GUELPH INNOVATION DISTRICT
WATER AND WASTEWATER STUDY

CITY OF GUELPH

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City of Guelph

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1.0 INTRODUCTION

The Guelph Innovation District (GID) comprises 436 ha (1,077 acres) on Guelph's east side. It is bounded by York Road, Victoria Road South, the York-Watson Industrial Park and the City's southern boundary.

The Guelph Innovation District is being planned as a compact mixed-use community that integrates an urban village with an employment area, strives to be carbon neutral and offers meaningful places to live, work, shop, play and learn in a setting rich in natural and cultural heritage. The City identified objectives for the development of these lands, including:

- To provide employment lands;
- To meet the goals of the Growth Plan;
- To continue to host the Waste Resource Innovation Centre;
- To conserve natural and cultural heritage resources;
- To put the Community Energy Initiative into practice; and
- To build partnerships with the Province and those with an interest in the lands.

AMEC Environment & Infrastructure has been retained to address water and wastewater systems for the Guelph Innovation District and provide guidance and policies to ensure these services meet the needs of the District. The policy requirements have been addressed during the development of the Secondary Plan and are considered completed.

The infrastructure design is based on the preferred land use adopted by the City Council in May 2014.

2.0 BACKGROUND REPORTS AND STUDIES

Several documents have been made available for this Study. The Water and Wastewater study focuses attention to those documents which specifically pertain to the water and wastewater servicing for the study area. The primary documents reviewed include:

a. City of Guelph Water and Wastewater Servicing Master Plan, Earth Tech, 2008
b. Water Conservation and Efficiency Strategy Update, Resources Management Strategies Inc., 2009
c. York Trunk Sewer and Paisley-Clythe Feedermain Municipal Class Environmental Assessment, Genivar, 2012
d. City of Guelph Residential Greywater Field Test Draft Final Report, Genivar, 2012
e. Guelph Innovation District Secondary Plan-Preferred Design, Planning Alliance, 2011

3.0 EXISTING WATER SYSTEM

The City of Guelph's water system consists of twenty-three (23) wells, three (3) elevated storage tanks and six (6) in-ground storage reservoirs. The distribution system is operated within two (2) major pressure zones with over 500 km of watermains up to 1050 mm in diameter.

The GID is located in Pressure Zone 1 with elevations ranging from 310 m to 346 m. Water services on the perimeter of the site include (refer to **Figure 1, Appendix C**):

- A combination of a 400 mm and 200 mm main on York Road at the GID area;
- A 300 mm watermain on Watson Parkway from York Road to just south of Dunlop Drive;
- A 400 mm watermain on Watson Parkway from Dunlop Drive to Stone Road;
- A 400 mm watermain on Stone Road at the GID area;
- A 250 mm watermain on Victoria Road from York Road to Florence Lane; and
- A 500 mm watermain on Victoria Road from Florence Lane to Stone Road.
- A 400 mm watermain on Victoria Road from Stone Road to Clair Road.

Within the GID, there is a 1050 mm water transmission line which traverses through the site. This is the transmission main from the Arkell Spring Grounds. The water main is directly west and adjacent to the Eramosa River. Since the 1050 mm line is a water transmission main, direct service connections are not permitted based on City's specifications. Other watermains and service mains (refer to **Figure 1, Appendix C**) within the GID include:

- The Guelph Correctional Centre is serviced by a watermain supplied from the 300 mm watermain on Dunlop Drive;
- The Waste Innovation Resource Centre is serviced by a 250 mm watermain loop supplied from the 300 mm watermain on Dunlop Drive;
- The Guelph Research Station (Guelph Turfgrass Institute and Agro-Forest Station) is serviced by a 200 mm watermain supplied from the 500 mm watermain on Victoria Road; and
- Water supply for the former Wellington Detention Centre is from the 400 mm watermain on Victoria Road.

4.0 EXISTING WASTEWATER SYSTEM

The City of Guelph's wastewater system consists of approximately 490 km of sanitary sewer with up to 1650 mm in diameter; four (4) sewage pumping stations and a central wastewater treatment facility. The treated wastewater effluent is discharged to the Speed River. The exiting wastewater treatment plant went through an upgrade/expansion in 2008/2009. The existing capacity as of 2013 is 75,000 m^3/day (868 l/s).

The existing and proposed neighbourhood development within the subject lands is serviced via an existing 750 mm sanitary trunk on Victoria Road starting just north of Stone Road East, which was constructed in 2007. This sanitary trunk conveys wastewater flow from Kortright Heights Sewage Pumping Station located at Victoria Road and MacAlister Blvd. After crossing the Eramosa River the sanitary trunk then changes in size to 600 mm and to 675 mm further downstream which ultimately discharge to the Guelph WWTP (refer to **Figure 2, Appendix C**). Detailed descriptions of the wastewater services on the perimeter of the site are below:

- Sanitary trunk sewer on Victoria Road with diameters of 750 mm, 600 mm and 675 mm;
- Sanitary trunk sewer on York Road and Beaumont Crescent as well as crossing the plaza at the southeast corner of York Road and Victoria Road with diameters of 675 mm and 900 mm; and
- Sanitary trunk sewer on Watson Parkway from Dunlop Drive to Stone Road with diameters of 300 mm and 375 mm.

Other sanitary sewer servicing includes a private pumping station off Dunlop Drive with a forcemain connecting to a manhole on Watson Parkway.

5.0 CITY OF GUELPH WATER AND WASTEWATER SERVICING MASTER PLAN (EARTH TECH CANADA INC.), 2008

The City of Guelph retained Earth Tech Canada Inc. to prepare Master Servicing and System Optimization Studies in 2008 for the water and wastewater linear infrastructure. The intent was to determine how best to provide water/storage and wastewater conveyance servicing for the City of Guelph to year 2031. The project included:

- An inventory of the existing water distribution and wastewater collection systems;
- Design parameters used for growth within the City;
- Modelling of the systems to identify system constraints and opportunities; and
- Analysis of future development within the City including the identification of new water distribution and wastewater collection infrastructure.

6.0 WATER CONSERVATION AND EFFICIENCY STRATEGY UPDATE, 2009

The City of Guelph has a long history of promoting water conservation. The first program was initiated in 1998 and included an active water conservation engagement and programming for reducing per capita consumption of potable water, and by association, wastewater generation.

In 2009, the City adopted the Water Conservation and Efficiency Strategy Update. The Program covers residential, industrial, commercial and institutional users and new home development. In addition to extensive Public Outreach, the program provides for:

- Various Rebate Programs;
- Grey Water Reuse System Program;
- Landscape Assessment Program;
- Rainwater Harvesting;
- New Home Construction Indoor and Outdoor Water Efficiency Incentives;
- Capacity Buyback Program;
- Pre-Rinse Spray Valve Replacement Program; and
- Municipal Water Loss Management.

Given the desire of the City to develop the Guelph Innovation District in an environmentally sustainable manner, the existing Water Conservation and Efficiency Strategy Update should be considered as the starting point. Additional water conservation initiatives for the District could include:

- Wastewater Reuse – Conservation Strategy recommends testing of decentralized water reuse and rainwater harvesting technologies to assess market readiness and gain local capacity and knowledge.

- Water Distribution District Metering and Pressure Management – The City of Guelph water supply consists of two pressure zones. The pressure zones have been developed to provide water volume at an acceptable pressure for all water users in the City. Promoting district metering approaches and actively measuring demand in real time can alert instances of leakage to the City. In addition, pressure reduction within the water distribution system has the potential to save on electricity costs due to reduced pumping requirements. Implementation of this would require a comprehensive review of the water system including supply, storage, pumping stations and the distribution system.

- Water Efficient Fixtures and Appliances – The Water Conservation and Efficiency Strategy Update identified several flow control devices which are commercially available and which could be used within the City. Standards, such as USEPA WaterSense, are available as guides.

For future major water consumption industrial establishment in the District, a water conservation plan (water demand process model) should be required. A water audit should also be carried out to determine the water leakage.

With the implementation of the water conservation program, the City has witnessed a lower water consumption rate (and wastewater generation rate) per capita and per employment.

7.0 WATER AND WASTEWATER SERVICING PLAN

7.1 Policies and Objectives

The planning and design of water and wastewater facilities follows recognized standards and planning documents, including:

- Design Guidelines for Sewage Works, MOE, 2008
- Design Guidelines for Drinking Water Systems, MOE, 2008
- City of Guelph Water and Wastewater Master Plan (various versions)
- Guelph Innovation District Secondary Plan, 2011
- York Trunk Sewer and Paisley-Clythe Feedermain Municipal Class Environmental Assessment, Genivar, 2012
- Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services, 2014

The primary objective of the GID water servicing plan is to develop a strategy to provide a water distribution network to meet the system pressure and flow requirements of the development.

The primary objective of the GID wastewater servicing plan is to develop a strategy to provide linear infrastructure to collect and convey the peak wastewater flow generated within the GID to outlets, using gravity sewers to the greatest extent possible.

Water demand and pressure criteria used within the City of Guelph are presented in **Table 7.1**.

Table 7.1. Design Criteria - Water Distribution System		
Operating Pressures		
Average Day and Maximum Day Flow Conditions	350 kPa (50 psi) to 550 kPa (80 psi)	MOE
Peak Hour	not less than 275 kPa (40 psi with a target of 45 psi for pressure fluctuations)	MOE
Minimum Pressure	140 kPa (20 psi)	MOE
Maximum Pressure	700 kPa (100 psi)	MOE
Demand		
Average Day Service Demands (Residential, Industrial, Commercial and Institutional)	300 L/cap/day and 300 L/emp/day	Guelph
Maximum Day Factor	1.5	Guelph
Peak (Maximum) Hour Factor	2.5	Guelph
Design		
Depth of Cover	not less than 2.0 m for 350 mm diameter and smaller	DGSSMS
C factor	130	DGSSMS
Maximum Velocity under All Flow Conditions	5.0 m/s	DGSSMS

Wastewater collection criteria used within the City of Guelph are presented in **Table 7.2**.

Table 7.2. Design Criteria – Wastewater Collection System		
Pipe Flow		
Coefficient of Roughness	n = 0.013	MOE
Wastewater Generation Rate (Residential, Industrial, Commercial and Institutional)	300 L/cap/day and 300 L/emp/day (with Harmon peak factor)	Guelph
Minimum Flow Velocity	0.6 m/sec	MOE
Maximum Flow Velocity	3.0 m/sec	MOE
Infiltration		
Infiltration Allowance	0.1 L/sec/hectare	Guelph
Design		
Manhole Minimum Depth	2.8 m	DGSSMS
Manhole Maximum Spacing	90 m for 450 mm diameter and smaller	DGSSMS
Minimum Slope	0.5%	DGSSMS

In addition, a sensitivity analysis was conducted using the City's area-based water demands/flow generation for industrial, commercial and intuitional areas (refer to **Section 7.4** and **7.5**).

7.2 Proposed Official Plan Amendment 54 (OPA 54)

In an effort to implement the Guelph Innovation District, the City of Guelph undertook the process to develop a Secondary Plan for the area. The Secondary Plan is contained within Official Plan Amendment 54. Included in the Amendment is a series of policies related to the development of the GID. Of particular interest to water and wastewater infrastructure are the following policies:

> ***"11.2.3.3 Water and Wastewater Servicing"***
>
> 1. Development within the GID shall be in accordance with the Water and Wastewater Systems policies of the Official Plan.
> 2. Development within the GID will implement water and wastewater master plans and the City of Guelph Water Conservation and Efficiency Strategy as updated from time-to-time. Given the importance of "Innovation" for the GID, development is encouraged to demonstrate water efficiency measures.
> 3. Industrial, Commercial and Institutional (ICI) development shall be encouraged to decrease water use through the reuse and/or substitution of water demands via greywater reuse or rainwater harvesting. Developers shall be required to demonstrate the efficient use of potable water with any development application. A target of 250 litres per day, per employee, is proposed for the new ICI development.

The Water and Wastewater Master Plan has been prepared based on conventional design parameters. Flow monitoring within the GID is recommended to determine if the water conservation strategies identified in Section 6 – Water Conservation and entrenched through Proposed Official Plan Amendment 54 are being realized.

7.3 Design

7.3.1 Land Use Map and Shapefiles

AMEC received the proposed land use map on May 20, 2014, for the GID from the City. The GID and the adjacent area are divided into 4 development blocks. Block 1 consists of areas along the extension of College Ave. East. Block 2 consists of the area north of Stone Road E. and south of Block 1. Block 3 includes the area south of Stone Road E. and west of the Eramosa River. Block 4 includes a large area designated as "Adaptive

Re-use" at the corner of York Road and Watson Parkway as well as a park on York Road. All other areas are outside of a Block Plan Area. The areas are outlined on **Figure 3, Appendix C**.

7.3.2 Population and Employment Density

AMEC was provided with the Site Statistics for Sustainability Analysis and Block Plans (a version of March 25, 2014) by the City of Guelph, which detail population and employment planning within the planned area.

The study area also includes the designated "Employment Mixed-use 2" lands and "Glenholme Estate Residential" at the corner of Stone Road E. and Watson Parkway. These areas are outside of a Block Plan Area.

Table 7.3 and **7.4** summarize target and ranging number of the planned population and employment for each Block Plan Area in this study.

Table 7.3. Proposed Residential Population and Employment Numbers-Target

Block Plan Area	Residential Population	Employment
Block Plan Area 1	4600	1700
Block Plan Area 2	0	2500
Block Plan Area 3	2000	1300
Block Plan Area 4	NA	750
Outside of a Block Plan Area	80	700
Total	6680	6950

Table 7.4. Proposed Residential Population and Employment Numbers-Ranges

Block Plan Area	Residential Population	Employment
Block Plan Area 1	3100-5200	900-1900
Block Plan Area 2	0-0	2300-2500
Block Plan Area 3	1500-2500	900-1800
Block Plan Area 4	NA	500-1000
Outside of a Block Plan Area	80	600-700
Total	4680-7780	5200-7900

The Official Plan indicates that there will be 6650 residential population and 8650 employment in the area. It should be noted that the employment numbers do not include existing employment numbers within and outside of the studied area boundary.

7.4 Water Servicing

7.4.1 Water Calculation and Piping Layout

Water use on a per capita (for both residential population and employment number) basis for the design of the water distribution design is 300 l/cap/day, although a goal of 250 l/cap/day has been identified for ICI land in OPA 54. A maximum day factor of 1.5 and a maximum (peak) hour factor of 2.5 were used in which is consistent with the 2008 Master Plan. InfoWater was used to model the water distribution system.

Table 7.5 presents the water demand projections. For example, with considering the development of the areas at Stone Road East and Watson Parkway (i.e., Outside of a Block Plan Area), the total Peak Hour Demand (PHD) is 117 l/s and 135 l/s for Target and High scenarios respectively.

