

TOWN OF CALEDON PLANNING RECEIVED

May 29,2020

Appendix A - Water Modelling Technical Memorandum



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Memorandum

Organization:	The Town of Caledon	BluePlan Project No: C001-0021
Attention:	File	Date: June 18, 2014
Project:	Bolton Residential Expansion Study (BRES)	
RE:	Hydraulic Water Modelling Analysis	

Introduction

This technical memorandum summarizes the hydraulic water modelling analysis, including the methodology and assumptions utilized to model the alternative water servicing strategies, for the Bolton Residential Expansion Study (BRES) to support residential growth post 2021. The focus of this analysis is on Option 1 and Option 3 growth areas, which were carried forward following the high level screening process undertaken in Phases 1 and 2 of the study.

This infrastructure study has drawn on both historical and recent studies and resources including the following:

- 2013 Water and Wastewater Master Plan (BluePlan & AECOM, Mar 2014)
- North Bolton Elevated Tank and Feedermain Environmental Study Report (AECOM, Oct 2011)
- Water and Wastewater Servicing Plan for the South Albion-Bolton Community Plan Employment Land and North Hill Supermarket Areas (AECOM, Mar 2010)
- Bolton Urban Community Water and Wastewater Analysis (AECOM, Mar 2010)

Objectives

The objective of the hydraulic water modelling analysis was to identify alternatives for servicing the preferred growth option and select a strategy that considers the following key aspects of servicing impacts including:

- Impact of existing level of service
- Impact on water quality
- Provision of security of supply
- System redundancy
- Flexibility of servicing
- Complexity and cost of infrastructure upgrades
- Opportunity to support long term servicing of other growth areas

The technical information contained herein is intended to support the decision making process for the evaluation and selection of the preferred growth option (Option 1 or Option 3).



Water Demand Criteria and Forecasts

The BRES hydraulic water modelling analysis utilized the Region of Peel Master Plan water criteria to estimate future demands within the study area. The Master Plan Water Demand Criteria is summarized in Table 1 below.

Table 1. Region of Peel Master Plan Water Demand Criteria

DESIGN CRITERIA					
	Res Avg Day Demand Criteria	280	L/cap/d		
Residential	Max Day Peak Factor (MDF)	2.0			
	Peak Hour Factor (PHF)	3.0			
Non-Residential	Non-Res Avg Day Demand Criteria	280	L/emp/d		
	Max Day Peak Factor (MDF)	1.4			
	Peak Hour Factor (PHF)	3.0			

Using the criteria in Table 1, the average day demand (ADD), maximum day demand (MDD), peak hour demand (PHD), and maximum day plus fire demands were determined for the BRES service area. These water demands are summarized in Table 2.

Table 2. BRES Planning and Water Demand Estimates

BRES Land Use	Area (Ha)	Population (persons) ¹	ADD (L/s)	MDD (L/s)	PHD (L/s)	Fire Flow (L/s)
Residential	-	10,348	33.5	67.1	100.6	
Employment	-	2,635	8.5	12.0	25.6	
Total	190	12,983	42.1	79.0	126.2	220.0
¹ Per direction received from Town of Caledon Council.						

Theoretical demands were also determined for the three (3) rounding out areas using the same approach and are summarized in Table 3.

Table 3. Theoretical Population and Water Demand Estimates for Rounding Out Areas

Rounding Out Area	Area (Ha)	Population (persons) ¹	ADD (L/s)	MDD (L/s)	PHD (L/s)
ROA1	18	1759	7.29	14.57	21.86
ROA2	6	775	2.89	5.78	8.66
ROA3	7	614	2.60	5.20	7.81

¹ Population estimates for rounding out areas based on available land area and density assumptions, provided by Meridian Planning, and are included in the total BRES population forecast of 10,348.



Service Levels

To ensure an adequate level of service to the local distribution system, the size of watermains were determined based on Region of Peel standards and practices. Minimum watermain sizes are as follows:

- 150 mm diameter watermain for main lines in residential areas; 50 mm diameter watermains are allowed in cul-de-sacs and shall be looped back to the main line;
- 300 mm diameter watermain for main lines servicing schools and high density residential areas;
- 300 mm diameter watermain for main lines servicing industrial/commercial/institutional areas.

As per MOE Guidelines, the water system is to be designed based on maximum day demands with consideration to fire flow and peak hour demand requirements.

Operating pressures within the distribution system are as follows:

- Minimum of 40 psi (275 kPa) and a maximum operating pressure of 100 psi (690 kPa) shall be maintained within the distribution system under maximum day conditions
- A minimum operating pressure of 40 psi shall be maintained under peak hour demand
- Under fire flow conditions, it is permissible to have pressure drop to a minimum of 20 psi (140 kPa).

Water Modelling Analysis

The water modelling analysis was carried out using the Peel Region 2013 Master Plan water model. Existing demands in the model were allocated mainly based on water billing data. Future water demands within the model were allocated based on SGU planning forecasts and Region of Peel Master Plan water demand criteria.

Water Modelling Scenarios

Various water modelling scenario were developed as part of the BRES servicing analysis, including:

- Average Day Demand
- Maximum Day Demand
- Peak Hour Demand
- Max Day Plus Fire Demand

Fire flow runs were carried out where necessary for a specific water pressure zone.

Base Model Existing Capacity Analysis

An assessment of capacity in the existing system without the Bolton Residential Expansion provides a baseline to reference existing and future capacities, issues and constraints.

The existing scenario in the Peel hydraulic model was assumed as the 2012 runs for average day, maximum day, and peak hour demand conditions. As seen in Figure 1, under average day, maximum day, and peak hour conditions, pressures throughout Zones 5 and 6 are within 60 to 80 psi, and considered reasonable with minimal fluctuation due to pressure stabilization provided by the Bolton elevated tank.



Future Water Modelling Analysis & Results

For Option 1, the existing Bolton system was reviewed to determine whether it could support transmission and distribution of the additional demands and fire flows to the new service area. It was determined that the existing Zone 6 feedermains in Bolton and servicing the North Hill are not considered adequate for supplying the required maximum day plus fire flows. As such, the Option 1 servicing strategies were modelled using the B.A.R. alignment.

The water modelling undertaken as part of the BRES was carried out using the full pipe Regional water model in InfoWater (Innovyze). Table 4 below summarizes the pumping, storage, and feedermain requirements, as well as crossings and impacts to level of service for each servicing strategy modelled and evaluated.

Table 4. Summary of Water Servicing Strategies and Level of Service Impacts

Option - Strategy	Pumping / Storage Requirements	Feedermain Requirements	Crossings
Option 1 - Strategy 1	Zone 6A/7 BPS, Capacity = 79.0 L/s Zone 6A/7 ET, Capacity =5.1 ML	Coleraine/B.A.R. Diameter = 400 mm Total Length = 6.5 km	Major Crossing of Humber River
Option 1 - Strategy 2	Zone 6A/7 BPS, Capacity = 300 L/s Zone 5 in-ground reservoir, Capacity = 5.1 ML	Innis Lake/B.A.R. Diameter = 600 mm Total Length = 15.9 km	Major Crossing of Humber RiverCrossing of C.P.R.
Option 1 – Strategy 3	Zone 6A/7 BPS, Capacity = 79.0 L/s Zone 6A/7 ET, Capacity =5.1 ML	Innis Lake/B.A.R. Diameter = 400 mm Total Length = 15.9 km	Major Crossing of Humber RiverCrossing of C.P.R.
Option 3 – Strategy 1	Zone 7 BPS, Capacity = 79.0 L/s Zone 7 ET, Capacity =5.1 ML	Coleraine/King/Gore Diameter = 400 mm Total Length = 7.8 km	Crossing of C.P.R.
Option 3 – Strategy 2	Zone 7 BPS, Capacity = 300 L/s Zone 5 in-ground reservoir, Capacity = 5.1 ML	Innis Lake/King/Gore Diameter = 600 mm Total Length = 10.1 km	
Option 3 - Strategy 3	Zone 7 BPS, Capacity = 79.0 L/s Zone 7 ET, Capacity =5.1 ML	Innis Lake/King/Gore Diameter = 400 mm Total Length =13.6 km	

In general, water modelling analyses indicated that system pressures within Option 1 and Option 3 lands were nearly 60 psi under maximum day conditions based on the alternative servicing strategies. This demonstrates that the strategies meet Regional levels of service.

Water modelling analyses indicate that pressures in Rounding Out Area 1, if connected to the existing Zone 6 distribution network, would be near the lower limit of acceptable level of service, at approximately 44 psi. ROA1 is located on higher ground, ranging between 258 m and 265 m in some local spots. As such, ROA1 would best be serviced via the new pressure zone to ensure that service levels are maintained.

Rounding Out Areas 2 and 3 were similar, hovering around 52 psi - 53 psi, assuming connection to the existing Zone 6 distribution system. Pressures to the Rounding Out Areas could be improved by connecting to the new pressure zone system.



Conclusion

The hydraulic modelling analysis carried out helped identify and confirm the sizing of recommended infrastructure to service the potential BRES expansion areas. Results from the modelling analysis show that impacts from the proposed infrastructure to the existing water system are within Regional levels of service. Furthermore, all recommended water infrastructure meets existing Regional design standards and levels of service.



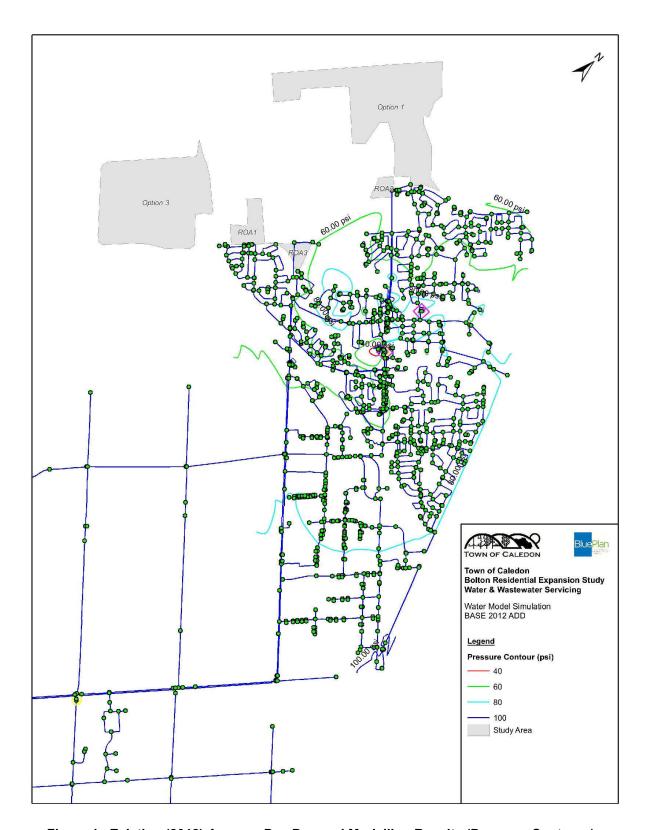


Figure 1. Existing (2012) Average Day Demand Modelling Results (Pressure Contours)



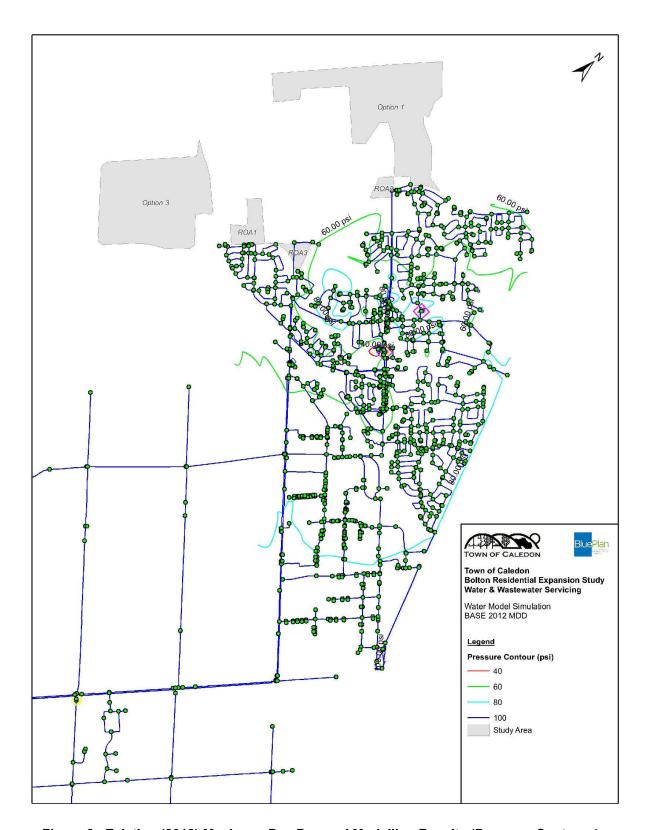


Figure 2. Existing (2012) Maximum Day Demand Modelling Results (Pressure Contours)



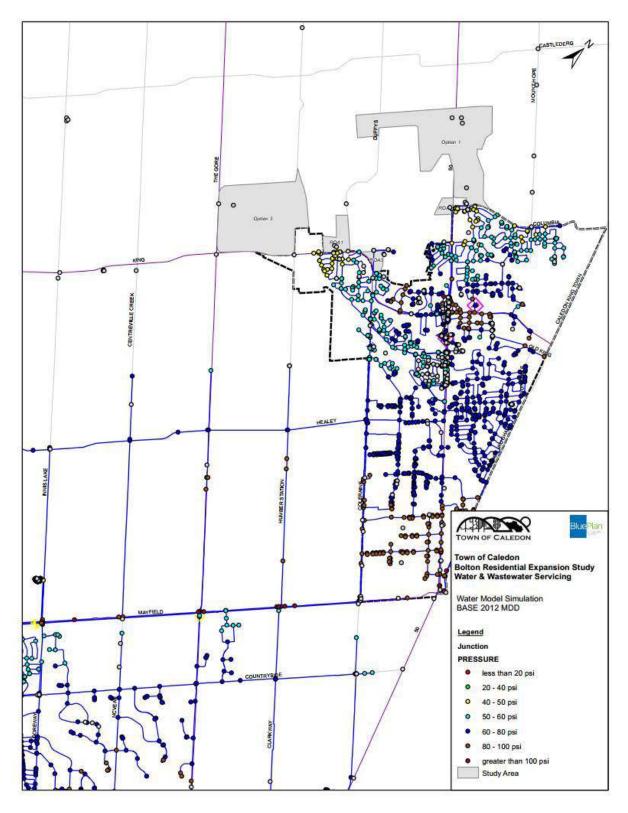


Figure 3. Existing (2012) Maximum Day Demand Modelling Results (Nodal Pressures)



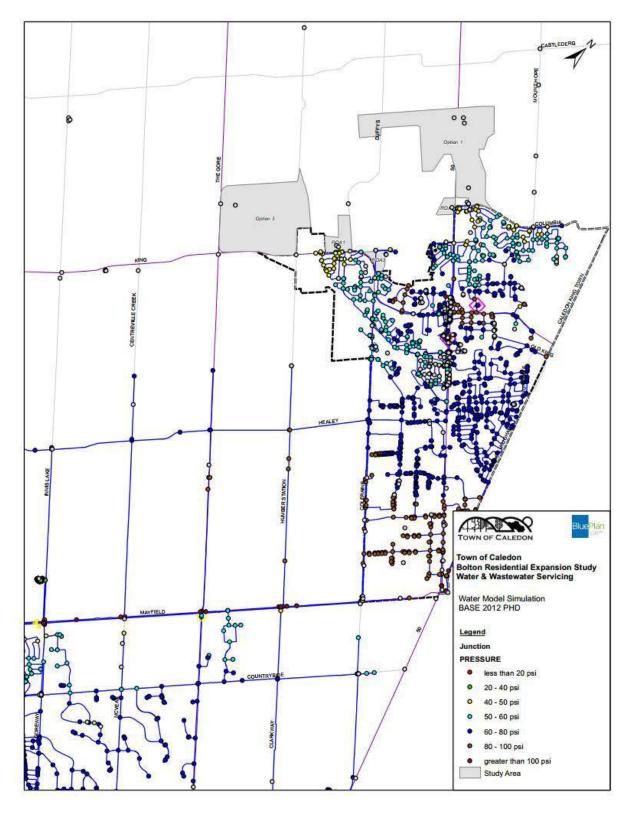


Figure 4. Existing (2012) Maximum Day Demand Modelling Results (Nodal Pressures)



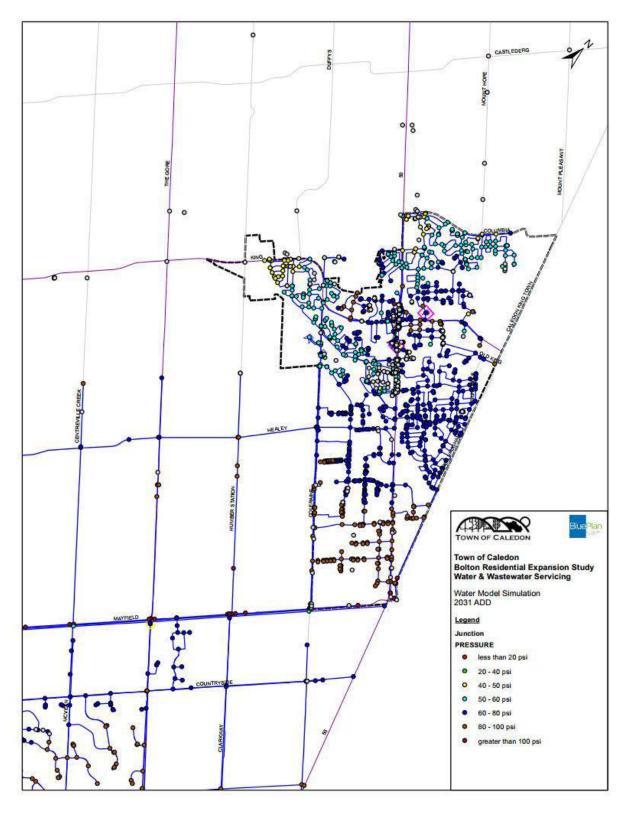


Figure 5. 2031 Average Day Demand Modelling Results (Nodal Pressures)



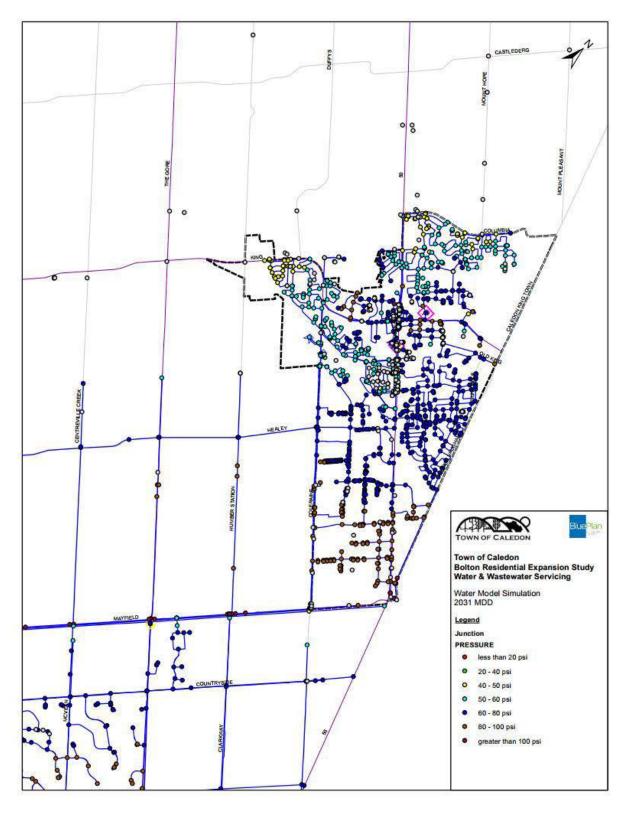


Figure 6. 2031 Maximum Day Demand Modelling Results (Nodal Pressures)



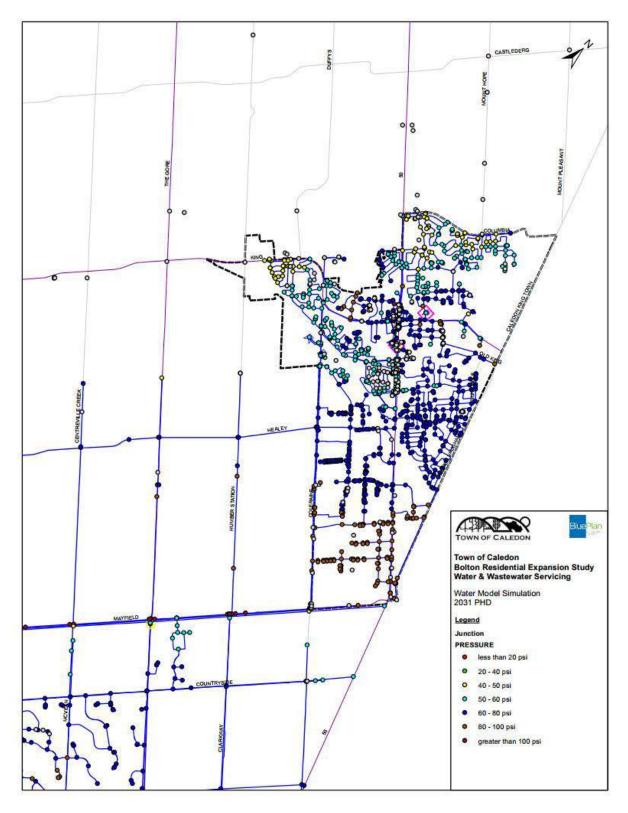


Figure 7. 2031 Peak Hour Demand Modelling Results (Nodal Pressures)



Option 1 – Strategy 2: Supply from Tullamore Zone 6 Pumping Station, via Mayfield Road and Coleraine Drive to a new pumping station at approximately Chickadee Lane and Glasgow Road, storage provided by an elevated tank to service Option 1 lands.

