	0.32	0.58	Open
PIPE9	2.71	0.15	0.21	Open
PIPE10	2.35	0.13	0.16	Open
PIPE11	2.00	0.11	0.12	Open
PIPE12	1.99	0.11	0.12	Open
PIPE13	1.95	0.11	0.11	Open
PIPE14	1.77	0.10	0.09	Open
PIPE15	1.60	0.09	0.08	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	7.02	0.22	0.29	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	6.29	0.20	0.24	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	5.59	0.18	0.19	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	5.03	0.16	0.16	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	4.98	0.16	0.16	Open
PIPE27	2.95	0.17	0.24	Open
PIPE28	0.36	0.02	0.00	Open
PIPE29	2.50	0.14	0.18	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	0.16	0.01	0.00	Open

PIPE32	2.40	0.14	0.16	Open
PIPE33	2.23	0.13	0.14	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open

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Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE38	5.41	0.31	0.74	Open
PIPE39	1.53	0.09	0.07	Open
PIPE40	1.32	0.07	0.05	Open
PIPE41	1.14	0.14	0.30	Open
PIPE42	1.09	0.06	0.04	Open
PIPE43	1.06	0.06	0.04	Open
PIPE44	3.83	0.22	0.39	Open
PIPE45	-0.97	0.06	0.03	Open
PIPE46	2.21	0.12	0.14	Open
PIPE47	2.59	0.15	0.19	Open
PIPE48	2.01	0.11	0.12	Open
PIPE49	1.93	0.11	0.11	Open
PIPE50	1.64	0.09	0.08	Open
PIPE51	0.76	0.04	0.02	Open
PIPE52	0.44	0.02	0.01	Open
PIPE53	3.05	0.17	0.26	Open
PIPE54	4.96	0.16	0.15	Open
PIPE55	4.47	0.14	0.13	Open
PIPE56	5.37	0.17	0.18	Open
PIPE57	5.23	0.17	0.17	Open
PIPE58	1.37	0.08	0.06	Open
PIPE59	1.14	0.06	0.04	Open
PIPE60	-1.27	0.03	0.00	Open
PIPE61	7.50	0.11	0.05	Open
PIPE62	-1.73	0.04	0.01	Open
PIPE63	1.83	0.04	0.01	Open
PIPE64	1.42	0.08	0.06	Open
PIPE65	5.48	0.11	0.06	Open
PIPE66	-0.07	0.00	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	1.39	0.08	0.06	Open
PIPE69	2.49	0.14	0.18	Open
PIPE70	5.12	0.10	0.06	Open
PIPE71	-1.28	0.07	0.05	Open
PIPE72	3.84	0.22	0.39	Open
PIPE73	2.48	0.14	0.17	Open

PIPE74	1.36	0.08	0.06	Open
PIPE75	1.01	0.06	0.03	Open
PIPE76	0.87	0.05	0.03	Open
PIPE77	0.73	0.04	0.02	Open
PIPE78	3.12	0.18	0.27	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	2.21	0.12	0.14	Open
PIPE82	3.36	0.11	0.08	Open
PIPE83	3.31	0.19	0.30	Open
PIPE84	-0.35	0.02	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE85	2.62	0.15	0.19	Open
PIPE86	2.50	0.14	0.18	Open
PIPE87	1.77	0.10	0.09	Open
PIPE88	0.21	0.01	0.00	Open
PIPE89	4.01	0.23	0.42	Open
PIPE90	1.99	0.11	0.12	Open
PIPE91	1.96	0.11	0.11	Open
PIPE92	1.71	0.10	0.09	Open
PIPE93	2.00	0.11	0.12	Open
PIPE94	1.94	0.11	0.11	Open
PIPE95	1.54	0.09	0.07	Open
PIPE96	4.14	0.13	0.11	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	2.80	0.09	0.05	Open
PIPE99	1.27	0.07	0.05	Open
PIPE100	2.47	0.08	0.04	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	3.26	0.10	0.07	Open
PIPE109	-0.95	0.03	0.01	Open
PIPE110	4.19	0.24	0.46	Open
PIPE111	1.96	0.11	0.11	Open
PIPE112	1.97	0.11	0.11	Open
PIPE113	2.21	0.13	0.14	Open
PIPE114	4.01	0.23	0.42	Open
PIPE115	4.15	0.23	0.40	Open

PIPE116	-0.29	0.02	0.00	Open
PIPE117	1.29	0.07	0.05	Open
PIPE118	2.69	0.15	0.20	Open
PIPE119	2.51	0.14	0.18	Open
PIPE120	1.98	0.11	0.10	Open
PIPE121	1.87	0.11	0.09	Open
PIPE122	2.10	0.12	0.11	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	1.76	0.10	0.09	Open
PIPE127	0.50	0.03	0.01	Open
PIPE128	0.39	0.02	0.01	Open
PIPE129	-0.95	0.05	0.03	Open
PIPE130	1.14	0.06	0.04	Open
PIPE131	1.04	0.06	0.03	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE132	-0.80	0.05	0.02	Open
PIPE133	-0.85	0.05	0.02	Open
PIPE134	-1.02	0.06	0.03	Open
PIPE135	1.98	0.11	0.12	Open
PIPE136	1.04	0.06	0.03	Open
PIPE137	0.46	0.01	0.00	Open
PIPE138	0.37	0.01	0.00	Open
PIPE139	0.17	0.01	0.00	Open
PIPE141	0.49	0.03	0.01	Open
PIPE142	0.46	0.03	0.01	Open
PIPE143	0.36	0.02	0.01	Open
PIPE147	-0.20	0.01	0.00	Open
PIPE148	-0.29	0.02	0.00	Open
PIPE149	-0.42	0.02	0.01	Open
PIPE150	0.27	0.02	0.00	Open
PIPE152	1.33	0.08	0.05	Open
PIPE153	-0.54	0.03	0.01	Open
PIPE154	-0.81	0.05	0.02	Open
PIPE155	-0.08	0.04	0.06	Open
PIPE156	-0.24	0.01	0.00	Open
PIPE157	1.77	0.10	0.09	Open
PIPE158	0.93	0.05	0.03	Open
PIPE159	-1.21	0.07	0.05	Open
PIPE160	-0.45	0.03	0.01	Open
PIPE161	0.47	0.03	0.01	Open
PIPE162	0.23	0.01	0.00	Open

PIPE163	-0.42	0.02	0.01	Open
PIPE164	-0.48	0.03	0.01	Open
PIPE165	-0.57	0.03	0.01	Open
PIPE166	-1.26	0.07	0.05	Open
PIPE167	3.27	0.07	0.02	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	3.18	0.06	0.02	Open
PIPE169	3.18	0.06	0.02	Open
PIPE170	3.07	0.06	0.02	Open
PIPE171	1.12	0.02	0.00	Open
PIPE172	0.86	0.02	0.00	Open
PIPE173	0.86	0.02	0.00	Open
PIPE174	0.86	0.02	0.00	Open
PIPE175	0.86	0.02	0.00	Open
PIPE176	0.64	0.01	0.00	Open
PIPE177	0.62	0.01	0.00	Open
PIPE178	0.57	0.01	0.00	Open
PIPE179	0.20	0.01	0.00	Open
PIPE180	0.20	0.01	0.00	Open
PIPE181	0.19	0.01	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE182	0.19	0.01	0.00	Open
PIPE183	0.19	0.01	0.00	Open
PIPE184	0.19	0.01	0.00	Open
PIPE185	-0.42	0.02	0.01	Open
PIPE186	0.04	0.00	0.00	Open
PIPE187	0.04	0.00	0.00	Open
PIPE188	0.03	0.00	0.00	Open
PIPE189	0.03	0.00	0.00	Open
PIPE189A	0.00	0.00	0.00	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.13	0.01	0.00	Open
PIPE193	0.05	0.00	0.00	Open
PIPE194	0.04	0.00	0.00	Open
PIPE195	0.01	0.00	0.00	Open
PIPE196	-0.02	0.00	0.00	Open
PIPE197	0.01	0.00	0.00	Open
PIPE198	-0.03	0.00	0.00	Open
PIPE199	-0.09	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open

PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	0.00	0.00	0.00	Closed
PIPE140	1.00	0.06	0.03	Open
PIPE144	0.33	0.02	0.00	Open
PIPE145	1.18	0.07	0.04	Open
PIPE146	-0.20	0.01	0.00	Open
PIPE151	1.38	0.08	0.05	Open
PIPE215	-0.95	0.05	0.03	Open
PIPE216	-0.95	0.05	0.03	Open
PUMP1	33.22	0.00	-54.34	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	0.03	0.00	47.41	Active Valve
VALVE2	0.00	0.00	38.13	Active Valve
VALVE3	0.00	0.00	0.00	Open Valve

EPANet Future Residential Only ADD Model Results


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*********************************************************************
*                            E P A N E T                            *
*                    Hydraulic and Water Quality                    *
*                    Analysis for Pipe Networks                     *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential ADD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

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PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	30.14	30.14	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	344.03	49.73	0.00
D2	0.00	343.98	49.68	0.00
D3	0.00	343.98	49.68	0.00
D4	0.00	343.98	49.68	0.00
DH	0.00	343.98	49.68	0.00
J1A	0.10	343.98	50.78	0.00
J1	0.00	343.98	50.74	0.00
J2	0.10	343.85	50.64	0.00
J3	0.05	343.76	50.58	0.00
J4	0.07	343.76	50.64	0.00

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J5	0.06	343.97	51.40	0.00
J6	0.10	343.94	52.85	0.00
J7	0.03	343.94	52.98	0.00
J8	0.19	343.90	50.55	0.00
J9	0.37	343.79	50.13	0.00
J10	0.36	343.75	51.02	0.00
J11	0.36	343.71	49.11	0.00
J12	0.01	343.67	48.25	0.00
J13	0.04	343.66	48.28	0.00
J14	0.18	343.63	46.91	0.00
J15	0.17	343.60	46.43	0.00
J16	0.18	343.52	49.32	0.00
J17	0.16	343.52	52.37	0.00
J18	0.34	343.52	50.50	0.00
J19	0.19	343.75	49.09	0.00
J20	0.53	343.74	48.39	0.00
J21	0.14	343.71	49.98	0.00
J22	0.56	343.71	48.28	0.00
J23	0.10	343.68	50.49	0.00
J24	0.47	343.68	48.10	0.00
J25	0.05	343.65	50.26	0.00
J26	0.98	343.65	50.31	0.00
J27	0.02	343.62	49.12	0.00
J28	0.08	343.60	49.39	0.00
J29	0.42	343.60	48.07	0.00
J30	0.14	343.56	48.51	0.00
J31	2.21	343.54	49.78	0.00
J32	0.48	343.54	48.23	0.00
J33	0.17	343.94	50.39	0.00
J34	0.17	343.92	48.96	0.00
J35	0.03	343.92	48.09	0.00
J36	0.31	343.92	47.40	0.00
J37	0.17	343.85	49.66	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	0.60	343.85	47.26	0.00
J39	0.05	343.72	50.50	0.00
J40	0.21	343.70	49.19	0.00
J41	0.19	343.69	47.79	0.00
J42	0.04	343.65	47.51	0.00
J43	0.04	343.64	47.65	0.00
J44	0.68	343.63	47.74	0.00
J45	0.65	343.66	49.01	0.00
J46	0.43	343.55	47.83	0.00

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J47	0.08	343.60	48.22	0.00
J48	0.28	343.57	47.86	0.00
J49	0.44	343.54	48.34	0.00
J50	0.04	343.47	54.00	0.00
J51	0.49	343.95	51.38	0.00
J52	2.10	343.92	50.09	0.00
J53	0.14	343.88	50.56	0.00
J54	0.22	343.85	50.80	0.00
J55	0.23	343.93	50.84	0.00
J56	0.28	343.92	51.31	0.00
J57	0.20	343.92	51.90	0.00
J58	0.10	343.91	50.45	0.00
J59	0.00	343.91	50.45	0.00
J60	0.28	343.91	52.68	0.00
J61	0.18	343.90	51.45	0.00
J62	0.00	343.90	51.45	0.00
J63	0.01	343.89	51.96	0.00
J64	0.09	343.85	54.08	0.00
J65	0.35	343.87	52.67	0.00
J66	0.13	343.86	54.10	0.00
J67	0.14	343.85	53.48	0.00
J68	0.16	343.79	55.50	0.00
J69	0.18	343.79	55.41	0.00
J70	0.21	343.79	55.39	0.00
J71	0.43	343.73	54.86	0.00
J72	0.05	343.83	54.91	0.00
J73	0.09	343.79	55.06	0.00
J74	0.12	343.74	54.54	0.00
J75	0.06	343.70	54.52	0.00
J76	0.20	343.70	54.09	0.00
J77	0.01	343.60	54.42	0.00
J78	0.03	343.58	53.97	0.00
J79	0.25	343.51	53.87	0.00
J80	0.13	343.50	53.66	0.00
J81	0.06	343.55	54.55	0.00
J82	0.40	343.49	54.01	0.00
J83	0.13	343.48	53.91	0.00
J84	0.00	343.82	54.71	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.07	343.82	54.84	0.00
J86	0.01	343.81	54.59	0.00
J87	0.01	343.81	54.59	0.00
J88	0.11	343.80	54.52	0.00

J89	0.18	343.80	54.24	0.00
J90	0.12	343.81	54.46	0.00
J91	0.20	343.81	54.60	0.00
J92	0.01	343.81	54.41	0.00
J93	0.06	343.80	54.45	0.00
J94	0.11	343.80	54.64	0.00
J95	0.01	343.79	54.85	0.00
J96	0.01	343.74	54.59	0.00
J97	0.18	343.68	54.04	0.00
J98	0.16	343.50	53.56	0.00
J99	0.07	343.42	53.53	0.00
J100	0.18	343.40	53.42	0.00
J101	0.16	343.33	52.41	0.00
J102	0.10	343.36	53.05	0.00
J103	0.14	343.41	53.96	0.00
J104	0.10	343.41	53.38	0.00
J105	0.04	343.41	54.39	0.00
J106	0.06	343.41	53.83	0.00
J107	0.12	343.39	53.61	0.00
J108	0.12	343.37	53.17	0.00
J109	0.08	343.35	52.86	0.00
J110	0.10	343.40	53.75	0.00
J111	0.07	343.41	53.38	0.00
J112	0.05	343.43	53.64	0.00
J113	0.17	343.46	53.97	0.00
J114	0.00	343.45	54.01	0.00
J115	0.35	343.43	53.41	0.00
J116	0.09	343.45	53.81	0.00
J117	0.25	343.45	53.74	0.00
J118	0.17	343.45	53.88	0.00
J120	0.04	343.45	53.70	0.00
J121	0.10	343.45	53.21	0.00
J122	0.03	343.45	53.31	0.00
J124	0.00	343.43	52.08	0.00
J125	0.09	343.43	52.35	0.00
J126	0.13	343.43	52.91	0.00
J127	0.43	343.41	52.92	0.00
J128	0.05	343.41	51.59	0.00
J129	1.87	343.40	51.39	0.00
J130	0.27	343.40	52.22	0.00
J131	0.48	343.40	52.72	0.00
J132	0.13	343.40	52.82	0.00
J133	0.17	343.40	52.56	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.20	343.39	52.90	0.00
J135	0.24	343.40	53.18	0.00
J136	0.06	343.38	52.88	0.00
J137	0.09	343.37	54.27	0.00
J138	0.69	343.35	53.56	0.00
J139	0.09	343.28	52.81	0.00
FS	0.00	343.31	52.71	0.00
FD	0.00	343.29	52.69	0.00
J140	0.00	343.24	54.59	0.00
J141	0.11	343.20	55.20	0.00
J142	1.95	343.04	56.54	0.00
J143	0.26	342.91	56.63	0.00
J144	0.01	342.77	58.02	0.00
J145	0.00	342.73	58.16	0.00
J146	0.00	342.69	58.66	0.00
J147	0.01	342.68	58.78	0.00
J148	0.02	342.66	59.46	0.00
J149	0.04	342.64	59.75	0.00
J150	0.12	342.61	60.56	0.00
J151	0.01	342.67	58.27	0.00
J152	0.00	342.65	59.70	0.00
J153	0.00	342.64	60.49	0.00
J154	0.00	342.64	60.79	0.00
J155	0.01	342.63	62.03	0.00
J156	0.60	342.62	60.77	0.00
J157	0.00	342.59	61.09	0.00
J158	0.01	342.55	62.25	0.00
J159A	0.00	341.60	62.10	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.03	293.30	44.80	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.07	246.60	41.50	0.00
J162	0.01	246.60	41.20	0.00
J163	0.08	246.59	41.49	0.00
J164	0.03	246.59	40.69	0.00
J165	0.03	246.59	39.99	0.00
J166	0.04	246.59	40.09	0.00
J167	0.02	246.59	40.59	0.00
J168	0.04	246.59	41.69	0.00
J169	0.05	246.59	39.89	0.00
J170	0.00	246.59	49.59	0.00
J171	0.08	246.59	46.59	0.00
J172	0.00	246.58	53.58	0.00
J173	0.00	246.58	56.58	0.00
J174	0.02	246.58	55.88	0.00
J175	0.05	246.58	55.48	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	1.84	246.58	57.58	0.00	
J177	0.04	246.58	53.88	0.00	
J178	0.04	246.58	54.68	0.00	
J179	0.01	246.58	54.48	0.00	
J180	0.02	246.58	56.68	0.00	
J181	0.01	246.58	56.48	0.00	
J182	0.09	246.58	52.08	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.52	50.50	0.00	
JFF2	0.00	343.45	53.88	0.00	
JFF3	0.00	343.88	50.56	0.00	
JFF4	0.00	343.81	54.41	0.00	
JFF5	0.00	343.79	55.39	0.00	
JFF6	0.00	342.63	62.03	0.00	
JFF7	0.00	246.59	39.89	0.00	
JFF8	0.00	343.54	49.78	0.00	
JFF9	0.00	343.91	52.68	0.00	
J119	0.20	343.44	53.71	0.00	
J123	0.04	343.43	53.55	0.00	
J183	0.10	343.51	50.54	0.00	
J184	0.00	343.53	49.23	0.00	
J185	0.03	343.52	50.58	0.00	
J186	0.12	343.52	50.34	0.00	
J187	0.06	343.52	49.92	0.00	
J188	0.05	343.52	50.13	0.00	
RES1	-43.86	291.50	0.00	0.00	Reservoir
RES2	0.00	291.50	0.00	0.00	Reservoir
TANK1	7.42	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	43.86	1.40	8.77	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	43.86	1.40	8.78	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	43.86	0.35	0.30	Open
PIPE1A	11.59	0.09	0.02	Open

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PIPE1	8.39	0.48	1.67	Open
PIPE2	7.52	0.43	1.36	Open
PIPE3	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	32.17	0.26	0.15	Open
PIPE5	12.12	0.25	0.27	Open
PIPE6	10.20	0.21	0.20	Open
PIPE7	13.44	0.43	0.98	Open
PIPE8	13.25	0.42	0.96	Open
PIPE9	3.49	0.20	0.33	Open
PIPE10	3.13	0.18	0.27	Open
PIPE11	2.77	0.16	0.21	Open
PIPE12	2.77	0.16	0.21	Open
PIPE13	2.73	0.15	0.21	Open
PIPE14	2.55	0.14	0.18	Open
PIPE15	2.38	0.13	0.16	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	9.39	0.30	0.51	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	8.67	0.28	0.44	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	7.97	0.25	0.37	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	7.41	0.24	0.33	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	7.68	0.24	0.35	Open
PIPE27	4.37	0.25	0.50	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	3.86	0.22	0.40	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	1.52	0.09	0.07	Open
PIPE32	3.20	0.18	0.28	Open
PIPE33	3.03	0.17	0.25	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	7.40	0.42	1.32	Open
PIPE39	2.05	0.12	0.12	Open
PIPE40	1.84	0.10	0.10	Open
PIPE41	1.66	0.21	0.59	Open
PIPE42	1.61	0.09	0.08	Open

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PIPE43	1.57	0.09	0.08	Open
PIPE44	5.30	0.30	0.71	Open
PIPE45	-1.30	0.07	0.05	Open
PIPE46	3.35	0.19	0.30	Open
PIPE47	4.25	0.24	0.47	Open
PIPE48	3.29	0.19	0.29	Open
PIPE49	3.21	0.18	0.28	Open
PIPE50	2.92	0.17	0.24	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	1.30	0.07	0.05	Open
PIPE52	2.34	0.13	0.16	Open
PIPE53	5.44	0.31	0.75	Open
PIPE54	6.56	0.21	0.26	Open
PIPE55	6.07	0.19	0.23	Open
PIPE56	7.93	0.25	0.37	Open
PIPE57	7.79	0.25	0.36	Open
PIPE58	1.82	0.10	0.10	Open
PIPE59	1.59	0.09	0.08	Open
PIPE60	-1.44	0.03	0.01	Open
PIPE61	10.16	0.14	0.08	Open
PIPE62	-2.52	0.05	0.01	Open
PIPE63	2.15	0.04	0.01	Open
PIPE64	2.03	0.11	0.12	Open
PIPE65	7.81	0.16	0.12	Open
PIPE66	-0.09	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	2.02	0.11	0.12	Open
PIPE69	3.74	0.21	0.37	Open
PIPE70	7.43	0.15	0.11	Open
PIPE71	-1.89	0.11	0.11	Open
PIPE72	5.54	0.31	0.77	Open
PIPE73	3.67	0.21	0.36	Open
PIPE74	1.86	0.11	0.10	Open
PIPE75	1.51	0.09	0.07	Open
PIPE76	1.38	0.08	0.06	Open
PIPE77	1.24	0.07	0.05	Open
PIPE78	4.82	0.27	0.60	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	3.50	0.20	0.33	Open
PIPE82	5.10	0.16	0.16	Open
PIPE83	5.05	0.29	0.65	Open
PIPE84	-0.76	0.04	0.02	Open

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PIPE85	4.21	0.24	0.46	Open
PIPE86	4.09	0.23	0.44	Open
PIPE87	3.07	0.17	0.26	Open
PIPE88	0.36	0.02	0.00	Open
PIPE89	6.74	0.38	1.11	Open
PIPE90	3.33	0.19	0.30	Open
PIPE91	3.30	0.19	0.30	Open
PIPE92	3.05	0.17	0.26	Open
PIPE93	3.40	0.19	0.31	Open
PIPE94	3.34	0.19	0.30	Open
PIPE95	2.93	0.17	0.24	Open
PIPE96	6.20	0.20	0.23	Open
PIPE97	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE98	4.21	0.13	0.11	Open
PIPE99	1.91	0.11	0.11	Open
PIPE100	3.88	0.12	0.10	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	5.32	0.17	0.18	Open
PIPE109	-1.51	0.05	0.02	Open
PIPE110	6.81	0.39	1.13	Open
PIPE111	3.16	0.18	0.27	Open
PIPE112	3.32	0.19	0.30	Open
PIPE113	3.63	0.21	0.35	Open
PIPE114	6.78	0.38	1.12	Open
PIPE115	7.09	0.40	1.07	Open
PIPE116	-0.47	0.03	0.01	Open
PIPE117	2.46	0.14	0.17	Open
PIPE118	5.25	0.30	0.70	Open
PIPE119	5.08	0.29	0.66	Open
PIPE120	4.50	0.25	0.46	Open
PIPE121	4.40	0.25	0.44	Open
PIPE122	2.52	0.14	0.16	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.18	0.12	0.14	Open

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PIPE127	3.39	0.19	0.31	Open
PIPE128	3.27	0.18	0.29	Open
PIPE129	3.96	0.22	0.42	Open
PIPE130	-1.33	0.07	0.05	Open
PIPE131	-1.43	0.08	0.06	Open
PIPE132	-2.50	0.14	0.18	Open
PIPE133	-2.56	0.14	0.18	Open
PIPE134	-2.73	0.15	0.21	Open
PIPE135	2.68	0.15	0.20	Open
PIPE136	2.48	0.14	0.17	Open
PIPE137	-0.59	0.02	0.00	Open
PIPE138	-0.68	0.02	0.00	Open
PIPE139	-0.93	0.03	0.01	Open
PIPE141	0.79	0.04	0.02	Open
PIPE142	0.75	0.04	0.02	Open
PIPE143	0.66	0.04	0.01	Open
PIPE147	0.25	0.01	0.00	Open
PIPE148	0.16	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	0.02	0.00	0.00	Open
PIPE150	2.15	0.12	0.13	Open
PIPE152	2.23	0.13	0.14	Open
PIPE153	0.37	0.02	0.01	Open
PIPE154	0.10	0.01	0.00	Open
PIPE155	-0.11	0.06	0.12	Open
PIPE156	1.61	0.09	0.08	Open
PIPE157	1.00	0.06	0.03	Open
PIPE158	1.36	0.08	0.06	Open
PIPE159	-0.27	0.02	0.00	Open
PIPE160	0.92	0.05	0.03	Open
PIPE161	1.13	0.06	0.04	Open
PIPE162	0.89	0.05	0.03	Open
PIPE163	1.61	0.09	0.08	Open
PIPE164	1.55	0.09	0.07	Open
PIPE165	1.46	0.08	0.07	Open
PIPE166	0.77	0.04	0.02	Open
PIPE167	13.27	0.27	0.28	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	13.18	0.27	0.28	Open
PIPE169	13.18	0.27	0.28	Open
PIPE170	13.07	0.27	0.28	Open
PIPE171	11.12	0.23	0.21	Open

PIPE172	10.86	0.22	0.20	Open
PIPE173	10.86	0.22	0.20	Open
PIPE174	10.86	0.22	0.20	Open
PIPE175	10.86	0.22	0.20	Open
PIPE176	9.04	0.18	0.14	Open
PIPE177	9.02	0.18	0.14	Open
PIPE178	8.97	0.18	0.14	Open
PIPE179	1.80	0.10	0.09	Open
PIPE180	1.80	0.10	0.08	Open
PIPE181	1.79	0.10	0.08	Open
PIPE182	1.79	0.10	0.08	Open
PIPE183	1.79	0.10	0.08	Open
PIPE184	1.79	0.10	0.08	Open
PIPE185	1.18	0.07	0.04	Open
PIPE186	10.04	0.20	0.17	Open
PIPE187	10.04	0.20	0.17	Open
PIPE188	10.03	0.57	2.04	Open
PIPE189	10.03	0.57	2.48	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.17	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.06	0.00	0.00	Open
PIPE194	0.08	0.00	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	0.02	0.00	0.00	Open
PIPE197	0.05	0.00	0.00	Open
PIPE198	0.01	0.00	0.00	Open
PIPE199	-0.05	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open

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PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	2.14	0.12	0.12	Open
PIPE144	0.63	0.04	0.01	Open
PIPE145	2.57	0.15	0.16	Open
PIPE146	0.25	0.01	0.00	Open
PIPE151	2.29	0.13	0.13	Open
PIPE215	-3.25	0.18	0.25	Open
PIPE216	-1.70	0.10	0.08	Open
PIPE217	1.90	0.11	0.09	Open
PIPE218	1.20	0.07	0.04	Open
PIPE219	0.73	0.04	0.02	Open
PIPE220	0.70	0.04	0.01	Open
PIPE221	0.64	0.04	0.01	Open
PIPE222	0.45	0.03	0.01	Open
PIPE223	1.04	0.06	0.03	Open
PIPE224	1.65	0.09	0.07	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	43.86	0.00	-52.57	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.03	0.57	43.50	Active Valve
VALVE2	10.00	0.57	33.34	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential Only MDD Model Results


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*****************************************************************
*                          E P A N E T                          *
*                  Hydraulic and Water Quality                  *
*                  Analysis for Pipe Networks                   *
*                        Version 2.2                            *
*****************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential MDD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	27.33	27.33	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.19	26.81	26.81	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.49	-2.81	0.00
D1	0.00	344.78	50.48	0.00
D2	0.00	344.74	50.44	0.00
D3	0.00	344.74	50.44	0.00
D4	0.00	344.76	50.46	0.00
DH	0.00	344.74	50.44	0.00
J1A	0.19	344.74	51.54	0.00
J1	0.00	344.73	51.49	0.00
J2	0.20	344.36	51.15	0.00
J3	0.10	344.10	50.92	0.00
J4	0.15	344.10	50.98	0.00

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J5	0.12	344.71	52.14	0.00
J6	0.20	344.62	53.53	0.00
J7	0.06	344.62	53.66	0.00
J8	0.37	344.49	51.14	0.00
J9	0.74	344.18	50.52	0.00
J10	0.71	344.05	51.32	0.00
J11	0.72	343.94	49.34	0.00
J12	0.01	343.85	48.43	0.00
J13	0.08	343.81	48.43	0.00
J14	0.36	343.73	47.01	0.00
J15	0.34	343.66	46.49	0.00
J16	0.35	343.45	49.25	0.00
J17	0.32	343.44	52.29	0.00
J18	0.68	343.44	50.42	0.00
J19	0.38	344.05	49.39	0.00
J20	1.06	344.04	48.69	0.00
J21	0.28	343.95	50.22	0.00
J22	1.12	343.94	48.51	0.00
J23	0.19	343.86	50.67	0.00
J24	0.93	343.86	48.28	0.00
J25	0.10	343.79	50.40	0.00
J26	1.95	343.78	50.44	0.00
J27	0.04	343.70	49.20	0.00
J28	0.16	343.65	49.44	0.00
J29	0.85	343.64	48.11	0.00
J30	0.28	343.53	48.48	0.00
J31	4.41	343.47	49.71	0.00
J32	0.96	343.50	48.19	0.00
J33	0.34	344.62	51.07	0.00
J34	0.34	344.57	49.61	0.00
J35	0.05	344.57	48.74	0.00
J36	0.62	344.57	48.05	0.00
J37	0.34	344.35	50.16	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	344.35	47.76	0.00
J39	0.09	343.97	50.75	0.00
J40	0.42	343.93	49.42	0.00
J41	0.38	343.90	48.00	0.00
J42	0.09	343.77	47.63	0.00
J43	0.07	343.75	47.76	0.00
J44	1.35	343.73	47.84	0.00
J45	1.30	343.82	49.17	0.00
J46	0.86	343.53	47.81	0.00

J47	0.16	343.65	48.27	0.00
J48	0.57	343.58	47.87	0.00
J49	0.87	343.50	48.30	0.00
J50	0.07	343.36	53.89	0.00
J51	0.98	344.65	52.08	0.00
J52	4.19	344.57	50.74	0.00
J53	0.29	344.47	51.15	0.00
J54	0.44	344.40	51.35	0.00
J55	0.46	344.59	51.50	0.00
J56	0.55	344.57	51.96	0.00
J57	0.41	344.57	52.55	0.00
J58	0.19	344.54	51.08	0.00
J59	0.00	344.54	51.08	0.00
J60	0.57	344.54	53.31	0.00
J61	0.36	344.51	52.06	0.00
J62	0.00	344.51	52.06	0.00
J63	0.01	344.48	52.55	0.00
J64	0.18	344.38	54.61	0.00
J65	0.71	344.44	53.24	0.00
J66	0.27	344.40	54.64	0.00
J67	0.28	344.39	54.02	0.00
J68	0.33	344.24	55.95	0.00
J69	0.37	344.24	55.86	0.00
J70	0.42	344.24	55.84	0.00
J71	0.87	344.08	55.21	0.00
J72	0.10	344.33	55.41	0.00
J73	0.18	344.24	55.51	0.00
J74	0.24	344.11	54.91	0.00
J75	0.12	344.02	54.84	0.00
J76	0.40	344.02	54.41	0.00
J77	0.03	343.77	54.59	0.00
J78	0.06	343.73	54.12	0.00
J79	0.50	343.56	53.92	0.00
J80	0.25	343.53	53.69	0.00
J81	0.12	343.65	54.65	0.00
J82	0.81	343.52	54.04	0.00
J83	0.27	343.50	53.93	0.00
J84	0.00	344.30	55.19	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	344.30	55.32	0.00
J86	0.02	344.27	55.05	0.00
J87	0.02	344.27	55.05	0.00
J88	0.22	344.27	54.99	0.00

J89	0.37	344.27	54.71	0.00
J90	0.23	344.27	54.92	0.00
J91	0.39	344.27	55.06	0.00
J92	0.02	344.27	54.87	0.00
J93	0.12	344.27	54.92	0.00
J94	0.22	344.27	55.11	0.00
J95	0.03	344.24	55.30	0.00
J96	0.03	344.12	54.97	0.00
J97	0.35	343.95	54.31	0.00
J98	0.31	343.53	53.59	0.00
J99	0.14	343.35	53.46	0.00
J100	0.35	343.32	53.34	0.00
J101	0.33	343.18	52.26	0.00
J102	0.20	343.24	52.93	0.00
J103	0.29	343.32	53.87	0.00
J104	0.19	343.32	53.29	0.00
J105	0.07	343.32	54.30	0.00
J106	0.12	343.31	53.73	0.00
J107	0.23	343.25	53.47	0.00
J108	0.23	343.22	53.02	0.00
J109	0.16	343.19	52.70	0.00
J110	0.21	343.25	53.60	0.00
J111	0.14	343.25	53.22	0.00
J112	0.10	343.29	53.50	0.00
J113	0.34	343.35	53.86	0.00
J114	0.00	343.31	53.87	0.00
J115	0.70	343.26	53.24	0.00
J116	0.19	343.31	53.67	0.00
J117	0.50	343.31	53.60	0.00
J118	0.34	343.31	53.74	0.00
J120	0.07	343.31	53.56	0.00
J121	0.19	343.30	53.06	0.00
J122	0.06	343.30	53.16	0.00
J124	0.00	343.26	51.91	0.00
J125	0.18	343.26	52.18	0.00
J126	0.27	343.26	52.74	0.00
J127	0.86	343.24	52.75	0.00
J128	0.10	343.23	51.41	0.00
J129	3.73	343.20	51.19	0.00
J130	0.54	343.20	52.02	0.00
J131	0.96	343.21	52.53	0.00
J132	0.25	343.23	52.65	0.00
J133	0.34	343.21	52.37	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.40	343.21	52.72	0.00
J135	0.48	343.22	53.00	0.00
J136	0.12	343.21	52.71	0.00
J137	0.18	343.20	54.10	0.00
J138	1.39	343.19	53.40	0.00
J139	0.18	343.10	52.63	0.00
FS	0.00	343.15	52.55	0.00
FD	0.00	343.13	52.53	0.00
J140	0.00	343.04	54.39	0.00
J141	0.22	342.98	54.98	0.00
J142	3.90	342.75	56.25	0.00
J143	0.51	342.60	56.32	0.00
J144	0.01	342.43	57.68	0.00
J145	0.00	342.39	57.82	0.00
J146	0.00	342.34	58.31	0.00
J147	0.03	342.33	58.43	0.00
J148	0.04	342.31	59.11	0.00
J149	0.09	342.29	59.40	0.00
J150	0.24	342.25	60.20	0.00
J151	0.01	342.31	57.91	0.00
J152	0.01	342.30	59.35	0.00
J153	0.00	342.29	60.14	0.00
J154	0.00	342.28	60.43	0.00
J155	0.01	342.27	61.67	0.00
J156	1.21	342.25	60.40	0.00
J157	0.00	342.23	60.73	0.00
J158	0.01	342.19	61.89	0.00
J159A	0.00	341.24	61.74	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.44	50.42	0.00	
JFF2	0.00	343.31	53.74	0.00	
JFF3	0.00	344.47	51.15	0.00	
JFF4	0.00	344.27	54.87	0.00	
JFF5	0.00	344.24	55.84	0.00	
JFF6	0.00	342.27	61.67	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	343.47	49.71	0.00	
JFF9	0.00	344.54	53.31	0.00	
J119	0.40	343.30	53.57	0.00	
J123	0.08	343.26	53.38	0.00	
J183	0.21	343.43	50.46	0.00	
J184	0.00	343.46	49.16	0.00	
J185	0.05	343.46	50.52	0.00	
J186	0.23	343.45	50.27	0.00	
J187	0.13	343.46	49.86	0.00	
J188	0.09	343.46	50.07	0.00	
RES1	-39.22	291.50	0.00	0.00	Reservoir
RES2	-38.50	291.50	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	39.22	1.25	7.13	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	38.51	0.78	2.33	Open
PD1	39.22	1.25	7.13	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	38.51	0.78	2.32	Open
PD5	77.72	0.62	0.87	Open
PIPE1A	20.67	0.16	0.07	Open

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PIPE1	15.06	0.85	4.92	Open
PIPE2	13.32	0.75	3.92	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	56.86	0.45	0.43	Open
PIPE5	21.14	0.43	0.77	Open
PIPE6	17.75	0.36	0.55	Open
PIPE7	24.08	0.77	2.89	Open
PIPE8	23.71	0.75	2.81	Open
PIPE9	6.17	0.35	0.94	Open
PIPE10	5.45	0.31	0.75	Open
PIPE11	4.74	0.27	0.58	Open
PIPE12	4.72	0.27	0.57	Open
PIPE13	4.64	0.26	0.56	Open
PIPE14	4.29	0.24	0.48	Open
PIPE15	3.94	0.22	0.41	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	16.80	0.53	1.48	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	15.35	0.49	1.26	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	13.95	0.44	1.05	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	12.82	0.41	0.90	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	13.11	0.42	0.94	Open
PIPE27	7.68	0.43	1.41	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	6.66	0.38	1.09	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	1.97	0.11	0.11	Open
PIPE32	5.61	0.32	0.79	Open
PIPE33	5.27	0.30	0.70	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	13.07	0.74	3.78	Open
PIPE39	3.65	0.21	0.36	Open
PIPE40	3.23	0.18	0.28	Open
PIPE41	2.85	0.36	1.63	Open
PIPE42	2.77	0.16	0.21	Open

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PIPE43	2.69	0.15	0.20	Open
PIPE44	9.33	0.53	2.03	Open
PIPE45	-2.34	0.13	0.16	Open
PIPE46	5.68	0.32	0.81	Open
PIPE47	7.02	0.40	1.20	Open
PIPE48	5.39	0.31	0.74	Open
PIPE49	5.23	0.30	0.69	Open
PIPE50	4.66	0.26	0.56	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.73	0.15	0.21	Open
PIPE52	3.75	0.21	0.37	Open
PIPE53	8.09	0.46	1.56	Open
PIPE54	11.52	0.37	0.74	Open
PIPE55	10.55	0.34	0.63	Open
PIPE56	13.31	0.42	0.96	Open
PIPE57	13.03	0.41	0.93	Open
PIPE58	3.20	0.18	0.28	Open
PIPE59	2.73	0.15	0.21	Open
PIPE60	-2.70	0.06	0.02	Open
PIPE61	17.68	0.25	0.23	Open
PIPE62	-4.25	0.09	0.04	Open
PIPE63	3.98	0.08	0.04	Open
PIPE64	3.45	0.20	0.32	Open
PIPE65	13.30	0.27	0.32	Open
PIPE66	-0.16	0.01	0.00	Open
PIPE67	0.57	0.03	0.01	Open
PIPE68	3.42	0.19	0.32	Open
PIPE69	6.24	0.35	0.96	Open
PIPE70	12.57	0.26	0.29	Open
PIPE71	-3.17	0.18	0.28	Open
PIPE72	9.39	0.53	2.05	Open
PIPE73	6.15	0.35	0.94	Open
PIPE74	3.23	0.18	0.28	Open
PIPE75	2.52	0.14	0.18	Open
PIPE76	2.25	0.13	0.15	Open
PIPE77	1.97	0.11	0.11	Open
PIPE78	7.95	0.45	1.51	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	5.72	0.32	0.82	Open
PIPE82	8.47	0.27	0.42	Open
PIPE83	8.37	0.47	1.66	Open
PIPE84	-1.12	0.06	0.04	Open

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PIPE85	6.84	0.39	1.14	Open
PIPE86	6.61	0.37	1.07	Open
PIPE87	4.85	0.27	0.60	Open
PIPE88	0.57	0.03	0.01	Open
PIPE89	10.76	0.61	2.64	Open
PIPE90	5.33	0.30	0.72	Open
PIPE91	5.27	0.30	0.70	Open
PIPE92	4.77	0.27	0.58	Open
PIPE93	5.40	0.31	0.74	Open
PIPE94	5.28	0.30	0.71	Open
PIPE95	4.47	0.25	0.52	Open
PIPE96	10.35	0.33	0.60	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	7.02	0.22	0.29	Open
PIPE99	3.18	0.18	0.28	Open
PIPE100	6.36	0.20	0.25	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	8.59	0.27	0.43	Open
PIPE109	-2.46	0.08	0.04	Open
PIPE110	11.02	0.62	2.76	Open
PIPE111	5.13	0.29	0.67	Open
PIPE112	5.31	0.30	0.71	Open
PIPE113	5.86	0.33	0.86	Open
PIPE114	10.81	0.61	2.66	Open
PIPE115	11.33	0.64	2.56	Open
PIPE116	-0.84	0.05	0.02	Open
PIPE117	3.68	0.21	0.36	Open
PIPE118	7.88	0.45	1.48	Open
PIPE119	7.52	0.43	1.36	Open
PIPE120	6.32	0.36	0.87	Open
PIPE121	6.11	0.35	0.82	Open
PIPE122	4.88	0.28	0.54	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	4.20	0.24	0.46	Open

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Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE127	4.05	0.23	0.43	Open
PIPE128	3.82	0.22	0.39	Open
PIPE129	3.24	0.18	0.28	Open
PIPE130	-0.09	0.01	0.00	Open
PIPE131	-0.30	0.02	0.00	Open
PIPE132	-3.26	0.18	0.29	Open
PIPE133	-3.37	0.19	0.31	Open
PIPE134	-3.71	0.21	0.37	Open
PIPE135	4.31	0.24	0.49	Open
PIPE136	3.60	0.20	0.35	Open
PIPE137	-0.55	0.02	0.00	Open
PIPE138	-0.74	0.02	0.00	Open
PIPE139	-1.24	0.04	0.01	Open
PIPE141	1.26	0.07	0.05	Open
PIPE142	1.19	0.07	0.04	Open
PIPE143	0.99	0.06	0.03	Open
PIPE147	0.17	0.01	0.00	Open
PIPE148	-0.01	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	-0.27	0.02	0.00	Open
PIPE150	2.63	0.15	0.19	Open
PIPE152	3.36	0.19	0.31	Open
PIPE153	-0.37	0.02	0.01	Open
PIPE154	-0.91	0.05	0.03	Open
PIPE155	-0.18	0.09	0.30	Open
PIPE156	1.59	0.09	0.08	Open
PIPE157	2.82	0.16	0.22	Open
PIPE158	2.52	0.14	0.18	Open
PIPE159	-1.69	0.10	0.09	Open
PIPE160	0.49	0.03	0.01	Open
PIPE161	1.64	0.09	0.08	Open
PIPE162	1.16	0.07	0.04	Open
PIPE163	1.26	0.07	0.05	Open
PIPE164	1.14	0.06	0.04	Open
PIPE165	0.96	0.05	0.03	Open
PIPE166	-0.43	0.02	0.01	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open

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PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.26	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.09	0.01	0.00	Open
PIPE194	0.11	0.01	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	-0.01	0.00	0.00	Open
PIPE197	0.03	0.00	0.00	Open
PIPE198	-0.06	0.00	0.00	Open
PIPE199	-0.17	0.01	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

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PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	3.18	0.18	0.24	Open
PIPE144	0.94	0.05	0.03	Open
PIPE145	3.71	0.21	0.32	Open
PIPE146	0.17	0.01	0.00	Open
PIPE151	3.46	0.20	0.28	Open
PIPE215	-4.76	0.27	0.51	Open
PIPE216	-2.59	0.15	0.17	Open
PIPE217	2.88	0.16	0.20	Open
PIPE218	1.81	0.10	0.09	Open
PIPE219	1.08	0.06	0.03	Open
PIPE220	1.07	0.06	0.03	Open
PIPE221	0.94	0.05	0.03	Open
PIPE222	0.68	0.04	0.01	Open
PIPE223	1.53	0.09	0.06	Open
PIPE224	2.37	0.13	0.14	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PUMP1	39.22	0.00	-53.32	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	38.51	0.00	-53.27	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	43.14	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential Only MDD and FF S1 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	40.43	40.43	0.00
PUMP2	100.00	75.00	0.20	60.37	60.37	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.20	60.37	60.37	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.98	-7.32	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.44	49.14	0.00
D2	0.00	343.42	49.12	0.00
D3	0.00	343.38	49.08	0.00
D4	0.00	343.42	49.12	0.00
DH	0.00	343.38	49.08	0.00
J1A	0.19	343.32	50.12	0.00
J1	0.00	343.30	50.06	0.00
J2	0.20	340.56	47.35	0.00
J3	0.10	338.26	45.08	0.00
J4	0.15	338.26	45.14	0.00

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J5	0.12	343.13	50.56	0.00
J6	0.20	342.61	51.52	0.00
J7	0.06	342.58	51.62	0.00
J8	0.37	341.42	48.07	0.00
J9	0.74	338.92	45.26	0.00
J10	0.71	337.60	44.87	0.00
J11	0.72	336.28	41.68	0.00
J12	0.01	335.02	39.60	0.00
J13	0.08	334.41	39.03	0.00
J14	0.36	333.25	36.53	0.00
J15	0.34	332.04	34.87	0.00
J16	0.35	328.05	33.85	0.00
J17	0.32	322.67	31.52	0.00
J18	0.68	317.60	24.58	0.00
J19	0.38	337.85	43.19	0.00
J20	1.06	337.84	42.49	0.00
J21	0.28	336.94	43.21	0.00
J22	1.12	336.93	41.50	0.00
J23	0.19	336.09	42.90	0.00
J24	0.93	336.08	40.50	0.00
J25	0.10	335.26	41.87	0.00
J26	1.95	335.25	41.91	0.00
J27	0.04	333.96	39.46	0.00
J28	0.16	333.02	38.81	0.00
J29	0.85	333.02	37.49	0.00
J30	0.28	330.35	35.30	0.00
J31	4.41	326.86	33.10	0.00
J32	0.96	330.60	35.29	0.00
J33	0.34	342.65	49.10	0.00
J34	0.34	342.32	47.36	0.00
J35	0.05	342.32	46.49	0.00
J36	0.62	342.32	45.80	0.00
J37	0.34	340.55	46.36	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	340.55	43.96	0.00
J39	0.09	337.17	43.95	0.00
J40	0.42	336.81	42.30	0.00
J41	0.38	336.58	40.68	0.00
J42	0.09	335.25	39.11	0.00
J43	0.07	335.01	39.02	0.00
J44	1.35	334.81	38.92	0.00
J45	1.30	335.72	41.07	0.00
J46	0.86	332.04	36.32	0.00

J47	0.16	333.47	38.09	0.00
J48	0.57	332.71	37.00	0.00
J49	0.87	330.46	35.26	0.00
J50	0.07	331.18	41.71	0.00
J51	0.98	342.82	50.25	0.00
J52	4.19	342.29	48.46	0.00
J53	0.29	341.21	47.89	0.00
J54	0.44	341.01	47.96	0.00
J55	0.46	342.46	49.37	0.00
J56	0.55	342.31	49.70	0.00
J57	0.41	342.32	50.30	0.00
J58	0.19	342.14	48.68	0.00
J59	0.00	342.14	48.68	0.00
J60	0.57	342.14	50.91	0.00
J61	0.36	341.95	49.50	0.00
J62	0.00	341.97	49.52	0.00
J63	0.01	341.78	49.85	0.00
J64	0.18	341.24	51.47	0.00
J65	0.71	341.62	50.42	0.00
J66	0.27	341.43	51.67	0.00
J67	0.28	341.32	50.95	0.00
J68	0.33	340.43	52.14	0.00
J69	0.37	340.43	52.05	0.00
J70	0.42	340.43	52.03	0.00
J71	0.87	339.58	50.71	0.00
J72	0.10	340.74	51.82	0.00
J73	0.18	340.35	51.62	0.00
J74	0.24	339.65	50.45	0.00
J75	0.12	339.18	50.00	0.00
J76	0.40	339.17	49.56	0.00
J77	0.03	337.70	48.52	0.00
J78	0.06	337.45	47.84	0.00
J79	0.50	336.46	46.82	0.00
J80	0.25	336.24	46.40	0.00
J81	0.12	337.00	48.00	0.00
J82	0.81	336.26	46.78	0.00
J83	0.27	336.08	46.51	0.00
J84	0.00	340.61	51.50	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	340.61	51.63	0.00
J86	0.02	340.51	51.29	0.00
J87	0.02	340.49	51.27	0.00
J88	0.22	340.49	51.21	0.00

J89	0.37	340.49	50.93	0.00
J90	0.23	340.50	51.15	0.00
J91	0.39	340.50	51.29	0.00
J92	0.02	340.50	51.10	0.00
J93	0.12	340.49	51.14	0.00
J94	0.22	340.49	51.33	0.00
J95	0.03	340.32	51.38	0.00
J96	0.03	339.67	50.52	0.00
J97	0.35	338.76	49.12	0.00
J98	0.31	336.18	46.24	0.00
J99	0.14	334.91	45.02	0.00
J100	0.35	334.96	44.98	0.00
J101	0.33	334.07	43.15	0.00
J102	0.20	334.35	44.04	0.00
J103	0.29	334.57	45.12	0.00
J104	0.19	334.57	44.54	0.00
J105	0.07	334.57	45.55	0.00
J106	0.12	334.56	44.98	0.00
J107	0.23	333.64	43.86	0.00
J108	0.23	333.69	43.49	0.00
J109	0.16	333.73	43.24	0.00
J110	0.21	332.70	43.05	0.00
J111	0.14	331.44	41.41	0.00
J112	0.10	331.34	41.55	0.00
J113	0.34	331.21	41.72	0.00
J114	0.00	329.83	40.39	0.00
J115	0.70	329.99	39.97	0.00
J116	0.19	329.44	39.80	0.00
J117	0.50	329.09	39.38	0.00
J118	0.34	328.76	39.19	0.00
J120	0.07	329.68	39.93	0.00
J121	0.19	329.46	39.22	0.00
J122	0.06	329.38	39.24	0.00
J124	0.00	329.59	38.24	0.00
J125	0.18	329.71	38.63	0.00
J126	0.27	329.83	39.31	0.00
J127	0.86	330.46	39.97	0.00
J128	0.10	329.67	37.85	0.00
J129	3.73	329.75	37.74	0.00
J130	0.54	330.10	38.92	0.00
J131	0.96	330.53	39.85	0.00
J132	0.25	330.92	40.34	0.00
J133	0.34	330.85	40.01	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.40	331.05	40.56	0.00
J135	0.48	330.99	40.77	0.00
J136	0.12	331.48	40.98	0.00
J137	0.18	331.97	42.87	0.00
J138	1.39	332.70	42.91	0.00
J139	0.18	333.99	43.52	0.00
FS	0.00	334.04	43.44	0.00
FD	0.00	334.02	43.42	0.00
J140	0.00	333.93	45.28	0.00
J141	0.22	333.87	45.87	0.00
J142	3.90	333.64	47.14	0.00
J143	0.51	333.49	47.21	0.00
J144	0.01	333.32	48.57	0.00
J145	0.00	333.28	48.71	0.00
J146	0.00	333.23	49.20	0.00
J147	0.03	333.22	49.32	0.00
J148	0.04	333.20	50.00	0.00
J149	0.09	333.18	50.29	0.00
J150	0.24	333.14	51.09	0.00
J151	0.01	333.20	48.80	0.00
J152	0.01	333.19	50.24	0.00
J153	0.00	333.17	51.02	0.00
J154	0.00	333.17	51.32	0.00
J155	0.01	333.16	52.56	0.00
J156	1.21	333.14	51.29	0.00
J157	0.00	333.11	51.61	0.00
J158	0.01	333.08	52.78	0.00
J159A	0.00	332.13	52.63	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	38.00	317.60	24.58	0.00	
JFF2	38.00	328.76	39.19	0.00	
JFF3	26.81	341.21	47.89	0.00	
JFF4	0.00	340.50	51.10	0.00	
JFF5	0.00	340.43	52.03	0.00	
JFF6	0.00	333.16	52.56	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	38.00	326.86	33.10	0.00	
JFF9	0.00	342.14	50.91	0.00	
J119	0.40	329.26	39.53	0.00	
J123	0.08	329.56	39.68	0.00	
J183	0.21	328.68	35.71	0.00	
J184	0.00	329.65	35.35	0.00	
J185	0.05	329.48	36.54	0.00	
J186	0.23	329.20	36.02	0.00	
J187	0.13	329.48	35.88	0.00	
J188	0.09	329.40	36.01	0.00	
RES1	-136.66	287.05	0.00	0.00	Reservoir
RES2	-81.87	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	54.79	1.74	13.25	Open
PS2	81.87	1.67	9.40	Open
PS3	0.00	0.00	0.00	Open
PS4	81.87	1.67	9.40	Open
PD1	54.79	1.74	13.25	Open
PD2	81.87	1.67	9.40	Open
PD3	0.00	0.00	0.00	Open
PD4	81.87	1.67	9.40	Open
PD5	218.53	1.74	5.87	Open
PIPE1A	59.18	0.47	0.46	Open

PIPE1	44.39	2.51	36.42	Open
PIPE2	42.65	2.41	33.82	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	159.16	1.27	2.87	Open
PIPE5	55.52	1.13	4.58	Open
PIPE6	47.17	0.96	3.39	Open
PIPE7	73.87	2.35	23.04	Open
PIPE8	73.50	2.34	22.83	Open
PIPE9	21.43	1.21	9.46	Open
PIPE10	20.72	1.17	8.88	Open
PIPE11	20.00	1.13	8.32	Open
PIPE12	19.99	1.13	8.31	Open
PIPE13	19.91	1.13	8.25	Open
PIPE14	19.55	1.11	7.98	Open
PIPE15	19.21	1.09	7.72	Open
PIPE16	39.00	2.21	28.66	Open
PIPE17	38.68	2.19	28.23	Open
PIPE18	51.33	1.63	11.74	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	49.88	1.59	11.13	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	48.48	1.54	10.56	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	47.35	1.51	10.11	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	55.41	1.76	13.53	Open
PIPE27	36.46	2.06	25.30	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	35.44	2.01	24.01	Open
PIPE30	42.41	2.40	33.48	Open
PIPE31	-7.25	0.41	1.27	Open
PIPE32	14.79	0.84	4.76	Open
PIPE33	14.45	0.82	4.56	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	42.39	2.40	33.45	Open
PIPE39	10.90	0.62	2.70	Open
PIPE40	10.48	0.59	2.51	Open
PIPE41	10.10	1.29	16.92	Open
PIPE42	10.01	0.57	2.31	Open

PIPE43	9.94	0.56	2.28	Open
PIPE44	31.41	1.78	19.19	Open
PIPE45	-10.11	0.57	2.35	Open
PIPE46	19.99	1.13	8.31	Open
PIPE47	28.58	1.62	16.11	Open
PIPE48	18.91	1.07	7.50	Open
PIPE49	18.75	1.06	7.38	Open
PIPE50	18.18	1.03	6.97	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	25.95	1.47	13.48	Open
PIPE52	17.75	1.00	6.67	Open
PIPE53	19.95	1.13	8.28	Open
PIPE54	29.65	0.94	4.25	Open
PIPE55	28.68	0.91	3.99	Open
PIPE56	48.77	1.55	10.68	Open
PIPE57	21.68	0.69	2.38	Open
PIPE58	8.14	0.46	1.58	Open
PIPE59	7.68	0.43	1.41	Open
PIPE60	-10.85	0.22	0.22	Open
PIPE61	47.11	0.67	1.39	Open
PIPE62	-13.44	0.27	0.33	Open
PIPE63	12.57	0.26	0.29	Open
PIPE64	8.84	0.50	1.83	Open
PIPE65	34.14	0.70	1.86	Open
PIPE66	-0.54	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	9.19	0.52	1.97	Open
PIPE69	19.38	1.10	7.85	Open
PIPE70	33.03	0.67	1.75	Open
PIPE71	-10.55	0.60	2.54	Open
PIPE72	22.48	1.27	10.33	Open
PIPE73	15.37	0.87	5.11	Open
PIPE74	7.09	0.40	1.22	Open
PIPE75	6.39	0.36	1.01	Open
PIPE76	6.12	0.35	0.93	Open
PIPE77	5.84	0.33	0.85	Open
PIPE78	21.03	1.19	9.13	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	14.15	0.80	4.38	Open
PIPE82	18.42	0.59	1.76	Open
PIPE83	18.31	1.04	7.07	Open
PIPE84	-5.77	0.33	0.83	Open

PIPE85	16.83	0.95	6.04	Open
PIPE86	16.59	0.94	5.89	Open
PIPE87	13.28	0.75	3.90	Open
PIPE88	1.87	0.11	0.10	Open
PIPE89	27.88	1.58	15.39	Open
PIPE90	13.98	0.79	4.28	Open
PIPE91	13.92	0.79	4.25	Open
PIPE92	13.41	0.76	3.97	Open
PIPE93	13.88	0.79	4.23	Open
PIPE94	13.76	0.78	4.16	Open
PIPE95	12.95	0.73	3.72	Open
PIPE96	22.20	0.71	2.49	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	15.14	0.48	1.22	Open
PIPE99	6.92	0.39	1.16	Open
PIPE100	14.47	0.46	1.13	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	20.44	0.65	2.13	Open
PIPE109	-7.08	0.23	0.30	Open
PIPE110	27.48	1.56	14.99	Open
PIPE111	12.60	0.71	3.54	Open
PIPE112	14.07	0.80	4.34	Open
PIPE113	14.85	0.84	4.80	Open
PIPE114	28.57	1.62	16.10	Open
PIPE115	32.95	1.86	18.46	Open
PIPE116	-4.69	0.27	0.57	Open
PIPE117	8.46	0.48	1.69	Open
PIPE118	21.14	1.20	9.22	Open
PIPE119	20.79	1.18	8.94	Open
PIPE120	14.86	0.84	4.22	Open
PIPE121	14.65	0.83	4.12	Open
PIPE122	17.95	1.02	5.99	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	17.28	0.98	6.34	Open