Calculation of fire flow requirements should be based on the Fire Underwriters Survey (FUC) method. The detailed information for the development is not available at this stage and therefore the fire flow calculations are not included in this study. However in the simplified InfoWater model for GID, a conservative fire flow demand of 250 l/s was used. The proposed pipe sizing includes the consideration of high density population and compact commercial/industrial land uses within GID, such as the three nodes as shown on the Schedule C. City wide water distribution modeling should be exercised to confirm available fire flows and residual pressures in the area during fire events.

Table 7.5. Water Demands

Scenario	Equivalent Population	Average Day Demands (ADD)	Maximum Day Demands (MDD)	Peak Hour Demands (PHD)
Target Scenario				
With East Area Development	13486	47 l/s	70 l/s	117 l/s
Without East Area Development	12705	44 l/s	66 l/s	110 l/s
High Scenario				
With East Area Development	15492	54 l/s	81 l/s	135 l/s
Without East Area Development	14712	51 l/s	77 l/s	128 l/s

The water system design was based on the proposed road patterns and a 0.5 m level contour map provided by the City. Based on City of Guelph minimum requirements, a

300 mm PVC watermain branches from the 500 mm watermain on Victoria Road were proposed in this study for the GID west of the Eramosa River. A 200 mm servicing line was proposed in this study to branch from the existing 400 mm watermain on Stone Road East or on Watson Parkway to serve the area east of the Eramosa River. For Block 4, PHD flows of 7 l/s and 9 l/s were projected for Target and High scenarios respectively. A servicing branch could be connected to the 400 mm watermain on York Road.

The watermain layout is presented in **Figure 4, Appendix C**. The detailed calculation is included in **Appendix A**.

7.4.2 Sensitivity Analysis

A sensitivity analysis was conducted using the area based water demand for the employment area and to compare with the equivalent population based method specified above. **Table 7.6** summarizes parameters used for area based water flow calculation.

Table 7.6. Parameters of Area Based Water Demand for Employment Area

MOE	**Average Water Demand**	**Maximum Hour Peaking Factor**
Commercial and Institutional	28 m^3/ha/d (0.32 l/ha/s)	Refer to actual peak water usage rates
Industrial	35 m^3/ha/d (0.40 l/ha/s)	Varies, generally 2.0-4.0
Region of Waterloo and Area	**Average Water Demand**	**Maximum Hour Peaking Factor**
Commercial	Core: 1.16 l/ha/s Shopping Mall: 0.3 l/ha/s General: 0.6 l/ha/s	2.5
Industrial	0.50 l/ha/s	per MOE Guide

In this sensitivity analysis, a water demand rate of 0.6 l/ha/s and a maximum hour peaking factor of 2.5 were used for employment lands. The High scenario was selected to compare area based method and employment number based method. **Table 7.7** presents the calculation comparison.

Table 7.7. Area Based Method vs. Employment Number Based Method*		
Comparison	**Area Based Method**	**Employment Number Based Method**
ADD from Employment Lands	37 l/s	24 l/s
Total ADD for the Study Area	64 l/s	51 l/s
MDD from Employment Lands	56 l/s	36 l/s
Total MDD for the Study Area	96 l/s	77 l/s
PHD from Employment Lands	93 l/s	61 l/s
Total PHD for the Study Area	160 l/s	128 l/s
PHD from East Area Development	7 l/s	18 l/s

*Note: For High Scenario only.

Flow values in **Table 7.7** indicate that the area based method is more conservative to project water demands. Using the equivalent number based method, the water demands from employment lands would be 47% of the total demands; while using the area based method, the water demands from employment lands would be 58% of the total demands. Total gross employment lands of 53 hectares of Block 1, 2 and 3 were extracted in the area based calculation, which is equivalent to 5952 employment in Block 1, 2 and 3 for the High scenario. This indicates that these two calculation methods are inherently linked by a gross employment density of 113 jobs per hectare.

Using the employment density above, an actual employment land area of 8.8 hectares was calculated and used in the flow projection for Block 4.

7.5 Wastewater Servicing

7.5.1 Wastewater Calculation and Piping Layout

The wastewater peak flow was calculated based on the land use map, the Block Plan Area planning numbers and the wastewater flow generation rate. A flow generation rate of 300 l/cap/day was used for both residential and employment numbers, although a goal of 250 l/cap/day has been identified for ICI land in OPA 54 policy 11.2.3.3.3. PCSWMM was the hydraulic model used in the analysis.

There are 26 sanitary catchment areas **(Figure 5, Appendix C)** delineated based on a 0.5 m level contour map provided by the City and the existing wastewater linear infrastructure in the area. The sanitary sewer layout **(Figure 6, Appendix C)** was based on the proposed road pattern for the area.

The identified outlet for GID wastewater is the 750 mm sanitary sewer constructed on Victoria Road in 2008. The trunk is approximately 3-5 m deep, which is relatively shallow (invert of 330.381 m at MH32A). The area south of Stone Road East is at an elevation lower than the trunk sewer therefore, a pumping station (South Pumping Station) was proposed at the southern end to collect wastewater flows in the area with approximate rated capacities of 35 l/s and 44 l/s for the target scenario and high scenarios respectively. An approximate 560 m long 150 mm forcemain is also proposed to connect manhole J21 (AMEC label) at Stone Road East and Victoria Road.

Development timing of the area designated as “Employment Mixed-use 2” at the corner of Stone Road E. and Watson Parkway may lag that of the GID area. The City also has a medium to long term plan to provide municipal sanitary service to the residential community along Glenholme Drive, which currently uses private wastewater services. In order to service this area, a pumping station (East Pumping Station) was proposed at the intersection of Stone Road E. and Watson Parkway to collect wastewater flows in the area with an approximate rated capacity of 13 l/s for both the target and high scenarios. This scenario would also require approximately 1560 m of 100 mm forcemain to cross the Eramosa River and connect manhole J54 (AMEC label) on Stone Road East.

Table 7.8 summarizes the pumping station parameters.

The proposed wastewater pipe sizes range from 200 mm to 375 mm. Four connection points to the existing City of Guelph wastewater collection system were identified for the proposed wastewater system (refer to **Figure 5, Appendix C**). **Table 7.9** summarizes the wastewater flow projections.

Table 7.8. Proposed Wastewater Lifting Pumping Stations				
Pumping Station	**Rated Peak Capacity**		**Forcemain**	**Downstream Gravity Pipe**
South PS	Target Scenario	35 l/s	Length: 560m Size: 150 mm	375 mm with 0.51% Slope
	High Scenario	44 l/s		
East PS	Target Scenario	13 l/s	Length: 1560m Size: 100 mm	250 mm with 0.50% Slope
	High Scenario	13 l/s		

Table 7.9. Wastewater Flows and Proposed Connection Points				
Connection Point	**Target Scenario**		**High Scenario**	
Connection Point 1 (MH13A)	53 l/s		57 l/s	
Connection Point 2 (MH25A)	36 l/s		40 l/s	
Connection Point 3 (MH28A)	12 l/s		12 l/s	
Connection Point 4 (MH32A)	If receiving flow from East PS	65 l/s	If receiving flow from East PS	76 l/s
	If not receiving flow from East PS	53 l/s	If not receiving flow from East PS	64 l/s
Connection Point on York Road for Block Area 4	14 l/s		17 l/s	
Total	**166** l/s without East PS **176** l/s with East PS		**187** l/s without East PS **197** l/s with East PS	

The existing 750 mm sanitary trunk on Victoria Road South which is the outlet for wastewater from the GID has a minimum slope of 0.45% and thus a full capacity of 747 l/s. It receives wastewater flow from the existing Kortright Heights Sewage Pumping Station from the south, which has a peak design rate of 131 l/s. Therefore this sanitary trunk has the capacity to convey the wastewater flow from the GID.

For Block 4, wastewater peak flows of 14 l/s and 17 l/s were projected for the target and high scenarios respectively. To service this area, the wastewater outlet could be connected to the existing 675 mm trunk on York Road.

The detailed calculations for wastewater are included in **Appendix A**.

7.5.2 Sensitivity Analysis

Same as in **Section 7.4.2**, a sensitivity analysis was conducted using 0.6 l/ha/s as an average wastewater generation rate for employment lands. The high scenario was selected to compare the area based method and the employment number based method.

Table 7.10. Area Based Method vs. Employment Number Based Method*

Comparison	Area Based Method	Employment Number Based Method
South PS capacity	34 l/s	44 l/s
East PS capacity	22 l/s	14 l/s
Wastewater Flow From Block 4 Area Only	17 l/s	17 l/s
Wastewater Flow Projection for the Block Plan	201 l/s	184 l/s
Dry Weather Wastewater Flow Contributed From Employment Lands	97 l/s	87 l/s

*Note: For High Scenario with East Pumping Station.

Wastewater generation flows in **Table 7.10** indicate that the area based method is more conservative in terms of overall wastewater flow projection but less conservative in terms of South Pumping Station capacity projection.

Same as in **Section 7.4.2**, wastewater flow projections were obtained using a gross employment density of 113 jobs per hectare for Block 4.

In addition to the pumping station capacities, there are three sections of the proposed 250 mm sewers that require replacement with a 300 mm diameter sewer and two sections of the proposed 300 mm sewers that require replacement with a 375 mm diameter sewer if the employment number based method is switched to the area based method.

8.0 CONSTRUCTABILITY

8.1 Water Projects

The proposed water servicing plan can be constructed using conventional methods. Watermains with 350 mm diameter and smaller shall have a minimum depth of cover of 2.0 m. Refer to Figure 4 for the proposed water systems.

8.2 Wastewater Projects

Forcemain for the East Pumping Station was proposed to cross a bridge over the Eramosa River on Stone Road East. Special design and construction, including insulation of the sewer, for the bridge crossing will be needed. Other wastewater pipes can be constructed using conventional methods with most of the sections shallower than 5 meters. Refer to **Figure 6, Appendix C**, for the proposed wastewater systems.

9.0 COST EVALUATION

Table 9.1 below provides a list of proposed projects, the estimated costs and the suggested Municipal Class Environmental Assessment Schedule for the GID water projects.

Table 9.1. Proposed Water Projects for GID Development

Project Description	Cost (CAD)	Class EA Schedule
Block Plan Area and Glenholme Drive Area		
3300 meters 300 mm PVC Watermain	$1,155,000	A+
1030 meters 300 mm PVC Watermain	$ 360,500	A+
930 meters 300 mm PVC Watermain (for Block 4)	$ 325,500	A+
TOTAL	**$1,841,000**	

Table 9.2 below provides a list of proposed projects, the estimated costs and the suggested Municipal Class Environmental Assessment Schedule for the GID wastewater projects.

Table 9.2. Proposed Wastewater Projects for GID Development		
Project Description	**Cost (CAD)**	**Class EA Schedule**
Block Plan Area and Glenholme Drive Area		
South Pumping Station (potential land acquisition)	$ 683,800	C
560 meters 100 mm Forcemain and Connecting from Proposed South Pumping Station to Proposed Manhole J21	$ 291,000	A+
East Pumping Station (potential land acquisition)	$ 191,500	C
1550 meters 50 mm Forcemain Connecting from Proposed East Pumping Station to Proposed Manhole J54	$ 466,400	A+
4500 meters of 200 mm, 250 mm, 300 mm and 375 mm Sanitary Sewers	$2,461,700	A+
930 meters of 200 mm Sanitary Sewer Connecting to York Trunk Sewer (for Block 4)	$ 483,300	A+
TOTAL	**$4,577,700**	

10.0 CONCLUSIONS

Water demand and wastewater flow were analyzed and preliminary water and wastewater infrastructure was developed. It should be noted that this plan only considers the proposed development area. Should any development be proposed on adjacent lands, additional servicing analysis would be required.

The general conclusions for the study include:

- The water and wastewater trunk systems ensure servicing is available for GID.
- Pipe sizes for wastewater collection range from 200 mm to 375 mm and for water distribution is 300 mm.
- Two pumping stations are required to lift the sewage to the Victoria Road South trunk sewer.
- The cost to service GID is estimated as follows:
  Water: $1,841,000
  Wastewater: $4,577,700.

11.0 RECOMMENDATIONS

The general recommendations for the study include:

a. Further study related to water and wastewater generation is suggested. The GID has been identified for innovative servicing solutions and the City of Guelph and MOE design parameters are conservative and will likely over-estimate the water and wastewater flows.

b. The design of the water and wastewater systems were undertaken based on the tertiary plan. Subdivision plans, which will be based on the tertiary plans may include additional local streets, and as such the linear water and wastewater systems could be optimized based on the updated road patterns.

Appendix A

Water Flow Calculation Sheet
And
Selected InfoWater Modeling Results

Water Flow Calculation-Target Scenario

						300 l/cap/day	PF=1.5	PF=2.5
Water Demand Polygon ID	**Junction**	**Water Demand Polygon (hectare)**	**Population**	**Employment**	**Total Equivalent Population**	**Average Day Water Demand (l/s)**	**Maximum Day Water Demand (l/s)**	**Maximum (Peak) Hour Water Demand (l/s)**
Block 1, 2 and 3								
4	J40	5.0489	566	366	932	3.2	4.8	8.0
10	J20	3.2055	419	0	419	1.5	2.3	3.8
23	J49	5.2553	526	631	1157	4.0	6.0	10.0
18	J22	2.2771	297	0	297	1.0	1.5	2.5
12	J54	2.4588	56	301	357	1.2	1.8	3.0
11	J26	4.6392	95	342	437	1.5	2.3	3.8
5	J26	5.0067	73	355	428	1.5	2.3	3.8
8	J23	7.0883	0	506	506	1.8	2.7	4.5
14	J56	5.2111	0	395	395	1.4	2.1	3.5
6	J35	7.0659	0	519	519	1.8	2.7	4.5
13	J6	4.1421	0	295	295	1.0	1.5	2.5
9	J7	4.1608	0	297	297	1.0	1.5	2.5
24	J10	10.4574	592	478	1070	3.7	5.6	9.3
21	J60	7.0424	696	197	893	3.1	4.7	7.8
22	J33	10.1524	974	341	1315	4.6	6.9	11.5
20	J13	7.3651	831	0	831	2.9	4.4	7.3
7	J64	7.3457	829	0	829	2.9	4.4	7.3
15	J17	7.9462	697	281	978	3.4	5.1	8.5
Block 4								
19	J84	39.0247	0	750	750	2.6	3.9	6.5
Outside of Block Plan								
2	J67	3.4643	0	208	208	0.7	1.1	1.8
17	J70	3.0887	0	185	185	0.6	0.9	1.5
1	J73	19.1012	80	0	80	0.3	0.5	0.8
16	J72	1.4581	0	87	87	0.3	0.5	0.8
3	J66	3.6910	0	221	221	0.8	1.2	2.0
		TOTAL	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**
	Block Plan	144.8936	6652	6054	12705	44.1	66.2	110.3
	Plus Outside	175.6969	6732	6756	13486	46.8	70.2	117.0