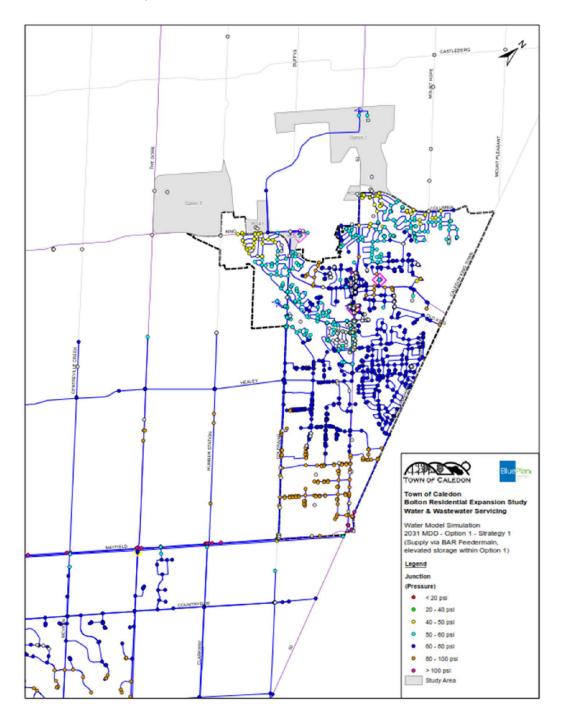


Figure 8. Option 1 – Strategy 1 Modelling Results (Nodal Pressures)



Option 1 – Strategy 2: Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street east of Innis Lake Road, pumped storage provided by in-ground Zone 5 reservoir to service Option 1 lands.

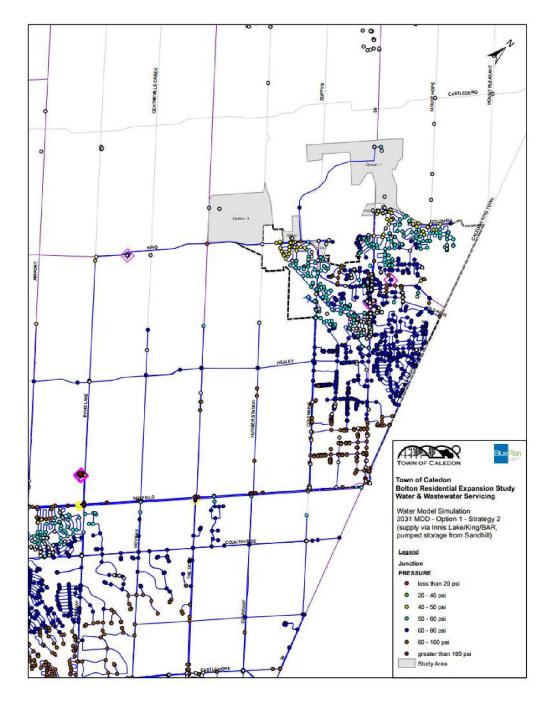


Figure 9. Option 1 – Strategy 2 Modelling Results (Nodal Pressures)



Option 1 – Strategy 3: Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street east of Innis Lake Road, pumped storage provided by in-ground Zone 5 reservoir to service Option 1 lands.

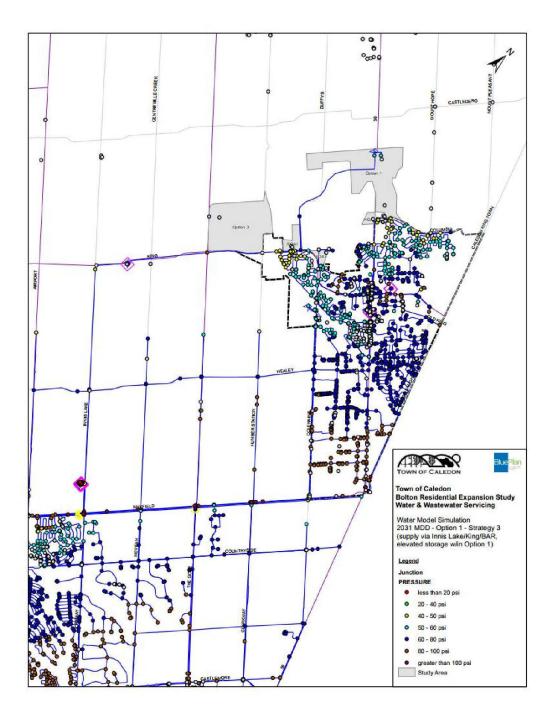


Figure 10. Option 1 – Strategy 3 Modelling Results (Nodal Pressures)



Option 3 – Strategy 1Supply from Tullamore Zone 6 Pumping Station, via Coleraine Drive/Chickadee Lane to the new booster pumping station to service Option 3, with floating storage provided by an elevated tank located outside Option 3 lands.

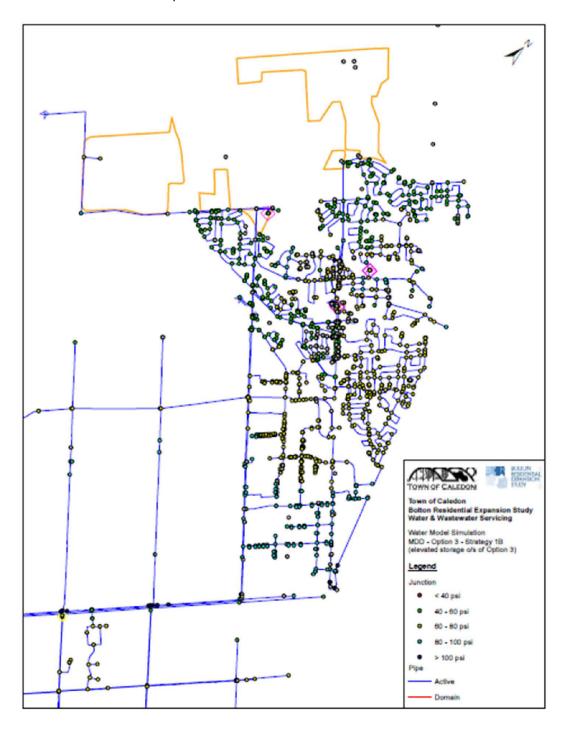


Figure 11. Option 3 – Strategy 1 Modelling Results (Nodal Pressures)



Option 3 – Strategy 2 – Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street, pumped storage provided by in-ground Zone 5 reservoir to service Option 3 lands.

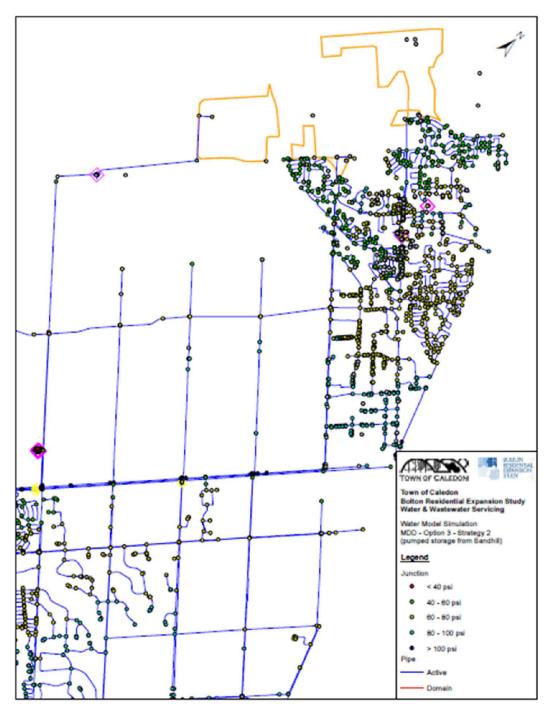


Figure 12. Option 3 – Strategy 2 Modelling Results (Nodal Pressures)



Appendix B - Wastewater Modelling Technical Memorandum



Memorandum

Organization	n: The Town of Caledon	BluePlan Project No: C001-0021
Attention:	File	Date: June 18, 2014
Project:	Bolton Residential Expansion Study	
RE:	Hydraulic Wastewater Modelling Analysis	

Introduction

This technical memorandum presents the hydraulic analysis carried out for the Bolton wastewater collection system as part of the Bolton Residential Expansion Study (BRES), including the methodology and assumptions utilized. The focus of this analysis is on Option 1 and Option 3 growth areas, which were carried forward following the high level screening process undertaken in Phases 1 and 2 of the study.

This infrastructure study has drawn on both historical and recent studies and resources including:

- 2013 Water and Wastewater Master Plan (BluePlan & AECOM, Mar 2014)
- Water and Wastewater Servicing Plan for the South Albion-Bolton Community Plan Employment Land and North Hill Supermarket Areas (AECOM, Mar 2010)
- Bolton Urban Community Water and Wastewater Analysis (AECOM, Mar 2010)

Objectives

The objective of the hydraulic wastewater modelling analysis was to identify alternatives for servicing the preferred growth option and select a strategy that considers the following key aspects of servicing impacts including:

- Existing system conditions
- Flexibility of servicing
- Complexity and cost of infrastructure upgrades
- Opportunity to support long term servicing of other growth areas

The technical information contained herein is intended to support the decision making process for the evaluation and selection of the preferred growth option (Option 1 or Option 3).

Wastewater Flow Criteria and Forecasts

The BRES utilized the wastewater criteria summarized in Table 1 below to estimate future wastewater flows within the expansion area(s).

Table 1. BRES Wastewater Criteria

DESIGN CRITERIA					
Residential Avg Day Wastewater Generation Criteria 300 L/cap/d					
Employment Avg Day Wastewater Generation Criteria	300	L/cap/d			
Peaking Factor	Harmon				
Inflow and Infiltration Allowance	0.2	L/s/ha			



The theoretical average dry weather flow (DWF), peak dry weather flow (PDWF), and peak wet weather flow (PWWF) were determined based on the BRES population and employment and area forecasts provided. The estimated wastewater flows are summarized in Table 2.

Table 2. BRES Wastewater Average DWF Estimates

BRES Land Use	Area (Ha)	Population (persons) ¹	Average DWF (L/s)	Peak DWF (L/s)	Peak WWF (L/s)
Residential	-	10,348	35.9		
Employment	-	2,635	9.1		
Total	190	12,983	45.1	128.1	166.1
¹ Per direction receiv	ed from Town o				

Theoretical average DWF, peak DWF, and peak WWF for the three ROAs were also calculated based on approximate population and areas and the same criteria, and are summarized in Table 3.

Table 3. Wastewater Flow Estimates for Rounding Out Areas

Rounding Out Area	Area (Ha)	Population (persons) ¹	Average DWF (L/s)	Peak DWF (L/s)	Peak WWF (L/s)
ROA1	18	1759	6.11	22.16	26.00
ROA2	6	775	2.69	10.41	12.00
ROA3	7	614	2.13	8.37	10.00

¹ Population estimates for rounding out areas based on available land area and density assumptions, provided by Meridian Planning, and are included in the total BRES population forecast of 10,348.

Triggers and Performance Criteria

Establishing hydraulic performance criteria is required in determining the need and scope of upgrades required to service future growth within the existing system. Assessing the impact of growth on the existing collection system was undertaken in accordance with the Region of Peel Water and Wastewater Master Plan approach. Triggers for a linear project are based on the following criteria:

- Pipe is surcharged
- Maximum water level is within 1.8 meters of ground level, indicating the potential for basement flooding
- Design storm event

The trigger for a sewage pumping station is based on exceeding the firm capacity of the station. The firm capacity of a pumping station is defined as the sum of all pump capacities (total installed), minus the largest pump capacity.

Any new local pumping station(s) would need to be sized to convey peak wet weather flows (sum of peak flows plus extraneous flows) generated by the total equivalent population tributary to the new pumping station.

Wastewater Modelling Analysis

For the wastewater hydraulic analysis, the Region of Peel's all-pipe model (built in InfoWorks CS and calibrated in 2007) was utilized as the key modelling tool. This model has been updated by the Region of Peel based on new findings and survey data. However, the model has not been re-calibrated since it was originally developed. All of the analysis carried out as part of this project was undertaken using the BRES planning projections provided.



The InfoWorks CS model was calibrated using RTK parameters in conjunction with the Ground Infiltration Module (GIM). The design storm used is a 12 hour SCS Type II Distribution design storm using a 1 in 5 year return period.

The Region of Peel Master Plan utilized the Region's trunk sewer model, built in InfoWorks CS and calibrated in 2010. It should be noted that the Master Plan used a 1 in 5 year AES design storm, while the BRES analysis was undertaken using an all-pipe model that uses a 1 in 5 year SCS Type II design storm. The SCS Type II design storm has a higher peak intensity, which is determined to be applicable for this capacity analysis.

To ensure the validity of the model, flows in the all-pipe model were compared to the more recently calibrated trunk sewer model, as well as to theoretical flows from the Region of Peel Master Plan (2013). Based on this comparison, the all-pipe model was considered the most appropriate model to utilize for the BRES wastewater servicing analysis.

The results also show that the I/I in the calibrated models is significantly higher than the I/I calculated from the design standards, which suggests that 0.2 L/s/ha underestimates extraneous flow in this area.

Base Model Update

An extract of the all-pipe model was taken for the Caledon servicing area. The model was given a free outfall a short distance downstream of McVean SPS, as there was no possibility of flows downstream of McVean SPS hydraulically impacting on the service area that was being analyzed. Reducing the model file size helped speed up the performance of the model so that results could be obtained for a variety of different scenarios.

A thorough review of the subcatchments within the Bolton service area was undertaken. Further updates to the model were carried out to resolve issues in the model that would affect the results of the analysis, largely due to connectivity and level errors. These changes were performed upon agreement with the Region.

Furthermore, a portion of the existing catchment was designated to be re-routed to drain to the Albion-Vaughan Trunk Sewer, in accordance with the current Regional servicing strategy. Therefore, limited flow from the Bolton SPS reaches the Coleraine Trunk Sewer in the future scenarios. The servicing strategy requires diverting flows from two local pumping stations to the Albion-Vaughan Trunk Sewer via gravity connections.

As part of the diversion strategy, the sewer to the west of Landsbridge Street along Queensgate Boulevard will be disconnected, such that all flow will be carried down Landsbridge Street along the existing 675mm diameter sewer to connect to the Albion-Vaughan Trunk Sewer.

The estimated population, area, and flows for the diverted catchment area were compared against the allpipe model and theoretical calculations based on SGU population and design criteria, and this comparison was shown to correlate relatively well.

Assessment of Existing Wastewater Servicing Capacity

An assessment of capacity in the existing system (with and without any development flows) provides a baseline reference to determine the amount of additional flow that could be accommodated under a 1 in 5 year design storm, and identifies infrastructure that would require upgrades.



Bolton SPS

According to the Certificate of Approval (C of A) for the Bolton SPS, the firm capacity of the pumping station is 380 L/s.

Existing peak flows entering the Bolton SPS were modelled under a 1 in 5 year design storm to determine the available capacity for additional flows.

Upstream of Bolton SPS

There are three primary twinning routes in the North Hill area of Bolton along which the BRES development flow can be conveyed to the Bolton SPS. From review of the potential existing sewers that could receive flows from Option 1, there is no single sewer route or combination of routes that could accommodate the entire 166 L/s required for the Option 1 lands, under a 1 in 5 year design storm. The sewer routes that could potentially convey Option 1 flows are shown in Figure 1.

Downstream of Bolton SPS

For Option 1, downstream of the Bolton SPS, the existing sewers leading to the Coleraine Trunk Sewer and leading to the future decommissioned Albion-Vaughan Pumping SPS cannot accommodate the entire 166 L/s required for the Option 1 lands. As such, it was determined that diversion of additional flows from the Bolton SPS to the east side of Bolton would be required, and a new proposed forcemain to Nunnville Road was modelled.

Coleraine Drive Trunk Sewer

Similarly, the existing Coleraine Trunk Sewer cannot accommodate the entire 166 L/s required for the Option 3 lands. As such, twinning of the Coleraine Trunk Sewer would be necessary from the rail line to north of George Bolton Parkway. However, as a result of the diversion strategy redirecting flows towards the new Albion-Vaughan Trunk sewer on the east side of Bolton, there is available capacity on Coleraine Drive south of McEwen Drive even with the additional flow from the Option 3 lands.

When the initial simulations were performed, it was found that after point loading the 166 L/s inflow from the BRES development area into the existing trunk sewer along Coleraine Drive, surcharging occurred on Coleraine Drive, between Harvest Moon Drive and McEwan Drive. There is a 900 m long stretch of existing sewer along this section where the gradient flattens out and the flow transitions from supercritical to subcritical flow, resulting in a hydraulic jump. This is shown in Figure 2 and Figure 3.

Albion Vaughan Trunk Sewer

The future Nunnville Road sewer and Albion-Vaughan Trunk Sewer, down to the connection point with the Coleraine Trunk Sewer, have sufficient capacity to accommodate the full Option 1 flows. As such, the new proposed forcemain from the Bolton SPS to Nunnville Road has been sized to convey all of Option 1 flows.

BRES Modelling Scenarios

Multiple scenarios were developed to assess servicing strategies for the two BRES growth options, including existing and future conditions under a 1 in 5 year design storm. The alternative wastewater servicing strategies analyzed under the BRES are further described in the BRES Infrastructure Study Report.

Thematic maps showing modelling outputs of d/D with the BRES inflow added, both before and after upgrades are provided at the back of this technical memorandum.



Levels of surcharge in the network are as follows:

- < 0.25
- 0.25-0.50
- 0.50-0.85
- => 1.00 (Surcharged by depth back water conditions)
- => 2.00 (Surcharge by flow capacity)

Conclusion

The wastewater modelling analysis carried out identified and confirmed the sizing of recommended infrastructure to service the potential BRES expansion areas. As such, all recommended wastewater infrastructure meets existing Regional design standards and levels of service.



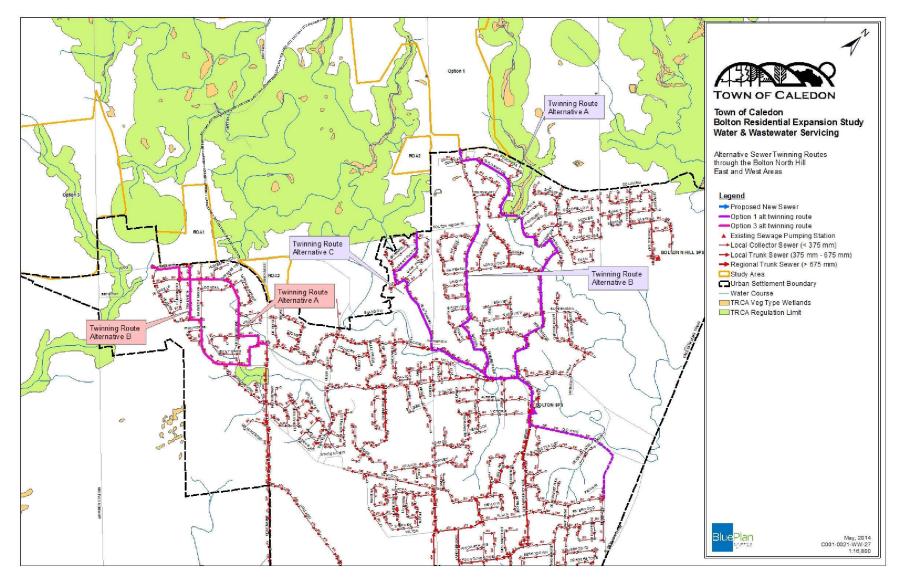


Figure 1. Alternative Sewer Twinning Routes for Conveying Option 1 or Option 3 lands



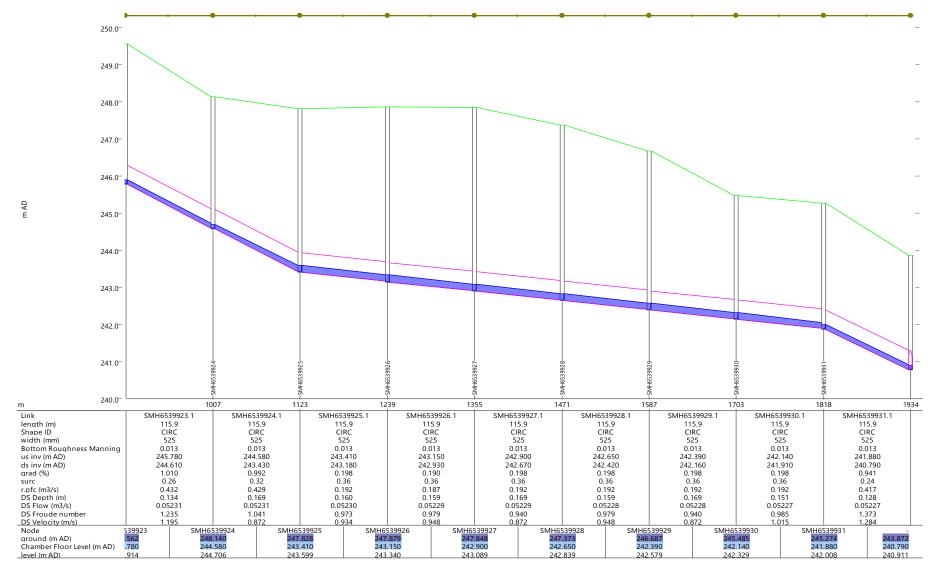


Figure 2. HGL along surcharged section of existing Coleraine trunk sewer without BRES flows