PIPE127	-4.86	0.27	0.61	Open
PIPE128	-5.09	0.29	0.66	Open
PIPE129	-18.57	1.05	7.25	Open
PIPE130	21.90	1.24	9.84	Open
PIPE131	21.69	1.23	9.67	Open
PIPE132	5.44	0.31	0.75	Open
PIPE133	5.33	0.30	0.72	Open
PIPE134	4.99	0.28	0.64	Open
PIPE135	24.87	1.41	12.46	Open
PIPE136	-6.88	0.39	1.15	Open
PIPE137	23.61	0.75	2.45	Open
PIPE138	23.42	0.75	2.41	Open
PIPE139	22.92	0.73	2.32	Open
PIPE141	8.15	0.46	1.58	Open
PIPE142	8.07	0.46	1.55	Open
PIPE143	7.88	0.45	1.48	Open
PIPE147	-5.85	0.33	0.85	Open
PIPE148	-6.03	0.34	0.90	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	-6.30	0.36	0.98	Open
PIPE150	-13.88	0.79	4.23	Open
PIPE152	-6.31	0.36	0.98	Open
PIPE153	-10.04	0.57	2.32	Open
PIPE154	-10.58	0.60	2.56	Open
PIPE155	0.27	0.14	0.61	Open
PIPE156	-14.47	0.82	4.57	Open
PIPE157	16.11	0.91	5.58	Open
PIPE158	5.17	0.29	0.68	Open
PIPE159	-11.81	0.67	3.14	Open
PIPE160	-6.99	0.40	1.19	Open
PIPE161	-3.78	0.21	0.38	Open
PIPE162	-4.25	0.24	0.47	Open
PIPE163	-11.64	0.66	3.05	Open
PIPE164	-11.76	0.67	3.11	Open
PIPE165	-11.94	0.68	3.20	Open
PIPE166	-13.32	0.75	3.92	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	38.00	0.05	0.00	Open
PIPEFF2	38.00	0.05	0.04	Open
PIPEFF3	26.81	0.03	0.04	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	38.00	0.05	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	-19.40	1.10	6.92	Open
PIPE144	7.83	0.44	1.29	Open
PIPE145	-11.98	0.68	2.83	Open
PIPE146	-5.85	0.33	0.75	Open
PIPE151	-6.21	0.35	0.84	Open
PIPE215	3.98	0.23	0.37	Open
PIPE216	20.15	1.14	7.42	Open
PIPE217	16.88	0.95	5.35	Open
PIPE218	10.74	0.61	2.31	Open
PIPE219	6.75	0.38	0.98	Open
PIPE220	6.14	0.35	0.82	Open
PIPE221	6.01	0.34	0.79	Open
PIPE222	3.93	0.22	0.36	Open
PIPE223	9.85	0.56	1.97	Open
PIPE224	16.37	0.93	5.06	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	54.79	0.00	-56.46	Open Pump
PUMP2	81.87	0.00	-56.42	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	81.87	0.00	-56.42	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	34.03	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential Only MDD and FF S2 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                    Hydraulic and Water Quality                    *
*                    Analysis for Pipe Networks                     *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	40.43	40.43	0.00
PUMP2	100.00	75.00	0.20	60.37	60.37	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.20	60.37	60.37	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.98	-7.32	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.44	49.14	0.00
D2	0.00	343.42	49.12	0.00
D3	0.00	343.38	49.08	0.00
D4	0.00	343.42	49.12	0.00
DH	0.00	343.38	49.08	0.00
J1A	0.19	343.32	50.12	0.00
J1	0.00	343.31	50.07	0.00
J2	0.20	342.53	49.32	0.00
J3	0.10	341.93	48.75	0.00
J4	0.15	341.93	48.81	0.00

J5	0.12	343.09	50.52	0.00
J6	0.20	341.81	50.72	0.00
J7	0.06	341.73	50.77	0.00
J8	0.37	342.67	49.32	0.00
J9	0.74	342.05	48.39	0.00
J10	0.71	341.77	49.04	0.00
J11	0.72	341.51	46.91	0.00
J12	0.01	341.28	45.86	0.00
J13	0.08	341.17	45.79	0.00
J14	0.36	340.96	44.24	0.00
J15	0.34	340.75	43.58	0.00
J16	0.35	340.11	45.91	0.00
J17	0.32	340.11	48.96	0.00
J18	0.68	340.10	47.08	0.00
J19	0.38	341.79	47.13	0.00
J20	1.06	341.78	46.43	0.00
J21	0.28	341.57	47.84	0.00
J22	1.12	341.57	46.14	0.00
J23	0.19	341.38	48.19	0.00
J24	0.93	341.38	45.80	0.00
J25	0.10	341.21	47.82	0.00
J26	1.95	341.20	47.86	0.00
J27	0.04	340.98	46.48	0.00
J28	0.16	340.86	46.65	0.00
J29	0.85	340.86	45.33	0.00
J30	0.28	340.56	45.51	0.00
J31	4.41	340.51	46.75	0.00
J32	0.96	340.38	45.07	0.00
J33	0.34	341.88	48.33	0.00
J34	0.34	341.15	46.19	0.00
J35	0.05	341.15	45.32	0.00
J36	0.62	341.15	44.63	0.00
J37	0.34	342.52	48.33	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	342.52	45.93	0.00
J39	0.09	341.64	48.42	0.00
J40	0.42	341.54	47.03	0.00
J41	0.38	341.48	45.58	0.00
J42	0.09	341.15	45.01	0.00
J43	0.07	341.09	45.10	0.00
J44	1.35	341.04	45.15	0.00
J45	1.30	341.28	46.63	0.00
J46	0.86	340.39	44.67	0.00

J47	0.16	340.82	45.44	0.00
J48	0.57	340.59	44.88	0.00
J49	0.87	340.35	45.15	0.00
J50	0.07	339.58	50.11	0.00
J51	0.98	342.37	49.80	0.00
J52	4.19	341.07	47.24	0.00
J53	0.29	339.36	46.04	0.00
J54	0.44	338.88	45.83	0.00
J55	0.46	341.44	48.35	0.00
J56	0.55	341.07	48.46	0.00
J57	0.41	341.07	49.05	0.00
J58	0.19	340.38	46.92	0.00
J59	0.00	340.37	46.91	0.00
J60	0.57	336.52	45.29	0.00
J61	0.36	340.10	47.65	0.00
J62	0.00	340.12	47.67	0.00
J63	0.01	339.83	47.90	0.00
J64	0.18	338.95	49.18	0.00
J65	0.71	339.58	48.38	0.00
J66	0.27	339.27	49.51	0.00
J67	0.28	339.09	48.72	0.00
J68	0.33	337.65	49.36	0.00
J69	0.37	333.17	44.79	0.00
J70	0.42	328.78	40.38	0.00
J71	0.87	337.70	48.83	0.00
J72	0.10	338.45	49.53	0.00
J73	0.18	337.83	49.10	0.00
J74	0.24	337.78	48.58	0.00
J75	0.12	337.74	48.56	0.00
J76	0.40	337.75	48.14	0.00
J77	0.03	337.73	48.55	0.00
J78	0.06	337.72	48.11	0.00
J79	0.50	337.72	48.08	0.00
J80	0.25	337.72	47.88	0.00
J81	0.12	337.72	48.72	0.00
J82	0.81	337.71	48.23	0.00
J83	0.27	337.71	48.14	0.00
J84	0.00	338.00	48.89	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	338.00	49.02	0.00
J86	0.02	337.75	48.53	0.00
J87	0.02	337.77	48.55	0.00
J88	0.22	337.76	48.48	0.00

J89	0.37	337.76	48.20	0.00
J90	0.23	336.29	46.94	0.00
J91	0.39	336.00	46.79	0.00
J92	0.02	333.59	44.19	0.00
J93	0.12	337.76	48.41	0.00
J94	0.22	337.76	48.60	0.00
J95	0.03	337.78	48.84	0.00
J96	0.03	337.77	48.62	0.00
J97	0.35	337.75	48.11	0.00
J98	0.31	337.74	47.80	0.00
J99	0.14	337.74	47.85	0.00
J100	0.35	337.69	47.71	0.00
J101	0.33	337.67	46.75	0.00
J102	0.20	337.69	47.38	0.00
J103	0.29	337.78	48.33	0.00
J104	0.19	337.78	47.75	0.00
J105	0.07	337.78	48.76	0.00
J106	0.12	337.77	48.19	0.00
J107	0.23	337.92	48.14	0.00
J108	0.23	337.86	47.66	0.00
J109	0.16	337.80	47.31	0.00
J110	0.21	338.25	48.60	0.00
J111	0.14	338.71	48.68	0.00
J112	0.10	339.02	49.23	0.00
J113	0.34	339.46	49.97	0.00
J114	0.00	339.39	49.95	0.00
J115	0.70	339.11	49.09	0.00
J116	0.19	339.40	49.76	0.00
J117	0.50	339.41	49.70	0.00
J118	0.34	339.42	49.85	0.00
J120	0.07	339.37	49.62	0.00
J121	0.19	339.35	49.11	0.00
J122	0.06	339.34	49.20	0.00
J124	0.00	339.14	47.79	0.00
J125	0.18	339.13	48.05	0.00
J126	0.27	339.12	48.60	0.00
J127	0.86	338.88	48.39	0.00
J128	0.10	338.97	47.15	0.00
J129	3.73	338.85	46.84	0.00
J130	0.54	338.79	47.61	0.00
J131	0.96	338.73	48.05	0.00
J132	0.25	338.72	48.14	0.00
J133	0.34	338.71	47.87	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential Only MDD and FF S2 Model Results

J134	0.40	338.62	48.13	0.00
J135	0.48	338.66	48.44	0.00
J136	0.12	338.45	47.95	0.00
J137	0.18	338.26	49.16	0.00
J138	1.39	338.00	48.21	0.00
J139	0.18	337.59	47.12	0.00
FS	0.00	337.65	47.05	0.00
FD	0.00	337.62	47.02	0.00
J140	0.00	337.53	48.88	0.00
J141	0.22	337.47	49.47	0.00
J142	3.90	337.24	50.74	0.00
J143	0.51	337.09	50.81	0.00
J144	0.01	336.92	52.17	0.00
J145	0.00	336.88	52.31	0.00
J146	0.00	336.84	52.81	0.00
J147	0.03	336.82	52.92	0.00
J148	0.04	336.80	53.60	0.00
J149	0.09	336.78	53.89	0.00
J150	0.24	336.74	54.69	0.00
J151	0.01	336.81	52.41	0.00
J152	0.01	336.79	53.84	0.00
J153	0.00	336.78	54.63	0.00
J154	0.00	336.77	54.92	0.00
J155	0.01	336.76	56.16	0.00
J156	1.21	336.75	54.90	0.00
J157	0.00	336.72	55.22	0.00
J158	0.01	336.69	56.39	0.00
J159A	0.00	335.73	56.23	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

EPANet Future Residential Only MDD and FF S2 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	340.10	47.08	0.00	
JFF2	0.00	339.42	49.85	0.00	
JFF3	26.81	339.36	46.04	0.00	
JFF4	38.00	333.59	44.19	0.00	
JFF5	38.00	328.78	40.38	0.00	
JFF6	0.00	336.76	56.16	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	340.51	46.75	0.00	
JFF9	38.00	336.52	45.29	0.00	
J119	0.40	339.33	49.60	0.00	
J123	0.08	339.14	49.26	0.00	
J183	0.21	340.05	47.08	0.00	
J184	0.00	340.21	45.91	0.00	
J185	0.05	340.18	47.24	0.00	
J186	0.23	340.13	46.95	0.00	
J187	0.13	340.18	46.58	0.00	
J188	0.09	340.16	46.77	0.00	
RES1	-136.66	287.05	0.00	0.00	Reservoir
RES2	-81.87	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	54.79	1.74	13.25	Open
PS2	81.87	1.67	9.40	Open
PS3	0.00	0.00	0.00	Open
PS4	81.87	1.67	9.40	Open
PD1	54.79	1.74	13.25	Open
PD2	81.87	1.67	9.40	Open
PD3	0.00	0.00	0.00	Open
PD4	81.87	1.67	9.40	Open
PD5	218.53	1.74	5.87	Open
PIPE1A	45.10	0.36	0.28	Open

PIPE1	22.47	1.27	10.32	Open
PIPE2	20.73	1.17	8.89	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	173.24	1.38	3.36	Open
PIPE5	90.90	1.85	11.41	Open
PIPE6	77.52	1.58	8.50	Open
PIPE7	34.83	1.11	5.72	Open
PIPE8	34.46	1.10	5.61	Open
PIPE9	9.39	0.53	2.05	Open
PIPE10	8.67	0.49	1.77	Open
PIPE11	7.96	0.45	1.51	Open
PIPE12	7.94	0.45	1.50	Open
PIPE13	7.86	0.44	1.48	Open
PIPE14	7.50	0.42	1.35	Open
PIPE15	7.16	0.41	1.24	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	24.33	0.77	2.95	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	22.88	0.73	2.63	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	21.48	0.68	2.34	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	20.35	0.65	2.12	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	22.01	0.70	2.45	Open
PIPE27	11.86	0.67	3.16	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	10.85	0.61	2.68	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	6.16	0.35	0.94	Open
PIPE32	22.63	1.28	10.46	Open
PIPE33	22.29	1.26	10.17	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	20.47	1.16	8.69	Open
PIPE39	5.57	0.31	0.78	Open
PIPE40	5.15	0.29	0.67	Open
PIPE41	4.77	0.61	4.22	Open
PIPE42	4.68	0.26	0.57	Open

PIPE43	4.61	0.26	0.55	Open
PIPE44	14.82	0.84	4.77	Open
PIPE45	-3.71	0.21	0.37	Open
PIPE46	9.80	0.55	2.22	Open
PIPE47	13.06	0.74	3.78	Open
PIPE48	10.11	0.57	2.35	Open
PIPE49	9.95	0.56	2.28	Open
PIPE50	9.38	0.53	2.05	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.21	0.13	0.14	Open
PIPE52	7.41	0.42	1.32	Open
PIPE53	19.36	1.10	7.84	Open
PIPE54	47.39	1.51	10.13	Open
PIPE55	46.41	1.48	9.74	Open
PIPE56	62.44	1.99	16.88	Open
PIPE57	35.34	1.13	5.88	Open
PIPE58	13.18	0.75	3.85	Open
PIPE59	12.72	0.72	3.60	Open
PIPE60	1.06	0.02	0.00	Open
PIPE61	77.46	1.10	3.49	Open
PIPE62	-21.28	0.43	0.78	Open
PIPE63	5.33	0.11	0.06	Open
PIPE64	18.56	1.05	7.24	Open
PIPE65	71.72	1.46	7.36	Open
PIPE66	7.07	0.40	1.21	Open
PIPE67	38.57	2.18	37.35	Open
PIPE68	11.29	0.64	2.89	Open
PIPE69	22.38	1.27	10.25	Open
PIPE70	40.22	0.82	2.52	Open
PIPE71	-11.45	0.65	2.96	Open
PIPE72	28.77	1.63	16.32	Open
PIPE73	19.81	1.12	8.18	Open
PIPE74	8.95	0.51	1.88	Open
PIPE75	8.24	0.47	1.61	Open
PIPE76	7.97	0.45	1.52	Open
PIPE77	7.69	0.44	1.42	Open
PIPE78	27.32	1.55	14.83	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	-3.01	0.17	0.25	Open
PIPE82	23.43	0.75	2.75	Open
PIPE83	23.33	1.32	11.06	Open
PIPE84	8.78	0.50	1.81	Open

PIPE85	4.44	0.25	0.51	Open
PIPE86	4.20	0.24	0.46	Open
PIPE87	-3.88	0.22	0.40	Open
PIPE88	-1.90	0.11	0.11	Open
PIPE89	2.10	0.12	0.13	Open
PIPE90	0.69	0.04	0.02	Open
PIPE91	0.63	0.04	0.01	Open
PIPE92	0.13	0.01	0.00	Open
PIPE93	1.38	0.08	0.06	Open
PIPE94	1.26	0.07	0.05	Open
PIPE95	0.45	0.03	0.01	Open
PIPE96	33.86	1.08	5.43	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	23.94	0.76	2.86	Open
PIPE99	9.77	0.55	2.21	Open
PIPE100	-14.72	0.47	1.16	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	-5.91	0.19	0.21	Open
PIPE109	-9.93	0.32	0.56	Open
PIPE110	3.99	0.23	0.42	Open
PIPE111	2.13	0.12	0.13	Open
PIPE112	-0.16	0.01	0.00	Open
PIPE113	1.83	0.10	0.10	Open
PIPE114	1.31	0.07	0.05	Open
PIPE115	-1.46	0.08	0.06	Open
PIPE116	2.46	0.14	0.17	Open
PIPE117	2.33	0.13	0.15	Open
PIPE118	2.51	0.14	0.18	Open
PIPE119	2.16	0.12	0.13	Open
PIPE120	3.94	0.22	0.36	Open
PIPE121	3.73	0.21	0.33	Open
PIPE122	-5.54	0.31	0.68	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-6.21	0.35	0.95	Open

PIPE127	5.91	0.33	0.87	Open
PIPE128	5.68	0.32	0.81	Open
PIPE129	10.98	0.62	2.74	Open
PIPE130	-12.36	0.70	3.41	Open
PIPE131	-12.56	0.71	3.52	Open
PIPE132	-10.21	0.58	2.40	Open
PIPE133	-10.31	0.58	2.44	Open
PIPE134	-10.66	0.60	2.59	Open
PIPE135	8.64	0.49	1.76	Open
PIPE136	9.14	0.52	1.95	Open
PIPE137	-3.01	0.10	0.05	Open
PIPE138	-3.20	0.10	0.06	Open
PIPE139	-3.69	0.12	0.08	Open
PIPE141	2.50	0.14	0.18	Open
PIPE142	2.43	0.14	0.17	Open
PIPE143	2.24	0.13	0.14	Open
PIPE147	1.47	0.08	0.07	Open
PIPE148	1.30	0.07	0.05	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	1.03	0.06	0.03	Open
PIPE150	9.47	0.54	2.08	Open
PIPE152	7.73	0.44	1.43	Open
PIPE153	4.00	0.23	0.42	Open
PIPE154	3.46	0.20	0.32	Open
PIPE155	-0.40	0.20	1.24	Open
PIPE156	8.21	0.46	1.60	Open
PIPE157	-2.50	0.14	0.18	Open
PIPE158	1.87	0.11	0.10	Open
PIPE159	2.90	0.16	0.23	Open
PIPE160	4.43	0.25	0.51	Open
PIPE161	3.59	0.20	0.35	Open
PIPE162	3.11	0.18	0.26	Open
PIPE163	7.15	0.40	1.24	Open
PIPE164	7.03	0.40	1.20	Open
PIPE165	6.85	0.39	1.14	Open
PIPE166	5.46	0.31	0.75	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.25	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	26.81	0.03	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	38.00	0.05	0.00	Open
PIPE140	7.61	0.43	1.22	Open
PIPE144	2.18	0.12	0.12	Open
PIPE145	9.39	0.53	1.80	Open
PIPE146	1.47	0.08	0.06	Open
PIPE151	7.84	0.44	1.29	Open
PIPE215	-11.64	0.66	2.69	Open
PIPE216	-5.81	0.33	0.74	Open
PIPE217	6.54	0.37	0.92	Open
PIPE218	4.14	0.23	0.40	Open
PIPE219	2.56	0.15	0.16	Open
PIPE220	2.40	0.14	0.14	Open
PIPE221	2.27	0.13	0.13	Open
PIPE222	1.53	0.09	0.06	Open
PIPE223	3.71	0.21	0.32	Open
PIPE224	6.04	0.34	0.80	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	54.79	0.00	-56.46	Open Pump
PUMP2	81.87	0.00	-56.42	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	81.87	0.00	-56.42	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	37.63	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential Only MDD and FF S3 Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	32.09	32.09	0.00
PUMP2	100.00	75.00	0.21	53.70	53.70	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	53.70	53.70	0.00
PUMP5	100.00	75.00	0.07	14.07	14.07	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	287.01	-7.29	0.00
S2	0.00	287.02	-7.28	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.02	-7.28	0.00
D1	0.00	346.13	51.83	0.00
D2	0.00	346.12	51.82	0.00
D3	0.00	346.09	51.79	0.00
D4	0.00	346.12	51.82	0.00
DH	0.00	346.09	51.79	0.00
J1A	0.19	346.05	52.85	0.00
J1	0.00	346.04	52.80	0.00
J2	0.20	345.13	51.92	0.00
J3	0.10	344.41	51.23	0.00
J4	0.15	344.41	51.29	0.00

J5	0.12	345.90	53.33	0.00
J6	0.20	345.20	54.11	0.00
J7	0.06	345.15	54.19	0.00
J8	0.37	345.38	52.03	0.00
J9	0.74	344.62	50.96	0.00
J10	0.71	344.27	51.54	0.00
J11	0.72	343.94	49.34	0.00
J12	0.01	343.64	48.22	0.00
J13	0.08	343.50	48.12	0.00
J14	0.36	343.24	46.52	0.00
J15	0.34	342.97	45.80	0.00
J16	0.35	342.12	47.92	0.00
J17	0.32	342.11	50.96	0.00
J18	0.68	342.11	49.09	0.00
J19	0.38	344.29	49.63	0.00
J20	1.06	344.29	48.94	0.00
J21	0.28	344.02	50.29	0.00
J22	1.12	344.02	48.59	0.00
J23	0.19	343.79	50.60	0.00
J24	0.93	343.78	48.20	0.00
J25	0.10	343.56	50.17	0.00
J26	1.95	343.55	50.21	0.00
J27	0.04	343.27	48.77	0.00
J28	0.16	343.12	48.91	0.00
J29	0.85	343.12	47.59	0.00
J30	0.28	342.75	47.70	0.00
J31	4.41	342.70	48.94	0.00
J32	0.96	342.48	47.17	0.00
J33	0.34	345.23	51.68	0.00
J34	0.34	344.83	49.87	0.00
J35	0.05	344.83	49.00	0.00
J36	0.62	344.82	48.30	0.00
J37	0.34	345.12	50.93	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	345.11	48.52	0.00
J39	0.09	344.07	50.85	0.00
J40	0.42	343.95	49.44	0.00
J41	0.38	343.87	47.97	0.00
J42	0.09	343.46	47.32	0.00
J43	0.07	343.39	47.40	0.00
J44	1.35	343.33	47.44	0.00
J45	1.30	343.64	48.99	0.00
J46	0.86	342.49	46.77	0.00

J47	0.16	343.06	47.68	0.00
J48	0.57	342.75	47.04	0.00
J49	0.87	342.44	47.24	0.00
J50	0.07	341.36	51.89	0.00
J51	0.98	345.49	52.92	0.00
J52	4.19	344.78	50.95	0.00
J53	0.29	343.66	50.34	0.00
J54	0.44	342.75	49.70	0.00
J55	0.46	344.99	51.90	0.00
J56	0.55	344.79	52.18	0.00
J57	0.41	344.79	52.77	0.00
J58	0.19	344.47	51.01	0.00
J59	0.00	344.47	51.01	0.00
J60	0.57	344.47	53.24	0.00
J61	0.36	344.14	51.69	0.00
J62	0.00	344.17	51.72	0.00
J63	0.01	343.78	51.85	0.00
J64	0.18	342.60	52.83	0.00
J65	0.71	343.46	52.26	0.00
J66	0.27	343.04	53.28	0.00
J67	0.28	342.79	52.42	0.00
J68	0.33	340.85	52.56	0.00
J69	0.37	337.49	49.11	0.00
J70	0.42	334.21	45.81	0.00
J71	0.87	340.57	51.70	0.00
J72	0.10	342.05	53.13	0.00
J73	0.18	341.04	52.31	0.00
J74	0.24	340.69	51.49	0.00
J75	0.12	340.46	51.28	0.00
J76	0.40	340.46	50.85	0.00
J77	0.03	339.82	50.64	0.00
J78	0.06	339.72	50.11	0.00
J79	0.50	339.33	49.69	0.00
J80	0.25	339.24	49.40	0.00
J81	0.12	339.50	50.50	0.00
J82	0.81	339.16	49.68	0.00
J83	0.27	339.08	49.51	0.00
J84	0.00	341.41	52.30	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	341.41	52.43	0.00
J86	0.02	341.03	51.81	0.00
J87	0.02	341.03	51.81	0.00
J88	0.22	341.03	51.75	0.00

J89	0.37	341.03	51.47	0.00
J90	0.23	339.93	50.58	0.00
J91	0.39	339.72	50.51	0.00
J92	0.02	337.92	48.52	0.00
J93	0.12	341.03	51.68	0.00
J94	0.22	341.02	51.86	0.00
J95	0.03	341.00	52.06	0.00
J96	0.03	340.70	51.55	0.00
J97	0.35	340.30	50.66	0.00
J98	0.31	339.25	49.31	0.00
J99	0.14	338.89	49.00	0.00
J100	0.35	338.38	48.40	0.00
J101	0.33	337.82	46.90	0.00
J102	0.20	338.17	47.86	0.00
J103	0.29	338.89	49.44	0.00
J104	0.19	338.89	48.86	0.00
J105	0.07	338.89	49.87	0.00
J106	0.12	338.88	49.30	0.00
J107	0.23	338.90	49.12	0.00
J108	0.23	338.58	48.38	0.00
J109	0.16	338.29	47.80	0.00
J110	0.21	339.40	49.75	0.00
J111	0.14	340.09	50.06	0.00
J112	0.10	340.55	50.76	0.00
J113	0.34	341.18	51.69	0.00
J114	0.00	341.11	51.67	0.00
J115	0.70	340.72	50.70	0.00
J116	0.19	341.12	51.48	0.00
J117	0.50	341.13	51.42	0.00
J118	0.34	341.15	51.58	0.00
J120	0.07	341.08	51.33	0.00
J121	0.19	341.05	50.81	0.00
J122	0.06	341.04	50.90	0.00
J124	0.00	340.75	49.40	0.00
J125	0.18	340.74	49.66	0.00
J126	0.27	340.73	50.21	0.00
J127	0.86	340.37	49.88	0.00
J128	0.10	340.53	48.71	0.00
J129	3.73	340.37	48.36	0.00
J130	0.54	340.26	49.08	0.00
J131	0.96	340.15	49.47	0.00
J132	0.25	340.11	49.53	0.00
J133	0.34	340.10	49.26	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential Only MDD and FF S3 Model Results

J134	0.40	339.94	49.45	0.00
J135	0.48	340.00	49.78	0.00
J136	0.12	339.60	49.10	0.00
J137	0.18	339.24	50.14	0.00
J138	1.39	338.73	48.94	0.00
J139	0.18	356.82	66.35	0.00
FS	0.00	337.24	46.64	0.00
FD	0.00	356.97	66.37	0.00
J140	0.00	356.28	67.63	0.00
J141	0.22	355.73	67.73	0.00
J142	3.90	353.53	67.03	0.00
J143	0.51	351.48	65.20	0.00
J144	0.01	349.04	64.29	0.00
J145	0.00	348.47	63.90	0.00
J146	0.00	347.79	63.76	0.00
J147	0.03	347.55	63.65	0.00
J148	0.04	347.38	64.18	0.00
J149	0.09	347.14	64.25	0.00
J150	0.24	346.79	64.74	0.00
J151	0.01	346.95	62.55	0.00
J152	0.01	346.19	63.24	0.00
J153	0.00	345.53	63.38	0.00
J154	0.00	345.10	63.25	0.00
J155	0.01	344.65	64.05	0.00
J156	1.21	345.79	63.94	0.00
J157	0.00	346.76	65.26	0.00
J158	0.01	346.73	66.43	0.00
J159A	0.00	345.77	66.27	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	231.58	26.48	0.00
J162	0.03	230.82	25.42	0.00
J163	0.16	229.71	24.61	0.00
J164	0.06	229.37	23.47	0.00
J165	0.06	229.21	22.61	0.00
J166	0.07	229.32	22.82	0.00
J167	0.04	229.26	23.26	0.00
J168	0.09	228.43	23.53	0.00
J169	0.10	227.80	21.10	0.00
J170	0.00	229.69	32.69	0.00
J171	0.16	229.69	29.69	0.00
J172	0.00	229.68	36.68	0.00
J173	0.00	229.67	39.67	0.00
J174	0.04	229.67	38.97	0.00
J175	0.10	229.66	38.56	0.00

EPANet Future Residential Only MDD and FF S3 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	229.66	40.66	0.00	
J177	0.07	229.67	36.97	0.00	
J178	0.07	229.67	37.77	0.00	
J179	0.01	229.67	37.57	0.00	
J180	0.04	229.68	39.78	0.00	
J181	0.01	229.67	39.57	0.00	
J182	0.18	229.67	35.17	0.00	
JFS	0.00	231.62	26.52	0.00	
JFF1	0.00	342.11	49.09	0.00	
JFF2	0.00	341.15	51.58	0.00	
JFF3	0.00	343.66	50.34	0.00	
JFF4	32.41	337.92	48.52	0.00	
JFF5	32.41	334.21	45.81	0.00	
JFF6	38.00	344.65	64.05	0.00	
JFF7	38.00	227.80	21.10	0.00	
JFF8	0.00	342.70	48.94	0.00	
JFF9	0.00	344.47	53.24	0.00	
J119	0.40	341.03	51.30	0.00	
J123	0.08	340.76	50.88	0.00	
J183	0.21	342.03	49.06	0.00	
J184	0.00	342.25	47.95	0.00	
J185	0.05	342.21	49.27	0.00	
J186	0.23	342.15	48.97	0.00	
J187	0.13	342.21	48.61	0.00	
J188	0.09	342.19	48.80	0.00	
RES1	-111.03	287.05	0.00	0.00	Reservoir
RES2	-69.51	287.05	0.00	0.00	Reservoir
TANK1	-33.16	231.61	26.51	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	41.53	1.32	7.93	Open
PS2	69.51	1.42	6.94	Open
PS3	0.00	0.00	0.00	Open
PS4	69.51	1.42	6.94	Open
PD1	41.53	1.32	7.93	Open
PD2	69.51	1.42	6.94	Open
PD3	0.00	0.00	0.00	Open
PD4	69.51	1.42	6.94	Open
PD5	180.54	1.44	4.12	Open
PIPE1A	41.13	0.33	0.23	Open

PIPE1	24.51	1.39	12.13	Open
PIPE2	22.77	1.29	10.58	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	139.22	1.11	2.24	Open
PIPE5	65.69	1.34	6.25	Open
PIPE6	55.91	1.14	4.64	Open
PIPE7	38.89	1.24	7.02	Open
PIPE8	38.52	1.23	6.90	Open
PIPE9	10.54	0.60	2.54	Open
PIPE10	9.82	0.56	2.23	Open
PIPE11	9.11	0.52	1.94	Open
PIPE12	9.09	0.51	1.93	Open
PIPE13	9.01	0.51	1.90	Open
PIPE14	8.65	0.49	1.76	Open
PIPE15	8.31	0.47	1.64	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	27.24	0.87	3.63	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	25.79	0.82	3.28	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	24.39	0.78	2.96	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	23.26	0.74	2.71	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	25.03	0.80	3.10	Open
PIPE27	13.26	0.75	3.89	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	12.25	0.69	3.36	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	7.56	0.43	1.37	Open
PIPE32	16.61	0.94	5.90	Open
PIPE33	16.27	0.92	5.68	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	22.52	1.27	10.37	Open
PIPE39	6.14	0.35	0.93	Open
PIPE40	5.72	0.32	0.82	Open
PIPE41	5.34	0.68	5.20	Open
PIPE42	5.25	0.30	0.70	Open

PIPE43	5.18	0.29	0.68	Open
PIPE44	16.29	0.92	5.69	Open
PIPE45	-3.81	0.22	0.39	Open
PIPE46	11.18	0.63	2.83	Open
PIPE47	15.00	0.85	4.89	Open
PIPE48	11.72	0.66	3.09	Open
PIPE49	11.56	0.65	3.01	Open
PIPE50	10.99	0.62	2.74	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	1.98	0.11	0.11	Open
PIPE52	8.58	0.49	1.74	Open
PIPE53	23.16	1.31	10.91	Open
PIPE54	34.52	1.10	5.63	Open
PIPE55	33.54	1.07	5.34	Open
PIPE56	49.89	1.59	11.14	Open
PIPE57	49.60	1.58	11.02	Open
PIPE58	9.58	0.54	2.13	Open
PIPE59	9.12	0.52	1.94	Open
PIPE60	-5.28	0.11	0.06	Open
PIPE61	55.85	0.79	1.90	Open
PIPE62	-15.26	0.31	0.42	Open
PIPE63	8.85	0.18	0.15	Open
PIPE64	12.13	0.69	3.30	Open
PIPE65	46.59	0.95	3.31	Open
PIPE66	-0.50	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	12.44	0.70	3.45	Open
PIPE69	24.04	1.36	11.70	Open
PIPE70	45.53	0.93	3.17	Open
PIPE71	-11.96	0.68	3.21	Open
PIPE72	33.57	1.90	21.71	Open
PIPE73	23.19	1.31	10.95	Open
PIPE74	10.36	0.59	2.46	Open
PIPE75	9.65	0.55	2.16	Open
PIPE76	9.39	0.53	2.05	Open
PIPE77	9.10	0.52	1.94	Open
PIPE78	32.12	1.82	20.01	Open
PIPE79	33.19	1.88	21.26	Open
PIPE80	32.83	1.86	20.83	Open
PIPE81	7.65	0.43	1.40	Open
PIPE82	30.55	0.97	4.49	Open
PIPE83	30.45	1.72	18.12	Open
PIPE84	9.06	0.51	1.92	Open

PIPE85	11.62	0.66	3.04	Open
PIPE86	11.38	0.64	2.93	Open
PIPE87	6.79	0.38	1.12	Open
PIPE88	0.36	0.02	0.00	Open
PIPE89	17.69	1.00	6.63	Open
PIPE90	8.52	0.48	1.71	Open
PIPE91	8.46	0.48	1.69	Open
PIPE92	7.95	0.45	1.51	Open
PIPE93	9.14	0.52	1.95	Open
PIPE94	9.02	0.51	1.90	Open
PIPE95	8.21	0.46	1.60	Open
PIPE96	42.65	1.36	8.33	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	29.87	0.95	4.31	Open
PIPE99	12.63	0.71	3.55	Open
PIPE100	-3.20	0.10	0.07	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	33.05	1.05	5.20	Open
PIPE104	32.82	1.04	5.13	Open
PIPE105	32.43	1.83	20.36	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	8.48	0.27	0.42	Open
PIPE109	-9.59	0.31	0.53	Open
PIPE110	18.04	1.02	6.88	Open
PIPE111	8.49	0.48	1.70	Open
PIPE112	8.44	0.48	1.68	Open
PIPE113	9.53	0.54	2.11	Open
PIPE114	17.61	1.00	6.58	Open
PIPE115	16.48	0.93	5.12	Open
PIPE116	0.82	0.05	0.02	Open
PIPE117	8.52	0.48	1.71	Open
PIPE118	16.46	0.93	5.80	Open
PIPE119	16.11	0.91	5.57	Open
PIPE120	16.89	0.96	5.36	Open
PIPE121	16.69	0.94	5.24	Open
PIPE122	-0.56	0.03	0.01	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-1.23	0.07	0.05	Open

PIPE127	14.02	0.79	4.31	Open
PIPE128	13.78	0.78	4.17	Open
PIPE129	22.07	1.25	9.99	Open
PIPE130	-15.48	0.88	5.18	Open
PIPE131	-15.69	0.89	5.31	Open
PIPE132	-12.54	0.71	3.50	Open
PIPE133	-12.64	0.72	3.56	Open
PIPE134	-12.98	0.73	3.74	Open
PIPE135	10.10	0.57	2.35	Open
PIPE136	11.04	0.62	2.77	Open
PIPE137	-3.84	0.12	0.08	Open
PIPE138	-4.03	0.13	0.09	Open
PIPE139	-4.52	0.14	0.11	Open
PIPE141	2.90	0.16	0.23	Open
PIPE142	2.83	0.16	0.22	Open
PIPE143	2.64	0.15	0.20	Open
PIPE147	1.93	0.11	0.11	Open
PIPE148	1.75	0.10	0.09	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	1.48	0.08	0.07	Open
PIPE150	11.82	0.67	3.14	Open
PIPE152	9.16	0.52	1.96	Open
PIPE153	5.43	0.31	0.74	Open
PIPE154	4.90	0.28	0.61	Open
PIPE155	-0.49	0.25	1.79	Open
PIPE156	10.47	0.59	2.51	Open
PIPE157	-3.29	0.19	0.29	Open
PIPE158	2.09	0.12	0.13	Open
PIPE159	4.42	0.25	0.51	Open
PIPE160	6.18	0.35	0.94	Open
PIPE161	4.83	0.27	0.60	Open
PIPE162	4.35	0.25	0.49	Open
PIPE163	10.13	0.57	2.36	Open
PIPE164	10.01	0.57	2.31	Open
PIPE165	9.83	0.56	2.23	Open
PIPE166	8.45	0.48	1.69	Open
PIPE167	0.00	0.00	0.00	Closed
PFS	54.54	1.11	3.90	Open
PFD	54.54	1.11	3.90	Open
PIPE168	54.36	1.11	3.88	Open
PIPE169	54.36	1.11	3.88	Open
PIPE170	54.14	1.10	3.85	Open
PIPE171	50.24	1.02	3.35	Open

PIPE172	49.73	1.01	3.29	Open
PIPE173	49.71	1.01	3.28	Open
PIPE174	49.71	1.01	3.28	Open
PIPE175	49.71	1.01	3.28	Open
PIPE176	33.76	0.69	1.60	Open
PIPE177	33.71	0.69	1.60	Open
PIPE178	33.63	0.69	1.59	Open
PIPE179	15.93	0.90	4.80	Open
PIPE180	15.92	0.90	4.80	Open
PIPE181	15.91	0.90	4.79	Open
PIPE182	15.91	0.90	4.79	Open
PIPE183	15.91	0.90	4.79	Open
PIPE184	-22.10	1.25	8.81	Open
PIPE185	-23.31	1.32	9.73	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	43.16	1.37	8.52	Open
PIPE190	43.02	1.37	7.45	Open
PIPE191	42.99	1.37	7.44	Open
PIPE192	14.22	0.80	3.89	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE193	10.23	0.58	2.12	Open
PIPE194	3.93	0.22	0.36	Open
PIPE195	3.86	0.22	0.35	Open
PIPE196	3.82	0.22	0.34	Open
PIPE197	13.99	0.79	3.78	Open
PIPE198	13.90	0.79	3.73	Open
PIPE199	-24.21	1.37	10.43	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	32.41	0.04	0.00	Open
PIPEFF5	32.41	0.04	0.00	Open
PIPEFF6	38.00	0.05	0.04	Open
PIPEFF7	38.00	0.05	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	9.10	0.51	1.70	Open
PIPE144	2.58	0.15	0.16	Open
PIPE145	11.27	0.64	2.53	Open
PIPE146	1.93	0.11	0.10	Open
PIPE151	9.27	0.52	1.76	Open
PIPE215	-13.96	0.79	3.76	Open
PIPE216	-6.96	0.39	1.04	Open
PIPE217	7.71	0.44	1.25	Open
PIPE218	4.89	0.28	0.54	Open
PIPE219	3.04	0.17	0.22	Open
PIPE220	2.82	0.16	0.19	Open
PIPE221	2.69	0.15	0.18	Open
PIPE222	1.80	0.10	0.08	Open
PIPE223	4.40	0.25	0.44	Open
PIPE224	7.21	0.41	1.11	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	41.53	0.00	-59.12	Open Pump
PUMP2	69.51	0.00	-59.11	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	69.51	0.00	-59.11	Open Pump
PUMP5	54.54	0.00	-19.73	Open Pump
VALVE1	10.06	0.57	47.67	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	26.05	Active Valve

EPANet Future Residential Only Chlorine Decay Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential Chlorine_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPE140	J118	J119	71.63	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PIPE217	J49	J184	152.50	150	
PIPE218	J184	J185	73.5	150	
PIPE219	J185	J186	281.2	150	
PIPE220	J184	J187	203.4	150	
PIPE221	J187	J188	98.2	150	
PIPE222	J185	J188	206.4	150	
PIPE223	J188	J186	102.1	150	
PIPE224	J186	J183	103.8	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump

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PUMP5	FS	FD		#N/A	#N/A Pump
VALVE1	J159A	J159		#N/A	150 Valve
VALVE2	J160A	J160B		#N/A	150 Valve
VALVE3	J160	JFS		#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	25.57	30.14	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results at 120:00 Hrs:

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
S1	0.00	291.47	-2.83	0.86
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	345.69	51.39	0.86
D2	0.00	345.67	51.37	0.00
D3	0.00	345.67	51.37	0.00
D4	0.00	345.67	51.37	0.00
DH	0.00	345.67	51.37	0.86
J1A	0.10	345.67	52.47	0.86
J1	0.00	345.67	52.43	0.86
J2	0.10	345.58	52.37	0.86
J3	0.05	345.53	52.35	0.86
J4	0.07	345.53	52.41	0.74
J5	0.06	345.66	53.09	0.86
J6	0.10	345.64	54.55	0.86
J7	0.03	345.64	54.68	0.85
J8	0.19	345.61	52.26	0.86
J9	0.37	345.55	51.89	0.86
J10	0.36	345.52	52.79	0.85
J11	0.36	345.50	50.90	0.85
J12	0.01	345.48	50.06	0.84
J13	0.04	345.47	50.09	0.84
J14	0.18	345.46	48.74	0.83
J15	0.17	345.44	48.27	0.82
J16	0.18	345.40	51.20	0.80

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J17	0.16	345.40	54.25	0.78
J18	0.34	345.40	52.38	0.73
J19	0.19	345.52	50.86	0.85
J20	0.53	345.52	50.17	0.83
J21	0.14	345.50	51.77	0.85
J22	0.56	345.49	50.06	0.83
J23	0.10	345.48	52.29	0.85
J24	0.47	345.48	49.90	0.82
J25	0.05	345.46	52.07	0.85
J26	0.98	345.46	52.12	0.83
J27	0.02	345.45	50.95	0.84
J28	0.08	345.44	51.23	0.84
J29	0.42	345.43	49.90	0.81
J30	0.14	345.41	50.36	0.84
J31	2.21	345.40	51.64	0.83
J32	0.48	345.41	50.10	0.82
J33	0.17	345.64	52.09	0.85
J34	0.17	345.63	50.67	0.85
J35	0.03	345.63	49.80	0.84
J36	0.31	345.63	49.11	0.80
J37	0.17	345.58	51.39	0.83

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J38	0.60	345.58	48.99	0.82
J39	0.05	345.50	52.28	0.85
J40	0.21	345.49	50.98	0.85
J41	0.19	345.49	49.59	0.84
J42	0.04	345.46	49.32	0.84
J43	0.04	345.46	49.47	0.83
J44	0.68	345.45	49.56	0.84
J45	0.65	345.47	50.82	0.85
J46	0.43	345.42	49.70	0.83
J47	0.08	345.44	50.06	0.84
J48	0.28	345.43	49.72	0.84
J49	0.44	345.41	50.21	0.82
J50	0.04	345.40	55.93	0.83
J51	0.49	345.65	53.08	0.86
J52	2.10	345.63	51.80	0.84
J53	0.14	345.61	52.29	0.84
J54	0.22	345.60	52.55	0.83
J55	0.23	345.64	52.55	0.85
J56	0.28	345.63	53.02	0.84
J57	0.20	345.63	53.61	0.85
J58	0.10	345.63	52.17	0.84

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J59	0.00	345.63	52.17	0.84
J60	0.28	345.63	54.40	0.82
J61	0.18	345.62	53.17	0.84
J62	0.00	345.62	53.17	0.84
J63	0.01	345.61	53.68	0.84
J64	0.09	345.59	55.82	0.83
J65	0.35	345.61	54.41	0.83
J66	0.13	345.60	55.84	0.81
J67	0.14	345.60	55.23	0.81
J68	0.16	345.57	57.28	0.83
J69	0.18	345.57	57.19	0.80
J70	0.21	345.57	57.17	0.74
J71	0.43	345.54	56.67	0.81
J72	0.05	345.59	56.67	0.83
J73	0.09	345.57	56.84	0.82
J74	0.12	345.55	56.35	0.82
J75	0.06	345.53	56.35	0.81
J76	0.20	345.53	55.92	0.81
J77	0.01	345.49	56.31	0.81
J78	0.03	345.48	55.87	0.81
J79	0.25	345.46	55.82	0.80
J80	0.13	345.45	55.61	0.80
J81	0.06	345.47	56.47	0.81
J82	0.40	345.45	55.97	0.80
J83	0.13	345.45	55.88	0.80
J84	0.00	345.58	56.47	0.83

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J85	0.07	345.58	56.60	0.72
J86	0.01	345.58	56.36	0.82
J87	0.01	345.57	56.35	0.82
J88	0.11	345.57	56.29	0.81
J89	0.18	345.57	56.01	0.75
J90	0.12	345.57	56.22	0.73
J91	0.20	345.57	56.36	0.71
J92	0.01	345.57	56.17	0.24
J93	0.06	345.57	56.22	0.75
J94	0.11	345.57	56.41	0.67
J95	0.01	345.57	56.63	0.82
J96	0.01	345.55	56.40	0.82
J97	0.18	345.52	55.88	0.81
J98	0.16	345.45	55.51	0.80
J99	0.07	345.42	55.53	0.80
J100	0.18	345.42	55.44	0.79

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J101	0.16	345.40	54.48	0.79
J102	0.10	345.41	55.10	0.80
J103	0.14	345.42	55.97	0.80
J104	0.10	345.42	55.39	0.77
J105	0.04	345.42	56.40	0.59
J106	0.06	345.41	55.83	0.75
J107	0.12	345.40	55.62	0.80
J108	0.12	345.40	55.20	0.79
J109	0.08	345.40	54.91	0.78
J110	0.10	345.40	55.75	0.79
J111	0.07	345.39	55.36	0.79
J112	0.05	345.39	55.60	0.80
J113	0.17	345.40	55.91	0.83
J114	0.00	345.39	55.95	0.83
J115	0.35	345.38	55.36	0.82
J116	0.09	345.39	55.75	0.56
J117	0.25	345.39	55.68	0.70
J118	0.17	345.39	55.82	0.76
J120	0.04	345.39	55.64	0.81
J121	0.10	345.39	55.15	0.79
J122	0.03	345.39	55.25	0.70
J124	0.00	345.38	54.03	0.62
J125	0.09	345.38	54.30	0.73
J126	0.13	345.38	54.86	0.80
J127	0.43	345.38	54.89	0.78
J128	0.05	345.37	53.55	0.72
J129	1.87	345.37	53.36	0.73
J130	0.27	345.37	54.19	0.75
J131	0.48	345.38	54.70	0.75
J132	0.13	345.38	54.80	0.78
J133	0.17	345.38	54.54	0.75

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J134	0.20	345.38	54.89	0.67
J135	0.24	345.38	55.16	0.77
J136	0.06	345.38	54.88	0.45
J137	0.09	345.38	56.28	0.76
J138	0.69	345.39	55.60	0.78
J139	0.09	345.40	54.93	0.79
FS	0.00	345.40	54.80	0.00
FD	0.00	345.40	54.80	0.00
J140	0.00	345.40	56.75	0.78
J141	0.11	345.39	57.39	0.78
J142	1.95	345.38	58.88	0.74

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J143	0.26	345.38	59.10	0.72
J144	0.01	345.38	60.63	0.66
J145	0.00	345.38	60.81	0.66
J146	0.00	345.38	61.35	0.64
J147	0.01	345.38	61.48	0.64
J148	0.02	345.38	62.18	0.63
J149	0.04	345.38	62.49	0.63
J150	0.12	345.38	63.33	0.61
J151	0.01	345.38	60.98	0.63
J152	0.00	345.38	62.43	0.61
J153	0.00	345.38	63.23	0.61
J154	0.00	345.38	63.53	0.59
J155	0.01	345.38	64.78	0.58
J156	0.60	345.38	63.53	0.60
J157	0.00	345.38	63.88	0.58
J158	0.01	345.38	65.08	0.58
J159A	0.00	345.38	65.88	0.56
J159	0.00	298.10	18.60	0.56
J160A	0.03	298.10	49.60	0.51
J160B	0.00	259.96	11.47	0.51
J160	0.00	259.96	54.87	0.51
J161	0.07	245.88	40.78	0.86
J162	0.01	245.87	40.47	0.85
J163	0.08	245.87	40.77	0.85
J164	0.03	245.87	39.97	0.80
J165	0.03	245.87	39.27	0.69
J166	0.04	245.87	39.37	0.58
J167	0.02	245.87	39.87	0.20
J168	0.04	245.87	40.97	0.34
J169	0.05	245.87	39.17	0.69
J170	0.00	245.86	48.86	0.83
J171	0.08	245.86	45.86	0.62
J172	0.00	245.86	52.86	0.83
J173	0.00	245.86	55.86	0.83
J174	0.02	245.86	55.16	0.80
J175	0.05	245.86	54.76	0.77

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J176	1.84	245.85	56.85	0.77
J177	0.04	245.86	53.16	0.77
J178	0.04	245.86	53.96	0.80
J179	0.01	245.86	53.76	0.80
J180	0.02	245.86	55.96	0.82
J181	0.01	245.86	55.76	0.74

J182	0.09	245.86	51.36	0.62	
JFS	0.00	259.96	54.87	0.51	
J119	0.20	345.39	55.66	0.76	
J123	0.04	345.38	55.50	0.72	
J183	0.10	345.40	52.43	0.76	
J184	0.00	345.41	51.11	0.81	
J185	0.03	345.40	52.46	0.80	
J186	0.12	345.40	52.22	0.74	
J187	0.06	345.40	51.80	0.79	
J188	0.05	345.40	52.01	0.74	
RES1	-33.86	291.50	0.00	0.86	Reservoir
RES2	0.00	291.50	0.00	0.86	Reservoir
TANK1	-2.58	245.88	40.78	0.22	Tank

Link Results at 120:00 Hrs:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	33.86	1.08	5.43	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	33.86	1.08	5.43	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	33.86	0.27	0.19	Open
PIPE1A	9.05	0.07	0.01	Open
PIPE1	6.63	0.38	1.08	Open
PIPE2	5.76	0.33	0.83	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	24.71	0.20	0.09	Open
PIPE5	9.08	0.19	0.16	Open
PIPE6	7.60	0.15	0.12	Open
PIPE7	10.58	0.34	0.63	Open
PIPE8	10.39	0.33	0.61	Open
PIPE9	2.67	0.15	0.20	Open
PIPE10	2.31	0.13	0.15	Open
PIPE11	1.95	0.11	0.11	Open
PIPE12	1.95	0.11	0.11	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE13	1.91	0.11	0.11	Open

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PIPE14	1.73	0.10	0.09	Open
PIPE15	1.56	0.09	0.07	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	7.35	0.23	0.32	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	6.63	0.21	0.27	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	5.93	0.19	0.22	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	5.36	0.17	0.18	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	5.37	0.17	0.18	Open
PIPE27	3.27	0.18	0.29	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	2.76	0.16	0.21	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	0.42	0.02	0.01	Open
PIPE32	2.43	0.14	0.17	Open
PIPE33	2.25	0.13	0.15	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	5.63	0.32	0.80	Open
PIPE39	1.59	0.09	0.08	Open
PIPE40	1.38	0.08	0.06	Open
PIPE41	1.19	0.15	0.32	Open
PIPE42	1.15	0.06	0.04	Open
PIPE43	1.11	0.06	0.04	Open
PIPE44	4.00	0.23	0.42	Open
PIPE45	-1.04	0.06	0.03	Open
PIPE46	2.31	0.13	0.15	Open
PIPE47	2.74	0.16	0.21	Open
PIPE48	2.09	0.12	0.13	Open
PIPE49	2.00	0.11	0.12	Open
PIPE50	1.72	0.10	0.09	Open
PIPE51	1.44	0.08	0.06	Open
PIPE52	1.38	0.08	0.06	Open
PIPE53	2.60	0.15	0.19	Open
PIPE54	4.99	0.16	0.16	Open
PIPE55	4.51	0.14	0.13	Open
PIPE56	5.43	0.17	0.18	Open
PIPE57	5.29	0.17	0.17	Open
PIPE58	1.38	0.08	0.06	Open
PIPE59	1.15	0.07	0.04	Open

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Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE60	-1.27	0.03	0.00	Open
PIPE61	7.57	0.11	0.05	Open
PIPE62	-1.75	0.04	0.01	Open
PIPE63	1.83	0.04	0.01	Open
PIPE64	1.43	0.08	0.06	Open
PIPE65	5.53	0.11	0.06	Open
PIPE66	-0.07	0.00	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	1.41	0.08	0.06	Open
PIPE69	2.52	0.14	0.18	Open
PIPE70	5.18	0.11	0.06	Open
PIPE71	-1.29	0.07	0.05	Open
PIPE72	3.88	0.22	0.40	Open
PIPE73	2.50	0.14	0.18	Open
PIPE74	1.37	0.08	0.06	Open
PIPE75	1.02	0.06	0.03	Open
PIPE76	0.88	0.05	0.03	Open
PIPE77	0.74	0.04	0.02	Open
PIPE78	3.16	0.18	0.27	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	2.24	0.13	0.14	Open
PIPE82	3.40	0.11	0.08	Open
PIPE83	3.35	0.19	0.30	Open
PIPE84	-0.36	0.02	0.01	Open
PIPE85	2.66	0.15	0.20	Open
PIPE86	2.54	0.14	0.18	Open
PIPE87	1.81	0.10	0.10	Open
PIPE88	0.21	0.01	0.00	Open
PIPE89	4.07	0.23	0.44	Open
PIPE90	2.02	0.11	0.12	Open
PIPE91	1.99	0.11	0.12	Open
PIPE92	1.74	0.10	0.09	Open
PIPE93	2.04	0.12	0.12	Open
PIPE94	1.98	0.11	0.11	Open
PIPE95	1.57	0.09	0.07	Open
PIPE96	4.19	0.13	0.11	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	2.83	0.09	0.05	Open
PIPE99	1.28	0.07	0.05	Open
PIPE100	2.50	0.08	0.04	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open

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PIPE106	0.17	0.01	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE107	0.11	0.01	0.00	Open
PIPE108	3.31	0.11	0.07	Open
PIPE109	-0.96	0.03	0.01	Open
PIPE110	4.25	0.24	0.47	Open
PIPE111	1.99	0.11	0.12	Open
PIPE112	2.01	0.11	0.12	Open
PIPE113	2.25	0.13	0.15	Open
PIPE114	4.08	0.23	0.44	Open
PIPE115	4.23	0.24	0.41	Open
PIPE116	-0.31	0.02	0.00	Open
PIPE117	1.30	0.07	0.05	Open
PIPE118	2.74	0.16	0.21	Open
PIPE119	2.56	0.15	0.19	Open
PIPE120	2.01	0.11	0.10	Open
PIPE121	1.91	0.11	0.09	Open
PIPE122	2.15	0.12	0.12	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	1.81	0.10	0.10	Open
PIPE127	0.45	0.03	0.01	Open
PIPE128	0.34	0.02	0.00	Open
PIPE129	-1.03	0.06	0.03	Open
PIPE130	1.24	0.07	0.05	Open
PIPE131	1.14	0.06	0.04	Open
PIPE132	-0.65	0.04	0.01	Open
PIPE133	-0.70	0.04	0.02	Open
PIPE134	-0.88	0.05	0.03	Open
PIPE135	1.68	0.10	0.09	Open
PIPE136	1.05	0.06	0.04	Open
PIPE137	0.14	0.00	0.00	Open
PIPE138	0.05	0.00	0.00	Open
PIPE139	-0.20	0.01	0.00	Open
PIPE141	0.48	0.03	0.01	Open
PIPE142	0.45	0.03	0.01	Open
PIPE143	0.35	0.02	0.00	Open
PIPE147	-0.20	0.01	0.00	Open
PIPE148	-0.29	0.02	0.00	Open
PIPE149	-0.42	0.02	0.01	Open
PIPE150	0.28	0.02	0.00	Open
PIPE152	1.33	0.08	0.05	Open