Water Flow Calculation-High Scenario

						300 l/cap/day	PF=1.5	PF=2.5
Water Demand Polygon ID	**Junction**	**Water Demand Polygon (hectare)**	**Population**	**Employment**	**Total Equivalent Population**	**Average Day Water Demand (l/s)**	**Maximum Day Water Demand (l/s)**	**Maximum (Peak) Hour Water Demand (l/s)**
Block 1, 2 and 3								
4	J40	5.0489	708	505	1213	4.2	6.3	10.5
10	J20	3.2055	523	0	523	1.8	2.7	4.5
23	J49	5.2553	657	871	1528	5.3	8.0	13.3
18	J22	2.2771	372	0	372	1.3	2.0	3.3
12	J54	2.4588	70	325	395	1.4	2.1	3.5
11	J26	4.6392	119	387	506	1.8	2.7	4.5
5	J26	5.0067	91	387	478	1.7	2.6	4.3
8	J23	7.0883	0	506	506	1.8	2.7	4.5
14	J56	5.2111	0	395	395	1.4	2.1	3.5
6	J35	7.0659	0	519	519	1.8	2.7	4.5
13	J6	4.1421	0	295	295	1.0	1.5	2.5
9	J7	4.1608	0	297	297	1.0	1.5	2.5
24	J10	10.4574	668	540	1208	4.2	6.3	10.5
21	J60	7.0424	786	223	1009	3.5	5.3	8.8
22	J33	10.1524	1101	385	1486	5.2	7.8	13.0
20	J13	7.3651	939	0	939	3.3	5.0	8.3
7	J64	7.3457	937	0	937	3.3	5.0	8.3
15	J17	7.9462	787	317	1105	3.8	5.7	9.5
Block 4								
19	J84	39.0247	0	1000	1000	3.5	5.3	8.8
Outside of Block Plan								
2	J67	3.4643	0	208	208	0.7	1.1	1.8
17	J70	3.0887	0	185	185	0.6	0.9	1.5
1	J73	19.1012	80	0	80	0.3	0.5	0.8
16	J72	1.4581	0	87	87	0.3	0.5	0.8
3	J66	3.6910	0	221	221	0.8	1.2	2.0
		TOTAL	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**
	Block Plan	144.8936	7760	6952	14711	51.3	77.0	128.0
	Plus Outside	175.6969	7840	7654	15492	54.0	81.0	135.0

Water Flow Calculation-High Scenario With Area Based Method for Employment Land

				300 l/cap/day	PF=1.5	PF=2.5		0.6 l/s/ha	PF=1.5	PF=2.5			
Water Demand Polygon ID	Junction	Water Demand Polygon (hectare)	Residential Population	Average Day Residential Water Demand (l/s)	Maximum Day Residential Water Demand (l/s)	Maximum (Peak) Hour Residential Water Demand (l/s)	Employment Land (hectare)	Average Day Employment Water Demand (l/s)	Maximum Day Employment Water Demand (l/s)	Maximum (Peak) Hour Employment Water Demand (l/s)	Average Day Total Water Demand (l/s)	Maximum Day Total Water Demand (l/s)	Maximum (Peak) Hour Total Water Demand (l/s)
Block 1, 2 and 3													
4	J40	5.0489	708	2.5	3.8	6.3	1.2060	0.7	1.1	1.8	3.2	4.9	8.1
10	J20	3.2055	523	1.8	2.7	4.5	0	0.0	0.0	0.0	1.8	2.7	4.5
23	J49	5.2553	657	2.3	3.5	5.8	2.1020	1.3	2.0	3.3	3.6	5.5	9.1
18	J22	2.2771	372	1.3	2.0	3.3	0	0.0	0.0	0.0	1.3	2.0	3.3
12	J54	2.4588	70	0.2	0.3	0.5	3.5516	2.1	3.2	5.3	2.3	3.5	5.8
11	J26	4.6392	119	0.4	0.6	1.0	4.7624	2.9	4.4	7.3	3.3	5.0	8.3
5	J26	5.0067	91	0.3	0.5	0.8	4.0009	2.4	3.6	6.0	2.7	4.1	6.8
8	J23	7.0883	0	0.0	0.0	0.0	7.0883	4.3	6.5	10.8	4.3	6.5	10.8
14	J56	5.2111	0	0.0	0.0	0.0	5.2111	3.1	4.7	7.8	3.1	4.7	7.8
6	J35	7.0659	0	0.0	0.0	0.0	7.0659	4.2	6.3	10.5	4.2	6.3	10.5
13	J6	4.1421	0	0.0	0.0	0.0	4.1421	2.5	3.8	6.3	2.5	3.8	6.3
9	J7	4.1608	0	0.0	0.0	0.0	4.1435	2.5	3.8	6.3	2.5	3.8	6.3
24	J10	10.4574	668	2.3	3.5	5.8	5.3505	3.2	4.8	8.0	5.5	8.3	13.8
21	J60	7.0424	786	2.7	4.1	6.8	0.8836	0.5	0.8	1.3	3.2	4.9	8.1
22	J33	10.1524	1101	3.8	5.7	9.5	1.6482	1.0	1.5	2.5	4.8	7.2	12.0
20	J13	7.3651	939	3.3	5.0	8.3	0	0.0	0.0	0.0	3.3	5.0	8.3
7	J64	7.3457	937	3.3	5.0	8.3	0	0.0	0.0	0.0	3.3	5.0	8.3
15	J17	7.9462	787	2.7	4.1	6.8	1.3288	0.8	1.2	2.0	3.5	5.3	8.8
Block 4													
19	J84	39.0247	0	0.0	0.0	0.0	8.8496	5.3	8.0	13.3	5.3	8.0	13.3
Outside of Block Plan													
2	J67	3.4643	0	0.0	0.0	0.0	3.4635	2.1	3.2	5.3	2.1	3.2	5.3
17	J70	3.0887	0	0.0	0.0	0.0	3.0801	1.8	2.7	4.5	1.8	2.7	4.5
1	J73	19.1012	80	0.3	0.5	0.8	0	0.0	0.0	0.0	0.3	0.5	0.8
16	J72	1.4581	0	0.0	0.0	0.0	1.4717	0.9	1.4	2.3	0.9	1.4	2.3
3	J66	3.6910	0	0.0	0.0	0.0	3.7153	2.2	3.3	5.5	2.2	3.3	5.5
		TOTAL	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**
	Block Plan	144.8936	7760	26.9	40.4	67.3	61.3345	36.8	55.7	92.5	63.7	96.1	159.8
	Plus Outside	175.6969	7840	27.2	40.8	68.0	73.0651	43.8	66.3	110.1	71	107.1	178.1
						Block 1,2,3 Total	52.4849						
						Block 1,2,3 Total	5952						

Block 4 emp density	113
Block 4 actual emp lands	8.8496

Test Report Print Title

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	C-J1-20	0.00	340.00	378.53	377.53
2	C-J2-58	0.00	325.00	378.35	522.80
3	J1	0.00	335.00	377.91	420.46
4	J10	10.50	326.25	377.73	504.43
5	J11	0.00	325.75	377.73	509.36
6	J12	0.00	326.50	377.74	502.07
7	J13	8.25	326.25	377.74	504.54
8	J14	0.00	323.50	377.75	531.66
9	J15	0.00	322.50	377.78	541.69
10	J16	0.00	326.50	377.87	503.35
11	J17	9.50	328.00	377.94	489.35
12	J18	0.00	327.00	378.08	500.57
13	J2	0.00	330.00	378.02	470.54
14	J20	4.50	328.00	377.73	487.30
15	J21	0.00	332.25	377.97	448.03
16	J22	3.25	329.00	377.72	477.41
17	J23	4.50	338.00	377.80	390.01
18	J25	0.00	338.00	377.82	390.16
19	J26	8.75	336.50	377.84	405.07
20	J28	0.00	328.00	378.32	493.10
21	J3	0.00	326.00	377.73	506.94
22	J30	0.00	328.00	378.23	492.26
23	J32	0.00	328.00	378.09	490.85
24	J33	13.00	328.50	377.88	483.91
25	J34	0.00	330.00	377.83	468.70
26	J35	4.25	331.00	377.94	459.98
27	J36	0.00	336.00	377.89	410.46
28	J38	0.00	334.00	377.84	429.60
29	J4	0.00	338.00	377.79	389.92
30	J40	10.50	331.50	377.78	453.51
31	J41	0.00	329.00	377.76	477.79
32	J47	0.00	329.00	377.75	477.67
33	J48	0.00	329.00	377.72	477.45
34	J49	13.25	330.00	377.72	467.60
35	J5	0.00	338.00	377.80	389.97

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
36	J50	0.00	329.00	377.74	477.58
37	J51	0.00	330.00	377.75	467.93
38	J53	0.00	335.00	377.90	420.40
39	J54	3.50	336.00	377.89	410.52
40	J56	3.25	340.75	377.84	363.43
41	J58	0.00	317.50	377.96	592.46
42	J59	0.00	339.00	377.73	379.49
43	J6	2.50	327.00	377.77	497.48
44	J60	8.75	336.00	377.73	408.89
45	J61	0.00	331.50	377.78	453.49
46	J62	0.00	317.75	377.94	589.85
47	J64	8.25	322.00	377.81	546.86
48	J66	2.00	318.50	377.94	582.44
49	J67	1.75	319.50	377.90	572.32
50	J68	0.00	321.50	377.91	552.74
51	J69	0.00	321.00	377.91	557.66
52	J7	2.50	326.00	377.74	507.01
53	J70	1.50	321.50	377.91	552.79
54	J71	0.00	321.25	377.92	555.30
55	J72	0.75	319.00	377.93	577.44
56	J73	0.75	317.00	377.94	597.14
57	J74	0.00	317.50	377.95	592.37
58	J75	0.00	317.25	377.95	594.80
59	J76	0.00	335.00	377.99	421.30
60	J78	0.00	337.00	378.02	401.98
61	J8	0.00	326.50	377.75	502.25
62	J80	0.00	340.00	378.33	375.63
63	J82	0.00	340.00	378.36	375.86
64	J84	8.75	336.00	377.72	408.82
65	J9	0.00	325.50	377.73	511.84

Test Report Print Title

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/km)	Status	Flow Reversal Count
1		P101	J1	J21	343.56	400.00	130.00	-31.34	0.25	0.06	0.18	Open	0
2		P103	J1	J38	75.54	250.00	130.00	21.44	0.44	0.07	0.90	Open	0
3		P105	J38	J40	65.69	250.00	130.00	21.44	0.44	0.06	0.90	Open	0
4		P107	J40	J41	85.84	250.00	130.00	10.94	0.22	0.02	0.26	Open	0
5		P109	J41	J47	49.02	250.00	130.00	10.94	0.22	0.01	0.26	Open	0
6		P111	J47	J20	64.32	250.00	130.00	10.94	0.22	0.02	0.26	Open	0
7		P113	J20	J48	56.87	250.00	130.00	6.44	0.13	0.01	0.10	Open	0
8		P115	J48	J22	43.34	250.00	130.00	6.44	0.13	0.00	0.10	Open	0
9		P117	J22	J49	49.91	250.00	130.00	3.19	0.06	0.00	0.03	Open	0
10		P119	J49	J50	83.43	250.00	130.00	-10.06	0.20	0.02	0.22	Open	0
11		P121	J50	J51	71.07	250.00	130.00	-10.06	0.20	0.02	0.22	Open	0
12		P123	J1	J58	1,705.78	400.00	130.00	-11.81	0.09	0.05	0.03	Open	0
13		P125	J54	J53	85.99	200.00	130.00	-3.50	0.11	0.01	0.09	Open	0
14		P127	J53	J1	74.55	200.00	130.00	-3.50	0.11	0.01	0.09	Open	0
15		P129	J67	J68	80.00	200.00	130.00	-1.75	0.06	0.00	0.03	Open	0
16		P131	J68	J69	89.25	200.00	130.00	-1.75	0.06	0.00	0.03	Open	0
17		P133	J69	J70	89.20	200.00	130.00	-1.75	0.06	0.00	0.03	Open	0
18		P135	J70	J71	86.77	200.00	130.00	-3.25	0.10	0.01	0.08	Open	0
19		P137	J71	J72	104.41	200.00	130.00	-3.25	0.10	0.01	0.08	Open	0
20		P139	J72	J73	88.26	200.00	130.00	-4.00	0.13	0.01	0.12	Open	0
21		P141	J73	J74	84.68	200.00	130.00	-4.75	0.15	0.01	0.16	Open	0
22		P143	J74	J75	86.33	200.00	130.00	2.00	0.06	0.00	0.03	Open	0
23		P145	J75	J62	138.63	200.00	130.00	2.00	0.06	0.00	0.03	Open	0
24		P147	J62	J66	188.77	200.00	130.00	2.00	0.06	0.01	0.03	Open	0
25		P149	J58	J76	478.31	400.00	130.00	-18.56	0.15	0.03	0.07	Open	0
26		P151	J76	J78	406.61	400.00	130.00	-18.56	0.15	0.03	0.07	Open	0
27		P153	J78	J80	1,094.67	300.00	130.00	-18.56	0.26	0.31	0.28	Open	0
28		P155	C-J1-20	J82	1,192.48	400.00	130.00	27.31	0.22	0.17	0.14	Open	0
29		P157	J82	J80	338.82	400.00	130.00	18.56	0.15	0.02	0.07	Open	0
30		P159	J82	J84	308.12	150.00	130.00	8.75	0.50	0.64	2.06	Open	0
31		P163	C-J1-20	C-J2-58	287.87	500.00	130.00	107.19	0.55	0.17	0.61	Open	0
32		P169	C-J1-20	RES904	1,594.56	500.00	130.00	-134.50	0.68	1.47	0.92	Open	0
33		P173	J74	J58	26.69	200.00	130.00	-6.75	0.21	0.01	0.31	Open	0
34		P23	C-J2-58	J28	200.56	660.00	130.00	107.19	0.31	0.03	0.16	Open	0
35		P25	J28	J30	140.76	500.00	130.00	107.19	0.55	0.09	0.61	Open	0