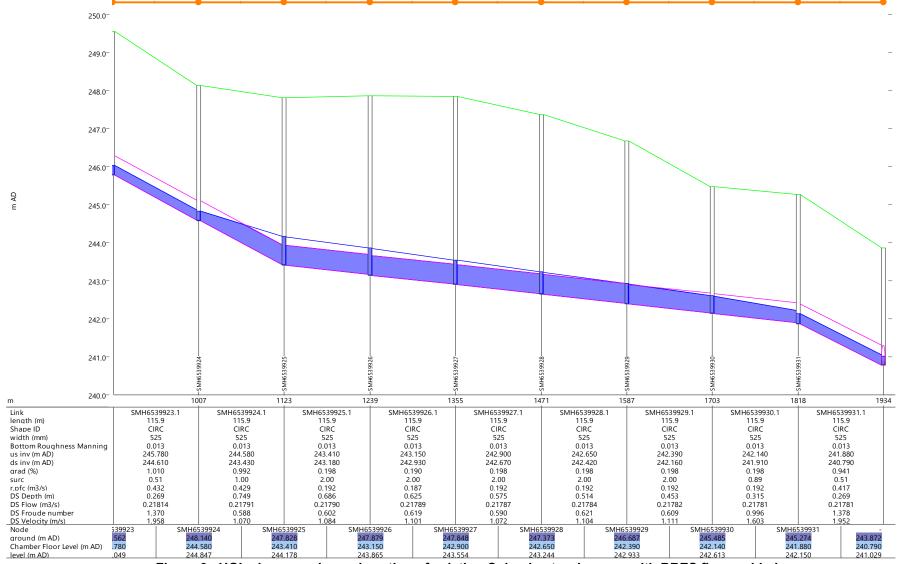
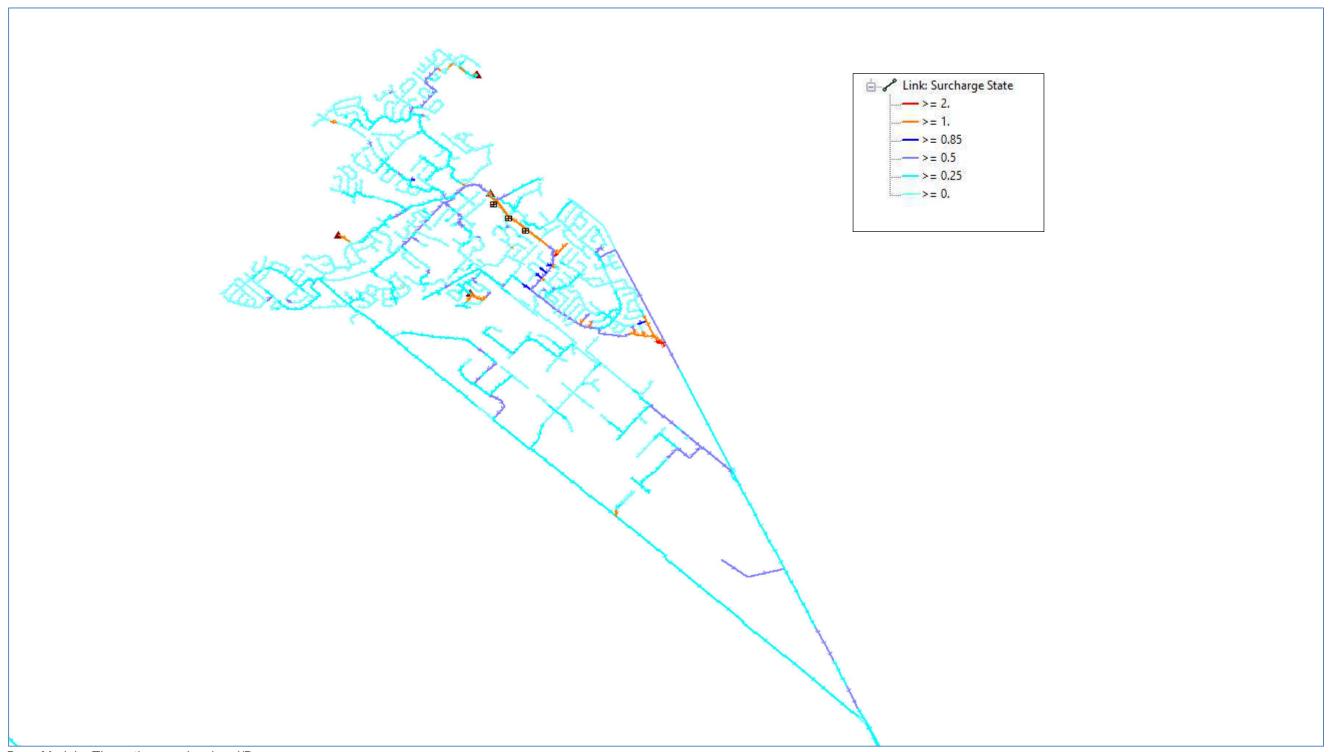


Figure 3. HGL along surcharged section of existing Coleraine trunk sewer with BRES flows added



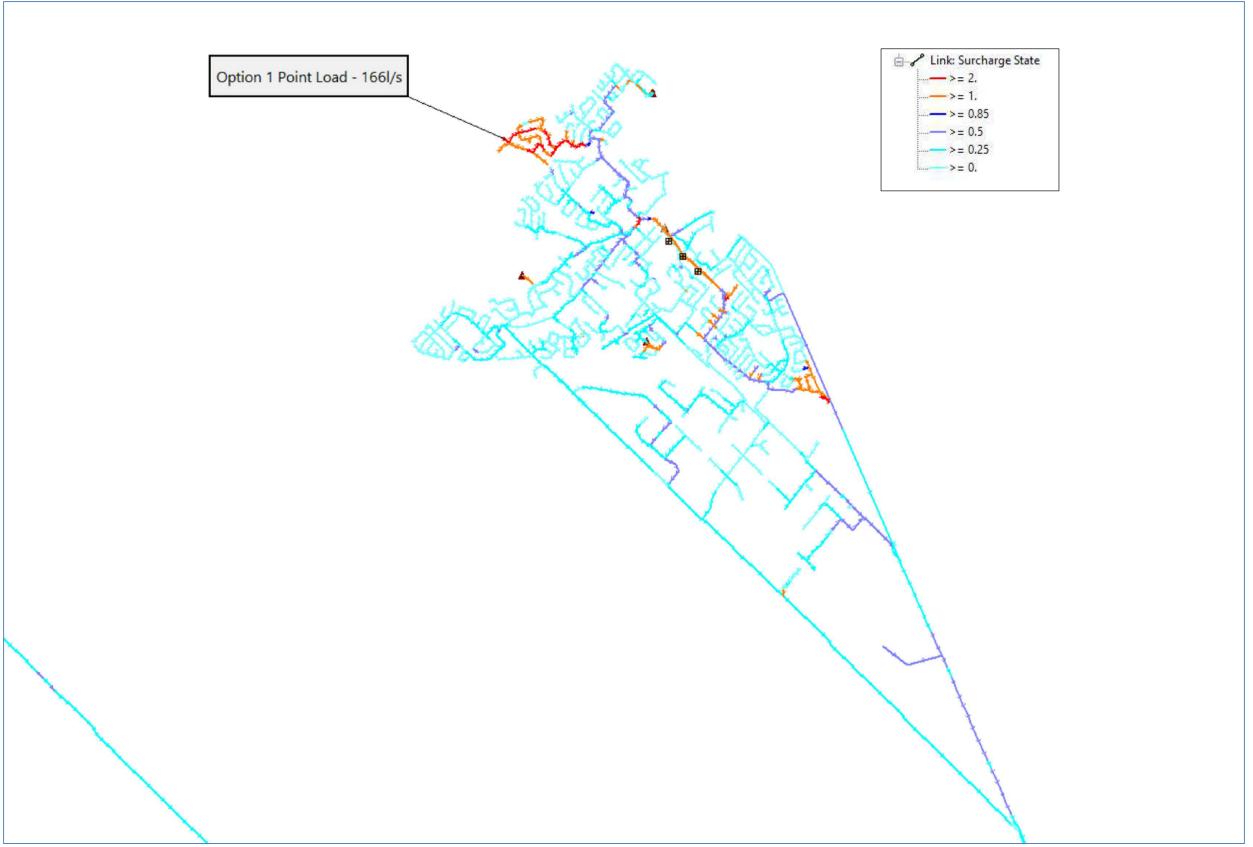
Wastewater Modelling Mapping





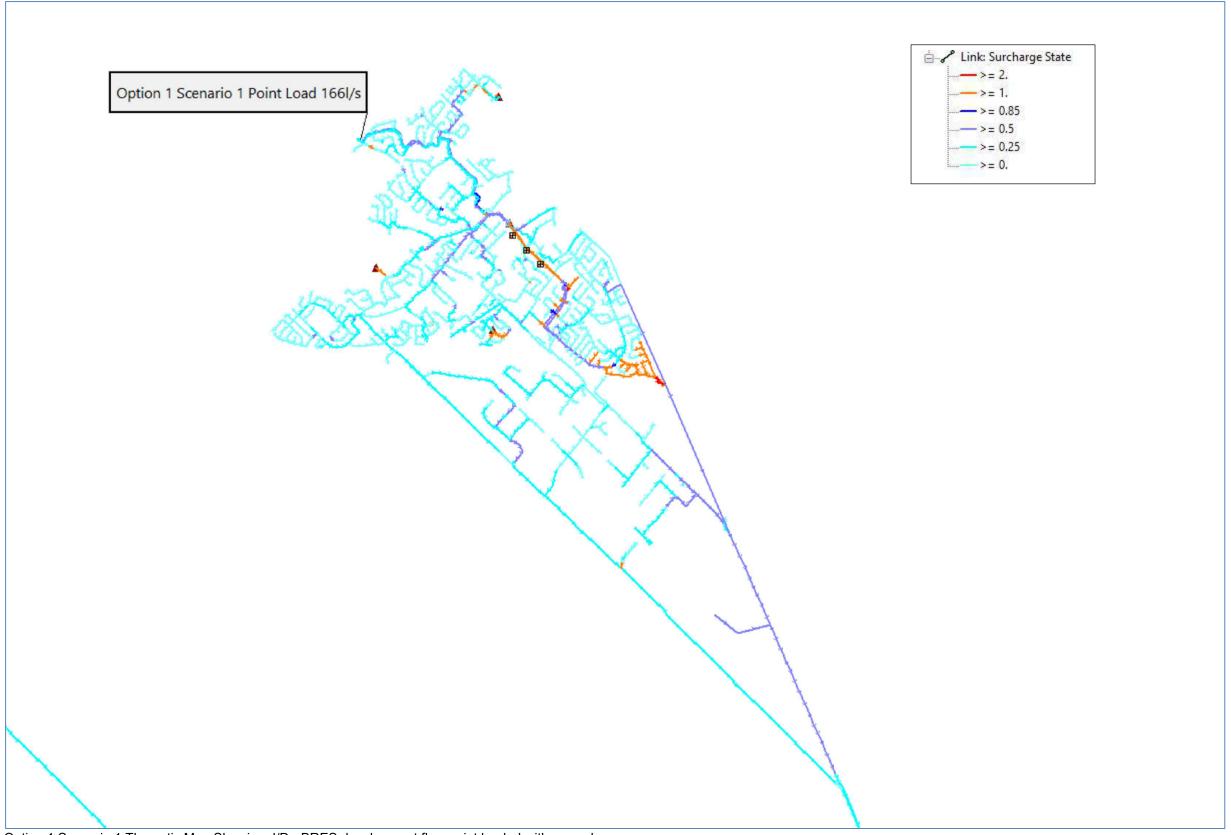
Base Model – Thematic map showing d/D





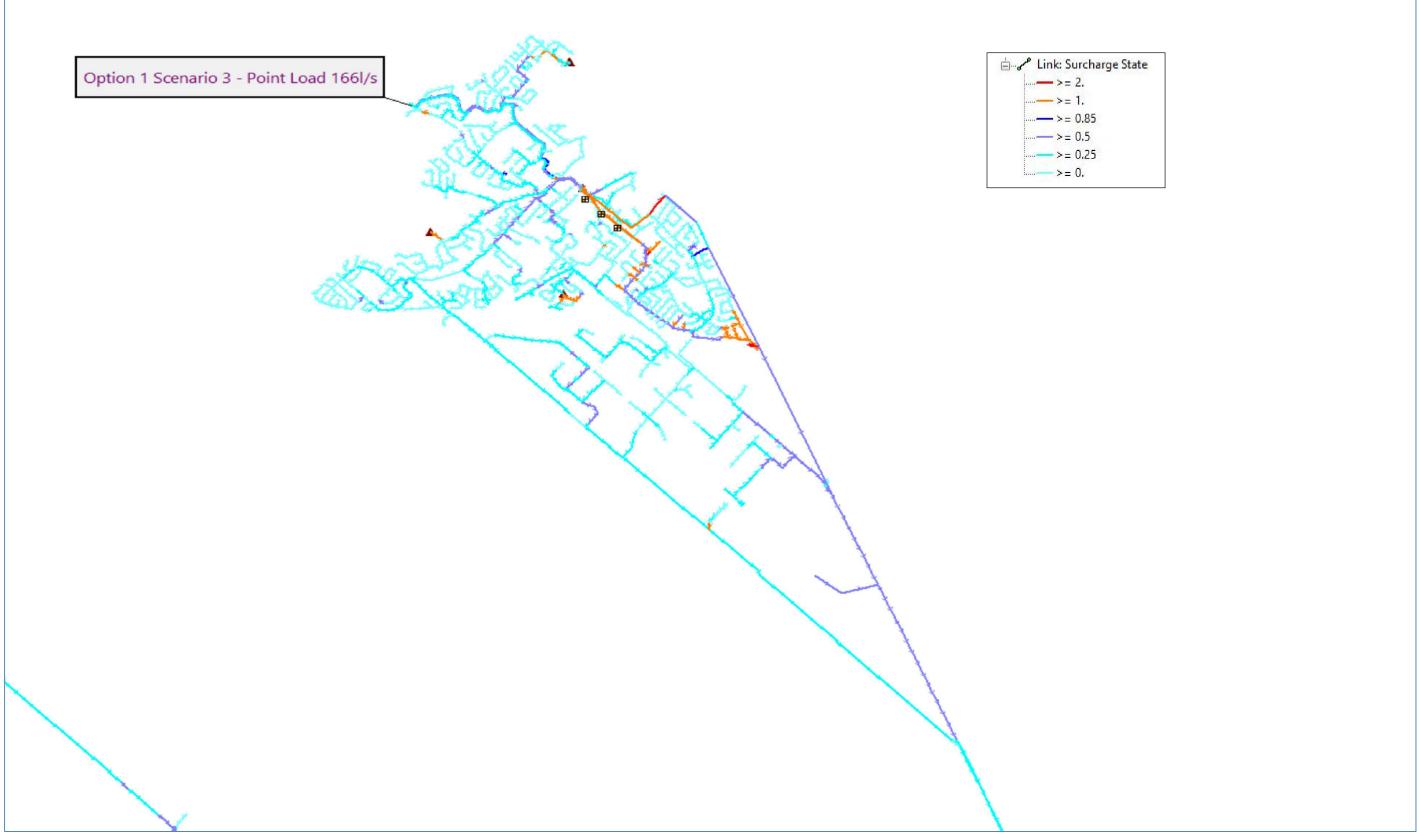
Option 1 Thematic Map Showing d/D – BRES Development Flow Point Loaded – No Upgrades





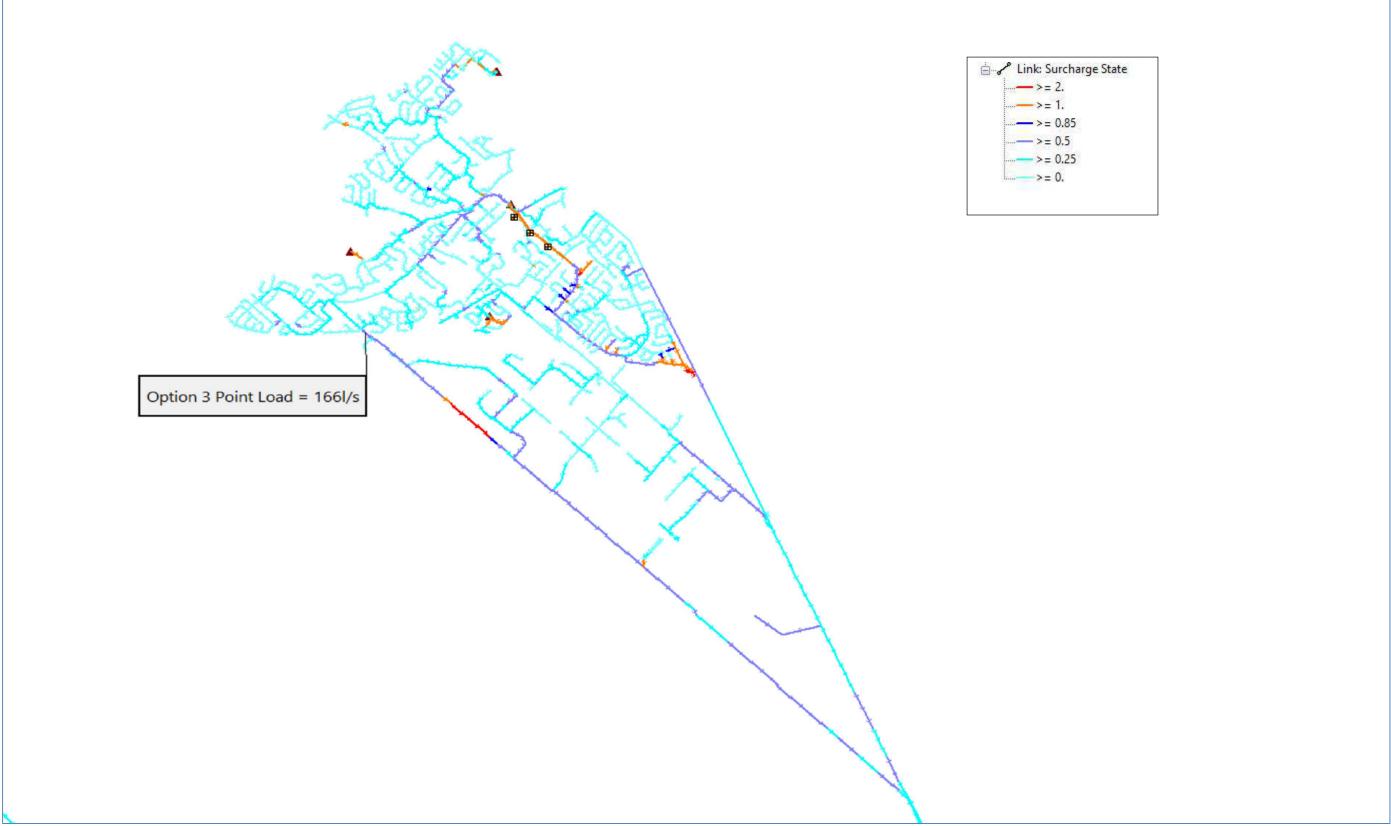
Option 1 Scenario 1 Thematic Map Showing d/D - BRES development flow point loaded with upgrades





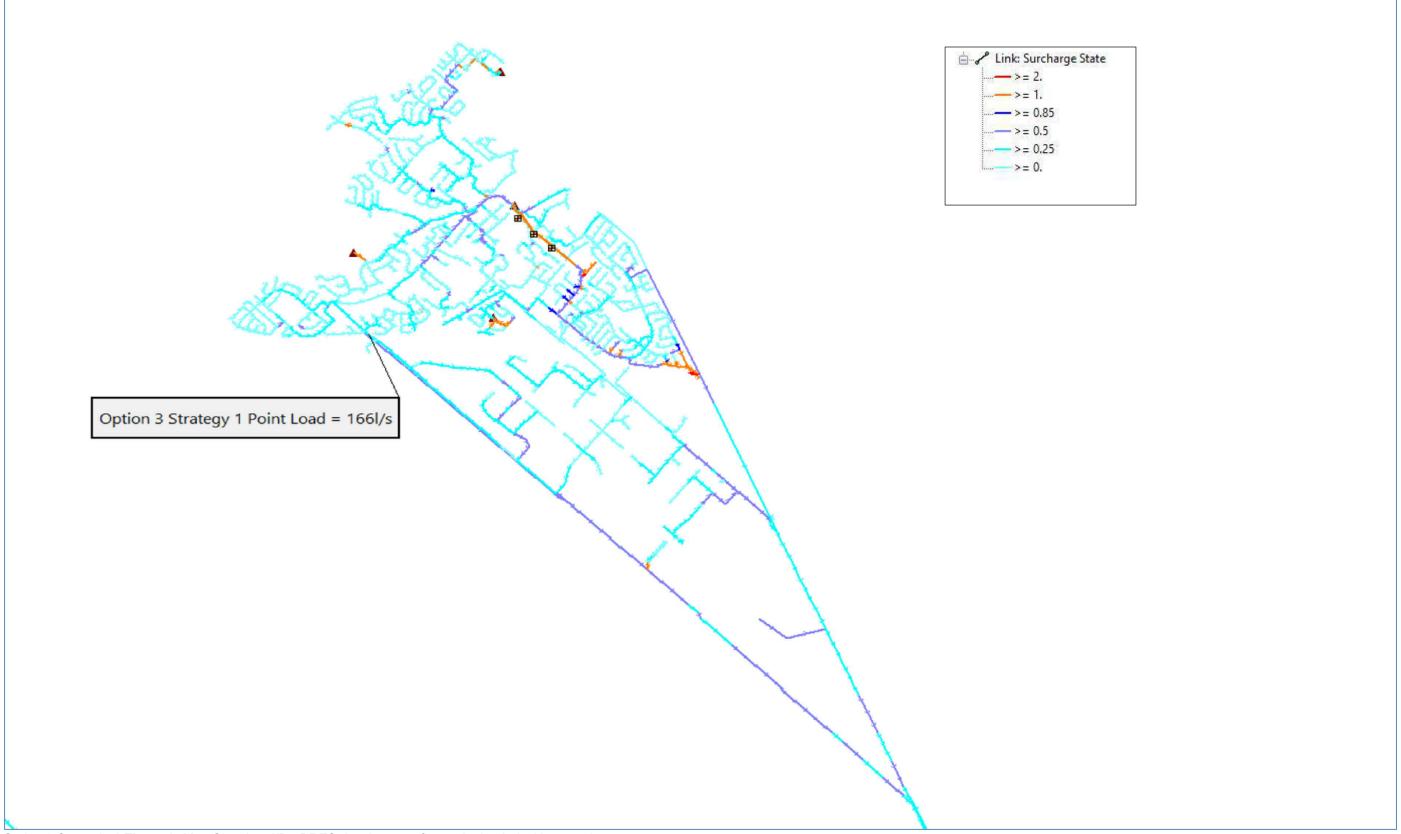
Option 1 Scenario 3 Thematic Map Showing d/D - BRES development flow point loaded with upgrades





Option 1 Thematic Map Showing d/D – BRES Development Flow Point Loaded – No Upgrades





Option 3 Scenario 1 Thematic Map Showing d/D - BRES development flow point loaded with upgrades







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Memorandum

Organization:	The Town of Caledon	BluePlan Project No: C001-0021
Attention:	File	Date: June 16, 2014
Project:	Bolton Residential Expansion Study	
RE:	Unit Costs for Water & Wastewater Servicing	

Introduction

This technical memorandum summarizes the methodology and assumptions utilized to derive the costs for the Bolton Residential Expansion Study (BRES) water and wastewater servicing strategies. Costs were derived in 2013 dollars. It should be noted that these costs reflect BRES trunk infrastructure only and do not include internal servicing. The costs also do not include trunk infrastructure related to the Region of Peel Master Servicing Plan and Development Charge Programs. As such, the infrastructure is not currently carried in the Region capital plan.