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PIPE153	-0.54	0.03	0.01	Open
PIPE154	-0.81	0.05	0.02	Open
PIPE155	-0.08	0.04	0.06	Open
PIPE156	-0.22	0.01	0.00	Open
PIPE157	1.72	0.10	0.09	Open
PIPE158	0.92	0.05	0.03	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE159	-1.21	0.07	0.05	Open
PIPE160	-0.46	0.03	0.01	Open
PIPE161	0.45	0.03	0.01	Open
PIPE162	0.21	0.01	0.00	Open
PIPE163	-0.45	0.03	0.01	Open
PIPE164	-0.51	0.03	0.01	Open
PIPE165	-0.60	0.03	0.01	Open
PIPE166	-1.29	0.07	0.05	Open
PIPE167	3.27	0.07	0.02	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	3.18	0.06	0.02	Open
PIPE169	3.18	0.06	0.02	Open
PIPE170	3.07	0.06	0.02	Open
PIPE171	1.12	0.02	0.00	Open
PIPE172	0.86	0.02	0.00	Open
PIPE173	0.86	0.02	0.00	Open
PIPE174	0.86	0.02	0.00	Open
PIPE175	0.86	0.02	0.00	Open
PIPE176	0.64	0.01	0.00	Open
PIPE177	0.62	0.01	0.00	Open
PIPE178	0.57	0.01	0.00	Open
PIPE179	0.20	0.01	0.00	Open
PIPE180	0.20	0.01	0.00	Open
PIPE181	0.19	0.01	0.00	Open
PIPE182	0.19	0.01	0.00	Open
PIPE183	0.19	0.01	0.00	Open
PIPE184	0.19	0.01	0.00	Open
PIPE185	-0.42	0.02	0.01	Open
PIPE186	0.04	0.00	0.00	Open
PIPE187	0.04	0.00	0.00	Open
PIPE188	0.03	0.00	0.00	Open
PIPE189	0.03	0.00	0.00	Open
PIPE189A	0.00	0.00	0.00	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open

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PIPE191	2.49	0.08	0.04	Open
PIPE192	0.13	0.01	0.00	Open
PIPE193	0.05	0.00	0.00	Open
PIPE194	0.04	0.00	0.00	Open
PIPE195	0.01	0.00	0.00	Open
PIPE196	-0.02	0.00	0.00	Open
PIPE197	0.01	0.00	0.00	Open
PIPE198	-0.03	0.00	0.00	Open
PIPE199	-0.09	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.00	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	0.00	0.00	0.00	Closed
PIPE140	1.10	0.06	0.03	Open
PIPE144	0.32	0.02	0.00	Open
PIPE145	1.22	0.07	0.04	Open
PIPE146	-0.20	0.01	0.00	Open
PIPE151	1.38	0.08	0.05	Open
PIPE215	-1.47	0.08	0.06	Open
PIPE216	-0.88	0.05	0.02	Open
PIPE217	0.94	0.05	0.03	Open
PIPE218	0.59	0.03	0.01	Open
PIPE219	0.34	0.02	0.00	Open
PIPE220	0.36	0.02	0.00	Open
PIPE221	0.29	0.02	0.00	Open
PIPE222	0.22	0.01	0.00	Open
PIPE223	0.47	0.03	0.01	Open
PIPE224	0.69	0.04	0.01	Open
PUMP1	33.86	0.00	-54.22	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump

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PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	0.03	0.00	47.28	Active Valve
VALVE2	0.00	0.00	38.13	Active Valve
VALVE3	0.00	0.00	0.00	Open Valve

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*************************************************************
*                          E P A N E T                      *
*                  Hydraulic and Water Quality              *
*                  Analysis for Pipe Networks               *
*                        Version 2.2                        *
*************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential 2 ADD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

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Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

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PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	30.14	30.14	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	344.03	49.73	0.00
D2	0.00	343.98	49.68	0.00
D3	0.00	343.98	49.68	0.00
D4	0.00	343.98	49.68	0.00
DH	0.00	343.98	49.68	0.00
J1A	0.10	343.98	50.78	0.00
J1	0.00	343.98	50.74	0.00
J2	0.10	343.85	50.64	0.00
J3	0.05	343.76	50.58	0.00
J4	0.07	343.76	50.64	0.00

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J5	0.06	343.97	51.40	0.00
J6	0.10	343.94	52.85	0.00
J7	0.03	343.94	52.98	0.00
J8	0.19	343.90	50.55	0.00
J9	0.37	343.79	50.13	0.00
J10	0.36	343.75	51.02	0.00
J11	0.36	343.71	49.11	0.00
J12	0.01	343.67	48.25	0.00
J13	0.04	343.66	48.28	0.00
J14	0.18	343.63	46.91	0.00
J15	0.17	343.60	46.43	0.00
J16	0.18	343.52	49.32	0.00
J17	0.16	343.51	52.36	0.00
J18	0.34	343.51	50.49	0.00
J19	0.19	343.75	49.09	0.00
J20	0.53	343.74	48.39	0.00
J21	0.14	343.71	49.98	0.00
J22	0.56	343.71	48.28	0.00
J23	0.10	343.68	50.49	0.00
J24	0.47	343.68	48.10	0.00
J25	0.05	343.65	50.26	0.00
J26	0.98	343.65	50.31	0.00
J27	0.02	343.62	49.12	0.00
J28	0.08	343.60	49.39	0.00
J29	0.42	343.60	48.07	0.00
J30	0.14	343.56	48.51	0.00
J31	2.21	343.54	49.78	0.00
J32	0.48	343.54	48.23	0.00
J33	0.17	343.94	50.39	0.00
J34	0.17	343.92	48.96	0.00
J35	0.03	343.92	48.09	0.00
J36	0.31	343.92	47.40	0.00
J37	0.17	343.85	49.66	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	0.60	343.85	47.26	0.00
J39	0.05	343.72	50.50	0.00
J40	0.21	343.70	49.19	0.00
J41	0.19	343.69	47.79	0.00
J42	0.04	343.65	47.51	0.00
J43	0.04	343.64	47.65	0.00
J44	0.68	343.63	47.74	0.00
J45	0.65	343.66	49.01	0.00
J46	0.43	343.55	47.83	0.00

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J47	0.08	343.60	48.22	0.00
J48	0.28	343.57	47.86	0.00
J49	0.44	343.54	48.34	0.00
J50	0.04	343.47	54.00	0.00
J51	0.49	343.95	51.38	0.00
J52	2.10	343.92	50.09	0.00
J53	0.14	343.88	50.56	0.00
J54	0.22	343.85	50.80	0.00
J55	0.23	343.93	50.84	0.00
J56	0.28	343.92	51.31	0.00
J57	0.20	343.92	51.90	0.00
J58	0.10	343.91	50.45	0.00
J59	0.00	343.91	50.45	0.00
J60	0.28	343.91	52.68	0.00
J61	0.18	343.90	51.45	0.00
J62	0.00	343.90	51.45	0.00
J63	0.01	343.89	51.96	0.00
J64	0.09	343.85	54.08	0.00
J65	0.35	343.87	52.67	0.00
J66	0.13	343.86	54.10	0.00
J67	0.14	343.85	53.48	0.00
J68	0.16	343.80	55.51	0.00
J69	0.18	343.79	55.41	0.00
J70	0.21	343.79	55.39	0.00
J71	0.43	343.73	54.86	0.00
J72	0.05	343.83	54.91	0.00
J73	0.09	343.79	55.06	0.00
J74	0.12	343.74	54.54	0.00
J75	0.06	343.70	54.52	0.00
J76	0.20	343.70	54.09	0.00
J77	0.01	343.60	54.42	0.00
J78	0.03	343.58	53.97	0.00
J79	0.25	343.51	53.87	0.00
J80	0.13	343.50	53.66	0.00
J81	0.06	343.55	54.55	0.00
J82	0.40	343.49	54.01	0.00
J83	0.13	343.48	53.91	0.00
J84	0.00	343.82	54.71	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.07	343.82	54.84	0.00
J86	0.01	343.81	54.59	0.00
J87	0.01	343.81	54.59	0.00
J88	0.11	343.80	54.52	0.00

J89	0.18	343.80	54.24	0.00
J90	0.12	343.81	54.46	0.00
J91	0.20	343.81	54.60	0.00
J92	0.01	343.81	54.41	0.00
J93	0.06	343.80	54.45	0.00
J94	0.11	343.80	54.64	0.00
J95	0.01	343.79	54.85	0.00
J96	0.01	343.74	54.59	0.00
J97	0.18	343.68	54.04	0.00
J98	0.16	343.50	53.56	0.00
J99	0.07	343.42	53.53	0.00
J100	0.18	343.40	53.42	0.00
J101	0.16	343.33	52.41	0.00
J102	0.10	343.36	53.05	0.00
J103	0.14	343.41	53.96	0.00
J104	0.10	343.41	53.38	0.00
J105	0.04	343.41	54.39	0.00
J106	0.06	343.41	53.83	0.00
J107	0.12	343.39	53.61	0.00
J108	0.12	343.37	53.17	0.00
J109	0.08	343.35	52.86	0.00
J110	0.10	343.40	53.75	0.00
J111	0.07	343.41	53.38	0.00
J112	0.05	343.43	53.64	0.00
J113	0.17	343.46	53.97	0.00
J114	0.00	343.45	54.01	0.00
J115	0.35	343.43	53.41	0.00
J116	0.08	343.45	53.81	0.00
J117	0.20	343.45	53.74	0.00
J118	0.12	343.45	53.88	0.00
J120	0.04	343.45	53.70	0.00
J121	0.10	343.45	53.21	0.00
J122	0.03	343.45	53.31	0.00
J124	0.00	343.43	52.08	0.00
J125	0.09	343.43	52.35	0.00
J126	0.13	343.43	52.91	0.00
J127	0.43	343.41	52.92	0.00
J128	0.05	343.41	51.59	0.00
J129	1.87	343.40	51.39	0.00
J130	0.27	343.40	52.22	0.00
J131	0.48	343.40	52.72	0.00
J132	0.13	343.41	52.83	0.00
J133	0.17	343.40	52.56	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.20	343.39	52.90	0.00
J135	0.24	343.40	53.18	0.00
J136	0.06	343.38	52.88	0.00
J137	0.09	343.37	54.27	0.00
J138	0.69	343.36	53.57	0.00
J139	0.09	343.28	52.81	0.00
FS	0.00	343.31	52.71	0.00
FD	0.00	343.30	52.70	0.00
J140	0.00	343.24	54.59	0.00
J141	0.11	343.20	55.20	0.00
J142	1.95	343.04	56.54	0.00
J143	0.26	342.92	56.64	0.00
J144	0.01	342.77	58.02	0.00
J145	0.00	342.74	58.17	0.00
J146	0.00	342.69	58.66	0.00
J147	0.01	342.68	58.78	0.00
J148	0.02	342.67	59.47	0.00
J149	0.04	342.64	59.75	0.00
J150	0.12	342.61	60.56	0.00
J151	0.01	342.67	58.27	0.00
J152	0.00	342.66	59.71	0.00
J153	0.00	342.64	60.49	0.00
J154	0.00	342.64	60.79	0.00
J155	0.01	342.63	62.03	0.00
J156	0.60	342.62	60.77	0.00
J157	0.00	342.59	61.09	0.00
J158	0.01	342.56	62.26	0.00
J159A	0.00	341.60	62.10	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.03	293.30	44.80	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.07	246.60	41.50	0.00
J162	0.01	246.60	41.20	0.00
J163	0.08	246.59	41.49	0.00
J164	0.03	246.59	40.69	0.00
J165	0.03	246.59	39.99	0.00
J166	0.04	246.59	40.09	0.00
J167	0.02	246.59	40.59	0.00
J168	0.04	246.59	41.69	0.00
J169	0.05	246.59	39.89	0.00
J170	0.00	246.59	49.59	0.00
J171	0.08	246.59	46.59	0.00
J172	0.00	246.58	53.58	0.00
J173	0.00	246.58	56.58	0.00
J174	0.02	246.58	55.88	0.00
J175	0.05	246.58	55.48	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	1.84	246.58	57.58	0.00	
J177	0.04	246.58	53.88	0.00	
J178	0.04	246.58	54.68	0.00	
J179	0.01	246.58	54.48	0.00	
J180	0.02	246.58	56.68	0.00	
J181	0.01	246.58	56.48	0.00	
J182	0.09	246.58	52.08	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.51	50.49	0.00	
JFF2	0.00	343.45	53.88	0.00	
JFF3	0.00	343.88	50.56	0.00	
JFF4	0.00	343.81	54.41	0.00	
JFF5	0.00	343.79	55.39	0.00	
JFF6	0.00	342.63	62.03	0.00	
JFF7	0.00	246.59	39.89	0.00	
JFF8	0.00	343.54	49.78	0.00	
JFF9	0.00	343.91	52.68	0.00	
J119	0.15	343.45	53.72	0.00	
J123	0.00	343.43	53.55	0.00	
J183	0.13	343.51	50.54	0.00	
J184	0.00	343.52	49.22	0.00	
J185	0.05	343.52	50.58	0.00	
J186	0.19	343.52	50.34	0.00	
J187	0.11	343.52	49.92	0.00	
J188	0.08	343.52	50.13	0.00	
RES1	-43.86	291.50	0.00	0.00	Reservoir
RES2	0.00	291.50	0.00	0.00	Reservoir
TANK1	7.42	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	43.86	1.40	8.77	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	43.86	1.40	8.78	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	43.86	0.35	0.30	Open
PIPE1A	11.60	0.09	0.02	Open

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PIPE1	8.40	0.48	1.67	Open
PIPE2	7.53	0.43	1.36	Open
PIPE3	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	32.17	0.26	0.15	Open
PIPE5	12.11	0.25	0.27	Open
PIPE6	10.19	0.21	0.20	Open
PIPE7	13.45	0.43	0.98	Open
PIPE8	13.27	0.42	0.96	Open
PIPE9	3.50	0.20	0.33	Open
PIPE10	3.14	0.18	0.27	Open
PIPE11	2.78	0.16	0.22	Open
PIPE12	2.77	0.16	0.21	Open
PIPE13	2.73	0.15	0.21	Open
PIPE14	2.56	0.14	0.18	Open
PIPE15	2.38	0.13	0.16	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	9.40	0.30	0.51	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	8.68	0.28	0.44	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	7.98	0.25	0.37	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	7.41	0.24	0.33	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	7.69	0.24	0.35	Open
PIPE27	4.38	0.25	0.50	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	3.87	0.22	0.40	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	1.53	0.09	0.07	Open
PIPE32	3.20	0.18	0.28	Open
PIPE33	3.02	0.17	0.25	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	7.40	0.42	1.32	Open
PIPE39	2.05	0.12	0.12	Open
PIPE40	1.85	0.10	0.10	Open
PIPE41	1.66	0.21	0.59	Open
PIPE42	1.61	0.09	0.08	Open

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PIPE43	1.58	0.09	0.08	Open
PIPE44	5.30	0.30	0.71	Open
PIPE45	-1.30	0.07	0.05	Open
PIPE46	3.35	0.19	0.30	Open
PIPE47	4.25	0.24	0.47	Open
PIPE48	3.29	0.19	0.29	Open
PIPE49	3.20	0.18	0.28	Open
PIPE50	2.92	0.17	0.24	Open

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Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	1.36	0.08	0.06	Open
PIPE52	2.41	0.14	0.16	Open
PIPE53	5.38	0.30	0.73	Open
PIPE54	6.55	0.21	0.26	Open
PIPE55	6.06	0.19	0.22	Open
PIPE56	7.92	0.25	0.37	Open
PIPE57	7.78	0.25	0.36	Open
PIPE58	1.82	0.10	0.10	Open
PIPE59	1.59	0.09	0.08	Open
PIPE60	-1.44	0.03	0.01	Open
PIPE61	10.16	0.14	0.08	Open
PIPE62	-2.52	0.05	0.01	Open
PIPE63	2.15	0.04	0.01	Open
PIPE64	2.03	0.11	0.12	Open
PIPE65	7.80	0.16	0.12	Open
PIPE66	-0.09	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	2.02	0.11	0.12	Open
PIPE69	3.73	0.21	0.37	Open
PIPE70	7.42	0.15	0.11	Open
PIPE71	-1.89	0.11	0.11	Open
PIPE72	5.53	0.31	0.77	Open
PIPE73	3.66	0.21	0.36	Open
PIPE74	1.86	0.11	0.10	Open
PIPE75	1.51	0.09	0.07	Open
PIPE76	1.38	0.08	0.06	Open
PIPE77	1.23	0.07	0.05	Open
PIPE78	4.81	0.27	0.59	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	3.50	0.20	0.33	Open
PIPE82	5.10	0.16	0.16	Open
PIPE83	5.05	0.29	0.65	Open
PIPE84	-0.76	0.04	0.02	Open

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Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE85	4.21	0.24	0.46	Open
PIPE86	4.09	0.23	0.44	Open
PIPE87	3.07	0.17	0.26	Open
PIPE88	0.36	0.02	0.00	Open
PIPE89	6.73	0.38	1.11	Open
PIPE90	3.33	0.19	0.30	Open
PIPE91	3.30	0.19	0.30	Open
PIPE92	3.04	0.17	0.25	Open
PIPE93	3.39	0.19	0.31	Open
PIPE94	3.33	0.19	0.30	Open
PIPE95	2.93	0.17	0.24	Open
PIPE96	6.19	0.20	0.23	Open
PIPE97	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE98	4.20	0.13	0.11	Open
PIPE99	1.91	0.11	0.11	Open
PIPE100	3.87	0.12	0.10	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	5.31	0.17	0.18	Open
PIPE109	-1.51	0.05	0.02	Open
PIPE110	6.80	0.38	1.13	Open
PIPE111	3.16	0.18	0.27	Open
PIPE112	3.32	0.19	0.30	Open
PIPE113	3.63	0.21	0.35	Open
PIPE114	6.77	0.38	1.12	Open
PIPE115	7.08	0.40	1.07	Open
PIPE116	-0.46	0.03	0.01	Open
PIPE117	2.45	0.14	0.17	Open
PIPE118	5.25	0.30	0.70	Open
PIPE119	5.07	0.29	0.65	Open
PIPE120	4.50	0.25	0.46	Open
PIPE121	4.40	0.25	0.44	Open
PIPE122	2.51	0.14	0.16	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.17	0.12	0.14	Open

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PIPE127	3.39	0.19	0.31	Open
PIPE128	3.27	0.19	0.29	Open
PIPE129	3.97	0.22	0.42	Open
PIPE130	-1.34	0.08	0.06	Open
PIPE131	-1.44	0.08	0.06	Open
PIPE132	-2.49	0.14	0.18	Open
PIPE133	-2.55	0.14	0.18	Open
PIPE134	-2.72	0.15	0.21	Open
PIPE135	2.62	0.15	0.19	Open
PIPE136	2.47	0.14	0.17	Open
PIPE137	-0.62	0.02	0.00	Open
PIPE138	-0.70	0.02	0.00	Open
PIPE139	-0.91	0.03	0.01	Open
PIPE141	0.77	0.04	0.02	Open
PIPE142	0.74	0.04	0.02	Open
PIPE143	0.64	0.04	0.01	Open
PIPE147	0.27	0.02	0.00	Open
PIPE148	0.18	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	0.05	0.00	0.00	Open
PIPE150	2.17	0.12	0.14	Open
PIPE152	2.25	0.13	0.15	Open
PIPE153	0.38	0.02	0.01	Open
PIPE154	0.11	0.01	0.00	Open
PIPE155	-0.11	0.06	0.12	Open
PIPE156	1.63	0.09	0.08	Open
PIPE157	0.98	0.06	0.03	Open
PIPE158	1.36	0.08	0.06	Open
PIPE159	-0.26	0.01	0.00	Open
PIPE160	0.93	0.05	0.03	Open
PIPE161	1.13	0.06	0.04	Open
PIPE162	0.89	0.05	0.03	Open
PIPE163	1.62	0.09	0.08	Open
PIPE164	1.56	0.09	0.07	Open
PIPE165	1.47	0.08	0.07	Open
PIPE166	0.78	0.04	0.02	Open
PIPE167	13.27	0.27	0.28	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	13.18	0.27	0.28	Open
PIPE169	13.18	0.27	0.28	Open
PIPE170	13.07	0.27	0.28	Open
PIPE171	11.12	0.23	0.21	Open

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PIPE172	10.86	0.22	0.20	Open
PIPE173	10.86	0.22	0.20	Open
PIPE174	10.86	0.22	0.20	Open
PIPE175	10.86	0.22	0.20	Open
PIPE176	9.04	0.18	0.14	Open
PIPE177	9.02	0.18	0.14	Open
PIPE178	8.97	0.18	0.14	Open
PIPE179	1.80	0.10	0.09	Open
PIPE180	1.80	0.10	0.08	Open
PIPE181	1.79	0.10	0.08	Open
PIPE182	1.79	0.10	0.08	Open
PIPE183	1.79	0.10	0.08	Open
PIPE184	1.79	0.10	0.08	Open
PIPE185	1.18	0.07	0.04	Open
PIPE186	10.04	0.20	0.17	Open
PIPE187	10.04	0.20	0.17	Open
PIPE188	10.03	0.57	2.04	Open
PIPE189	10.03	0.57	2.48	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.17	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.06	0.00	0.00	Open
PIPE194	0.08	0.00	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	0.02	0.00	0.00	Open
PIPE197	0.05	0.00	0.00	Open
PIPE198	0.01	0.00	0.00	Open
PIPE199	-0.05	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open

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PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	2.11	0.12	0.11	Open
PIPE144	0.61	0.03	0.01	Open
PIPE145	2.57	0.15	0.16	Open
PIPE146	0.27	0.02	0.00	Open
PIPE151	2.30	0.13	0.13	Open
PIPE215	-3.13	0.18	0.24	Open
PIPE216	-1.71	0.10	0.08	Open
PIPE217	1.98	0.11	0.10	Open
PIPE218	1.24	0.07	0.04	Open
PIPE219	0.73	0.04	0.02	Open
PIPE220	0.74	0.04	0.02	Open
PIPE221	0.63	0.04	0.01	Open
PIPE222	0.46	0.03	0.01	Open
PIPE223	1.02	0.06	0.03	Open
PIPE224	1.55	0.09	0.06	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	43.86	0.00	-52.57	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.03	0.57	43.51	Active Valve
VALVE2	10.00	0.57	33.34	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential 2 MDD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	27.33	27.33	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.19	26.81	26.81	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.46	-2.84	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.49	-2.81	0.00
D1	0.00	344.78	50.48	0.00
D2	0.00	344.74	50.44	0.00
D3	0.00	344.74	50.44	0.00
D4	0.00	344.76	50.46	0.00
DH	0.00	344.74	50.44	0.00
J1A	0.19	344.74	51.54	0.00
J1	0.00	344.73	51.49	0.00
J2	0.20	344.36	51.15	0.00
J3	0.10	344.09	50.91	0.00
J4	0.15	344.09	50.97	0.00

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J5	0.12	344.71	52.14	0.00
J6	0.20	344.62	53.53	0.00
J7	0.06	344.62	53.66	0.00
J8	0.37	344.49	51.14	0.00
J9	0.74	344.18	50.52	0.00
J10	0.71	344.05	51.32	0.00
J11	0.72	343.94	49.34	0.00
J12	0.01	343.85	48.43	0.00
J13	0.08	343.81	48.43	0.00
J14	0.36	343.73	47.01	0.00
J15	0.34	343.66	46.49	0.00
J16	0.35	343.44	49.24	0.00
J17	0.32	343.44	52.29	0.00
J18	0.68	343.43	50.41	0.00
J19	0.38	344.05	49.39	0.00
J20	1.06	344.04	48.69	0.00
J21	0.28	343.95	50.22	0.00
J22	1.12	343.94	48.51	0.00
J23	0.19	343.86	50.67	0.00
J24	0.93	343.86	48.28	0.00
J25	0.10	343.79	50.40	0.00
J26	1.95	343.78	50.44	0.00
J27	0.04	343.70	49.20	0.00
J28	0.16	343.64	49.43	0.00
J29	0.85	343.64	48.11	0.00
J30	0.28	343.52	48.47	0.00
J31	4.41	343.47	49.71	0.00
J32	0.96	343.50	48.19	0.00
J33	0.34	344.62	51.07	0.00
J34	0.34	344.57	49.61	0.00
J35	0.05	344.57	48.74	0.00
J36	0.62	344.57	48.05	0.00
J37	0.34	344.35	50.16	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	344.35	47.76	0.00
J39	0.09	343.97	50.75	0.00
J40	0.42	343.92	49.41	0.00
J41	0.38	343.90	48.00	0.00
J42	0.09	343.77	47.63	0.00
J43	0.07	343.75	47.76	0.00
J44	1.35	343.73	47.84	0.00
J45	1.30	343.82	49.17	0.00
J46	0.86	343.52	47.80	0.00

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J47	0.16	343.65	48.27	0.00
J48	0.57	343.58	47.87	0.00
J49	0.87	343.49	48.29	0.00
J50	0.07	343.37	53.90	0.00
J51	0.98	344.65	52.08	0.00
J52	4.19	344.57	50.74	0.00
J53	0.29	344.47	51.15	0.00
J54	0.44	344.40	51.35	0.00
J55	0.46	344.59	51.50	0.00
J56	0.55	344.57	51.96	0.00
J57	0.41	344.57	52.55	0.00
J58	0.19	344.54	51.08	0.00
J59	0.00	344.54	51.08	0.00
J60	0.57	344.54	53.31	0.00
J61	0.36	344.51	52.06	0.00
J62	0.00	344.51	52.06	0.00
J63	0.01	344.48	52.55	0.00
J64	0.18	344.38	54.61	0.00
J65	0.71	344.44	53.24	0.00
J66	0.27	344.41	54.65	0.00
J67	0.28	344.39	54.02	0.00
J68	0.33	344.24	55.95	0.00
J69	0.37	344.24	55.86	0.00
J70	0.42	344.24	55.84	0.00
J71	0.87	344.09	55.22	0.00
J72	0.10	344.33	55.41	0.00
J73	0.18	344.24	55.51	0.00
J74	0.24	344.11	54.91	0.00
J75	0.12	344.02	54.84	0.00
J76	0.40	344.02	54.41	0.00
J77	0.03	343.77	54.59	0.00
J78	0.06	343.73	54.12	0.00
J79	0.50	343.57	53.93	0.00
J80	0.25	343.53	53.69	0.00
J81	0.12	343.65	54.65	0.00
J82	0.81	343.52	54.04	0.00
J83	0.27	343.50	53.93	0.00
J84	0.00	344.30	55.19	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	344.30	55.32	0.00
J86	0.02	344.27	55.05	0.00
J87	0.02	344.27	55.05	0.00
J88	0.22	344.27	54.99	0.00

J89	0.37	344.27	54.71	0.00
J90	0.23	344.27	54.92	0.00
J91	0.39	344.27	55.06	0.00
J92	0.02	344.27	54.87	0.00
J93	0.12	344.27	54.92	0.00
J94	0.22	344.27	55.11	0.00
J95	0.03	344.24	55.30	0.00
J96	0.03	344.12	54.97	0.00
J97	0.35	343.96	54.32	0.00
J98	0.31	343.53	53.59	0.00
J99	0.14	343.36	53.47	0.00
J100	0.35	343.32	53.34	0.00
J101	0.33	343.18	52.26	0.00
J102	0.20	343.24	52.93	0.00
J103	0.29	343.33	53.88	0.00
J104	0.19	343.32	53.29	0.00
J105	0.07	343.32	54.30	0.00
J106	0.12	343.31	53.73	0.00
J107	0.23	343.26	53.48	0.00
J108	0.23	343.23	53.03	0.00
J109	0.16	343.20	52.71	0.00
J110	0.21	343.26	53.61	0.00
J111	0.14	343.26	53.23	0.00
J112	0.10	343.30	53.51	0.00
J113	0.34	343.35	53.86	0.00
J114	0.00	343.32	53.88	0.00
J115	0.70	343.27	53.25	0.00
J116	0.16	343.32	53.68	0.00
J117	0.41	343.32	53.61	0.00
J118	0.24	343.32	53.75	0.00
J120	0.07	343.31	53.56	0.00
J121	0.19	343.31	53.07	0.00
J122	0.06	343.30	53.16	0.00
J124	0.00	343.27	51.92	0.00
J125	0.18	343.27	52.19	0.00
J126	0.27	343.27	52.75	0.00
J127	0.86	343.25	52.76	0.00
J128	0.10	343.23	51.41	0.00
J129	3.73	343.21	51.20	0.00
J130	0.54	343.21	52.03	0.00
J131	0.96	343.21	52.53	0.00
J132	0.25	343.24	52.66	0.00
J133	0.34	343.22	52.38	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.40	343.22	52.73	0.00
J135	0.48	343.22	53.00	0.00
J136	0.12	343.21	52.71	0.00
J137	0.18	343.20	54.10	0.00
J138	1.39	343.20	53.41	0.00
J139	0.18	343.10	52.63	0.00
FS	0.00	343.16	52.56	0.00
FD	0.00	343.13	52.53	0.00
J140	0.00	343.05	54.40	0.00
J141	0.22	342.99	54.99	0.00
J142	3.90	342.75	56.25	0.00
J143	0.51	342.60	56.32	0.00
J144	0.01	342.43	57.68	0.00
J145	0.00	342.40	57.83	0.00
J146	0.00	342.35	58.32	0.00
J147	0.03	342.33	58.43	0.00
J148	0.04	342.32	59.12	0.00
J149	0.09	342.29	59.40	0.00
J150	0.24	342.26	60.21	0.00
J151	0.01	342.32	57.92	0.00
J152	0.01	342.30	59.35	0.00
J153	0.00	342.29	60.14	0.00
J154	0.00	342.28	60.43	0.00
J155	0.01	342.27	61.67	0.00
J156	1.21	342.26	60.41	0.00
J157	0.00	342.23	60.73	0.00
J158	0.01	342.20	61.90	0.00
J159A	0.00	341.24	61.74	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.43	50.41	0.00	
JFF2	0.00	343.32	53.75	0.00	
JFF3	0.00	344.47	51.15	0.00	
JFF4	0.00	344.27	54.87	0.00	
JFF5	0.00	344.24	55.84	0.00	
JFF6	0.00	342.27	61.67	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	343.47	49.71	0.00	
JFF9	0.00	344.54	53.31	0.00	
J119	0.30	343.30	53.57	0.00	
J123	0.00	343.27	53.39	0.00	
J183	0.26	343.43	50.46	0.00	
J184	0.00	343.46	49.16	0.00	
J185	0.09	343.45	50.51	0.00	
J186	0.39	343.44	50.26	0.00	
J187	0.22	343.45	49.85	0.00	
J188	0.15	343.45	50.06	0.00	
RES1	-39.22	291.50	0.00	0.00	Reservoir
RES2	-38.50	291.50	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	39.22	1.25	7.13	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	38.50	0.78	2.33	Open
PD1	39.22	1.25	7.14	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	38.50	0.78	2.33	Open
PD5	77.72	0.62	0.86	Open
PIPE1A	20.68	0.16	0.07	Open

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PIPE1	15.07	0.85	4.93	Open
PIPE2	13.33	0.75	3.93	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	56.85	0.45	0.43	Open
PIPE5	21.12	0.43	0.76	Open
PIPE6	17.73	0.36	0.55	Open
PIPE7	24.10	0.77	2.90	Open
PIPE8	23.73	0.76	2.81	Open
PIPE9	6.18	0.35	0.95	Open
PIPE10	5.47	0.31	0.75	Open
PIPE11	4.75	0.27	0.58	Open
PIPE12	4.74	0.27	0.58	Open
PIPE13	4.66	0.26	0.56	Open
PIPE14	4.30	0.24	0.48	Open
PIPE15	3.96	0.22	0.41	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	16.81	0.54	1.49	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	15.36	0.49	1.26	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	13.96	0.44	1.05	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	12.83	0.41	0.90	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	13.13	0.42	0.94	Open
PIPE27	7.70	0.44	1.42	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	6.69	0.38	1.09	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	2.00	0.11	0.12	Open
PIPE32	5.61	0.32	0.79	Open
PIPE33	5.26	0.30	0.70	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	13.08	0.74	3.79	Open
PIPE39	3.65	0.21	0.36	Open
PIPE40	3.23	0.18	0.28	Open
PIPE41	2.86	0.36	1.63	Open
PIPE42	2.77	0.16	0.21	Open

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PIPE43	2.69	0.15	0.20	Open
PIPE44	9.33	0.53	2.03	Open
PIPE45	-2.35	0.13	0.16	Open
PIPE46	5.68	0.32	0.81	Open
PIPE47	7.02	0.40	1.20	Open
PIPE48	5.39	0.31	0.73	Open
PIPE49	5.23	0.30	0.69	Open
PIPE50	4.66	0.26	0.56	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE51	2.86	0.16	0.23	Open
PIPE52	3.90	0.22	0.40	Open
PIPE53	7.97	0.45	1.51	Open
PIPE54	11.51	0.37	0.74	Open
PIPE55	10.53	0.34	0.63	Open
PIPE56	13.29	0.42	0.96	Open
PIPE57	13.01	0.41	0.92	Open
PIPE58	3.19	0.18	0.28	Open
PIPE59	2.73	0.15	0.21	Open
PIPE60	-2.70	0.06	0.02	Open
PIPE61	17.66	0.25	0.23	Open
PIPE62	-4.25	0.09	0.04	Open
PIPE63	3.98	0.08	0.04	Open
PIPE64	3.45	0.20	0.32	Open
PIPE65	13.28	0.27	0.32	Open
PIPE66	-0.16	0.01	0.00	Open
PIPE67	0.57	0.03	0.01	Open
PIPE68	3.42	0.19	0.32	Open
PIPE69	6.23	0.35	0.96	Open
PIPE70	12.55	0.26	0.29	Open
PIPE71	-3.17	0.18	0.27	Open
PIPE72	9.38	0.53	2.05	Open
PIPE73	6.14	0.35	0.93	Open
PIPE74	3.23	0.18	0.28	Open
PIPE75	2.52	0.14	0.18	Open
PIPE76	2.25	0.13	0.15	Open
PIPE77	1.97	0.11	0.11	Open
PIPE78	7.93	0.45	1.50	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	5.71	0.32	0.82	Open
PIPE82	8.46	0.27	0.42	Open
PIPE83	8.36	0.47	1.65	Open
PIPE84	-1.11	0.06	0.04	Open

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PIPE85	6.83	0.39	1.14	Open
PIPE86	6.60	0.37	1.07	Open
PIPE87	4.84	0.27	0.60	Open
PIPE88	0.57	0.03	0.01	Open
PIPE89	10.74	0.61	2.63	Open
PIPE90	5.32	0.30	0.72	Open
PIPE91	5.26	0.30	0.70	Open
PIPE92	4.76	0.27	0.58	Open
PIPE93	5.39	0.31	0.73	Open
PIPE94	5.27	0.30	0.70	Open
PIPE95	4.46	0.25	0.52	Open
PIPE96	10.34	0.33	0.60	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	7.01	0.22	0.29	Open
PIPE99	3.18	0.18	0.28	Open
PIPE100	6.35	0.20	0.25	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	8.57	0.27	0.43	Open
PIPE109	-2.46	0.08	0.04	Open
PIPE110	11.00	0.62	2.75	Open
PIPE111	5.13	0.29	0.67	Open
PIPE112	5.30	0.30	0.71	Open
PIPE113	5.85	0.33	0.85	Open
PIPE114	10.79	0.61	2.65	Open
PIPE115	11.31	0.64	2.55	Open
PIPE116	-0.83	0.05	0.02	Open
PIPE117	3.67	0.21	0.36	Open
PIPE118	7.86	0.45	1.48	Open
PIPE119	7.51	0.42	1.36	Open
PIPE120	6.31	0.36	0.86	Open
PIPE121	6.11	0.35	0.81	Open
PIPE122	4.86	0.28	0.53	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	4.18	0.24	0.46	Open

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PIPE127	4.06	0.23	0.43	Open
PIPE128	3.82	0.22	0.39	Open
PIPE129	3.26	0.18	0.29	Open
PIPE130	-0.11	0.01	0.00	Open
PIPE131	-0.32	0.02	0.00	Open
PIPE132	-3.24	0.18	0.29	Open
PIPE133	-3.34	0.19	0.30	Open
PIPE134	-3.69	0.21	0.36	Open
PIPE135	4.21	0.24	0.46	Open
PIPE136	3.59	0.20	0.35	Open
PIPE137	-0.61	0.02	0.00	Open
PIPE138	-0.77	0.02	0.00	Open
PIPE139	-1.18	0.04	0.01	Open
PIPE141	1.23	0.07	0.05	Open
PIPE142	1.16	0.07	0.04	Open
PIPE143	0.96	0.05	0.03	Open
PIPE147	0.23	0.01	0.00	Open
PIPE148	0.05	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	-0.22	0.01	0.00	Open
PIPE150	2.67	0.15	0.20	Open
PIPE152	3.38	0.19	0.31	Open
PIPE153	-0.35	0.02	0.00	Open
PIPE154	-0.89	0.05	0.03	Open
PIPE155	-0.18	0.09	0.30	Open
PIPE156	1.63	0.09	0.08	Open
PIPE157	2.78	0.16	0.22	Open
PIPE158	2.52	0.14	0.18	Open
PIPE159	-1.67	0.09	0.08	Open
PIPE160	0.51	0.03	0.01	Open
PIPE161	1.64	0.09	0.08	Open
PIPE162	1.16	0.07	0.04	Open
PIPE163	1.27	0.07	0.05	Open
PIPE164	1.16	0.07	0.04	Open
PIPE165	0.97	0.06	0.03	Open
PIPE166	-0.41	0.02	0.01	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.25	Open

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PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.26	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.09	0.01	0.00	Open
PIPE194	0.11	0.01	0.00	Open
PIPE195	0.04	0.00	0.00	Open
PIPE196	-0.01	0.00	0.00	Open
PIPE197	0.03	0.00	0.00	Open
PIPE198	-0.06	0.00	0.00	Open
PIPE199	-0.17	0.01	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

EPANet Future Residential 2 Only MDD Model Results

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	3.11	0.18	0.23	Open
PIPE144	0.91	0.05	0.02	Open
PIPE145	3.71	0.21	0.32	Open
PIPE146	0.23	0.01	0.00	Open
PIPE151	3.48	0.20	0.29	Open
PIPE215	-4.52	0.26	0.47	Open
PIPE216	-2.60	0.15	0.17	Open
PIPE217	3.03	0.17	0.22	Open
PIPE218	1.88	0.11	0.09	Open
PIPE219	1.08	0.06	0.03	Open
PIPE220	1.15	0.06	0.04	Open
PIPE221	0.93	0.05	0.02	Open
PIPE222	0.71	0.04	0.02	Open
PIPE223	1.49	0.08	0.06	Open
PIPE224	2.18	0.12	0.12	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	39.22	0.00	-53.32	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	38.50	0.00	-53.27	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	43.14	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential 2 Only MDD and FF S1 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential 2 MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	40.43	40.43	0.00
PUMP2	100.00	75.00	0.20	60.37	60.37	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.20	60.37	60.37	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.98	-7.32	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.44	49.14	0.00
D2	0.00	343.42	49.12	0.00
D3	0.00	343.38	49.08	0.00
D4	0.00	343.42	49.12	0.00
DH	0.00	343.38	49.08	0.00
J1A	0.19	343.32	50.12	0.00
J1	0.00	343.30	50.06	0.00
J2	0.20	340.56	47.35	0.00
J3	0.10	338.26	45.08	0.00
J4	0.15	338.26	45.14	0.00

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J5	0.12	343.13	50.56	0.00
J6	0.20	342.61	51.52	0.00
J7	0.06	342.58	51.62	0.00
J8	0.37	341.42	48.07	0.00
J9	0.74	338.91	45.25	0.00
J10	0.71	337.60	44.87	0.00
J11	0.72	336.28	41.68	0.00
J12	0.01	335.02	39.60	0.00
J13	0.08	334.41	39.03	0.00
J14	0.36	333.25	36.53	0.00
J15	0.34	332.03	34.86	0.00
J16	0.35	328.04	33.84	0.00
J17	0.32	322.66	31.51	0.00
J18	0.68	317.59	24.57	0.00
J19	0.38	337.84	43.18	0.00
J20	1.06	337.84	42.49	0.00
J21	0.28	336.94	43.21	0.00
J22	1.12	336.93	41.50	0.00
J23	0.19	336.09	42.90	0.00
J24	0.93	336.08	40.50	0.00
J25	0.10	335.26	41.87	0.00
J26	1.95	335.25	41.91	0.00
J27	0.04	333.96	39.46	0.00
J28	0.16	333.02	38.81	0.00
J29	0.85	333.01	37.48	0.00
J30	0.28	330.35	35.30	0.00
J31	4.41	326.85	33.09	0.00
J32	0.96	330.59	35.28	0.00
J33	0.34	342.65	49.10	0.00
J34	0.34	342.32	47.36	0.00
J35	0.05	342.32	46.49	0.00
J36	0.62	342.32	45.80	0.00
J37	0.34	340.55	46.36	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	340.55	43.96	0.00
J39	0.09	337.17	43.95	0.00
J40	0.42	336.81	42.30	0.00
J41	0.38	336.57	40.67	0.00
J42	0.09	335.25	39.11	0.00
J43	0.07	335.01	39.02	0.00
J44	1.35	334.81	38.92	0.00
J45	1.30	335.72	41.07	0.00
J46	0.86	332.04	36.32	0.00

J47	0.16	333.47	38.09	0.00
J48	0.57	332.71	37.00	0.00
J49	0.87	330.45	35.25	0.00
J50	0.07	331.19	41.72	0.00
J51	0.98	342.82	50.25	0.00
J52	4.19	342.29	48.46	0.00
J53	0.29	341.21	47.89	0.00
J54	0.44	341.01	47.96	0.00
J55	0.46	342.46	49.37	0.00
J56	0.55	342.31	49.70	0.00
J57	0.41	342.32	50.30	0.00
J58	0.19	342.14	48.68	0.00
J59	0.00	342.14	48.68	0.00
J60	0.57	342.14	50.91	0.00
J61	0.36	341.95	49.50	0.00
J62	0.00	341.97	49.52	0.00
J63	0.01	341.78	49.85	0.00
J64	0.18	341.24	51.47	0.00
J65	0.71	341.62	50.42	0.00
J66	0.27	341.43	51.67	0.00
J67	0.28	341.32	50.95	0.00
J68	0.33	340.43	52.14	0.00
J69	0.37	340.43	52.05	0.00
J70	0.42	340.43	52.03	0.00
J71	0.87	339.58	50.71	0.00
J72	0.10	340.74	51.82	0.00
J73	0.18	340.35	51.62	0.00
J74	0.24	339.65	50.45	0.00
J75	0.12	339.18	50.00	0.00
J76	0.40	339.17	49.56	0.00
J77	0.03	337.70	48.52	0.00
J78	0.06	337.46	47.85	0.00
J79	0.50	336.47	46.83	0.00
J80	0.25	336.24	46.40	0.00
J81	0.12	337.01	48.01	0.00
J82	0.81	336.26	46.78	0.00
J83	0.27	336.08	46.51	0.00
J84	0.00	340.61	51.50	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	340.61	51.63	0.00
J86	0.02	340.51	51.29	0.00
J87	0.02	340.49	51.27	0.00
J88	0.22	340.49	51.21	0.00

J89	0.37	340.49	50.93	0.00
J90	0.23	340.51	51.16	0.00
J91	0.39	340.51	51.30	0.00
J92	0.02	340.51	51.11	0.00
J93	0.12	340.49	51.14	0.00
J94	0.22	340.49	51.33	0.00
J95	0.03	340.32	51.38	0.00
J96	0.03	339.67	50.52	0.00
J97	0.35	338.76	49.12	0.00
J98	0.31	336.19	46.25	0.00
J99	0.14	334.92	45.03	0.00
J100	0.35	334.96	44.98	0.00
J101	0.33	334.07	43.15	0.00
J102	0.20	334.35	44.04	0.00
J103	0.29	334.58	45.13	0.00
J104	0.19	334.58	44.55	0.00
J105	0.07	334.58	45.56	0.00
J106	0.12	334.57	44.99	0.00
J107	0.23	333.65	43.87	0.00
J108	0.23	333.69	43.49	0.00
J109	0.16	333.74	43.25	0.00
J110	0.21	332.71	43.06	0.00
J111	0.14	331.45	41.42	0.00
J112	0.10	331.35	41.56	0.00
J113	0.34	331.22	41.73	0.00
J114	0.00	329.84	40.40	0.00
J115	0.70	330.00	39.98	0.00
J116	0.16	329.45	39.81	0.00
J117	0.41	329.10	39.39	0.00
J118	0.24	328.77	39.20	0.00
J120	0.07	329.69	39.94	0.00
J121	0.19	329.47	39.23	0.00
J122	0.06	329.40	39.26	0.00
J124	0.00	329.61	38.26	0.00
J125	0.18	329.72	38.64	0.00
J126	0.27	329.84	39.32	0.00
J127	0.86	330.47	39.98	0.00
J128	0.10	329.68	37.86	0.00
J129	3.73	329.76	37.75	0.00
J130	0.54	330.11	38.93	0.00
J131	0.96	330.54	39.86	0.00
J132	0.25	330.93	40.35	0.00
J133	0.34	330.85	40.01	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential 2 Only MDD and FF S1 Model Results

J134	0.40	331.06	40.57	0.00
J135	0.48	331.00	40.78	0.00
J136	0.12	331.49	40.99	0.00
J137	0.18	331.98	42.88	0.00
J138	1.39	332.71	42.92	0.00
J139	0.18	333.99	43.52	0.00
FS	0.00	334.05	43.45	0.00
FD	0.00	334.02	43.42	0.00
J140	0.00	333.94	45.29	0.00
J141	0.22	333.88	45.88	0.00
J142	3.90	333.64	47.14	0.00
J143	0.51	333.49	47.21	0.00
J144	0.01	333.32	48.57	0.00
J145	0.00	333.28	48.71	0.00
J146	0.00	333.24	49.21	0.00
J147	0.03	333.22	49.32	0.00
J148	0.04	333.20	50.00	0.00
J149	0.09	333.18	50.29	0.00
J150	0.24	333.15	51.10	0.00
J151	0.01	333.21	48.81	0.00
J152	0.01	333.19	50.24	0.00
J153	0.00	333.18	51.03	0.00
J154	0.00	333.17	51.32	0.00
J155	0.01	333.16	52.56	0.00
J156	1.21	333.15	51.30	0.00
J157	0.00	333.12	51.62	0.00
J158	0.01	333.09	52.79	0.00
J159A	0.00	332.13	52.63	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

EPANet Future Residential 2 Only MDD and FF S1 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	38.00	317.59	24.57	0.00	
JFF2	38.00	328.77	39.20	0.00	
JFF3	26.81	341.21	47.89	0.00	
JFF4	0.00	340.51	51.11	0.00	
JFF5	0.00	340.43	52.03	0.00	
JFF6	0.00	333.16	52.56	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	38.00	326.85	33.09	0.00	
JFF9	0.00	342.14	50.91	0.00	
J119	0.30	329.27	39.54	0.00	
J123	0.00	329.58	39.70	0.00	
J183	0.26	328.67	35.70	0.00	
J184	0.00	329.63	35.33	0.00	
J185	0.09	329.46	36.52	0.00	
J186	0.39	329.18	36.00	0.00	
J187	0.22	329.46	35.86	0.00	
J188	0.15	329.38	35.99	0.00	
RES1	-136.66	287.05	0.00	0.00	Reservoir
RES2	-81.87	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	54.79	1.74	13.25	Open
PS2	81.87	1.67	9.40	Open
PS3	0.00	0.00	0.00	Open
PS4	81.87	1.67	9.40	Open
PD1	54.79	1.74	13.25	Open
PD2	81.87	1.67	9.40	Open
PD3	0.00	0.00	0.00	Open
PD4	81.87	1.67	9.40	Open
PD5	218.53	1.74	5.87	Open
PIPE1A	59.18	0.47	0.46	Open

EPANet Future Residential 2 Only MDD and FF S1 Model Results

PIPE1	44.39	2.51	36.43	Open
PIPE2	42.65	2.41	33.83	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	159.16	1.27	2.87	Open
PIPE5	55.51	1.13	4.58	Open
PIPE6	47.17	0.96	3.38	Open
PIPE7	73.88	2.35	23.05	Open
PIPE8	73.51	2.34	22.83	Open
PIPE9	21.43	1.21	9.46	Open
PIPE10	20.72	1.17	8.88	Open
PIPE11	20.00	1.13	8.32	Open
PIPE12	19.99	1.13	8.31	Open
PIPE13	19.91	1.13	8.25	Open
PIPE14	19.55	1.11	7.98	Open
PIPE15	19.21	1.09	7.72	Open
PIPE16	39.00	2.21	28.66	Open
PIPE17	38.68	2.19	28.23	Open
PIPE18	51.34	1.63	11.74	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	49.89	1.59	11.14	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	48.49	1.54	10.56	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	47.36	1.51	10.11	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	55.43	1.76	13.54	Open
PIPE27	36.48	2.06	25.33	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	35.47	2.01	24.04	Open
PIPE30	42.41	2.40	33.48	Open
PIPE31	-7.22	0.41	1.26	Open
PIPE32	14.79	0.84	4.76	Open
PIPE33	14.45	0.82	4.56	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	42.40	2.40	33.46	Open
PIPE39	10.90	0.62	2.70	Open
PIPE40	10.48	0.59	2.51	Open
PIPE41	10.10	1.29	16.93	Open
PIPE42	10.01	0.57	2.31	Open

PIPE43	9.94	0.56	2.28	Open
PIPE44	31.41	1.78	19.20	Open
PIPE45	-10.12	0.57	2.36	Open
PIPE46	19.99	1.13	8.31	Open
PIPE47	28.57	1.62	16.11	Open
PIPE48	18.91	1.07	7.50	Open
PIPE49	18.74	1.06	7.38	Open
PIPE50	18.17	1.03	6.97	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE51	26.02	1.47	13.55	Open
PIPE52	17.84	1.01	6.74	Open
PIPE53	19.87	1.12	8.22	Open
PIPE54	29.65	0.94	4.25	Open
PIPE55	28.67	0.91	3.99	Open
PIPE56	48.77	1.55	10.68	Open
PIPE57	21.67	0.69	2.38	Open
PIPE58	8.14	0.46	1.58	Open
PIPE59	7.68	0.43	1.41	Open
PIPE60	-10.85	0.22	0.22	Open
PIPE61	47.10	0.67	1.39	Open
PIPE62	-13.43	0.27	0.33	Open
PIPE63	12.57	0.26	0.29	Open
PIPE64	8.84	0.50	1.83	Open
PIPE65	34.13	0.70	1.86	Open
PIPE66	-0.54	0.03	0.01	Open
PIPE67	0.57	0.03	0.01	Open
PIPE68	9.19	0.52	1.97	Open
PIPE69	19.37	1.10	7.84	Open
PIPE70	33.02	0.67	1.75	Open
PIPE71	-10.54	0.60	2.54	Open
PIPE72	22.48	1.27	10.33	Open
PIPE73	15.37	0.87	5.11	Open
PIPE74	7.09	0.40	1.22	Open
PIPE75	6.39	0.36	1.00	Open
PIPE76	6.12	0.35	0.93	Open
PIPE77	5.83	0.33	0.85	Open
PIPE78	21.03	1.19	9.13	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	14.15	0.80	4.38	Open
PIPE82	18.41	0.59	1.76	Open
PIPE83	18.31	1.04	7.06	Open
PIPE84	-5.77	0.33	0.83	Open

PIPE85	16.82	0.95	6.04	Open
PIPE86	16.59	0.94	5.88	Open
PIPE87	13.28	0.75	3.90	Open
PIPE88	1.87	0.11	0.10	Open
PIPE89	27.87	1.58	15.39	Open
PIPE90	13.97	0.79	4.28	Open
PIPE91	13.91	0.79	4.25	Open
PIPE92	13.41	0.76	3.97	Open
PIPE93	13.87	0.78	4.23	Open
PIPE94	13.75	0.78	4.16	Open
PIPE95	12.94	0.73	3.72	Open
PIPE96	22.19	0.71	2.48	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	15.13	0.48	1.22	Open
PIPE99	6.91	0.39	1.16	Open
PIPE100	14.47	0.46	1.12	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	20.43	0.65	2.13	Open
PIPE109	-7.08	0.23	0.30	Open
PIPE110	27.48	1.55	14.98	Open
PIPE111	12.60	0.71	3.53	Open
PIPE112	14.06	0.80	4.33	Open
PIPE113	14.85	0.84	4.79	Open
PIPE114	28.56	1.62	16.10	Open
PIPE115	32.94	1.86	18.45	Open
PIPE116	-4.69	0.27	0.57	Open
PIPE117	8.46	0.48	1.69	Open
PIPE118	21.14	1.20	9.22	Open
PIPE119	20.78	1.18	8.93	Open
PIPE120	14.85	0.84	4.22	Open
PIPE121	14.65	0.83	4.11	Open
PIPE122	17.95	1.02	5.99	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	17.27	0.98	6.34	Open

PIPE127	-4.85	0.27	0.60	Open
PIPE128	-5.09	0.29	0.66	Open
PIPE129	-18.56	1.05	7.24	Open
PIPE130	21.89	1.24	9.83	Open
PIPE131	21.68	1.23	9.66	Open
PIPE132	5.46	0.31	0.75	Open
PIPE133	5.36	0.30	0.73	Open
PIPE134	5.01	0.28	0.64	Open
PIPE135	24.81	1.40	12.40	Open
PIPE136	-6.90	0.39	1.16	Open
PIPE137	23.58	0.75	2.45	Open
PIPE138	23.42	0.75	2.42	Open
PIPE139	23.01	0.73	2.34	Open
PIPE141	8.12	0.46	1.57	Open
PIPE142	8.05	0.46	1.54	Open
PIPE143	7.86	0.44	1.48	Open
PIPE147	-5.82	0.33	0.85	Open
PIPE148	-6.00	0.34	0.89	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	-6.27	0.35	0.97	Open
PIPE150	-13.86	0.78	4.22	Open
PIPE152	-6.29	0.36	0.98	Open
PIPE153	-10.02	0.57	2.31	Open
PIPE154	-10.56	0.60	2.55	Open
PIPE155	0.27	0.14	0.61	Open
PIPE156	-14.45	0.82	4.56	Open
PIPE157	16.08	0.91	5.55	Open
PIPE158	5.15	0.29	0.67	Open
PIPE159	-11.79	0.67	3.13	Open
PIPE160	-6.98	0.39	1.18	Open
PIPE161	-3.77	0.21	0.38	Open
PIPE162	-4.25	0.24	0.47	Open
PIPE163	-11.63	0.66	3.05	Open
PIPE164	-11.75	0.66	3.11	Open
PIPE165	-11.93	0.67	3.19	Open
PIPE166	-13.31	0.75	3.92	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

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PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	38.00	0.05	0.00	Open
PIPEFF2	38.00	0.05	0.00	Open
PIPEFF3	26.81	0.03	0.04	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	38.00	0.05	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	-19.51	1.10	6.99	Open
PIPE144	7.80	0.44	1.28	Open
PIPE145	-12.01	0.68	2.85	Open
PIPE146	-5.82	0.33	0.75	Open
PIPE151	-6.18	0.35	0.83	Open
PIPE215	4.28	0.24	0.42	Open
PIPE216	20.15	1.14	7.42	Open
PIPE217	16.97	0.96	5.40	Open
PIPE218	10.78	0.61	2.33	Open
PIPE219	6.73	0.38	0.97	Open
PIPE220	6.19	0.35	0.84	Open
PIPE221	5.97	0.34	0.78	Open
PIPE222	3.96	0.22	0.36	Open
PIPE223	9.78	0.55	1.95	Open
PIPE224	16.12	0.91	4.91	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	54.79	0.00	-56.46	Open Pump
PUMP2	81.87	0.00	-56.42	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	81.87	0.00	-56.42	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	34.03	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential 2 Only MDD and FF S2 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential 2 MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	40.43	40.43	0.00
PUMP2	100.00	75.00	0.20	60.37	60.37	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.20	60.37	60.37	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.98	-7.32	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.44	49.14	0.00
D2	0.00	343.42	49.12	0.00
D3	0.00	343.38	49.08	0.00
D4	0.00	343.42	49.12	0.00
DH	0.00	343.38	49.08	0.00
J1A	0.19	343.32	50.12	0.00
J1	0.00	343.31	50.07	0.00
J2	0.20	342.53	49.32	0.00
J3	0.10	341.93	48.75	0.00
J4	0.15	341.93	48.81	0.00

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J5	0.12	343.09	50.52	0.00
J6	0.20	341.82	50.73	0.00
J7	0.06	341.73	50.77	0.00
J8	0.37	342.67	49.32	0.00
J9	0.74	342.05	48.39	0.00
J10	0.71	341.77	49.04	0.00
J11	0.72	341.50	46.90	0.00
J12	0.01	341.27	45.85	0.00
J13	0.08	341.16	45.78	0.00
J14	0.36	340.95	44.23	0.00
J15	0.34	340.75	43.58	0.00
J16	0.35	340.10	45.90	0.00
J17	0.32	340.10	48.95	0.00
J18	0.68	340.09	47.07	0.00
J19	0.38	341.78	47.12	0.00
J20	1.06	341.78	46.43	0.00
J21	0.28	341.57	47.84	0.00
J22	1.12	341.57	46.14	0.00
J23	0.19	341.38	48.19	0.00
J24	0.93	341.38	45.80	0.00
J25	0.10	341.21	47.82	0.00
J26	1.95	341.20	47.86	0.00
J27	0.04	340.97	46.47	0.00
J28	0.16	340.85	46.64	0.00
J29	0.85	340.85	45.32	0.00
J30	0.28	340.56	45.51	0.00
J31	4.41	340.50	46.74	0.00
J32	0.96	340.37	45.06	0.00
J33	0.34	341.88	48.33	0.00
J34	0.34	341.15	46.19	0.00
J35	0.05	341.15	45.32	0.00
J36	0.62	341.15	44.63	0.00
J37	0.34	342.52	48.33	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	342.51	45.92	0.00
J39	0.09	341.64	48.42	0.00
J40	0.42	341.54	47.03	0.00
J41	0.38	341.48	45.58	0.00
J42	0.09	341.14	45.00	0.00
J43	0.07	341.09	45.10	0.00
J44	1.35	341.04	45.15	0.00
J45	1.30	341.28	46.63	0.00
J46	0.86	340.39	44.67	0.00