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/km)	Status	Flow Reversal Count
36		P31	J30	J32	435.71	500.00	130.00	77.28	0.39	0.14	0.33	Open	0
37		P33	J32	J2	411.31	500.00	130.00	54.85	0.28	0.07	0.18	Open	0
38		P35	J2	J21	450.74	500.00	130.00	41.40	0.21	0.05	0.10	Open	0
39		P37	J18	J30	90.98	250.00	130.00	-29.91	0.61	0.15	1.67	Open	0
40		P39	J18	J17	86.92	250.00	130.00	29.91	0.61	0.15	1.67	Open	0
41		P41	J17	J16	86.81	250.00	130.00	20.41	0.42	0.07	0.82	Open	0
42		P43	J16	J64	72.50	250.00	130.00	20.41	0.42	0.06	0.82	Open	0
43		P45	J64	J15	88.39	250.00	130.00	12.16	0.25	0.03	0.32	Open	0
44		P47	J15	J14	75.24	250.00	130.00	12.16	0.25	0.02	0.32	Open	0
45		P49	J14	J13	54.35	250.00	130.00	12.16	0.25	0.02	0.32	Open	0
46		P51	J13	J12	42.99	250.00	130.00	3.91	0.08	0.00	0.04	Open	0
47		P53	J12	J3	88.18	250.00	130.00	3.91	0.08	0.00	0.04	Open	0
48		P55	J3	J11	86.48	250.00	130.00	3.91	0.08	0.00	0.04	Open	0
49		P57	J11	J10	82.77	250.00	130.00	3.91	0.08	0.00	0.04	Open	0
50		P59	J10	J59	99.11	200.00	130.00	-0.69	0.02	0.00	0.00	Open	0
51		P61	J59	J60	89.95	200.00	130.00	-0.69	0.02	0.00	0.00	Open	0
52		P63	J60	J61	87.19	200.00	130.00	-9.44	0.30	0.05	0.59	Open	0
53		P65	J61	J34	89.96	200.00	130.00	-9.44	0.30	0.05	0.59	Open	0
54		P67	J34	J33	88.17	200.00	130.00	-9.44	0.30	0.05	0.58	Open	0
55		P69	J33	J32	71.58	200.00	130.00	-22.44	0.71	0.21	2.91	Open	0
56		P71	J10	J9	78.05	250.00	130.00	-5.90	0.12	0.01	0.08	Open	0
57		P73	J9	J7	88.90	250.00	130.00	-5.90	0.12	0.01	0.08	Open	0
58		P75	J7	J8	88.92	250.00	130.00	-8.40	0.17	0.01	0.16	Open	0
59		P77	J8	J6	85.24	250.00	130.00	-8.40	0.17	0.01	0.16	Open	0
60		P79	J6	J4	89.21	250.00	130.00	-10.90	0.22	0.02	0.26	Open	0
61		P81	J4	J5	90.01	250.00	130.00	-4.96	0.10	0.01	0.06	Open	0
62		P83	J5	J23	73.67	250.00	130.00	-4.96	0.10	0.00	0.06	Open	0
63		P85	J23	J25	75.98	250.00	130.00	-9.46	0.19	0.02	0.20	Open	0
64		P87	J25	J26	108.68	250.00	130.00	-9.46	0.19	0.02	0.20	Open	0
65		P89	J26	J1	106.44	250.00	130.00	-18.21	0.37	0.07	0.67	Open	0
66		P91	J4	J56	189.75	200.00	130.00	-5.95	0.19	0.05	0.25	Open	0
67		P93	J56	J36	87.34	200.00	130.00	-9.20	0.29	0.05	0.56	Open	0
68		P95	J36	J35	96.68	200.00	130.00	-9.20	0.29	0.05	0.56	Open	0
69		P97	J35	J2	69.01	200.00	130.00	-13.45	0.43	0.08	1.13	Open	0
70		P99	J21	J51	332.66	200.00	130.00	10.06	0.32	0.22	0.66	Open	0

Test Report Print Title

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Available Flow at Hydrant (L/s)	Available Flow Pressure (kPa)
1		C-J1-20	0.00	387.67	379.56	250.00	320.12	707.38	20.00
2		C-J2-58	0.00	534.14	379.51	250.00	456.32	791.64	20.00

Test Report Print Title

		ID	Total Demand (L/s)	Critical Fire Node ID	Critical Fire Node Pressure (kPa)	Critical Fire Node Head (m)	Adjusted Fire-Flow (L/s)	Available Flow at Hydrant (L/s)
1		C-J1-20	250.00	C-J1-20	320.12	372.67	707.37	707.38
2		C-J2-58	250.00	C-J1-20	320.12	372.67	707.37	791.64

		ID	Critical Available Node ID	Critical Available Node Pressure (kPa)	Critical Available Node Head (m)	Adjusted Available Flow (L/s)	Design Flow (L/s)
1		C-J1-20	C-J1-20	20.00	342.04	707.38	707.37
2		C-J2-58	C-J1-20	-58.11	334.07	707.38	707.37

Appendix B

Wastewater Flow Calculation Sheet
And
Selected PCSWMM Modeling Results

Wastewater Flow Calculation-Target Scenario

							300 l/cap/day					0.1 l/s/ha	
Sewershed ID	**Junction**	**Sewershed Area (hectare)**	**Population**	**Employment**	**Total Equivalent Population (single catchment)**	**Total Equivalent Population (adding upstream)**	**Average Flow (adding upstream) (l/s)**	**Harmon Peaking Factor**	**Sanitary Flow adding upstream (l/s)**	**Incremental Sanitary Flow (l/s)**	**Upstream-Downstream Relationship**	**Inflow and Infiltration (l/s)**	**Total Flow Assigned (l/s)**
1	J38	5.0489	566	366	932	932	3.2	3.8194	12.4	12.4	A1	0.5	12.9
2	J47	3.2055	419	0	419	1351	4.7	3.7120	17.4	5.0	A2-A1	0.3	5.4
3	J39	2.7766	278	333	611	611	2.1	3.9278	8.3	8.3	A3	0.3	8.6
4	J50	2.4787	248	298	546	1157	4.0	3.7584	15.1	6.8	A4-A3	0.2	7.0
5	J22	2.2771	297	0	297	2805	9.7	3.4670	33.8	1.3	A5-A2-A4	0.2	1.5
To PS SOUTH AND CONNECT J21													
6 (BLOCK 0)	J67	3.4643	0	208	208	208	0.7	4.0000	2.9	2.9	A6	0.3	3.2
7 (BLOCK 0)	J70	3.0887	0	185	185	393	1.4	4.0000	5.5	2.6	A7-A6	0.3	2.9
8 (BLOCK 0)	J73	19.1012	80	0	80	473	1.6	3.9866	6.5	1.1	A8-A7	1.9	3.0
9 (BLOCK 0)	J75	3.6910	0	221	221	221	0.8	4.0000	3.1	3.1	A9	0.4	3.4
10 (BLOCK 0)	J74	1.4581	0	87	87	782	2.7	3.8665	10.5	0.9	A10-A8-A9	0.1	1.0
TO PS EAST AND CONNECT J54													
RECEIVING PS EAST													
11	J54	2.4588	56	301	357	1139	4.0	3.7628	14.9	4.4	A11-A10	0.2	4.6
12	J1	4.6392	95	342	437	1576	5.5	3.6640	20.0	5.2	A12-A11	0.5	5.6
13	J21	5.0067	73	355	428	4809	16.7	3.2606	54.4	0.6	A13-A12-A5	0.5	1.1
CONNECT J21													
14	J56	5.2111	0	395	395	395	1.4	4.0000	5.5	5.5	A14	0.5	6.0
15	J36	7.0659	0	519	519	914	3.2	3.8247	12.1	6.7	A15-A14	0.7	7.4
CONNECT MH28A													
16	J59	4.4294	414	177	592	592	2.1	3.9355	8.1	8.1	A16	0.4	8.5
17	J60	7.0424	696	197	893	1485	5.2	3.6828	19.0	10.9	A17-A16	0.7	11.6
18	J34	10.1524	974	341	1315	2800	9.7	3.4677	33.7	14.7	A18-A17	1.0	15.7
CONNECT MH25A													
19	J25	7.0883	0	506	506	506	1.8	3.9718	7.0	7.0	A19	0.7	7.7
20	J6	4.1421	0	295	295	801	2.8	3.8601	10.7	3.8	A20-A19	0.4	4.2
21	J7	4.1608	0	297	297	1098	3.8	3.7735	14.4	3.6	A21-A20	0.4	4.1
22	J10	6.0301	177	301	478	1576	5.5	3.6639	20.1	5.7	A22-A21	0.6	6.3
23	J13	7.3651	831	0	831	2408	8.4	3.5218	29.4	9.4	A23-A22	0.7	10.1
24	J64	7.3457	829	0	829	3237	11.2	3.4142	38.4	8.9	A24-A23	0.7	9.7
25	J18	7.9462	697	281	978	4214	14.6	3.3129	48.5	10.1	A25-A24	0.8	10.9
CONNECT MH13A													
26 (BLOCK 4)	J26	39.0247	0	750	750	750	2.6	3.8771	10.1	10.1		3.9	14.0
CONNECT YORK TRUNK													

	TOTAL	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**
Block Plan	144.8957	6652	6055	12707	**148.4**	**14.5**	**162.9**
Plus Outside	175.6990	6732	6756	13488	**158.9**	**17.6**	**176.4**

Wastewater Flow Calculation-Target Scenario

without east ps

300 l/cap.day

0.1 l/s/ha

Sewershed ID	Junction	Sewershed Area (hectare)	Population	Employment	Total Equivalent Population (single catchment)	Total Equivalent Population (adding upstream)	Average Flow (adding upstream) (l/s)	Harmon Peaking Factor	Sanitary Flow adding upstream (l/s)	Incremental Sanitary Flow (l/s)	Upstream-Downstream Relationship	Inflow and Infiltration (l/s)	Total Flow Assigned (l/s)
1	J38	5.0489	566	366	932	932	3.2	3.8194	12.4	12.4	A1	0.5	12.9
2	J47	3.2055	419	0	419	1351	4.7	3.7120	17.4	5.0	A2-A1	0.3	5.4
3	J39	2.7766	278	333	611	611	2.1	3.9278	8.3	8.3	A3	0.3	8.6
4	J50	2.4787	248	298	546	1157	4.0	3.7584	15.1	6.8	A4-A3	0.2	7.0
5	J22	2.2771	297	0	297	2805	9.7	3.4670	33.8	1.3	A5-A2-A4	0.2	1.5
To PS SOUTH AND CONNECT J21													
6 (BLOCK 0)	J67	3.4643	0	0	0	0	0.0	4.0000	0.0	0.0	A6	0.0	0.0
7 (BLOCK 0)	J70	3.0887	0	0	0	0	0.0	4.0000	0.0	0.0	A7-A6	0.0	0.0
8 (BLOCK 0)	J73	19.1012	0	0	0	0	0.0	4.0000	0.0	0.0	A8-A7	0.0	0.0
9 (BLOCK 0)	J75	3.6910	0	0	0	0	0.0	4.0000	0.0	0.0	A9	0.0	0.0
10 (BLOCK 0)	J74	1.4581	0	0	0	0	0.0	4.0000	0.0	0.0	A10-A8-A9	0.0	0.0
TO PS EAST AND CONNECT J54													
RECEIVING PS EAST													
11	J54	2.4588	56	301	357	357	1.2	4.0000	5.0	5.0	A11-A10	0.2	5.2
12	J1	4.6392	95	342	437	794	2.8	3.8623	10.7	5.7	A12-A11	0.5	6.2
13	J21	5.0067	73	355	428	4028	14.0	3.3306	46.6	2.2	A13-A12-A5	0.5	2.7
CONNECT J21													
14	J56	5.2111	0	395	395	395	1.4	4.0000	5.5	5.5	A14	0.5	6.0
15	J36	7.0659	0	519	519	914	3.2	3.8247	12.1	6.7	A15-A14	0.7	7.4
CONNECT MH28A													
16	J59	4.4294	414	177	592	592	2.1	3.9355	8.1	8.1	A16	0.4	8.5
17	J60	7.0424	696	197	893	1485	5.2	3.6828	19.0	10.9	A17-A16	0.7	11.6
18	J34	10.1524	974	341	1315	2800	9.7	3.4677	33.7	14.7	A18-A17	1.0	15.7
CONNECT MH25A													
19	J25	7.0883	0	506	506	506	1.8	3.9718	7.0	7.0	A19	0.7	7.7
20	J6	4.1421	0	295	295	801	2.8	3.8601	10.7	3.8	A20-A19	0.4	4.2
21	J7	4.1608	0	297	297	1098	3.8	3.7735	14.4	3.6	A21-A20	0.4	4.1
22	J10	6.0301	177	301	478	1576	5.5	3.6639	20.1	5.7	A22-A21	0.6	6.3
23	J13	7.3651	831	0	831	2408	8.4	3.5218	29.4	9.4	A23-A22	0.7	10.1
24	J64	7.3457	829	0	829	3237	11.2	3.4142	38.4	8.9	A24-A23	0.7	9.7
25	J18	7.9462	697	281	978	4214	14.6	3.3129	48.5	10.1	A25-A24	0.8	10.9
CONNECT MH13A													
26 (BLOCK 4)		39.0247	0	750	750	750	2.6	3.8771	10.1	10.1		3.9	14.0
CONNECT YORK TRUNK													

	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
Block Plan	144.8957	6652	6055	12707	**151.0**	**14.5**	**165.7**
Plus Outside	175.6990	6652	6055	12707	**151.0**	**14.5**	**165.7**