Base Costs

Base costs for linear infrastructure were calculated based on length and unit cost. Unit costs varied based on diameter, depth of installation (for sewers), and nature of crossing. Vertical infrastructure such as pumping stations, elevated tanks, and reservoirs were calculated based on capacity (L/s) and or volume (ML or m³).

Construction Uplift

An uplift to the total base cost was applied for projects where constructability challenges were foreseeable due to physical or environmental constraints.

Urban Uplift

An uplift was applied to the base cost for projects in built-up areas. Depending on the existing land use, and proximity to residential / downtown areas, the uplift varied from 25% to 100%.

Crossings

An additional lump sum was added to the base cost for any crossings, including minor creeks, Regional Roads, railways, major creeks, and trenchless crossings.

Construction Sub-Total

The Construction Sub-Total was based on the sum of: Base Cost + Construction Uplift + Urban Uplift + Valves + Crossings.

Construction Contingency

Construction Contingency was based on proximity to environmental crossings, etc.



Construction Total

Construction Total was based on the sum of Construction Sub-Total + Construction Contingency.

Geotechnical / Hydrogeological

A factor of 2% of the Total Construction Cost was applied as the Geotechnical / Hydrogeological component.

Property / Easement Acquisition

Property / Easement Acquisition was determined based on an approximation of land value in Bolton. A value of \$278,000 per hectare was utilized. A 30 m width is used for the easements required.

Additional Costs

Additional Costs represent the sum of construction uplift, urban uplift, valves, crossings, construction contingency, geotechnical/hydrogeological and property/easements.

Sub-Total Cost

The Sub-Total Cost represents the sum of the base cost and additional costs.

Engineering / Contingency

A value of 35% is utilized for Engineering / Contingency. This is further comprised of: 15% Consulting Engineering, 10% for In-House Fees, and 10% for Project Contingency.

Non-Refundable HST

Non-Refundable HST is calculated as 1.76% of the sum of the Sub-Total Cost, Consulting Engineering, and Project Contingency costs.

Total Estimated Cost

The Total Estimated Cost is the sum of the Sub-Total Cost, Engineering / Contingency, and the Non-Refundable HST.



Summary of Costing Categories:

- Base Cost:
 - Linear = Unit Cost * Length
 - Vertical = Unit Cost * Capacity/Volume
- Construction Uplift = % Uplift * Base Cost
- Urban Uplift = % Uplift * Base Cost
- Crossings = Minor Creeks + Regional Road/Rail + Major Creek + Trenchless
- Construction Sub-Total = Base + Construction Uplift + Urban Uplift + Valves + Crossings
- Construction Contingency = % Contingency * Construction Sub-total
- Construction Total = Construction Sub-Total + Construction Contingency
- Geotechnical / Hydrogeological = % Geo/Hydro * Total Construction
- Property / Easement Acquisition = \$ value
- Additional Costs = Construction Uplift + Urban Uplift + Valves + Crossings + Construction Contingency + Geotech/HydroG + Property/Easement
- Sub-Total = Base + Additional Costs
- Engineering / Contingency = 35% of Sub-Total
 - Consulting Engineering = 15% of Sub-Total
 - In-House Fees = 10% of Sub-Total
 - Project Contingency = 10% of Sub-Total
- Non-Refundable HST = 1.76% of (Sub-Total + Consulting Engineering + Project Contingency)
- Total Estimated Cost = Sub-Total + Engineering / Contingency + HST

^{**} Assume trenchless or open cut for base cost (i.e. base cost = open cut cost + trenchless cost)



BOLTON RESIDENTIAL EXPANSION STUDY WATER / WASTEWATER VERTICAL UNIT COSTS

Vertical Unit Costs Water / Wastewater

Water

Facility	Cost 2013\$	Unit
New Pumping Station (Greenfield)	\$48,000	per L/s
Pumping Station Upgrade	\$12,000	per L/s
Elevated Tank	\$1,000,000	per ML
In-Ground / Partially In-Ground Reservoir	\$1,000,000	per ML

Wastewater

Facility	Cost 2013\$	Unit
New Pumping Station (Greenfield)	\$48,000	per L/s
Pumping Station Upgrade	\$12,000	per L/s
Offline Storage Tank	\$2,000	per m3

General

Facility	Cost 2013\$	Unit	
Property Acquisition	\$278,000	per ha	
Extra Factor (Rock Excavation)	\$433	per MLD	



Water Linear Unit Costs

Water Pipes

Inflation 0.00%

Pipe Diameter	Cost 2012\$	Cost 2013\$
(mm)		
250	\$916	\$916
300	\$1,018	\$1,018
400	\$1,131	\$1,131
450	\$1,260	\$1,260
500	\$1,434	\$1,434
600	\$1,584	\$1,584
750	\$1,835	\$1,835
900	\$2,176	\$2,176
1050	\$2,548	\$2,548
1200	\$3,961	\$3,961
1350	\$4,500	\$4,500
1500	\$5,383	\$5,383
1650	\$6,034	\$6,034
1800	\$7,083	\$7,083
2100	\$7,715	\$7,715
2400	\$8,191	\$8,191

Valves

Inflation 0%

Diameter (mm)	Cost 2012\$	Cost 2013\$	Spacing
250	27,703	\$27,703	300
300	30,781	\$30,781	300
400	34,201	\$34,201	300
450	36,565	\$36,565	600
500	41,746	\$41,746	600
600	54,320	\$54,320	600
750	75,595	\$75,595	600
900	80,675	\$80,675	600
1050	107,935	\$107,935	600
1200	138,012	\$138,012	2,000
1350	161,148	\$161,148	2,000
1500	195,550	\$195,550	2,000
1650	223,816	\$223,816	2,000
1800	282,059	\$282,059	2,000
2100	327,728	\$327,728	2,000
2400	373,396	\$373,396	2,000

Trenchless Crossings, all include a valve at each side of crossing

For Creeks & Trans Canada For Regional Roads, Rail and Hydro Corridors

BOLTON RESIDENTIAL EXPANSION STUDY

WATER LINEAR UNIT COSTS

Length =	20
Diameter (mm)	Cost 2013\$
250	\$140,130
300	\$155,700
400	\$173,000
450	\$185,000
500	\$203,000
600	\$243,000
750	\$308,000
900	\$341,000
1050	\$419,000
1200	\$501,000
1350	\$570,000
1500	\$662,000
1650	\$741,000
1800	\$880,000
2100	\$1,017,000
2400	\$1,154,000

Length= 60		
Diameter (mm)	Cost 2013\$	
250	\$308,610	
300	\$342,900	
400	\$381,000	
450	\$408,000	
500	\$442,000	
600	\$512,000	
750	\$623,000	
900	\$701,000	
1050	\$824,000	
1200	\$952,000	
1350	\$1,067,000	
1500	\$1,204,000	
1650	\$1,328,000	
1800	\$1,513,000	
2100	\$1,741,000	
2400	\$1,968,000	

For Freeways, Major Creek Crossings Length= 150

Lengui-	130
Diameter (mm)	Cost 2013\$
250	\$688,500
300	\$765,000
400	\$850,000
450	\$911,000
500	\$979,000
600	\$1,117,000
750	\$1,330,000
900	\$1,511,000
1050	\$1,736,000
1200	\$1,967,000
1350	\$2,183,000
1500	\$2,422,000
1650	\$2,649,000
1800	\$2,936,000
2100	\$3,369,000
2400	\$3,801,000

Trenchless Rates

Inflation 0%

May 15, 2014

Diameter (mm)	Cost 2012\$	Unit Rate 2013\$
250	\$4,220	\$4,220
300	\$4,689	\$4,689
400	\$5,210	\$5,210
450	\$5,588	\$5,588
500	\$5,967	\$5,967
600	\$6,725	\$6,725
750	\$7,861	\$7,861
900	\$8,997	\$8,997
1050	\$10,134	\$10,134
1200	\$11,270	\$11,270
1350	\$12,406	\$12,406
1500	\$13,543	\$13,543
1650	\$14,679	\$14,679
1800	\$15,815	\$15,815
2100	\$18,088	\$18,088
2400	\$20,360	\$20,360

Valve Spacing

Diameter (mm)	Valve Spacing
Diameter (IIIII)	(m)
150	300
200	300
250	300
300	300
400	300
450	600
500	600
600	600
750	600
900	600
1050	600
1200	2000
1350	2000
1500	2000
1650	2000
1800	2000
2100	2000
2400	2000

^{*} Based upon Region of Peel Design Criteria

¹ Taken from MOE maximum spacing

May 15, 2014



Wastewater Linear Unit Costs

Date

Depth 5m		-
Pipe Diameter (mm)	Cost 2013\$	
200	\$0	
250	\$625	= 300 mm costs x 95%
300	\$657	= 375 mm costs x 95%
375	\$692	
450	\$735	
525	\$780	
600	\$865	
675	\$1,086	
750	\$1,190	
825	\$1,239	
900	\$1,517	
975	\$2,349	
1050	\$2,693	
1200	\$3,006	
1350	\$3,383	
1500	\$3,794	
1650	\$4,202	
1800	\$4,742	
2100	\$5,355	
2400	\$6,960	
2000		

Depth 10m	
Pipe	
Diameter	Cost 2013\$
(mm)	
200	\$0.00
250	\$2,111
300	\$2,222
375	\$2,339
450	\$2,394
525	\$2,454
600	\$2,903
675	\$3,191
750	\$3,313
825	\$3,358
900	\$3,720
975	\$3,785
1050	\$4,449
1200	\$4,693
1350	\$5,044
1500	\$5,758
1650	\$6,165
1800	\$6,733
2100	\$7,378
2400	\$8,986
3000	\$11,533
	'

Pipe	
Diameter	Cost 2013\$
(mm)	
150	\$564
200	\$608
250	\$656
300	\$713
350	\$910
400	\$1,072
450	\$1,232
500	\$1,402
600	\$1,784
750	\$1,900
900	\$2,211
1050	\$2,597
1200	\$2,987

Note: Unit rates for sewers include manholes. Assumptions are:

Diameter	Spacing	
375-750	100 m	
825 - 900	125 m	
975 - 3000	150 m	

Taken from MOE Guidelines but compliant with Peel DC

Sewer Trenchless Crossings Assumed Length Stated on table and incldes manhole each side of crossing

For Creeks & Trans Canada Length = 20

Length =	20	
Diameter	Cost 2013\$	
200	\$64,000	
250	\$64,000	
300	\$64,000	
375	\$142,000	
450	\$153,000	
525	\$165,000	
600	\$176,000	
675	\$212,000	
750	\$223,000	
825	\$235,000	
900	\$295,000	
975	\$306,000	
1050	\$332,000	
1200	\$355,000	
1350	\$378,000	
1500	\$400,000	
1650	\$423,000	
1800	\$483,000	
2100	\$528,000	
2400	\$574,000	
3000	\$664,000	

Regional	Roads, Rail and Hydro Corridors
	00

For Regional Roads, Rail and Hydr		
Length = 60		
Diameter	Cost 2013\$	
200	\$108,000	
250	\$108,000	
300	\$108,000	
375	\$343,000	
450	\$377,000	
525	\$411,000	
600	\$445,000	
675	\$504,000	
750	\$538,000	
825	\$572,000	
900	\$655,000	
975	\$689,000	
1050	\$737,000	
1200	\$806,000	
1350	\$874,000	
1500	\$942,000	
1650	\$1,010,000	
1800	\$1,115,000	
2100	\$1,252,000	
2400	\$1,388,000	
3000	\$1 661 000	

or	Freeways,	Maior	Creek	Crossina
٠.	i iccirayo,	major	Olcok	Orossing

For Freeways, Major Creek Cross			
Length = 150			
Diameter	Cost 2013\$		
200	\$207,000		
250	\$207,000		
300	\$207,000		
375	\$795,000		
450	\$880,000		
525	\$965,000		
600	\$1,050,000		
675	\$1,160,000		
750	\$1,245,000		
825	\$1,330,000		
900	\$1,464,000		
975	\$1,550,000		
1050	\$1,649,000		
1200	\$1,820,000		
1350	\$1,990,000		
1500	\$2,161,000		
1650	\$2,331,000		
1800	\$2,539,000		
2100	\$2,879,000		
2400	\$3,220,000	ı	
3000	\$3,902,000		

Forcemain Trenchless Crossings Assumed Length Stated on table and includes valve each side of crossing

For Creeks & Trans Canada			
Length = 20			
Diameter	Cost 2013\$		
150	\$25,000		
200	\$26,000		
250	\$26,000		
300	\$32,000		
350	\$39,000		
400	\$174,000		
450	\$196,000		

For Regional Roads, Rail and Hydro Co For Freeways, Major Creek Crossings

Length=	60	
Diameter	Cost 2013\$	
150	\$69,000	
200	\$70,000	
250	\$70,000	
300	\$76,000	
350	\$83,000	
400	\$382,000	
450	\$410,000	
500	\$443,000	
600	\$514,000	
750	\$626,000	
900	\$705,000	
1050	\$828,000	
1200	\$958,000	

-,		
60	Length=	150

Lengui- 13		
Diameter	Cost 2013\$	
150	\$168,000	
200	\$169,000	
250	\$169,000	
300	\$175,000	
350	\$182,000	
400	\$851,000	
450	\$913,000	
500	\$980,000	
600	\$1,120,000	
750	\$1,333,000	
900	\$1,514,000	
1050	\$1,740,000	
1200	\$1,972,000	

Manhole Costs For Trenchless Crossings

Inflation 0.009				
Diameter	Manhole Size	Cost 2012\$	Cost 2013\$	
200	1500	\$20,752	\$20,752	
250	1500	\$20,752	\$20,752	
300	1500	\$20,752	\$20,752	
350	1500	\$20,752	\$20,752	
375	1500	\$20,752	\$20,752	
450	1500	\$20,752	\$20,752	
525	1500	\$20,752	\$20,752	
600	1500	\$20,752	\$20,752	
675	1800	\$32,983	\$32,983	
750	1800	\$32,983	\$32,983	
825	1800	\$32,983	\$32,983	
900	2400	\$57,446	\$57,446	
975	2400	\$57,446	\$57,446	
1050	3000	\$64,702	\$64,702	
1200	3000	\$64,702	\$64,702	
1350	3000	\$64,702	\$64,702	
1500	3000	\$64,702	\$64,702	
1650	3000	\$64,702	\$64,702	
1800	Special Construction	\$83,153	\$83,153	
2100	Special Construction	\$83,153	\$83,153	
2400	Special Construction	\$83,153	\$83,153	
3000	Special Construction	\$83,153	\$83,153	

Data from Peel Final Linear Unit Costs July 2011 Assuming for Crossings all Manholes are 5-10m deep

Trenchless

Diameter	st 2012\$	st 2013\$
150	\$ 1,100	\$ 1,100
200	\$ 1,100	\$ 1,100
250	\$ 1,100	\$ 1,100
300	\$ 1,100	\$ 1,100
325	\$ 1,100	\$ 1,100
350	\$ 1,100	\$ 1,100
375	\$ 5,020	\$ 5,020
400	\$ 5,210	\$ 5,210
450	\$ 5,588	\$ 5,588
500	\$ 5,967	\$ 5,967
525	\$ 6,156	\$ 6,156
600	\$ 6,725	\$ 6,725
675	\$ 7,293	\$ 7,293
750	\$ 7,861	\$ 7,861
825	\$ 8,429	\$ 8,429
900	\$ 8,997	\$ 8,997
975	\$ 9,565	\$ 9,565
1050	\$ 10,134	\$ 10,134
1200	\$ 11,270	\$ 11,270
1350	\$ 12,406	\$ 12,406
1500	\$ 13,543	\$ 13,543
1650	\$ 14,679	\$ 14,679
1800	\$ 15,815	\$ 15,815
2100	\$ 18,088	\$ 18,088
2400	\$ 20,360	\$ 20,360
3000	\$ 24,906	\$ 24,906

Compound Inflation

Valve Costs For Forcemain

	Inflation	0%
Diameter (mm)	Cost 2012\$	Cost 2013\$
150	\$1,445	\$1,445
200	\$1,779	\$1,779
250	\$1,996	\$1,996
300	\$5,199	\$5,199
350	\$8,403	\$8,403
400	\$34,907	\$34,907
450	\$37,319	\$37,319
500	\$42,607	\$42,607
600	\$55,440	\$55,440
750	\$77,154	\$77,154
900	\$82,339	\$82,339
1050	\$110,161	\$110,161
1200	\$140,859	\$140,859
	•	

\$245,000 \$312,000 \$345,000 \$423,000

Data from Peel Final Linear Unit Costs July 2011

BRES SERVICING COSTS - WATER SERVICING STRATEGIES

Option 1 - North of Columbia Way

	Water																				
	OPT 1 - STRAT 1 **PREF** (Tunnel on B.A.R. w/ E.T.)	Supply fi	rom Tulla	more Z	6 PS via Cole	raine & BAR (OPEN CUT), n	ew BPS to service	Option 1, floating	storage pro	vided by new E.	T. in Option 1										
Project #	Project Description	Туре	Size	Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
	Z6 Feedermain, from ex. 1050 mm at Coleraine-King to Z6A BPS	WM	400	mm	\$ per m	1,038	\$ 1,173,978	\$ 1,173,978	\$ -	\$ 171,006	\$ 173,000	\$ 2,691,962	\$ 269,196	\$ 2,961,158	\$ 59,223	\$ - \$	1,846,403	\$ 3,020,381	\$ 1,057,133	\$ 4,150,000	1 minor creek,100% constr. conting. due to narrow road along Chickadee
	Z6A BPS, at King & Coleraine (greenfield)	PS	79.0	L/s	\$ per L/s	79.03	\$ 3,793,440	\$ -	\$ -	\$ -	\$ -	\$ 3,793,440	\$ 379,344	\$ 4,172,784	\$ 83,456	\$ 173,750 \$	636,550	\$ 4,429,990	\$ 1,550,496	\$ 6,080,000	25% uplift for property proximity to Coleraine Dr.
	Z6A Feedermain on BAR, from Z6A BPS to E.T. in Option 1	WM	400	mm	\$ per m	4,360	\$ 4,931,160	\$ 1,232,790	\$ -	\$ 547,219	\$ 5,972,273	\$ 12,683,442	\$ 6,341,721	\$ 19,025,162	\$ 380,503	\$ - \$	14,474,506	\$ 19,405,666	\$ 6,791,983	\$ 26,630,000	2 minor creeks, 1080m trenchless @ 400mm diameter on BAR
	E.T. for Option 1 (TWL = 315m)	ET	5.1	ML	\$ per ML	5.1	\$ 5,100,000	\$ -	\$ -	\$ -	\$ -	\$ 5,100,000	\$ 510,000	\$ 5,610,000	\$ 112,200	\$ 521,250 \$	1,143,450	\$ 6,243,450	\$ 2,185,208	\$ 8,570,000	50% uplift for property proximity to Hwy 50
	Z6A Feedermain, from E.T. to distribution (south & west)	WM	400	mm	\$ per m	1,113	\$ 1,258,803	\$ -	\$ -	\$ 171,006	\$ 381,000	\$ 1,810,809	\$ 181,081	\$ 1,991,890	\$ 39,838	\$ - \$	772,925	\$ 2,031,728	\$ 711,105	\$ 2,790,000	1 RR crossing (Hwy 50)
	Sub-Total Water Option 1 - Strategy 1					6,511	\$ 16,257,381	\$ 2,406,768	\$ -	\$ 889,230	\$ 6,526,273	\$ 26,079,652	\$ 7,681,342	\$ 33,760,994	\$ 675,220	\$ 695,000 \$	18,873,833	\$ 35,131,214	\$ 12,295,925		
					•											•					