J47	0.16	340.82	45.44	0.00
J48	0.57	340.58	44.87	0.00
J49	0.87	340.34	45.14	0.00
J50	0.07	339.59	50.12	0.00
J51	0.98	342.37	49.80	0.00
J52	4.19	341.07	47.24	0.00
J53	0.29	339.36	46.04	0.00
J54	0.44	338.88	45.83	0.00
J55	0.46	341.44	48.35	0.00
J56	0.55	341.07	48.46	0.00
J57	0.41	341.07	49.05	0.00
J58	0.19	340.38	46.92	0.00
J59	0.00	340.37	46.91	0.00
J60	0.57	336.52	45.29	0.00
J61	0.36	340.10	47.65	0.00
J62	0.00	340.12	47.67	0.00
J63	0.01	339.83	47.90	0.00
J64	0.18	338.95	49.18	0.00
J65	0.71	339.59	48.39	0.00
J66	0.27	339.28	49.52	0.00
J67	0.28	339.09	48.72	0.00
J68	0.33	337.65	49.36	0.00
J69	0.37	333.18	44.80	0.00
J70	0.42	328.79	40.39	0.00
J71	0.87	337.70	48.83	0.00
J72	0.10	338.45	49.53	0.00
J73	0.18	337.84	49.11	0.00
J74	0.24	337.78	48.58	0.00
J75	0.12	337.74	48.56	0.00
J76	0.40	337.75	48.14	0.00
J77	0.03	337.73	48.55	0.00
J78	0.06	337.73	48.12	0.00
J79	0.50	337.73	48.09	0.00
J80	0.25	337.73	47.89	0.00
J81	0.12	337.72	48.72	0.00
J82	0.81	337.71	48.23	0.00
J83	0.27	337.71	48.14	0.00
J84	0.00	338.01	48.90	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	338.01	49.03	0.00
J86	0.02	337.75	48.53	0.00
J87	0.02	337.77	48.55	0.00
J88	0.22	337.77	48.49	0.00

J89	0.37	337.77	48.21	0.00
J90	0.23	336.29	46.94	0.00
J91	0.39	336.01	46.80	0.00
J92	0.02	333.59	44.19	0.00
J93	0.12	337.77	48.42	0.00
J94	0.22	337.77	48.61	0.00
J95	0.03	337.79	48.85	0.00
J96	0.03	337.77	48.62	0.00
J97	0.35	337.75	48.11	0.00
J98	0.31	337.74	47.80	0.00
J99	0.14	337.75	47.86	0.00
J100	0.35	337.69	47.71	0.00
J101	0.33	337.68	46.76	0.00
J102	0.20	337.70	47.39	0.00
J103	0.29	337.79	48.34	0.00
J104	0.19	337.79	47.76	0.00
J105	0.07	337.79	48.77	0.00
J106	0.12	337.77	48.19	0.00
J107	0.23	337.93	48.15	0.00
J108	0.23	337.86	47.66	0.00
J109	0.16	337.81	47.32	0.00
J110	0.21	338.25	48.60	0.00
J111	0.14	338.71	48.68	0.00
J112	0.10	339.03	49.24	0.00
J113	0.34	339.46	49.97	0.00
J114	0.00	339.40	49.96	0.00
J115	0.70	339.13	49.11	0.00
J116	0.16	339.41	49.77	0.00
J117	0.41	339.42	49.71	0.00
J118	0.24	339.43	49.86	0.00
J120	0.07	339.38	49.63	0.00
J121	0.19	339.36	49.12	0.00
J122	0.06	339.35	49.21	0.00
J124	0.00	339.15	47.80	0.00
J125	0.18	339.14	48.06	0.00
J126	0.27	339.13	48.61	0.00
J127	0.86	338.89	48.40	0.00
J128	0.10	338.99	47.17	0.00
J129	3.73	338.86	46.85	0.00
J130	0.54	338.80	47.62	0.00
J131	0.96	338.74	48.06	0.00
J132	0.25	338.73	48.15	0.00
J133	0.34	338.72	47.88	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.40	338.63	48.14	0.00
J135	0.48	338.67	48.45	0.00
J136	0.12	338.46	47.96	0.00
J137	0.18	338.27	49.17	0.00
J138	1.39	338.00	48.21	0.00
J139	0.18	337.60	47.13	0.00
FS	0.00	337.65	47.05	0.00
FD	0.00	337.62	47.02	0.00
J140	0.00	337.54	48.89	0.00
J141	0.22	337.48	49.48	0.00
J142	3.90	337.25	50.75	0.00
J143	0.51	337.10	50.82	0.00
J144	0.01	336.93	52.18	0.00
J145	0.00	336.89	52.32	0.00
J146	0.00	336.84	52.81	0.00
J147	0.03	336.82	52.92	0.00
J148	0.04	336.81	53.61	0.00
J149	0.09	336.78	53.89	0.00
J150	0.24	336.75	54.70	0.00
J151	0.01	336.81	52.41	0.00
J152	0.01	336.80	53.85	0.00
J153	0.00	336.78	54.63	0.00
J154	0.00	336.77	54.92	0.00
J155	0.01	336.76	56.16	0.00
J156	1.21	336.75	54.90	0.00
J157	0.00	336.72	55.22	0.00
J158	0.01	336.69	56.39	0.00
J159A	0.00	335.73	56.23	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	340.09	47.07	0.00	
JFF2	0.00	339.43	49.86	0.00	
JFF3	26.81	339.36	46.04	0.00	
JFF4	38.00	333.59	44.19	0.00	
JFF5	38.00	328.79	40.39	0.00	
JFF6	0.00	336.76	56.16	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	340.50	46.74	0.00	
JFF9	38.00	336.52	45.29	0.00	
J119	0.30	339.34	49.61	0.00	
J123	0.00	339.15	49.27	0.00	
J183	0.26	340.04	47.07	0.00	
J184	0.00	340.19	45.89	0.00	
J185	0.09	340.16	47.22	0.00	
J186	0.39	340.12	46.94	0.00	
J187	0.22	340.16	46.56	0.00	
J188	0.15	340.15	46.76	0.00	
RES1	-136.66	287.05	0.00	0.00	Reservoir
RES2	-81.87	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	54.79	1.74	13.25	Open
PS2	81.87	1.67	9.40	Open
PS3	0.00	0.00	0.00	Open
PS4	81.87	1.67	9.40	Open
PD1	54.79	1.74	13.25	Open
PD2	81.87	1.67	9.40	Open
PD3	0.00	0.00	0.00	Open
PD4	81.87	1.67	9.40	Open
PD5	218.53	1.74	5.87	Open
PIPE1A	45.11	0.36	0.28	Open

PIPE1	22.48	1.27	10.33	Open
PIPE2	20.74	1.17	8.90	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	173.23	1.38	3.36	Open
PIPE5	90.88	1.85	11.41	Open
PIPE6	77.50	1.58	8.49	Open
PIPE7	34.86	1.11	5.73	Open
PIPE8	34.49	1.10	5.62	Open
PIPE9	9.40	0.53	2.06	Open
PIPE10	8.69	0.49	1.78	Open
PIPE11	7.97	0.45	1.52	Open
PIPE12	7.96	0.45	1.51	Open
PIPE13	7.88	0.45	1.48	Open
PIPE14	7.52	0.43	1.36	Open
PIPE15	7.18	0.41	1.25	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	24.34	0.77	2.95	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	22.89	0.73	2.63	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	21.49	0.68	2.34	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	20.37	0.65	2.12	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	22.03	0.70	2.45	Open
PIPE27	11.88	0.67	3.17	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	10.87	0.61	2.69	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	6.18	0.35	0.94	Open
PIPE32	22.63	1.28	10.46	Open
PIPE33	22.28	1.26	10.17	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	20.49	1.16	8.70	Open
PIPE39	5.57	0.32	0.78	Open
PIPE40	5.15	0.29	0.67	Open
PIPE41	4.77	0.61	4.22	Open
PIPE42	4.69	0.27	0.57	Open

PIPE43	4.61	0.26	0.55	Open
PIPE44	14.83	0.84	4.78	Open
PIPE45	-3.72	0.21	0.37	Open
PIPE46	9.81	0.55	2.22	Open
PIPE47	13.07	0.74	3.78	Open
PIPE48	10.11	0.57	2.35	Open
PIPE49	9.95	0.56	2.28	Open
PIPE50	9.38	0.53	2.05	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.36	0.13	0.16	Open
PIPE52	7.58	0.43	1.38	Open
PIPE53	19.23	1.09	7.74	Open
PIPE54	47.37	1.51	10.12	Open
PIPE55	46.40	1.48	9.74	Open
PIPE56	62.42	1.99	16.87	Open
PIPE57	35.32	1.12	5.88	Open
PIPE58	13.18	0.75	3.84	Open
PIPE59	12.72	0.72	3.60	Open
PIPE60	1.06	0.02	0.00	Open
PIPE61	77.43	1.10	3.49	Open
PIPE62	-21.27	0.43	0.77	Open
PIPE63	5.33	0.11	0.06	Open
PIPE64	18.55	1.05	7.24	Open
PIPE65	71.70	1.46	7.35	Open
PIPE66	7.07	0.40	1.21	Open
PIPE67	38.57	2.18	37.35	Open
PIPE68	11.28	0.64	2.88	Open
PIPE69	22.37	1.27	10.24	Open
PIPE70	40.21	0.82	2.52	Open
PIPE71	-11.45	0.65	2.96	Open
PIPE72	28.76	1.63	16.30	Open
PIPE73	19.80	1.12	8.17	Open
PIPE74	8.94	0.51	1.87	Open
PIPE75	8.24	0.47	1.61	Open
PIPE76	7.97	0.45	1.51	Open
PIPE77	7.69	0.43	1.42	Open
PIPE78	27.31	1.55	14.82	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	-3.02	0.17	0.25	Open
PIPE82	23.42	0.75	2.74	Open
PIPE83	23.31	1.32	11.05	Open
PIPE84	8.78	0.50	1.81	Open

PIPE85	4.43	0.25	0.51	Open
PIPE86	4.19	0.24	0.46	Open
PIPE87	-3.89	0.22	0.40	Open
PIPE88	-1.90	0.11	0.11	Open
PIPE89	2.08	0.12	0.13	Open
PIPE90	0.68	0.04	0.02	Open
PIPE91	0.62	0.04	0.01	Open
PIPE92	0.12	0.01	0.00	Open
PIPE93	1.37	0.08	0.06	Open
PIPE94	1.25	0.07	0.05	Open
PIPE95	0.45	0.03	0.01	Open
PIPE96	33.84	1.08	5.43	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	23.93	0.76	2.86	Open
PIPE99	9.76	0.55	2.21	Open
PIPE100	-14.73	0.47	1.16	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	-5.92	0.19	0.22	Open
PIPE109	-9.92	0.32	0.56	Open
PIPE110	3.97	0.22	0.42	Open
PIPE111	2.12	0.12	0.13	Open
PIPE112	-0.18	0.01	0.00	Open
PIPE113	1.82	0.10	0.10	Open
PIPE114	1.28	0.07	0.05	Open
PIPE115	-1.49	0.08	0.06	Open
PIPE116	2.46	0.14	0.17	Open
PIPE117	2.32	0.13	0.15	Open
PIPE118	2.50	0.14	0.18	Open
PIPE119	2.14	0.12	0.13	Open
PIPE120	3.93	0.22	0.36	Open
PIPE121	3.72	0.21	0.33	Open
PIPE122	-5.56	0.31	0.68	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-6.23	0.35	0.96	Open

PIPE127	5.92	0.33	0.87	Open
PIPE128	5.68	0.32	0.81	Open
PIPE129	11.01	0.62	2.75	Open
PIPE130	-12.38	0.70	3.43	Open
PIPE131	-12.59	0.71	3.53	Open
PIPE132	-10.20	0.58	2.39	Open
PIPE133	-10.30	0.58	2.43	Open
PIPE134	-10.64	0.60	2.59	Open
PIPE135	8.52	0.48	1.71	Open
PIPE136	9.13	0.52	1.95	Open
PIPE137	-3.08	0.10	0.06	Open
PIPE138	-3.24	0.10	0.06	Open
PIPE139	-3.65	0.12	0.08	Open
PIPE141	2.46	0.14	0.17	Open
PIPE142	2.39	0.14	0.16	Open
PIPE143	2.20	0.12	0.14	Open
PIPE147	1.51	0.09	0.07	Open
PIPE148	1.34	0.08	0.06	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	1.07	0.06	0.04	Open
PIPE150	9.50	0.54	2.10	Open
PIPE152	7.76	0.44	1.44	Open
PIPE153	4.03	0.23	0.43	Open
PIPE154	3.49	0.20	0.33	Open
PIPE155	-0.40	0.20	1.24	Open
PIPE156	8.24	0.47	1.61	Open
PIPE157	-2.54	0.14	0.18	Open
PIPE158	1.86	0.11	0.10	Open
PIPE159	2.93	0.17	0.24	Open
PIPE160	4.44	0.25	0.51	Open
PIPE161	3.59	0.20	0.35	Open
PIPE162	3.11	0.18	0.27	Open
PIPE163	7.16	0.41	1.24	Open
PIPE164	7.05	0.40	1.20	Open
PIPE165	6.86	0.39	1.15	Open
PIPE166	5.48	0.31	0.76	Open
PIPE167	16.54	0.34	0.43	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	16.36	0.33	0.42	Open
PIPE169	16.36	0.33	0.42	Open
PIPE170	16.14	0.33	0.41	Open
PIPE171	12.24	0.25	0.24	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

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PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	26.81	0.03	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	38.00	0.05	0.00	Open
PIPE140	7.54	0.43	1.20	Open
PIPE144	2.14	0.12	0.12	Open
PIPE145	9.38	0.53	1.80	Open
PIPE146	1.51	0.09	0.06	Open
PIPE151	7.87	0.45	1.30	Open
PIPE215	-11.42	0.65	2.60	Open
PIPE216	-5.83	0.33	0.75	Open
PIPE217	6.71	0.38	0.97	Open
PIPE218	4.23	0.24	0.41	Open
PIPE219	2.57	0.15	0.16	Open
PIPE220	2.48	0.14	0.15	Open
PIPE221	2.26	0.13	0.13	Open
PIPE222	1.57	0.09	0.07	Open
PIPE223	3.67	0.21	0.32	Open
PIPE224	5.86	0.33	0.75	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	54.79	0.00	-56.46	Open Pump
PUMP2	81.87	0.00	-56.42	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	81.87	0.00	-56.42	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	37.64	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

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*********************************************************************
*                            E P A N E T                            *
*                    Hydraulic and Water Quality                    *
*                    Analysis for Pipe Networks                     *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Residential 2 MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

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PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	32.09	32.09	0.00
PUMP2	100.00	75.00	0.21	53.70	53.70	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.21	53.70	53.70	0.00
PUMP5	100.00	75.00	0.07	14.07	14.07	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	287.01	-7.29	0.00
S2	0.00	287.02	-7.28	0.00
S3	0.00	287.05	-7.25	0.00
S4	0.00	287.02	-7.28	0.00
D1	0.00	346.13	51.83	0.00
D2	0.00	346.12	51.82	0.00
D3	0.00	346.09	51.79	0.00
D4	0.00	346.12	51.82	0.00
DH	0.00	346.09	51.79	0.00
J1A	0.19	346.05	52.85	0.00
J1	0.00	346.04	52.80	0.00
J2	0.20	345.13	51.92	0.00
J3	0.10	344.41	51.23	0.00
J4	0.15	344.41	51.29	0.00

J5	0.12	345.90	53.33	0.00
J6	0.20	345.20	54.11	0.00
J7	0.06	345.15	54.19	0.00
J8	0.37	345.38	52.03	0.00
J9	0.74	344.62	50.96	0.00
J10	0.71	344.27	51.54	0.00
J11	0.72	343.93	49.33	0.00
J12	0.01	343.64	48.22	0.00
J13	0.08	343.50	48.12	0.00
J14	0.36	343.23	46.51	0.00
J15	0.34	342.96	45.79	0.00
J16	0.35	342.11	47.91	0.00
J17	0.32	342.10	50.95	0.00
J18	0.68	342.10	49.08	0.00
J19	0.38	344.29	49.63	0.00
J20	1.06	344.28	48.93	0.00
J21	0.28	344.02	50.29	0.00
J22	1.12	344.02	48.59	0.00
J23	0.19	343.78	50.59	0.00
J24	0.93	343.78	48.20	0.00
J25	0.10	343.56	50.17	0.00
J26	1.95	343.55	50.21	0.00
J27	0.04	343.26	48.76	0.00
J28	0.16	343.12	48.91	0.00
J29	0.85	343.12	47.59	0.00
J30	0.28	342.74	47.69	0.00
J31	4.41	342.69	48.93	0.00
J32	0.96	342.47	47.16	0.00
J33	0.34	345.23	51.68	0.00
J34	0.34	344.83	49.87	0.00
J35	0.05	344.83	49.00	0.00
J36	0.62	344.82	48.30	0.00
J37	0.34	345.12	50.93	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	345.11	48.52	0.00
J39	0.09	344.07	50.85	0.00
J40	0.42	343.94	49.43	0.00
J41	0.38	343.87	47.97	0.00
J42	0.09	343.46	47.32	0.00
J43	0.07	343.39	47.40	0.00
J44	1.35	343.33	47.44	0.00
J45	1.30	343.64	48.99	0.00
J46	0.86	342.49	46.77	0.00

J47	0.16	343.06	47.68	0.00
J48	0.57	342.75	47.04	0.00
J49	0.87	342.43	47.23	0.00
J50	0.07	341.37	51.90	0.00
J51	0.98	345.49	52.92	0.00
J52	4.19	344.78	50.95	0.00
J53	0.29	343.66	50.34	0.00
J54	0.44	342.75	49.70	0.00
J55	0.46	344.99	51.90	0.00
J56	0.55	344.79	52.18	0.00
J57	0.41	344.79	52.77	0.00
J58	0.19	344.48	51.02	0.00
J59	0.00	344.48	51.02	0.00
J60	0.57	344.47	53.24	0.00
J61	0.36	344.14	51.69	0.00
J62	0.00	344.17	51.72	0.00
J63	0.01	343.78	51.85	0.00
J64	0.18	342.61	52.84	0.00
J65	0.71	343.46	52.26	0.00
J66	0.27	343.04	53.28	0.00
J67	0.28	342.79	52.42	0.00
J68	0.33	340.85	52.56	0.00
J69	0.37	337.50	49.12	0.00
J70	0.42	334.21	45.81	0.00
J71	0.87	340.58	51.71	0.00
J72	0.10	342.05	53.13	0.00
J73	0.18	341.05	52.32	0.00
J74	0.24	340.70	51.50	0.00
J75	0.12	340.46	51.28	0.00
J76	0.40	340.46	50.85	0.00
J77	0.03	339.82	50.64	0.00
J78	0.06	339.73	50.12	0.00
J79	0.50	339.33	49.69	0.00
J80	0.25	339.25	49.41	0.00
J81	0.12	339.51	50.51	0.00
J82	0.81	339.17	49.69	0.00
J83	0.27	339.09	49.52	0.00
J84	0.00	341.41	52.30	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	341.41	52.43	0.00
J86	0.02	341.03	51.81	0.00
J87	0.02	341.03	51.81	0.00
J88	0.22	341.03	51.75	0.00

J89	0.37	341.03	51.47	0.00
J90	0.23	339.94	50.59	0.00
J91	0.39	339.72	50.51	0.00
J92	0.02	337.92	48.52	0.00
J93	0.12	341.03	51.68	0.00
J94	0.22	341.03	51.87	0.00
J95	0.03	341.00	52.06	0.00
J96	0.03	340.70	51.55	0.00
J97	0.35	340.30	50.66	0.00
J98	0.31	339.25	49.31	0.00
J99	0.14	338.90	49.01	0.00
J100	0.35	338.38	48.40	0.00
J101	0.33	337.83	46.91	0.00
J102	0.20	338.18	47.87	0.00
J103	0.29	338.90	49.45	0.00
J104	0.19	338.90	48.87	0.00
J105	0.07	338.90	49.88	0.00
J106	0.12	338.89	49.31	0.00
J107	0.23	338.91	49.13	0.00
J108	0.23	338.59	48.39	0.00
J109	0.16	338.29	47.80	0.00
J110	0.21	339.41	49.76	0.00
J111	0.14	340.10	50.07	0.00
J112	0.10	340.56	50.77	0.00
J113	0.34	341.19	51.70	0.00
J114	0.00	341.12	51.68	0.00
J115	0.70	340.73	50.71	0.00
J116	0.16	341.13	51.49	0.00
J117	0.41	341.15	51.44	0.00
J118	0.24	341.16	51.59	0.00
J120	0.07	341.10	51.35	0.00
J121	0.19	341.07	50.83	0.00
J122	0.06	341.06	50.92	0.00
J124	0.00	340.77	49.42	0.00
J125	0.18	340.76	49.68	0.00
J126	0.27	340.74	50.22	0.00
J127	0.86	340.38	49.89	0.00
J128	0.10	340.55	48.73	0.00
J129	3.73	340.38	48.37	0.00
J130	0.54	340.27	49.09	0.00
J131	0.96	340.16	49.48	0.00
J132	0.25	340.13	49.55	0.00
J133	0.34	340.11	49.27	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.40	339.95	49.46	0.00
J135	0.48	340.01	49.79	0.00
J136	0.12	339.62	49.12	0.00
J137	0.18	339.25	50.15	0.00
J138	1.39	338.74	48.95	0.00
J139	0.18	356.83	66.36	0.00
FS	0.00	337.24	46.64	0.00
FD	0.00	356.98	66.38	0.00
J140	0.00	356.29	67.64	0.00
J141	0.22	355.73	67.73	0.00
J142	3.90	353.54	67.04	0.00
J143	0.51	351.49	65.21	0.00
J144	0.01	349.04	64.29	0.00
J145	0.00	348.48	63.91	0.00
J146	0.00	347.80	63.77	0.00
J147	0.03	347.55	63.65	0.00
J148	0.04	347.39	64.19	0.00
J149	0.09	347.15	64.26	0.00
J150	0.24	346.80	64.75	0.00
J151	0.01	346.96	62.56	0.00
J152	0.01	346.20	63.25	0.00
J153	0.00	345.54	63.39	0.00
J154	0.00	345.10	63.25	0.00
J155	0.01	344.66	64.06	0.00
J156	1.21	345.79	63.94	0.00
J157	0.00	346.77	65.27	0.00
J158	0.01	346.74	66.44	0.00
J159A	0.00	345.78	66.28	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	231.58	26.48	0.00
J162	0.03	230.82	25.42	0.00
J163	0.16	229.71	24.61	0.00
J164	0.06	229.37	23.47	0.00
J165	0.06	229.21	22.61	0.00
J166	0.07	229.32	22.82	0.00
J167	0.04	229.26	23.26	0.00
J168	0.09	228.43	23.53	0.00
J169	0.10	227.80	21.10	0.00
J170	0.00	229.69	32.69	0.00
J171	0.16	229.69	29.69	0.00
J172	0.00	229.68	36.68	0.00
J173	0.00	229.67	39.67	0.00
J174	0.04	229.67	38.97	0.00
J175	0.10	229.66	38.56	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	229.66	40.66	0.00	
J177	0.07	229.67	36.97	0.00	
J178	0.07	229.67	37.77	0.00	
J179	0.01	229.67	37.57	0.00	
J180	0.04	229.68	39.78	0.00	
J181	0.01	229.67	39.57	0.00	
J182	0.18	229.67	35.17	0.00	
JFS	0.00	231.62	26.52	0.00	
JFF1	0.00	342.10	49.08	0.00	
JFF2	0.00	341.16	51.59	0.00	
JFF3	0.00	343.66	50.34	0.00	
JFF4	32.41	337.92	48.52	0.00	
JFF5	32.41	334.21	45.81	0.00	
JFF6	38.00	344.66	64.06	0.00	
JFF7	38.00	227.80	21.10	0.00	
JFF8	0.00	342.69	48.93	0.00	
JFF9	0.00	344.47	53.24	0.00	
J119	0.30	341.04	51.31	0.00	
J123	0.00	340.78	50.90	0.00	
J183	0.26	342.02	49.05	0.00	
J184	0.00	342.24	47.94	0.00	
J185	0.09	342.20	49.26	0.00	
J186	0.39	342.13	48.95	0.00	
J187	0.22	342.19	48.59	0.00	
J188	0.15	342.18	48.79	0.00	
RES1	-111.03	287.05	0.00	0.00	Reservoir
RES2	-69.51	287.05	0.00	0.00	Reservoir
TANK1	-33.16	231.61	26.51	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	41.53	1.32	7.93	Open
PS2	69.51	1.42	6.94	Open
PS3	0.00	0.00	0.00	Open
PS4	69.51	1.42	6.94	Open
PD1	41.53	1.32	7.93	Open
PD2	69.51	1.42	6.94	Open
PD3	0.00	0.00	0.00	Open
PD4	69.51	1.42	6.94	Open
PD5	180.54	1.44	4.12	Open
PIPE1A	41.13	0.33	0.23	Open

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PIPE1	24.53	1.39	12.14	Open
PIPE2	22.79	1.29	10.59	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	139.22	1.11	2.24	Open
PIPE5	65.67	1.34	6.25	Open
PIPE6	55.89	1.14	4.64	Open
PIPE7	38.92	1.24	7.03	Open
PIPE8	38.55	1.23	6.91	Open
PIPE9	10.55	0.60	2.55	Open
PIPE10	9.84	0.56	2.24	Open
PIPE11	9.12	0.52	1.94	Open
PIPE12	9.11	0.52	1.94	Open
PIPE13	9.03	0.51	1.91	Open
PIPE14	8.67	0.49	1.77	Open
PIPE15	8.33	0.47	1.64	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	27.25	0.87	3.63	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	25.81	0.82	3.29	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	24.40	0.78	2.96	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	23.28	0.74	2.71	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	25.04	0.80	3.11	Open
PIPE27	13.28	0.75	3.90	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	12.27	0.69	3.36	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	7.58	0.43	1.38	Open
PIPE32	16.61	0.94	5.90	Open
PIPE33	16.26	0.92	5.67	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	22.53	1.28	10.38	Open
PIPE39	6.14	0.35	0.93	Open
PIPE40	5.72	0.32	0.82	Open
PIPE41	5.34	0.68	5.20	Open
PIPE42	5.25	0.30	0.70	Open

PIPE43	5.18	0.29	0.68	Open
PIPE44	16.30	0.92	5.70	Open
PIPE45	-3.82	0.22	0.39	Open
PIPE46	11.18	0.63	2.83	Open
PIPE47	15.01	0.85	4.89	Open
PIPE48	11.72	0.66	3.09	Open
PIPE49	11.56	0.65	3.01	Open
PIPE50	10.99	0.62	2.74	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.13	0.12	0.13	Open
PIPE52	8.75	0.49	1.80	Open
PIPE53	23.02	1.30	10.79	Open
PIPE54	34.51	1.10	5.63	Open
PIPE55	33.53	1.07	5.34	Open
PIPE56	49.87	1.59	11.13	Open
PIPE57	49.58	1.58	11.01	Open
PIPE58	9.58	0.54	2.13	Open
PIPE59	9.12	0.52	1.94	Open
PIPE60	-5.28	0.11	0.06	Open
PIPE61	55.83	0.79	1.90	Open
PIPE62	-15.25	0.31	0.42	Open
PIPE63	8.84	0.18	0.15	Open
PIPE64	12.13	0.69	3.29	Open
PIPE65	46.58	0.95	3.31	Open
PIPE66	-0.50	0.03	0.01	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	12.43	0.70	3.45	Open
PIPE69	24.03	1.36	11.69	Open
PIPE70	45.51	0.93	3.17	Open
PIPE71	-11.96	0.68	3.21	Open
PIPE72	33.56	1.90	21.70	Open
PIPE73	23.18	1.31	10.94	Open
PIPE74	10.36	0.59	2.46	Open
PIPE75	9.65	0.55	2.16	Open
PIPE76	9.38	0.53	2.05	Open
PIPE77	9.10	0.51	1.93	Open
PIPE78	32.11	1.82	19.99	Open
PIPE79	33.19	1.88	21.26	Open
PIPE80	32.83	1.86	20.83	Open
PIPE81	7.64	0.43	1.40	Open
PIPE82	30.54	0.97	4.49	Open
PIPE83	30.43	1.72	18.11	Open
PIPE84	9.06	0.51	1.92	Open

PIPE85	11.61	0.66	3.04	Open
PIPE86	11.37	0.64	2.92	Open
PIPE87	6.78	0.38	1.12	Open
PIPE88	0.35	0.02	0.00	Open
PIPE89	17.67	1.00	6.61	Open
PIPE90	8.51	0.48	1.71	Open
PIPE91	8.45	0.48	1.69	Open
PIPE92	7.94	0.45	1.50	Open
PIPE93	9.13	0.52	1.95	Open
PIPE94	9.01	0.51	1.90	Open
PIPE95	8.20	0.46	1.60	Open
PIPE96	42.64	1.36	8.33	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	29.86	0.95	4.30	Open
PIPE99	12.63	0.71	3.55	Open
PIPE100	-3.21	0.10	0.07	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	33.05	1.05	5.20	Open
PIPE104	32.82	1.04	5.13	Open
PIPE105	32.43	1.83	20.36	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	8.46	0.27	0.42	Open
PIPE109	-9.59	0.31	0.53	Open
PIPE110	18.02	1.02	6.86	Open
PIPE111	8.48	0.48	1.70	Open
PIPE112	8.43	0.48	1.68	Open
PIPE113	9.52	0.54	2.10	Open
PIPE114	17.59	1.00	6.56	Open
PIPE115	16.45	0.93	5.10	Open
PIPE116	0.83	0.05	0.02	Open
PIPE117	8.52	0.48	1.71	Open
PIPE118	16.45	0.93	5.80	Open
PIPE119	16.10	0.91	5.57	Open
PIPE120	16.89	0.96	5.36	Open
PIPE121	16.69	0.94	5.24	Open
PIPE122	-0.58	0.03	0.01	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-1.26	0.07	0.05	Open

PIPE127	14.01	0.79	4.31	Open
PIPE128	13.78	0.78	4.17	Open
PIPE129	22.08	1.25	10.00	Open
PIPE130	-15.51	0.88	5.19	Open
PIPE131	-15.72	0.89	5.32	Open
PIPE132	-12.52	0.71	3.50	Open
PIPE133	-12.62	0.71	3.55	Open
PIPE134	-12.97	0.73	3.73	Open
PIPE135	9.98	0.56	2.29	Open
PIPE136	11.03	0.62	2.76	Open
PIPE137	-3.91	0.12	0.09	Open
PIPE138	-4.07	0.13	0.09	Open
PIPE139	-4.48	0.14	0.11	Open
PIPE141	2.86	0.16	0.23	Open
PIPE142	2.79	0.16	0.22	Open
PIPE143	2.60	0.15	0.19	Open
PIPE147	1.97	0.11	0.11	Open
PIPE148	1.79	0.10	0.10	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	1.52	0.09	0.07	Open
PIPE150	11.85	0.67	3.16	Open
PIPE152	9.19	0.52	1.97	Open
PIPE153	5.46	0.31	0.75	Open
PIPE154	4.92	0.28	0.62	Open
PIPE155	-0.49	0.25	1.79	Open
PIPE156	10.50	0.59	2.52	Open
PIPE157	-3.34	0.19	0.30	Open
PIPE158	2.08	0.12	0.13	Open
PIPE159	4.45	0.25	0.51	Open
PIPE160	6.18	0.35	0.95	Open
PIPE161	4.83	0.27	0.60	Open
PIPE162	4.36	0.25	0.49	Open
PIPE163	10.14	0.57	2.37	Open
PIPE164	10.03	0.57	2.32	Open
PIPE165	9.85	0.56	2.24	Open
PIPE166	8.46	0.48	1.69	Open
PIPE167	0.00	0.00	0.00	Closed
PFS	54.54	1.11	3.90	Open
PFD	54.54	1.11	3.90	Open
PIPE168	54.36	1.11	3.88	Open
PIPE169	54.36	1.11	3.88	Open
PIPE170	54.14	1.10	3.85	Open
PIPE171	50.24	1.02	3.35	Open

PIPE172	49.73	1.01	3.29	Open
PIPE173	49.71	1.01	3.28	Open
PIPE174	49.71	1.01	3.28	Open
PIPE175	49.71	1.01	3.28	Open
PIPE176	33.76	0.69	1.60	Open
PIPE177	33.71	0.69	1.60	Open
PIPE178	33.63	0.69	1.59	Open
PIPE179	15.93	0.90	4.80	Open
PIPE180	15.92	0.90	4.80	Open
PIPE181	15.91	0.90	4.79	Open
PIPE182	15.91	0.90	4.79	Open
PIPE183	15.91	0.90	4.79	Open
PIPE184	-22.10	1.25	8.81	Open
PIPE185	-23.31	1.32	9.73	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	43.16	1.37	8.52	Open
PIPE190	43.02	1.37	7.45	Open
PIPE191	42.99	1.37	7.44	Open
PIPE192	14.22	0.80	3.89	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	10.23	0.58	2.12	Open
PIPE194	3.93	0.22	0.36	Open
PIPE195	3.86	0.22	0.35	Open
PIPE196	3.82	0.22	0.34	Open
PIPE197	13.99	0.79	3.78	Open
PIPE198	13.90	0.79	3.73	Open
PIPE199	-24.21	1.37	10.43	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	32.41	0.04	0.00	Open
PIPEFF5	32.41	0.04	0.00	Open
PIPEFF6	38.00	0.05	0.00	Open
PIPEFF7	38.00	0.05	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	9.03	0.51	1.68	Open
PIPE144	2.54	0.14	0.16	Open
PIPE145	11.26	0.64	2.53	Open
PIPE146	1.97	0.11	0.10	Open
PIPE151	9.30	0.53	1.77	Open
PIPE215	-13.74	0.78	3.65	Open
PIPE216	-6.97	0.39	1.04	Open
PIPE217	7.88	0.45	1.30	Open
PIPE218	4.97	0.28	0.56	Open
PIPE219	3.04	0.17	0.22	Open
PIPE220	2.90	0.16	0.21	Open
PIPE221	2.68	0.15	0.18	Open
PIPE222	1.84	0.10	0.09	Open
PIPE223	4.37	0.25	0.44	Open
PIPE224	7.03	0.40	1.05	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	41.53	0.00	-59.12	Open Pump
PUMP2	69.51	0.00	-59.11	Open Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	69.51	0.00	-59.11	Open Pump
PUMP5	54.54	0.00	-19.73	Open Pump
VALVE1	10.06	0.57	47.68	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	26.05	Active Valve

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  ******************************************************************
  *                            E P A N E T                         *
  *                     Hydraulic and Water Quality                *
  *                     Analysis for Pipe Networks                 *
  *                          Version 2.2                           *
  ******************************************************************

  Input File: Wawa Water Hydraulic Model_Future Residential 2 Chlorine_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

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PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

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PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPE140	J118	J119	71.63	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PIPE217	J49	J184	152.50	150	
PIPE218	J184	J185	73.5	150	
PIPE219	J185	J186	281.2	150	
PIPE220	J184	J187	203.4	150	
PIPE221	J187	J188	98.2	150	
PIPE222	J185	J188	206.4	150	
PIPE223	J188	J186	102.1	150	
PIPE224	J186	J183	103.8	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump

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PUMP5	FS	FD		#N/A	#N/A Pump
VALVE1	J159A	J159		#N/A	150 Valve
VALVE2	J160A	J160B		#N/A	150 Valve
VALVE3	J160	JFS		#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	25.57	30.14	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results at 120:00 Hrs:

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
S1	0.00	291.47	-2.83	0.86
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	345.69	51.39	0.86
D2	0.00	345.67	51.37	0.00
D3	0.00	345.67	51.37	0.00
D4	0.00	345.67	51.37	0.00
DH	0.00	345.67	51.37	0.86
J1A	0.10	345.67	52.47	0.86
J1	0.00	345.67	52.43	0.86
J2	0.10	345.58	52.37	0.86
J3	0.05	345.53	52.35	0.86
J4	0.07	345.53	52.41	0.74
J5	0.06	345.66	53.09	0.86
J6	0.10	345.64	54.55	0.86
J7	0.03	345.64	54.68	0.85
J8	0.19	345.61	52.26	0.86
J9	0.37	345.55	51.89	0.86
J10	0.36	345.52	52.79	0.85
J11	0.36	345.50	50.90	0.85
J12	0.01	345.48	50.06	0.84
J13	0.04	345.47	50.09	0.84
J14	0.18	345.45	48.73	0.83
J15	0.17	345.44	48.27	0.82

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J16	0.18	345.40	51.20	0.80
J17	0.16	345.40	54.25	0.78
J18	0.34	345.40	52.38	0.73
J19	0.19	345.52	50.86	0.85
J20	0.53	345.52	50.17	0.83
J21	0.14	345.49	51.77	0.85
J22	0.56	345.49	50.06	0.83
J23	0.10	345.48	52.29	0.85
J24	0.47	345.48	49.90	0.82
J25	0.05	345.46	52.07	0.85
J26	0.98	345.46	52.12	0.83
J27	0.02	345.45	50.95	0.84
J28	0.08	345.43	51.22	0.84
J29	0.42	345.43	49.90	0.81
J30	0.14	345.41	50.36	0.84
J31	2.21	345.40	51.64	0.83
J32	0.48	345.41	50.10	0.82
J33	0.17	345.64	52.09	0.85
J34	0.17	345.63	50.67	0.85
J35	0.03	345.63	49.80	0.84
J36	0.31	345.63	49.11	0.80
J37	0.17	345.58	51.39	0.83

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J38	0.60	345.58	48.99	0.82
J39	0.05	345.50	52.28	0.85
J40	0.21	345.49	50.98	0.85
J41	0.19	345.49	49.59	0.84
J42	0.04	345.46	49.32	0.84
J43	0.04	345.46	49.47	0.83
J44	0.68	345.45	49.56	0.84
J45	0.65	345.47	50.82	0.85
J46	0.43	345.42	49.70	0.83
J47	0.08	345.44	50.06	0.84
J48	0.28	345.43	49.72	0.84
J49	0.44	345.41	50.21	0.82
J50	0.04	345.40	55.93	0.83
J51	0.49	345.65	53.08	0.86
J52	2.10	345.63	51.80	0.84
J53	0.14	345.61	52.29	0.84
J54	0.22	345.60	52.55	0.83
J55	0.23	345.64	52.55	0.85
J56	0.28	345.63	53.02	0.84
J57	0.20	345.63	53.61	0.85

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J58	0.10	345.63	52.17	0.84
J59	0.00	345.63	52.17	0.84
J60	0.28	345.63	54.40	0.82
J61	0.18	345.62	53.17	0.84
J62	0.00	345.62	53.17	0.84
J63	0.01	345.61	53.68	0.84
J64	0.09	345.59	55.82	0.83
J65	0.35	345.61	54.41	0.83
J66	0.13	345.60	55.84	0.81
J67	0.14	345.60	55.23	0.81
J68	0.16	345.57	57.28	0.83
J69	0.18	345.57	57.19	0.80
J70	0.21	345.57	57.17	0.74
J71	0.43	345.54	56.67	0.81
J72	0.05	345.59	56.67	0.83
J73	0.09	345.57	56.84	0.82
J74	0.12	345.55	56.35	0.82
J75	0.06	345.53	56.35	0.81
J76	0.20	345.53	55.92	0.81
J77	0.01	345.49	56.31	0.81
J78	0.03	345.48	55.87	0.81
J79	0.25	345.46	55.82	0.80
J80	0.13	345.45	55.61	0.80
J81	0.06	345.47	56.47	0.81
J82	0.40	345.45	55.97	0.80
J83	0.13	345.45	55.88	0.80
J84	0.00	345.58	56.47	0.83

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J85	0.07	345.58	56.60	0.73
J86	0.01	345.58	56.36	0.82
J87	0.01	345.57	56.35	0.82
J88	0.11	345.57	56.29	0.81
J89	0.18	345.57	56.01	0.75
J90	0.12	345.58	56.23	0.73
J91	0.20	345.58	56.37	0.71
J92	0.01	345.58	56.18	0.24
J93	0.06	345.57	56.22	0.75
J94	0.11	345.57	56.41	0.66
J95	0.01	345.57	56.63	0.82
J96	0.01	345.55	56.40	0.82
J97	0.18	345.52	55.88	0.81
J98	0.16	345.45	55.51	0.80
J99	0.07	345.42	55.53	0.80

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J100	0.18	345.42	55.44	0.79
J101	0.16	345.40	54.48	0.79
J102	0.10	345.41	55.10	0.80
J103	0.14	345.42	55.97	0.80
J104	0.10	345.42	55.39	0.77
J105	0.04	345.42	56.40	0.59
J106	0.06	345.41	55.83	0.75
J107	0.12	345.40	55.62	0.80
J108	0.12	345.40	55.20	0.79
J109	0.08	345.40	54.91	0.78
J110	0.10	345.40	55.75	0.79
J111	0.07	345.39	55.36	0.79
J112	0.05	345.39	55.60	0.80
J113	0.17	345.40	55.91	0.83
J114	0.00	345.39	55.95	0.83
J115	0.35	345.38	55.36	0.82
J116	0.08	345.39	55.75	0.56
J117	0.20	345.39	55.68	0.70
J118	0.12	345.39	55.82	0.76
J120	0.04	345.39	55.64	0.81
J121	0.10	345.39	55.15	0.79
J122	0.03	345.39	55.25	0.71
J124	0.00	345.38	54.03	0.56
J125	0.09	345.38	54.30	0.70
J126	0.13	345.38	54.86	0.79
J127	0.43	345.38	54.89	0.79
J128	0.05	345.38	53.56	0.71
J129	1.87	345.37	53.36	0.73
J130	0.27	345.37	54.19	0.75
J131	0.48	345.38	54.70	0.75
J132	0.13	345.38	54.80	0.78
J133	0.17	345.38	54.54	0.75

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J134	0.20	345.38	54.89	0.67
J135	0.24	345.38	55.16	0.77
J136	0.06	345.38	54.88	0.52
J137	0.09	345.38	56.28	0.75
J138	0.69	345.39	55.60	0.78
J139	0.09	345.40	54.93	0.79
FS	0.00	345.40	54.80	0.00
FD	0.00	345.40	54.80	0.00
J140	0.00	345.40	56.75	0.78
J141	0.11	345.39	57.39	0.78

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J142	1.95	345.38	58.88	0.74
J143	0.26	345.38	59.10	0.72
J144	0.01	345.38	60.63	0.66
J145	0.00	345.38	60.81	0.66
J146	0.00	345.38	61.35	0.64
J147	0.01	345.38	61.48	0.64
J148	0.02	345.38	62.18	0.64
J149	0.04	345.38	62.49	0.63
J150	0.12	345.38	63.33	0.61
J151	0.01	345.38	60.98	0.64
J152	0.00	345.38	62.43	0.61
J153	0.00	345.38	63.23	0.61
J154	0.00	345.38	63.53	0.59
J155	0.01	345.38	64.78	0.58
J156	0.60	345.38	63.53	0.60
J157	0.00	345.38	63.88	0.58
J158	0.01	345.38	65.08	0.58
J159A	0.00	345.38	65.88	0.56
J159	0.00	298.10	18.60	0.56
J160A	0.03	298.10	49.60	0.53
J160B	0.00	259.96	11.47	0.53
J160	0.00	259.96	54.87	0.51
J161	0.07	245.88	40.78	0.86
J162	0.01	245.87	40.47	0.85
J163	0.08	245.87	40.77	0.85
J164	0.03	245.87	39.97	0.80
J165	0.03	245.87	39.27	0.69
J166	0.04	245.87	39.37	0.58
J167	0.02	245.87	39.87	0.20
J168	0.04	245.87	40.97	0.34
J169	0.05	245.87	39.17	0.69
J170	0.00	245.86	48.86	0.83
J171	0.08	245.86	45.86	0.62
J172	0.00	245.86	52.86	0.83
J173	0.00	245.86	55.86	0.83
J174	0.02	245.86	55.16	0.80
J175	0.05	245.86	54.76	0.77

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J176	1.84	245.85	56.85	0.77
J177	0.04	245.86	53.16	0.77
J178	0.04	245.86	53.96	0.80
J179	0.01	245.86	53.76	0.80
J180	0.02	245.86	55.96	0.82

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J181	0.01	245.86	55.76	0.74	
J182	0.09	245.86	51.36	0.62	
JFS	0.00	259.96	54.87	0.51	
J119	0.15	345.39	55.66	0.76	
J123	0.00	345.38	55.50	0.72	
J183	0.13	345.40	52.43	0.76	
J184	0.00	345.40	51.10	0.80	
J185	0.05	345.40	52.46	0.80	
J186	0.19	345.40	52.22	0.74	
J187	0.11	345.40	51.80	0.79	
J188	0.08	345.40	52.01	0.75	
RES1	-33.86	291.50	0.00	0.86	Reservoir
RES2	0.00	291.50	0.00	0.86	Reservoir
TANK1	-2.58	245.88	40.78	0.22	Tank

Link Results at 120:00 Hrs:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	33.86	1.08	5.43	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	33.86	1.08	5.43	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	33.86	0.27	0.19	Open
PIPE1A	9.06	0.07	0.01	Open
PIPE1	6.63	0.38	1.08	Open
PIPE2	5.76	0.33	0.83	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	24.71	0.20	0.09	Open
PIPE5	9.07	0.18	0.16	Open
PIPE6	7.59	0.15	0.12	Open
PIPE7	10.59	0.34	0.63	Open
PIPE8	10.40	0.33	0.61	Open
PIPE9	2.67	0.15	0.20	Open
PIPE10	2.32	0.13	0.15	Open
PIPE11	1.96	0.11	0.11	Open
PIPE12	1.95	0.11	0.11	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status

PIPE13	1.91	0.11	0.11	Open
PIPE14	1.73	0.10	0.09	Open
PIPE15	1.56	0.09	0.07	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	7.36	0.23	0.32	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	6.63	0.21	0.27	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	5.93	0.19	0.22	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	5.37	0.17	0.18	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	5.38	0.17	0.18	Open
PIPE27	3.28	0.19	0.29	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	2.77	0.16	0.21	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	0.43	0.02	0.01	Open
PIPE32	2.42	0.14	0.17	Open
PIPE33	2.25	0.13	0.15	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	5.64	0.32	0.80	Open
PIPE39	1.59	0.09	0.08	Open
PIPE40	1.38	0.08	0.06	Open
PIPE41	1.19	0.15	0.32	Open
PIPE42	1.15	0.06	0.04	Open
PIPE43	1.11	0.06	0.04	Open
PIPE44	4.00	0.23	0.42	Open
PIPE45	-1.04	0.06	0.03	Open
PIPE46	2.31	0.13	0.15	Open
PIPE47	2.74	0.16	0.21	Open
PIPE48	2.08	0.12	0.13	Open
PIPE49	2.00	0.11	0.12	Open
PIPE50	1.71	0.10	0.09	Open
PIPE51	1.49	0.08	0.07	Open
PIPE52	1.44	0.08	0.06	Open
PIPE53	2.54	0.14	0.18	Open
PIPE54	4.99	0.16	0.16	Open
PIPE55	4.50	0.14	0.13	Open
PIPE56	5.42	0.17	0.18	Open
PIPE57	5.28	0.17	0.17	Open
PIPE58	1.38	0.08	0.06	Open
PIPE59	1.15	0.07	0.04	Open

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Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE60	-1.27	0.03	0.00	Open
PIPE61	7.56	0.11	0.05	Open
PIPE62	-1.74	0.04	0.01	Open
PIPE63	1.83	0.04	0.01	Open
PIPE64	1.43	0.08	0.06	Open
PIPE65	5.53	0.11	0.06	Open
PIPE66	-0.07	0.00	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	1.41	0.08	0.06	Open
PIPE69	2.52	0.14	0.18	Open
PIPE70	5.17	0.11	0.06	Open
PIPE71	-1.29	0.07	0.05	Open
PIPE72	3.88	0.22	0.40	Open
PIPE73	2.50	0.14	0.18	Open
PIPE74	1.37	0.08	0.06	Open
PIPE75	1.02	0.06	0.03	Open
PIPE76	0.88	0.05	0.03	Open
PIPE77	0.74	0.04	0.02	Open
PIPE78	3.15	0.18	0.27	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	2.24	0.13	0.14	Open
PIPE82	3.39	0.11	0.08	Open
PIPE83	3.34	0.19	0.30	Open
PIPE84	-0.36	0.02	0.01	Open
PIPE85	2.66	0.15	0.20	Open
PIPE86	2.54	0.14	0.18	Open
PIPE87	1.80	0.10	0.10	Open
PIPE88	0.21	0.01	0.00	Open
PIPE89	4.06	0.23	0.44	Open
PIPE90	2.02	0.11	0.12	Open
PIPE91	1.99	0.11	0.12	Open
PIPE92	1.74	0.10	0.09	Open
PIPE93	2.03	0.12	0.12	Open
PIPE94	1.97	0.11	0.11	Open
PIPE95	1.57	0.09	0.07	Open
PIPE96	4.18	0.13	0.11	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	2.83	0.09	0.05	Open
PIPE99	1.28	0.07	0.05	Open
PIPE100	2.50	0.08	0.04	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open

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PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE107	0.11	0.01	0.00	Open
PIPE108	3.30	0.11	0.07	Open
PIPE109	-0.96	0.03	0.01	Open
PIPE110	4.25	0.24	0.47	Open
PIPE111	1.99	0.11	0.12	Open
PIPE112	2.00	0.11	0.12	Open
PIPE113	2.24	0.13	0.14	Open
PIPE114	4.07	0.23	0.44	Open
PIPE115	4.22	0.24	0.41	Open
PIPE116	-0.31	0.02	0.00	Open
PIPE117	1.30	0.07	0.05	Open
PIPE118	2.74	0.15	0.21	Open
PIPE119	2.56	0.14	0.18	Open
PIPE120	2.00	0.11	0.10	Open
PIPE121	1.90	0.11	0.09	Open
PIPE122	2.14	0.12	0.12	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	1.81	0.10	0.10	Open
PIPE127	0.46	0.03	0.01	Open
PIPE128	0.34	0.02	0.00	Open
PIPE129	-1.02	0.06	0.03	Open
PIPE130	1.23	0.07	0.05	Open
PIPE131	1.13	0.06	0.04	Open
PIPE132	-0.64	0.04	0.01	Open
PIPE133	-0.69	0.04	0.02	Open
PIPE134	-0.86	0.05	0.02	Open
PIPE135	1.64	0.09	0.08	Open
PIPE136	1.05	0.06	0.04	Open
PIPE137	0.12	0.00	0.00	Open
PIPE138	0.04	0.00	0.00	Open
PIPE139	-0.17	0.01	0.00	Open
PIPE141	0.47	0.03	0.01	Open
PIPE142	0.43	0.02	0.01	Open
PIPE143	0.34	0.02	0.00	Open
PIPE147	-0.18	0.01	0.00	Open
PIPE148	-0.26	0.01	0.00	Open
PIPE149	-0.40	0.02	0.01	Open
PIPE150	0.30	0.02	0.00	Open

EPANet Future Residential 2 Only Chlorine Decay Model Results

PIPE152	1.33	0.08	0.05	Open
PIPE153	-0.53	0.03	0.01	Open
PIPE154	-0.80	0.05	0.02	Open
PIPE155	-0.08	0.04	0.06	Open
PIPE156	-0.20	0.01	0.00	Open
PIPE157	1.70	0.10	0.09	Open
PIPE158	0.92	0.05	0.03	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE159	-1.20	0.07	0.05	Open
PIPE160	-0.46	0.03	0.01	Open
PIPE161	0.45	0.03	0.01	Open
PIPE162	0.21	0.01	0.00	Open
PIPE163	-0.44	0.03	0.01	Open
PIPE164	-0.50	0.03	0.01	Open
PIPE165	-0.59	0.03	0.01	Open
PIPE166	-1.28	0.07	0.05	Open
PIPE167	3.27	0.07	0.02	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	3.18	0.06	0.02	Open
PIPE169	3.18	0.06	0.02	Open
PIPE170	3.07	0.06	0.02	Open
PIPE171	1.12	0.02	0.00	Open
PIPE172	0.86	0.02	0.00	Open
PIPE173	0.86	0.02	0.00	Open
PIPE174	0.86	0.02	0.00	Open
PIPE175	0.86	0.02	0.00	Open
PIPE176	0.64	0.01	0.00	Open
PIPE177	0.62	0.01	0.00	Open
PIPE178	0.57	0.01	0.00	Open
PIPE179	0.20	0.01	0.00	Open
PIPE180	0.20	0.01	0.00	Open
PIPE181	0.19	0.01	0.00	Open
PIPE182	0.19	0.01	0.00	Open
PIPE183	0.19	0.01	0.00	Open
PIPE184	0.19	0.01	0.00	Open
PIPE185	-0.42	0.02	0.01	Open
PIPE186	0.04	0.00	0.00	Open
PIPE187	0.04	0.00	0.00	Open
PIPE188	0.03	0.00	0.00	Open
PIPE189	0.03	0.00	0.00	Open
PIPE189A	0.00	0.00	0.00	Open
PWT2	2.58	0.08	0.05	Open

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PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.13	0.01	0.00	Open
PIPE193	0.05	0.00	0.00	Open
PIPE194	0.04	0.00	0.00	Open
PIPE195	0.01	0.00	0.00	Open
PIPE196	-0.02	0.00	0.00	Open
PIPE197	0.01	0.00	0.00	Open
PIPE198	-0.03	0.00	0.00	Open
PIPE199	-0.09	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.00	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	0.00	0.00	0.00	Closed
PIPE140	1.05	0.06	0.03	Open
PIPE144	0.31	0.02	0.00	Open
PIPE145	1.21	0.07	0.04	Open
PIPE146	-0.18	0.01	0.00	Open
PIPE151	1.39	0.08	0.05	Open
PIPE215	-1.34	0.08	0.05	Open
PIPE216	-0.89	0.05	0.02	Open
PIPE217	1.01	0.06	0.03	Open
PIPE218	0.62	0.04	0.01	Open
PIPE219	0.33	0.02	0.00	Open
PIPE220	0.39	0.02	0.00	Open
PIPE221	0.28	0.02	0.00	Open
PIPE222	0.24	0.01	0.00	Open
PIPE223	0.44	0.03	0.01	Open
PIPE224	0.58	0.03	0.01	Open
PUMP1	33.86	0.00	-54.22	Open Pump

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PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	0.03	0.00	47.28	Active Valve
VALVE2	0.00	0.00	38.13	Active Valve
VALVE3	0.00	0.00	0.00	Open Valve

EPANet Future Residential plus Industrial ADD Model Results


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*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Res plus Ind ADD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

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PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.18	35.19	35.19	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.44	-2.86	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	342.02	47.72	0.00
D2	0.00	341.95	47.65	0.00
D3	0.00	341.95	47.65	0.00
D4	0.00	341.95	47.65	0.00
DH	0.00	341.95	47.65	0.00
J1A	0.10	341.95	48.75	0.00
J1	0.00	341.95	48.71	0.00
J2	0.10	341.78	48.57	0.00
J3	0.05	341.65	48.47	0.00
J4	0.07	341.65	48.53	0.00

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J5	0.06	341.94	49.37	0.00
J6	0.10	341.89	50.80	0.00
J7	0.03	341.89	50.93	0.00
J8	0.19	341.84	48.49	0.00
J9	0.37	341.69	48.03	0.00
J10	0.36	341.63	48.90	0.00
J11	0.36	341.57	46.97	0.00
J12	0.01	341.52	46.10	0.00
J13	0.04	341.50	46.12	0.00
J14	0.18	341.45	44.73	0.00
J15	0.17	341.41	44.24	0.00
J16	0.18	341.27	47.07	0.00
J17	0.16	341.27	50.12	0.00
J18	0.34	341.27	48.25	0.00
J19	0.19	341.63	46.97	0.00
J20	0.53	341.63	46.28	0.00
J21	0.14	341.58	47.85	0.00
J22	0.56	341.58	46.15	0.00
J23	0.10	341.54	48.35	0.00
J24	0.47	341.54	45.96	0.00
J25	0.05	341.50	48.11	0.00
J26	0.98	341.49	48.15	0.00
J27	0.02	341.45	46.95	0.00
J28	0.08	341.42	47.21	0.00
J29	0.42	341.42	45.89	0.00
J30	0.14	341.35	46.30	0.00
J31	2.21	341.34	47.58	0.00
J32	0.48	341.32	46.01	0.00
J33	0.17	341.89	48.34	0.00
J34	0.17	341.86	46.90	0.00
J35	0.03	341.86	46.03	0.00
J36	0.31	341.86	45.34	0.00
J37	0.17	341.78	47.59	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	0.60	341.77	45.18	0.00
J39	0.05	341.59	48.37	0.00
J40	0.21	341.56	47.05	0.00
J41	0.19	341.55	45.65	0.00
J42	0.04	341.48	45.34	0.00
J43	0.04	341.47	45.48	0.00
J44	0.68	341.46	45.57	0.00
J45	0.65	341.51	46.86	0.00
J46	0.43	341.33	45.61	0.00