Wastewater Flow Calculation-High Scenario

							300 l/cap/day					0.1 l/s/ha	
Sewershed ID	**Junction**	**Sewershed Area (hectare)**	**Population**	**Employment**	**Total Equivalent Population (single catchment)**	**Total Equivalent Population (adding upstream)**	**Average Flow (adding upstream) (l/s)**	**Harmon Peaking Factor**	**Sanitary Flow adding upstream (l/s)**	**Incremental Sanitary Flow (l/s)**	**Upstream-Downstream Relationship**	**Inflow and Infiltration (l/s)**	**Total Flow Assigned (l/s)**
1	J38	5.0489	708	505	1213	1213	4.2	3.7444	15.8	15.8	A1	0.5	16.3
2	J47	3.2055	523	0	523	1736	6.0	3.6327	21.9	6.1	A2-A1	0.3	6.5
3	J39	2.7766	347	460	807	807	2.8	3.8580	10.8	10.8	A3	0.3	11.1
4	J50	2.4787	310	411	721	1528	5.3	3.6738	19.5	8.7	A4-A3	0.2	8.9
5	J22	2.2771	372	0	372	3636	12.6	3.3701	42.5	1.2	A5-A2-A4	0.2	1.4
To PS SOUTH AND CONNECT J21													
6 (BLOCK 0)	J67	3.4643	0	208	208	208	0.7	4.0000	2.9	2.9	A6	0.3	3.2
7 (BLOCK 0)	J70	3.0887	0	185	185	393	1.4	4.0000	5.5	2.6	A7-A6	0.3	2.9
8 (BLOCK 0)	J73	19.1012	80	0	80	473	1.6	3.9866	6.5	1.1	A8-A7	1.9	3.0
9 (BLOCK 0)	J75	3.6910	0	221	221	221	0.8	4.0000	3.1	3.1	A9	0.4	3.4
10 (BLOCK 0)	J74	1.4581	0	87	87	782	2.7	3.8665	10.5	0.9	A10-A8-A9	0.1	1.0
TO PS EAST AND CONNECT J54													
RECEIVING PS EAST													
11	J54	2.4588	70	325	395	1177	4.1	3.7533	15.3	4.8	A11-A10	0.2	5.1
12	J1	4.6392	119	387	506	1683	5.8	3.6429	21.3	5.9	A12-A11	0.5	6.4
13	J21	5.0067	91	390	481	5800	20.1	3.1846	64.1	0.3	A13-A12-A5	0.5	0.8
CONNECT J21													
14	J56	5.2111	0	395	395	395	1.4	4.0000	5.5	5.5	A14	0.5	6.0
15	J36	7.0659	0	519	519	914	3.2	3.8247	12.1	6.7	A15-A14	0.7	7.4
CONNECT MH28A													
16	J59	4.4294	468	200	669	669	2.3	3.9060	9.1	9.1	A16	0.4	9.5
17	J60	7.0424	786	223	1009	1678	5.8	3.6439	21.2	12.2	A17-A16	0.7	12.9
18	J34	10.1524	1101	385	1486	3164	11.0	3.4227	37.6	16.4	A18-A17	1.0	17.4
CONNECT MH25A													
19	J25	7.0883	0	506	506	506	1.8	3.9718	7.0	7.0	A19	0.7	7.7
20	J6	4.1421	0	295	295	801	2.8	3.8601	10.7	3.8	A20-A19	0.4	4.2
21	J7	4.1608	0	297	297	1098	3.8	3.7735	14.4	3.6	A21-A20	0.4	4.1
22	J10	6.0301	200	340	541	1638	5.7	3.6515	20.8	6.4	A22-A21	0.6	7.0
23	J13	7.3651	939	0	939	2578	9.0	3.4975	31.3	10.5	A23-A22	0.7	11.3
24	J64	7.3457	937	0	937	3515	12.2	3.3831	41.3	10.0	A24-A23	0.7	10.7
25	J18	7.9462	787	317	1105	4620	16.0	3.2767	52.6	11.3	A25-A24	0.8	12.1
CONNECT MH13A													
26 (BLOCK 4)	J26	39.0247	0	1000	1000	1000	3.5	3.8000	13.2	13.2		3.9	17.1
CONNECT YORK TRUNK													
		TOTAL	**TOTAL**	**TOTAL**	**TOTAL**					**TOTAL**		**TOTAL**	**TOTAL**
	Block Plan	144.8957	7761	6956	14717					**169.1**		**14.5**	**183.9**
	Plus Outside	175.6990	7841	7658	15498					**179.6**		**18.4**	**197.4**

Wastewater Flow Calculation-High Scenario

without east ps

300 l/cap/day

0.1 l/s/ha

Sewershed ID	Junction	Sewershed Area (hectare)	Population	Employment	Total Equivalent Population (single catchment)	Total Equivalent Population (adding upstream)	Average Flow (adding upstream) (l/s)	Harmon Peaking Factor	Sanitary Flow adding upstream (l/s)	Incremental Sanitary Flow (l/s)	Upstream-Downstream Relationship	Inflow and Infiltration (l/s)	Total Flow Assigned (l/s)
1	J38	5.0489	708	505	1213	1213	4.2	3.7444	15.8	15.8	A1	0.5	16.3
2	J47	3.2055	523	0	523	1736	6.0	3.6327	21.9	6.1	A2-A1	0.3	6.5
3	J39	2.7766	347	460	807	807	2.8	3.8580	10.8	10.8	A3	0.3	11.1
4	J50	2.4787	310	411	721	1528	5.3	3.6738	19.5	8.7	A4-A3	0.2	8.9
5	J22	2.2771	372	0	372	3636	12.6	3.3701	42.5	1.2	A5-A2-A4	0.2	1.4
To PS SOUTH AND CONNECT J21													
6 (BLOCK 0)	J67	3.4643	0	0	0	0	0.0	4.0000	0.0	0.0	A6	0.0	0.0
7 (BLOCK 0)	J70	3.0887	0	0	0	0	0.0	4.0000	0.0	0.0	A7-A6	0.0	0.0
8 (BLOCK 0)	J73	19.1012	0	0	0	0	0.0	4.0000	0.0	0.0	A8-A7	0.0	0.0
9 (BLOCK 0)	J75	3.6910	0	0	0	0	0.0	4.0000	0.0	0.0	A9	0.0	0.0
10 (BLOCK 0)	J74	1.4581	0	0	0	0	0.0	4.0000	0.0	0.0	A10-A8-A9	0.0	0.0
TO PS EAST AND CONNECT J54													
RECEIVING PS EAST													
11	J54	2.4588	70	325	395	395	1.4	4.0000	5.5	5.5	A11-A10	0.2	5.7
12	J1	4.6392	119	387	506	901	3.1	3.8287	12.0	6.5	A12-A11	0.5	7.0
13	J21	5.0067	91	390	481	5019	17.4	3.2435	56.5	2.0	A13-A12-A5	0.5	2.5
CONNECT J21													
14	J56	5.2111	0	395	395	395	1.4	4.0000	5.5	5.5	A14	0.5	6.0
15	J36	7.0659	0	519	519	914	3.2	3.8247	12.1	6.7	A15-A14	0.7	7.4
CONNECT MH28A													
16	J59	4.4294	468	200	669	669	2.3	3.9060	9.1	9.1	A16	0.4	9.5
17	J60	7.0424	786	223	1009	1678	5.8	3.6439	21.2	12.2	A17-A16	0.7	12.9
18	J34	10.1524	1101	385	1486	3164	11.0	3.4227	37.6	16.4	A18-A17	1.0	17.4
CONNECT MH25A													
19	J25	7.0883	0	506	506	506	1.8	3.9718	7.0	7.0	A19	0.7	7.7
20	J6	4.1421	0	295	295	801	2.8	3.8601	10.7	3.8	A20-A19	0.4	4.2
21	J7	4.1608	0	297	297	1098	3.8	3.7735	14.4	3.6	A21-A20	0.4	4.1
22	J10	6.0301	200	340	541	1638	5.7	3.6515	20.8	6.4	A22-A21	0.6	7.0
23	J13	7.3651	939	0	939	2578	9.0	3.4975	31.3	10.5	A23-A22	0.7	11.3
24	J64	7.3457	937	0	937	3515	12.2	3.3831	41.3	10.0	A24-A23	0.7	10.7
25	J18	7.9462	787	317	1105	4620	16.0	3.2767	52.6	11.3	A25-A24	0.8	12.1
CONNECT MH13A													
26 (BLOCK 4)	J26	39.0247	0	1000	1000	1000	3.5	3.8000	13.2	13.2		3.9	17.1
CONNECT YORK TRUNK													
		TOTAL	**TOTAL**	**TOTAL**	**TOTAL**					**TOTAL**		**TOTAL**	**TOTAL**
Block Plan		144.8957	7761	6956	14717					**172.0**		**14.5**	**186.8**
Plus Outside		175.6990	7761	6956	14717					**172.0**		**14.5**	**186.8**

Wastewater Flow Calculation-High Scenario With Area Based Method for Employment Land

				300 l/cap/day						0.6 l/s/ha	PK=2.5	0.1 l/s/ha	
Sewershed ID	**Junction**	**Sewershed Area (hectare)**	**Total Population (single catchment)**	**Total Population (adding upstream)**	**Average Flow (adding upstream) (l/s)**	**Harmon Peaking Factor**	**Sanitary Flow adding upstream (l/s)**	**Incremental Sanitary Flow (l/s)**	**Upstream-Downstream Relationship**	**Employment Land (hectare)**	**Employment Land Average Flow (l/s)**	**Employment Land Peak Flow (l/s)**	**Inflow and Infiltration (l/s)**	**Total Flow Assigned (l/s)**
1	J38	5.0489	708	708	2.5	3.8918	9.6	9.6	A1	1.2060	0.7	1.8	0.5	11.9
2	J47	3.2055	523	1231	4.3	3.7399	16.0	6.4	A2-A1	0.0000	0.0	0.0	0.3	6.7
3	J39	2.7766	347	347	1.2	4.0000	4.8	4.8	A3	1.1106	0.7	1.8	0.3	6.9
4	J50	2.4787	310	657	2.3	3.9102	8.9	4.1	A4-A3	0.9915	0.6	1.5	0.2	5.8
5	J22	2.2771	372	2260	7.8	3.5439	27.8	2.9	A5-A2-A4	0.0000	0.0	0.0	0.2	3.1
To PS SOUTH AND CONNECT J21														
6 (BLOCK 0)	J67	3.4643	0	0	0.0	4.0000	0.0	0.0	A6	3.4635	2.1	5.3	0.3	5.6
7 (BLOCK 0)	J70	3.0887	0	0	0.0	4.0000	0.0	0.0	A7-A6	3.0801	1.8	4.5	0.3	4.8
8 (BLOCK 0)	J73	19.1012	80	80	0.3	4.0000	1.1	1.1	A8-A7	0.0000	0.0	0.0	1.9	3.0
9 (BLOCK 0)	J75	3.6910	0	0	0.0	4.0000	0.0	0.0	A9	3.7153	2.2	5.5	0.4	5.9
10 (BLOCK 0)	J74	1.4581	0	80	0.3	4.0000	1.1	0.0	A10-A8-A9	1.4717	0.9	2.3	0.1	2.4
TO PS EAST AND CONNECT J54														
RECEIVING PS EAST														0.0
11	J54	2.4588	70	150	0.5	4.0000	2.1	1.0	A11-A10	3.5516	2.1	5.3	0.2	6.5
12	J1	4.6392	119	269	0.9	4.0000	3.7	1.7	A12-A11	4.7624	2.9	7.3	0.5	9.5
13	J21	5.0067	91	2621	9.1	3.4916	31.8	0.2	A13-A12-A5	4.0009	2.4	6.0	0.5	6.7
CONNECT J21														
14	J56	5.2111	0	0	0.0	4.0000	0.0	0.0	A14	5.2111	3.1	7.8	0.5	8.3
15	J36	7.0659	0	0	0.0	4.0000	0.0	0.0	A15-A14	7.0659	4.2	10.5	0.7	11.2
CONNECT MH28A														
16	J59	4.4294	468	468	1.6	3.9887	6.5	6.5	A16	0.8654	0.5	1.3	0.4	8.2
17	J60	7.0424	786	1254	4.4	3.7344	16.3	9.8	A17-A16	0.8836	0.5	1.3	0.7	11.8
18	J34	10.1524	1101	2355	8.2	3.5295	28.9	12.6	A18-A17	1.6482	1.0	2.5	1.0	16.1
CONNECT MH25A														
19	J25	7.0883	0	0	0.0	4.0000	0.0	0.0	A19	7.0883	4.3	10.8	0.7	11.5
20	J6	4.1421	0	0	0.0	4.0000	0.0	0.0	A20-A19	4.1421	2.5	6.3	0.4	6.7
21	J7	4.1608	0	0	0.0	4.0000	0.0	0.0	A21-A20	4.1435	2.5	6.3	0.4	6.7
22	J10	6.0301	200	200	0.7	4.0000	2.8	2.8	A22-A21	4.4851	2.7	6.8	0.6	10.2
23	J13	7.3651	939	1140	4.0	3.7626	14.9	12.1	A23-A22	0.0000	0.0	0.0	0.7	12.8
24	J64	7.3457	937	2077	7.2	3.5730	25.8	10.9	A24-A23	0.0000	0.0	0.0	0.7	11.6
25	J18	7.9462	787	2864	9.9	3.4594	34.4	8.6	A25-A24	1.3288	0.8	2.0	0.8	11.4
CONNECT MH13A														
26 (BLOCK 4)	J26	39.0247	0	0	0.0	4.0000	0.0	0.0	A26	8.8496	5.3	13.3	3.9	17.2
CONNECT YORK TRUNK														
		TOTAL	**TOTAL**		**TOTAL**				**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**	**TOTAL**
	Block Plan	144.8957	7761		64.6				**93.9**	61.3347	36.8	92.6	14.2	200.8
	Plus Outside	175.6990	7841		65.2				**95.0**	73.0653	43.8	110.2	17.2	222.5

Block 4 emp density	113
Block 4 actual emp lands	8.8496

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

Guelph innovation wastewater

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NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Flow Routing Method ..... KINWAVE
Starting Date MAY-01-2012 00:00:00
Ending Date MAY-02-2012 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Routing Time Step ..... 5.00 sec

****
Element Count
****
Number of rain gages 0
Number of subcatchments ... 0
Number of nodes 80
Number of links 78
Number of pollutants 0
Number of land uses 0

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	332.83	4.17	0.0	Yes
J10	JUNCTION	324.11	4.14	0.0	Yes
J11	JUNCTION	323.66	4.09	0.0	
J12	JUNCTION	322.68	5.82	0.0	
J13	JUNCTION	322.39	5.86	0.0	Yes
J14	JUNCTION	322.07	3.43	0.0	
J15	JUNCTION	321.64	2.86	0.0	
J16	JUNCTION	320.75	7.75	0.0	
J17	JUNCTION	320.25	9.75	0.0	
J18	JUNCTION	319.75	9.25	0.0	Yes
J19	JUNCTION	330.42	3.83	0.0	
J2	JUNCTION	328.71	3.29	0.0	
J20	JUNCTION	327.16	2.84	0.0	
J21	JUNCTION	330.87	3.38	0.0	Yes
J22	JUNCTION	326.88	4.12	0.0	Yes
J23	JUNCTION	327.48	12.52	0.0	