	Water																				
	OPT 1 - STRAT 1 (Open cut on B.A.R. w/ E.T.)	Supply f	rom Tullan	nore Z6	PS via Cole	raine & BAR (TUNNELING),	, new BPS to service	e Option 1, floatir	ig storage pr	ovided by new	E.T. in Option 1										
Project #	Project Description	Туре	Size	Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)		operty / ement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
	Z6 Feedermain, from ex. 1050 mm at Coleraine-King to Z6A BPS	WM	400 r	nm	\$ per m	1,038	\$ 1,173,978	\$ 1,173,978	\$ -	\$ 171,006	\$ 173,000	\$ 2,691,962	\$ 269,196	\$ 2,961,158	\$ 59,223 \$	- \$	1,846,403	\$ 3,020,381	\$ 1,057,133	\$ 4,150,000	1 minor creek,100% constr. conting. due to narrow road along Chickadee
	Z6A BPS, at King & Coleraine (greenfield)	PS	79.0 L	/s	\$ per L/s	79.03	\$ 3,793,440	\$ -	\$ -	\$ -	\$ -	\$ 3,793,440	\$ 379,344	\$ 4,172,784	\$ 83,456 \$	173,750 \$	636,550	\$ 4,429,990	\$ 1,550,496	\$ 6,080,000	25% uplift for property proximity to Coleraine Dr.
	Z6A Feedermain on BAR, from Z6A BPS to E.T. in Option 1	WM	400 r	nm	\$ per m	4,360	\$ 4,931,160	\$ 1,232,790	\$ -	\$ 547,219	\$ 1,542,000	\$ 8,253,169	\$ 4,126,584	\$ 12,379,753	\$ 247,595 \$	- \$	7,696,188	\$ 12,627,348	\$ 4,419,572	\$ 17,330,000	4 minor creeks, 1 major creek (open cut @400mm on BAR)
	E.T. for Option 1 (TWL = 315m)	ET	5.1	ИL	\$ per ML	5.1	\$ 5,100,000	\$ -	\$ -	\$ -	\$ -	\$ 5,100,000	\$ 510,000	\$ 5,610,000	\$ 112,200 \$	521,250 \$	1,143,450	\$ 6,243,450	\$ 2,185,208	\$ 8,570,000	50% uplift for property proximity to Hwy 50
	Z6A Feedermain, from E.T. to distribution (south & west)	WM	400 r	nm	\$ per m	1,113	\$ 1,258,803	\$ -	\$ -	\$ 171,006	\$ 381,000	\$ 1,810,809	\$ 181,081	\$ 1,991,890	\$ 39,838 \$	- \$	772,925	\$ 2,031,728	\$ 711,105	\$ 2,790,000	1 RR crossing (Hwy 50)
	Sub-Total Water Option 1 - Strategy 1					6,511	\$ 16,257,381	\$ 2,406,768	\$ -	\$ 889,230	\$ 2,096,000	\$ 21,649,379	\$ 5,466,205	\$ 27,115,585	\$ 542,312 \$	695,000 \$	12,095,515	\$ 28,352,896	\$ 9,923,514	\$ 38,920,000	

	Water																				
	OPT 1 - STRAT 2 (via Innis Lake, no E.T.)	Supply fr	om Tullar	nore Z5	PS through	Innis Lake-King, through ne	w BPS (Sandhill), p	umped storage	provided by	in-ground Z5 Re	s (Sandhill)										
Project #	Project Description	Туре	Size	Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)		Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
1	Z5 Feedermain on Innis Lake, from Tullamore Z5 PS to Z5 Res Sandhill	7,702,110	\$ -	\$ -	\$ 886,894	\$ 9,755,832	\$ 195,117 \$	- 5	\$ 2,248,838	\$ 9,950,948	\$ 3,482,832	\$ 13,660,000	2 minor creeks								
2	Z5 In-ground reservoir at Sandhill	7,000,000	\$ -	\$ 700,000	\$ 7,700,000	\$ 154,000 \$	834,000	\$ 1,688,000	\$ 8,688,000	\$ 3,040,800	\$ 11,920,000	does not include rock excavation									
3	Z6A BPS, at Sandhill (greenfield)	PS	126.2 l	_/s	\$ per L/s	126.2 \$	6,057,600	\$ -	\$ -	\$ -	\$ - :	6,057,600	\$ 605,760	\$ 6,663,360	\$ 133,267 \$	208,500	\$ 947,527	\$ 7,005,127	\$ 2,451,795	\$ 9,620,000	
4	Z6A Feedermain on King St, from Z5 Res Sandhill to BAR	WM	000 r	mm	\$ per m	4,316 \$	6,836,544	\$ -	\$ -	\$ 488,876	\$ 3,454,000	10,779,420	\$ 1,077,942	\$ 11,857,361	\$ 237,147 \$	- 5	\$ 5,257,965	\$ 12,094,509	\$ 4,233,078	\$ 16,600,000	10 minor creeks, 2 RR crossings (King St & The Gore Rd)
5	Z6A Feedermain on BAR, from King St to Option 1	WM	000 r	mm	\$ per m	3,697 \$	5,856,048	\$ 1,464,012	\$ -	\$ 434,556	\$ 7,748,577	15,503,193	\$ 7,751,596	\$ 23,254,789	\$ 465,096 \$	- 5	\$ 17,863,837	\$ 23,719,885	\$ 8,301,960	\$ 32,550,000	2 minor creeks, 1080m trenchless @ 600mm diameter on BAR
6	Z6A Feedermain, from E.T. to distribution (south & west)	WM	000 r	mm	\$ per m	1,113 \$	1,762,992	\$ -	\$ -	\$ 162,959	\$ 512,000	2,437,951	\$ 243,795	\$ 2,681,746	\$ 53,635 \$	- 5	\$ 972,388	\$ 2,735,380	\$ 957,383	\$ 3,760,000	1 RR crossing (Hwy 50)
	Sub-Total Water Option 1 - Strategy 2					15,936 \$	35,215,294	\$ 1,464,012	\$ -	\$ 1,907,218	\$ 12,060,577	50,647,101	\$ 11,265,987	\$ 61,913,088	\$ 1,238,262 \$	1,042,500	\$ 28,978,556	\$ 64,193,850	\$ 22,467,847	\$ 88,110,000	
												2.052									

	Water																				
	OPT 1 - STRAT 3 (via Innis Lake, w/ E.T.)	Supply fro	om Tullar	more Z5	5 PS through	Innis Lake-King, through i	new BPS (Sandhill),	in-ground Z5 Res	(Sandhill), 1	floating storage	provided by new E.	T. in Option 1									
Project#	Project Description	Туре	Size	Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
1	Z5 Feedermain on Innis Lake, from Tullamore Z5 PS to Z5 Res Sandhill	WM	400	mm	\$ per m	6,810	\$ 7,702,110	\$ -	\$ -	\$ 820,828	\$ 346,000	\$ 8,868,938	\$ 886,894	\$ 9,755,832	\$ 195,117 \$	\$ -	\$ 2,248,838	\$ 9,950,948	\$ 3,482,832	\$ 13,660,000	2 minor creeks
2	Z5 In-ground reservoir at Sandhill	RES	7.0	ML	\$ per ML	7.0	\$ 7,000,000	\$ -	\$ -	\$ -	\$ -	\$ 7,000,000	\$ 700,000	\$ 7,700,000	\$ 154,000 \$	\$ 834,000	\$ 1,688,000	\$ 8,688,000	\$ 3,040,800	\$ 11,920,000	does not include rock excavation
3	Z6A BPS, at Sandhill (greenfield)	PS	79.0	L/s	\$ per L/s	79.03	\$ 3,793,440	\$ -	\$ -	\$ -	\$ -	\$ 3,793,440	\$ 379,344	\$ 4,172,784	\$ 83,456 \$	\$ 208,500	\$ 671,300	\$ 4,464,740	\$ 1,562,659	\$ 6,130,000	
4	Z6A Feedermain on King St, from Z5 Res Sandhill to BAR	WM	400	mm	\$ per m	4,316	\$ 4,881,396	\$ -	\$ -	\$ 547,219	\$ 2,492,000	\$ 7,920,615	\$ 792,061	\$ 8,712,676	\$ 174,254 \$	\$ -	\$ 4,005,534	\$ 8,886,930	\$ 3,110,425	\$ 12,200,000	10 minor creeks, 2 RR crossings (King St & The Gore Rd)
5	Z6A Feedermain on BAR, from King St to E.T. in Option 1	WM	400	mm	\$ per m	4,360	\$ 4,931,160	\$ 1,232,790	\$ -	\$ 547,219	\$ 5,972,273	\$ 12,683,442	\$ 6,341,721	\$ 19,025,162	\$ 380,503 \$	\$ -	\$ 14,474,506	\$ 19,405,666	\$ 6,791,983	\$ 26,630,000	2 minor creeks, 1080m trenchless @ 400mm diameter on BAR
6	E.T. for Option 1 (TWL = 315m)	ET	5.1	ML	\$ per ML	5.1	\$ 5,100,000	\$ -	\$ -	\$ -	\$ -	\$ 5,100,000	\$ 510,000	\$ 5,610,000	\$ 112,200 \$	\$ 521,250	\$ 1,143,450	\$ 6,243,450	\$ 2,185,208	\$ 8,570,000	
7	Z6A Feedermain, from E.T. to distribution (south & west)	WM	400	mm	\$ per m	1,113	\$ 1,258,803	\$ -	\$ -	\$ 171,006	\$ 381,000	\$ 1,810,809	\$ 181,081	\$ 1,991,890	\$ 39,838 \$	\$ -	\$ 772,925	\$ 2,031,728	\$ 711,105	\$ 2,790,000	1 RR crossing (Hwy 50)
	Sub-Total Water Option 1 - Strategy 3					16,599	\$ 34,666,909	\$ 1,232,790	\$ -	\$ 2,086,271	\$ 9,191,273	\$ 47,177,243	\$ 9,791,101	\$ 56,968,344	\$ 1,139,367 \$	\$ 1,563,750	\$ 25,004,552	\$ 59,671,461	\$ 20,885,011	\$ 81,900,000	

Option 3 - North Hill West

	Water																			
	OPT 3 - STRAT 1 **PREF** (King-Gore WM, w/ E.T.)	Supply fr	rom Tullamore	6 PS through	Coleraine to new Zone 7 B	PS, floating storage	provided by new	Z7 E.T. outs	side of Option 3											
Project #	Project Description	Туре	Size Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
1	Z6 Feedermain, from ex. 1050 mm at Coleraine-King, east to Future Z7 BPS	WM	400 mm	\$ per m	1,038	\$ 1,173,978	\$ 1,173,978	\$ -	\$ 171,006	\$ 173,000	\$ 2,691,962	\$ 269,196	\$ 2,961,158	\$ 59,223 \$	- 5	\$ 1,846,403	\$ 3,020,381	\$ 1,057,133	\$ 4,150,000 1	minor creek, 100% constr. uplift due to narrow rd along Chickadee & G
2	Z7 BPS, at King & Coleraine (greenfield)	PS	79.0 L/s	\$ per L/s	79.03	\$ 3,793,440	\$ -	\$ -	\$ -	\$ -	\$ 3,793,440	\$ 379,344	\$ 4,172,784	\$ 83,456 \$	173,750	\$ 636,550	\$ 4,429,990	\$ 1,550,496	\$ 6,080,000 2	5% uplift for property proximity to Coleraine Dr.
3	Z7 Feedermain on King/Gore, from Z7 BPS to E.T. outside Option 3	WM	400 mm	\$ per m	5,176	\$ 5,854,056	\$ -	\$ -	\$ 649,822	\$ 1,800,000	\$ 8,303,878	\$ 830,388	\$ 9,134,266	\$ 182,685 \$	537,096	\$ 3,999,991	\$ 9,854,047	\$ 3,448,917	\$ 13,520,000 6	minor creeks, 2 RR crossings (King St & The Gore Rd)
4	E.T. for Option 3 (TWL = 327.7m)	ET	5.1 ML	\$ per ML	5.1	\$ 5,100,000	\$ 510,000	\$ -	\$ -	\$ -	\$ 5,610,000	\$ 561,000	\$ 6,171,000	\$ 123,420 \$	347,500	\$ 1,541,920	\$ 6,641,920	\$ 2,324,672	\$ 9,120,000 1	0% constr. uplift due to taller pedestal
5	Z7 Feedermain, from E.T. to distribution	WM	400 mm	\$ per m	1,570	\$ 1,775,670	\$ -	\$ -	\$ 239,408	\$ 381,000	\$ 2,396,078	\$ 239,608	\$ 2,635,686	\$ 52,714 \$	- 5	\$ 912,730	\$ 2,688,400	\$ 940,940	\$ 3,690,000 1	RR crossing (The Gore Rd)
	Sub-Total Water Option 3 - Strategy 1				7,784	\$ 17,697,144	\$ 1,683,978	\$ -	\$ 1,060,236	\$ 2,354,000	\$ 22,795,358	\$ 2,279,536	\$ 25,074,894	\$ 501,498 \$	1,058,346	\$ 8,937,594	\$ 26,634,738	\$ 9,322,158	\$ 36,560,000	

Water																				
OPT 3 - STRAT 2 (via Innis-Lake, no E.T.)	Supply	from Tulla	amore Z	5 PS through	Innis Lake-King, through I	new BPS (Sandhill),	pumped storage	provided by	in-ground Z5 Re	s (Sandhill)										
Project # Project Description	Туре	Size	Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
1 Z5 Feedermain on Innis Lake, from Tullamore Z5 PS to Z5 Res Sandhill	WM	600	mm (\$ per m	6,810	\$ 10,787,040	\$ -	\$ -	\$ 706,154	\$ 486,000	\$ 11,979,194	\$ 1,197,919	\$ 13,177,113	\$ 263,542	\$ -	\$ 2,653,615	\$ 13,440,655	\$ 4,704,229	\$ 18,450,000	2 minor creeks
2 Z5 In-ground reservoir at Sandhill	RES	7.0	ML	\$ per ML	7.0	\$ 7,000,000	\$ -	\$ -	\$ -	\$ -	\$ 7,000,000	\$ 700,000	\$ 7,700,000	\$ 154,000	\$ 556,000	\$ 1,410,000	\$ 8,410,000	\$ 2,943,500	\$ 11,540,000	does not include rock excavation
3 Z7 BPS, at Sandhill (greenfield)	PS	126.2	2 L/s	\$ per L/s	126.2	\$ 6,057,600	\$ -	\$ -	\$ -	\$ -	\$ 6,057,600	\$ 605,760	\$ 6,663,360	\$ 133,267	\$ 139,000	\$ 878,027	\$ 6,935,627	\$ 2,427,470	\$ 9,520,000	
4 Z7 Feedermain on King/Gore, from Z7 BPS to Option 3	WM	600	mm (\$ per m	3,266			\$ -	\$ 380,237		\$ 7,792,581	\$ 779,258				\$ 3,569,931	\$ 8,743,275			5 minor creeks, 2 RR crossings (King St & The Gore Rd)
Sub-Total Water Option 3 - Strategy 2					10,076	\$ 29,017,984	\$ -	\$ -	\$ 1,086,390	\$ 2,725,000	\$ 32,829,374	\$ 3,282,937	\$ 36,112,311	\$ 722,246	\$ 695,000	\$ 8,511,574	\$ 37,529,558	\$ 13,135,345	\$ 51,510,000	

	Water																			
	OPT 3 - STRAT 3 (via Innis-Lake, w/ E.T.)	Supply fr	om Tullamore Z	PS through	Innis Lake-King, through	new BPS (Sandhill),	in-ground Z5 Res	(Sandhill), flo	oating storage pr	rovided by new E.	T. Option 3									
Project #	Project Description	Туре	Size Unit	Unit	Length (m) or Capacity (L/s or ML)	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	Valves (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$2013)	Engineering / Contingency (\$)	Total Estimated Cost (2013\$)	Comments
1	Z5 Feedermain on Innis Lake, from Tullamore Z5 PS to Z5 Res Sandhill	WM	600 mm	\$ per m	6,810	\$ 10,787,040	\$ -	\$ - \$	706,154	\$ 486,000	\$ 11,979,194	\$ 1,197,919	\$ 13,177,113	\$ 263,542	\$ -	\$ 2,653,615	\$ 13,440,655	\$ 4,704,229	\$ 18,450,00	0 2 minor creeks
2	Z5 In-ground reservoir at Sandhill	RES	7.0 ML	\$ per ML	7.0	\$ 7,000,000	\$ -	\$ - \$	- :	\$ -	\$ 7,000,000	\$ 700,000	\$ 7,700,000	\$ 154,000	\$ 556,000	\$ 1,410,000 \$	\$ 8,410,000	\$ 2,943,500	\$ 11,540,00	0 does not include rock excavation
3	Z7 BPS, at Sandhill (greenfield)	PS	79.0 L/s	\$ per L/s	79.03	\$ 3,793,440	\$ -	\$ - \$	- :	\$ -	\$ 3,793,440	\$ 379,344	\$ 4,172,784	\$ 83,456	\$ 139,000	\$ 601,800 \$	\$ 4,395,240	\$ 1,538,334	\$ 6,040,00	0
4	Z7 Feedermain on King/Gore, from Z7 BPS to E.T. outside Option 3	WM	400 mm	\$ per m	5,176	\$ 5,854,056	\$ -	\$ - \$	649,822	\$ 1,627,000	\$ 8,130,878	\$ 813,088	\$ 8,943,966	\$ 178,879	\$ 537,096	\$ 3,805,885	\$ 9,659,941	\$ 3,380,979	\$ 13,260,00	5 minor creeks, 2 RR crossings (King St & The Gore Rd)
5	Z7 Feedermain on Gore Rd, from E.T. to distribution	WM	400 mm	\$ per m	1,570	\$ 1,775,670	\$ -	\$ - \$	239,408	\$ 381,000	\$ 2,396,078	\$ 239,608	\$ 2,635,686	\$ 52,714	\$ -	\$ 912,730 \$	\$ 2,688,400	\$ 940,940	\$ 3,690,00	1 RR crossing (The Gore Rd)
6	E.T. for Option 3 (TWL = 327.7m)	ET	5.1 ML	\$ per ML	5.1	\$ 5,100,000	\$ 510,000	\$ - \$	- :	\$ -	\$ 5,610,000	\$ 561,000	\$ 6,171,000	\$ 123,420	\$ 347,500	\$ 1,541,920 \$	\$ 6,641,920	\$ 2,324,672	\$ 9,120,00	0 10% constr. uplift due to taller pedestal
	Sub-Total Water Option 3 - Strategy 3				13,556	\$ 34,310,206	\$ 510,000	\$ - \$	1,595,384	\$ 2,494,000	\$ 38,909,590	\$ 3,890,959	\$ 42,800,549	\$ 856,011	\$ 1,579,596	\$ 10,925,950 \$	\$ 45,236,156	\$ 15,832,655	\$ 62,100,00	0

All costs expressed in 2013\$ dollars.
 Costs do not include internal servicing.
 Costs do not include DC level trunk infrastructure.