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J47	0.08	341.41	46.03	0.00
J48	0.28	341.37	45.66	0.00
J49	0.44	341.32	46.12	0.00
J50	0.04	341.17	51.70	0.00
J51	0.49	341.91	49.34	0.00
J52	2.10	341.86	48.03	0.00
J53	0.14	341.80	48.48	0.00
J54	0.22	341.75	48.70	0.00
J55	0.23	341.88	48.79	0.00
J56	0.28	341.86	49.25	0.00
J57	0.20	341.86	49.84	0.00
J58	0.10	341.84	48.38	0.00
J59	0.00	341.84	48.38	0.00
J60	0.28	341.84	50.61	0.00
J61	0.18	341.83	49.38	0.00
J62	0.00	341.83	49.38	0.00
J63	0.01	341.80	49.87	0.00
J64	0.09	341.74	51.97	0.00
J65	0.35	341.78	50.58	0.00
J66	0.13	341.76	52.00	0.00
J67	0.14	341.75	51.38	0.00
J68	0.16	341.65	53.36	0.00
J69	0.18	341.65	53.27	0.00
J70	0.21	341.65	53.25	0.00
J71	0.43	341.53	52.66	0.00
J72	0.05	341.71	52.79	0.00
J73	0.09	341.64	52.91	0.00
J74	0.12	341.55	52.35	0.00
J75	0.06	341.48	52.30	0.00
J76	0.20	341.48	51.87	0.00
J77	0.01	341.28	52.10	0.00
J78	0.03	341.25	51.64	0.00
J79	0.25	341.13	51.49	0.00
J80	0.13	341.10	51.26	0.00
J81	0.06	341.19	52.19	0.00
J82	0.40	341.09	51.61	0.00
J83	0.13	341.06	51.49	0.00
J84	0.00	341.69	52.58	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.07	341.69	52.71	0.00
J86	0.01	341.67	52.45	0.00
J87	0.01	341.67	52.45	0.00
J88	0.11	341.67	52.39	0.00

J89	0.18	341.67	52.11	0.00
J90	0.12	341.67	52.32	0.00
J91	0.20	341.67	52.46	0.00
J92	0.01	341.67	52.27	0.00
J93	0.06	341.67	52.32	0.00
J94	0.11	341.67	52.51	0.00
J95	0.01	341.64	52.70	0.00
J96	0.01	341.55	52.40	0.00
J97	0.18	341.43	51.79	0.00
J98	0.16	341.10	51.16	0.00
J99	0.07	340.96	51.07	0.00
J100	0.18	340.88	50.90	0.00
J101	0.16	340.74	49.82	0.00
J102	0.10	340.81	50.50	0.00
J103	0.14	340.95	51.50	0.00
J104	0.10	340.95	50.92	0.00
J105	0.04	340.95	51.93	0.00
J106	0.06	340.95	51.37	0.00
J107	0.12	340.93	51.15	0.00
J108	0.12	340.87	50.67	0.00
J109	0.08	340.81	50.32	0.00
J110	0.10	340.97	51.32	0.00
J111	0.07	341.02	50.99	0.00
J112	0.05	341.07	51.28	0.00
J113	0.17	341.15	51.66	0.00
J114	0.00	341.13	51.69	0.00
J115	0.35	341.08	51.06	0.00
J116	0.09	341.13	51.49	0.00
J117	0.25	341.14	51.43	0.00
J118	0.17	341.14	51.57	0.00
J120	0.04	341.13	51.38	0.00
J121	0.10	341.12	50.88	0.00
J122	0.03	341.12	50.98	0.00
J124	0.00	341.08	49.73	0.00
J125	0.09	341.08	50.00	0.00
J126	0.13	341.08	50.56	0.00
J127	0.43	341.04	50.55	0.00
J128	0.05	341.05	49.23	0.00
J129	1.87	341.03	49.02	0.00
J130	0.27	341.02	49.84	0.00
J131	0.48	341.01	50.33	0.00
J132	0.13	341.02	50.44	0.00
J133	0.17	341.01	50.17	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

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J134	0.20	340.99	50.50	0.00
J135	0.24	341.00	50.78	0.00
J136	0.06	340.95	50.45	0.00
J137	0.09	340.91	51.81	0.00
J138	0.69	340.85	51.06	0.00
J139	0.09	340.60	50.13	0.00
FS	0.00	340.69	50.09	0.00
FD	0.00	340.64	50.04	0.00
J140	0.00	340.49	51.84	0.00
J141	0.11	340.38	52.38	0.00
J142	11.32	339.95	53.45	0.00
J143	0.26	339.83	53.55	0.00
J144	0.01	339.68	54.93	0.00
J145	0.00	339.65	55.08	0.00
J146	0.00	339.61	55.58	0.00
J147	0.01	339.59	55.69	0.00
J148	0.02	339.58	56.38	0.00
J149	0.04	339.56	56.67	0.00
J150	0.12	339.53	57.48	0.00
J151	0.01	339.58	55.18	0.00
J152	0.00	339.57	56.62	0.00
J153	0.00	339.56	57.41	0.00
J154	0.00	339.55	57.70	0.00
J155	0.01	339.54	58.94	0.00
J156	0.60	339.53	57.68	0.00
J157	0.00	339.50	58.00	0.00
J158	0.01	339.47	59.17	0.00
J159A	0.00	338.51	59.01	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.03	293.30	44.80	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.07	246.60	41.50	0.00
J162	0.01	246.60	41.20	0.00
J163	0.08	246.59	41.49	0.00
J164	0.03	246.59	40.69	0.00
J165	0.03	246.59	39.99	0.00
J166	0.04	246.59	40.09	0.00
J167	0.02	246.59	40.59	0.00
J168	0.04	246.59	41.69	0.00
J169	0.05	246.59	39.89	0.00
J170	0.00	246.59	49.59	0.00
J171	0.08	246.59	46.59	0.00
J172	0.00	246.58	53.58	0.00
J173	0.00	246.58	56.58	0.00
J174	0.02	246.58	55.88	0.00
J175	0.05	246.58	55.48	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	1.84	246.58	57.58	0.00	
J177	0.04	246.58	53.88	0.00	
J178	0.04	246.58	54.68	0.00	
J179	0.01	246.58	54.48	0.00	
J180	0.02	246.58	56.68	0.00	
J181	0.01	246.58	56.48	0.00	
J182	0.09	246.58	52.08	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	341.27	48.25	0.00	
JFF2	0.00	341.14	51.57	0.00	
JFF3	0.00	341.80	48.48	0.00	
JFF4	0.00	341.67	52.27	0.00	
JFF5	0.00	341.65	53.25	0.00	
JFF6	0.00	339.54	58.94	0.00	
JFF7	0.00	246.59	39.89	0.00	
JFF8	0.00	341.34	47.58	0.00	
JFF9	0.00	341.84	50.61	0.00	
J119	0.20	341.12	51.39	0.00	
J123	0.04	341.08	51.20	0.00	
J183	0.10	341.26	48.29	0.00	
J184	0.00	341.29	46.99	0.00	
J185	0.03	341.28	48.34	0.00	
J186	0.12	341.27	48.09	0.00	
J187	0.06	341.28	47.68	0.00	
J188	0.05	341.28	47.89	0.00	
RES1	-53.24	291.50	0.00	0.00	Reservoir
RES2	0.00	291.50	0.00	0.00	Reservoir
TANK1	7.42	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.24	1.69	12.56	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	53.24	1.69	12.55	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	53.24	0.42	0.43	Open
PIPE1A	13.88	0.11	0.03	Open

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PIPE1	9.91	0.56	2.27	Open
PIPE2	9.04	0.51	1.91	Open
PIPE3	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	39.26	0.31	0.22	Open
PIPE5	15.17	0.31	0.41	Open
PIPE6	12.81	0.26	0.30	Open
PIPE7	15.90	0.51	1.34	Open
PIPE8	15.71	0.50	1.31	Open
PIPE9	4.21	0.24	0.46	Open
PIPE10	3.85	0.22	0.39	Open
PIPE11	3.49	0.20	0.33	Open
PIPE12	3.49	0.20	0.33	Open
PIPE13	3.45	0.19	0.32	Open
PIPE14	3.27	0.18	0.29	Open
PIPE15	3.09	0.18	0.26	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	11.13	0.35	0.69	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	10.41	0.33	0.61	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	9.71	0.31	0.54	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	9.14	0.29	0.48	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	9.63	0.31	0.53	Open
PIPE27	5.29	0.30	0.71	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	4.78	0.27	0.59	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	2.44	0.14	0.17	Open
PIPE32	3.97	0.22	0.42	Open
PIPE33	3.80	0.21	0.38	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	8.92	0.50	1.86	Open
PIPE39	2.46	0.14	0.17	Open
PIPE40	2.25	0.13	0.14	Open
PIPE41	2.06	0.26	0.89	Open
PIPE42	2.01	0.11	0.12	Open

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PIPE43	1.98	0.11	0.11	Open
PIPE44	6.42	0.36	1.01	Open
PIPE45	-1.51	0.09	0.07	Open
PIPE46	4.25	0.24	0.47	Open
PIPE47	5.55	0.31	0.77	Open
PIPE48	4.32	0.24	0.49	Open
PIPE49	4.24	0.24	0.47	Open
PIPE50	3.96	0.22	0.41	Open

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Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE51	1.17	0.07	0.04	Open
PIPE52	3.13	0.18	0.27	Open
PIPE53	7.90	0.45	1.49	Open
PIPE54	8.13	0.26	0.39	Open
PIPE55	7.64	0.24	0.35	Open
PIPE56	10.44	0.33	0.61	Open
PIPE57	10.30	0.33	0.60	Open
PIPE58	2.26	0.13	0.15	Open
PIPE59	2.03	0.11	0.12	Open
PIPE60	-1.60	0.03	0.01	Open
PIPE61	12.78	0.18	0.12	Open
PIPE62	-3.29	0.07	0.02	Open
PIPE63	2.48	0.05	0.01	Open
PIPE64	2.63	0.15	0.19	Open
PIPE65	10.10	0.21	0.19	Open
PIPE66	-0.12	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	2.64	0.15	0.20	Open
PIPE69	4.96	0.28	0.63	Open
PIPE70	9.70	0.20	0.18	Open
PIPE71	-2.49	0.14	0.18	Open
PIPE72	7.20	0.41	1.26	Open
PIPE73	4.84	0.27	0.60	Open
PIPE74	2.36	0.13	0.16	Open
PIPE75	2.00	0.11	0.12	Open
PIPE76	1.87	0.11	0.10	Open
PIPE77	1.73	0.10	0.09	Open
PIPE78	6.48	0.37	1.03	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	4.78	0.27	0.59	Open
PIPE82	6.82	0.22	0.28	Open
PIPE83	6.77	0.38	1.12	Open
PIPE84	-1.15	0.07	0.04	Open

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PIPE85	5.77	0.33	0.83	Open
PIPE86	5.65	0.32	0.80	Open
PIPE87	4.34	0.25	0.49	Open
PIPE88	0.50	0.03	0.01	Open
PIPE89	9.43	0.53	2.07	Open
PIPE90	4.64	0.26	0.56	Open
PIPE91	4.61	0.26	0.55	Open
PIPE92	4.36	0.25	0.50	Open
PIPE93	4.78	0.27	0.59	Open
PIPE94	4.72	0.27	0.57	Open
PIPE95	4.31	0.24	0.49	Open
PIPE96	8.22	0.26	0.39	Open
PIPE97	0.07	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	5.59	0.18	0.19	Open
PIPE99	2.55	0.14	0.18	Open
PIPE100	5.26	0.17	0.17	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open
PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open
PIPE107	0.11	0.01	0.00	Open
PIPE108	7.34	0.23	0.32	Open
PIPE109	-2.06	0.07	0.03	Open
PIPE110	9.38	0.53	2.05	Open
PIPE111	4.34	0.25	0.49	Open
PIPE112	4.64	0.26	0.56	Open
PIPE113	5.02	0.28	0.64	Open
PIPE114	9.48	0.54	2.09	Open
PIPE115	9.84	0.56	1.97	Open
PIPE116	-0.51	0.03	0.01	Open
PIPE117	3.72	0.21	0.37	Open
PIPE118	7.90	0.45	1.49	Open
PIPE119	7.72	0.44	1.43	Open
PIPE120	7.21	0.41	1.11	Open
PIPE121	7.11	0.40	1.08	Open
PIPE122	2.56	0.14	0.16	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.22	0.13	0.14	Open

PIPE127	5.82	0.33	0.85	Open
PIPE128	5.71	0.32	0.82	Open
PIPE129	7.98	0.45	1.52	Open
PIPE130	-3.72	0.21	0.37	Open
PIPE131	-3.82	0.22	0.39	Open
PIPE132	-4.00	0.23	0.42	Open
PIPE133	-4.05	0.23	0.43	Open
PIPE134	-4.22	0.24	0.47	Open
PIPE135	3.64	0.21	0.36	Open
PIPE136	3.70	0.21	0.37	Open
PIPE137	-1.12	0.04	0.01	Open
PIPE138	-1.22	0.04	0.01	Open
PIPE139	-1.46	0.05	0.01	Open
PIPE141	1.07	0.06	0.04	Open
PIPE142	1.03	0.06	0.03	Open
PIPE143	0.94	0.05	0.03	Open
PIPE147	0.51	0.03	0.01	Open
PIPE148	0.42	0.02	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	0.29	0.02	0.00	Open
PIPE150	3.64	0.21	0.35	Open
PIPE152	3.23	0.18	0.28	Open
PIPE153	1.36	0.08	0.06	Open
PIPE154	1.09	0.06	0.04	Open
PIPE155	-0.17	0.08	0.24	Open
PIPE156	3.04	0.17	0.25	Open
PIPE157	0.11	0.01	0.00	Open
PIPE158	1.32	0.07	0.05	Open
PIPE159	0.78	0.04	0.02	Open
PIPE160	1.93	0.11	0.11	Open
PIPE161	1.70	0.10	0.09	Open
PIPE162	1.46	0.08	0.07	Open
PIPE163	3.19	0.18	0.28	Open
PIPE164	3.14	0.18	0.27	Open
PIPE165	3.05	0.17	0.25	Open
PIPE166	2.35	0.13	0.16	Open
PIPE167	22.65	0.46	0.77	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	22.56	0.46	0.76	Open
PIPE169	22.56	0.46	0.76	Open
PIPE170	22.44	0.46	0.75	Open
PIPE171	11.12	0.23	0.21	Open

PIPE172	10.86	0.22	0.20	Open
PIPE173	10.86	0.22	0.20	Open
PIPE174	10.86	0.22	0.20	Open
PIPE175	10.86	0.22	0.20	Open
PIPE176	9.04	0.18	0.14	Open
PIPE177	9.02	0.18	0.14	Open
PIPE178	8.97	0.18	0.14	Open
PIPE179	1.80	0.10	0.08	Open
PIPE180	1.80	0.10	0.08	Open
PIPE181	1.79	0.10	0.08	Open
PIPE182	1.79	0.10	0.08	Open
PIPE183	1.79	0.10	0.08	Open
PIPE184	1.79	0.10	0.08	Open
PIPE185	1.18	0.07	0.04	Open
PIPE186	10.04	0.20	0.17	Open
PIPE187	10.04	0.20	0.17	Open
PIPE188	10.03	0.57	2.04	Open
PIPE189	10.03	0.57	2.48	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	2.58	0.08	0.05	Open
PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.25	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.09	0.00	0.00	Open
PIPE194	0.13	0.01	0.00	Open
PIPE195	0.10	0.01	0.00	Open
PIPE196	0.07	0.00	0.00	Open
PIPE197	0.13	0.01	0.00	Open
PIPE198	0.09	0.00	0.00	Open
PIPE199	0.03	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.01	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open

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PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	3.13	0.18	0.24	Open
PIPE144	0.91	0.05	0.02	Open
PIPE145	3.83	0.22	0.34	Open
PIPE146	0.51	0.03	0.01	Open
PIPE151	3.28	0.19	0.26	Open
PIPE215	-4.76	0.27	0.51	Open
PIPE216	-2.42	0.14	0.15	Open
PIPE217	2.70	0.15	0.18	Open
PIPE218	1.71	0.10	0.08	Open
PIPE219	1.05	0.06	0.03	Open
PIPE220	0.99	0.06	0.03	Open
PIPE221	0.93	0.05	0.02	Open
PIPE222	0.63	0.04	0.01	Open
PIPE223	1.51	0.09	0.06	Open
PIPE224	2.45	0.14	0.15	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	53.24	0.00	-50.58	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.03	0.57	40.42	Active Valve
VALVE2	10.00	0.57	33.34	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential plus Industrial MDD Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Res plus Ind MDD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.20	24.55	24.55	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	100.00	75.00	0.20	43.61	43.61	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	291.47	-2.83	0.00
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.47	-2.83	0.00
D1	0.00	345.53	51.23	0.00
D2	0.00	345.50	51.20	0.00
D3	0.00	345.50	51.20	0.00
D4	0.00	345.53	51.23	0.00
DH	0.00	345.50	51.20	0.00
J1A	0.19	345.49	52.29	0.00
J1	0.00	345.48	52.24	0.00
J2	0.20	344.96	51.75	0.00
J3	0.10	344.56	51.38	0.00
J4	0.15	344.56	51.44	0.00

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J5	0.12	345.45	52.88	0.00
J6	0.20	345.31	54.22	0.00
J7	0.06	345.30	54.34	0.00
J8	0.37	345.14	51.79	0.00
J9	0.74	344.70	51.04	0.00
J10	0.71	344.50	51.77	0.00
J11	0.72	344.33	49.73	0.00
J12	0.01	344.18	48.76	0.00
J13	0.08	344.11	48.73	0.00
J14	0.36	343.98	47.26	0.00
J15	0.34	343.85	46.68	0.00
J16	0.35	343.47	49.27	0.00
J17	0.32	343.46	52.31	0.00
J18	0.68	343.46	50.44	0.00
J19	0.38	344.50	49.84	0.00
J20	1.06	344.50	49.15	0.00
J21	0.28	344.35	50.62	0.00
J22	1.12	344.35	48.92	0.00
J23	0.19	344.22	51.03	0.00
J24	0.93	344.22	48.64	0.00
J25	0.10	344.10	50.71	0.00
J26	1.95	344.09	50.75	0.00
J27	0.04	343.95	49.45	0.00
J28	0.16	343.88	49.67	0.00
J29	0.85	343.87	48.34	0.00
J30	0.28	343.68	48.63	0.00
J31	4.41	343.63	49.87	0.00
J32	0.96	343.60	48.29	0.00
J33	0.34	345.32	51.77	0.00
J34	0.34	345.24	50.28	0.00
J35	0.05	345.24	49.41	0.00
J36	0.62	345.23	48.71	0.00
J37	0.34	344.95	50.76	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	344.94	48.35	0.00
J39	0.09	344.38	51.16	0.00
J40	0.42	344.31	49.80	0.00
J41	0.38	344.27	48.37	0.00
J42	0.09	344.06	47.92	0.00
J43	0.07	344.03	48.04	0.00
J44	1.35	344.00	48.11	0.00
J45	1.30	344.15	49.50	0.00
J46	0.86	343.62	47.90	0.00

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J47	0.16	343.86	48.48	0.00
J48	0.57	343.73	48.02	0.00
J49	0.87	343.59	48.39	0.00
J50	0.07	343.22	53.75	0.00
J51	0.98	345.36	52.79	0.00
J52	4.19	345.23	51.40	0.00
J53	0.29	345.06	51.74	0.00
J54	0.44	344.92	51.87	0.00
J55	0.46	345.27	52.18	0.00
J56	0.55	345.23	52.62	0.00
J57	0.41	345.23	53.21	0.00
J58	0.19	345.18	51.72	0.00
J59	0.00	345.18	51.72	0.00
J60	0.57	345.18	53.95	0.00
J61	0.36	345.13	52.68	0.00
J62	0.00	345.13	52.68	0.00
J63	0.01	345.07	53.14	0.00
J64	0.18	344.89	55.12	0.00
J65	0.71	345.01	53.81	0.00
J66	0.27	344.94	55.18	0.00
J67	0.28	344.91	54.54	0.00
J68	0.33	344.64	56.35	0.00
J69	0.37	344.64	56.26	0.00
J70	0.42	344.63	56.23	0.00
J71	0.87	344.33	55.46	0.00
J72	0.10	344.80	55.88	0.00
J73	0.18	344.63	55.90	0.00
J74	0.24	344.37	55.17	0.00
J75	0.12	344.20	55.02	0.00
J76	0.40	344.19	54.58	0.00
J77	0.03	343.67	54.49	0.00
J78	0.06	343.58	53.97	0.00
J79	0.50	343.24	53.60	0.00
J80	0.25	343.17	53.33	0.00
J81	0.12	343.42	54.42	0.00
J82	0.81	343.15	53.67	0.00
J83	0.27	343.09	53.52	0.00
J84	0.00	344.74	55.63	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	344.74	55.76	0.00
J86	0.02	344.70	55.48	0.00
J87	0.02	344.69	55.47	0.00
J88	0.22	344.69	55.41	0.00

J89	0.37	344.69	55.13	0.00
J90	0.23	344.69	55.34	0.00
J91	0.39	344.69	55.48	0.00
J92	0.02	344.69	55.29	0.00
J93	0.12	344.69	55.34	0.00
J94	0.22	344.69	55.53	0.00
J95	0.03	344.62	55.68	0.00
J96	0.03	344.38	55.23	0.00
J97	0.35	344.05	54.41	0.00
J98	0.31	343.17	53.23	0.00
J99	0.14	342.81	52.92	0.00
J100	0.35	342.63	52.65	0.00
J101	0.33	342.28	51.36	0.00
J102	0.20	342.45	52.14	0.00
J103	0.29	342.77	53.32	0.00
J104	0.19	342.77	52.74	0.00
J105	0.07	342.77	53.75	0.00
J106	0.12	342.76	53.18	0.00
J107	0.23	342.70	52.92	0.00
J108	0.23	342.56	52.36	0.00
J109	0.16	342.43	51.94	0.00
J110	0.21	342.76	53.11	0.00
J111	0.14	342.85	52.82	0.00
J112	0.10	342.98	53.19	0.00
J113	0.34	343.17	53.68	0.00
J114	0.00	343.12	53.68	0.00
J115	0.70	342.99	52.97	0.00
J116	0.19	343.12	53.48	0.00
J117	0.50	343.12	53.41	0.00
J118	0.34	343.13	53.56	0.00
J120	0.07	343.11	53.36	0.00
J121	0.19	343.09	52.85	0.00
J122	0.06	343.09	52.95	0.00
J124	0.00	342.99	51.64	0.00
J125	0.18	342.99	51.91	0.00
J126	0.27	342.99	52.47	0.00
J127	0.86	342.89	52.40	0.00
J128	0.10	342.90	51.08	0.00
J129	3.73	342.84	50.83	0.00
J130	0.54	342.83	51.65	0.00
J131	0.96	342.82	52.14	0.00
J132	0.25	342.84	52.26	0.00
J133	0.34	342.82	51.98	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential plus Industrial MDD Model Results

J134	0.40	342.78	52.29	0.00
J135	0.48	342.80	52.58	0.00
J136	0.12	342.70	52.20	0.00
J137	0.18	342.61	53.51	0.00
J138	1.39	342.49	52.70	0.00
J139	0.18	341.96	51.49	0.00
FS	0.00	342.17	51.57	0.00
FD	0.00	342.07	51.47	0.00
J140	0.00	341.71	53.06	0.00
J141	0.22	341.47	53.47	0.00
J142	22.65	340.50	54.00	0.00
J143	0.51	340.35	54.07	0.00
J144	0.01	340.18	55.43	0.00
J145	0.00	340.14	55.57	0.00
J146	0.00	340.09	56.06	0.00
J147	0.03	340.08	56.18	0.00
J148	0.04	340.06	56.86	0.00
J149	0.09	340.04	57.15	0.00
J150	0.24	340.00	57.95	0.00
J151	0.01	340.06	55.66	0.00
J152	0.01	340.05	57.10	0.00
J153	0.00	340.03	57.88	0.00
J154	0.00	340.02	58.17	0.00
J155	0.01	340.02	59.42	0.00
J156	1.21	340.00	58.15	0.00
J157	0.00	339.97	58.47	0.00
J158	0.01	339.94	59.64	0.00
J159A	0.00	338.98	59.48	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

EPANet Future Residential plus Industrial MDD Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	343.46	50.44	0.00	
JFF2	0.00	343.13	53.56	0.00	
JFF3	0.00	345.06	51.74	0.00	
JFF4	0.00	344.69	55.29	0.00	
JFF5	0.00	344.63	56.23	0.00	
JFF6	0.00	340.02	59.42	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	343.63	49.87	0.00	
JFF9	0.00	345.18	53.95	0.00	
J119	0.40	343.08	53.35	0.00	
J123	0.08	342.99	53.11	0.00	
J183	0.21	343.44	50.47	0.00	
J184	0.00	343.51	49.21	0.00	
J185	0.05	343.50	50.56	0.00	
J186	0.23	343.48	50.30	0.00	
J187	0.13	343.50	49.90	0.00	
J188	0.09	343.49	50.10	0.00	
RES1	-34.75	291.50	0.00	0.00	Reservoir
RES2	-61.72	291.50	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	34.75	1.11	5.70	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	61.72	1.26	5.57	Open
PD1	34.75	1.11	5.70	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	61.72	1.26	5.57	Open
PD5	96.47	0.77	1.29	Open
PIPE1A	25.33	0.20	0.10	Open

PIPE1	18.23	1.03	7.01	Open
PIPE2	16.49	0.93	5.82	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE4	70.95	0.56	0.64	Open
PIPE5	27.05	0.55	1.21	Open
PIPE6	22.81	0.46	0.88	Open
PIPE7	29.21	0.93	4.13	Open
PIPE8	28.84	0.92	4.04	Open
PIPE9	7.66	0.43	1.41	Open
PIPE10	6.94	0.39	1.17	Open
PIPE11	6.23	0.35	0.96	Open
PIPE12	6.21	0.35	0.95	Open
PIPE13	6.13	0.35	0.93	Open
PIPE14	5.77	0.33	0.83	Open
PIPE15	5.43	0.31	0.74	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	20.44	0.65	2.13	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	18.99	0.60	1.86	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	17.59	0.56	1.61	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	16.46	0.52	1.43	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	17.21	0.55	1.55	Open
PIPE27	9.61	0.54	2.14	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	8.60	0.49	1.74	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	3.91	0.22	0.40	Open
PIPE32	7.11	0.40	1.23	Open
PIPE33	6.76	0.38	1.12	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	16.23	0.92	5.65	Open
PIPE39	4.49	0.25	0.52	Open
PIPE40	4.07	0.23	0.44	Open
PIPE41	3.69	0.47	2.62	Open
PIPE42	3.60	0.20	0.35	Open

PIPE43	3.53	0.20	0.33	Open
PIPE44	11.66	0.66	3.06	Open
PIPE45	-2.80	0.16	0.22	Open
PIPE46	7.55	0.43	1.37	Open
PIPE47	9.73	0.55	2.19	Open
PIPE48	7.56	0.43	1.37	Open
PIPE49	7.39	0.42	1.32	Open
PIPE50	6.82	0.39	1.14	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.48	0.14	0.17	Open
PIPE52	5.43	0.31	0.74	Open
PIPE53	13.21	0.75	3.86	Open
PIPE54	14.57	0.46	1.14	Open
PIPE55	13.59	0.43	1.00	Open
PIPE56	18.18	0.58	1.72	Open
PIPE57	17.89	0.57	1.67	Open
PIPE58	4.04	0.23	0.43	Open
PIPE59	3.58	0.20	0.34	Open
PIPE60	-3.03	0.06	0.02	Open
PIPE61	22.74	0.32	0.36	Open
PIPE62	-5.75	0.12	0.07	Open
PIPE63	4.61	0.09	0.05	Open
PIPE64	4.61	0.26	0.55	Open
PIPE65	17.73	0.36	0.55	Open
PIPE66	-0.21	0.01	0.00	Open
PIPE67	0.57	0.03	0.02	Open
PIPE68	4.62	0.26	0.55	Open
PIPE69	8.60	0.49	1.74	Open
PIPE70	16.96	0.35	0.51	Open
PIPE71	-4.34	0.25	0.49	Open
PIPE72	12.62	0.71	3.55	Open
PIPE73	8.42	0.48	1.68	Open
PIPE74	4.18	0.24	0.46	Open
PIPE75	3.48	0.20	0.33	Open
PIPE76	3.21	0.18	0.28	Open
PIPE77	2.93	0.17	0.24	Open
PIPE78	11.17	0.63	2.83	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	8.18	0.46	1.59	Open
PIPE82	11.79	0.38	0.77	Open
PIPE83	11.69	0.66	3.08	Open
PIPE84	-1.88	0.11	0.10	Open

PIPE85	9.86	0.56	2.25	Open
PIPE86	9.63	0.54	2.15	Open
PIPE87	7.31	0.41	1.29	Open
PIPE88	0.85	0.05	0.02	Open
PIPE89	15.97	0.90	5.48	Open
PIPE90	7.87	0.45	1.48	Open
PIPE91	7.81	0.44	1.46	Open
PIPE92	7.31	0.41	1.29	Open
PIPE93	8.07	0.46	1.55	Open
PIPE94	7.95	0.45	1.51	Open
PIPE95	7.14	0.40	1.23	Open
PIPE96	14.26	0.45	1.10	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	9.70	0.31	0.54	Open
PIPE99	4.42	0.25	0.51	Open
PIPE100	9.03	0.29	0.47	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	12.50	0.40	0.86	Open
PIPE109	-3.53	0.11	0.08	Open
PIPE110	15.99	0.90	5.50	Open
PIPE111	7.42	0.42	1.32	Open
PIPE112	7.86	0.44	1.48	Open
PIPE113	8.55	0.48	1.72	Open
PIPE114	16.05	0.91	5.54	Open
PIPE115	16.73	0.95	5.26	Open
PIPE116	-0.98	0.06	0.03	Open
PIPE117	6.07	0.34	0.91	Open
PIPE118	12.94	0.73	3.72	Open
PIPE119	12.59	0.71	3.53	Open
PIPE120	11.50	0.65	2.63	Open
PIPE121	11.30	0.64	2.54	Open
PIPE122	5.08	0.29	0.58	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	4.41	0.25	0.51	Open

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PIPE127	9.07	0.51	1.92	Open
PIPE128	8.84	0.50	1.83	Open
PIPE129	11.74	0.66	3.10	Open
PIPE130	-4.90	0.28	0.61	Open
PIPE131	-5.11	0.29	0.66	Open
PIPE132	-6.43	0.36	1.02	Open
PIPE133	-6.53	0.37	1.05	Open
PIPE134	-6.87	0.39	1.15	Open
PIPE135	6.27	0.35	0.97	Open
PIPE136	6.10	0.35	0.92	Open
PIPE137	-1.68	0.05	0.02	Open
PIPE138	-1.87	0.06	0.02	Open
PIPE139	-2.37	0.08	0.03	Open
PIPE141	1.85	0.10	0.10	Open
PIPE142	1.77	0.10	0.09	Open
PIPE143	1.58	0.09	0.08	Open
PIPE147	0.72	0.04	0.02	Open
PIPE148	0.55	0.03	0.01	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	0.28	0.02	0.00	Open
PIPE150	5.68	0.32	0.81	Open
PIPE152	5.43	0.31	0.75	Open
PIPE153	1.70	0.10	0.09	Open
PIPE154	1.17	0.07	0.04	Open
PIPE155	-0.27	0.14	0.62	Open
PIPE156	4.55	0.26	0.54	Open
PIPE157	1.18	0.07	0.04	Open
PIPE158	2.70	0.15	0.20	Open
PIPE159	0.48	0.03	0.01	Open
PIPE160	2.83	0.16	0.22	Open
PIPE161	2.78	0.16	0.22	Open
PIPE162	2.30	0.13	0.15	Open
PIPE163	4.74	0.27	0.58	Open
PIPE164	4.62	0.26	0.55	Open
PIPE165	4.44	0.25	0.51	Open
PIPE166	3.06	0.17	0.26	Open
PIPE167	35.29	0.72	1.74	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	35.11	0.72	1.72	Open
PIPE169	35.11	0.72	1.72	Open
PIPE170	34.89	0.71	1.70	Open
PIPE171	12.24	0.25	0.25	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	0.00	0.00	0.00	Open
PIPE140	5.22	0.30	0.61	Open
PIPE144	1.52	0.09	0.06	Open
PIPE145	6.34	0.36	0.87	Open
PIPE146	0.72	0.04	0.02	Open
PIPE151	5.54	0.31	0.68	Open
PIPE215	-7.93	0.45	1.32	Open
PIPE216	-4.08	0.23	0.39	Open
PIPE217	4.56	0.26	0.47	Open
PIPE218	2.88	0.16	0.20	Open
PIPE219	1.76	0.10	0.08	Open
PIPE220	1.68	0.10	0.07	Open
PIPE221	1.55	0.09	0.06	Open
PIPE222	1.07	0.06	0.03	Open
PIPE223	2.53	0.14	0.16	Open
PIPE224	4.06	0.23	0.38	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PUMP1	34.75	0.00	-54.06	Open Pump
PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	61.72	0.00	-54.06	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	40.89	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential plus Industrial MDD and FF S1 Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Res plus Ind MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.81	39.81	0.00
PUMP2	100.00	75.00	0.21	59.77	59.77	0.00
PUMP3	100.00	75.00	0.21	39.81	39.81	0.00
PUMP4	100.00	75.00	0.21	59.77	59.77	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	286.99	-7.31	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.75	49.45	0.00
D2	0.00	343.73	49.43	0.00
D3	0.00	343.75	49.45	0.00
D4	0.00	343.73	49.43	0.00
DH	0.00	343.68	49.38	0.00
J1A	0.19	343.60	50.40	0.00
J1	0.00	343.57	50.33	0.00
J2	0.20	340.42	47.21	0.00
J3	0.10	337.75	44.57	0.00
J4	0.15	337.75	44.63	0.00

J5	0.12	343.30	50.73	0.00
J6	0.20	342.31	51.22	0.00
J7	0.06	342.25	51.29	0.00
J8	0.37	341.36	48.01	0.00
J9	0.74	338.51	44.85	0.00
J10	0.71	337.03	44.30	0.00
J11	0.72	335.53	40.93	0.00
J12	0.01	334.10	38.68	0.00
J13	0.08	333.40	38.02	0.00
J14	0.36	332.09	35.37	0.00
J15	0.34	330.70	33.53	0.00
J16	0.35	326.14	31.94	0.00
J17	0.32	320.76	29.61	0.00
J18	0.68	315.69	22.67	0.00
J19	0.38	337.28	42.62	0.00
J20	1.06	337.28	41.93	0.00
J21	0.28	336.24	42.51	0.00
J22	1.12	336.24	40.81	0.00
J23	0.19	335.26	42.07	0.00
J24	0.93	335.25	39.67	0.00
J25	0.10	334.30	40.91	0.00
J26	1.95	334.29	40.95	0.00
J27	0.04	332.80	38.30	0.00
J28	0.16	331.77	37.56	0.00
J29	0.85	331.77	36.24	0.00
J30	0.28	328.83	33.78	0.00
J31	4.41	325.34	31.58	0.00
J32	0.96	328.97	33.66	0.00
J33	0.34	342.39	48.84	0.00
J34	0.34	341.79	46.83	0.00
J35	0.05	341.79	45.96	0.00
J36	0.62	341.79	45.27	0.00
J37	0.34	340.41	46.22	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	340.40	43.81	0.00
J39	0.09	336.48	43.26	0.00
J40	0.42	336.07	41.56	0.00
J41	0.38	335.79	39.89	0.00
J42	0.09	334.23	38.09	0.00
J43	0.07	333.95	37.96	0.00
J44	1.35	333.71	37.82	0.00
J45	1.30	334.80	40.15	0.00
J46	0.86	330.37	34.65	0.00

J47	0.16	332.18	36.80	0.00
J48	0.57	331.22	35.51	0.00
J49	0.87	328.81	33.61	0.00
J50	0.07	329.00	39.53	0.00
J51	0.98	342.73	50.16	0.00
J52	4.19	341.72	47.89	0.00
J53	0.29	340.01	46.69	0.00
J54	0.44	339.76	46.71	0.00
J55	0.46	342.02	48.93	0.00
J56	0.55	341.73	49.12	0.00
J57	0.41	341.73	49.71	0.00
J58	0.19	341.30	47.84	0.00
J59	0.00	341.29	47.83	0.00
J60	0.57	340.08	48.85	0.00
J61	0.36	341.04	48.59	0.00
J62	0.00	341.07	48.62	0.00
J63	0.01	340.82	48.89	0.00
J64	0.18	340.09	50.32	0.00
J65	0.71	340.62	49.42	0.00
J66	0.27	340.36	50.60	0.00
J67	0.28	340.20	49.83	0.00
J68	0.33	339.02	50.73	0.00
J69	0.37	339.01	50.63	0.00
J70	0.42	339.01	50.61	0.00
J71	0.87	337.88	49.01	0.00
J72	0.10	339.41	50.49	0.00
J73	0.18	338.89	50.16	0.00
J74	0.24	337.97	48.77	0.00
J75	0.12	337.33	48.15	0.00
J76	0.40	337.32	47.71	0.00
J77	0.03	335.33	46.15	0.00
J78	0.06	335.00	45.39	0.00
J79	0.50	333.67	44.03	0.00
J80	0.25	333.37	43.53	0.00
J81	0.12	334.39	45.39	0.00
J82	0.81	333.38	43.90	0.00
J83	0.27	333.13	43.56	0.00
J84	0.00	339.24	50.13	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	339.24	50.26	0.00
J86	0.02	339.10	49.88	0.00
J87	0.02	339.08	49.86	0.00
J88	0.22	339.08	49.80	0.00

J89	0.37	339.08	49.52	0.00
J90	0.23	339.10	49.75	0.00
J91	0.39	339.10	49.89	0.00
J92	0.02	339.10	49.70	0.00
J93	0.12	339.08	49.73	0.00
J94	0.22	339.08	49.92	0.00
J95	0.03	338.86	49.92	0.00
J96	0.03	337.99	48.84	0.00
J97	0.35	336.77	47.13	0.00
J98	0.31	333.30	43.36	0.00
J99	0.14	331.62	41.73	0.00
J100	0.35	331.53	41.55	0.00
J101	0.33	330.26	39.34	0.00
J102	0.20	330.71	40.40	0.00
J103	0.29	331.24	41.79	0.00
J104	0.19	331.24	41.21	0.00
J105	0.07	331.24	42.22	0.00
J106	0.12	331.23	41.65	0.00
J107	0.23	330.20	40.42	0.00
J108	0.23	330.19	39.99	0.00
J109	0.16	330.18	39.69	0.00
J110	0.21	329.68	40.03	0.00
J111	0.14	328.99	38.96	0.00
J112	0.10	328.99	39.20	0.00
J113	0.34	328.99	39.50	0.00
J114	0.00	327.65	38.21	0.00
J115	0.70	327.75	37.73	0.00
J116	0.19	327.30	37.66	0.00
J117	0.50	326.99	37.28	0.00
J118	0.34	326.70	37.13	0.00
J120	0.07	327.51	37.76	0.00
J121	0.19	327.30	37.06	0.00
J122	0.06	327.23	37.09	0.00
J124	0.00	327.39	36.04	0.00
J125	0.18	327.49	36.41	0.00
J126	0.27	327.61	37.09	0.00
J127	0.86	328.11	37.62	0.00
J128	0.10	327.43	35.61	0.00
J129	3.73	327.49	35.48	0.00
J130	0.54	327.78	36.60	0.00
J131	0.96	328.14	37.46	0.00
J132	0.25	328.47	37.89	0.00
J133	0.34	328.39	37.55	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential plus Industrial MDD and FF S1 Model Results

J134	0.40	328.53	38.04	0.00
J135	0.48	328.50	38.28	0.00
J136	0.12	328.78	38.28	0.00
J137	0.18	329.08	39.98	0.00
J138	1.39	329.52	39.73	0.00
J139	0.18	329.93	39.46	0.00
FS	0.00	330.15	39.55	0.00
FD	0.00	330.04	39.44	0.00
J140	0.00	329.69	41.04	0.00
J141	0.22	329.44	41.44	0.00
J142	22.65	328.47	41.97	0.00
J143	0.51	328.32	42.04	0.00
J144	0.01	328.15	43.40	0.00
J145	0.00	328.11	43.54	0.00
J146	0.00	328.07	44.04	0.00
J147	0.03	328.05	44.15	0.00
J148	0.04	328.03	44.83	0.00
J149	0.09	328.01	45.12	0.00
J150	0.24	327.98	45.93	0.00
J151	0.01	328.04	43.64	0.00
J152	0.01	328.02	45.07	0.00
J153	0.00	328.01	45.86	0.00
J154	0.00	328.00	46.15	0.00
J155	0.01	327.99	47.39	0.00
J156	1.21	327.98	46.13	0.00
J157	0.00	327.95	46.45	0.00
J158	0.01	327.92	47.62	0.00
J159A	0.00	326.96	47.46	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	38.00	315.69	22.67	0.00	
JFF2	38.00	326.70	37.13	0.00	
JFF3	38.00	340.01	46.69	0.00	
JFF4	0.00	339.10	49.70	0.00	
JFF5	0.00	339.01	50.61	0.00	
JFF6	0.00	327.99	47.39	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	38.00	325.34	31.58	0.00	
JFF9	20.10	340.08	48.85	0.00	
J119	0.40	327.12	37.39	0.00	
J123	0.08	327.36	37.48	0.00	
J183	0.21	326.69	33.72	0.00	
J184	0.00	327.84	33.54	0.00	
J185	0.05	327.64	34.70	0.00	
J186	0.23	327.32	34.14	0.00	
J187	0.13	327.65	34.05	0.00	
J188	0.09	327.55	34.16	0.00	
RES1	-134.29	287.05	0.00	0.00	Reservoir
RES2	-134.29	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.66	1.71	12.75	Open
PS2	80.62	1.64	9.13	Open
PS3	53.66	1.71	12.75	Open
PS4	80.62	1.64	9.13	Open
PD1	53.66	1.71	12.75	Open
PD2	80.62	1.64	9.14	Open
PD3	53.66	1.71	12.75	Open
PD4	80.62	1.64	9.14	Open
PD5	268.57	2.14	8.59	Open
PIPE1A	68.35	0.54	0.60	Open

PIPE1	47.92	2.71	41.98	Open
PIPE2	46.18	2.61	39.20	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	200.03	1.59	4.38	Open
PIPE5	79.17	1.61	8.83	Open
PIPE6	67.45	1.37	6.57	Open
PIPE7	79.21	2.52	26.22	Open
PIPE8	78.84	2.51	25.99	Open
PIPE9	22.86	1.29	10.66	Open
PIPE10	22.15	1.25	10.05	Open
PIPE11	21.44	1.21	9.46	Open
PIPE12	21.42	1.21	9.45	Open
PIPE13	21.34	1.21	9.38	Open
PIPE14	20.98	1.19	9.09	Open
PIPE15	20.64	1.17	8.82	Open
PIPE16	39.00	2.21	28.66	Open
PIPE17	38.68	2.19	28.23	Open
PIPE18	55.23	1.76	13.45	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	53.79	1.71	12.80	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	52.38	1.67	12.19	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	51.26	1.63	11.71	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	59.84	1.90	15.60	Open
PIPE27	38.37	2.17	27.81	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	37.35	2.11	26.46	Open
PIPE30	42.41	2.40	33.48	Open
PIPE31	-5.33	0.30	0.72	Open
PIPE32	20.43	1.16	8.66	Open
PIPE33	20.09	1.14	8.39	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	45.93	2.60	38.80	Open
PIPE39	11.83	0.67	3.15	Open
PIPE40	11.41	0.65	2.94	Open
PIPE41	11.03	1.40	19.93	Open
PIPE42	10.95	0.62	2.72	Open

PIPE43	10.87	0.62	2.69	Open
PIPE44	34.01	1.92	22.24	Open
PIPE45	-10.63	0.60	2.58	Open
PIPE46	22.08	1.25	9.99	Open
PIPE47	31.60	1.79	19.41	Open
PIPE48	21.42	1.21	9.45	Open
PIPE49	21.26	1.20	9.32	Open
PIPE50	20.69	1.17	8.86	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE51	25.63	1.45	13.17	Open
PIPE52	19.34	1.09	7.82	Open
PIPE53	25.80	1.46	13.34	Open
PIPE54	41.52	1.32	7.93	Open
PIPE55	40.55	1.29	7.59	Open
PIPE56	62.64	1.99	16.98	Open
PIPE57	24.36	0.78	2.95	Open
PIPE58	11.52	0.65	2.99	Open
PIPE59	11.05	0.63	2.78	Open
PIPE60	-7.21	0.15	0.10	Open
PIPE61	67.39	0.95	2.70	Open
PIPE62	-19.07	0.39	0.63	Open
PIPE63	11.19	0.23	0.24	Open
PIPE64	14.47	0.82	4.57	Open
PIPE65	55.80	1.14	4.62	Open
PIPE66	3.46	0.20	0.32	Open
PIPE67	20.67	1.17	11.76	Open
PIPE68	10.82	0.61	2.67	Open
PIPE69	22.93	1.30	10.72	Open
PIPE70	38.59	0.79	2.33	Open
PIPE71	-12.47	0.71	3.47	Open
PIPE72	26.12	1.48	13.64	Open
PIPE73	17.94	1.02	6.80	Open
PIPE74	8.17	0.46	1.58	Open
PIPE75	7.46	0.42	1.34	Open
PIPE76	7.19	0.41	1.25	Open
PIPE77	6.91	0.39	1.16	Open
PIPE78	24.67	1.40	12.27	Open
PIPE79	0.78	0.04	0.02	Open
PIPE80	0.42	0.02	0.01	Open
PIPE81	16.54	0.94	5.85	Open
PIPE82	21.27	0.68	2.30	Open
PIPE83	21.16	1.20	9.24	Open
PIPE84	-7.02	0.40	1.20	Open

PIPE85	19.66	1.11	8.06	Open
PIPE86	19.42	1.10	7.88	Open
PIPE87	15.67	0.89	5.30	Open
PIPE88	2.19	0.12	0.14	Open
PIPE89	32.78	1.86	20.78	Open
PIPE90	16.40	0.93	5.76	Open
PIPE91	16.34	0.92	5.72	Open
PIPE92	15.83	0.90	5.40	Open
PIPE93	16.36	0.93	5.73	Open
PIPE94	16.24	0.92	5.66	Open
PIPE95	15.43	0.87	5.14	Open
PIPE96	25.59	0.81	3.23	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	17.46	0.56	1.59	Open
PIPE99	7.98	0.45	1.52	Open
PIPE100	16.79	0.53	1.48	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	0.64	0.02	0.00	Open
PIPE104	0.41	0.01	0.00	Open
PIPE105	0.02	0.00	0.00	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	23.82	0.76	2.83	Open
PIPE109	-8.35	0.27	0.41	Open
PIPE110	32.14	1.82	20.03	Open
PIPE111	14.72	0.83	4.72	Open
PIPE112	16.51	0.93	5.83	Open
PIPE113	17.39	0.98	6.42	Open
PIPE114	33.54	1.90	21.68	Open
PIPE115	38.36	2.17	24.46	Open
PIPE116	-5.14	0.29	0.67	Open
PIPE117	10.45	0.59	2.50	Open
PIPE118	25.60	1.45	13.15	Open
PIPE119	25.25	1.43	12.81	Open
PIPE120	19.20	1.09	6.79	Open
PIPE121	18.99	1.07	6.65	Open
PIPE122	19.02	1.08	6.67	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	18.35	1.04	7.09	Open

PIPE127	2.24	0.13	0.15	Open
PIPE128	2.01	0.11	0.12	Open
PIPE129	-8.62	0.49	1.75	Open
PIPE130	15.87	0.90	5.42	Open
PIPE131	15.66	0.89	5.29	Open
PIPE132	-0.52	0.03	0.01	Open
PIPE133	-0.63	0.04	0.01	Open
PIPE134	-0.97	0.05	0.03	Open
PIPE135	24.76	1.40	12.36	Open
PIPE136	-5.33	0.30	0.72	Open
PIPE137	22.23	0.71	2.19	Open
PIPE138	22.04	0.70	2.16	Open
PIPE139	21.55	0.69	2.07	Open
PIPE141	7.86	0.44	1.47	Open
PIPE142	7.78	0.44	1.45	Open
PIPE143	7.59	0.43	1.38	Open
PIPE147	-5.55	0.31	0.77	Open
PIPE148	-5.73	0.32	0.82	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	-5.99	0.34	0.89	Open
PIPE150	-12.02	0.68	3.24	Open
PIPE152	-5.25	0.30	0.70	Open
PIPE153	-8.98	0.51	1.89	Open
PIPE154	-9.52	0.54	2.11	Open
PIPE155	0.15	0.08	0.21	Open
PIPE156	-12.72	0.72	3.60	Open
PIPE157	16.04	0.91	5.53	Open
PIPE158	5.39	0.31	0.73	Open
PIPE159	-10.64	0.60	2.58	Open
PIPE160	-5.59	0.32	0.78	Open
PIPE161	-2.32	0.13	0.15	Open
PIPE162	-2.80	0.16	0.22	Open
PIPE163	-8.79	0.50	1.81	Open
PIPE164	-8.91	0.50	1.86	Open
PIPE165	-9.09	0.51	1.93	Open
PIPE166	-10.47	0.59	2.51	Open
PIPE167	35.29	0.72	1.74	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	35.11	0.72	1.72	Open
PIPE169	35.11	0.72	1.72	Open
PIPE170	34.89	0.71	1.70	Open
PIPE171	12.24	0.25	0.25	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	38.00	0.05	0.00	Open
PIPEFF2	38.00	0.05	0.04	Open
PIPEFF3	38.00	0.05	0.04	Open
PIPEFF4	0.00	0.00	0.00	Open
PIPEFF5	0.00	0.00	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	38.00	0.05	0.00	Open
PIPEFF9	20.10	0.03	0.00	Open
PIPE140	-17.75	1.00	5.87	Open
PIPE144	7.53	0.43	1.20	Open
PIPE145	-10.62	0.60	2.27	Open
PIPE146	-5.55	0.31	0.68	Open
PIPE151	-5.15	0.29	0.59	Open
PIPE215	0.96	0.05	0.03	Open
PIPE216	18.71	1.06	6.47	Open
PIPE217	18.46	1.04	6.32	Open
PIPE218	11.75	0.67	2.74	Open
PIPE219	7.40	0.42	1.16	Open
PIPE220	6.71	0.38	0.97	Open
PIPE221	6.58	0.37	0.94	Open
PIPE222	4.30	0.24	0.43	Open
PIPE223	10.80	0.61	2.34	Open
PIPE224	17.96	1.02	6.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PUMP1	53.66	0.00	-56.76	Open Pump
PUMP2	80.62	0.00	-56.72	Open Pump
PUMP3	53.66	0.00	-56.76	Open Pump
PUMP4	80.62	0.00	-56.72	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	28.86	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential plus Industrial MDD and FF S2 Model Results


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*********************************************************************
*                            E P A N E T                            *
*                    Hydraulic and Water Quality                    *
*                    Analysis for Pipe Networks                     *
*                          Version 2.2                              *
*********************************************************************

Input File: Wawa Water Hydraulic Model_Future Res plus Ind MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	39.81	39.81	0.00
PUMP2	100.00	75.00	0.21	59.77	59.77	0.00
PUMP3	100.00	75.00	0.21	39.81	39.81	0.00
PUMP4	100.00	75.00	0.21	59.77	59.77	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	286.99	-7.31	0.00
S2	0.00	287.00	-7.30	0.00
S3	0.00	286.99	-7.31	0.00
S4	0.00	287.00	-7.30	0.00
D1	0.00	343.75	49.45	0.00
D2	0.00	343.73	49.43	0.00
D3	0.00	343.75	49.45	0.00
D4	0.00	343.73	49.43	0.00
DH	0.00	343.68	49.38	0.00
J1A	0.19	343.60	50.40	0.00
J1	0.00	343.58	50.34	0.00
J2	0.20	342.28	49.07	0.00
J3	0.10	341.22	48.04	0.00
J4	0.15	341.22	48.10	0.00

J5	0.12	343.27	50.70	0.00
J6	0.20	341.50	50.41	0.00
J7	0.06	341.38	50.42	0.00
J8	0.37	342.54	49.19	0.00
J9	0.74	341.48	47.82	0.00
J10	0.71	340.95	48.22	0.00
J11	0.72	340.45	45.85	0.00
J12	0.01	339.99	44.57	0.00
J13	0.08	339.76	44.38	0.00
J14	0.36	339.34	42.62	0.00
J15	0.34	338.91	41.74	0.00
J16	0.35	337.53	43.33	0.00
J17	0.32	337.53	46.38	0.00
J18	0.68	337.52	44.50	0.00
J19	0.38	341.02	46.36	0.00
J20	1.06	341.02	45.67	0.00
J21	0.28	340.64	46.91	0.00
J22	1.12	340.64	45.21	0.00
J23	0.19	340.30	47.11	0.00
J24	0.93	340.30	44.72	0.00
J25	0.10	339.98	46.59	0.00
J26	1.95	339.97	46.63	0.00
J27	0.04	339.53	45.03	0.00
J28	0.16	339.32	45.11	0.00
J29	0.85	339.32	43.79	0.00
J30	0.28	338.76	43.71	0.00
J31	4.41	338.71	44.95	0.00
J32	0.96	338.27	42.96	0.00
J33	0.34	341.59	48.04	0.00
J34	0.34	340.57	45.61	0.00
J35	0.05	340.57	44.74	0.00
J36	0.62	340.57	44.05	0.00
J37	0.34	342.27	48.08	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	342.26	45.67	0.00
J39	0.09	340.73	47.51	0.00
J40	0.42	340.55	46.04	0.00
J41	0.38	340.44	44.54	0.00
J42	0.09	339.82	43.68	0.00
J43	0.07	339.71	43.72	0.00
J44	1.35	339.62	43.73	0.00
J45	1.30	340.09	45.44	0.00
J46	0.86	338.29	42.57	0.00

J47	0.16	339.21	43.83	0.00
J48	0.57	338.71	43.00	0.00
J49	0.87	338.20	43.00	0.00
J50	0.07	336.45	46.98	0.00
J51	0.98	342.26	49.69	0.00
J52	4.19	340.46	46.63	0.00
J53	0.29	337.79	44.47	0.00
J54	0.44	337.14	44.09	0.00
J55	0.46	340.98	47.89	0.00
J56	0.55	340.46	47.85	0.00
J57	0.41	340.46	48.44	0.00
J58	0.19	339.56	46.10	0.00
J59	0.00	339.55	46.09	0.00
J60	0.57	335.71	44.48	0.00
J61	0.36	339.12	46.67	0.00
J62	0.00	339.17	46.72	0.00
J63	0.01	338.72	46.79	0.00
J64	0.18	337.40	47.63	0.00
J65	0.71	338.37	47.17	0.00
J66	0.27	337.90	48.14	0.00
J67	0.28	337.61	47.24	0.00
J68	0.33	335.40	47.11	0.00
J69	0.37	330.93	42.55	0.00
J70	0.42	326.54	38.14	0.00
J71	0.87	335.30	46.43	0.00
J72	0.10	336.51	47.59	0.00
J73	0.18	335.60	46.87	0.00
J74	0.24	335.40	46.20	0.00
J75	0.12	335.27	46.09	0.00
J76	0.40	335.27	45.66	0.00
J77	0.03	334.98	45.80	0.00
J78	0.06	334.93	45.32	0.00
J79	0.50	334.75	45.11	0.00
J80	0.25	334.72	44.88	0.00
J81	0.12	334.83	45.83	0.00
J82	0.81	334.67	45.19	0.00
J83	0.27	334.64	45.07	0.00
J84	0.00	335.89	46.78	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	335.89	46.91	0.00
J86	0.02	335.53	46.31	0.00
J87	0.02	335.54	46.32	0.00
J88	0.22	335.54	46.26	0.00