J24	JUNCTION	319.20	7.55	0.0	
J25	JUNCTION	327.89	12.11	0.0	Yes
J26	JUNCTION	323.00	3.00	0.0	Yes
J3	JUNCTION	323.20	4.80	0.0	
J33	JUNCTION	327.70	2.80	0.0	
J34	JUNCTION	329.20	2.80	0.0	Yes
J35	JUNCTION	330.20	2.80	0.0	
J36	JUNCTION	335.20	2.80	0.0	Yes
J38	JUNCTION	331.00	5.00	0.0	Yes
J39	JUNCTION	329.50	3.50	0.0	Yes
J4	JUNCTION	326.60	13.40	0.0	
J40	JUNCTION	330.62	2.88	0.0	
J41	JUNCTION	328.20	2.80	0.0	
J42	JUNCTION	332.34	2.91	0.0	
J43	JUNCTION	331.84	3.16	0.0	
J44	JUNCTION	331.35	3.15	0.0	
J46	JUNCTION	329.01	2.99	0.0	
J47	JUNCTION	327.87	3.13	0.0	Yes
J48	JUNCTION	326.39	4.61	0.0	
J49	JUNCTION	327.18	4.82	0.0	
J5	JUNCTION	327.08	12.92	0.0	
J50	JUNCTION	327.65	3.35	0.0	Yes
J51	JUNCTION	328.06	3.94	0.0	
J52	JUNCTION	328.56	3.44	0.0	
J53	JUNCTION	333.24	3.76	0.0	
J54	JUNCTION	333.70	2.80	0.0	Yes
J56	JUNCTION	339.95	2.80	0.0	Yes
J59	JUNCTION	338.20	2.80	0.0	Yes
J6	JUNCTION	326.10	2.90	0.0	Yes
J60	JUNCTION	335.20	2.80	0.0	Yes
J61	JUNCTION	330.70	2.80	0.0	
J64	JUNCTION	321.14	2.86	0.0	Yes
J67	JUNCTION	318.70	2.80	0.0	Yes
J68	JUNCTION	318.27	5.23	0.0	
J69	JUNCTION	317.79	5.21	0.0	
J7	JUNCTION	325.01	2.99	0.0	Yes
J70	JUNCTION	317.31	6.19	0.0	Yes
J71	JUNCTION	316.82	6.43	0.0	
J72	JUNCTION	316.31	4.69	0.0	
J73	JUNCTION	315.80	3.20	0.0	Yes
J74	JUNCTION	315.27	4.23	0.0	Yes
J75	JUNCTION	315.77	3.48	0.0	Yes
J8	JUNCTION	325.60	2.90	0.0	
J9	JUNCTION	324.54	2.96	0.0	
MH10A	JUNCTION	310.04	4.19	0.0	
MH11A	JUNCTION	317.37	1.36	0.0	
MH12A	JUNCTION	317.56	1.76	0.0	
MH13A	JUNCTION	318.75	5.13	0.0	
MH14A	JUNCTION	321.92	4.87	0.0	
MH15A	JUNCTION	325.04	5.34	0.0	
MH16A	JUNCTION	325.57	5.91	0.0	
MH17A	JUNCTION	326.10	4.70	0.0	
MH25A	JUNCTION	326.64	3.77	0.0	
MH26A	JUNCTION	327.15	3.60	0.0	
MH27A	JUNCTION	327.68	3.59	0.0	
MH28A	JUNCTION	328.21	3.54	0.0	
MH29A	JUNCTION	328.74	3.60	0.0	
MH30A	JUNCTION	329.27	3.63	0.0	
MH31A	JUNCTION	329.82	3.79	0.0	
MH32A	JUNCTION	329.98	4.22	0.0	
MH8A	JUNCTION	308.60	3.11	0.0	
MH9A	JUNCTION	309.85	3.36	0.0	
MH21A	OUTFALL	307.98	1.24	0.0	
YORKTRUNK	OUTFALL	322.00	0.30	0.0	

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J53	J1	CONDUIT	74.6	0.5096	0.0130
C10	J39	J46	CONDUIT	87.9	0.5003	0.0130
C11	J41	J47	CONDUIT	48.9	0.5527	0.0130
C12	J47	J20	CONDUIT	63.6	1.0224	0.0130
C13	J49	J22	CONDUIT	49.4	0.5062	0.0130
C14	J50	J49	CONDUIT	83.0	0.5060	0.0130
C15	J51	J50	CONDUIT	71.1	0.5063	0.0130
C16	J52	J51	CONDUIT	87.2	0.5046	0.0130
C17	J46	J52	CONDUIT	79.3	0.5045	0.0130
C18	J54	J53	CONDUIT	86.0	0.4999	0.0130
C19	J2	MH28A	CONDUIT	76.3	0.5205	0.0130
C2	J20	J48	CONDUIT	56.0	1.0183	0.0130
C20	J35	J2	CONDUIT	69.0	2.0717	0.0100
C21	J18	J24	CONDUIT	90.0	0.5445	0.0130
C22	J3	J12	CONDUIT	88.5	0.5200	0.0130
C23	J11	J3	CONDUIT	83.9	0.5126	0.0130
C24	MH25A	MH17A	CONDUIT	113.0	0.4504	0.0130
C25	MH32A	MH31A	CONDUIT	29.1	0.4497	0.0130
C26	MH31A	MH30A	CONDUIT	115.3	0.4501	0.0130
C27	MH30A	MH29A	CONDUIT	111.0	0.4505	0.0130
C28	MH29A	MH28A	CONDUIT	111.0	0.4505	0.0130
C29	MH16A	MH15A	CONDUIT	111.6	0.4498	0.0130
C3	J40	J41	CONDUIT	85.9	2.7494	0.0130
C30	J36	J35	CONDUIT	85.8	5.8009	0.0130
C31	J56	J36	CONDUIT	87.4	5.4102	0.0130
C32	J34	J33	CONDUIT	88.2	1.6669	0.0130
C33	MH14A	MH13A	CONDUIT	64.4	1.3914	0.0130
C34	MH28A	MH27A	CONDUIT	111.0	0.4505	0.0130
C35	MH27A	MH26A	CONDUIT	111.0	0.4505	0.0130
C36	MH26A	MH25A	CONDUIT	108.0	0.4500	0.0130
C37	MH12A	MH11A	CONDUIT	9.7	1.3919	0.0130
C38	J6	J8	CONDUIT	85.3	0.5512	0.0130
C39	J8	J7	CONDUIT	89.0	0.6296	0.0130
C4	J38	J40	CONDUIT	65.7	0.5022	0.0130
C40	J7	J9	CONDUIT	88.9	0.4948	0.0130
C41	J9	J10	CONDUIT	78.1	0.5123	0.0130
C42	J10	J11	CONDUIT	81.9	0.5130	0.0130
C43	J4	J6	CONDUIT	89.3	0.5266	0.0130
C44	J59	J60	CONDUIT	90.0	3.3025	0.0130
C45	J60	J61	CONDUIT	87.2	5.1317	0.0130
C46	J61	J34	CONDUIT	90.0	1.6337	0.0130
C47	J24	MH13A	CONDUIT	70.3	0.5749	0.0130
C48	MH11A	MH10A	CONDUIT	100.0	4.5046	0.0130
C49	MH10A	MH9A	CONDUIT	9.6	1.3855	0.0130
C5	J1	J42	CONDUIT	86.8	0.5303	0.0130
C50	MH17A	MH16A	CONDUIT	110.0	0.4500	0.0130
C51	MH9A	MH8A	CONDUIT	7.1	1.4086	0.0130
C52	MH8A	MH21A	CONDUIT	9.5	1.3896	0.0130
C53	MH15A	MH14A	CONDUIT	119.7	0.7302	0.0130
C54	J19	MH32A	CONDUIT	79.9	0.5095	0.0130
C55	J12	J13	CONDUIT	43.2	0.5329	0.0130
C56	J13	J14	CONDUIT	49.0	0.5308	0.0130
C57	J14	J15	CONDUIT	75.3	0.5314	0.0130
C58	J15	J64	CONDUIT	88.4	0.5316	0.0130
C59	J64	J16	CONDUIT	66.5	0.5411	0.0130
C6	J42	J43	CONDUIT	88.3	0.5326	0.0130
C60	J16	J17	CONDUIT	87.0	0.5405	0.0130

C61	J17	J18	CONDUIT	87.0	0.5405	0.0130
C62	J21	J19	CONDUIT	82.4	0.5095	0.0130
C63	MH13A	MH12A	CONDUIT	81.2	1.3856	0.0130
C64	J5	J4	CONDUIT	90.0	0.4998	0.0130
C65	J67	J68	CONDUIT	80.0	0.4998	0.0130
C66	J68	J69	CONDUIT	89.3	0.5040	0.0130
C67	J69	J70	CONDUIT	89.2	0.5043	0.0130
C68	J70	J71	CONDUIT	86.8	0.5300	0.0130
C69	J71	J72	CONDUIT	88.2	0.5443	0.0130
C7	J43	J44	CONDUIT	85.7	0.5369	0.0130
C70	J72	J73	CONDUIT	88.3	0.5437	0.0130
C71	J73	J74	CONDUIT	84.7	0.5548	0.0130
C72	J75	J74	CONDUIT	86.4	0.5095	0.0130
C73	J33	MH25A	CONDUIT	88.8	1.0840	0.0130
C74	J23	J5	CONDUIT	73.7	0.5021	0.0130
C75	J25	J23	CONDUIT	76.0	0.5000	0.0130
C76	J26	YORKTRUNK	CONDUIT	91.7	1.0359	0.0130
C8	J44	J21	CONDUIT	83.1	0.5417	0.0130
C9	J22	J48	CONDUIT	42.4	1.0152	0.0130
PSEAST	J74	J54	IDEAL PUMP			
PSSOUTH	J48	J21	IDEAL PUMP			

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Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C10	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C11	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C12	CIRCULAR	0.20	0.03	0.05	0.20	1	0.03
C13	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C14	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C15	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C16	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C17	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C18	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C19	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C2	CIRCULAR	0.20	0.03	0.05	0.20	1	0.03
C20	CIRCULAR	0.20	0.03	0.05	0.20	1	0.06
C21	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C22	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C23	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C24	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C25	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C26	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C27	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C28	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C29	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C3	CIRCULAR	0.20	0.03	0.05	0.20	1	0.05
C30	CIRCULAR	0.20	0.03	0.05	0.20	1	0.08
C31	CIRCULAR	0.20	0.03	0.05	0.20	1	0.08
C32	CIRCULAR	0.25	0.05	0.06	0.25	1	0.08
C33	CIRCULAR	0.75	0.44	0.19	0.75	1	1.31
C34	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C35	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C36	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C37	CIRCULAR	0.75	0.44	0.19	0.75	1	1.31
C38	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C39	CIRCULAR	0.25	0.05	0.06	0.25	1	0.05
C4	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C40	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07

C41	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C42	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C43	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C44	CIRCULAR	0.20	0.03	0.05	0.20	1	0.06
C45	CIRCULAR	0.20	0.03	0.05	0.20	1	0.07
C46	CIRCULAR	0.20	0.03	0.05	0.20	1	0.04
C47	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C48	CIRCULAR	0.80	0.50	0.20	0.80	1	2.81
C49	CIRCULAR	0.75	0.44	0.19	0.75	1	1.31
C5	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C50	CIRCULAR	0.75	0.44	0.19	0.75	1	0.75
C51	CIRCULAR	0.75	0.44	0.19	0.75	1	1.32
C52	CIRCULAR	0.75	0.44	0.19	0.75	1	1.31
C53	CIRCULAR	0.75	0.44	0.19	0.75	1	0.95
C54	CIRCULAR	0.38	0.11	0.09	0.38	1	0.13
C55	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C56	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C57	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C58	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C59	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C6	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C60	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C61	CIRCULAR	0.30	0.07	0.07	0.30	1	0.07
C62	CIRCULAR	0.38	0.11	0.09	0.38	1	0.13
C63	CIRCULAR	0.75	0.44	0.19	0.75	1	1.31
C64	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C65	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C66	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C67	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C68	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C69	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C7	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C70	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C71	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C72	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C73	CIRCULAR	0.25	0.05	0.06	0.25	1	0.06
C74	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C75	CIRCULAR	0.20	0.03	0.05	0.20	1	0.02
C76	CIRCULAR	0.25	0.05	0.06	0.25	1	0.06
C8	CIRCULAR	0.25	0.05	0.06	0.25	1	0.04
C9	CIRCULAR	0.20	0.03	0.05	0.20	1	0.03

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	1.697	16.968
External Outflow	1.676	16.760
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.021	0.210
Continuity Error (%)	-0.012	

Highest Flow Instability Indexes

All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 5.00 sec
Average Time Step : 5.00 sec
Maximum Time Step : 5.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 1.03

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.15	0.15	332.98	0 01:00
J10	JUNCTION	0.13	0.13	324.24	0 00:49
J11	JUNCTION	0.16	0.16	323.82	0 00:50
J12	JUNCTION	0.18	0.18	322.86	0 00:53
J13	JUNCTION	0.18	0.18	322.57	0 00:53
J14	JUNCTION	0.21	0.21	322.28	0 00:54
J15	JUNCTION	0.18	0.18	321.82	0 00:55
J16	JUNCTION	0.20	0.20	320.95	0 00:58
J17	JUNCTION	0.20	0.20	320.45	0 00:59
J18	JUNCTION	0.20	0.20	319.95	0 01:00
J19	JUNCTION	0.23	0.23	330.65	0 01:05
J2	JUNCTION	0.12	0.12	328.83	0 00:16
J20	JUNCTION	0.18	0.18	327.34	0 00:24
J21	JUNCTION	0.20	0.20	331.07	0 01:05
J22	JUNCTION	0.17	0.17	327.05	0 00:41
J23	JUNCTION	0.11	0.11	327.59	0 00:29
J24	JUNCTION	0.26	0.26	319.46	0 01:02
J25	JUNCTION	0.08	0.08	327.97	0 00:00
J26	JUNCTION	0.09	0.09	323.09	0 00:00
J3	JUNCTION	0.15	0.15	323.35	0 00:51
J33	JUNCTION	0.16	0.16	327.86	0 00:20
J34	JUNCTION	0.13	0.13	329.33	0 00:20
J35	JUNCTION	0.08	0.08	330.28	0 00:16
J36	JUNCTION	0.07	0.07	335.27	0 00:15
J38	JUNCTION	0.12	0.12	331.12	0 00:00
J39	JUNCTION	0.10	0.10	329.60	0 00:00
J4	JUNCTION	0.10	0.10	326.70	0 00:37
J40	JUNCTION	0.17	0.17	330.79	0 00:22
J41	JUNCTION	0.13	0.14	328.34	0 00:23
J42	JUNCTION	0.17	0.17	332.51	0 01:00
J43	JUNCTION	0.17	0.17	332.01	0 01:02
J44	JUNCTION	0.17	0.17	331.52	0 01:03
J46	JUNCTION	0.15	0.15	329.16	0 00:31
J47	JUNCTION	0.18	0.18	328.05	0 00:23
J48	JUNCTION	0.32	0.32	326.71	0 00:25
J49	JUNCTION	0.17	0.17	327.35	0 00:39
J5	JUNCTION	0.11	0.11	327.19	0 00:32
J50	JUNCTION	0.15	0.15	327.80	0 00:38
J51	JUNCTION	0.16	0.16	328.22	0 00:37
J52	JUNCTION	0.15	0.15	328.71	0 00:32
J53	JUNCTION	0.15	0.15	333.39	0 00:58
J54	JUNCTION	0.12	0.12	333.82	0 00:57
J56	JUNCTION	0.04	0.04	339.99	0 00:00