BRES SERVICING COSTS - WASTEWATER SERVICING STRATEGIES

Option 1 - North of Columbia Way

	Wastewater																									
	OPT 1 - STRAT 1 (twin ex. Bolton FM)	Convey flows	through urbar	core to B	Bolton SPS, upgra	ade Bolton SPS, twi	n existing FM,	twin downstream sewer to	Queensgate & Lands	sbridge St														35%		
Project	:# Project Description	Туре	Size	Unit	Unit Cost (\$/m) < 5m, or \$/L/s)	Unit Cost (\$/m) > 5 m depth	Unit	Length (m) < 5m depth or Capacity (L/s)	Length (m) > 5m depth	Base Cost (\$)	Construction Uplift (\$)	Urban # Creek Uplift (\$) Crossing	k Creek Crossing (\$)	#Regional Rd / Rail Crossing (\$) #Majo	or C	Adjor Creek Trenchless Trenchless ossing Length (m) Cost (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Property / Requirements (\$) Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$)	Eng / Conting (\$)	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
	1 Twinning of local collection sewers through North Hill (Alt A)	WWM-UPG	45	0 mm	\$ 735	\$ 2,394	\$ per m	2454	841 \$	3,816,455	\$ 1,908,228	\$ 2,862,342	3 \$459,000	1 \$377,000	0 \$	- 110 \$614,711 \$	1,450,711	\$ 10,037,736	\$ 1,003,774	\$ 11,041,510	\$ 220,830 \$ -	\$ 7,445,885	\$ 11,262,340	\$ 3,941,819	15,451,930 \$	15,460,000
	2 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	25	0 mm	\$ 625	\$ 2,111	\$ per m	242	0 \$	151,152	\$ -	\$ 37,788	0 \$ -	0 \$ -	0 \$	- 0 \$ - 5	-	\$ 188,939	\$ 18,894	\$ 207,833	\$ 4,157 \$ -	\$ 60,838	\$ 211,990	\$ 74,197	290,850 \$	300,000
	3 Bolton SPS upgrade	SPS-UPG	16	6 L/s	\$ 48,000	\$ -	\$ per L/s	166	\$	7,972,800	\$ -	\$ -	0 \$ -	0 \$ -	0 \$	- 0 \$ - 5	-	\$ 7,972,800	\$ 797,280	\$ 8,770,080	\$ 175,402 \$ -	\$ 972,682	\$ 8,945,482	\$ 3,130,919	12,273,201 \$	12,280,000
	4 Twinning of ex. Bolton SPS forcemain from Bolton SPS	FM-UPG	40	0 mm	\$ 1,072	! \$ -	\$ per m	975	- \$	1,045,276	\$ -	\$ 783,957	0 \$ -	0 \$ -	0 \$	- 120 \$625,141 \$	625,141	\$ 2,454,374	\$ 245,437	\$ 2,699,812	\$ 53,996 \$ -	\$ 1,708,532	\$ 2,753,808	\$ 963,833	3,778,224 \$	3,780,000
	5 Twinning of downstream trunk sewer, from 150m north of Fountainbridge Dr to Queensgate Blvd & Landsbrid	dge WWM-UPG	45	0 mm	\$ 735	\$ 2,394	\$ per m	416	579 \$	1,691,667	\$ -	\$ 845,834	0 \$ -	0 \$ -	0 \$	- 100 \$558,829 \$	558,829	\$ 3,096,330	\$ 309,633	\$ 3,405,963	\$ 68,119 \$ -	\$ 1,782,415	\$ 3,474,082	\$ 1,215,929	4,766,441 \$	4,770,000
	6 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	25	0 mm	\$ 625	\$ 2,111	\$ per m	405	0 \$	252,960	\$ 252,960	\$ 63,240	0 \$ -	0 \$ -	0 \$	- 0 \$ - 5	-	\$ 569,160	\$ 56,916	\$ 626,076	\$ 12,522 \$ -	\$ 385,638	\$ 638,598	\$ 223,509	876,156 \$	880,000
	Sub-Total Wastewater Option 1 - Strategy 1							4,492	1,420 \$	14,930,310	\$ 2,161,188	\$ 4,593,160	3 \$459,000	1 \$377,000	0 \$	- 330 ########	2,634,682	\$ 24,319,340	\$ 2,431,934	\$ 26,751,274	\$ 535,025 \$ -	\$ 12,355,989	\$ 27,286,299	\$ 9,550,205	\$ 37,436,803 \$	37,470,000

Wastewater																								
OPT 1 - STRAT 2A **PREF** (via Taylorwood)	Convey flows thr	ough urban	core to Bolto	n SPS, twin ex	xisting sewers in North Hill (AltA)	, upgrade Bolton SPS, in	stall new FM to diver	t flows east to Albio	n-Vaughan sewer															
Project # Project Description	Туре	Size	Unit Unit < 5	t Cost (\$/m) m, or \$/L/s)	Unit Cost (\$/m) > 5 m depth	Length (m) < 5m depth or Capacity (L/s)	Length (m) > 5m depth	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	# Creek Crossings Creek Crossing (\$)	# Regional Rd / Rail Crossing (\$)	# Major Creek Crossing (\$	or ek Trenchless sing Length (m) Cost (\$)	Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Property / Requirements (\$) Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$)	ng / Conting (\$)	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
1 Twinning of local collection sewers through North Hill (Alt A)	WWM-UPG	450	mm \$	735	\$ 2,394 \$ per m	245	4 841 \$	3,816,455	\$ 1,908,228	\$ 2,862,342	2 3 \$459,00	1 \$377,000	0 \$	- 110 \$614,711 \$	1,450,711	\$ 10,037,736	\$ 1,003,774 \$	11,041,510	\$ 220,830 \$ -	\$ 7,445,885	\$ 11,262,340 \$	3,941,819	15,451,930 \$	\$ 15,460,000
Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250	mm \$	625	\$ 2,111 \$ per m	24	2 0 \$	151,152	\$ -	\$ 37,788	8 0 \$ -	0 \$ -	0 \$	- 0 \$ - \$	- 9	\$ 188,939	\$ 18,894 \$	207,833	\$ 4,157 \$ -	\$ 60,838	\$ 211,990 \$	74,197	290,850 \$	\$ 300,000
3 Bolton SPS upgrade	SPS-UPG	166	L/s \$	48,000	\$ - \$ per L/s	166.	1 - \$	7,972,800	\$ -	\$ -	0 \$ -	0 \$ -	0 \$	- 0 \$ - \$	- 5	5 7,972,800	\$ 797,280 \$	8,770,080	\$ 175,402 \$ -	\$ 972,682	\$ 8,945,482 \$	3,130,919	12,273,201 \$	\$ 12,280,000
4 New forcemain from Bolton SPS east to Albion-Vaughan Trunk Sewer	FM-NEW	400	mm \$	1,072	\$ - \$ per m	1,242	- \$	1,331,521	\$ 665,760	\$ 665,760	0 0 \$ -	0 \$ -	0 \$	- 0 \$ - \$	- 9	\$ 2,663,041	\$ 266,304 \$	2,929,345	\$ 58,587 \$ -	\$ 1,656,412	\$ 2,987,932 \$	1,045,776	4,099,443 \$	\$ 4,100,000
5 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250	mm \$	625	\$ 2,111 \$ per m	405.	0 - \$	252,960	\$ 252,960	\$ 63,240	0 0 \$ -	0 \$ -	0 \$	- 0 \$ - \$	- 5	\$ 569,160	\$ 56,916 \$	626,076	\$ 12,522 \$ -	\$ 385,638	\$ 638,598 \$	223,509	876,156 \$	\$ 880,000
Sub-Total Wastewater Option 1 - Strategy 2A						4,343	841 \$	13,524,888	\$ 2,826,948	\$ 3,629,130	0 3 \$459,00	1 \$377,000	- \$	- 110 \$614,711 \$	1,450,711	\$ 21,431,677	\$ 2,143,168 \$	23,574,845	\$ 471,497 \$ -	\$ 10,521,454	\$ 24,046,342 \$	8,416,220 \$	32,991,581 \$	\$ 33,020,000
							2 205																	

Wastewater																								
OPT 1 - STRAT 2B (via Kingsview)	Convey flows vi	ia new sewer	on Hwy 50 to	Bolton Heigh	its/Cross Country, twin existing s	ewers in North Hill (AltB)	, upgrade Bolton SP:	, install new FM to	divert flows east to Albi	ion-Vaughan sewer														
Project # Project Description	Туре	Size	Unit Un	t Cost (\$/m) m, or \$/L/s)	Unit Cost (\$/m) > 5 m depth	Length (m) < 5m depth or Capacity (L/s)	Length (m) > 5m depth	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	# Creek Crossings Creel Crossings (\$)	# Regional Rd / Rail Crossing (\$) # Regional Rd / Rail Crossing (\$)	Creek	Trenchless Trenchless Cro		Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$)	Eng / Conting (\$)	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
1 New gravity sewer on Hwy 50, from Columbia Way to Bolton Heights Dr. & west to Cross Country B	d WWM-NEW	450	mm \$	735	\$ 2,394 \$ per m	806	- \$	592,292	\$ 296,146	\$ 444,219	9 0 \$ -	0 \$ -	0 \$ -	0 \$ - \$	- \$	1,332,657 \$	133,266 \$	1,465,922	\$ 29,318 \$ -	\$ 902,949	\$ 1,495,241 \$	523,334	2,051,470 \$	\$ 2,060,000
2 Twin existing sewers east of Hwy 50, from Kingsview/Bolton Heights to Bolton SPS (Alt B)	WWM-UPG	450	mm \$	735	\$ 2,394 \$ per m	1844	1 600 \$	2,791,306	\$ 1,395,653	\$ 2,093,480	0 \$ -	2 \$754,000	0 \$ -	110 \$614,711 \$	1,368,711 \$	7,649,151 \$	764,915 \$	8,414,066	\$ 168,281 \$ -	\$ 5,791,041	\$ 8,582,347 \$	3,003,822	11,774,980 \$	\$ 11,780,000
3 Bolton SPS upgrade	SPS-UPG	166	L/s \$	48,000	\$ - \$ per L/s	166.1	- \$	7,972,800	\$ - !	\$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ - \$	- \$	7,972,800 \$	797,280 \$	8,770,080	\$ 175,402 \$ -	\$ 972,682	\$ 8,945,482 \$	3,130,919	12,273,201 \$	\$ 12,280,000
4 New forcemain from Bolton SPS east to Albion-Vaughan Trunk Sewer	FM-NEW	400	mm \$	1,072	\$ - \$ per m	1,242	- \$	1,331,521	\$ 665,760	\$ 665,760	0 \$ -	0 \$ -	0 \$ -	0 \$ - \$	- \$	2,663,041 \$	266,304 \$	2,929,345	\$ 58,587 \$ -	\$ 1,656,412	\$ 2,987,932 \$	1,045,776	4,099,443	\$ 4,100,000
5 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250	mm \$	625	\$ 2,111 \$ per m	405.0	- \$	252,960	\$ 252,960	\$ 63,240	0 7	0 \$ -	0 \$ -	0 \$ - \$	- \$	569,160 \$	56,916 \$	626,076	\$ 12,522 \$ -	\$ 385,638	\$ 638,598 \$	223,509	876,156 \$	\$ 880,000
Sub-Total Wastewater Option 1 - Strategy 2B						4,297	600 \$	12,940,879	\$ 2,610,520	\$ 3,266,699	9 - \$ -	2 \$754,000	- \$ -	110 \$614,711 \$	1,368,711 \$	20,186,809 \$	2,018,681 \$	22,205,490	\$ 444,110 \$ -	\$ 9,708,721	\$ 22,649,600 \$	7,927,360	\$ 31,075,251 \$	\$ 31,100,000

	Wastewater																								
	OPT 1 - STRAT 2C (via Cross Country)	Convey flows via	new sewer on Hwy	50 to Bolton Heights/Kingsview, tv	vin existing sewe	ers in North Hill (AltC), upg	grade Bolton SPS, inst	all new FM to diver	t flows east to Albion-Va	aughan sewer															
Project	tt# Project Description	Туре	Size Unit	Unit Cost (\$/m) < 5m, or \$/L/s) Unit Cost (\$/m > 5 m depth) Unit	Length (m) < 5m depth or Capacity (L/s)	Length (m) > 5m depth	Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	# Creek Crossings Creek Crossing (\$) # Rei	gional / Rail ssing Regiona Rd / Ra Crossin (\$)	al #Major Creek Crossing	Major Creek Trenchless rossing Length (m) Cost (\$)	s Crossings (\$)	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$)	Eng / Conting (\$)	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
	1 New gravity sewer on Hwy 50, from Columbia Way to Bolton Heights Dr.	WWM-NEW	450 mm	\$ 735 \$ 2,394	\$ per m	806	- \$	592,292	\$ 296,146 \$	444,219	0 \$ -	0 \$ -	0 \$	- 0 \$ -	\$ -	\$ 1,332,657	\$ 133,266 \$	1,465,922	\$ 29,318	\$ -	\$ 902,949	\$ 1,495,241	\$ 523,334	2,051,470	\$ 2,060,000
	2 Twin existing sewers west of Hwy 50, from Cross Country Blvd to Bolton SPS (Alt C)	WWM-UPG	450 mm	\$ 735 \$ 2,394	\$ per m	1299	1186 \$	3,793,536	\$ 1,896,768 \$	2,845,152	0 \$ -	1 \$377,00	0 \$	- 110 \$614,71	\$ 991,711	\$ 9,527,167	\$ 952,717 \$	10,479,884	\$ 209,598	\$ -	\$ 6,895,946	\$ 10,689,481	\$ 3,741,319	14,665,969	\$ 14,670,000
	3 Bolton SPS upgrade	SPS-UPG	166 L/s	\$ 48,000 \$ -	\$ per L/s	166.1	- \$	7,972,800	\$ - \$	-	0 \$ -	0 \$ -	0 \$	- 0 \$ -	\$ -	\$ 7,972,800	\$ 797,280 \$	8,770,080	\$ 175,402	\$ -	\$ 972,682	\$ 8,945,482	\$ 3,130,919	12,273,201	\$ 12,280,000
	4 New forcemain from Bolton SPS east to Albion-Vaughan Trunk Sewer	FM-NEW	400 mm	\$ 1,072 \$ -	\$ per m	1,242	- \$	1,331,521	\$ 665,760 \$	665,760	0 \$ -	0 \$ -	0 \$	- 0 \$ -	\$ -	\$ 2,663,041	\$ 266,304 \$	2,929,345	\$ 58,587	\$ -	\$ 1,656,412	\$ 2,987,932	\$ 1,045,776	4,099,443	\$ 4,100,000
	5 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250 mm	\$ 625 \$ 2,111	1 \$ per m	405.0	- \$	252,960	\$ 252,960 \$	63,240	0 \$ -	0 \$ -	0 \$	- 0 \$ -	\$ -	\$ 569,160	\$ 56,916 \$	626,076	\$ 12,522	\$ -	\$ 385,638	\$ 638,598	\$ 223,509	876,156	\$ 880,000
	Sub-Total Wastewater Option 1 - Strategy 2C					3,752	1,186 \$	13,943,108	\$ 3,111,634 \$	4,018,371	\$ -	1 \$377,00	00 - \$	- 110 \$614,71	\$ 991,711	\$ 22,064,825	\$ 2,206,483 \$	24,271,308	\$ 485,426	\$ -	\$ 10,813,626	\$ 24,756,734	\$ 8,664,857	\$ 33,966,239	\$ 33,990,000

	Wastewater																									
	OPT 1 - STRAT 3 (bypasses urban area)	Convey flows alo	ng Columbia Way to	connect to future gravity sew	er on Albion/Vau	ghan Rd																				
Project	Project Description	Туре	Size Unit	Unit Cost (\$/m) Unit Cost (5m, or \$/L/s) > 5 m de		Length (m) < 5m depth or Capacity (L/s)		Base Cost (\$)	Construction Uplift (\$)	Urban Uplift (\$)	# Creek Crossings Creek # Regio Rd / R (\$)		# Major Creek Crossing	reek Trenchless Trenchlessing Length (m) Cost	less Crossin \$) (\$)		nstruction b-Total (\$)	Construction Contingency (\$)	Construction Total (\$)	Geotech / Hydrog Requirements (\$)	Property / Easement (\$)	Additional Costs (\$)	Sub-Total Cost (\$)	Eng / Conting (\$)	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
	1 New gravity sewer from Option 1 to SPS on Columbia Way west of Albion-Vaughan	WWM-NEW	525 mm	\$ 780 \$,454 \$ per m	920	920 \$	2,973,439	\$ 1,486,720	5 743,360	0 1 \$165,000	1 \$411,000	0 \$	- 110 \$677	1,25	3,209 \$	6,456,728	\$ 645,673 \$	7,102,401	\$ 142,048	\$ -	\$ 4,271,010	7,244,449	\$ 2,535,557	9,939,384	\$ 9,940,000
	2 New SPS#1 to pump flows across river valley (greenfield)	SPS-NEW	166 L/s	\$ 48,000 \$	- \$ per L/s	166.	1 \$	7,972,800	\$ - !	5 -	\$ -	\$ -	\$	- \$. \$	- \$	7,972,800	\$ 797,280 \$	8,770,080	\$ 175,402	\$ 278,000	\$ 1,250,682	9,223,482	\$ 3,228,219	12,654,617	\$ 12,660,000
	3 New forcemain from SPS #1 to future Albion/Vaughan Rd Trunk Sewer	FM-NEW	400 mm	\$ 1,072 \$	 \$ per m 	760	760 \$	814,779	\$ 407,390	\$ -	1 \$174,000	\$ -	\$	- \$	\$ 17	74,000 \$	1,396,169	\$ 139,617 \$	1,535,786	\$ 30,716	\$ -	\$ 751,722	1,566,501	\$ 548,275	2,149,240	\$ 2,150,000
	4 New gravity sewer on Albion Vaughan Rd to south of Old King Rd	WWM-NEW	525 mm	\$ 780 \$,454 \$ per m	685	685 \$	2,215,123	\$ 1,107,562	5 -	2 \$330,000	0 \$ -	0 \$	- 110 \$677	09 \$ 1,00	7,209 \$	4,329,894	\$ 432,989 \$	4,762,884	\$ 95,258	\$ -	\$ 2,643,018	4,858,141	\$ 1,700,349	6,665,370	\$ 6,670,000
	5 New SPS#2 to pump flows across river valley (greenfield)	SPS-NEW	166 L/s	\$ 48,000 \$ 4	,000 \$ per L/s	166.	1 \$	7,972,800	\$ - !	5 -	\$ -	\$ -	\$	- \$. \$	- \$	7,972,800	\$ 797,280 \$	8,770,080	\$ 175,402	\$ 278,000	\$ 1,250,682	9,223,482	\$ 3,228,219	12,654,617	\$ 12,660,000
	6 New forcemain from SPS #2 to future Albion/Vaughan Rd Trunk Sewer	FM-NEW	400 mm	\$ 1,072 \$	 \$ per m 	105	105 \$	112,568	\$ 56,284	5 -	1 \$174,000	0 \$ -	0 \$	- 0 \$	\$ 17	74,000 \$	342,852	\$ 34,285 \$	377,137	\$ 7,543	\$ -	\$ 272,112	384,680	\$ 134,638	527,781	\$ 530,000
	7 New gravity sewer on Albion Vaughan Rd, from south of Old King Rd to future Albion/Vaughan Trunk Sewer	WWM-NEW	525 mm	\$ 780 \$,454 \$ per m	303	303 \$	978,211	\$ 489,106	5 -	\$ -	\$ -	\$	- \$. \$	- \$	1,467,317	\$ 146,732 \$	1,614,049	\$ 32,281	\$ -	\$ 668,118	1,646,330	\$ 576,215	2,258,765	\$ 2,260,000
	8 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250 mm	\$ 625 \$,111 \$ per m	24	2 0 \$	151,152	\$ - !	\$ 37,788	8 0 \$ -	0 \$ -	0 \$	- 0 \$. \$	- \$	188,939	\$ 18,894 \$	207,833	\$ 4,157	\$ -	\$ 60,838	211,990	\$ 74,197	290,850	\$ 300,000
	9 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250 mm	\$ 625 \$,111 \$ per m	405.	0 - \$	252,960	\$ 252,960	63,240	0 0 \$ -	0 \$ -	0 \$	- 0 \$. \$	- \$	569,160	\$ 56,916 \$	626,076	\$ 12,522	\$ -	\$ 385,638	638,598	\$ 223,509	876,156	\$ 880,000
	Sub-Total Wastewater Ontion 1 - Strategy 3					3.419	2.772 \$	23.443.833	\$ 3,800,021	\$ 844.389	8 5 \$843,000	1 \$411.000	0 \$	- 220 ####	### \$ 2.60	08.418 \$	30.696.660	\$ 3,069,666 \$	33.766.326	\$ 675.327	\$ 556,000	\$ 11.553.820	34.997.653	\$ 12,249,179	\$ 48.016.780	\$ 48,050,000