J89	0.37	335.54	45.98	0.00
J90	0.23	334.07	44.72	0.00
J91	0.39	333.78	44.57	0.00
J92	0.02	331.37	41.97	0.00
J93	0.12	335.54	46.19	0.00
J94	0.22	335.54	46.38	0.00
J95	0.03	335.54	46.60	0.00
J96	0.03	335.39	46.24	0.00
J97	0.35	335.20	45.56	0.00
J98	0.31	334.72	44.78	0.00
J99	0.14	334.57	44.68	0.00
J100	0.35	334.33	44.35	0.00
J101	0.33	334.09	43.17	0.00
J102	0.20	334.24	43.93	0.00
J103	0.29	334.58	45.13	0.00
J104	0.19	334.58	44.55	0.00
J105	0.07	334.58	45.56	0.00
J106	0.12	334.56	44.98	0.00
J107	0.23	334.59	44.81	0.00
J108	0.23	334.44	44.24	0.00
J109	0.16	334.30	43.81	0.00
J110	0.21	334.86	45.21	0.00
J111	0.14	335.25	45.22	0.00
J112	0.10	335.68	45.89	0.00
J113	0.34	336.28	46.79	0.00
J114	0.00	335.74	46.30	0.00
J115	0.70	335.51	45.49	0.00
J116	0.19	335.71	46.07	0.00
J117	0.50	335.68	45.97	0.00
J118	0.34	335.66	46.09	0.00
J120	0.07	335.71	45.96	0.00
J121	0.19	335.66	45.42	0.00
J122	0.06	335.65	45.51	0.00
J124	0.00	335.51	44.16	0.00
J125	0.18	335.51	44.43	0.00
J126	0.27	335.51	44.99	0.00
J127	0.86	335.35	44.86	0.00
J128	0.10	335.39	43.57	0.00
J129	3.73	335.29	43.28	0.00
J130	0.54	335.26	44.08	0.00
J131	0.96	335.23	44.55	0.00
J132	0.25	335.25	44.67	0.00
J133	0.34	335.22	44.38	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential plus Industrial MDD and FF S2 Model Results

J134	0.40	335.14	44.65	0.00
J135	0.48	335.18	44.96	0.00
J136	0.12	334.96	44.46	0.00
J137	0.18	334.77	45.67	0.00
J138	1.39	334.50	44.71	0.00
J139	0.18	333.76	43.29	0.00
FS	0.00	333.98	43.38	0.00
FD	0.00	333.87	43.27	0.00
J140	0.00	333.52	44.87	0.00
J141	0.22	333.27	45.27	0.00
J142	22.65	332.30	45.80	0.00
J143	0.51	332.15	45.87	0.00
J144	0.01	331.98	47.23	0.00
J145	0.00	331.94	47.37	0.00
J146	0.00	331.90	47.87	0.00
J147	0.03	331.88	47.98	0.00
J148	0.04	331.86	48.66	0.00
J149	0.09	331.84	48.95	0.00
J150	0.24	331.80	49.75	0.00
J151	0.01	331.87	47.47	0.00
J152	0.01	331.85	48.90	0.00
J153	0.00	331.84	49.69	0.00
J154	0.00	331.83	49.98	0.00
J155	0.01	331.82	51.22	0.00
J156	1.21	331.81	49.96	0.00
J157	0.00	331.78	50.28	0.00
J158	0.01	331.74	51.44	0.00
J159A	0.00	330.79	51.29	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	246.60	41.50	0.00
J162	0.03	246.59	41.19	0.00
J163	0.16	246.56	41.46	0.00
J164	0.06	246.56	40.66	0.00
J165	0.06	246.56	39.96	0.00
J166	0.07	246.56	40.06	0.00
J167	0.04	246.56	40.56	0.00
J168	0.09	246.56	41.66	0.00
J169	0.10	246.56	39.86	0.00
J170	0.00	246.55	49.55	0.00
J171	0.16	246.55	46.55	0.00
J172	0.00	246.53	53.53	0.00
J173	0.00	246.53	56.53	0.00
J174	0.04	246.53	55.83	0.00
J175	0.10	246.52	55.42	0.00

EPANet Future Residential plus Industrial MDD and FF S2 Model Results

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	246.51	57.51	0.00	
J177	0.07	246.53	53.83	0.00	
J178	0.07	246.53	54.63	0.00	
J179	0.01	246.53	54.43	0.00	
J180	0.04	246.53	56.63	0.00	
J181	0.01	246.53	56.43	0.00	
J182	0.18	246.53	52.03	0.00	
JFS	0.00	246.61	41.51	0.00	
JFF1	0.00	337.52	44.50	0.00	
JFF2	20.10	335.66	46.09	0.00	
JFF3	38.00	337.79	44.47	0.00	
JFF4	38.00	331.37	41.97	0.00	
JFF5	38.00	326.54	38.14	0.00	
JFF6	0.00	331.82	51.22	0.00	
JFF7	0.00	246.56	39.86	0.00	
JFF8	0.00	338.71	44.95	0.00	
JFF9	38.00	335.71	44.48	0.00	
J119	0.40	335.63	45.90	0.00	
J123	0.08	335.51	45.63	0.00	
J183	0.21	337.38	44.41	0.00	
J184	0.00	337.82	43.52	0.00	
J185	0.05	337.74	44.80	0.00	
J186	0.23	337.61	44.43	0.00	
J187	0.13	337.74	44.14	0.00	
J188	0.09	337.70	44.31	0.00	
RES1	-134.29	287.05	0.00	0.00	Reservoir
RES2	-134.29	287.05	0.00	0.00	Reservoir
TANK1	4.84	246.60	41.50	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	53.66	1.71	12.75	Open
PS2	80.62	1.64	9.13	Open
PS3	53.66	1.71	12.75	Open
PS4	80.62	1.64	9.13	Open
PD1	53.66	1.71	12.75	Open
PD2	80.62	1.64	9.14	Open
PD3	53.66	1.71	12.75	Open
PD4	80.62	1.64	9.14	Open
PD5	268.57	2.14	8.60	Open
PIPE1A	56.74	0.45	0.42	Open

PIPE1	29.71	1.68	17.31	Open
PIPE2	27.97	1.58	15.48	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	211.63	1.68	4.87	Open
PIPE5	108.41	2.21	15.81	Open
PIPE6	92.51	1.88	11.79	Open
PIPE7	46.67	1.49	9.84	Open
PIPE8	46.30	1.47	9.70	Open
PIPE9	13.05	0.74	3.77	Open
PIPE10	12.34	0.70	3.40	Open
PIPE11	11.62	0.66	3.05	Open
PIPE12	11.61	0.66	3.04	Open
PIPE13	11.53	0.65	3.00	Open
PIPE14	11.17	0.63	2.83	Open
PIPE15	10.83	0.61	2.67	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	32.50	1.03	5.04	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	31.05	0.99	4.63	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	29.65	0.94	4.25	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	28.53	0.91	3.96	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	31.25	0.99	4.68	Open
PIPE27	16.19	0.92	5.63	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	15.18	0.86	4.99	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	10.49	0.59	2.52	Open
PIPE32	27.04	1.53	14.55	Open
PIPE33	26.70	1.51	14.20	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	27.71	1.57	15.22	Open
PIPE39	7.48	0.42	1.35	Open
PIPE40	7.06	0.40	1.21	Open
PIPE41	6.68	0.85	7.88	Open
PIPE42	6.60	0.37	1.07	Open

PIPE43	6.52	0.37	1.04	Open
PIPE44	20.14	1.14	8.43	Open
PIPE45	-4.77	0.27	0.59	Open
PIPE46	14.07	0.80	4.34	Open
PIPE47	19.24	1.09	7.74	Open
PIPE48	15.01	0.85	4.89	Open
PIPE49	14.84	0.84	4.79	Open
PIPE50	14.27	0.81	4.46	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	2.51	0.14	0.18	Open
PIPE52	12.05	0.68	3.25	Open
PIPE53	30.14	1.71	17.79	Open
PIPE54	56.44	1.80	14.00	Open
PIPE55	55.47	1.77	13.55	Open
PIPE56	79.58	2.53	26.45	Open
PIPE57	41.29	1.31	7.85	Open
PIPE58	15.70	0.89	5.31	Open
PIPE59	15.23	0.86	5.03	Open
PIPE60	-2.62	0.05	0.02	Open
PIPE61	92.45	1.31	4.84	Open
PIPE62	-25.68	0.52	1.10	Open
PIPE63	9.37	0.19	0.17	Open
PIPE64	21.43	1.21	9.45	Open
PIPE65	82.67	1.68	9.57	Open
PIPE66	6.95	0.39	1.18	Open
PIPE67	38.57	2.18	37.35	Open
PIPE68	14.28	0.81	4.46	Open
PIPE69	29.13	1.65	16.70	Open
PIPE70	51.06	1.04	3.92	Open
PIPE71	-15.21	0.86	5.01	Open
PIPE72	35.85	2.03	24.52	Open
PIPE73	24.80	1.40	12.40	Open
PIPE74	11.03	0.62	2.76	Open
PIPE75	10.33	0.58	2.45	Open
PIPE76	10.06	0.57	2.33	Open
PIPE77	9.77	0.55	2.21	Open
PIPE78	34.40	1.95	22.72	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	4.37	0.25	0.50	Open
PIPE82	28.90	0.92	4.05	Open
PIPE83	28.80	1.63	16.35	Open
PIPE84	9.08	0.51	1.93	Open

PIPE85	8.53	0.48	1.72	Open
PIPE86	8.29	0.47	1.63	Open
PIPE87	3.50	0.20	0.33	Open
PIPE88	0.01	0.00	0.00	Open
PIPE89	11.66	0.66	3.06	Open
PIPE90	5.58	0.32	0.78	Open
PIPE91	5.52	0.31	0.77	Open
PIPE92	5.02	0.28	0.64	Open
PIPE93	6.05	0.34	0.91	Open
PIPE94	5.93	0.34	0.88	Open
PIPE95	5.12	0.29	0.67	Open
PIPE96	41.08	1.31	7.77	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	28.86	0.92	4.04	Open
PIPE99	12.08	0.68	3.27	Open
PIPE100	-9.81	0.31	0.55	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	1.31	0.04	0.01	Open
PIPE109	-11.01	0.35	0.68	Open
PIPE110	12.30	0.70	3.38	Open
PIPE111	5.85	0.33	0.85	Open
PIPE112	5.47	0.31	0.75	Open
PIPE113	6.41	0.36	1.01	Open
PIPE114	11.53	0.65	3.00	Open
PIPE115	10.22	0.58	2.11	Open
PIPE116	0.99	0.06	0.03	Open
PIPE117	5.75	0.33	0.83	Open
PIPE118	10.60	0.60	2.57	Open
PIPE119	10.25	0.58	2.41	Open
PIPE120	11.07	0.63	2.45	Open
PIPE121	10.87	0.62	2.37	Open
PIPE122	-0.99	0.06	0.03	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-1.67	0.09	0.08	Open

PIPE127	9.36	0.53	2.04	Open
PIPE128	9.12	0.52	1.94	Open
PIPE129	14.50	0.82	4.59	Open
PIPE130	-11.26	0.64	2.87	Open
PIPE131	-11.47	0.65	2.97	Open
PIPE132	-12.11	0.69	3.29	Open
PIPE133	-12.22	0.69	3.34	Open
PIPE134	-12.56	0.71	3.51	Open
PIPE135	17.51	0.99	6.51	Open
PIPE136	8.31	0.47	1.63	Open
PIPE137	5.79	0.18	0.18	Open
PIPE138	5.60	0.18	0.17	Open
PIPE139	5.11	0.16	0.14	Open
PIPE141	3.41	0.19	0.31	Open
PIPE142	3.34	0.19	0.30	Open
PIPE143	3.15	0.18	0.27	Open
PIPE147	0.49	0.03	0.01	Open
PIPE148	0.31	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	0.05	0.00	0.00	Open
PIPE150	7.65	0.43	1.40	Open
PIPE152	6.62	0.37	1.07	Open
PIPE153	2.89	0.16	0.23	Open
PIPE154	2.35	0.13	0.16	Open
PIPE155	-0.35	0.18	0.99	Open
PIPE156	6.44	0.36	1.02	Open
PIPE157	0.50	0.03	0.01	Open
PIPE158	2.92	0.17	0.24	Open
PIPE159	1.74	0.10	0.09	Open
PIPE160	4.32	0.24	0.49	Open
PIPE161	3.77	0.21	0.38	Open
PIPE162	3.29	0.19	0.29	Open
PIPE163	7.22	0.41	1.26	Open
PIPE164	7.10	0.40	1.22	Open
PIPE165	6.92	0.39	1.17	Open
PIPE166	5.54	0.31	0.77	Open
PIPE167	35.29	0.72	1.74	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	35.11	0.72	1.73	Open
PIPE169	35.11	0.72	1.72	Open
PIPE170	34.89	0.71	1.70	Open
PIPE171	12.24	0.25	0.24	Open

PIPE172	11.73	0.24	0.23	Open
PIPE173	11.71	0.24	0.23	Open
PIPE174	11.71	0.24	0.23	Open
PIPE175	11.71	0.24	0.23	Open
PIPE176	9.70	0.20	0.16	Open
PIPE177	9.66	0.20	0.16	Open
PIPE178	9.57	0.20	0.16	Open
PIPE179	1.98	0.11	0.10	Open
PIPE180	1.97	0.11	0.10	Open
PIPE181	1.96	0.11	0.10	Open
PIPE182	1.96	0.11	0.10	Open
PIPE183	1.96	0.11	0.10	Open
PIPE184	1.95	0.11	0.10	Open
PIPE185	0.74	0.04	0.02	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	5.16	0.16	0.17	Open
PIPE190	5.02	0.16	0.14	Open
PIPE191	4.99	0.16	0.14	Open
PIPE192	0.35	0.02	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE193	0.12	0.01	0.00	Open
PIPE194	0.17	0.01	0.00	Open
PIPE195	0.09	0.01	0.00	Open
PIPE196	0.05	0.00	0.00	Open
PIPE197	0.12	0.01	0.00	Open
PIPE198	0.03	0.00	0.00	Open
PIPE199	-0.08	0.00	0.00	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	20.10	0.03	0.00	Open
PIPEFF3	38.00	0.05	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.00	Open
PIPEFF6	0.00	0.00	0.00	Open
PIPEFF7	0.00	0.00	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	38.00	0.05	0.00	Open
PIPE140	4.61	0.26	0.48	Open
PIPE144	3.09	0.17	0.23	Open
PIPE145	7.29	0.41	1.13	Open
PIPE146	0.49	0.03	0.01	Open
PIPE151	6.73	0.38	0.97	Open
PIPE215	-19.94	1.13	7.28	Open
PIPE216	-9.47	0.54	1.84	Open
PIPE217	11.17	0.63	2.49	Open
PIPE218	7.10	0.40	1.08	Open
PIPE219	4.44	0.25	0.45	Open
PIPE220	4.07	0.23	0.38	Open
PIPE221	3.94	0.22	0.36	Open
PIPE222	2.61	0.15	0.17	Open
PIPE223	6.46	0.37	0.90	Open
PIPE224	10.67	0.60	2.29	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PUMP1	53.66	0.00	-56.76	Open Pump
PUMP2	80.62	0.00	-56.72	Open Pump
PUMP3	53.66	0.00	-56.76	Open Pump
PUMP4	80.62	0.00	-56.72	Open Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	10.06	0.57	32.69	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	11.06	Active Valve

EPANet Future Residential plus Industrial MDD and FF S3 Model Results


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******************************************************************
*                            E P A N E T                         *
*                    Hydraulic and Water Quality                 *
*                    Analysis for Pipe Networks                  *
*                          Version 2.2                           *
******************************************************************

Input File: Wawa Water Hydraulic Model_Future Res plus Ind MDD and FF_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPEFF1	J18	JFF1	1	1000

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPEFF2	J118	JFF2	1	1000
PIPEFF3	J53	JFF3	1	1000
PIPEFF4	J92	JFF4	1	1000
PIPEFF5	J70	JFF5	1	1000
PIPEFF6	J155	JFF6	1	1000
PIPEFF7	J169	JFF7	1	1000
PIPEFF8	J31	JFF8	1	1000
PIPEFF9	J60	JFF9	1	1000
PIPE140	J118	J119	71.63	150
PIPE144	J122	J119	96	150
PIPE145	J119	J123	106.0	150
PIPE146	J123	J124	41.15	150
PIPE151	J123	J128	126.8	150
PIPE215	J118	J183	235	150
PIPE216	J183	J16	85	150
PIPE217	J49	J184	152.50	150
PIPE218	J184	J185	73.5	150
PIPE219	J185	J186	281.2	150

PIPE220	J184	J187	203.4	150
PIPE221	J187	J188	98.2	150
PIPE222	J185	J188	206.4	150
PIPE223	J188	J186	102.1	150
PIPE224	J186	J183	103.8	150
PUMP1	S1	D1	#N/A	#N/A Pump
PUMP2	S2	D2	#N/A	#N/A Pump
PUMP3	S3	D3	#N/A	#N/A Pump
PUMP4	S4	D4	#N/A	#N/A Pump
PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.21	33.61	33.61	0.00
PUMP2	100.00	75.00	0.21	54.88	54.88	0.00
PUMP3	100.00	75.00	0.21	33.61	33.61	0.00
PUMP4	100.00	75.00	0.21	54.88	54.88	0.00
PUMP5	100.00	75.00	0.04	11.60	11.60	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
S1	0.00	287.01	-7.29	0.00
S2	0.00	287.01	-7.29	0.00
S3	0.00	287.01	-7.29	0.00
S4	0.00	287.01	-7.29	0.00
D1	0.00	345.74	51.44	0.00
D2	0.00	345.74	51.44	0.00
D3	0.00	345.74	51.44	0.00
D4	0.00	345.74	51.44	0.00
DH	0.00	345.70	51.40	0.00
J1A	0.19	345.64	52.44	0.00
J1	0.00	345.62	52.38	0.00
J2	0.20	344.44	51.23	0.00
J3	0.10	343.48	50.30	0.00
J4	0.15	343.48	50.36	0.00

J5	0.12	345.40	52.83	0.00
J6	0.20	344.17	53.08	0.00
J7	0.06	344.09	53.13	0.00
J8	0.37	344.72	51.37	0.00
J9	0.74	343.74	50.08	0.00
J10	0.71	343.28	50.55	0.00
J11	0.72	342.83	48.23	0.00
J12	0.01	342.43	47.01	0.00
J13	0.08	342.23	46.85	0.00
J14	0.36	341.86	45.14	0.00
J15	0.34	341.49	44.32	0.00
J16	0.35	340.29	46.09	0.00
J17	0.32	340.28	49.13	0.00
J18	0.68	340.28	47.26	0.00
J19	0.38	343.32	48.66	0.00
J20	1.06	343.31	47.96	0.00
J21	0.28	342.97	49.24	0.00
J22	1.12	342.96	47.53	0.00
J23	0.19	342.65	49.46	0.00
J24	0.93	342.65	47.07	0.00
J25	0.10	342.35	48.96	0.00
J26	1.95	342.34	49.00	0.00
J27	0.04	341.95	47.45	0.00
J28	0.16	341.75	47.54	0.00
J29	0.85	341.75	46.22	0.00
J30	0.28	341.25	46.20	0.00
J31	4.41	341.20	47.44	0.00
J32	0.96	340.82	45.51	0.00
J33	0.34	344.24	50.69	0.00
J34	0.34	343.53	48.57	0.00
J35	0.05	343.53	47.70	0.00
J36	0.62	343.53	47.01	0.00
J37	0.34	344.42	50.23	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J38	1.20	344.42	47.83	0.00
J39	0.09	343.03	49.81	0.00
J40	0.42	342.87	48.36	0.00
J41	0.38	342.76	46.86	0.00
J42	0.09	342.21	46.07	0.00
J43	0.07	342.11	46.12	0.00
J44	1.35	342.02	46.13	0.00
J45	1.30	342.45	47.80	0.00
J46	0.86	340.83	45.11	0.00

J47	0.16	341.66	46.28	0.00
J48	0.57	341.21	45.50	0.00
J49	0.87	340.77	45.57	0.00
J50	0.07	339.11	49.64	0.00
J51	0.98	344.70	52.13	0.00
J52	4.19	343.45	49.62	0.00
J53	0.29	341.83	48.51	0.00
J54	0.44	340.52	47.47	0.00
J55	0.46	343.81	50.72	0.00
J56	0.55	343.45	50.84	0.00
J57	0.41	343.45	51.43	0.00
J58	0.19	342.78	49.32	0.00
J59	0.00	342.78	49.32	0.00
J60	0.57	341.57	50.34	0.00
J61	0.36	342.34	49.89	0.00
J62	0.00	342.37	49.92	0.00
J63	0.01	341.85	49.92	0.00
J64	0.18	340.26	50.49	0.00
J65	0.71	341.42	50.22	0.00
J66	0.27	340.86	51.10	0.00
J67	0.28	340.51	50.14	0.00
J68	0.33	337.86	49.57	0.00
J69	0.37	333.38	45.00	0.00
J70	0.42	328.99	40.59	0.00
J71	0.87	337.44	48.57	0.00
J72	0.10	339.54	50.62	0.00
J73	0.18	338.13	49.40	0.00
J74	0.24	337.61	48.41	0.00
J75	0.12	337.25	48.07	0.00
J76	0.40	337.25	47.64	0.00
J77	0.03	336.27	47.09	0.00
J78	0.06	336.12	46.51	0.00
J79	0.50	335.52	45.88	0.00
J80	0.25	335.39	45.55	0.00
J81	0.12	335.78	46.78	0.00
J82	0.81	335.25	45.77	0.00
J83	0.27	335.12	45.55	0.00
J84	0.00	338.65	49.54	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J85	0.15	338.65	49.67	0.00
J86	0.02	338.12	48.90	0.00
J87	0.02	338.12	48.90	0.00
J88	0.22	338.12	48.84	0.00

J89	0.37	338.12	48.56	0.00
J90	0.23	336.66	47.31	0.00
J91	0.39	336.37	47.16	0.00
J92	0.02	333.96	44.56	0.00
J93	0.12	338.12	48.77	0.00
J94	0.22	338.12	48.96	0.00
J95	0.03	338.07	49.13	0.00
J96	0.03	337.62	48.47	0.00
J97	0.35	337.01	47.37	0.00
J98	0.31	335.39	45.45	0.00
J99	0.14	334.86	44.97	0.00
J100	0.35	333.96	43.98	0.00
J101	0.33	333.03	42.11	0.00
J102	0.20	333.63	43.32	0.00
J103	0.29	334.87	45.42	0.00
J104	0.19	334.86	44.83	0.00
J105	0.07	334.86	45.84	0.00
J106	0.12	334.85	45.27	0.00
J107	0.23	334.90	45.12	0.00
J108	0.23	334.35	44.15	0.00
J109	0.16	333.86	43.37	0.00
J110	0.21	335.80	46.15	0.00
J111	0.14	337.05	47.02	0.00
J112	0.10	337.80	48.01	0.00
J113	0.34	338.82	49.33	0.00
J114	0.00	338.73	49.29	0.00
J115	0.70	338.13	48.11	0.00
J116	0.19	338.76	49.12	0.00
J117	0.50	338.78	49.07	0.00
J118	0.34	338.81	49.24	0.00
J120	0.07	338.70	48.95	0.00
J121	0.19	338.66	48.42	0.00
J122	0.06	338.64	48.50	0.00
J124	0.00	338.21	46.86	0.00
J125	0.18	338.18	47.10	0.00
J126	0.27	338.15	47.63	0.00
J127	0.86	337.55	47.06	0.00
J128	0.10	337.88	46.06	0.00
J129	3.73	337.64	45.63	0.00
J130	0.54	337.43	46.25	0.00
J131	0.96	337.23	46.55	0.00
J132	0.25	337.13	46.55	0.00
J133	0.34	337.12	46.28	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality

EPANet Future Residential plus Industrial MDD and FF S3 Model Results

J134	0.40	336.83	46.34	0.00
J135	0.48	336.94	46.72	0.00
J136	0.12	336.25	45.75	0.00
J137	0.18	335.61	46.51	0.00
J138	1.39	334.71	44.92	0.00
J139	0.18	343.88	53.41	0.00
FS	0.00	332.02	41.42	0.00
FD	0.00	344.13	53.53	0.00
J140	0.00	342.94	54.29	0.00
J141	0.22	341.98	53.98	0.00
J142	22.65	338.18	51.68	0.00
J143	0.51	336.13	49.85	0.00
J144	0.01	333.68	48.93	0.00
J145	0.00	333.11	48.54	0.00
J146	0.00	332.44	48.41	0.00
J147	0.03	332.19	48.29	0.00
J148	0.04	332.02	48.82	0.00
J149	0.09	331.78	48.89	0.00
J150	0.24	331.43	49.38	0.00
J151	0.01	331.59	47.19	0.00
J152	0.01	330.83	47.88	0.00
J153	0.00	330.18	48.03	0.00
J154	0.00	329.74	47.89	0.00
J155	0.01	329.29	48.69	0.00
J156	1.21	330.43	48.58	0.00
J157	0.00	331.40	49.90	0.00
J158	0.01	331.37	51.07	0.00
J159A	0.00	330.41	50.91	0.00
J159	0.00	298.10	18.60	0.00
J160A	0.06	293.28	44.78	0.00
J160B	0.00	259.96	11.47	0.00
J160	0.00	257.67	52.57	0.00
J161	0.15	231.58	26.48	0.00
J162	0.03	230.82	25.42	0.00
J163	0.16	229.71	24.61	0.00
J164	0.06	229.37	23.47	0.00
J165	0.06	229.21	22.61	0.00
J166	0.07	229.32	22.82	0.00
J167	0.04	229.26	23.26	0.00
J168	0.09	228.43	23.53	0.00
J169	0.10	227.80	21.10	0.00
J170	0.00	229.69	32.69	0.00
J171	0.16	229.69	29.69	0.00
J172	0.00	229.68	36.68	0.00
J173	0.00	229.67	39.67	0.00
J174	0.04	229.67	38.97	0.00
J175	0.10	229.66	38.56	0.00

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Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J176	3.69	229.66	40.66	0.00	
J177	0.07	229.67	36.97	0.00	
J178	0.07	229.67	37.77	0.00	
J179	0.01	229.67	37.57	0.00	
J180	0.04	229.68	39.78	0.00	
J181	0.01	229.67	39.57	0.00	
J182	0.18	229.67	35.17	0.00	
JFS	0.00	231.62	26.52	0.00	
JFF1	0.00	340.28	47.26	0.00	
JFF2	0.00	338.81	49.24	0.00	
JFF3	0.00	341.83	48.51	0.00	
JFF4	38.00	333.96	44.56	0.00	
JFF5	38.00	328.99	40.59	0.00	
JFF6	38.00	329.29	48.69	0.00	
JFF7	38.00	227.80	21.10	0.00	
JFF8	0.00	341.20	47.44	0.00	
JFF9	20.10	341.57	50.34	0.00	
J119	0.40	338.62	48.89	0.00	
J123	0.08	338.21	48.33	0.00	
J183	0.21	340.15	47.18	0.00	
J184	0.00	340.48	46.18	0.00	
J185	0.05	340.42	47.48	0.00	
J186	0.23	340.33	47.15	0.00	
J187	0.13	340.42	46.82	0.00	
J188	0.09	340.40	47.01	0.00	
RES1	-115.29	287.05	0.00	0.00	Reservoir
RES2	-115.29	287.05	0.00	0.00	Reservoir
TANK1	-33.16	231.61	26.51	0.00	Tank

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PS1	43.79	1.39	8.74	Open
PS2	71.50	1.46	7.31	Open
PS3	43.79	1.39	8.74	Open
PS4	71.50	1.46	7.31	Open
PD1	43.79	1.39	8.74	Open
PD2	71.50	1.46	7.31	Open
PD3	43.79	1.39	8.74	Open
PD4	71.50	1.46	7.31	Open
PD5	230.57	1.83	6.48	Open
PIPE1A	50.51	0.40	0.34	Open

PIPE1	28.28	1.60	15.80	Open
PIPE2	26.54	1.50	14.05	Open
PIPE3	0.15	0.01	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE4	179.87	1.43	3.60	Open
PIPE5	88.80	1.81	10.93	Open
PIPE6	75.72	1.54	8.14	Open
PIPE7	44.64	1.42	9.07	Open
PIPE8	44.27	1.41	8.93	Open
PIPE9	12.26	0.69	3.36	Open
PIPE10	11.55	0.65	3.01	Open
PIPE11	10.83	0.61	2.67	Open
PIPE12	10.82	0.61	2.66	Open
PIPE13	10.74	0.61	2.63	Open
PIPE14	10.38	0.59	2.47	Open
PIPE15	10.03	0.57	2.32	Open
PIPE16	1.00	0.06	0.03	Open
PIPE17	0.68	0.04	0.02	Open
PIPE18	31.27	1.00	4.69	Open
PIPE19	1.06	0.06	0.04	Open
PIPE20	29.82	0.95	4.29	Open
PIPE21	1.12	0.06	0.04	Open
PIPE22	28.42	0.90	3.93	Open
PIPE23	0.93	0.05	0.03	Open
PIPE24	27.29	0.87	3.64	Open
PIPE25	1.95	0.11	0.11	Open
PIPE26	29.67	0.94	4.25	Open
PIPE27	15.43	0.87	5.14	Open
PIPE28	0.85	0.05	0.02	Open
PIPE29	14.41	0.82	4.54	Open
PIPE30	4.41	0.25	0.51	Open
PIPE31	9.72	0.55	2.19	Open
PIPE32	22.24	1.26	10.13	Open
PIPE33	21.89	1.24	9.84	Open
PIPE34	0.67	0.04	0.02	Open
PIPE35	0.62	0.04	0.01	Open
PIPE36	1.54	0.09	0.07	Open
PIPE37	1.20	0.07	0.05	Open
PIPE38	26.28	1.49	13.80	Open
PIPE39	7.12	0.40	1.23	Open
PIPE40	6.70	0.38	1.10	Open
PIPE41	6.33	0.81	7.11	Open
PIPE42	6.24	0.35	0.96	Open

PIPE43	6.16	0.35	0.94	Open
PIPE44	19.07	1.08	7.62	Open
PIPE45	-4.42	0.25	0.51	Open
PIPE46	13.34	0.76	3.93	Open
PIPE47	18.15	1.03	6.95	Open
PIPE48	14.20	0.80	4.41	Open
PIPE49	14.03	0.79	4.32	Open
PIPE50	13.46	0.76	4.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE51	1.66	0.09	0.08	Open
PIPE52	10.43	0.59	2.49	Open
PIPE53	29.10	1.65	16.66	Open
PIPE54	46.30	1.47	9.70	Open
PIPE55	45.33	1.44	9.33	Open
PIPE56	60.73	1.93	16.03	Open
PIPE57	60.45	1.92	15.89	Open
PIPE58	12.88	0.73	3.69	Open
PIPE59	12.42	0.70	3.44	Open
PIPE60	1.29	0.03	0.00	Open
PIPE61	75.66	1.07	3.34	Open
PIPE62	-20.88	0.43	0.75	Open
PIPE63	5.10	0.10	0.06	Open
PIPE64	18.25	1.03	7.03	Open
PIPE65	70.15	1.43	7.06	Open
PIPE66	3.55	0.20	0.34	Open
PIPE67	20.67	1.17	11.76	Open
PIPE68	14.51	0.82	4.59	Open
PIPE69	27.75	1.57	15.26	Open
PIPE70	53.03	1.08	4.21	Open
PIPE71	-13.60	0.77	4.08	Open
PIPE72	39.44	2.23	29.26	Open
PIPE73	27.33	1.55	14.84	Open
PIPE74	12.09	0.68	3.27	Open
PIPE75	11.38	0.64	2.93	Open
PIPE76	11.11	0.63	2.80	Open
PIPE77	10.83	0.61	2.67	Open
PIPE78	37.99	2.15	27.30	Open
PIPE79	38.78	2.19	28.37	Open
PIPE80	38.42	2.17	27.88	Open
PIPE81	9.63	0.54	2.15	Open
PIPE82	36.68	1.17	6.30	Open
PIPE83	36.58	2.07	25.45	Open
PIPE84	10.75	0.61	2.64	Open

PIPE85	14.40	0.81	4.53	Open
PIPE86	14.16	0.80	4.39	Open
PIPE87	8.76	0.50	1.80	Open
PIPE88	0.47	0.03	0.01	Open
PIPE89	22.32	1.26	10.20	Open
PIPE90	10.71	0.61	2.62	Open
PIPE91	10.65	0.60	2.59	Open
PIPE92	10.15	0.57	2.37	Open
PIPE93	11.59	0.66	3.03	Open
PIPE94	11.47	0.65	2.97	Open
PIPE95	10.66	0.60	2.59	Open
PIPE96	51.07	1.63	11.63	Open
PIPE97	0.15	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE98	35.78	1.14	6.02	Open
PIPE99	15.14	0.86	4.97	Open
PIPE100	-2.88	0.09	0.06	Open
PIPE101	0.93	0.05	0.03	Open
PIPE102	0.37	0.01	0.00	Open
PIPE103	38.64	1.23	6.94	Open
PIPE104	38.41	1.22	6.86	Open
PIPE105	38.02	2.15	27.34	Open
PIPE106	0.34	0.02	0.00	Open
PIPE107	0.22	0.01	0.00	Open
PIPE108	11.31	0.36	0.71	Open
PIPE109	-11.25	0.36	0.71	Open
PIPE110	22.53	1.27	10.37	Open
PIPE111	10.57	0.60	2.55	Open
PIPE112	10.64	0.60	2.59	Open
PIPE113	11.93	0.67	3.19	Open
PIPE114	22.22	1.26	10.11	Open
PIPE115	20.62	1.17	7.75	Open
PIPE116	1.28	0.07	0.05	Open
PIPE117	11.17	0.63	2.83	Open
PIPE118	21.56	1.22	9.56	Open
PIPE119	21.21	1.20	9.28	Open
PIPE120	22.49	1.27	9.10	Open
PIPE121	22.29	1.26	8.95	Open
PIPE122	-2.01	0.11	0.10	Open
PIPE123	0.39	0.02	0.01	Open
PIPE124	0.07	0.00	0.00	Open
PIPE125	0.12	0.06	0.12	Open
PIPE126	-2.69	0.15	0.20	Open

PIPE127	18.52	1.05	7.21	Open
PIPE128	18.28	1.03	7.05	Open
PIPE129	30.13	1.70	17.77	Open
PIPE130	-21.44	1.21	9.46	Open
PIPE131	-21.65	1.23	9.63	Open
PIPE132	-16.24	0.92	5.66	Open
PIPE133	-16.34	0.92	5.73	Open
PIPE134	-16.69	0.94	5.95	Open
PIPE135	12.34	0.70	3.40	Open
PIPE136	13.97	0.79	4.28	Open
PIPE137	-5.13	0.16	0.15	Open
PIPE138	-5.32	0.17	0.16	Open
PIPE139	-5.81	0.19	0.18	Open
PIPE141	3.50	0.20	0.33	Open
PIPE142	3.42	0.19	0.32	Open
PIPE143	3.23	0.18	0.28	Open
PIPE147	2.66	0.15	0.20	Open
PIPE148	2.48	0.14	0.17	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE149	2.21	0.13	0.14	Open
PIPE150	15.48	0.88	5.18	Open
PIPE152	11.31	0.64	2.89	Open
PIPE153	7.57	0.43	1.38	Open
PIPE154	7.04	0.40	1.20	Open
PIPE155	-0.67	0.34	2.74	Open
PIPE156	13.95	0.79	4.27	Open
PIPE157	-5.55	0.31	0.77	Open
PIPE158	1.87	0.11	0.10	Open
PIPE159	6.75	0.38	1.11	Open
PIPE160	8.28	0.47	1.63	Open
PIPE161	6.28	0.36	0.97	Open
PIPE162	5.80	0.33	0.84	Open
PIPE163	13.68	0.77	4.12	Open
PIPE164	13.57	0.77	4.05	Open
PIPE165	13.38	0.76	3.96	Open
PIPE166	12.00	0.68	3.23	Open
PIPE167	0.00	0.00	0.00	Closed
PFS	73.29	1.49	6.74	Open
PFD	73.29	1.49	6.74	Open
PIPE168	73.11	1.49	6.71	Open
PIPE169	73.11	1.49	6.71	Open
PIPE170	72.89	1.48	6.67	Open
PIPE171	50.24	1.02	3.35	Open

PIPE172	49.73	1.01	3.29	Open
PIPE173	49.71	1.01	3.28	Open
PIPE174	49.71	1.01	3.28	Open
PIPE175	49.71	1.01	3.28	Open
PIPE176	33.76	0.69	1.60	Open
PIPE177	33.71	0.69	1.60	Open
PIPE178	33.63	0.69	1.59	Open
PIPE179	15.93	0.90	4.80	Open
PIPE180	15.92	0.90	4.80	Open
PIPE181	15.91	0.90	4.79	Open
PIPE182	15.91	0.90	4.79	Open
PIPE183	15.91	0.90	4.79	Open
PIPE184	-22.10	1.25	8.81	Open
PIPE185	-23.31	1.32	9.73	Open
PIPE186	10.07	0.21	0.17	Open
PIPE187	10.07	0.21	0.17	Open
PIPE188	10.06	0.57	2.05	Open
PIPE189	10.06	0.57	2.49	Open
PIPE189A	10.00	0.57	2.47	Open
PWT2	43.16	1.37	8.52	Open
PIPE190	43.02	1.37	7.45	Open
PIPE191	42.99	1.37	7.44	Open
PIPE192	14.22	0.80	3.89	Open

Link Results: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE193	10.23	0.58	2.12	Open
PIPE194	3.93	0.22	0.36	Open
PIPE195	3.86	0.22	0.35	Open
PIPE196	3.82	0.22	0.34	Open
PIPE197	13.99	0.79	3.78	Open
PIPE198	13.90	0.79	3.73	Open
PIPE199	-24.21	1.37	10.43	Open
PIPE200	4.40	0.14	0.11	Open
PIPE201	0.16	0.01	0.00	Open
PIPE202	4.24	0.13	0.10	Open
PIPE203	3.11	0.10	0.06	Open
PIPE204	2.25	0.07	0.03	Open
PIPE205	2.20	0.07	0.03	Open
PIPE206	3.69	0.12	0.08	Open
PIPE207	-1.59	0.09	0.07	Open
PIPE208	0.86	0.05	0.02	Open
PIPE209	0.79	0.04	0.02	Open
PIPE210	-0.88	0.05	0.02	Open
PIPE211	1.13	0.06	0.04	Open

PIPE212	1.09	0.06	0.03	Open
PIPE213	0.20	0.01	0.00	Open
PIPE214	0.18	0.01	0.00	Open
PWT1	10.00	0.57	2.31	Open
PIPEFF1	0.00	0.00	0.00	Open
PIPEFF2	0.00	0.00	0.00	Open
PIPEFF3	0.00	0.00	0.00	Open
PIPEFF4	38.00	0.05	0.00	Open
PIPEFF5	38.00	0.05	0.00	Open
PIPEFF6	38.00	0.05	0.00	Open
PIPEFF7	38.00	0.05	0.00	Open
PIPEFF8	0.00	0.00	0.00	Open
PIPEFF9	20.10	0.03	0.00	Open
PIPE140	11.37	0.64	2.57	Open
PIPE144	3.17	0.18	0.24	Open
PIPE145	14.14	0.80	3.86	Open
PIPE146	2.66	0.15	0.17	Open
PIPE151	11.41	0.65	2.59	Open
PIPE215	-17.53	0.99	5.74	Open
PIPE216	-8.68	0.49	1.56	Open
PIPE217	9.56	0.54	1.87	Open
PIPE218	6.07	0.34	0.80	Open
PIPE219	3.79	0.21	0.34	Open
PIPE220	3.49	0.20	0.29	Open
PIPE221	3.36	0.19	0.27	Open
PIPE222	2.23	0.13	0.13	Open
PIPE223	5.50	0.31	0.67	Open
PIPE224	9.06	0.51	1.69	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PUMP1	43.79	0.00	-58.74	Open Pump
PUMP2	71.50	0.00	-58.72	Open Pump
PUMP3	43.79	0.00	-58.74	Open Pump
PUMP4	71.50	0.00	-58.72	Open Pump
PUMP5	73.29	0.00	-12.11	Open Pump
VALVE1	10.06	0.57	32.32	Active Valve
VALVE2	10.00	0.57	33.31	Active Valve
VALVE3	10.00	5.09	26.05	Active Valve

EPANet Future Residential plus Industrial Chlorine Decay Model Results


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  ******************************************************************
  *                            E P A N E T                         *
  *                     Hydraulic and Water Quality                *
  *                     Analysis for Pipe Networks                 *
  *                          Version 2.2                           *
  ******************************************************************

  Input File: Wawa Water Hydraulic Model_Future Res plus Ind ADD_V2_PK.net
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Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
PS1	RES1	S1	5	200
PS2	RES1	S2	5	250
PS3	RES2	S3	5	200
PS4	RES2	S4	5	250
PD1	D1	DH	5	200
PD2	D2	DH	5	250
PD3	D3	DH	5	200
PD4	D4	DH	5	250
PD5	DH	J1A	10	400
PIPE1A	J1A	J1	38.19	400
PIPE1	J1	J2	75.15	150
PIPE2	J2	J3	68.1	150
PIPE3	J3	J4	101.75	150
PIPE4	J1A	J5	66.61	400
PIPE5	J5	J6	112.2	250
PIPE6	J6	J7	9.6	250
PIPE7	J5	J8	74.1	200
PIPE8	J8	J9	109.73	200
PIPE9	J9	J10	138.7	150
PIPE10	J10	J11	148.9	150
PIPE11	J11	J12	151.6	150
PIPE12	J12	J13	73.4	150
PIPE13	J13	J14	140.3	150
PIPE14	J14	J15	152.5	150
PIPE15	J15	J16	516.8	150
PIPE16	J16	J17	187.63	150
PIPE17	J17	J18	179.7	150
PIPE18	J9	J19	91.1	200
PIPE19	J19	J20	121.16	150
PIPE20	J19	J21	81.5	200
PIPE21	J21	J22	110.2	150
PIPE22	J21	J23	80.5	200
PIPE23	J23	J24	139.76	150

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PIPE24	J23	J25	81.5	200
PIPE25	J25	J26	100	150
PIPE26	J25	J27	96.3	200
PIPE27	J27	J28	37.18	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE28	J28	J29	105.27	150
PIPE29	J28	J30	111.1	150
PIPE30	J30	J31	104.3	150
PIPE31	J30	J32	196.9	150
PIPE32	J1	J33	136.6	150
PIPE33	J33	J34	71.87	150
PIPE34	J34	J35	43.43	150
PIPE35	J35	J36	125.73	150
PIPE36	J2	J37	148.1	150
PIPE37	J37	J38	139.7	150
PIPE38	J3	J39	32.6	150
PIPE39	J39	J40	131.83	150
PIPE40	J40	J41	94.49	150
PIPE41	J41	J42	78.3	100
PIPE42	J42	J43	103.5	150
PIPE43	J43	J44	87.64	150
PIPE44	J39	J45	75.64	150
PIPE45	J25	J45	192.7	150
PIPE46	J45	J44	109	150
PIPE47	J44	J46	172	150
PIPE48	J27	J47	65.7	150
PIPE49	J47	J48	102.7	150
PIPE50	J48	J46	96	150
PIPE51	J46	J32	106.6	150
PIPE52	J32	J49	21	150
PIPE53	J46	J50	103.4	150
PIPE54	J5	J51	72	200
PIPE55	J51	J52	133.35	200
PIPE56	J52	J53	101	200
PIPE57	J53	J54	82.6	200
PIPE58	J6	J55	97.5	150
PIPE59	J55	J56	103.7	150
PIPE60	J52	J56	111.1	250
PIPE61	J7	J57	190.86	300
PIPE62	J52	J34	104.8	250
PIPE63	J57	J56	8.5	250
PIPE64	J56	J58	95.3	150
PIPE65	J57	J59	95.3	250

PIPE66	J58	J59	8.5	150
PIPE67	J59	J60	102.87	150
PIPE68	J58	J61	97.3	150
PIPE69	J61	J54	118.95	150
PIPE70	J59	J62	97.3	250
PIPE71	J61	J62	8.5	150
PIPE72	J62	J63	18	150
PIPE73	J63	J64	107	150
PIPE74	J63	J65	129.6	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE75	J65	J66	192.4	150
PIPE76	J66	J67	123.86	150
PIPE77	J67	J64	94.54	150
PIPE78	J64	J68	87.9	150
PIPE79	J68	J69	157.7	150
PIPE80	J69	J70	157.5	150
PIPE81	J68	J71	194.7	150
PIPE82	J54	J72	155.11	200
PIPE83	J72	J73	55.63	150
PIPE84	J73	J68	102.7	150
PIPE85	J73	J74	115.06	150
PIPE86	J74	J75	80.77	150
PIPE87	J71	J75	103.23	150
PIPE88	J75	J76	84.7	150
PIPE89	J75	J77	96.2	150
PIPE90	J77	J78	56.6	150
PIPE91	J78	J79	232.98	150
PIPE92	J79	J80	56.1	150
PIPE93	J77	J81	163.41	150
PIPE94	J81	J82	178.69	150
PIPE95	J82	J83	48.7	150
PIPE96	J54	J84	160.9	200
PIPE97	J84	J85	55.86	200
PIPE98	J84	J86	88.03	200
PIPE99	J84	J87	106.4	150
PIPE100	J86	J87	14.4	200
PIPE101	J87	J88	91.81	150
PIPE102	J88	J89	72.73	200
PIPE103	J86	J90	210.34	200
PIPE104	J90	J91	41.91	200
PIPE105	J91	J92	88.39	150
PIPE106	J88	J93	132.00	150
PIPE107	J93	J94	127.25	150

PIPE108	J87	J95	79.3	200
PIPE109	J95	J73	90.0	200
PIPE110	J95	J96	43.4	150
PIPE111	J96	J76	141.91	150
PIPE112	J76	J97	94.2	150
PIPE113	J96	J97	189.8	150
PIPE114	J97	J98	159.9	150
PIPE115	J98	J99	68.82	150
PIPE116	J98	J80	98.4	150
PIPE117	J80	J83	94.38	150
PIPE118	J83	J100	121.5	150
PIPE119	J100	J101	99.6	150
PIPE120	J99	J102	134.56	150
PIPE121	J102	J101	67.06	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE122	J99	J103	56.5	150
PIPE123	J103	J104	99.1	150
PIPE124	J104	J105	94.2	150
PIPE125	J104	J106	105.32	50
PIPE126	J103	J107	147.26	150
PIPE127	J107	J108	75.1	150
PIPE128	J108	J109	69.9	150
PIPE129	J109	J101	46.5	150
PIPE130	J107	J110	95.55	150
PIPE131	J110	J111	130.2	150
PIPE132	J111	J112	131.3	150
PIPE133	J112	J113	178.9	150
PIPE134	J113	J50	47.71	150
PIPE135	J50	J114	109.0	150
PIPE136	J114	J115	140.8	150
PIPE137	J114	J116	159.6	200
PIPE138	J116	J117	143.1	200
PIPE139	J117	J118	140.23	200
PIPE141	J114	J120	92.0	150
PIPE142	J120	J121	144.2	150
PIPE143	J121	J122	49.9	150
PIPE147	J124	J125	137.16	150
PIPE148	J125	J126	137.16	150
PIPE149	J126	J115	160.0	150
PIPE150	J115	J127	111.56	150
PIPE152	J128	J129	85.3	150
PIPE153	J129	J130	149.7	150
PIPE154	J130	J131	170.4	150

PIPE155	J131	J127	119.8	50
PIPE156	J127	J132	100.0	150
PIPE157	J111	J132	93.87	150
PIPE158	J132	J133	106.9	150
PIPE159	J131	J133	99.1	150
PIPE160	J133	J134	173.6	150
PIPE161	J132	J135	188.4	150
PIPE162	J135	J134	130.9	150
PIPE163	J134	J136	141.1	150
PIPE164	J136	J137	158.5	150
PIPE165	J137	J138	227.9	150
PIPE166	J138	J109	262.3	150
PIPE167	J101	J139	187.4	250
PFS	J101	FS	150	250
PFD	FD	J139	37.4	250
PIPE168	J139	J140	140.13	250
PIPE169	J140	J141	143.46	250
PIPE170	J141	J142	569.8	250
PIPE171	J142	J143	612.3	250

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
PIPE172	J143	J144	745.0	250
PIPE173	J144	J145	172.3	250
PIPE174	J145	J146	206.0	250
PIPE175	J146	J147	75.4	250
PIPE176	J147	J148	103.0	250
PIPE177	J148	J149	150.0	250
PIPE178	J149	J150	222.0	250
PIPE179	J147	J151	123.73	150
PIPE180	J151	J152	158.6	150
PIPE181	J152	J153	137.00	150
PIPE182	J153	J154	91.5	150
PIPE183	J154	J155	93.25	150
PIPE184	J155	J156	129.0	150
PIPE185	J156	J150	103.0	150
PIPE186	J150	J157	161.1	250
PIPE187	J157	J158	185.0	250
PIPE188	J158	J159A	466.8	150
PIPE189	J159	J160A	1933.9	150
PIPE189A	J160B	J160	929.5	150
PWT2	TANK1	J161	4	200
PIPE190	J161	J162	101.6	200
PIPE191	J162	J163	149.2	200
PIPE192	J163	J164	87.8	150

PIPE193	J164	J165	75.1	150
PIPE194	J164	J166	136.0	150
PIPE195	J166	J167	177.0	150
PIPE196	J167	J165	141.39	150
PIPE197	J165	J168	207.4	150
PIPE198	J168	J169	167.6	150
PIPE199	J169	J163	183.1	150
PIPE200	J163	J170	166.5	200
PIPE201	J170	J171	233.5	150
PIPE202	J170	J172	122.8	200
PIPE203	J172	J173	81.3	200
PIPE204	J173	J174	128.8	200
PIPE205	J174	J175	178.9	200
PIPE206	J175	J176	88.8	200
PIPE207	J175	J177	89.4	150
PIPE208	J173	J178	102.50	150
PIPE209	J178	J177	68.68	150
PIPE210	J177	J179	96.0	150
PIPE211	J172	J180	59.5	150
PIPE212	J180	J179	116.3	150
PIPE213	J179	J181	72.78	150
PIPE214	J181	J182	148.8	150
PWT1	JFS	TANK1	4	150
PIPE140	J118	J119	71.63	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
PIPE144	J122	J119	96	150	
PIPE145	J119	J123	106.0	150	
PIPE146	J123	J124	41.15	150	
PIPE151	J123	J128	126.8	150	
PIPE215	J118	J183	235	150	
PIPE216	J183	J16	85	150	
PIPE217	J49	J184	152.50	150	
PIPE218	J184	J185	73.5	150	
PIPE219	J185	J186	281.2	150	
PIPE220	J184	J187	203.4	150	
PIPE221	J187	J188	98.2	150	
PIPE222	J185	J188	206.4	150	
PIPE223	J188	J186	102.1	150	
PIPE224	J186	J183	103.8	150	
PUMP1	S1	D1	#N/A	#N/A	Pump
PUMP2	S2	D2	#N/A	#N/A	Pump
PUMP3	S3	D3	#N/A	#N/A	Pump
PUMP4	S4	D4	#N/A	#N/A	Pump

PUMP5	FS	FD	#N/A	#N/A Pump
VALVE1	J159A	J159	#N/A	150 Valve
VALVE2	J160A	J160B	#N/A	150 Valve
VALVE3	J160	JFS	#N/A	50 Valve

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
PUMP1	100.00	75.00	0.19	31.15	35.19	0.00
PUMP2	0.00	0.00	0.00	0.00	0.00	0.00
PUMP3	0.00	0.00	0.00	0.00	0.00	0.00
PUMP4	0.00	0.00	0.00	0.00	0.00	0.00
PUMP5	0.00	0.00	0.00	0.00	0.00	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results at 120:00 Hrs:

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
S1	0.00	291.46	-2.84	0.86
S2	0.00	291.50	-2.80	0.00
S3	0.00	291.50	-2.80	0.00
S4	0.00	291.50	-2.80	0.00
D1	0.00	344.13	49.83	0.86
D2	0.00	344.09	49.79	0.00
D3	0.00	344.09	49.79	0.00
D4	0.00	344.09	49.79	0.00
DH	0.00	344.09	49.79	0.86
J1A	0.10	344.08	50.88	0.86
J1	0.00	344.08	50.84	0.86
J2	0.10	343.96	50.75	0.86
J3	0.05	343.87	50.69	0.86
J4	0.07	343.87	50.75	0.75
J5	0.06	344.07	51.50	0.86
J6	0.10	344.04	52.95	0.86
J7	0.03	344.04	53.08	0.86
J8	0.19	344.00	50.65	0.86
J9	0.37	343.90	50.24	0.86
J10	0.36	343.86	51.13	0.85
J11	0.36	343.82	49.22	0.85
J12	0.01	343.78	48.36	0.84
J13	0.04	343.77	48.39	0.84
J14	0.18	343.74	47.02	0.84
J15	0.17	343.71	46.54	0.83

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J16	0.18	343.63	49.43	0.82
J17	0.16	343.63	52.48	0.78
J18	0.34	343.63	50.61	0.75
J19	0.19	343.85	49.19	0.85
J20	0.53	343.85	48.50	0.83
J21	0.14	343.82	50.09	0.85
J22	0.56	343.82	48.39	0.83
J23	0.10	343.79	50.60	0.85
J24	0.47	343.79	48.21	0.83
J25	0.05	343.76	50.37	0.85
J26	0.98	343.76	50.42	0.84
J27	0.02	343.73	49.23	0.85
J28	0.08	343.71	49.50	0.85
J29	0.42	343.71	48.18	0.83
J30	0.14	343.67	48.62	0.84
J31	2.21	343.66	49.90	0.84
J32	0.48	343.66	48.35	0.83
J33	0.17	344.04	50.49	0.85
J34	0.17	344.03	49.07	0.85
J35	0.03	344.03	48.20	0.85
J36	0.31	344.03	47.51	0.81
J37	0.17	343.96	49.77	0.85

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J38	0.60	343.95	47.36	0.83
J39	0.05	343.83	50.61	0.86
J40	0.21	343.81	49.30	0.85
J41	0.19	343.80	47.90	0.85
J42	0.04	343.76	47.62	0.84
J43	0.04	343.75	47.76	0.84
J44	0.68	343.74	47.85	0.85
J45	0.65	343.77	49.12	0.85
J46	0.43	343.66	47.94	0.84
J47	0.08	343.71	48.33	0.85
J48	0.28	343.69	47.98	0.84
J49	0.44	343.66	48.46	0.83
J50	0.04	343.59	54.12	0.84
J51	0.49	344.05	51.48	0.86
J52	2.10	344.03	50.20	0.85
J53	0.14	343.99	50.67	0.85
J54	0.22	343.96	50.91	0.84
J55	0.23	344.03	50.94	0.85
J56	0.28	344.03	51.42	0.85
J57	0.20	344.03	52.01	0.85

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J58	0.10	344.02	50.56	0.84
J59	0.00	344.02	50.56	0.85
J60	0.28	344.01	52.78	0.82
J61	0.18	344.00	51.55	0.84
J62	0.00	344.00	51.55	0.84
J63	0.01	343.99	52.06	0.84
J64	0.09	343.95	54.18	0.83
J65	0.35	343.98	52.78	0.84
J66	0.13	343.97	54.21	0.82
J67	0.14	343.96	53.59	0.82
J68	0.16	343.90	55.61	0.83
J69	0.18	343.90	55.52	0.81
J70	0.21	343.90	55.50	0.74
J71	0.43	343.84	54.97	0.83
J72	0.05	343.94	55.02	0.84
J73	0.09	343.90	55.17	0.83
J74	0.12	343.85	54.65	0.83
J75	0.06	343.82	54.64	0.83
J76	0.20	343.82	54.21	0.82
J77	0.01	343.72	54.54	0.83
J78	0.03	343.70	54.09	0.82
J79	0.25	343.63	53.99	0.82
J80	0.13	343.62	53.78	0.82
J81	0.06	343.67	54.67	0.82
J82	0.40	343.62	54.14	0.82
J83	0.13	343.60	54.03	0.82
J84	0.00	343.93	54.82	0.84

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J85	0.07	343.93	54.95	0.73
J86	0.01	343.92	54.70	0.83
J87	0.01	343.91	54.69	0.83
J88	0.11	343.91	54.63	0.82
J89	0.18	343.91	54.35	0.76
J90	0.12	343.92	54.57	0.75
J91	0.20	343.92	54.71	0.71
J92	0.01	343.92	54.52	0.23
J93	0.06	343.91	54.56	0.75
J94	0.11	343.91	54.75	0.67
J95	0.01	343.90	54.96	0.83
J96	0.01	343.85	54.70	0.83
J97	0.18	343.79	54.15	0.82
J98	0.16	343.62	53.68	0.82
J99	0.07	343.55	53.66	0.82

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J100	0.18	343.52	53.54	0.81
J101	0.16	343.46	52.54	0.81
J102	0.10	343.49	53.18	0.82
J103	0.14	343.54	54.09	0.82
J104	0.10	343.54	53.51	0.79
J105	0.04	343.54	54.52	0.60
J106	0.06	343.54	53.96	0.77
J107	0.12	343.52	53.74	0.81
J108	0.12	343.50	53.30	0.81
J109	0.08	343.48	52.99	0.79
J110	0.10	343.52	53.87	0.82
J111	0.07	343.53	53.50	0.83
J112	0.05	343.55	53.76	0.83
J113	0.17	343.58	54.09	0.84
J114	0.00	343.57	54.13	0.82
J115	0.35	343.55	53.53	0.81
J116	0.09	343.57	53.93	0.75
J117	0.25	343.57	53.86	0.77
J118	0.17	343.57	54.00	0.79
J120	0.04	343.57	53.82	0.80
J121	0.10	343.57	53.33	0.78
J122	0.03	343.57	53.43	0.78
J124	0.00	343.55	52.20	0.77
J125	0.09	343.55	52.47	0.73
J126	0.13	343.55	53.03	0.68
J127	0.43	343.53	53.04	0.81
J128	0.05	343.53	51.71	0.77
J129	1.87	343.52	51.51	0.77
J130	0.27	343.52	52.34	0.75
J131	0.48	343.52	52.84	0.78
J132	0.13	343.53	52.95	0.81
J133	0.17	343.52	52.68	0.80