J59	JUNCTION	0.05	0.05	338.25	0	00:00
J6	JUNCTION	0.10	0.10	326.20	0	00:41
J60	JUNCTION	0.08	0.08	335.28	0	00:16
J61	JUNCTION	0.11	0.11	330.81	0	00:17
J64	JUNCTION	0.18	0.18	321.32	0	00:57
J67	JUNCTION	0.05	0.05	318.75	0	00:00
J68	JUNCTION	0.08	0.08	318.35	0	00:37
J69	JUNCTION	0.08	0.08	317.87	0	00:45
J7	JUNCTION	0.12	0.12	325.13	0	00:45
J70	JUNCTION	0.08	0.08	317.39	0	00:50
J71	JUNCTION	0.10	0.10	316.92	0	00:52
J72	JUNCTION	0.10	0.10	316.41	0	00:54
J73	JUNCTION	0.10	0.10	315.90	0	00:56
J74	JUNCTION	0.14	0.14	315.41	0	00:57
J75	JUNCTION	0.05	0.05	315.82	0	00:00
J8	JUNCTION	0.12	0.12	325.72	0	00:43
J9	JUNCTION	0.13	0.13	324.67	0	00:47
MH10A	JUNCTION	2.96	2.96	313.00	0	01:19
MH11A	JUNCTION	0.25	0.25	317.61	0	01:19
MH12A	JUNCTION	0.25	0.25	317.81	0	01:19
MH13A	JUNCTION	2.43	2.44	321.18	0	01:18
MH14A	JUNCTION	2.42	2.42	324.35	0	01:18
MH15A	JUNCTION	0.23	0.24	325.28	0	01:18
MH16A	JUNCTION	0.23	0.24	325.81	0	01:16
MH17A	JUNCTION	0.23	0.24	326.33	0	01:15
MH25A	JUNCTION	0.25	0.25	326.88	0	00:22
MH26A	JUNCTION	0.20	0.20	327.35	0	01:13
MH27A	JUNCTION	0.20	0.20	327.88	0	01:12
MH28A	JUNCTION	0.19	0.19	328.41	0	00:28
MH29A	JUNCTION	0.18	0.18	328.93	0	01:09
MH30A	JUNCTION	0.18	0.18	329.46	0	01:08
MH31A	JUNCTION	0.18	0.19	330.01	0	01:06
MH32A	JUNCTION	0.23	0.23	330.21	0	01:06
MH8A	JUNCTION	1.33	1.33	309.93	0	01:19
MH9A	JUNCTION	0.25	0.25	310.09	0	01:19
MH21A	OUTFALL	0.68	0.68	308.66	0	01:20
YORKTRUNK	OUTFALL	0.14	0.14	322.14	0	00:22

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min		Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.006	0.025	0	01:00	0.553	2.151
J10	JUNCTION	0.007	0.023	0	00:49	0.605	1.978
J11	JUNCTION	0.000	0.023	0	00:50	0.000	1.976
J12	JUNCTION	0.000	0.023	0	00:53	0.000	1.971
J13	JUNCTION	0.011	0.034	0	00:53	0.976	2.946
J14	JUNCTION	0.000	0.034	0	00:54	0.000	2.945
J15	JUNCTION	0.000	0.034	0	00:55	0.000	2.942
J16	JUNCTION	0.000	0.045	0	00:58	0.000	3.861
J17	JUNCTION	0.000	0.045	0	00:59	0.000	3.857
J18	JUNCTION	0.012	0.057	0	01:00	1.045	4.899
J19	JUNCTION	0.000	0.070	0	01:06	0.000	6.012
J2	JUNCTION	0.000	0.012	0	00:16	0.000	1.070
J20	JUNCTION	0.000	0.023	0	00:24	0.000	1.966
J21	JUNCTION	0.001	0.070	0	01:05	0.069	6.018
J22	JUNCTION	0.001	0.021	0	00:41	0.121	1.842

J23	JUNCTION	0.000	0.008	0	00:29	0.000	0.665
J24	JUNCTION	0.000	0.057	0	01:02	0.000	4.894
J25	JUNCTION	0.008	0.008	0	00:00	0.665	0.665
J26	JUNCTION	0.017	0.017	0	00:00	1.477	1.477
J3	JUNCTION	0.000	0.023	0	00:51	0.000	1.974
J33	JUNCTION	0.000	0.040	0	00:20	0.000	3.434
J34	JUNCTION	0.017	0.040	0	00:20	1.503	3.436
J35	JUNCTION	0.000	0.012	0	00:16	0.000	1.071
J36	JUNCTION	0.007	0.012	0	00:15	0.596	1.071
J38	JUNCTION	0.016	0.016	0	00:00	1.408	1.408
J39	JUNCTION	0.011	0.011	0	00:00	0.959	0.959
J4	JUNCTION	0.000	0.008	0	00:37	0.000	0.663
J40	JUNCTION	0.000	0.016	0	00:22	0.000	1.407
J41	JUNCTION	0.000	0.016	0	00:23	0.000	1.407
J42	JUNCTION	0.000	0.025	0	01:01	0.000	2.149
J43	JUNCTION	0.000	0.025	0	01:02	0.000	2.147
J44	JUNCTION	0.000	0.025	0	01:03	0.000	2.145
J46	JUNCTION	0.000	0.011	0	00:31	0.000	0.958
J47	JUNCTION	0.007	0.023	0	00:23	0.562	1.967
J48	JUNCTION	0.000	0.044	0	00:41	0.000	3.806
J49	JUNCTION	0.000	0.020	0	00:39	0.000	1.722
J5	JUNCTION	0.000	0.008	0	00:32	0.000	0.664
J50	JUNCTION	0.009	0.020	0	00:38	0.769	1.724
J51	JUNCTION	0.000	0.011	0	00:37	0.000	0.956
J52	JUNCTION	0.000	0.011	0	00:32	0.000	0.957
J53	JUNCTION	0.000	0.019	0	00:58	0.000	1.600
J54	JUNCTION	0.005	0.019	0	00:57	0.441	1.602
J56	JUNCTION	0.006	0.006	0	00:00	0.475	0.475
J59	JUNCTION	0.009	0.009	0	00:00	0.821	0.821
J6	JUNCTION	0.004	0.012	0	00:41	0.363	1.025
J60	JUNCTION	0.013	0.022	0	00:16	1.115	1.935
J61	JUNCTION	0.000	0.022	0	00:17	0.000	1.934
J64	JUNCTION	0.011	0.045	0	00:57	0.924	3.863
J67	JUNCTION	0.003	0.003	0	00:00	0.276	0.276
J68	JUNCTION	0.000	0.003	0	00:37	0.000	0.276
J69	JUNCTION	0.000	0.003	0	00:45	0.000	0.276
J7	JUNCTION	0.004	0.016	0	00:45	0.354	1.377
J70	JUNCTION	0.003	0.006	0	00:50	0.251	0.526
J71	JUNCTION	0.000	0.006	0	00:52	0.000	0.525
J72	JUNCTION	0.000	0.006	0	00:54	0.000	0.524
J73	JUNCTION	0.003	0.009	0	00:56	0.259	0.782
J74	JUNCTION	0.001	0.013	0	00:57	0.086	1.161
J75	JUNCTION	0.003	0.003	0	00:00	0.294	0.294
J8	JUNCTION	0.000	0.012	0	00:43	0.000	1.024
J9	JUNCTION	0.000	0.016	0	00:47	0.000	1.375
MH10A	JUNCTION	0.000	0.179	0	01:19	0.000	15.286
MH11A	JUNCTION	0.000	0.179	0	01:19	0.000	15.292
MH12A	JUNCTION	0.000	0.179	0	01:19	0.000	15.293
MH13A	JUNCTION	0.000	0.179	0	01:19	0.000	15.300
MH14A	JUNCTION	0.000	0.122	0	01:18	0.000	10.414
MH15A	JUNCTION	0.000	0.122	0	01:18	0.000	10.424
MH16A	JUNCTION	0.000	0.122	0	01:16	0.000	10.435
MH17A	JUNCTION	0.000	0.122	0	01:15	0.000	10.446
MH25A	JUNCTION	0.000	0.122	0	01:14	0.000	10.458
MH26A	JUNCTION	0.000	0.082	0	01:13	0.000	7.035
MH27A	JUNCTION	0.000	0.082	0	01:12	0.000	7.043
MH28A	JUNCTION	0.000	0.082	0	01:10	0.000	7.052
MH29A	JUNCTION	0.000	0.070	0	01:10	0.000	5.990
MH30A	JUNCTION	0.000	0.070	0	01:08	0.000	5.998
MH31A	JUNCTION	0.000	0.070	0	01:06	0.000	6.006
MH32A	JUNCTION	0.000	0.070	0	01:06	0.000	6.008
MH8A	JUNCTION	0.000	0.179	0	01:20	0.000	15.285
MH9A	JUNCTION	0.000	0.179	0	01:19	0.000	15.285
MH21A	OUTFALL	0.000	0.179	0	01:20	0.000	15.284

YORKTRUNK	OUTFALL	0.000	0.017	0	00:22	0.000	1.476

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
MH21A	99.69	0.177	0.179	15.284
YORKTRUNK	99.99	0.017	0.017	1.476
System	99.84	0.195	0.196	16.760

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.019	0	01:00	0.84	0.44	0.46
C10	CONDUIT	0.011	0	00:31	0.73	0.48	0.49
C11	CONDUIT	0.016	0	00:23	0.83	0.67	0.60
C12	CONDUIT	0.023	0	00:24	1.14	0.69	0.61
C13	CONDUIT	0.020	0	00:41	0.85	0.47	0.48
C14	CONDUIT	0.020	0	00:39	0.85	0.47	0.48
C15	CONDUIT	0.011	0	00:38	0.73	0.48	0.49
C16	CONDUIT	0.011	0	00:37	0.73	0.48	0.49
C17	CONDUIT	0.011	0	00:32	0.73	0.48	0.49
C18	CONDUIT	0.019	0	00:58	0.83	0.44	0.47
C19	CONDUIT	0.012	0	00:28	0.76	0.29	0.37
C2	CONDUIT	0.023	0	00:25	1.14	0.69	0.61
C20	CONDUIT	0.012	0	00:16	1.53	0.20	0.30
C21	CONDUIT	0.057	0	01:02	1.12	0.80	0.68
C22	CONDUIT	0.023	0	00:53	0.88	0.33	0.40
C23	CONDUIT	0.023	0	00:51	0.88	0.33	0.40
C24	CONDUIT	0.122	0	01:15	1.25	0.16	0.27
C25	CONDUIT	0.070	0	01:06	1.06	0.09	0.21
C26	CONDUIT	0.070	0	01:08	1.06	0.09	0.21
C27	CONDUIT	0.070	0	01:10	1.06	0.09	0.21
C28	CONDUIT	0.070	0	01:10	1.06	0.09	0.21
C29	CONDUIT	0.122	0	01:18	1.25	0.16	0.27
C3	CONDUIT	0.016	0	00:23	1.51	0.30	0.38

C30	CONDUIT	0.012	0	00:16	1.83	0.16	0.27
C31	CONDUIT	0.005	0	00:15	1.41	0.07	0.18
C32	CONDUIT	0.040	0	00:20	1.58	0.52	0.51
C33	CONDUIT	0.122	0	01:19	1.86	0.09	0.21
C34	CONDUIT	0.082	0	01:12	1.11	0.11	0.22
C35	CONDUIT	0.082	0	01:13	1.11	0.11	0.22
C36	CONDUIT	0.082	0	01:14	1.11	0.11	0.22
C37	CONDUIT	0.179	0	01:19	2.08	0.14	0.25
C38	CONDUIT	0.012	0	00:43	0.76	0.27	0.35
C39	CONDUIT	0.012	0	00:45	0.80	0.25	0.34
C4	CONDUIT	0.016	0	00:22	0.80	0.70	0.62
C40	CONDUIT	0.016	0	00:47	0.79	0.24	0.33
C41	CONDUIT	0.016	0	00:49	0.80	0.23	0.33
C42	CONDUIT	0.023	0	00:50	0.88	0.54	0.52
C43	CONDUIT	0.008	0	00:41	0.65	0.11	0.22
C44	CONDUIT	0.009	0	00:16	1.39	0.16	0.27
C45	CONDUIT	0.022	0	00:17	2.07	0.30	0.38
C46	CONDUIT	0.022	0	00:20	1.36	0.53	0.52
C47	CONDUIT	0.057	0	01:03	1.15	0.78	0.66
C48	CONDUIT	0.179	0	01:19	3.12	0.06	0.17
C49	CONDUIT	0.179	0	01:19	2.08	0.14	0.25
C5	CONDUIT	0.025	0	01:01	0.91	0.58	0.55
C50	CONDUIT	0.122	0	01:16	1.25	0.16	0.27
C51	CONDUIT	0.179	0	01:20	2.09	0.14	0.25
C52	CONDUIT	0.179	0	01:20	2.08	0.14	0.25
C53	CONDUIT	0.122	0	01:18	1.48	0.13	0.24
C54	CONDUIT	0.070	0	01:06	1.16	0.56	0.53
C55	CONDUIT	0.023	0	00:53	0.89	0.33	0.39
C56	CONDUIT	0.034	0	00:54	0.99	0.49	0.49
C57	CONDUIT	0.034	0	00:55	0.99	0.49	0.49
C58	CONDUIT	0.034	0	00:57	0.99	0.49	0.49
C59	CONDUIT	0.045	0	00:58	1.06	0.63	0.58
C6	CONDUIT	0.025	0	01:02	0.91	0.58	0.54
C60	CONDUIT	0.045	0	00:59	1.06	0.63	0.58
C61	CONDUIT	0.045	0	01:00	1.06	0.63	0.58
C62	CONDUIT	0.070	0	01:06	1.16	0.56	0.53
C63	CONDUIT	0.179	0	01:19	2.08	0.14	0.25
C64	CONDUIT	0.008	0	00:37	0.65	0.18	0.29
C65	CONDUIT	0.003	0	00:37	0.52	0.14	0.25
C66	CONDUIT	0.003	0	00:45	0.52	0.14	0.25
C67	CONDUIT	0.003	0	00:50	0.52	0.14	0.25
C68	CONDUIT	0.006	0	00:52	0.64	0.26	0.34
C69	CONDUIT	0.006	0	00:54	0.64	0.25	0.34
C7	CONDUIT	0.025	0	01:03	0.92	0.57	0.54
C70	CONDUIT	0.006	0	00:56	0.64	0.25	0.34
C71	CONDUIT	0.009	0	00:57	0.72	0.37	0.42
C72	CONDUIT	0.003	0	00:39	0.53	0.15	0.26
C73	CONDUIT	0.040	0	00:23	1.34	0.64	0.58
C74	CONDUIT	0.008	0	00:32	0.66	0.33	0.40
C75	CONDUIT	0.008	0	00:29	0.66	0.33	0.40
C76	CONDUIT	0.017	0	00:22	1.06	0.28	0.36
C8	CONDUIT	0.025	0	01:05	0.92	0.57	0.54
C9	CONDUIT	0.021	0	00:41	1.12	0.65	0.59
PSEAST	PUMP	0.013	0	00:57			
PSSOUTH	PUMP	0.044	0	00:41			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

****
Pumping Summary
****

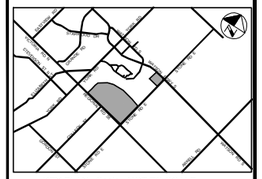
Pump	Percent Utilized	Number of Start-Ups	Min Flow CMS	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr	Power Usage Kw-hr
PSEAST	100.00	1	0.00	0.01	0.01	1.161	58.19
PSSOUTH	99.99	1	0.00	0.04	0.04	3.806	45.17

Analysis begun on: Fri Jul 11 13:25:59 2014
Analysis ended on: Fri Jul 11 13:25:59 2014
Total elapsed time: < 1 sec

Appendix C

Figures

FIGURE: 1 OF 6



KEY PLAN Scale : NOT TO SCALE

THE POSITION OF POLES, LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	DATE	DESCRIPTION	BY:	CHKD.
1	12/06/13	REVISION	P.D.	P.D.S.