June, 2014



Option 3 - North Hill West																				
Wastewater																				
OPT 3 - STRAT 1 (via easement)	Convey flows sou	theast via new sewe	er along future easement from King	St W to Colerai	ne Dr. Twin Coleraine Trunk Sewer, from so	uth of rail to just north of George Bolton F	Pkwy.		T T		T T						ı	T	1	
Project # Project Description	Туре	Size Unit	Unit Cost (\$/m)	Unit	Length (m) < 5m depth Length (m) or Capacity (L/s) > 5m depth	Base Construction Cost (\$) Uplift (\$)	Urban # Cre Uplift (\$) Cross	creek ssings Creek (\$) Creek Region Rd / Rai (\$) Crossing	il Rd / Rail Creek	Major Creek Trenchless Trenchle Crossing Length (m) Cost (\$	crossings (\$)		Construction Contingency (\$)				itional Sub-Tota sts (\$) Cost (\$)		Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
New gravity sewer on future easement, from Option 3 to ex. Coleraine Trunk Sewer south of rail	WWM-NEW	450 mm	¢ 725 ¢ 2.204	\$ per m	1,941 -	\$ 1,426,350 \$ 713,17	s e -	1 \$153,000	2 \$754.000 0	(\$)	\$ 907.000 \$	3,046,526 \$	304,653 \$	3,351,178 \$	67.024 \$	1.348.995 \$ 3	.340.846 \$ 4.767.	197 \$ 1.668.5	19 \$ 6.540.594	\$ 6.550.000
2 Twinning of Coleraine Trunk Sewer, from south of rail to 700 m north of George Bolton Pkwy	WWM-UPG	525 mm		\$ per m	1385 1,240		\$ 824,594	1 \$165,000	0 \$ - 0 :	\$ - 0 \$ -	\$ 165,000 \$	5,112,563 \$		5,623,819 \$	112,476 \$,613,326 \$ 5,736,			
3 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250 mm		\$ per m	405 -	\$ 252,960 \$ 252,96		0 \$ -	0 \$ - 0 :	\$ - 0 \$ -	\$ - \$	569,160 \$	56,916 \$	626,076 \$	12,522 \$		385,638 \$ 638,			
4 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 1	WWM-NEW	250 mm	\$ 625 \$ 2,111	\$ per m	242 0 3,973 1,240	\$ 151,152 \$ - \$ 5,953,431 \$ 966,13	\$ 37,788 5 \$ 925,622	0 \$ - 2 \$318,000	0 \$ - 0 : 2 \$754,000 0 :	\$ - 0 \$ - \$ - 0 \$ -	\$ 1,072,000 \$	188,939 \$ 8,917,188 \$	18,894 \$ 891,719 \$	207,833 \$ 9,808,907 \$	4,157 \$ 196,178 \$		60,838 \$ 211, 400,649 \$ 11,354,			
					, ,			,,	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	, , ,	,		, , , ,	, ,,,,,	, , , ,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Wastewater OPT 3 - STRAT 2 (King-Coleraine, twin @450, ex. prof.)	Convey flows via	now sower along Kir	ng/Coloraino Twin Coloraino Trunk	Sower (4E0mm) south of rail line, from south of rail to just	north of Goorge Bolton Bkusy														
OF 1 3 - 3 (King-Coleranie, twin & 430, ex. prof.)	Convey nows via	new sewer along Kil	ing/coleranie. Twin coleranie Trunk	Sewei (430iiiii	, south of fair line, from south of fair to just	north of George Botton Fkwy.		Creek # Region	Regional # Major	Major										
Project # Project Description	Туре	Size Unit	Unit Cost (\$/m) Unit Cost (\$/m) < 5m, or \$/L/s) > 5 m depth	Unit	Length (m) < 5m depth Length (m) or Capacity (L/s) > 5m depth	Base Construction Cost (\$) Uplift (\$)	Urban # Cre Uplift (\$) Cross	reek Crossing Rd / Rai	il Rd / Rail Creek	Creek Trenchless Trenchle	crossings						itional Sub-Tota sts (\$) Cost (\$)		Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
			< 5m, or \$/L/s) > 5 m depth		or Capacity (L/s) > 5m depth	Cost (\$) Uplift (\$)	Uplift (\$) Cross	(\$) Crossing	Crossing (\$)	Crossing Length (m) Cost (\$	(\$)	Sub-Total (\$)	Contingency (\$)	iotai (\$)	equirements (\$) E	asement (\$) Co	sts (\$) Cost (\$)	'	Cost (2013\$)	Cost (2013\$)
1 New gravity sewer on King & Coleraine, from Option 3 to ex. Coleraine Trunk Sewer south of rail	WWM-NEW	450 mm		\$ per m	1,498 1,126	\$ 3,796,148 \$ 949,03		4 \$612,000	2 \$754,000 0 :	\$ - 0 \$ -	\$ 1,366,000 \$	6,111,185 \$	611,118 \$	6,722,303 \$	134,446 \$,060,602 \$ 6,856,			
Twinning of Coleraine Trunk Sewer, from south of rail to 700 m north of George Bolton Pkwy Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-UPG WWM-NEW	250 mm		\$ per m . \$ per m	712 2,196 242 -	\$ 5,779,842 \$ - \$ 151.152 \$ -	\$ 1,155,968 \$ 37,788	1 \$153,000 0 \$ -	1 \$377,000 0 : 0 \$ - 0 :	\$ - 0 \$ - \$ - 0 \$ -	\$ 530,000 \$ S - S	7,465,810 \$ 188.939 \$	746,581 \$ 18.894 \$	8,212,392 \$ 207.833 \$	164,248 \$ 4.157 \$,596,797 \$ 8,376, 60.838 \$ 211.			
Sub-Total Wastewater Option 3 - Strategy 2					2,452 3,322	\$ 9,727,142 \$ 949,03	7 \$ 1,193,756	5 \$765,000	3 ######## 0	\$ - 0 \$ -	\$ 1,896,000 \$	13,765,935 \$	1,376,593 \$	15,142,528 \$	302,851 \$	- \$ 5	,718,237 \$ 15,445,	379 \$ 5,405,8	33 \$ 21,191,060	\$ 21,210,000
Westernatur																				
Wastewater OPT 3 - STRAT 2 ** PREF** (King-Coleraine twin @525, new prof.)	Convey flows via	new sewer along Kir	ng/Coleraine. Twin Coleraine Trunk	Sewer (525mm), from south of rail to just north of George	Bolton Pkwy.														
								Creek # Region	nal Regional # Major	Major										
Project # Project Description	Туре	Size Unit	Unit Cost (\$/m) Unit Cost (\$/m) < 5m, or \$/L/s) > 5 m depth	Unit	Length (m) < 5m depth Length (m) or Capacity (L/s) > 5m depth	Base Construction Cost (\$) Uplift (\$)	Urban # Cre Uplift (\$) Cross	reek Crossing Rd / Rai	il Rd / Rall Creek	Creek Trenchless Trenchle Crossing Length (m) Cost (\$			Construction Contingency (\$)				itional Sub-Tota sts (\$) Cost (\$)		Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
								- (\$) Crossing	(\$)	(\$)										
New gravity sewer on King & Coleraine, from Option 3 to ex. Coleraine Trunk Sewer Twinning of Coleraine Trunk Sewer, from south of rail to 700 m north of George Bolton Pkwy	WWM-NEW WWM-UPG	450 mm		\$ per m \$ per m	1,498 1,126 1644 1,264	\$ 3,796,148 \$ 949,03 \$ 4,383,896 \$ -	7 \$ - \$ 876,779	4 \$612,000 1 \$165,000	2 \$754,000 0 : 1 \$411,000 0 :	5 - 0 5 -	\$ 1,366,000 \$ \$ 576,000 \$	6,111,185 \$ 5,836,675 \$	611,118 \$ 583,667 \$	6,722,303 \$ 6,420,342 \$	134,446 \$ 128,407 \$,060,602 \$ 6,856, ,164,853 \$ 6,548,			
3 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250 mm		\$ per m	242 -	\$ 151,152 \$ -	\$ 37,788	0 \$ -	0 \$ - 0 :	\$ - 0 \$ -	\$ - \$	188,939 \$	18,894 \$	207,833 \$	4,157 \$	- \$	60,838 \$ 211,	990 \$ 74,1	97 \$ 290,850	\$ 300,000
Sub-Total Wastewater Option 3 - Strategy 2 (Coleraine @ 450mm)					3,384 2,390	\$ 8,331,195 \$ 949,03	7 \$ 914,567	5 \$777,000	3 ######## 0	\$ - 0 \$ -	\$ 1,942,000 \$	12,136,799 \$	1,213,680 \$	13,350,479 \$	267,010 \$	- \$ 5	,286,294 \$ 13,617,	489 \$ 4,766,1	21 \$ 18,683,195	\$ 18,700,000
Wastewater																				
OPT 3 - STRAT 3A (via Cedargrove)	Convey flows via	twinning of existing	sewers in the North Hill West syste	em (via Cedargro	ove). Twin Coleraine Trunk Sewer from Harv	estmoon Dr. to north of George Bolton Pk	wy.		Regional	Major								1	1	
Project # Project Description	Туре	Size Unit	Unit Cost (\$/m) Unit Cost (\$/m)	Unit	Length (m) < 5m depth Length (m)	Base Construction	Urban # Cre	reek Crossing Rd / Rai	Rd / Rail # Major	Creek Trenchless Trenchle	ess Crossings	Construction	Construction C	Construction G	eotech / Hydrog	Property / Add	itional Sub-Tota	Eng / Conting (\$	Total Estimated	Total Estimated
Project # Project Description	Туре	Size Oill	< 5m, or \$/L/s) > 5 m depth	Onit	or Capacity (L/s) > 5m depth	Cost (\$) Uplift (\$)	Uplift (\$) Cross	ssings (\$) Crossing		Crossing Length (m) Cost (\$) (\$)	Sub-Total (\$)	Contingency (\$)	Total (\$) R	equirements (\$)	asement (\$) Co	sts (\$) Cost (\$)	Eng / Conting (\$	Cost (2013\$)	Cost (2013\$)
1 New sewer on King St, connect on Tarquini	WWM-NEW	450 mm	\$ 735 \$ 2,394	\$ per m	557 88	\$ 619,961 \$ 309,98	1 \$ 464,971	0 \$ -	2 \$754,000 0	(\$) \$ - 0 \$ -	\$ 754,000 \$	2,148,913 \$	214,891 \$	2,363,804 \$	47,276 \$	- \$ 1	,791,119 \$ 2,411,	081 \$ 843,8	78 3,308,003	3 \$ 3,310,000
2 Twin sewers in North Hill West (Alt A) via Cedargrove to railway connection on Coleraine	WWM-NEW	450 mm	\$ 735 \$ 2,394	\$ per m	595 1,162	\$ 3,218,750 \$ 1,609,37	5 \$ 2,414,062	4 \$612,000	0 \$ - 0 :	\$ - 0 \$ -	\$ 612,000 \$	7,854,187 \$	785,419 \$	8,639,605 \$	172,792 \$	- \$ 5	,593,648 \$ 8,812,	397 \$ 3,084,3	12,090,609	
Twinning of Coleraine Trunk Sewer, from Harvestmoon Dr to 700 m north of George Bolton Pkwy Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-UPG WWM-NFW	450 mm 250 mm		\$ per m \$ per m	1,385 1,523 405 -	\$ 4,663,420 \$ - \$ 252,960 \$ 252,960	\$ 932,684 0 \$ 63,240	1 \$153,000	1 \$377,000 0	\$ - 0\$ -	\$ 530,000 \$	6,126,103 \$ 569,160 \$	612,610 \$ 56,916 \$	6,738,714 \$ 626.076 \$	134,774 \$ 12,522 \$	7 -	,210,069 \$ 6,873, 385,638 \$ 638			
5 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250 mm		\$ per m	242 -	\$ 151,152 \$ -	\$ 37,788	0 \$ -	0 \$ - 0 :	\$ - 0 \$ -	\$ - \$	188,939 \$	18,894 \$	207,833 \$	4,157 \$	- \$	60,838 \$ 211,	990 \$ 74,1	97 290,850	\$ 300,000
Sub-Total Wastewater Option 3 - Strategy 3A					3,184 2,773	\$ 8,906,242 \$ 2,172,31	6 \$ 3.912.745	5 \$765,000	3 ####### 0 :	s - 0 s -	\$ 1.896.000 \$	16 007 202 C	1.688.730 S	18.576.033 S	371.521 S		,041,312 \$ 18,947,	554 \$ 6.631.6	14 \$ 25,996,044	\$ 26,030,000
				•			, ., .	1 7110,000			ÿ 1,030,000 ÿ	10,007,303	1,000,730 9	10,570,055	3/1,321 3	- 3 10	,041,312 \$ 10,947,			
Wastewater							2, 7, 1	1 1100,000		, ,,,	7 1,030,000	10,007,303	1,000,750	10,570,033	371,321	- 3 10	,041,512 \$ 18,547,	, J. 13, 13, 13, 13, 13, 13, 13, 13, 13, 13,		
Wastewater OPT 3 - STRAT 3B (via Harvest Moon)	Convey flows via	twinning of existing	sewers in the North Hill West syste	em (via Harvestr	moon Dr). Twin Coleraine Trunk Sewer from	Harvestmoon Dr. to north of George Bolto	on Pkwy.	1,110,111			\$ 1,050,000 \$	10,667,303	2,000,750	10,570,033	371,321 \$	- 3 10	041,312 \$ 10,347,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
					moon Dr). Twin Coleraine Trunk Sewer from Length (m) < 5m depth Length (m)	Harvestmoon Dr. to north of George Bolte Base Construction		rook Creek # Region	Regional #Major	Major	ess Crossings							si l	Total Estimated	Total Estimated
Wastewater OPT 3 - STRAT 38 (via Harvest Moon) Project # Project Description	Convey flows via	twinning of existing Size Unit		em (via Harvestr Unit			Urban # Cre	reek Creek # Region	nal Regional # Major Creek Crossing Crossing	Major Creek Trenchless Trenchle Crossing Length (m) Cost (\$	ess Crossings	Construction		Construction G	eotech / Hydrog	Property / Add	itional Sub-Tota sts (\$) Cost (\$)	al Eng / Conting (S	Total Estimated Cost (2013\$)	Total Estimated Cost (2013\$)
Project # Project Description	Туре	Size Unit	Unit Cost (\$/m)	Unit	Length (m) < 5m depth Length (m)	Base Construction Cost (\$) Uplift (\$)	Urban # Cre Uplift (\$) Cross	reek Creek #Region Crossing Rd / Rai	Regional Rd / Rail Crossing (\$) # Major Creek Crossing	Major Creek Trenchless Trenchle	ess Crossings	Construction Sub-Total (\$)	Construction Contingency (\$)	Construction G	eotech / Hydrog equirements (\$)	Property / Add	itional Sub-Tota	Eng / Conting (\$	Cost (2013\$)	Cost (2013\$)
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine	Type WWM-NEW WWM-NEW	Size Unit 450 mm 450 mm	Unit Cost (\$/m)	Unit \$ per m \$ per m	Length (m) < 5m depth or Capacity (L/s) > 5m depth 557 88 1,651 396	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,581	Urban # Crc Uplift (\$) 1 \$ 464,971 0 \$ 1,620,869	reek Crossing (\$) 0 \$ - 5 \$ \$765,000	Regional # Major Creek Crossing (5) Crossing 2 5754,000 0 5 0 0	Major Cresk Trenchless Trenchles (\$) S - 0 5 -	crossings) (\$) \$ 754,000 \$ \$ 765,000 \$	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$	Construction Contingency (\$) 214,891 \$ 562,761 \$	Construction G Total (\$) R 2,363,804 \$ 6,190,369 \$	eotech / Hydrog equirements (\$) 47,276 \$ 123,807 \$	Property / Add asement (\$) Co:	itional Sub-Tota sts (\$) Cost (\$) ,791,119 \$ 2,411, ,153,017 \$ 6,314,	Eng / Conting (\$	Cost (2013\$) 78 3,308,003 52 8,663,050	Cost (2013\$) 8 \$ 3,310,000 9 \$ 8,670,000
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3 Twining of Colerain runk. Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy	Type WWM-NEW WWM-NEW WWM-UPG	Size Unit	\text{\subseteq} Unit Cost (\subseteq) Unit Cost (\subseteq) \text{\subseteq} \subset	Unit \$ per m \$ per m \$ per m	Length (m) < 5m depth or Capacity (L/s) > 5m depth 557 88	Base Construction Uplift (\$) \$ 619,961 \$ 309,98	Urban # Crc Cross 1 \$ 464,971 0 \$ 1,620,869 5 932,684	reek Crossing Rd / Rai Crossing (\$) Crossing 0 \$ -	Regional Rd / Rail Creek Crossing (\$) 2 \$754,000 0	Major Cresk Trenchless Trenchles Crossing Length (m) Cost (S (S) 0 5 -	css Crossings) (\$) \$ 754,000 \$	Construction Sub-Total (\$) C	Construction Contingency (\$)	Construction G Total (\$) R	eotech / Hydrog equirements (\$) E: 47,276 \$ 123,807 \$ 134,774 \$	Property / Add asement (\$) Co: -	itional Sub-Tota sts (\$) Cost (\$) ,791,119 \$ 2,411,	Eng / Conting (\$ 081 \$ 843,8 176 \$ 2,209,9 488 \$ 2,405,7	Cost (2013\$) 78 3,308,003 52 8,663,050 21 9,430,426	Cost (2013\$) \$ \$ 3,310,000 \$ 8,670,000 \$ 9,440,000
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Columba Way from ROA2 to Kingsview Dr.	Type WWM-NEW WWM-NEW	450 mm 450 mm 450 mm	Unit Cost (\$/m)	Unit \$ per m \$ per m	Length (m) < 5m depth or Capacity (L/s)	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 252,960 \$ 252,960 \$ 5 252,960 \$ 5 151,152 \$ 5 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Urban Uplift (\$) #Crcss 1 \$ 464,971 0 \$ 1,620,869 5 932,684 0 \$ 63,240 \$ 37,788	Creek Region # Region Rd / Rai (5)	Regional # Major Creek Crossing (5) Crossing (5) Crossing 1 S774,000 0 0 5 - 0 0 5 - 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 1 0 0 0 0 0 0	Major Creek Trenchless Trenchless Crossing Length (m) Cost (§ S -	(S)	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S	Construction Contingency (\$) 214,891 \$ 562,761 \$ 612,610 \$ 56,916 \$ 18,894 \$	Construction G Total (\$) R 2,363,804 \$ 6,190,369 \$ 6,738,714 \$ 626,076 \$ 207,833 \$	eotech / Hydrog equirements (\$) Ei 47,276	Property / Add asement (\$) Co: - \$ 1 - \$ 4 - \$ 2 - \$ 5 - \$ 5	itional Sub-Tota tsts (\$) Cost (\$) (791,119 \$ 2,411, 153,017 \$ 6,314, 210,069 \$ 6,873, 385,638 \$ 638, 60,838 \$ 211,	el Eng / Conting (\$ 1081 \$ 843,8 176 \$ 2,209,9 188 \$ 2,405,7 598 \$ 223,5 1990 \$ 74,1	Cost (2013\$) 78 3,308,003 52 8,663,050 21 9,430,426 19 \$ 876,156 67 290,850	Cost (2013\$) S 3,310,000 S 8,670,000 S 9,440,000 S 880,000 S 300,000
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m onth of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-UPG WWM-NEW	450 mm 450 mm 450 mm 250 mm	Unit Cost (\$/m)	Unit S per m S per m S per m S per m	Length (m) < 5m depth or Capacity (L/s) > 577 88 1,651 396 1,385 1,523 405 -	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 252,960 \$ 252,960 \$ 5 252,960 \$ 5 151,152 \$ 5 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Urban Uplift (\$) #Crcss 1 \$ 464,971 0 \$ 1,620,869 5 932,684 0 \$ 63,240 \$ 37,788	reek Crossing (\$) 0 \$ - 5 \$ \$765,000	hal il Regional Rd / Rail / Major Creek (5) Crossing (5) Crossing 2 5754,000 0 0 0 5 - 0 0 1	Major Creek Trenchless Trenchless Crossing Length (m) Cost (§ S -	(S)	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 569,160 \$	Construction Contingency (\$) 214,891 \$ 562,761 \$ 612,610 \$ 56,916 \$ 18,894 \$	Construction G Total (\$) R 2,363,804 \$ 6,190,369 \$ 6,738,714 \$ 626,076 \$	eotech / Hydrog equirements (\$) 47,276 \$ 123,807 \$ 134,774 \$ 12,522 \$	Property / Add asement (\$) Co: - \$ 1 - \$ 4 - \$ 2 - \$ 5 - \$ 5	itional Sub-Tota sts (\$) Cost (\$) ,791,119 \$ 2,411, 153,017 \$ 6,314, 210,069 \$ 6,873, 385,638 \$ 638,	el Eng / Conting (\$ 1081 \$ 843,8 176 \$ 2,209,9 188 \$ 2,405,7 598 \$ 223,5 1990 \$ 74,1	Cost (2013\$) 78 3,308,003 52 8,663,050 21 9,430,426 19 \$ 876,156 67 290,850	Cost (2013\$) S 3,310,000 S 8,670,000 S 9,440,000 S 880,000 S 300,000
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 31 Wanning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-UPG WWM-NEW	450 mm 450 mm 450 mm 250 mm	Unit Cost (\$/m)	Unit S per m S per m S per m S per m	Length (m) < 5m depth or Capacity (L/s)	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 252,960 \$ 252,960 \$ 5 252,960 \$ 5 151,152 \$ 5 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Urban Uplift (\$) #Crcss 1 \$ 464,971 0 \$ 1,620,869 5 932,684 0 \$ 63,240 \$ 37,788	Creek Region # Region Rd / Rai (5)	Regional # Major Creek Crossing (5) Crossing (5) Crossing 1 S774,000 0 0 5 - 0 0 5 - 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 5 - 0 0 0 1 0 0 0 0 0 0	Major Creek Trenchless Trenchless Crossing Length (m) Cost (§ S -	(S)	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S	Construction Contingency (\$) 214,891 \$ 562,761 \$ 612,610 \$ 56,916 \$ 18,894 \$	Construction G Total (\$) R 2,363,804 \$ 6,190,369 \$ 6,738,714 \$ 626,076 \$ 207,833 \$	eotech / Hydrog equirements (\$) Ei 47,276	Property / Add asement (\$) Co: - \$ 1 - \$ 4 - \$ 2 - \$ 5 - \$ 5	itional Sub-Tota tsts (\$) Cost (\$) (791,119 \$ 2,411, 153,017 \$ 6,314, 210,069 \$ 6,873, 385,638 \$ 638, 60,838 \$ 211,	el Eng / Conting (\$ 1081 \$ 843,8 176 \$ 2,209,9 188 \$ 2,405,7 598 \$ 223,5 1990 \$ 74,1	Cost (2013\$) 78 3,308,003 52 8,663,050 21 9,430,426 19 \$ 876,156 67 290,850	Cost (2013\$) S 3,310,000 S 8,670,000 S 9,440,000 S 880,000 S 300,000
Project # Project Description 3 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Truits Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr	WWM-NEW WWM-NEW WWM-UPG WWM-NEW WWM-NEW	450 mm 450 mm 450 mm 250 mm 250 mm	Unit Cost (5/m)	Unit S per m	Length (m) < 5m depth or Capacity (L/s)	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ - 5 5 25,960 \$ 252,960 \$ 253,965 \$ 151,512 \$ - 7,848,652 \$ 1,643,52	Urban #Cross 1 \$ 464,971 0 \$ 1,620,869 \$ 9 332,684 0 \$ 63,240 \$ \$ 37,788 1 \$ 3,119,552	Creek Region # Region Rd / Rai (5)	hal Regional all Rd/Rail g Major Creek g (5) 0 5 . 0 0 0 5 . 0 0 0 5 . 0 0 0 5 . 0 0 0 5 . 0 0 0 0	Major Creek Trenchless Trenchless (5) (5) (5) (5) (5) (6) (7)	(S)	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S	Construction Contingency (\$) 214,891 \$ 562,761 \$ 612,610 \$ 56,916 \$ 18,894 \$	Construction G Total (\$) R 2,363,804 \$ 6,190,369 \$ 6,738,714 \$ 626,076 \$ 207,833 \$	eotech / Hydrog equirements (\$) Ei 47,276	Property / Add asement (\$) Co: - \$ 1 - \$ 4 - \$ 2 - \$ 5 - \$ 5	itional Sub-Tota tsts (\$) Cost (\$) (791,119 \$ 2,411, 153,017 \$ 6,314, 210,069 \$ 6,873, 385,638 \$ 638, 60,838 \$ 211,	el Eng / Conting (\$ 1081 \$ 843,8 176 \$ 2,209,9 188 \$ 2,405,7 598 \$ 223,5 990 \$ 74,1	Cost (2013\$) 78 3,308,003 52 8,663,050 21 9,430,426 19 \$ 876,156 67 290,850	Cost (2013\$) 8 \$ 3,310,000 9 \$ 8,670,000 9 \$ 9,440,000 9 \$ 880,000 9 \$ 300,000