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J134	0.20	343.52	53.03	0.78
J135	0.24	343.52	53.30	0.80
J136	0.06	343.51	53.01	0.78
J137	0.09	343.50	54.40	0.77
J138	0.69	343.48	53.69	0.73
J139	0.09	343.41	52.94	0.80
FS	0.00	343.45	52.85	0.00
FD	0.00	343.43	52.83	0.00
J140	0.00	343.38	54.73	0.80
J141	0.11	343.34	55.34	0.80

J142	11.32	343.20	56.70	0.79
J143	0.26	343.20	56.92	0.75
J144	0.01	343.19	58.44	0.71
J145	0.00	343.19	58.62	0.70
J146	0.00	343.19	59.16	0.66
J147	0.01	343.19	59.29	0.66
J148	0.02	343.19	59.99	0.66
J149	0.04	343.19	60.30	0.65
J150	0.12	343.19	61.14	0.64
J151	0.01	343.19	58.79	0.66
J152	0.00	343.19	60.24	0.64
J153	0.00	343.19	61.04	0.64
J154	0.00	343.19	61.34	0.63
J155	0.01	343.19	62.59	0.61
J156	0.60	343.19	61.34	0.63
J157	0.00	343.19	61.69	0.63
J158	0.01	343.19	62.89	0.61
J159A	0.00	343.19	63.69	0.59
J159	0.00	298.10	18.60	0.59
J160A	0.03	298.10	49.60	0.56
J160B	0.00	259.96	11.47	0.56
J160	0.00	259.96	54.87	0.53
J161	0.07	245.88	40.78	0.86
J162	0.01	245.87	40.47	0.85
J163	0.08	245.87	40.77	0.85
J164	0.03	245.87	39.97	0.80
J165	0.03	245.87	39.27	0.69
J166	0.04	245.87	39.37	0.58
J167	0.02	245.87	39.87	0.20
J168	0.04	245.87	40.97	0.34
J169	0.05	245.87	39.17	0.69
J170	0.00	245.86	48.86	0.83
J171	0.08	245.86	45.86	0.62
J172	0.00	245.86	52.86	0.83
J173	0.00	245.86	55.86	0.83
J174	0.02	245.86	55.16	0.80
J175	0.05	245.86	54.76	0.77

Node Results at 120:00 Hrs: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality mg/L
J176	1.84	245.85	56.85	0.77
J177	0.04	245.86	53.16	0.77
J178	0.04	245.86	53.96	0.80
J179	0.01	245.86	53.76	0.80
J180	0.02	245.86	55.96	0.82

J181	0.01	245.86	55.76	0.74	
J182	0.09	245.86	51.36	0.62	
JFS	0.00	259.96	54.87	0.54	
J119	0.20	343.56	53.83	0.79	
J123	0.04	343.55	53.67	0.79	
J183	0.10	343.63	50.66	0.79	
J184	0.00	343.64	49.34	0.83	
J185	0.03	343.64	50.70	0.82	
J186	0.12	343.64	50.46	0.79	
J187	0.06	343.64	50.04	0.79	
J188	0.05	343.64	50.25	0.79	
RES1	-43.24	291.50	0.00	0.86	Reservoir
RES2	0.00	291.50	0.00	0.86	Reservoir
TANK1	-2.58	245.88	40.78	0.23	Tank

Link Results at 120:00 Hrs:

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PS1	43.24	1.38	8.54	Open
PS2	0.00	0.00	0.00	Open
PS3	0.00	0.00	0.00	Open
PS4	0.00	0.00	0.00	Open
PD1	43.24	1.38	8.55	Open
PD2	0.00	0.00	0.00	Open
PD3	0.00	0.00	0.00	Open
PD4	0.00	0.00	0.00	Open
PD5	43.24	0.34	0.29	Open
PIPE1A	11.44	0.09	0.02	Open
PIPE1	8.29	0.47	1.63	Open
PIPE2	7.42	0.42	1.33	Open
PIPE3	0.07	0.00	0.00	Open
PIPE4	31.70	0.25	0.14	Open
PIPE5	11.92	0.24	0.26	Open
PIPE6	10.03	0.20	0.19	Open
PIPE7	13.27	0.42	0.96	Open
PIPE8	13.08	0.42	0.93	Open
PIPE9	3.44	0.19	0.32	Open
PIPE10	3.08	0.17	0.26	Open
PIPE11	2.72	0.15	0.21	Open
PIPE12	2.72	0.15	0.21	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status

PIPE13	2.68	0.15	0.20	Open
PIPE14	2.50	0.14	0.18	Open
PIPE15	2.33	0.13	0.15	Open
PIPE16	0.50	0.03	0.01	Open
PIPE17	0.34	0.02	0.00	Open
PIPE18	9.27	0.30	0.49	Open
PIPE19	0.53	0.03	0.01	Open
PIPE20	8.55	0.27	0.43	Open
PIPE21	0.56	0.03	0.01	Open
PIPE22	7.85	0.25	0.36	Open
PIPE23	0.47	0.03	0.01	Open
PIPE24	7.29	0.23	0.32	Open
PIPE25	0.98	0.06	0.03	Open
PIPE26	7.54	0.24	0.34	Open
PIPE27	4.31	0.24	0.48	Open
PIPE28	0.42	0.02	0.01	Open
PIPE29	3.80	0.21	0.38	Open
PIPE30	2.21	0.12	0.14	Open
PIPE31	1.45	0.08	0.07	Open
PIPE32	3.15	0.18	0.27	Open
PIPE33	2.98	0.17	0.24	Open
PIPE34	0.34	0.02	0.00	Open
PIPE35	0.31	0.02	0.00	Open
PIPE36	0.77	0.04	0.02	Open
PIPE37	0.60	0.03	0.01	Open
PIPE38	7.29	0.41	1.29	Open
PIPE39	2.03	0.11	0.12	Open
PIPE40	1.82	0.10	0.10	Open
PIPE41	1.63	0.21	0.58	Open
PIPE42	1.58	0.09	0.08	Open
PIPE43	1.55	0.09	0.07	Open
PIPE44	5.22	0.30	0.69	Open
PIPE45	-1.28	0.07	0.05	Open
PIPE46	3.29	0.19	0.29	Open
PIPE47	4.16	0.24	0.45	Open
PIPE48	3.22	0.18	0.28	Open
PIPE49	3.13	0.18	0.27	Open
PIPE50	2.85	0.16	0.23	Open
PIPE51	1.31	0.07	0.05	Open
PIPE52	2.28	0.13	0.15	Open
PIPE53	5.27	0.30	0.70	Open
PIPE54	6.45	0.21	0.25	Open
PIPE55	5.97	0.19	0.22	Open
PIPE56	7.77	0.25	0.36	Open
PIPE57	7.62	0.24	0.34	Open
PIPE58	1.79	0.10	0.10	Open
PIPE59	1.56	0.09	0.07	Open

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Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE60	-1.43	0.03	0.01	Open
PIPE61	10.00	0.14	0.08	Open
PIPE62	-2.47	0.05	0.01	Open
PIPE63	2.13	0.04	0.01	Open
PIPE64	1.99	0.11	0.12	Open
PIPE65	7.66	0.16	0.12	Open
PIPE66	-0.09	0.01	0.00	Open
PIPE67	0.28	0.02	0.00	Open
PIPE68	1.98	0.11	0.12	Open
PIPE69	3.66	0.21	0.36	Open
PIPE70	7.29	0.15	0.11	Open
PIPE71	-1.85	0.10	0.10	Open
PIPE72	5.43	0.31	0.74	Open
PIPE73	3.59	0.20	0.35	Open
PIPE74	1.83	0.10	0.10	Open
PIPE75	1.48	0.08	0.07	Open
PIPE76	1.35	0.08	0.06	Open
PIPE77	1.20	0.07	0.05	Open
PIPE78	4.71	0.27	0.57	Open
PIPE79	0.39	0.02	0.01	Open
PIPE80	0.21	0.01	0.00	Open
PIPE81	3.42	0.19	0.32	Open
PIPE82	4.99	0.16	0.16	Open
PIPE83	4.94	0.28	0.62	Open
PIPE84	-0.73	0.04	0.02	Open
PIPE85	4.11	0.23	0.44	Open
PIPE86	3.99	0.23	0.42	Open
PIPE87	2.99	0.17	0.25	Open
PIPE88	0.35	0.02	0.00	Open
PIPE89	6.57	0.37	1.06	Open
PIPE90	3.25	0.18	0.29	Open
PIPE91	3.22	0.18	0.28	Open
PIPE92	2.96	0.17	0.24	Open
PIPE93	3.31	0.19	0.30	Open
PIPE94	3.25	0.18	0.29	Open
PIPE95	2.84	0.16	0.22	Open
PIPE96	6.07	0.19	0.22	Open
PIPE97	0.07	0.00	0.00	Open
PIPE98	4.12	0.13	0.11	Open
PIPE99	1.87	0.11	0.10	Open
PIPE100	3.79	0.12	0.09	Open
PIPE101	0.47	0.03	0.01	Open
PIPE102	0.18	0.01	0.00	Open
PIPE103	0.32	0.01	0.00	Open
PIPE104	0.20	0.01	0.00	Open

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PIPE105	0.01	0.00	0.00	Open
PIPE106	0.17	0.01	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE107	0.11	0.01	0.00	Open
PIPE108	5.18	0.17	0.17	Open
PIPE109	-1.47	0.05	0.02	Open
PIPE110	6.64	0.38	1.08	Open
PIPE111	3.09	0.17	0.26	Open
PIPE112	3.24	0.18	0.29	Open
PIPE113	3.54	0.20	0.34	Open
PIPE114	6.60	0.37	1.07	Open
PIPE115	6.91	0.39	1.02	Open
PIPE116	-0.46	0.03	0.01	Open
PIPE117	2.37	0.13	0.16	Open
PIPE118	5.08	0.29	0.66	Open
PIPE119	4.91	0.28	0.62	Open
PIPE120	4.33	0.24	0.43	Open
PIPE121	4.22	0.24	0.41	Open
PIPE122	2.51	0.14	0.16	Open
PIPE123	0.19	0.01	0.00	Open
PIPE124	0.04	0.00	0.00	Open
PIPE125	0.06	0.03	0.03	Open
PIPE126	2.17	0.12	0.14	Open
PIPE127	3.22	0.18	0.28	Open
PIPE128	3.10	0.18	0.26	Open
PIPE129	3.68	0.21	0.36	Open
PIPE130	-1.16	0.07	0.04	Open
PIPE131	-1.27	0.07	0.05	Open
PIPE132	-2.40	0.14	0.16	Open
PIPE133	-2.45	0.14	0.17	Open
PIPE134	-2.62	0.15	0.19	Open
PIPE135	2.61	0.15	0.19	Open
PIPE136	2.40	0.14	0.16	Open
PIPE137	-0.55	0.02	0.00	Open
PIPE138	-0.65	0.02	0.00	Open
PIPE139	-0.90	0.03	0.01	Open
PIPE141	0.77	0.04	0.02	Open
PIPE142	0.73	0.04	0.02	Open
PIPE143	0.64	0.04	0.01	Open
PIPE147	0.23	0.01	0.00	Open
PIPE148	0.14	0.01	0.00	Open
PIPE149	0.01	0.00	0.00	Open
PIPE150	2.05	0.12	0.12	Open

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PIPE152	2.16	0.12	0.14	Open
PIPE153	0.30	0.02	0.00	Open
PIPE154	0.03	0.00	0.00	Open
PIPE155	-0.11	0.06	0.11	Open
PIPE156	1.52	0.09	0.07	Open
PIPE157	1.06	0.06	0.04	Open
PIPE158	1.36	0.08	0.06	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	VelocityUnit m/s	Headloss m/km	Status
PIPE159	-0.34	0.02	0.00	Open
PIPE160	0.85	0.05	0.02	Open
PIPE161	1.09	0.06	0.04	Open
PIPE162	0.85	0.05	0.02	Open
PIPE163	1.50	0.08	0.07	Open
PIPE164	1.44	0.08	0.06	Open
PIPE165	1.35	0.08	0.06	Open
PIPE166	0.66	0.04	0.01	Open
PIPE167	12.65	0.26	0.26	Open
PFS	0.00	0.00	0.00	Closed
PFD	0.00	0.00	0.00	Closed
PIPE168	12.56	0.26	0.26	Open
PIPE169	12.56	0.26	0.26	Open
PIPE170	12.44	0.25	0.25	Open
PIPE171	1.12	0.02	0.00	Open
PIPE172	0.86	0.02	0.00	Open
PIPE173	0.86	0.02	0.00	Open
PIPE174	0.86	0.02	0.00	Open
PIPE175	0.86	0.02	0.00	Open
PIPE176	0.64	0.01	0.00	Open
PIPE177	0.62	0.01	0.00	Open
PIPE178	0.57	0.01	0.00	Open
PIPE179	0.20	0.01	0.00	Open
PIPE180	0.20	0.01	0.00	Open
PIPE181	0.19	0.01	0.00	Open
PIPE182	0.19	0.01	0.00	Open
PIPE183	0.19	0.01	0.00	Open
PIPE184	0.19	0.01	0.00	Open
PIPE185	-0.42	0.02	0.01	Open
PIPE186	0.04	0.00	0.00	Open
PIPE187	0.04	0.00	0.00	Open
PIPE188	0.03	0.00	0.00	Open
PIPE189	0.03	0.00	0.00	Open
PIPE189A	0.00	0.00	0.00	Open
PWT2	2.58	0.08	0.05	Open

PIPE190	2.51	0.08	0.04	Open
PIPE191	2.49	0.08	0.04	Open
PIPE192	0.13	0.01	0.00	Open
PIPE193	0.05	0.00	0.00	Open
PIPE194	0.04	0.00	0.00	Open
PIPE195	0.01	0.00	0.00	Open
PIPE196	-0.02	0.00	0.00	Open
PIPE197	0.01	0.00	0.00	Open
PIPE198	-0.03	0.00	0.00	Open
PIPE199	-0.09	0.00	0.00	Open
PIPE200	2.20	0.07	0.03	Open
PIPE201	0.08	0.00	0.00	Open

Link Results at 120:00 Hrs: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
PIPE202	2.12	0.07	0.03	Open
PIPE203	1.55	0.05	0.02	Open
PIPE204	1.12	0.04	0.01	Open
PIPE205	1.10	0.04	0.01	Open
PIPE206	1.84	0.06	0.02	Open
PIPE207	-0.79	0.04	0.02	Open
PIPE208	0.43	0.02	0.01	Open
PIPE209	0.39	0.02	0.00	Open
PIPE210	-0.44	0.02	0.01	Open
PIPE211	0.56	0.03	0.01	Open
PIPE212	0.54	0.03	0.01	Open
PIPE213	0.10	0.01	0.00	Open
PIPE214	0.09	0.01	0.00	Open
PWT1	0.00	0.00	0.00	Closed
PIPE140	2.08	0.12	0.11	Open
PIPE144	0.61	0.03	0.01	Open
PIPE145	2.48	0.14	0.15	Open
PIPE146	0.23	0.01	0.00	Open
PIPE151	2.21	0.13	0.12	Open
PIPE215	-3.14	0.18	0.24	Open
PIPE216	-1.65	0.09	0.07	Open
PIPE217	1.85	0.10	0.09	Open
PIPE218	1.16	0.07	0.04	Open
PIPE219	0.70	0.04	0.01	Open
PIPE220	0.68	0.04	0.01	Open
PIPE221	0.62	0.04	0.01	Open
PIPE222	0.43	0.02	0.01	Open
PIPE223	1.01	0.06	0.03	Open
PIPE224	1.59	0.09	0.07	Open
PUMP1	43.24	0.00	-52.67	Open Pump

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PUMP2	0.00	0.00	0.00	Closed Pump
PUMP3	0.00	0.00	0.00	Closed Pump
PUMP4	0.00	0.00	0.00	Closed Pump
PUMP5	0.00	0.00	0.00	Closed Pump
VALVE1	0.03	0.00	45.10	Active Valve
VALVE2	0.00	0.00	38.13	Active Valve
VALVE3	0.00	0.00	0.00	Open Valve

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Appendix E

Wastewater Modelling Results

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Government Road	Lady Dunn Health Care Centre			Institutional			2.00							1.14												
Government Road	Algoma District Paramedic Service			Institutional			0.20							0.15												
Government Road	Garage			Commercial			0.13							0.10												
Government Road	Calvary Penecostal Church			Institutional			0.11							0.08												
Broadway Avenue	United Supply/Swish			Commercial			0.09							0.07												
Government Road @ Algoma St	679	98	197	Residential	68	149.6	8.87	149.6	8.87	4.19	2.02	0.65	2.67		1.18	5.39	200	62.299	0.30	18.08	0.30	Ok	Ok	9.07	0.58	0.50	Check
Broadway Avenue	675	197	3	Residential	0	0	0.00	149.6	8.87	4.19	2.02	0.65	2.67			5.39	250	54.863	0.31	33.17	0.16	Ok	Ok	21.14	0.68	0.50	Check
Broadway Avenue	Garage			Commercial			0.17							0.13												
Broadway Avenue	Canadian Red Cross			Commercial			0.10							0.08												
Broadway Avenue	Public Washorooms			Commercial			0.15							0.11												
Broadway Avenue	Iris Place			Commercial			0.20							0.15												
Ganley Street	Bell			Commercial			0.13							0.10												
Broadway Avenue	Beachfront Trading Post			Commercial			0.13							0.10												
Broadway Avenue	Garage			Commercial			0.09							0.07												
Broadway Avenue	694	3	214	Residential	3	6.6	0.33	156.2	9.20	4.19	2.10	0.68	2.78		0.26	6.50	250	74.675	0.38	36.44	0.18	Ok	Ok	22.65	0.74	0.56	Check
Broadway Avenue	687	214	213	Residential	0	0	0.29	156.2	9.49	4.19	2.10	0.68	2.78			6.50	250	31.997	0.22	27.83	0.23	Ok	Ok	15.77	0.57	0.46	Check
Broadway Avenue	Everything Floors			Commercial			0.13							0.10												
Broadway Avenue	Empty Building			Commercial			0.15							0.11												
Broadway Avenue	Lai's Resturant			Commercial			0.08							0.06												
Broadway Avenue	Northern Vision Care			Commercial			0.06							0.05												
Broadway Avenue	March Dimes of Canada			Commercial			0.15							0.11												
Broadway Avenue	Lakeview Hotel			Commercial			0.65							0.26												
Broadway Avenue	Lakeview Motel			Commercial			0.65							0.23												
Broadway Avenue	Lakeview Resturant			Commercial			0.02							0.01												
Broadway Avenue	SpikeMills Art Gallery			Commercial			0.02							0.02												
Broadway Avenue @Mackey Street	686	213	296	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78		0.26	7.65	250	97.536	0.38	36.56	0.21	Ok	Ok	21.60	0.74	0.59	Check
Broadway Avenue	Allemano & Fitzgerald			Commercial			0.05							0.03												
Broadway Avenue	Alzheimers Society			Commercial			0.05							0.03												
Broadway Avenue	The Co-operators			Commercial			0.05							0.03												
Broadway Avenue	Sonia Video			Commercial			0.07							0.05												
Broadway Avenue	The Brick			Commercial			0.07							0.05												
Broadway Avenue	Square Three			Commercial			0.07							0.05												
Broadway Avenue	The Thrift Barn			Commercial			0.07							0.05												
Broadway Avenue	Public Library			Commercial			0.10							0.08												
Broadway Avenue	Municipal Office			Commercial			0.10							0.08												
Broadway Avenue	OPP Station			Commercial			0.10							0.08												
Broadway Avenue	Canada Post Office			Commercial			0.10							0.08												
Broadway Avenue	685	296	157	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78	0.00	0.39	8.66	250	92.624	0.30	32.46	0.27	Ok	Ok	17.32	0.66	0.56	Check
Algoma Street	St Paul's Anglican Church			Institutional			0.11							0.08												
Algoma Street	Superior Childrens Centre			Commercial			0.10							0.08												
Algoma Street	Childrens Aid Society of Algoma			Commercial			0.05							0.04												
	Sir James Dunn Public School			Institutional			0.50							0.28												
Mackey Street	Wawa Handy Store			Commercial			0.12							0.09												
Mackey Street	Empty Building			Commercial			0.05							0.04												
Mackey Street	Superior North Mobile Vetrinary Service			Commercial			0.05							0.04												
Mackey Street	A Touch of Glass			Commercial			0.07							0.05												
Mackey Street	Wawa Laundromat			Commercial			0.07							0.05												
Mackey Street	Old Garage			Commercial			0.07							0.05												
Broadway Avenue	Wawa Volunteer Fire Department			Commercial			0.10							0.08												
Broadway Avenue	Water Treatment Plant			Commercial			0.29							0.22												
Broadway Avenue	LCBO			Commercial			0.05							0.04												
Broadway Avenue	Algoma Public Health			Commercial			0.05							0.04												
Broadway Avenue	Home Town Wines			Commercial			0.05							0.04												
Broadway Avenue	perior East Community Futures Development Corporation			Commercial			0.05							0.04												
Broadway Avenue	Algoma District Services Administration Board			Commercial			0.05							0.04												
Broadway Avenue	North Algoma Literacy Colaition			Commercial			0.05							0.04												
Broadway Avenue	Canadian Tire			Commercial			0.30							0.23												
Broadway Avenue	Dawson & Keenan			Commercial			0.06							0.05												
Broadway Avenue	The Bargain! Shop			Commercial			0.20							0.15												
Broadway Avenue	Roxy Bowling Centre			Commercial			0.15							0.11												
Broadway Avenue	The Royal Canadian Legion			Commercial			0.10							0.08												
Broadway Avenue	Sam's Foodline			Commercial			0.26							0.20												
Broadway Avenue	Feifel, Broadbent and Gualazzi			Commercial			0.08							0.06												
Broadway Avenue	Wawa Jewellers			Commercial			0.15							0.11												
Broadway Avenue	Garage Behind Bowling Alley			Commercial			0.05							0.04												
Broadway Avenue	Wawa Pharmacy			Commercial			0.03							0.02												
Broadway Avenue	U Wanna Cab			Commercial			0.03							0.02												
Broadway Avenue	Barber Shop			Commercial			0.03							0.02												
Broadway Avenue	Wawa Goose Senior Centre			Commercial			0.03							0.02												
Broadway Avenue	Regional Employment Help Centre			Commercial			0.06							0.04												
Broadway Avenue	Chic'N Swell			Commercial			0.04							0.03												
Broadway Avenue	Guided Fishing Trips			Commercial			0.04							0.03												
Broadway Avenue	Columbia Restaurant & Pizzeria			Commercial			0.18							0.14												
Broadway Avenue	RBC Royal Bank			Commercial			0.13							0.10												
Broadway Avenue	Embassy Restaurant			Commercial			0.08							0.06												
Broadway Avenue	North of 17 Restaurant			Commercial			0.10							0.08												
Broadway Avenue	Northern			Commercial			0.27							0.20												
Broadway Avenue	Creation Hairstyling			Commercial			0.11							0.08												
Broadway Avenue	Sam's Place			Commercial			0.06							0.05												
Broadway Avenue	Wawa Dental Centre			Commercial			0.14							0.11												
Broadway Avenue	AJ's Pizza & Wholesale			Commercial			0.06							0.05												
Broadway Avenue	Best Start Hub			Commercial			0.12							0.09												
Broadway Avenue	Paint+Glass			Commercial			0.11							0.08												
Ganley Street	778/779/777	157	332/307	Residential	416	915.2	30.35	1071.4	39.84	3.78	13.03	4.22	17.25		18.61	45.35	250		1.50	72.83	0.62	Ok	Ok	12.92	1.48	1.56	Ok
Ganley Street	Low Lift Station			Commercial			0.08							0.06												
Toronto Avenue	768	332	314	Residential	6	13.2	0.63	1084.6	40.47	3.78	13.18	4.27	17.45		0.52	46.13	375	53.105	0.05	40.25	1.15	Check	Check	-13.93	0.36	0.36	Check
	772	314	853	Residential	5	11	0.46	1095.6	40.93	3.77	13.30	4.31	17.61		0.66	46.95	375	22.54507	6.00	429.47	0.11	Ok	Ok	296.63	3.89	2.55	Ok
	773	853	76	Residential	3	6.6	0.19	1102.2	41.12	3.77	13.38	4.33	17.71			47.05	375	94.03863	0.41	111.58	0.42	Ok	Ok	42.22	1.01	0.97	Ok
	53	76	65	Residential	1	2.2	0.13	1104.4	41.25	3.77	13.40	4.34	17.74		0.39	47.47	375	59.66608	0.13	62.48	0.76	Ok	Ok	2.51	0.57	0.62	Ok
	52	65	67	Residential	22	48.4	1.81	1152.8	43.06	3.76	13.94	4.51	18.46		0.26	48.45	375	119.5854	0.21	80.54	0.60	Ok	Ok	15.98	0.73	0.76	Ok
Broadway Avenue	Parish of St. Monica			Commercial			0.15							0.11												
Broadway Avenue	The Algoma New Review			Commercial			0.04							0.03												
Broadway Avenue	ANP Office Supply			Commercial			0.04							0.03												
Broadway Avenue	Yellow Building			Commercial			0.14							0.11												
Broadway Avenue	Fenlons Pharmacy			Commercial			0.09							0.07												
Broadway Avenue	Algoma Family Services			Commercial			0.09							0.07												
Broadway Avenue	Bangin Burger N Chicken Shack			Commercial			0.11							0.08												
Broadway Avenue	Economic Development Corporation of Wawa			Commercial			0.09							0.07												

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Broadway Avenue	JJAM FM			Commercial			0.09							0.07												
	50	67	75	Residential	33	72.6	2.50	1225.4	45.56	3.74	14.75	4.78	19.53		1.18	51.33	375	117.427	0.36	105.20	0.49	Ok	Ok	32.83	0.95	0.95	Ok
	51	75	72	Residential	0	0	0.00	1225.4	45.56	3.74	14.75	4.78	19.53			51.33	375	51.711	0.66	142.33	0.36	Ok	Ok	62.53	1.29	1.18	Ok
Magpie Road	797	72	455	Residential	21	46.2	1.63	1271.6	47.19	3.73	15.26	4.94	20.20		0.39	52.40	375	81.082	0.15	67.91	0.77	Ok	Ok	1.92	0.61	0.68	Ok
Magpie Road	885	455	854	Residential	4	8.8	0.62	1280.4	47.81	3.73	15.36	4.97	20.33			52.53	375	21.629	0.67	143.51	0.37	Ok	Ok	62.28	1.30	1.20	Ok
Magpie Road	884	854	452	Residential	3	6.6	0.27	1287	48.08	3.73	15.43	5.00	20.43			52.63	375	63.295	0.18	74.72	0.70	Ok	Ok	7.15	0.68	0.73	Ok
Magpie Road	794	452	458	Residential	3	6.6	0.25	1293.6	48.33	3.73	15.51	5.02	20.52			52.72	375	76.628	0.13	62.70	0.84	Check	Ok	-2.56	0.57	0.64	Ok
Magpie Road	795	458	451	Residential	4	8.8	0.37	1302.4	48.70	3.72	15.60	5.05	20.65			52.85	375	74.2	0.18	73.66	0.72	Ok	Ok	6.08	0.67	0.73	Ok
Montreal Avenue	Municipality of Wawa Infrastructure Services Department			Commercial			0.50							0.38												
Montreal Avenue	Ontario Mine Rescue Algoma District Station			Commercial			0.19							0.14												
Montreal Avenue	Garage			Commercial			0.10							0.08												
Montreal Avenue	788	451	463	Residential	5	11	0.31	1313.4	49.01	3.72	15.72	5.09	20.81		0.26	53.87	375	77.028	0.41	111.72	0.48	Ok	Ok	35.51	1.01	1.00	Ok
Montreal Avenue	The Shop			Commercial			0.11							0.08												
Montreal Avenue	The Ship Boy Scouts Wawa Rotary Club			Commercial			0.05							0.04												
Montreal Avenue	790	463	73	Flow through	0	0	0.00	1313.4	49.01	3.72	15.72	5.09	20.81		0.13	54.12	375	74	0.17	72.90	0.74	Ok	Ok	4.21	0.66	0.72	Ok
Winston Road	Millette General Contractors Ltd.			Commercial			0.11							0.08												
	49	73	74	Flow through	0	0	0.00	1313.4	49.01	3.72	15.72	5.09	20.81			54.20	375	89.914	0.15	67.91	0.80	Ok	Ok	0.12	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
	7	74	X	Flow through	0	0	0.00	1313.4	49.01	3.72	15.72	5.09	20.81			54.24	375	91.439	0.15	67.91	0.80	Ok	Ok	0.09	0.61	0.68	Ok
Queen Street	724	X	579	Flow through	0	0	0.00	1313.4	49.01	3.72	15.72	5.09	20.81			54.24	375	63.438	0.15	67.91	0.80	Ok	Ok	0.09	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road @ Queen Street	719	579/578	555	Residential	31	68.2	3.00	1381.6	52.01	3.71	16.47	5.33	21.80		0.26	74.20	450	75.54766	0.15	111.15	0.67	Ok	Ok	14.72	0.70	0.75	Ok
Winston Road	718	555	554	Residential	2	4.4	0.37	1386	52.38	3.70	16.52	5.35	21.87		0.13	74.39	450	78.0338	0.15	109.68	0.68	Ok	Ok	13.35	0.69	0.74	Ok
Winston Road	717	554	553	Residential	3	6.6	0.30	1392.6	52.68	3.70	16.59	5.37	21.96		0.13	74.62	450	76.49896	0.15	110.94	0.67	Ok	Ok	14.13	0.70	0.75	Ok
Winston Road	RV Park			Commercial			2.00							0.91												
Winston Road	716	553	552	Residential	7	15.4	0.48	1408	53.16	3.70	16.76	5.43	22.18			75.75	450	81.38508	0.15	111.52	0.68	Ok	Ok	13.47	0.70	0.75	Ok
Winston Road	Ecole Publique l'Escalade			Institutional			2.00							0.58												
Winston Road	715	552	551	Residential	4	8.8	0.48	1416.8	53.64	3.70	16.86	5.46	22.31		0.26	76.45	450	84.1246	0.13	102.80	0.74	Ok	Ok	5.78	0.65	0.71	Ok
Winston Road	713	551	540	Residential	0	0	0.00	1416.8	53.64	3.70	16.86	5.46	22.31			76.45	450	62.48338	0.15	110.42	0.69	Ok	Ok	11.88	0.69	0.75	Ok
Mission Road	Gators Steakhouse			Commercial			0.36							0.27												
Mission Road	Garage			Commercial			0.16							0.12												
Winston Road	Kingdom Hall of Jehovah's Witness			Commercial			0.10							0.08												
Winston Road	711	540	46	Residential	12	26.4	0.53	1443.2	54.17	3.69	17.14	5.55	22.69		0.13	77.43	450	21.642	0.15	110.42	0.70	Ok	Ok	10.90	0.69	0.75	Ok
Winston Road	Wawa Rent-all and Repair			Commercial			0.20							0.15												
Winston Road	710	46	609	Residential	0	0	0.00	1443.2	54.17	3.69	17.14	5.55	22.69		0.13	77.71	450	99.062	0.50	201.60	0.39	Ok	Ok	83.57	1.27	1.18	Ok
Mission Road	Petro Canada			Commercial			0.23							0.17												
Mission Road	Krazy Fries			Commercial			0.05							0.04												
Mission Road	Northern Chiropractic			Commercial			0.05							0.04												
Winston Road	699	609	723	Residential	6	13.2	0.16	1456.4	54.33	3.69	17.29	5.60	22.88		0.52	78.68	450	60.807	0.15	110.42	0.71	Ok	Ok	9.66	0.69	0.75	Ok
Mission Road	Home Building Centre Garage			Commercial			0.32							0.24												
Mission Road	Home Building Centre			Commercial			0.32							0.24												
Mission Road	Young's General Store			Commercial			0.28							0.21												
Mission Road	Small Station			Commercial			0.25							0.19												
Winston Road	696	723	597	Residential	0	0	0.00	1456.4	54.33	3.69	17.29	5.60	22.88			79.56	450	41.915	0.15	110.42	0.72	Ok	Ok	8.78	0.69	0.76	Ok
					662	1456.4	73.85	1456.4	54.33		17.29	0.00	22.88	12.2	26.1	79.56											

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - Regina Cresent Trunk Line

CLIENT	Municipality of Wawa	Date:	July 13, 2023		Slopes and pipe diameters to be confirmed
PROJECT	Water and Wastewater Master Servicing Plan	Revision:	0		Slope calculated from GIS or as-built drawing information
PROJECT NO.	M22019	Design by:	NS		

Sewer location				Design Flow Calculation												Pipe Capacity										
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow $2/^{3/4}$ (L/s)	Peak Bypass Flows (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
	Low Pressure Forcemain		25	Residential	30	66	8.74	66	8.74	4.29	0.91	0.29	1.21			1.21											
							0.00							0.00													
Government Road	Lloyd's of Wawa			Commercial			0.76							0.57													
Government Road	Wagging Tails Kennel			Commercial			0.42							0.32													
Government Road	Leverington's Garden Centre			Industrial			0.20							0.28													
	Residential Apartment (Michipicoten Non-Profit Housing)		25	Residential	40	88	2.17	154	2.30	4.19	2.07	0.67	2.75			5.12											
	Michipicoten Non Profit Housing Office			Commercial			0.22							0.17													
Tamarack Road Subdivision	4	25	17	Flow through	73	160.6	5.00	314.6	7.30	4.07	4.12	1.33	5.45		1.70	9.69	300	24.899	0.800	86.49	11.20%	Ok	Ok	59.50	1.22	0.81	Ok
Tamarack Road	148	17	123	Flow through	0	0	0.00	314.6	7.30	4.07	4.12	1.33	5.45			9.69	300	39.603	0.800	86.49	11.20%	Ok	Ok	59.50	1.22	0.81	Ok
Regina Cresent	151	123	128	Residential	11	24.2	1.32	339	8.62	4.06	4.42	1.43	5.85		0.52	10.61	300	82.596	0.800	86.49	12.27%	Ok	Ok	58.58	1.22	0.83	Ok
Regina Cresent	153	128	129	Residential	7	15.4	0.70	354	9.32	4.05	4.61	1.49	6.10		0.13	11.00	300	76.001	0.165	39.28	28.00%	Ok	Ok	20.43	0.56	0.48	Check
Regina Cresent	154	129	130	Residential	5	11	0.50	365	9.82	4.04	4.75	1.54	6.29		0.13	11.31	300	54.404	0.68	79.62	14.20%	Ok	Ok	52.39	1.13	0.80	Ok
Regina Cresent	152	130	131	Residential	7	15.4	0.70	381	10.52	4.03	4.94	1.60	6.54		0.52	12.08	300	77.002	0.17	39.87	30.30%	Ok	Ok	19.81	0.56	0.49	Check
Regina Cresent	160	131	135	Residential	6	13.2	0.60	394	11.12	4.03	5.10	1.65	6.75			12.30	300	65.995	0.17	40.10	30.66%	Ok	Ok	19.79	0.57	0.50	Check
Regina Cresent	Confederation College Building			Institutional			0.33							0.25													
Regina Cresent	161	135	112	Residential	3	6.6	0.30	400	11.42	4.02	5.18	1.68	6.86			12.65	300	71.086	0.19	41.59	30.42%	Ok	Ok	20.62	0.59	0.52	Check
Regina Cresent @ Maple Street	162	112	136	Residential	30	66	3.37	466	14.79	3.99	5.99	1.94	7.93			13.72	300	70.096	0.12	33.50	40.95%	Ok	Ok	13.08	0.47	0.45	Check
Regina Cresent	163	136	142	Flow through		0	0.00	466	14.79	3.99	5.99	1.94	7.93			13.72	300	69.273	0.50	68.38	20.06%	Ok	Ok	40.98	0.97	0.75	Ok
Regina Cresent @ Birch Street	852	142	152	Residential	42	92.4	5.21	559	20.00	3.95	7.10	2.30	9.40		1.05	16.24	300	57.149	0.21	44.31	36.64%	Ok	Ok	19.21	0.63	0.58	Check
Regina Cresent	853	152	832	Flow through		0	0.00	559	20.00	3.95	7.10	2.30	9.40			16.24	300	54.297	0.25	48.35	33.58%	Ok	Ok	22.44	0.68	0.62	Ok
Regina Cresent @ Poplar Street	855	832	740	Residential	5	11	0.67	570	20.67	3.94	7.23	2.34	9.57		1.18	17.59	300	51.508	1.00	96.70	18.19%	Ok	Ok	59.77	1.37	1.04	Ok
Regina Cresent	856	740	741	Residential	1	2.2	0.26	572	20.93	3.94	7.26	2.35	9.61			17.62	300	50.001	0.70	80.91	21.78%	Ok	Ok	47.10	1.14	0.92	Ok
Regina Cresent @ Spruce Street	863	741	30	Residential	94	206.8	9.18	779	30.11	3.87	9.69	3.14	12.83		0.39	21.24	300	96.62	0.20	43.25	49.10%	Ok	Ok	13.36	0.61	0.61	Ok
Regina Cresent	875	30	822	Flow through		0	0.00	779	30.11	3.87	9.69	3.14	12.83		0.26	21.50	300	92.95	0.20	43.57	49.34%	Ok	Ok	13.36	0.62	0.61	Ok
Regina Cresent	864	822	31	Residential	53	116.6	6.57	895	36.68	3.83	11.04	3.57	14.61		2.22	25.50	300	68.878	0.20	43.25	58.96%	Ok	Ok	9.10	0.61	0.64	Ok
	20	31	32	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			25.50	300	90.223	0.20	43.14	59.11%	Ok	Ok	9.01	0.61	0.64	Ok
	867	32	698	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			25.50	300	89.613	0.20	43.25	58.96%	Ok	Ok	9.10	0.61	0.64	Ok
	868	698	33	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			25.50	300	90.223	0.20	43.14	59.11%	Ok	Ok	9.01	0.61	0.64	Ok
Mission Road	696	33	597	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			25.50	450	41.915	0.15	110.42	23.09%	Ok	Ok	62.84	0.69	0.56	Check
	Michipicoten Memorial Community Centre			Commercial			2.50							1.88													
Mission Road	862	597	48	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			107.17	525	76.202	0.20	194.24	55.17%	Ok	Ok	48.22	0.90	0.92	Ok
Mission Road	38	48	49	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			107.17	525	78.283	0.12	149.60	71.64%	Ok	Ok	12.50	0.69	0.75	Ok
Mission Road	Wawa Motor Inn			Commercial			5.11							1.84													
Mission Road	9	49	727	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			109.01	525	89.918	0.16	173.63	62.78%	Ok	Ok	29.90	0.80	0.85	Ok
Mission Road	10	727	728/812	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			109.01	525	88.788	0.18	179.91	60.59%	Ok	Ok	34.92	0.83	0.87	Ok
Mission Road	11	728/812	813	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			109.01	525	30.431	0.18	182.46	59.74%	Ok	Ok	36.96	0.84	0.88	Ok
WPCP	913	813	815	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			116.01	375		0.70	146.69	79.09%	Ok	Ok	1.34	1.33	1.47	Ok
WPCP	912	815	816	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			116.01	375		0.70	146.69	79.09%	Ok	Ok	1.34	1.33	1.47	Ok
WPCP	911	816	817	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			116.01	375	67.5	2.02	249.19	46.56%	Ok	Ok	83.34	2.26	2.21	Ok
WPCP	910	817	818	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			116.01	375	99.2	0.32	99.18	116.97%	Check	Check	-36.67	0.90	0.90	Ok
WPCP	914	818	WWTP	Flow through		0	0.00	895	36.68	3.83	11.04	3.57	14.61			116.01	375	102.7	0.25	87.67	132.34%	Check	Check	-45.88	0.79	0.79	Ok
					407	895.4	42.32	895	36.68		11.04	3.57	14.61	5.30	8.10	116.01											

Note:

1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019 plus inlow and infiltration
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions

1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Government Road	Lady Dunn Health Care Centre			Institutional			2.00							1.14													
Government Road	Algoma District Paramedic Service			Institutional			0.20							0.15													
Government Road	Garage			Commercial			0.13							0.10													
Government Road	Calvary Penecostal Church			Institutional			0.11							0.08													
Broadway Avenue	United Supply/Swish			Commercial			0.09							0.07													
Government Road @ Algoma St	679	98	197	Residential	68	149.6	8.87	149.6	8.87	4.19	2.02	0.65	2.67		1.18	5.39	200	62.299	0.30	18.08	0.30	Ok	Ok	9.08	0.58	0.50	Check
Broadway Ave	675	197	3	Residential	0	0	0.00	149.6	8.87	4.19	2.02	0.65	2.67			5.39	250	54.863	0.31	33.17	0.16	Ok	Ok	21.15	0.68	0.50	Check
Broadway Avenue	Garage			Commercial			0.17							0.13													
Broadway Avenue	Canadian Red Cross			Commercial			0.10							0.08													
Broadway Avenue	Public Washorooms			Commercial			0.15							0.11													
Broadway Avenue	Iris Place			Commercial			0.20							0.15													
Ganley Street	Bell			Commercial			0.13							0.10													
Broadway Avenue	Beachfront Trading Post			Commercial			0.13							0.10													
Broadway Avenue	Garage			Commercial			0.09							0.07													
Broadway Avenue	694	3	214	Residential	3	6.6	0.33	156.2	9.20	4.19	2.10	0.68	2.78		0.26	6.49	250	74.675	0.38	36.44	0.18	Ok	Ok	22.65	0.74	0.56	Check
Broadway Avenue	687	214	213	Residential	0	0	0.29	156.2	9.49	4.19	2.10	0.68	2.78			6.49	250	31.997	0.22	27.83	0.23	Ok	Ok	15.77	0.57	0.46	Check
Broadway Avenue	Everything Floors			Commercial			0.13							0.10													
Broadway Avenue	Empty Building			Commercial			0.15							0.11													
Broadway Avenue	Lai's Resturant			Commercial			0.08							0.06													
Broadway Avenue	Northern Vision Care			Commercial			0.06							0.05													
Broadway Avenue	March Dimes of Canada			Commercial			0.15							0.11													
Broadway Avenue	Lakeview Hotel			Commercial			0.65							0.26													
Broadway Avenue	Lakeview Motel			Commercial			0.65							0.23													
Broadway Avenue	Lakeview Resturant			Commercial			0.02							0.01													
Broadway Avenue	SpikeMills Art Gallery			Commercial			0.02							0.02													
Broadway Avenue @Mackey Street	686	213	296	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78		0.26	7.64	250	97.536	0.38	36.56	0.21	Ok	Ok	21.61	0.74	0.59	Check
Broadway Avenue	Allemano & Fitzgerald			Commercial			0.05							0.03													
Broadway Avenue	Alzheimers Society			Commercial			0.05							0.03													
Broadway Avenue	The Co-operators			Commercial			0.05							0.03													
Broadway Avenue	Sonia Video			Commercial			0.07							0.05													
Broadway Avenue	The Brick			Commercial			0.07							0.05													
Broadway Avenue	Square Three			Commercial			0.07							0.05													
Broadway Avenue	The Thrift Barn			Commercial			0.07							0.05													
Broadway Avenue	Public Library			Commercial			0.10							0.08													
Broadway Avenue	Municipal Office			Commercial			0.10							0.08													
Broadway Avenue	OPP Station			Commercial			0.10							0.08													
Broadway Avenue	Canada Post Office			Commercial			0.10							0.08													
Broadway Avenue	685	296	157	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78	0.00	0.39	8.65	250	92.624	0.30	32.46	0.27	Ok	Ok	17.32	0.66	0.56	Check
Algoma Street	St Paul's Anglican Church			Institutional			0.11							0.08													
Algoma Street	Superior Childrens Centre			Commercial			0.10							0.08													
Algoma Street	Childrens Aid Society of Algoma			Commercial			0.05							0.04													
	Sir James Dunn Public School			Institutional			0.50							0.28													
Mackey Street	Wawa Handy Store			Commercial			0.12							0.09													
Mackey Street	Empty Building			Commercial			0.05							0.04													
Mackey Street	Superior North Mobile Vetrinary Service			Commercial			0.05							0.04													
Mackey Street	A Touch of Glass			Commercial			0.07							0.05													
Mackey Street	Wawa Laundromat			Commercial			0.07							0.05													
Mackey Street	Old Garage			Commercial			0.07							0.05													
Broadway Avenue	Wawa Volunteer Fire Department			Commercial			0.10							0.08													
Broadway Avenue	Water Treatment Plant			Commercial			0.29							0.22													
Broadway Avenue	LCBO			Commercial			0.05							0.04													
Broadway Avenue	Algoma Public Health			Commercial			0.05							0.04													
Broadway Avenue	Home Town Wines			Commercial			0.05							0.04													
Broadway Avenue	perior East Community Futures Development Corporation			Commercial			0.05							0.04													
Broadway Avenue	Algoma District Services Administration Board			Commercial			0.05							0.04													
Broadway Avenue	North Algoma Literacy Colaition			Commercial			0.05							0.04													
Broadway Avenue	Canadian Tire			Commercial			0.30							0.23													
Broadway Avenue	Dawson & Keenan			Commercial			0.06							0.05													
Broadway Avenue	The Bargain! Shop			Commercial			0.20							0.15													
Broadway Avenue	Roxy Bowling Centre			Commercial			0.15							0.11													
Broadway Avenue	The Royal Canadian Legion			Commercial			0.10							0.08													
Broadway Avenue	Sam's Foodline			Commercial			0.26							0.20													
Broadway Avenue	Feifel, Broadbent and Gualazzi			Commercial			0.08							0.06													
Broadway Avenue	Wawa Jewellers			Commercial			0.15							0.11													
Broadway Avenue	Garage Behind Bowling Alley			Commercial			0.05							0.04													
Broadway Avenue	Wawa Pharmacy			Commercial			0.03							0.02													
Broadway Avenue	U Wanna Cab			Commercial			0.03							0.02													
Broadway Avenue	Barber Shop			Commercial			0.03							0.02													
Broadway Avenue	Wawa Goose Senior Centre			Commercial			0.03							0.02													
Broadway Avenue	Regional Employment Help Centre			Commercial			0.06							0.04													
Broadway Avenue	Chic'N Swell			Commercial			0.04							0.03													
Broadway Avenue	Guided Fishing Trips			Commercial			0.04							0.03													
Broadway Avenue	Columbia Restaurant & Pizzeria			Commercial			0.18							0.14													
Broadway Avenue	RBC Royal Bank			Commercial			0.13							0.10													
Broadway Avenue	Embassy Restaurant			Commercial			0.08							0.06													
Broadway Avenue	North of 17 Restaurant			Commercial			0.10							0.08													
Broadway Avenue	Northern			Commercial			0.27							0.20													
Broadway Avenue	Creation Hairstyling			Commercial			0.11							0.08													
Broadway Avenue	Sam's Place			Commercial			0.06							0.05													
Broadway Avenue	Wawa Dental Centre			Commercial			0.14							0.11													
Broadway Avenue	AJ's Pizza & Wholesale			Commercial			0.06							0.05													
Broadway Avenue	Best Start Hub			Commercial			0.12							0.09													
Broadway Avenue	Paint+Glass			Commercial			0.11							0.08													
Ganley Street	778/779/777	157	332/307	Residential	426	937.2	31.00	1093.4	40.49	3.77	13.28	4.30	17.58		18.56	45.62	250		1.50	72.83	0.63	Ok	Ok	12.65	1.48	1.57	Ok
Ganley Street	Low Lift Station			Commercial			0.08							0.06													
Toronto Avenue	768	332	314	Residential	6	13.2	0.63	1106.6	41.12	3.77	13.43	4.35	17.77		0.52	46.40	375	53.105	0.05	40.25	1.15	Check	Check	-14.20	0.36	0.36	Check
	772	314	853	Residential	5	11	0.46	1117.6	41.58	3.77	13.55	4.39	17.94		0.65	47.22	375	22.54507	6.00	429.47	0.11	Ok	Ok	296.36	3.89	2.55	Ok
	773	853	76	Residential	3	6.6	0.19	1124.2	41.77	3.77	13.62	4.41	18.04			47.31	375	94.03863	0.41	111.58	0.42	Ok	Ok	41.95	1.01	0.97	Ok
	53	76	65	Residential	1	2.2	0.13	1126.4	41.90	3.77	13.65	4.42	18.07		0.39	47.74	375	59.66608	0.13	62.48	0.76	Ok	Ok	2.25	0.57	0.62	Ok
	52	65	67	Residential	22	48.4	1.81	1174.8	43.71	3.75	14.19	4.59	18.78		0.26	48.71	375	119.5854	0.21	80.54	0.60	Ok	Ok	15.72	0.73	0.76	Ok
Broadway Avenue	Parish of St. Monica			Commercial			0.15							0.11													
Broadway Avenue	The Algoma New Review			Commercial			0.04							0.03													
Broadway Avenue	ANP Office Supply			Commercial			0.04							0.03													
Broadway Avenue	Yellow Building			Commercial			0.14							0.11													
Broadway Avenue	Fenlons Pharmacy			Commercial			0.09							0.07													
Broadway Avenue	Algoma Family Services			Commercial			0.09							0.07													
Broadway Avenue	Bangin Burger N Chicken Shack			Commercial			0.11							0.08													
Broadway Avenue	Economic Development Corporation of Wawa			Commercial			0.09							0.07													

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Broadway Avenue	JJAM FM			Commercial			0.09							0.07												
	50	67	75	Residential	33	72.6	2.50	1247.4	46.21	3.74	15.00	4.85	19.85		1.18	51.59	375	117.427	0.36	105.20	0.49	Ok	Ok	32.57	0.95	0.95	Ok
	51	75	72	Residential	0	0	0.00	1247.4	46.21	3.74	15.00	4.85	19.85			51.59	375	51.711	0.66	142.33	0.36	Ok	Ok	62.28	1.29	1.19	Ok
Magpie Road	797	72	455	Residential	21	46.2	1.63	1293.6	47.84	3.73	15.51	5.02	20.52		0.39	52.66	375	81.082	0.15	67.91	0.78	Ok	Ok	1.67	0.61	0.68	Ok
Magpie Road	885	455	854	Residential	4	8.8	0.62	1302.4	48.46	3.72	15.60	5.05	20.65			52.78	375	21.629	0.67	143.51	0.37	Ok	Ok	62.03	1.30	1.20	Ok
Magpie Road	884	854	452	Residential	3	6.6	0.27	1309	48.73	3.72	15.67	5.07	20.75			52.88	375	63.295	0.18	74.72	0.71	Ok	Ok	6.89	0.68	0.73	Ok
Magpie Road	794	452	458	Residential	3	6.6	0.25	1315.6	48.98	3.72	15.75	5.10	20.85			52.98	375	76.628	0.13	62.70	0.84	Check	Ok	-2.81	0.57	0.64	Ok
Magpie Road	795	458	451	Residential	4	8.8	0.37	1324.4	49.35	3.72	15.84	5.13	20.97			53.11	375	74.2	0.18	73.66	0.72	Ok	Ok	5.82	0.67	0.73	Ok
Montreal Avenue	Municipality of Wawa Infrastructure Services Department			Commercial			0.50							0.38												
Montreal Avenue	Ontario Mine Rescue Algoma District Station			Commercial			0.19							0.14												
Montreal Avenue	Garage			Commercial			0.10							0.08												
Montreal Avenue	788	451	463	Residential	5	11	0.31	1335.4	49.66	3.72	15.96	5.17	21.13		0.26	54.12	375	77.028	0.41	111.72	0.48	Ok	Ok	35.25	1.01	1.00	Ok
Montreal Avenue	The Shop			Commercial			0.11							0.08												
Montreal Avenue	The Ship Boy Scouts Wawa Rotary Club			Commercial			0.05							0.04												
Montreal Avenue	790	463	73	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13		0.13	54.37	375	74	0.17	72.90	0.75	Ok	Ok	3.95	0.66	0.72	Ok
Winston Road	Millette General Contractors Ltd.			Commercial			0.11							0.08												
	49	73	74	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.45	375	89.914	0.15	67.91	0.80	Check	Ok	-0.13	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
	7	74	X	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.49	375	91.439	0.15	67.91	0.80	Check	Ok	-0.17	0.61	0.68	Ok
Queen Street	724	X	579	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.49	375	63.438	0.15	67.91	0.80	Check	Ok	-0.17	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road @ Queen Street	719	579/578	555	Residential	31	68.2	3.00	1403.6	52.66	3.70	16.71	5.41	22.12		0.26	74.44	450	75.54766	0.15	111.15	0.67	Ok	Ok	14.48	0.70	0.75	Ok
Winston Road	718	555	554	Residential	2	4.4	0.37	1408	53.03	3.70	16.76	5.43	22.18		0.13	74.64	450	78.0338	0.15	109.68	0.68	Ok	Ok	13.11	0.69	0.74	Ok
Winston Road	717	554	553	Residential	3	6.6	0.30	1414.6	53.33	3.70	16.83	5.45	22.28		0.13	74.86	450	76.49896	0.15	110.94	0.67	Ok	Ok	13.89	0.70	0.75	Ok
Winston Road	RV Park			Commercial			2.00							0.91												
Winston Road	716	553	552	Residential	7	15.4	0.48	1430	53.81	3.69	17.00	5.50	22.50			75.99	450	81.38508	0.15	111.52	0.68	Ok	Ok	13.22	0.70	0.75	Ok
Winston Road	Ecole Publique l'Escalade			Institutional			2.00							0.58												
Winston Road	715	552	551	Residential	4	8.8	0.48	1438.8	54.29	3.69	17.09	5.53	22.63		0.26	76.69	450	84.1246	0.13	102.80	0.75	Ok	Ok	5.54	0.65	0.71	Ok
Winston Road	713	551	540	Residential	0	0	0.00	1438.8	54.29	3.69	17.09	5.53	22.63			76.69	450	62.48338	0.15	110.42	0.69	Ok	Ok	11.64	0.69	0.75	Ok
Mission Road	Gators Steakhouse			Commercial			0.36							0.27												
Mission Road	Garage			Commercial			0.16							0.12												
Winston Road	Kingdom Hall of Jehovah's Witness			Commercial			0.10							0.08												
Winston Road	711	540	46	Residential	12	26.4	0.53	1465.2	54.82	3.69	17.38	5.63	23.01		0.13	77.67	450	21.642	0.15	110.42	0.70	Ok	Ok	10.67	0.69	0.75	Ok
Winston Road	Wawa Rent-all and Repair			Commercial			0.20							0.15												
Winston Road	710	46	609	Residential	0	0	0.00	1465.2	54.82	3.69	17.38	5.63	23.01		0.13	77.95	450	99.062	0.50	201.60	0.39	Ok	Ok	83.33	1.27	1.19	Ok
Mission Road	Petro Canada			Commercial			0.23							0.17												
Mission Road	Krazy Fries			Commercial			0.05							0.04												
Mission Road	Northern Chiropractic			Commercial			0.05							0.04												
Winston Road	699	609	723	Residential	6	13.2	0.16	1478.4	54.98	3.68	17.52	5.67	23.20		0.52	78.91	450	60.807	0.15	110.42	0.71	Ok	Ok	9.42	0.69	0.75	Ok
Mission Road	Home Building Centre Garage			Commercial			0.32							0.24												
Mission Road	Home Building Centre			Commercial			0.32							0.24												
Mission Road	Young's General Store			Commercial			0.28							0.21												
Mission Road	Small Station			Commercial			0.25							0.19												
Winston Road	696	723	597	Residential	0	0	0.00	1478.4	54.98	3.68	17.52	5.67	23.20			79.79	450	41.915	0.15	110.42	0.72	Ok	Ok	8.54	0.69	0.76	Ok
					672	1478.4	74.50	1478.4	54.98		17.52	0.00	23.20	12.2	26.0	79.79											