ISSUES/REVISIONS

CITY OF Guelph

ENGINEERING SERVICES

GUELPH INNOVATION PARK
FIGURE 01
EXISTING WATER INFRASTRUCTURE

amec

SCALE: 1:5000	CONSULTANT DRAWING No. 109088
DATE DRAWN: JULY 2014	CITY CONTRACT No. 2-1116
DRAWN BY: P.D. / CHECKED BY: P.D.S. / CITY REFERENCE No. / REV. 1	

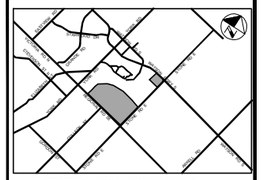
P:\Work\109088\Hwy\dwg\Sanitary\(Fig 1,2,3,4,6) Guelph Innovation Park (Land Use, Water, Sanitary).dwg

LEGEND:

- ERAMOSA RIVER
- GUELPH JUNCTION RAILWAY
- EXISTING WATER WELL
- EXISTING INACTIVE WELL
- EXISTING BOOSTER STATION
- EXISTING WATER TOWER
- EXISTING RESERVOIR
- EXISTING WATERMAIN
- EXISTING RECHARGE TRENCH
- PRESSURE ZONE BOUNDARY

- RESTORATION AREAS
- SIGNIFICANT NATURAL AREAS
- NATURAL AREAS
- ECOLOGICAL LINKAGES
- EMPLOYMENT MIXED USE 2
- SPECIAL RESIDENTIAL AREA
- RESIDENTIAL
- ADAPTIVE REUSE
- OPEN SPACE AND PARK
- NEIGHBORHOOD COMMERCIAL CENTRE
- INDUSTRIAL
- SERVICE AND COMMERCIAL
- MAJOR UTILITY
- CORRIDOR MIXED USE
- EMPLOYMENT MIXED USE 1

FIGURE: 2 OF 6



KEY PLAN Scale : NOT TO SCALE

BEVERLEY ST.
ARM STRONG / JOHNSTON ST.
KINGSMILL AVE.
HAYES AVE
LAWRENCE AVE
WELLS ST.
SUBURBAN AVE.
CLEARVIEW
SLOAN AVE.
WHITE ST.
BEAUMONT CRES.
YORK RD.
BELL AVE.
ERAMOSA RIVER
VICTORIA RD.
COLLEGE AVE. EAST
STONE RD. EAST
ERAMOSA RIVER
GUELPH JUNCTION RAILWAY
DUNLOP DR.
TAGGART ST.
AIRPARK PL.
SKYWAY DR.
WATSON PKY.
SHERRY CRT
PKY S.
GLENHOLM DR.
COOKS MILL RD.

LEGEND:

- ERAMOSA RIVER
- GUELPH JUNCTION RAILWAY
- 200mmØ EXISTING SANITARY SEWER
- EXISTING MANHOLE
- EXISTING LOCAL FORCEMAIN (PRIVATE)
- EXISTING FORCEMAIN (MUNICIPAL)
- EXISTING PUMPING STATION

- RESTORATION AREAS
- SIGNIFICANT NATURAL AREAS
- NATURAL AREAS
- ECOLOGICAL LINKAGES
- EMPLOYMENT MIXED USE 2
- SPECIAL RESIDENTIAL AREA
- RESIDENTIAL
- ADAPTIVE REUSE
- OPEN SPACE AND PARK
- NEIGHBORHOOD COMMERCIAL CENTRE
- INDUSTRIAL
- SERVICE AND COMMERCIAL
- MAJOR UTILITY
- CORRIDOR MIXED USE
- EMPLOYMENT MIXED USE 1

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No.	DATE	DESCRIPTION	BY:	CHKD.
1	12/06/13	REVISION	P.D.	P.D.S.

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CITY OF Guelph

ENGINEERING SERVICES

GUELPH INNOVATION PARK
FIGURE 02

EXISTING WASTEWATER INFRASTRUCTURE

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DATE DRAWN: JULY 2014	CITY CONTRACT No. 2-1116
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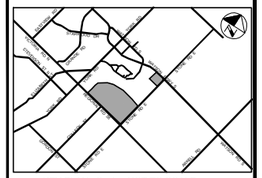
P:\Work\109088\Hwy\dwg\Sanitary\(Fig 1,2,3,4,6) Guelph Innovation Park (Land Use, Water, Sanitary).dwg

FIGURE: 3 OF 6



KEY PLAN Scale : NOT TO SCALE

BEVERLEY ST.
JOHNSTON ST.
KINGSMILL AVE.
ARM STRONG
HAYES AVE.
LAWRENCE AVE
WELLS ST.
SUBURBAN AVE.
CLEARVIEW
SLOAN AVE.
WHITE ST.
YORK RD.
BEAUMONT CRES.
BELL AVE.
ERAMOSA RIVER
TAGGART ST.
AIRPARK PL.
SKYWAY DR.
WATSON PKY.
SHERRY CRT
VICTORIA RD.
COLLEGE AVE. EAST
ERAMOSA RIVER
DUNLOP DR.
PKY S.
GUELPH JUNCTION RAILWAY
STONE RD. EAST
VICTORIA RD.
GLENHOLM DR.
COOKS MILL RD.

LEGEND:

- ERAMOSA RIVER
- GUELPH JUNCTION RAILWAY
- BLOCK 1
- BLOCK 2
- BLOCK 3
- BLOCK 4
- RESTORATION AREAS
- SIGNIFICANT NATURAL AREAS
- NATURAL AREAS
- ECOLOGICAL LINKAGES
- EMPLOYMENT MIXED USE 2
- SPECIAL RESIDENTIAL AREA
- RESIDENTIAL
- ADAPTIVE REUSE
- OPEN SPACE AND PARK
- NEIGHBORHOOD COMMERCIAL CENTRE
- INDUSTRIAL
- SERVICE AND COMMERCIAL
- MAJOR UTILITY
- CORRIDOR MIXED USE
- EMPLOYMENT MIXED USE 1

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CITY OF Guelph

ENGINEERING SERVICES

GUELPH INNOVATION PARK
FIGURE 03

LAND USE

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P:\Work\109088\Hwy\dwg\Sanitary\[Fig 1,2,3,4,6] Guelph Innovation Park (Land Use, Water, Sanitary).dwg

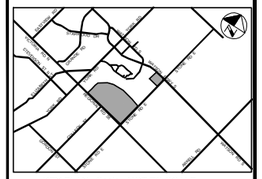
BEVERLEY ST.
JOHNSTON ST.
KINGSMILL AVE.
LAWRENCE AVE
HAYES AVE.
ARM STRONG
BELL AVE.
WELLS ST.
SUBURBAN AVE.
CLEARVIEW
SLOAN AVE.
WHITE ST.
BEAUMONT CRES.
YORK RD.
ERAMOSA RIVER
TAGGART ST.
AIRPARK PL.
SKYWAY DR.
WATSON PKY.
SHERRY CRT
VICTORIA RD.
PROPOSED CONNECTION TO EXISTING 500mm WATERMAIN
PROPOSED CONNECTION TO EXISTING 500mm WATERMAIN
PROPOSED CONNECTION TO EXISTING 500mm WATERMAIN
COLLEGE AVE. EAST
EXISTING 500mm WATERMAIN
ERAMOSA RIVER
DUNLOP DR.
EXISTING 400mm WATERMAIN
PKY S.
GUELPH JUNCTION RAILWAY
STONE RD. EAST
EXISTING 400mm WATERMAIN
PROPOSED CONNECTION TO EXISTING 400mm WATERMAIN
PROPOSED CONNECTION TO EXISTING 400mm WATERMAIN
EXISTING 400mm WATERMAIN
VICTORIA RD.
400 Ø
PROPOSED CONNECTION TO EXISTING 400mm WATERMAIN
GLENHOLM DR.
COOKS MILL RD.

LEGEND:

- ERAMOSA RIVER
- GUELPH JUNCTION RAILWAY
- EXISTING WATERMAIN
- PROPOSED WATERMAIN (300)

- RESTORATION AREAS
- SIGNIFICANT NATURAL AREAS
- NATURAL AREAS
- ECOLOGICAL LINKAGES
- EMPLOYMENT MIXED USE 2
- SPECIAL RESIDENTIAL AREA
- RESIDENTIAL
- ADAPTIVE REUSE
- OPEN SPACE AND PARK
- NEIGHBORHOOD COMMERCIAL CENTRE
- INDUSTRIAL
- SERVICE AND COMMERCIAL
- MAJOR UTILITY
- CORRIDOR MIXED USE
- EMPLOYMENT MIXED USE 1

FIGURE: 4 OF 6



KEY PLAN Scale : NOT TO SCALE

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CITY OF Guelph

ENGINEERING SERVICES

GUELPH INNOVATION PARK
FIGURE 04
PROPOSED WATER INFRASTRUCTURE

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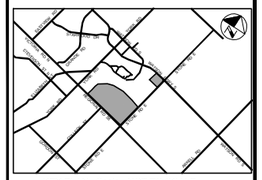
P:\Work\109088\Hwy\dwg\Sanitary\(Fig. 1-2,3,4,6) Guelph Innovation Park (Land Use, Water, Sanitary).dwg

FIGURE: 5 OF 6



KEY PLAN Scale : NOT TO SCALE

JOHNSTON

ARM STRONG

KINGSMILL AVE.

HAYES AVE.

LAWRENCE AVE

YORK RD.

WELLS ST

CLEARY

SLOAN AVE

ST.

BEAUMONT CRES.

BELL AVE.

ERAMOSA RIVER

TAGGART ST.

AIRPARK PL.

SKYWAY DR.

WATSON PKY.

SHERRY CRT

VICTORIA RD.

COLLEGE AVE. EAST

ERAMOSA RIVER

DUNLOP DR.

PKY S.

GUELPH JUNCTION RAILWAY

STONE RD. EAST

VICTORIA RD.

GLENHOLM DR.

COOKS MILL RD.

25 24 23 22 26 18 17 16 21 20 15 14 19 13 12 11 9 10 6 7 3 1 4 5 2 8

LEGEND:

ERAMOSA RIVER

GUELPH JUNCTION RAILWAY

27 SANITARY CATCHMENT AREA

RESTORATION AREAS

SIGNIFICANT NATURAL AREAS

NATURAL AREAS

ECOLOGICAL LINKAGES

EMPLOYMENT MIXED USE 2

SPECIAL RESIDENTIAL AREA

RESIDENTIAL

ADAPTIVE REUSE

OPEN SPACE AND PARK

NEIGHBORHOOD COMMERCIAL CENTRE

INDUSTRIAL

SERVICE AND COMMERCIAL

MAJOR UTILITY

CORRIDOR MIXED USE

EMPLOYMENT MIXED USE 1

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ENGINEERING SERVICES

GUELPH INNOVATION PARK
FIGURE 05

SANITARY CATCHMENT AREA

amec

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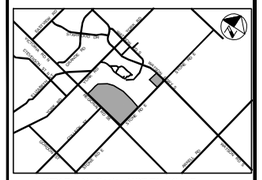
P:\Work\109088\Hwy\dwg\Sanitary\(Fig 5) Guelph Innovation Sewershed.dwg

FIGURE: 6 OF 6



KEY PLAN Scale : NOT TO SCALE

BEVERLEY ST.
JOHNSTON ST.
KINGSMILL AVE.
HAYES AVE.
LAWRENCE AVE
ARM STRONG
BELL AVE.
WELLS ST.
SUBURBAN AVE.
CLEARVIEW
SLOAN AVE.
WHITE ST.
YORK RD.
BEAUMONT CRES.
ERAMOSA RIVER
TAGGART ST.
AIRPARK PL.
SKYWAY DR.
WATSON PKY.
SHERRY CRT
DUNLOP DR.
PKY S.
VICTORIA RD.
PROPOSED CONNECTION POINT #1
(MH13A INVERT 323.746m)
PROPOSED CONNECTION POINT #2
(MH25A INVERT 326.637m)
COLLEGE AVE. EAST
PROPOSED CONNECTION POINT #3
(MH28A INVERT 328.213m)
PROPOSED CONNECTION POINT #4
(MH32A INVERT 330.381m)
STONE RD. EAST
PROPOSED FORCEMAIN CONNECTION
POINT (AMEC MH-J21 INVERT 333.870m)
PROPOSED FORCEMAIN
PROPOSED FORCEMAIN CONNECTION
POINT (AMEC MH-J54 INVERT 333.700m)
PROPOSED FORCEMAIN
PROPOSED PUMPING STATION SOUTH
(AMEC MH-J48 INVERT 326.390m)
PROPOSED PUMPING STATION EAST
(AMEC MH-J74 INVERT 315.270m)
GUELPH JUNCTION RAILWAY
GLENHOLM DR.
COOKS MILL RD.

LEGEND:

- ERAMOSA RIVER
- GUELPH JUNCTION RAILWAY
- EXISTING SANITARY SEWER
- EXISTING SANITARY MANHOLE
- EXISTING FORCEMAIN (MUNICIPAL)
- PROPOSED SANITARY SEWER
- PROPOSED FORCEMAIN (MUNICIPAL)
- PROPOSED SANITARY MANHOLE
- PROPOSED CONNECTION POINT
- PROPOSED PUMPING STATION
- RESTORATION AREAS
- SIGNIFICANT NATURAL AREAS
- NATURAL AREAS
- ECOLOGICAL LINKAGES
- EMPLOYMENT MIXED USE 2
- SPECIAL RESIDENTIAL AREA
- RESIDENTIAL
- ADAPTIVE REUSE
- OPEN SPACE AND PARK
- NEIGHBORHOOD COMMERCIAL CENTRE
- INDUSTRIAL
- SERVICE AND COMMERCIAL
- MAJOR UTILITY
- CORRIDOR MIXED USE
- EMPLOYMENT MIXED USE 1

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GUELPH INNOVATION PARK
FIGURE 06

PROPOSED WASTEWATER INFRASTRUCTURE

amec

SCALE:	CONSULTANT DRAWING No.
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P:\Work\109088\Hwy\dwg\Sanitary\(Fig 1,2,3,4,6) Guelph Innovation Park (Land Use, Water, Sanitary).dwg