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - East West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity										
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow 2/[2/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
	Ecole St. Joseph			Institutional			0.50							0.47													
Churchhill Avenue	835	689	688	Residential	6	13.2	0.60	13.2	0.60	4.40	0.19	0.06	0.25		0.13	0.85	200	99.809	4.87	72.39	0.01	Ok	Ok	57.07	2.30	0.78	Ok
Churchhill Avenue	834	688	35	Residential	9	19.8	0.88	33	1.48	4.35	0.46	0.15	0.61			1.21	200	94.493	0.35	19.35	0.06	Ok	Ok	14.26	0.62	0.34	Check
Churchhill Avenue	Kerry Funeral Home						0.09							0.07													
Churchhill Avenue	Beaver Motel			Commercial			0.27							0.13													
Parkhill Street	826	35	686	Residential	36	79.2	2.21	112.2	3.69	4.23	1.53	0.49	2.02		0.13	2.96	200	147.231	0.27	17.07	0.17	Ok	Ok	10.70	0.54	0.41	Check
	849	686	839	Residential	17	37.4	1.51	149.6	5.20	4.19	2.02	0.65	2.67			3.61	250	49.963	0.80	53.19	0.07	Ok	Ok	38.95	1.08	0.62	Ok
Hwy 101	Algoma Motel			Commercial			0.25							0.13													
Hwy 101	Beer Store			Commercial			0.25							0.19													
Hwy 101	T Cannabis			Commercial			0.20							0.15													
Hwy 101	Bristol Motel			Commercial			0.25							0.14													
Klondike Street	722	839	581	Flow through	0	0	0.00	149.6	5.20	4.19	2.02	0.65	2.67		0.39	4.61	250	45.948	0.75	51.50	0.09	Ok	Ok	36.59	1.05	0.65	Ok
Hwy 101	Outdoorsman Motel			Commercial			0.40							0.24													
Klondike Street	700	581	53	Residential	19	41.8	1.79	191.4	6.99	4.15	2.56	0.83	3.39		0.13	5.70	300	56.389	0.32	55.04	0.10	Ok	Ok	38.34	0.78	0.50	Check
Klondike Street	707	833	523	Residential	19	41.8	1.64	233.2	8.63	4.12	3.09	1.00	4.10			6.40	300	107.443	0.21	44.00	0.15	Ok	Ok	28.79	0.62	0.44	Check
Klondike Street	708	523	524	Residential	20	44	2.09	277.2	10.72	4.09	3.65	1.18	4.83		0.13	7.27	300	93.827	0.25	48.35	0.15	Ok	Ok	31.41	0.68	0.49	Check
Klondike Street	709	524	525	Residential	4	8.8	0.58	286	11.30	4.09	3.76	1.22	4.98			7.42	300	87.323	0.55	71.72	0.10	Ok	Ok	49.95	1.01	0.65	Ok
Hwy 101 @ George Street	Circle K Complex			Commercial			0.15							0.11													
Hwy 101	Pine Portage Lodge			Commercial			0.40							0.30													
Hwy 101	Northern Credit Union			Commercial			0.15							0.11													
Hwy 101	Empty Store			Commercial			0.15							0.11													
Hwy 101	X	55	X	Residential	10	22	1.30	22	1.30	4.37	0.31	0.10	0.41			1.04	250		0.28	31.47	0.03	Ok	Ok	24.13	0.64	0.29	Check
Hwy 101	Big Bird Inn			Commercial			0.44							0.36													
Hwy 101	Independent Grocery Store			Commercial			0.50							0.38													
Hwy 101	Subway			Commercial			0.18							0.14													
Hwy 101	Movie Gallery			Commercial			0.18							0.14													
Hwy 101	The Viking Resturant			Commercial			0.22							0.17													
Hwy 101	Polish Alliance of Canada			Commercial			0.16							0.12													
Hwy 101	Residential Apartments			Residential	12	26.4	0.50	48.4	1.80	4.32	0.67	0.22	0.89			1.52											
Hwy 101	Residential Apartments			Residential	12	26.4	0.22	74.8	2.02	4.28	1.03	0.33	1.36			1.99											
	First United Church			Institutional			0.45							0.34													
	Michipicoten High School			Institutional			2.00							0.72													
	St. Augustine School			Institutional			0.50							0.30													
Winston Road	798	811	579/578	Residential	127	279.4	11.70	640.2	25.02	3.92	8.07	2.61	10.68		2.22	18.63	300	99.777	0.29	52.08	0.36	Ok	Ok	23.04	0.74	0.68	Ok
					291	640.2	32.70		25.02		8.07	2.61	10.68	4.8	3.1	18.63											

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - Mission Road Trunk Line

CLIENT: Municipality of Wawa
PROJECT: Water and Wastewater Master Servicing Plan
PROJECT NO.: M22019

Date: July 13, 2023 January 0, 1900
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home) [1]	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flows (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Mission Road	Airport -Commercial, Storage Garage, Aircraft Hanger			Commercial			1.00							0.75												
Mission Road	Tourist Information Centre			Commercial			1.00							0.86												
Mission Road	95	84	736	Flow through		0		0	0.00	0.00	0.00	0.00	0.00		0.39	2.00	300	38.30	1.10	101.42	0.0198	Ok	Ok	79.13	1.43	0.56	Check
Mission Road	94	736	83	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	375	32.00	0.32	99.18	0.0202	Ok	Ok	77.34	0.90	0.36	Check
Mission Road	93	83	82	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	400	85.10	0.15	80.66	0.0248	Ok	Ok	62.52	0.64	0.27	Check
Mission Road	92	82	81	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	400	98.70	0.16	83.30	0.0240	Ok	Ok	64.64	0.66	0.28	Check
Mission Road	Government Storage Garage			Commercial			1.50							1.13												
Mission Road	Service Ontario			Commercial			0.50							0.38												
Mission Road	Ontario Ministry of Natural Resources			Institutional			0.20							0.15												
Mission Road	90	81	737	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			3.66	375	66.10	0.17	72.29	0.0506	Ok	Ok	54.17	0.65	0.34	Check
Mission Road	Mission Motors			Commercial			0.50							0.38												
Mission Road	87	737	735	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	24.10	0.13	63.22	0.0638	Ok	Ok	46.54	0.57	0.32	Check
Mission Road	86	735	738	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	100.10	0.12	60.74	0.0664	Ok	Ok	44.55	0.55	0.31	Check
Mission Road	84	738	79	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	90.90	0.28	92.78	0.0435	Ok	Ok	70.19	0.84	0.42	Check
Mission Road	83	79	732	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	90.30	0.36	105.20	0.0384	Ok	Ok	80.12	0.95	0.46	Check
Mission Road							0.00							0.00												
Mission Road	81	732	78	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	77.00	0.21	80.35	0.0502	Ok	Ok	60.24	0.73	0.38	Check
Mission Road	79	78	733	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	300	102.00	0.24	47.37	0.0852	Ok	Ok	33.86	0.67	0.41	Check
Mission Road	Tim Hortons			Commercial			1.07							0.80												
Mission Road	Wesdome Gold Mines			Industrial			0.77							1.08												
Mission Road	76	733	726	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			5.92	300	85.30	0.19	42.15	0.1404	Ok	Ok	27.80	0.60	0.42	Check
Mission Road	Canco			Commercial			0.77							0.58												
Mission Road	Garage			Commercial			0.50							0.38												
Mission Road	75	726	77	Flow through		0		0	0.00	0.00	0.00	0.00	0.00		0.13	7.00	375	16.10	9.94	552.78	0.0127	Ok	Ok	435.22	5.00	1.71	Ok
Mission Road	74	77	814	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			7.00	375	23.80	10.00	554.44	0.0126	Ok	Ok	436.55	5.02	1.72	Ok
														6.48	0.52											

Note:

1. Harmon Formula: M=1+(14/(P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019) plus inflow and infiltration
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Hectare	0.28 L/ha-s
Average Daily Flow per Capita	278 L/cap-d
n= Pipe Coefficient	0.013
Persons per Unit	2.2
Overall Peak Factor	3.46

Assumptions

1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - Regina Cresent Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity										
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow $2/^{3/4}$ (L/s)	Peak Bypass Flows (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [2]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
	Low Pressure Forcemain		25	Residential	30	66	8.74	66	8.74	4.29	0.91	0.29	1.21			1.21											
							0.00							0.00													
Government Road	Lloyd's of Wawa			Commercial			0.76							0.57													
Government Road	Wagging Tails Kennel			Commercial			0.42							0.32													
Government Road	Leverington's Garden Centre			Industrial			0.20							0.28													
	Residential Apartment (Michipicoten Non-Profit Housing)		25	Residential	40	88	2.17	154	2.30	4.19	2.07	0.67	2.75			5.12											
	Michipicoten Non Profit Housing Office			Commercial			0.22							0.17													
Tamarack Road Subdivision	4	25	17	Flow through	73	160.6	7.30	314.6	9.60	4.07	4.12	1.33	5.45		1.70	9.69	300	24.899	0.800	86.49	11.20%	Ok	Ok	59.50	1.22	0.81	Ok
Tamarack Road	148	17	123	Flow through	0	0	0.00	314.6	9.60	4.07	4.12	1.33	5.45			9.69	300	39.603	0.800	86.49	11.20%	Ok	Ok	59.50	1.22	0.81	Ok
Regina Cresent	151	123	128	Residential	11	24.2	1.32	339	10.92	4.06	4.42	1.43	5.85		0.52	10.61	300	82.596	0.800	86.49	12.27%	Ok	Ok	58.58	1.22	0.83	Ok
Regina Cresent	153	128	129	Residential	7	15.4	0.70	354	11.62	4.05	4.61	1.49	6.10		0.13	11.00	300	76.001	0.165	39.28	28.00%	Ok	Ok	20.43	0.56	0.48	Check
Regina Cresent	154	129	130	Residential	5	11	0.50	365	12.12	4.04	4.75	1.54	6.29		0.13	11.31	300	54.404	0.68	79.62	14.20%	Ok	Ok	52.39	1.13	0.80	Ok
Regina Cresent	152	130	131	Residential	7	15.4	0.70	381	12.82	4.03	4.94	1.60	6.54		0.52	12.08	300	77.002	0.17	39.87	30.30%	Ok	Ok	19.81	0.56	0.49	Check
Regina Cresent	160	131	135	Residential	6	13.2	0.60	394	13.42	4.03	5.10	1.65	6.75			12.30	300	65.995	0.17	40.10	30.66%	Ok	Ok	19.79	0.57	0.50	Check
Regina Cresent	Confederation College Building			Institutional			0.33							0.25													
Regina Cresent	161	135	112	Residential	3	6.6	0.30	400	13.72	4.02	5.18	1.68	6.86			12.65	300	71.086	0.19	41.59	30.42%	Ok	Ok	20.62	0.59	0.52	Check
Regina Cresent @ Maple Street	162	112	136	Residential	30	66	3.37	466	17.09	3.99	5.99	1.94	7.93			13.72	300	70.096	0.12	33.50	40.95%	Ok	Ok	13.08	0.47	0.45	Check
Regina Cresent	163	136	142	Flow through		0	0.00	466	17.09	3.99	5.99	1.94	7.93			13.72	300	69.273	0.50	68.38	20.06%	Ok	Ok	40.98	0.97	0.75	Ok
Regina Cresent @ Birch Street	852	142	152	Residential	42	92.4	5.21	559	22.30	3.95	7.10	2.30	9.40		1.05	16.24	300	57.149	0.21	44.31	36.64%	Ok	Ok	19.21	0.63	0.58	Check
Regina Cresent	853	152	832	Flow through		0	0.00	559	22.30	3.95	7.10	2.30	9.40			16.24	300	54.297	0.25	48.35	33.58%	Ok	Ok	22.44	0.68	0.62	Ok
Regina Cresent @ Poplar Street	855	832	740	Residential	5	11	0.67	570	22.97	3.94	7.23	2.34	9.57		1.18	17.59	300	51.508	1.00	96.70	18.19%	Ok	Ok	59.77	1.37	1.04	Ok
Regina Cresent	856	740	741	Residential	1	2.2	0.26	572	23.23	3.94	7.26	2.35	9.61			17.62	300	50.001	0.70	80.91	21.78%	Ok	Ok	47.10	1.14	0.92	Ok
Regina Cresent @ Spruce Street	863	741	30	Residential	94	206.8	9.18	779	32.41	3.87	9.69	3.14	12.83		0.39	21.24	300	96.62	0.20	43.25	49.10%	Ok	Ok	13.36	0.61	0.61	Ok
Regina Cresent	875	30	822	Flow through		0	0.00	779	32.41	3.87	9.69	3.14	12.83		0.26	21.50	300	92.95	0.20	43.57	49.34%	Ok	Ok	13.36	0.62	0.61	Ok
Regina Cresent	864	822	31	Residential	53	116.6	6.57	895	38.98	3.83	11.04	3.57	14.61		2.22	25.50	300	68.878	0.20	43.25	58.96%	Ok	Ok	9.10	0.61	0.64	Ok
	20	31	32	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			25.50	300	90.223	0.20	43.14	59.11%	Ok	Ok	9.01	0.61	0.64	Ok
	867	32	698	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			25.50	300	89.613	0.20	43.25	58.96%	Ok	Ok	9.10	0.61	0.64	Ok
	868	698	33	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			25.50	300	90.223	0.20	43.14	59.11%	Ok	Ok	9.01	0.61	0.64	Ok
Mission Road	696	33	597	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			25.50	450	41.915	0.15	110.42	23.09%	Ok	Ok	62.84	0.69	0.56	Check
	Michipicoten Memorial Community Centre			Commercial			2.50							1.88													
Mission Road	862	597	48	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			107.17	525	76.202	0.20	194.24	55.17%	Ok	Ok	48.22	0.90	0.92	Ok
Mission Road	38	48	49	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			107.17	525	78.283	0.12	149.60	71.64%	Ok	Ok	12.50	0.69	0.75	Ok
Mission Road	Wawa Motor Inn			Commercial			5.11							1.84													
Mission Road	9	49	727	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			109.01	525	89.918	0.16	173.63	62.78%	Ok	Ok	29.90	0.80	0.85	Ok
Mission Road	10	727	728/812	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			109.01	525	88.788	0.18	179.91	60.59%	Ok	Ok	34.92	0.83	0.87	Ok
Mission Road	11	728/812	813	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			109.01	525	30.431	0.18	182.46	59.74%	Ok	Ok	36.96	0.84	0.88	Ok
WPCP	913	813	815	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			141.24	375		0.70	146.69	96.29%	Check	Ok	-23.89	1.33	1.51	Ok
WPCP	912	815	816	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			141.24	375		0.70	146.69	96.29%	Check	Ok	-23.89	1.33	1.51	Ok
WPCP	911	816	817	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			141.24	375	67.5	2.02	249.19	56.68%	Ok	Ok	58.11	2.26	2.33	Ok
WPCP	910	817	818	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			141.24	375	99.2	0.32	99.18	142.41%	Check	Check	-61.90	0.90	0.90	Ok
WPCP	914	818	WWTP	Flow through		0	0.00	895	38.98	3.83	11.04	3.57	14.61			141.24	375	102.7	0.25	87.67	161.12%	Check	Check	-71.11	0.79	0.79	Ok
					407	895.4	44.62	895	38.98		11.04	3.57	14.61	5.30	8.10	141.24											

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019 plus inlow and infiltration
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Government Road	Lady Dunn Health Care Centre			Institutional			2.00							1.14												
Government Road	Algoma District Paramedic Service			Institutional			0.20							0.15												
Government Road	Garage			Commercial			0.13							0.10												
Government Road	Calvary Penecostal Church			Institutional			0.11							0.08												
Broadway Avenue	United Supply/Swish			Commercial			0.09							0.07												
Government Road @ Algoma St	679	98	197	Residential	68	149.6	8.87	149.6	8.87	4.19	2.02	0.65	2.67		1.18	5.39	200	62.299	0.30	18.08	0.30	Ok	Ok	9.08	0.58	0.50	Check
Broadway Ave	675	197	3	Residential	0	0	0.00	149.6	8.87	4.19	2.02	0.65	2.67			5.39	250	54.863	0.31	33.17	0.16	Ok	Ok	21.15	0.68	0.50	Check
Broadway Avenue	Garage			Commercial			0.17							0.13												
Broadway Avenue	Canadian Red Cross			Commercial			0.10							0.08												
Broadway Avenue	Public Washorooms			Commercial			0.15							0.11												
Broadway Avenue	Iris Place			Commercial			0.20							0.15												
Ganley Street	Bell			Commercial			0.13							0.10												
Broadway Avenue	Beachfront Trading Post			Commercial			0.13							0.10												
Broadway Avenue	Garage			Commercial			0.09							0.07												
Broadway Avenue	694	3	214	Residential	3	6.6	0.33	156.2	9.20	4.19	2.10	0.68	2.78		0.26	6.49	250	74.675	0.38	36.44	0.18	Ok	Ok	22.65	0.74	0.56	Check
Broadway Avenue	687	214	213	Residential	0	0	0.29	156.2	9.49	4.19	2.10	0.68	2.78			6.49	250	31.997	0.22	27.83	0.23	Ok	Ok	15.77	0.57	0.46	Check
Broadway Avenue	Everything Floors			Commercial			0.13							0.10												
Broadway Avenue	Empty Building			Commercial			0.15							0.11												
Broadway Avenue	Lai's Resturant			Commercial			0.08							0.06												
Broadway Avenue	Northern Vision Care			Commercial			0.06							0.05												
Broadway Avenue	March Dimes of Canada			Commercial			0.15							0.11												
Broadway Avenue	Lakeview Hotel			Commercial			0.65							0.26												
Broadway Avenue	Lakeview Motel			Commercial			0.65							0.23												
Broadway Avenue	Lakeview Resturant			Commercial			0.02							0.01												
Broadway Avenue	SpikeMills Art Gallery			Commercial			0.02							0.02												
Broadway Avenue @Mackey Street	686	213	296	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78		0.26	7.64	250	97.536	0.38	36.56	0.21	Ok	Ok	21.61	0.74	0.59	Check
Broadway Avenue	Allemano & Fitzgerald			Commercial			0.05							0.03												
Broadway Avenue	Alzheimers Society			Commercial			0.05							0.03												
Broadway Avenue	The Co-operators			Commercial			0.05							0.03												
Broadway Avenue	Sonia Video			Commercial			0.07							0.05												
Broadway Avenue	The Brick			Commercial			0.07							0.05												
Broadway Avenue	Square Three			Commercial			0.07							0.05												
Broadway Avenue	The Thrift Barn			Commercial			0.07							0.05												
Broadway Avenue	Public Library			Commercial			0.10							0.08												
Broadway Avenue	Municipal Office			Commercial			0.10							0.08												
Broadway Avenue	OPP Station			Commercial			0.10							0.08												
Broadway Avenue	Canada Post Office			Commercial			0.10							0.08												
Broadway Avenue	685	296	157	Residential		0	0.00	156.2	9.49	4.19	2.10	0.68	2.78	0.00	0.39	8.65	250	92.624	0.30	32.46	0.27	Ok	Ok	17.32	0.66	0.56	Check
Algoma Street	St Paul's Anglican Church			Institutional			0.11							0.08												
Algoma Street	Superior Childrens Centre			Commercial			0.10							0.08												
Algoma Street	Childrens Aid Society of Algoma			Commercial			0.05							0.04												
	Sir James Dunn Public School			Institutional			0.50							0.28												
Mackey Street	Wawa Handy Store			Commercial			0.12							0.09												
Mackey Street	Empty Building			Commercial			0.05							0.04												
Mackey Street	Superior North Mobile Vetrinary Service			Commercial			0.05							0.04												
Mackey Street	A Touch of Glass			Commercial			0.07							0.05												
Mackey Street	Wawa Laundromat			Commercial			0.07							0.05												
Mackey Street	Old Garage			Commercial			0.07							0.05												
Broadway Avenue	Wawa Volunteer Fire Department			Commercial			0.10							0.08												
Broadway Avenue	Water Treatment Plant			Commercial			0.29							0.22												
Broadway Avenue	LCBO			Commercial			0.05							0.04												
Broadway Avenue	Algoma Public Health			Commercial			0.05							0.04												
Broadway Avenue	Home Town Wines			Commercial			0.05							0.04												
Broadway Avenue	perior East Community Futures Development Corporation			Commercial			0.05							0.04												
Broadway Avenue	Algoma District Services Administration Board			Commercial			0.05							0.04												
Broadway Avenue	North Algoma Literacy Colaition			Commercial			0.05							0.04												
Broadway Avenue	Canadian Tire			Commercial			0.30							0.23												
Broadway Avenue	Dawson & Keenan			Commercial			0.06							0.05												
Broadway Avenue	The Bargain! Shop			Commercial			0.20							0.15												
Broadway Avenue	Roxy Bowling Centre			Commercial			0.15							0.11												
Broadway Avenue	The Royal Canadian Legion			Commercial			0.10							0.08												
Broadway Avenue	Sam's Foodline			Commercial			0.26							0.20												
Broadway Avenue	Feifel, Broadbent and Gualazzi			Commercial			0.08							0.06												
Broadway Avenue	Wawa Jewellers			Commercial			0.15							0.11												
Broadway Avenue	Garage Behind Bowling Alley			Commercial			0.05							0.04												
Broadway Avenue	Wawa Pharmacy			Commercial			0.03							0.02												
Broadway Avenue	U Wanna Cab			Commercial			0.03							0.02												
Broadway Avenue	Barber Shop			Commercial			0.03							0.02												
Broadway Avenue	Wawa Goose Senior Centre			Commercial			0.03							0.02												
Broadway Avenue	Regional Employment Help Centre			Commercial			0.06							0.04												
Broadway Avenue	Chic'N Swell			Commercial			0.04							0.03												
Broadway Avenue	Guided Fishing Trips			Commercial			0.04							0.03												
Broadway Avenue	Columbia Restaurant & Pizzeria			Commercial			0.18							0.14												
Broadway Avenue	RBC Royal Bank			Commercial			0.13							0.10												
Broadway Avenue	Embassy Restaurant			Commercial			0.08							0.06												
Broadway Avenue	North of 17 Restaurant			Commercial			0.10							0.08												
Broadway Avenue	Northern			Commercial			0.27							0.20												
Broadway Avenue	Creation Hairstyling			Commercial			0.11							0.08												
Broadway Avenue	Sam's Place			Commercial			0.06							0.05												
Broadway Avenue	Wawa Dental Centre			Commercial			0.14							0.11												
Broadway Avenue	AJ's Pizza & Wholesale			Commercial			0.06							0.05												
Broadway Avenue	Best Start Hub			Commercial			0.12							0.09												
Broadway Avenue	Paint+Glass			Commercial			0.11							0.08												
Ganley Street	778/779/777	157	332/307	Residential	426	937.2	31.00	1093.4	40.49	3.77	13.28	4.30	17.58		18.56	45.62	250		1.50	72.83	0.63	Ok	Ok	12.65	1.48	1.57	Ok
Ganley Street	Low Lift Station			Commercial			0.08							0.06												
Toronto Avenue	768	332	314	Residential	6	13.2	0.63	1106.6	41.12	3.77	13.43	4.35	17.77		0.52	46.40	375	53.105	0.05	40.25	1.15	Check	Check	-14.20	0.36	0.36	Check
	772	314	853	Residential	5	11	0.46	1117.6	41.58	3.77	13.55	4.39	17.94		0.65	47.22	375	22.54507	6.00	429.47	0.11	Ok	Ok	296.36	3.89	2.55	Ok
	773	853	76	Residential	3	6.6	0.19	1124.2	41.77	3.77	13.62	4.41	18.04			47.31	375	94.03863	0.41	111.58	0.42	Ok	Ok	41.95	1.01	0.97	Ok
	53	76	65	Residential	1	2.2	0.13	1126.4	41.90	3.77	13.65	4.42	18.07		0.39	47.74	375	59.66608	0.13	62.48	0.76	Ok	Ok	2.25	0.57	0.62	Ok
	52	65	67	Residential	22	48.4	1.81	1174.8	43.71	3.75	14.19	4.59	18.78		0.26	48.71	375	119.5854	0.21	80.54	0.60	Ok	Ok	15.72	0.73	0.76	Ok
Broadway Avenue	Parish of St. Monica			Commercial			0.15							0.11												
Broadway Avenue	The Algoma New Review			Commercial			0.04							0.03												
Broadway Avenue	ANP Office Supply			Commercial			0.04							0.03												
Broadway Avenue	Yellow Building			Commercial			0.14							0.11												
Broadway Avenue	Fenlons Pharmacy			Commercial			0.09							0.07												
Broadway Avenue	Algoma Family Services			Commercial			0.09							0.07												
Broadway Avenue	Bangin Burger N Chicken Shack			Commercial			0.11							0.08												
Broadway Avenue	Economic Development Corporation of Wawa			Commercial			0.09							0.07												

SANITARY SEWER DESIGN CALCULATIONS - South West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Broadway Avenue	JJAM FM			Commercial			0.09							0.07												
	50	67	75	Residential	33	72.6	2.50	1247.4	46.21	3.74	15.00	4.85	19.85		1.18	51.59	375	117.427	0.36	105.20	0.49	Ok	Ok	32.57	0.95	0.95	Ok
	51	75	72	Residential	0	0	0.00	1247.4	46.21	3.74	15.00	4.85	19.85			51.59	375	51.711	0.66	142.33	0.36	Ok	Ok	62.28	1.29	1.19	Ok
Magpie Road	797	72	455	Residential	21	46.2	1.63	1293.6	47.84	3.73	15.51	5.02	20.52		0.39	52.66	375	81.082	0.15	67.91	0.78	Ok	Ok	1.67	0.61	0.68	Ok
Magpie Road	885	455	854	Residential	4	8.8	0.62	1302.4	48.46	3.72	15.60	5.05	20.65			52.78	375	21.629	0.67	143.51	0.37	Ok	Ok	62.03	1.30	1.20	Ok
Magpie Road	884	854	452	Residential	3	6.6	0.27	1309	48.73	3.72	15.67	5.07	20.75			52.88	375	63.295	0.18	74.72	0.71	Ok	Ok	6.89	0.68	0.73	Ok
Magpie Road	794	452	458	Residential	3	6.6	0.25	1315.6	48.98	3.72	15.75	5.10	20.85			52.98	375	76.628	0.13	62.70	0.84	Check	Ok	-2.81	0.57	0.64	Ok
Magpie Road	795	458	451	Residential	4	8.8	0.37	1324.4	49.35	3.72	15.84	5.13	20.97			53.11	375	74.2	0.18	73.66	0.72	Ok	Ok	5.82	0.67	0.73	Ok
Montreal Avenue	Municipality of Wawa Infrastructure Services Department			Commercial			0.50							0.38												
Montreal Avenue	Ontario Mine Rescue Algoma District Station			Commercial			0.19							0.14												
Montreal Avenue	Garage			Commercial			0.10							0.08												
Montreal Avenue	788	451	463	Residential	5	11	0.31	1335.4	49.66	3.72	15.96	5.17	21.13		0.26	54.12	375	77.028	0.41	111.72	0.48	Ok	Ok	35.25	1.01	1.00	Ok
Montreal Avenue	The Shop			Commercial			0.11							0.08												
Montreal Avenue	The Ship Boy Scouts Wawa Rotary Club			Commercial			0.05							0.04												
Montreal Avenue	790	463	73	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13		0.13	54.37	375	74	0.17	72.90	0.75	Ok	Ok	3.95	0.66	0.72	Ok
Winston Road	Millette General Contractors Ltd.			Commercial			0.11							0.08												
	49	73	74	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.45	375	89.914	0.15	67.91	0.80	Check	Ok	-0.13	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
	7	74	X	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.49	375	91.439	0.15	67.91	0.80	Check	Ok	-0.17	0.61	0.68	Ok
Queen Street	724	X	579	Flow through	0	0	0.00	1335.4	49.66	3.72	15.96	5.17	21.13			54.49	375	63.438	0.15	67.91	0.80	Check	Ok	-0.17	0.61	0.68	Ok
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road	Garage			Commercial			0.05							0.04												
Winston Road @ Queen Street	719	579/578	555	Residential	31	68.2	3.00	1403.6	52.66	3.70	16.71	5.41	22.12		0.26	74.44	450	75.54766	0.15	111.15	0.67	Ok	Ok	14.48	0.70	0.75	Ok
Winston Road	718	555	554	Residential	2	4.4	0.37	1408	53.03	3.70	16.76	5.43	22.18		0.13	74.64	450	78.0338	0.15	109.68	0.68	Ok	Ok	13.11	0.69	0.74	Ok
Winston Road	717	554	553	Residential	3	6.6	0.30	1414.6	53.33	3.70	16.83	5.45	22.28		0.13	74.86	450	76.49896	0.15	110.94	0.67	Ok	Ok	13.89	0.70	0.75	Ok
Winston Road	RV Park			Commercial			2.00							0.91												
Winston Road	716	553	552	Residential	7	15.4	0.48	1430	53.81	3.69	17.00	5.50	22.50			75.99	450	81.38508	0.15	111.52	0.68	Ok	Ok	13.22	0.70	0.75	Ok
Winston Road	Ecole Publique l'Escalade			Institutional			2.00							0.58												
Winston Road	715	552	551	Residential	4	8.8	0.48	1438.8	54.29	3.69	17.09	5.53	22.63		0.26	76.69	450	84.1246	0.13	102.80	0.75	Ok	Ok	5.54	0.65	0.71	Ok
Winston Road	713	551	540	Residential	0	0	0.00	1438.8	54.29	3.69	17.09	5.53	22.63			76.69	450	62.48338	0.15	110.42	0.69	Ok	Ok	11.64	0.69	0.75	Ok
Mission Road	Gators Steakhouse			Commercial			0.36							0.27												
Mission Road	Garage			Commercial			0.16							0.12												
Winston Road	Kingdom Hall of Jehovah's Witness			Commercial			0.10							0.08												
Winston Road	711	540	46	Residential	12	26.4	0.53	1465.2	54.82	3.69	17.38	5.63	23.01		0.13	77.67	450	21.642	0.15	110.42	0.70	Ok	Ok	10.67	0.69	0.75	Ok
Winston Road	Wawa Rent-all and Repair			Commercial			0.20							0.15												
Winston Road	710	46	609	Residential	0	0	0.00	1465.2	54.82	3.69	17.38	5.63	23.01		0.13	77.95	450	99.062	0.50	201.60	0.39	Ok	Ok	83.33	1.27	1.19	Ok
Mission Road	Petro Canada			Commercial			0.23							0.17												
Mission Road	Krazy Fries			Commercial			0.05							0.04												
Mission Road	Northern Chiropractic			Commercial			0.05							0.04												
Winston Road	699	609	723	Residential	6	13.2	0.16	1478.4	54.98	3.68	17.52	5.67	23.20		0.52	78.91	450	60.807	0.15	110.42	0.71	Ok	Ok	9.42	0.69	0.75	Ok
Mission Road	Home Building Centre Garage			Commercial			0.32							0.24												
Mission Road	Home Building Centre			Commercial			0.32							0.24												
Mission Road	Young's General Store			Commercial			0.28							0.21												
Mission Road	Small Station			Commercial			0.25							0.19												
Winston Road	696	723	597	Residential	0	0	0.00	1478.4	54.98	3.68	17.52	5.67	23.20			79.79	450	41.915	0.15	110.42	0.72	Ok	Ok	8.54	0.69	0.76	Ok
					672	1478.4	74.50	1478.4	54.98		17.52	0.00	23.20	12.2	26.0	79.79											

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - East West Trunk Line

CLIENT Municipality of Wawa
PROJECT Water and Wastewater Master Servicing Plan
PROJECT NO. M22019

Date: July 13, 2023
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home)	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow 2/3/4 (L/s)	Peak Bypass Flow (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
	Ecole St. Joseph			Institutional			0.50							0.47												
Churchhill Avenue	835	689	688	Residential	6	13.2	0.60	13.2	0.60	4.40	0.19	0.06	0.25		0.13	0.85	200	99.809	4.87	72.39	0.01	Ok	Ok	57.07	2.30	0.78	Ok
Churchhill Avenue	834	688	35	Residential	9	19.8	0.88	33	1.48	4.35	0.46	0.15	0.61			1.21	200	94.493	0.35	19.35	0.06	Ok	Ok	14.26	0.62	0.34	Check
Churchhill Avenue	Kerry Funeral Home						0.09							0.07												
Churchhill Avenue	Beaver Motel			Commercial			0.27							0.13												
Parkhill Street	826	35	686	Residential	36	79.2	2.21	112.2	3.69	4.23	1.53	0.49	2.02		0.13	2.96	200	147.231	0.27	17.07	0.17	Ok	Ok	10.70	0.54	0.41	Check
	849	686	839	Residential	17	37.4	1.51	149.6	5.20	4.19	2.02	0.65	2.67			3.61	250	49.963	0.80	53.19	0.07	Ok	Ok	38.95	1.08	0.62	Ok
Hwy 101	Algoma Motel			Commercial			0.25							0.13												
Hwy 101	Beer Store			Commercial			0.25							0.19												
Hwy 101	T Cannabis			Commercial			0.20							0.15												
Hwy 101	Bristol Motel			Commercial			0.25							0.14												
Klondike Street	722	839	581	Flow through	0	0	0.00	149.6	5.20	4.19	2.02	0.65	2.67		0.39	4.61	250	45.948	0.75	51.50	0.09	Ok	Ok	36.59	1.05	0.65	Ok
Hwy 101	Outdoorsman Motel			Commercial			0.40							0.24												
Klondike Street	700	581	53	Residential	19	41.8	1.79	191.4	6.99	4.15	2.56	0.83	3.39		0.13	5.70	300	56.389	0.32	55.04	0.10	Ok	Ok	38.34	0.78	0.50	Check
Klondike Street	707	833	523	Residential	19	41.8	1.64	233.2	8.63	4.12	3.09	1.00	4.10			6.40	300	107.443	0.21	44.00	0.15	Ok	Ok	28.79	0.62	0.44	Check
Klondike Street	708	523	524	Residential	20	44	2.09	277.2	10.72	4.09	3.65	1.18	4.83		0.13	7.27	300	93.827	0.25	48.35	0.15	Ok	Ok	31.41	0.68	0.49	Check
Klondike Street	709	524	525	Residential	4	8.8	0.58	286	11.30	4.09	3.76	1.22	4.98			7.42	300	87.323	0.55	71.72	0.10	Ok	Ok	49.95	1.01	0.65	Ok
Hwy 101 @ George Street	Circle K Complex			Commercial			0.15							0.11												
Hwy 101	Pine Portage Lodge			Commercial			0.40							0.30												
Hwy 101	Northern Credit Union			Commercial			0.15							0.11												
Hwy 101	Empty Store			Commercial			0.15							0.11												
Hwy 101	X	55	X	Residential	10	22	1.30	22	1.30	4.37	0.31	0.10	0.41			1.04	250		0.28	31.47	0.03	Ok	Ok	24.13	0.64	0.29	Check
Hwy 101	Big Bird Inn			Commercial			0.44							0.36												
Hwy 101	Independent Grocery Store			Commercial			0.50							0.38												
Hwy 101	Subway			Commercial			0.18							0.14												
Hwy 101	Movie Gallery			Commercial			0.18							0.14												
Hwy 101	The Viking Resturant			Commercial			0.22							0.17												
Hwy 101	Polish Alliance of Canada			Commercial			0.16							0.12												
Hwy 101	Residential Apartments			Residential	12	26.4	0.50	48.4	1.80	4.32	0.67	0.22	0.89			1.52											
Hwy 101	Residential Apartments			Residential	12	26.4	0.22	74.8	2.02	4.28	1.03	0.33	1.36			1.99											
	First United Church			Institutional			0.45							0.34												
	Michipicoten High School			Institutional			2.00							0.72												
	St. Augustine School			Institutional			0.50							0.30												
Winston Road	798	811	579/578	Residential	127	279.4	11.70	640.2	25.02	3.92	8.07	2.61	10.68		2.22	18.63	300	99.777	0.29	52.08	0.36	Ok	Ok	23.04	0.74	0.68	Ok
					291	640.2	32.70		25.02		8.07	2.61	10.68	4.8	3.1	18.63										

Note:
1. Harmon Formula: M=1+(14/((P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019)
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019)

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Capita	90	L/cap-d
Peak Extraneous Flow Per Hectare	0.28	L/ha-s
Average Daily Flow per Capita	278	L/cap-d
n= Pipe Coefficient	0.013	
Persons per Unit	2.2	
Overall Peak Factor	3.46	

Assumptions
1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

SANITARY SEWER DESIGN CALCULATIONS - Mission Road Trunk Line

CLIENT: Municipality of Wawa
PROJECT: Water and Wastewater Master Servicing Plan
PROJECT NO.: M22019

Date: July 13, 2023 January 0, 1900
Revision: 0
Design by: NS

Slopes and pipe diameters to be confirmed
Slope calculated from GIS or as-built drawing information

Sewer location				Design Flow Calculation												Pipe Capacity									
Area	Sewer ID	From MH# (as labelled in the drawing)	To MH# (as labelled in the drawing)	Type (Residential/Commercial/Industrial/Institutional)	# of Homes	Indiv. Pop. (2.2 people /home) [1]	Indiv. Area (ha)	Cum. Pop.	Cum. Area (ha)	Peaking Factor - Harmon Formula [1]	Pop. Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Domestic Sewage Flow (L/s)	Commercial/Institutional Sewage Flow [2/3/4] (L/s)	Peak Bypass Flows (L/s)	Design Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Q Full (L/s)	Q Design/ Q Full	Q Design/ Q Full 80% Check [5]	Q Design/ Q Full 100% Check [5]	Q capacity Left (L/s)	V Full (m/s)	V Design (m/s)	Velocity Check [6]
Mission Road	Airport -Commercial, Storage Garage, Aircraft Hanger			Commercial			1.00							0.75												
Mission Road	Tourist Information Centre			Commercial			1.00							0.86												
Mission Road	95	84	736	Flow through		0		0	0.00	0.00	0.00	0.00	0.00		0.39	2.00	300	38.30	1.10	101.42	0.0198	Ok	Ok	79.13	1.43	0.56	Check
Mission Road	94	736	83	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	375	32.00	0.32	99.18	0.0202	Ok	Ok	77.34	0.90	0.36	Check
Mission Road	93	83	82	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	400	85.10	0.15	80.66	0.0248	Ok	Ok	62.52	0.64	0.27	Check
Mission Road	92	82	81	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			2.00	400	98.70	0.16	83.30	0.0240	Ok	Ok	64.64	0.66	0.28	Check
Mission Road	Government Storage Garage			Commercial			1.50							1.13												
Mission Road	Service Ontario			Commercial			0.50							0.38												
Mission Road	Ontario Ministry of Natural Resources			Institutional			0.20							0.15												
Mission Road	90	81	737	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			3.66	375	66.10	0.17	72.29	0.0506	Ok	Ok	54.17	0.65	0.34	Check
Mission Road	Mission Motors			Commercial			0.50							0.38												
Mission Road	87	737	735	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	24.10	0.13	63.22	0.0638	Ok	Ok	46.54	0.57	0.32	Check
Mission Road	86	735	738	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	100.10	0.12	60.74	0.0664	Ok	Ok	44.55	0.55	0.31	Check
Mission Road	84	738	79	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	90.90	0.28	92.78	0.0435	Ok	Ok	70.19	0.84	0.42	Check
Mission Road	83	79	732	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			4.03	375	90.30	0.36	105.20	0.0384	Ok	Ok	80.12	0.95	0.46	Check
Mission Road	Future Industrial			Industrial			18.00							25.23												
Mission Road	81	732	78	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			29.26	375	77.00	0.21	80.35	0.3642	Ok	Ok	35.01	0.73	0.67	Ok
Mission Road	79	78	733	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			29.26	300	102.00	0.24	47.37	0.6177	Ok	Ok	8.64	0.67	0.71	Ok
Mission Road	Tim Hortons			Commercial			1.07							0.80												
Mission Road	Wesdome Gold Mines			Industrial			0.77							1.08												
Mission Road	76	733	726	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			31.15	300	85.30	0.19	42.15	0.7390	Ok	Ok	2.57	0.60	0.65	Ok
Mission Road	Canco			Commercial			0.77							0.58												
Mission Road	Garage			Commercial			0.50							0.38												
Mission Road	75	726	77	Flow through		0		0	0.00	0.00	0.00	0.00	0.00		0.13	32.23	375	16.10	9.94	552.78	0.0583	Ok	Ok	409.99	5.00	2.72	Ok
Mission Road	74	77	814	Flow through		0		0	0.00	0.00	0.00	0.00	0.00			32.23	375	23.80	10.00	554.44	0.0581	Ok	Ok	411.32	5.02	2.73	Ok
														31.71	0.52											

Note:

1. Harmon Formula: M=1+(14/(P^0.5)+4)), where P = population, in thousands (MECP Guidelines for Sewage Works, 2019) plus inflow and infiltration
2. For institutional and commercial: use a design flow as mentioned in TABLE 5-3 in the MECP Guidelines for Sewage Works, 2019
3. For other commercial: use a design flow of 65 cu.m/ha-d including allowances for infiltration and peaking effect shall be used for the design of all local sewers (MECP Guidelines for Sewage Works, 2019)
4. For industrial: use a design flow of 35 cu.m/ha-d (average) and an overall peak factor of 3.46
5. Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe size (Design Criteria for Sewers and Watermains, City of Toronto, January 2021)
6. Velocity check based on: Minimum acceptable velocity = 0.6 m/s; Maximum acceptable velocity = 3.0 m/s (MECP Design Criteria, 2019

Constants (Based on Historical Data and MECP Design Criteria)

Peak Extraneous Flow Per Hectare	0.28 L/ha-s
Average Daily Flow per Capita	278 L/cap-d
n= Pipe Coefficient	0.013
Persons per Unit	2.2
Overall Peak Factor	3.46

Assumptions

1. Area used to determine ICI flows is the approximate using google maps. Hence the ICI flow estimates are more conservative.
2. Approximate building area was assumed for larger commercial lots for more realistic wastewater flows

Input Parameters Column Highlighted

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Appendix F

Calculations

Average, Min Hour, Max Day, and Peak Hour Flow Rates

		Average Flow Rate																		
		Total		Residential			ICI			UFW			Min Day Demand with MECP Peaking Factor		Max Daily Flow Rate from Data			Max Day Demand with MECP Peaking Factor		Peak Hour Demand with MECP Peaking Factor		
Year	Population	m^3/day	L/cap/day	m^3/day	L/cap/day	%	m^3/day	L/cap/day	%	m^3/day	L/cap/day	%	m^3/day	L/cap/day	m^3/day	L/cap/day	Peaking Factor	m^3/day	L/cap/day	m^3/day	L/cap/day	Equivalent Population[4]
2015	2972	2180	733.6	-	-	-	-	-	-	-	-	-	1090	366.8	3408	1147	1.56	4361	1467	6541	2201	4261
2016	2979	2231	748.8	-	-	-	-	-	-	-	-	-	1115	374.4	3463	1162	1.55	4461	1498	6692	2246	4271
2017	2967	2932	988.2	-	-	-	-	-	-	-	-	-	1466	494.1	4000	1348	1.36	5864	1976	8796	2965	4254
2018	2968	2965	998.9	-	-	-	-	-	-	-	-	-	1482	499.5	5461	1840	1.84	5930	1998	8894	2997	4255
2019	2995	2879	961.3	754.2	251.8	26.2	367.4	122.7	12.8	1757	586.8	61.0	1440	480.6	4381	1463	1.52	5758	1923	8637	2884	4294
2020	2964	2485	838.4	643.9	217.3	25.9	257.8	87.0	10.4	1583	534.2	63.7	1242	419.2	3603	1215	1.45	4970	1677	7455	2515	4250
2021	2997	2142	714.8	625.3	208.6	29.2	259.8	86.7	12.1	1257	419.5	58.7	1071	357.4	3212	1072	1.50	4284	1430	6427	2144	4297
Total	-	2545	854.9	674.5	225.9	27.1	295.0	98.8	11.8	1533	513.5	61.1	1071	357.4	5461	1840	-	5930	1998	8894	2565	-
	Assume	3093	1026	838.12	278.0		363.5	120.6		1891	627.3							6186	2052			

[1]Min Rate Factor = 0.5 Equivalent population of 3,001-10,000
[2]Max Rate Factor = 2.00 Equivalent population of 3,001-10,000
[3]Peak Rate Factor = 3.00 Equivalent population of 3,001-10,000
[4]Equivalent Population Factor = 1.43
[5]Max Rate Factor = 1.90 Equivalent population of 10,001-25,000
[6]Peak Rate Factor = 2.85 Equivalent population of 3,001-10,000
*Peaking factors are from Table 3-1 in Design Guidelines for Drinking Water Systems, Ministry of the Environment, 200

Estimate of Population that System Can Accommodate

System Capacity = 7880 m^3/day
7880000 L/day

1a. Using Average Day Rate of 1026 L/cap/day
Population = 7682

1b. Using average per capita residential and ICI consumption, and assume UFW unchanged with population
Population = 15026

2a. Using Max Day Rate of 2052 L/cap/day
Population = 3841

2b. Using MECP Max Day Peak Rate Factor, assuming Residential, ICI, and UFW are proportional to population
Population = 3841

3c. Using MECP Max Day Peak Rate Factor, assuming Residential and ICI are proportional to population, UFW does not change with population.
Population = 5141

Wawa Water Demand Distribution

Current and 10-Year Design Basis

	Current (2022)			10-Year Residential (2032)			10-Year Residential and Industrial (2032)		
	Units cap	Unit Demand L/cap/day	ADD L/day	Units cap	Unit Demand L/cap/day	ADD L/day	Units cap	Unit Demand L/cap/day	ADD L/day
Residential									
Population	3,015	278.0	838,160	3,200	278.0	889,589	3,200	278.0	889,589
Number of Houses	1,370			1,463			1,463		
ICI									
Existing - Water Meters			353,990			353,990			353,990
Existing - Unmetered[1]			99,726			99,726			99,726
Future 18 ha Development							18	45,000	810,000
Total			453,716			453,716			1,263,716
UFW									
Bypasses			1,020,510			1,020,510			1,020,510
WM Purging and Other			780,499			780,499			780,499
Total			1,801,010			1,801,010			1,801,010
ADD (Total) [m^3/d]			3,093			3,144			3,954
Equivalent Population			4,647			4,832			7,746
MDR			2.00			2.00			2.00
MDD [m3/d]			6,186			6,289			7,909
PHR			3.00			3.00			3.00
PHD [m3/d]			9,279			9,433			11,863

Notes

1. Unmetered data includes additional ICI addresses where no water meter was available.

91.53506

Method 1: MECP

Reference:
Design Guidelines for Drinking-Water Systems, MECP, 2008
8.4.2 Sizing Treated Water Storage for Systems Providing Fire Protection
The following method for sizing water storage needs may not fulfill the fire protection requirements of the municipality insurance company or the Fire Underwriters Survey. For fire flow requirements, refer to the latest edition of the Fire Underwriters Survey document Water Supply for Public Fire Protection. Historically, small municipalities in Ontario have used the following criteria.

Table 8-1: Fire Flow Requirements

Equivalent Population	*Suggested Fire Flow (L/s)*	*Duration (Hours)*
500-1000	*38*	*2*
1000	*64*	*2*
1500	*79*	*2*
2000	*95*	*2*
3000	*110*	*2*
4000	*125*	*2*
5000	*144*	*2*
6000	*159*	*3*
10000	*189*	*3*
13000	*220*	*3*
17000	*250*	*4*
27000	*318*	*5*
33000	*348*	*5*
40000	*378*	*6*

Based on the estimated equivalent population for the community the suggested fire flow (L/s) and duration (hours) were interpolated from Table 8-1 above. The fire flow requirements for the current, 5-year, 10-year, 15-year and 20-year scenarios are summarized in the table below.

Year	Equivalent Population	Fire Flow (L/s)	Duration
2022	4,647	137.29	2.00
2032 R	4,832	140.81	2.00
2032 R+I	**7,746**	**172.10**	**3.00**

Water Storage Requirements

Storage= A + B + C

A= Fire Storage = Fire Flow x Duration
B= Equalization Storage = Maximum Day Demand (MDD) x 0.25
C= Emergency Storage = (A + B) x 0.25

	2022	2032 R	**2032 R+I**
MDD (m3/d)	6185.8	6288.6	**7908.6**
A (m3)	989	1014	**1859**
B (m3)	1546	1572	**1977**
C (m3)	634	646	**959**
A+B+C (m3)	3169	3232	**4795**

Retention Time Under Average Day Demand Conditions

	2021	2032 R	**2032 R+I**
Reservoir Volume (m3)	3345	3345	**3345**
ADD (m3/d)	3093	3144	**3954**
Retention Time (d)	1.08	1.06	**0.85**

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A	2023-07-14	PK	NS	

CT Calculations

Project No.: M22019 | Site: Municipality of Wawa - Water Treatment Plant

Municipality of Wawa - Water Treatment Plant

Calculating Chlorine Contact time:

Volume =	507.00	m3	Baffling Factor	0.6		pH =	7.5		2021 Daily Logs	Required CT Value Summer
			Max Flow Rate	71.59	L/s	Temp =	20	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 11 *Table 5
			Pump 1		L/s	Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 3 *Table 7
			Pump 2		L/s					
			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 51 *Table 1
						Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 70.82 min

Available Contact Time: 62.32 min (At full reservoir, maximum day demand flow rate and average chlorine concentration)

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			Pump 2		L/s					
			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 48 *Table 1
						Chlorine Conc.	0.49	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 70.82 min

Available Contact Time: 34.70 min (At full reservoir, maximum day demand flow rate and minimum chlorine concentration)

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CT Calculations

Project No.: M22019 | Site: Municipality of Wawa - Water Treatment Plant

Municipality of Wawa - Water Treatment Plant

Calculating Chlorine Contact time:

Volume =	507.00	m3	Baffling Factor	0.6		pH =	7.5		2021 Daily Logs	Required CT Value Summer
			Max Flow Rate	72.79	L/s	Temp =	20	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 11 *Table 5
			Pump 1		L/s	Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 3 *Table 7
			Pump 2		L/s					
			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 51 *Table 1
						Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 69.65 min

Available Contact Time: 61.29 min (At full reservoir, maximum day demand flow rate and average chlorine concentration)

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CT Calculations

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Volume =	507.00	m3	Baffling Factor	0.6		pH =	7.5		2021 Daily Logs	Required CT Value Summer
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			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 48 *Table 1
						Chlorine Conc.	0.49	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 69.65 min

Available Contact Time: 34.13 min (At full reservoir, maximum day demand flow rate and minimum chlorine concentration)

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Volume =	507.00	m3	Baffling Factor	0.6		pH =	7.5		2021 Daily Logs	Required CT Value Summer
			Max Flow Rate	91.54	L/s	Temp =	20	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 11 *Table 5
			Pump 1		L/s	Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 3 *Table 7
			Pump 2		L/s					
			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 51 *Table 1
						Chlorine Conc.	0.88	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 55.39 min

Available Contact Time: 48.74 min (At full reservoir, maximum day demand flow rate and average chlorine concentration)

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CT Calculations

Project No.: M22019 | Site: Municipality of Wawa - Water Treatment Plant

Municipality of Wawa - Water Treatment Plant

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			Max Flow Rate	91.54	L/s	Temp =	20	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 11 *Table 5
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			Pump 3		L/s	pH =	8		2021 Daily Logs	Required CT Value Winter
			Pump 4		L/s	Temp =	0.5	°C	2021 Daily Logs	Giardia Cysts (0.5 log) 48 *Table 1
						Chlorine Conc.	0.49	mg/L	2021 Daily Logs	virus (4 log) 12 *Table 7

Time 55.39 min

Available Contact Time: 27.14 min (At full reservoir, maximum day demand flow rate and minimum chlorine concentration)

Average, Min Day, Max Day and Peak Wastewater Flow Rates

																	Estimates of Contributions to Average Flows											
	Population			Average Flow Rate		Min Day Flow Rate from Data		Max Day Flow Rate from Data			Peak Wastewater Flow Rate Harmon Formula[1]			Peak Wastewater Flow Rate Babbitt Formula[2]			Residential[3]			ICI[4]			I&I[5]			Bypasses		
Year	Total	MRV[6]	In-Town	m^3/day	L/cap/day	m^3/day	L/cap/day	m^3/day	L/cap/day	Factor	Factor	m^3/day	L/cap/day	Factor	m^3/day	L/cap/day	m^3/day	L/cap/day	%	m^3/day	L/cap/day		m^3/day	L/cap/day		m^3/day	L/cap/day	
2015	2972	156	2816	2501	888	1290	458.1	4913	2937	1.96	3.47	8669	3078	4.06	10168	3611											
2016	2979	156	2823	2407	853	420	148.8	4348	954	1.81	3.46	8339	2954	4.06	9779	3464											
2017	2967	156	2811	1852	659	874	310.9	3974	1993	2.15	3.47	6420	2284	4.07	7532	2679											
2018	2968	156	2812	2077	739	955	339.6	4234	2177	2.04	3.47	7199	2560	4.07	8445	3003											
2019	2995	156	2839	2183	769	1138	400.8	5533	2570	2.53	3.46	7559	2662	4.06	8859	3120	755.2	266.0	34.6	318.4	112.2	14.6	255.5	90.0	11.7	853.8	300.7	39.1
2020	2964	156	2808	1838	655	600	213.7	4170	1370	2.27	3.47	6373	2270	4.07	7477	2663	643.5	229.2	35.0	215.4	76.7	11.7	252.7	90.0	13.7	726.7	258.8	39.5
2021	2997	156	2841	1895	667	908	319.6	4074	2049	2.15	3.46	6563	2310	4.06	7691	2707	619.7	218.1	32.7	219.0	77.1	11.6	255.7	90.0	13.5	801.0	282.0	42.3
Total	-	-	-	2108	747	420	148.8	5533	2937	2.13	-	7303	2588	-	8564	3035	672.8	237.8	34.1	250.9	88.6	12.6	254.6	90.0	13.0	793.8	280.5	40.3
			Assume	2563	896											Assume	873.9	305.7		323.4	113.1		332.7	116.4		1033	361.3	

[1]Harmon Factor

M = 1.0 + 14/(4+(P/1000)^(1/2))

[2]Babbitt Factor

M = 5/(P/1000)^0.2

M: Factor

P: Population

[3]Residential water demand from water meter data for in-town

[4]ICI water demand for water meter data for in-town

[5]Assume I&I of 90 L/cap/day

[6]2022 MRV and Pinewood population estimate is 156, assumed to be constant in past (2.2 persons/household [Statistics Canada]*67 houses)

Estimate of In-Town Population that System Can Accommodate

System capacity = 4300 m^3/day

4300000 L/day

Average Flows Proportional to Population

Population = 4797

Average Residential, ICI and I&I Flows Proportional to Population, Bypasses and WM Purging Constant

Population = 5537

Wawa Wastewater Flow Distribution

Current and 10-Year Design Basis

	Current (2022)			10-Year Residential (2032)			10-Year Residential and Small Industrial (2032)		
	Units cap	Unit Demand L/cap/day	ADD L/day	Units cap	Unit Demand L/cap/day	ADD L/day	Units cap	Unit Demand L/cap/day	ADD L/day
Residential[1]									
Population	2,859	278.0	794,765	3,044	278.0	846,098	3,044	278.0	846,098
Number of Houses	1,299			1,392			1,392		
ICI[1]									
Existing - Water Meters			329,244			329,244			329,244
Existing - Unmetered[2]			41,072			41,072			41,072
Future 18 ha Development							18	45,000	810,000
Total			370,316			370,316			1,180,316
I&I[3]									
Residential	2,859	90	257,298	3,044	90	273,916	3,044	90	273,916
ICI	1,332	90	119,886	1,332	90	119,886	4,246	90	382,117
Total			377,185			393,803			656,033
Bypasses[4]									
Total			1,020,510			1,020,510			1,020,510
ADF (Total) [m^3/d]			2,563			2,631			3,703
MDF Ratio			2.53			2.53			2.53
MDF (Total) [m^3/d]			6,496			6,668			9,386
Peaking Factor (M)			3.46			3.44			3.44
PF (Total) [m^3/d]			8,867			9,042			12,727

Notes

1. Residential and ICI flows were assumed to increase by the same amount as the ADD for water.
2. Unmetered data includes additional ICI addresses where no water meter was available.
3. I&I was assumed to be 90 L/cap/day for ADF based on the equivalent population serviced by the wastewater collection system
4. Bypasses were calculated in the current year as the total ADF minus the residential, ICI and I&I flows. It was assumed to remain constant in the future growth scenarios

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Project No.: M22019	Project: W&WW Master Plan	Site: Wawa
Service: Lagoon Volume Calculation	Item No.: N/A	Page 1 of 4

DUTY

This calculation estimates the area and oxygen requirements of an aeration lagoon with continual discharge for the Municipality of Wawa.

BASIS OF CALCULATIONS

Three scenarios are examined in these calculations. The current (2022) scenario evaluates the capacity of the lagoon to service the current in-town community. The future residential (2032) and future residential plus industrial (2032) scenarios evalaute the capacity of the lagoon to service the future demands of the in-town community.

Current (2022):

Wastewater design flows for the current system:

	Average BOD			Maximum BOD		
Total Wastewater=	2,562,776	L/day	Total Wastewater=	2,562,776	L/day
BOD Mass Loading=	166	kg/day	BOD Mass Loading=	290	kg/day
BOD Loading[1]=	58.9	kg/ha/day	BOD Loading[1]=	103.1	kg/ha/day
Oxygen Required=	286	kg/day	Oxygen Required=	596	kg/day

Future Residential (2032):

Wastewater design flows for the future system with residential growth:

	Average			Maximum BOD		
Total Wastewater=	2,630,727	L/day	Total Wastewater=	2,630,727	L/day
BOD Mass Loading=	170	kg/day	BOD Mass Loading=	297	kg/day
BOD Loading[1]=	60.5	kg/ha/day	BOD Loading[1]=	105.8	kg/ha/day
Oxygen Required=	293	kg/day	Oxygen Required=	612	kg/day

Future Residential plus Industrial (2032):

Wastewater design flows for the future system with residential plus industrial growth:

	Average			Maximum BOD		
Total Wastewater=	3,702,957	L/day	Total Wastewater=	3,702,957	L/day
BOD Mass Loading=	239	kg/day	BOD Mass Loading=	418	kg/day
BOD Loading[1]=	85.1	kg/ha/day	BOD Loading[1]=	148.9	ha
Oxygen Required=	413	kg/day	Oxygen Required=	861	kg/day

Max BOD Removed

Low Max BOD Loading	84	kg BOD/ha/d	High Max BOD Loading	112	kg BOD/ha/d
	236	kg/d		315	kg/d

Notes

1) Aerated lagoons can be loaded with up to 75-100 lbs BOD/acre (84-112 kg BOD/ha) assuming the aeration system can supply 2.5 pounds of oxygen for each pound of BOD that must be removed.