Project # Project Description 3 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemain Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine)	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT	450 mm 450 mm 450 mm 250 mm 250 mm	Unit Cost (5/m)	Unit S per m	Length (m) < 5m depth or Capacity (L/s)	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ - 5 5,25,960 \$ 252,96 \$ 5 151,152 \$ - 5 7,848,652 \$ 1,643,52 \$ m south of rail to just north of George Bol	Urban Uplift (\$) # Cross 1 \$ 464,971 0 \$ 1,520,869 \$ 932,684 0 \$ 63,240 \$ \$ 37,788 1 \$ 3,119,552	reek Creek (Region of the Constitution of the	Anal Regional # Major Creek g (5) 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Major Trenchless Trenchless Cost (S) (SSS Crossings (S) \$ 754,000 \$ 5 765,000 \$ 5 5 530,000 \$ 5 \$ - \$ \$ \$ 2,049,000 \$	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 569,160 \$ 188,939 \$ 14,650,725 \$	Construction Contingency (\$) 214,891 5 562,761 5 612,610 5 56,916 5 13,894 5 1,466,072 \$	Construction Total (\$) R 2,363,804 \$ 6,190,369 \$ 6,738,714 \$ 626,076 \$ 207,833 \$ 16,126,797 \$	eotech / Hydrog equirements (\$) E. 47,276 \$ 123,807 \$ 134,774 \$ 1,2522 \$ 4,157 \$ 322,536 \$	Property / Add co co co seement (\$)	itional sts (s) Sub-Tots (s) (s) (s) (s) (s) (s) (s) (s) (s) (s	BI S 843,83 176 \$ 2,209.9 188 \$ 2,209.9 188 \$ 2,405,7 598 \$ 223,5 590 \$ 73,1 333 \$ 5,757,2	Cost (2013\$) 78 3,308,003 52 8,663,059 11 9,430,426 509 \$ 876,156 77 290,850 77 \$ 22,568,485	Cost (2013\$) S
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Truck Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from EOA3 to Harvest Moon Dr 5 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater	WWM-NEW WWM-NEW WWM-UPG WWM-NEW WWM-NEW	450 mm 450 mm 450 mm 250 mm 250 mm	Unit Cost (5/m)	Unit S per m	Length (m) < 5m depth or Capacity (L/s) S57 88 1,651 396 1,385 1,523 405 . 242 - 4,240 2,007	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ - 5 5 25,960 \$ 252,960 \$ 253,965 \$ 151,512 \$ - 7,848,652 \$ 1,643,52	Urban Uplift (\$) # Crcss 1	reek Creek (Region 8 d / Raisings (S) Crossing 8 d / Raisings (Ref Region Ref Region Raisings (Ref Region Raisings (Ref Region Raisings (Ref R	Regional Regional Regional Rd Rail Rd Rail Rd Rail Rd Rail Rd Rail Rd	Major Trenchless Trenchless Cost (S (S) S - 0 S -	Crossings (\$) \$ 754,000 \$ \$ 5 765,000 \$ \$ \$ 530,000 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Sub-Total (5) C 2,148,913 S 5,627,608 S 6,126,103 S 599,160 S 188,939 S 14,660,725 \$	Construction Contingency (\$) 214,891 5 562,761 5 612,610 5 56,916 5 13,894 5 1,466,072 \$	Construction G R 2,363,804 5 6,190,369 5 6,738,714 5 626,076 5 207,833 5 16,126,797 \$	eotech / Hydrog equirements (\$) E: 47,276 \$ 123,807 \$ 134,774 \$ 12,526 \$ 4,157 \$ 322,536 \$	Property / Add asement (\$) Co Co - \$ 1	itional Sub-Tota tsts (\$) Cost (\$) (791,119 \$ 2,411, 153,017 \$ 6,314, 210,069 \$ 6,873, 385,638 \$ 638, 60,838 \$ 211,	nl Eng / Conting (5) 181	Cost (2013\$) 78 3,308,003 52 8,663,059 11 9,430,426 509 \$ 876,156 77 290,850 77 \$ 22,568,485	Cost (2013\$) 8 \$ 3,310,000 9 \$ 8,670,000 9 \$ 9,440,000 9 \$ 880,000 9 \$ 300,000
Project # Project Description 3 New sewer on King St, connect on Targuini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Columbia Way from ROA3 to Kingwiew Dr. Sub-Total Wastewater Option 3 - Strategy 38 Visitawater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description	Type MOMINEW WOMENEW WOMENEW WOMENEW WOMENEW WOMENEW **SCREENED OUT	450 mm 450 mm 450 mm 250 mm 250 mm	Unit Cost (5/m)	Unit S per m Unit	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro	Base Construction Uplift (5)	Urban Uplift (\$) # Crcss 1	reek Crossing (\$)	hal Regional # Major Creek Crossing (5) 0 5 - 0 0 0 0	Major Trenchless Trenchle	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 530,000 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Sub-Total (\$) 2.148,31 \$ 5,627,608 \$ 6,126,103 \$ 569,160 \$ 188,939 \$ 14,660,725 \$ \$ \$ Construction Sub-Total (\$) \$ C	Construction Contingency (5) 21.891 5 562,761 5 612,610 5 55,916 5 13,894 5 1,466,072 5 Construction Contingency (5)	Construction G 2,363,804 S 6,190,369 S 6,738,714 S 207,833 S 16,126,797 S	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$	Property / Add Co 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 8 - 5 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ititional Sub-Totz	l Eng / Conting (\$ 1081 \$ 843,8 84 176 \$ 2,209,9 84 188 \$ 2,405,7 58 189 \$ 743,1 33 1 \$ 5,757,2 11 Eng / Conting (\$	Cost (2013\$) 78 3,308,003 52 8,663,050 11 9,430,426 99 \$ 876,136 77 290,850 77 \$ 22,568,485	Cost (2013\$) S
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All 8) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine)	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type WWM-NEW WWM-NEW	450 mm 450 mm 450 mm 250 mm 250 mm 250 mm 250 mm 250 mm 450 mm 450 mm	Unit Cost (5/m)	Unit S per m Unit Unit	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700	Base Construction Uplift (5) \$ 619,961 \$ 309,98 \$ \$ 2,161,159 \$ 1,080,58 \$ \$ 4,663,420 \$ 5 \$ 252,960 \$ 5 151,152 \$ \$ 7,848,663 \$ \$ 1,643,52 \$ \$ \$ 7,848,663 \$ \$ \$ 1,643,52 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Urban Uplift (\$) # Crcross 1	reek Crossing (\$) Crossing Rd / Raiglon Rd / Rd / Raiglon Rd / Rd	Regional Regional Regional Rd Rail Rd Rail Rd Rail Rd Rail Rd Rail Rd	Major Trenchless Trenchless Cost (S (S) S - 0 S -	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ \$ 5 - \$ \$ \$ 2,049,000 \$ Crossings (\$) \$ 907,000 \$	Construction Sub-Total (\$) C 2.148.3 (\$) C 5.627.608 \$ 5.627.608 \$ 5.69.160 \$ 188.939 \$ 14,666.725 \$ \$ \$ 14,660.725 \$ \$ \$ 10,558.962 \$ \$ 10,558.962 \$ \$ 10,558.962 \$ \$ \$ 10,558.962 \$ \$ \$ \$ \$ \$ 10,558.962 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Contingency (5) 21.891 5 562,761 5 612,610 5 55,916 5 138,894 5 1,466,072 \$ Construction Contingency (5) 143,022 5 1,055,896 5	Construction G R 2,363,804 § 6,190,369 § 6,798,714 § 207,833 § 16,126,797 § Construction Total (\$5\$) Construction Total (\$5\$) 1,573,237 § 11,614,858 § 5	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$ eotech / Hydrog equirements (\$) E: 31,465 5 232,297 5	Property / Add co - \$ 1 - \$ 4 - \$ 5 2 - \$ 5 - \$ 5 - \$ 5 - \$ 4 - \$ 6 - \$ 7 - \$	ititional Sub-Tott	l Eng / Conting (\$ 1081 \$ 843,8 \$ 176 \$ 2,209,9 \$ 1888 \$ 2,405,7 \$ 1899 \$ 743,1 \$ 10 Eng / Conting (\$ 11 Eng / Conting (\$ 12 \$ 561,6 \$ 155 \$ 4,146,5 \$ 1	Cost (20135) Cost (20135) 3,308,003 22 8,663,050 21 9,430,426 9,5 876,156 77 290,850 77 5 22,568,485 Total Estimated Cost (20135) 66 2,201,651 41 5,254,297	Cost (2013\$) 1. S
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West [All 8] via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trusk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemain Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Visit covater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trusk Sewer, Healey Rd to north of George Bolton Pkwy.	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW ***SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW	450 mm 450 mm 250 mm 350 mm 35	Unit Cost (5/m)	Unit S per m Unit Unit	Length (m) < 5m depth or Capacity (L/s)	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 5 5,551,512 \$ 5 7,848,652 \$ 1,643,52 \$ 1,643	Urban Uplift (\$) # Crcoss 1 \$ 464,971 0 \$ 1,620,869 \$ 932,684 0 \$ 63,240 1 \$ 3,119,552 Ton Pkwy. Urban Uplift (\$) Cross \$ 92,500 \$ 92,500 \$ 93,119,552	reek Crossing (\$)	hal Regional # Major Creek Crossing (5) 0 5 - 0 0 0 0	Major Trenchless Trenchless Cost (S (S) S - 0 S -	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 530,000 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Sub-Total (\$) C 2,148,176 S 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 5 188,393 \$ 14,660,725 \$ \$ \$ \$ 14,40,700 \$ 14,40,7	Construction Contingency (5) 21.89.1 5 562.76.1 5 612.610 5 56.916 5 1.8,894 5 1.466,072 5 Construction Contingency (5) 43,022 5 1,055,896 5 379,818 5	Construction G R 7 Total (\$) R 6.190,369 S 6.738,714 S 626,076 S 207,833 S 16,126,797 \$	eotech / Hydrog equirements (\$) E: 4.7,276 5. 123,807 \$ 134,774 \$ 12,522 \$ 322,536 \$ 5	Property / Add Co \$ 1 1 - \$ 4 - \$ 5 2 - \$ 5 - \$ 5 - \$ 5 - \$ 8 Property / Addenent (\$) - \$ 1 - \$ 3 - \$ 5 - \$ 5 - \$ 5	ititional sts (s), 19 5 2,411, 19 5 2,411, 19 5,014, 19 6,314, 210,069 \$ 6,873, 860,588 \$ 5,21, 600,681 \$ 16,449, 19 6,449, 19	ll Eng / Conting (\$ 108.1 \$ 844,8,8 176.5 \$ 2,209,9 1858.5 \$ 2,405,7 1859.0 \$ 74,1 1833.5 \$ 5,757,2 19 10 11 11 12 13 13 14 15 15 15 16 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Cost (20135) 78 3,388,003 78 8,663,050 11 9,430,426 19 5 876,156 77 290,850 75 5 22,568,485 Total Estimated Cost (20135) 16 2,201,651 4 16,254,237 4 5,846,852	Cost (2013\$) \$ \$ 3,310,000 \$ \$ 8,670,000 \$ \$ 9,440,000 \$ \$ 880,000 \$ \$ 300,000 \$ \$ 22,660,000 Total Estimated Cost (2013\$) \$ 2,210,000 \$ 2,210,000
Project # Project B Project Description 1 New sewer on King St, connect on Targuini 2 Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from DoA3 to Harvest Moon 5 Sewer extension, on Columbia Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Vistouries OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project B Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr.	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type WWM-NEW WWM-NEW	Size	Unit Cost (5/m)	Unit S per m Unit Unit	Length (m) < 5m depth or Capacity (L/s)	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 5 5 5,515,152 \$ 5 7,848,652 \$ 1,643,52 \$ m south of rail to just north of George Bol Cost (\$) Construction Uplift (\$) \$ 523,216 \$ 5 7,844,7169 \$ 2,111,79 \$ 5 3,027,7467 \$ 5 1,117,79 \$ 5 3,027,967 \$ 5 25,960 \$ 252,960 \$ 252,960 \$ 5	Urban Uplift (\$) # Crcoss 1	reek Crossing Rd / Ragion Rd / Rd	Regional # Major Creek Crossing (5) (5) (7) (7) (8) (7) (8) (7) (8) (7) (8) (8) (8) (7) (8)	Major Creek Crossing Length (m) Cost (5 5 - 0 5 - 0 5 - 0	Society Soci	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S 14,660,725 S 5 14,960,725 S 188,939 S 1,430,216 S 10,558,962 S 3,798,177 S 569,160 S 188,939 S 188,939 S 188,939 S 188,939 S 188,939 S	Construction Contingency (5) 214.891 5 562.761 5 612.610 5 56.916 5 1.8.894 5 1.466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 5,916 5 18,894 5	Construction G R 103,804 S 6,190,369 S 6,738,714 S 626,076 S 106,126,797 S 11,614,858 S 11,137,3237 S 11,614,858 S 626,076 S	eotech / Hydrog equirements (\$) E: 47,276 5. 123,807 5. 134,774 5. 12,522 5. 322,536 5. eotech / Hydrog equirements (\$) E: 31,465 5. 232,297 5. 83,560 5. 12,522 5.	Property / Add Co \$ 1 1 - \$ 4 4 - \$ 5 2 - \$ 5 5 - \$ 5 8 8	ititional sts (s) 5 Ub-Totz (cst (s) 1,791,119 5 2,411), 210,069 5 6,873, 385,638 5 314,600,681 \$ 16,604,681 \$ 16,604,399,986 \$ 11,807,408,608,608 \$ 1,807,408,608,608,608,608,608,608,608,608,608,6	ll Eng / Conting (\$ 1081 S 843,83 1476 S 2,209,9 1888 S 2,405,7 1598 S 223,5 1990 S 74,1 148,5 155 S 4,146,5 155 S 4,146,5 155 S 4,146,5 155 S 5 2,23,5 1598 S 223,5	Cost (20135) 78 3.308,003 78 8,663,050 70 9,430,426 70 290,850 70 22,568,485 Total Estimated Cost (20135) 16 2,201,651 4 16,254,287 44 5,846,875 19 \$ 876,155 70 290,850	Cost (20135) 1
Project # Project Description 3 New sewer on King St, connect on Targuini 2 Iwin sewers in North Hill West [All B] via Harvest Moon to railway connection on Coleraine 3 Iwinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr from DoA3 to Harvest Moon Dr to 700 m north of George Bolton Pkwy 5 Sewer extension, on Columbia Way From ROA2 to Kingsview Dr. 5 Sewer extension, on Columbia Way From ROA2 to Kingsview Dr. 5 Sub-Total Wastewater Option 3 - Strategy 38 Vestowers OPT 3 - STRAY 4 (Humber Stn-Healey-Coleraine) Project 8 Project B Project Boscription 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWW-NEW WWW-NEW WWW-NEW	450 mm 450 mm 250 mm 350 mm 35	Unit Cost (5/m)	Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 242 4,240 2,007 Mealey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 \$ 252,960 \$ 252,	Urban Uplift (\$) # Crcoss 1	reek Crossing Rd / Ragion Rd / Rd	hal Regional # Major Creek Crossing (5) 0 5 - 0 0 0 0	Major Creek Crossing Length (m) Cost (5 5 - 0 5 - 0 5 - 0	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ \$ 5 - \$ \$ \$ 2,049,000 \$ Crossings (\$) \$ 907,000 \$	Construction Sub-Total (\$) C 1,488,393 S 14,666,725 \$ Construction Sub-Total (\$) C 1,488,393 S 14,666,725 \$ Construction Sub-Total (\$) C 1,480,216 S 10,558,962 S 3,788,177 S 5,569,160 S	Construction Contingency (5) 214,891 5 562,761 5 612,610 5 56,916 5 1,866,072 5 Construction Contingency (5) 43,022 5 1,55,896 5 379,818 5 5,916 5 18,894 5	Construction G R 15,263,804 G 19,0349 S 6,190,349 S 626,076 S 207,833 S 16,126,797 S 11,614,858 S 4,177,994 S 626,076 S	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$ eotech / Hydrog equirements (\$) E: 31,465 5 232,297 5 83,560 5 12,522 5 12,522 5 12,522 5	Property / Add Co \$ 1 1 - \$ 4 4 - \$ 5 2 - \$ 5 5 - \$ 5 8 8	itional Sub-Totic Cost (\$1] 153,017 5 6,314, 153,017 5 6,314, 2180,693 5 6,838, 5 16,0088 \$ 16	ll Eng / Conting (\$ 1081 S 843,83 1476 S 2,209,9 1888 S 2,405,7 1598 S 223,5 1990 S 74,1 148,5 155 S 4,146,5 155 S 4,146,5 155 S 4,146,5 155 S 5 2,23,5 1598 S 223,5	Cost (20135) 78 3,308,003 78 8,663,050 11 9,430,426 19 5 876,156 77 290,850 75 5 22,568,485 Total Estimated Cost (20135) 16 2,201,651 14 5,846,852 19 5 876,156 77 290,850	Cost (20135) 1
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in Korth Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemain Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWW-NEW WWW-NEW WWW-NEW	Size	Unit Cost (5/m)	Unit S per m	Length (m) < 5m depth or Capacity (L/s)	Base Cost (\$) Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 5 5 5,515,152 \$ 5 7,848,652 \$ 1,643,52 \$ m south of rail to just north of George Bol Cost (\$) Construction Uplift (\$) \$ 523,216 \$ 5 7,844,7169 \$ 2,111,79 \$ 5 3,027,7467 \$ 5 1,117,79 \$ 5 3,027,967 \$ 5 25,960 \$ 252,960 \$ 252,960 \$ 5	Urban Uplift (\$) # Crcoss 1	reek Crossing Rd / Ragion Rd / Rd	Regional # Major Creek Crossing (5) (5) (7) (7) (8) (7) (8) (7) (8) (7) (8) (8) (8) (7) (8)	Major Creek Crossing Length (m) Cost (5 5 - 0 5 - 0 5 - 0	Society Soci	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S 14,660,725 S 5 14,960,725 S 188,939 S 1,430,216 S 10,558,962 S 3,798,177 S 569,160 S 188,939 S 188,939 S 188,939 S 188,939 S 188,939 S	Construction Contingency (5) 214.891 5 562.761 5 612.610 5 56.916 5 1.8.894 5 1.466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 5,916 5 18,894 5	Construction G R 103,804 S 6,190,369 S 6,738,714 S 626,076 S 106,126,797 S 11,614,858 S 11,137,3237 S 11,614,858 S 62,6,076 S 626,076 S 626,076 S 626,076 S 626,076 S 626,076 S 626,076 S	eotech / Hydrog equirements (\$) E: 47,276 5. 123,807 5. 134,774 5. 12,522 5. 322,536 5. eotech / Hydrog equirements (\$) E: 31,465 5. 232,297 5. 83,560 5. 12,522 5.	Property / Add Co \$ 1 1 - \$ 4 4 - \$ 5 2 - \$ 5 5 - \$ 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ititional sts (s) 5 Ub-Totz (cst (s) 1,791,119 5 2,411), 210,069 5 6,873, 385,638 5 314,600,681 \$ 16,604,681 \$ 16,604,399,986 \$ 11,807,408,608,608 \$ 1,807,408,608,608,608,608,608,608,608,608,608,6	ll Eng / Conting (\$ 1081 S 843,83 1476 S 2,209,9 1888 S 2,405,7 1598 S 223,5 1990 S 74,1 148,5 155 S 4,146,5 155 S 4,146,5 155 S 4,146,5 155 S 5 2,23,5 1598 S 223,5	Cost (20135) 78 3.308,003 78 8,663,050 70 9,430,426 70 290,850 70 22,568,485 Total Estimated Cost (20135) 16 2,201,651 4 5,846,857 44 5,846,857 9 \$ 876,156 70 290,850	Cost (20135) 1
Project # Project Description 3 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Dr From ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW	Size	Unit Cost (5/m)	Unit S per m S per m S per m S per m Unit Unit S per m	Length (m) < 5m depth or Capacity (L/s)	Base Construction Uplift (5) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 252,960 \$ 252,960	Urban Uplift (\$) # Crcross 1 \$ 464,971 0 \$ 1,620,869 5 932,684 0 \$ 63,240 5 37,788 1 \$ 3119,552 ton Pkwy. Urban Uplift (\$) # Crcss \$ \$ 2 \$ 5 605,529 0 \$ 63,240 5 37,788 3 \$ 706,557	reek Crossing Rd / Ragion Rd / Rd	Regional # Major Creek Crossing (5) (5) (7) (7) (8) (7) (8) (7) (8) (7) (8) (8) (8) (7) (8)	Major Creek Crossing Length (m) Cost (\$ (\$) S - 0	Society Soci	Construction Sub-Total (\$) C 2,148,913 S 5,627,608 S 6,126,103 S 569,160 S 188,939 S 14,660,725 S C Construction Sub-Total (\$) C 1,430,216 S 10,558,962 S 3,798,177 S 569,160 S 188,939 S 188,939 S	Construction Contingency (5) 214.891 5 562.761 5 612.610 5 56.916 5 1.8.894 5 1.466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 5,916 5 18,894 5	Construction G R 103,804 S 6,190,369 S 6,738,714 S 626,076 S 106,126,797 S 11,614,858 S 11,137,3237 S 11,614,858 S 62,6,076 S 626,076 S 626,076 S 626,076 S 626,076 S 626,076 S 626,076 S	eotech / Hydrog equirements (\$) E: 47,276 5. 123,807 5. 134,774 5. 12,522 5. 322,536 5. eotech / Hydrog equirements (\$) E: 31,465 5. 232,297 5. 83,560 5. 12,522 5.	Property / Add Co \$ 1 1 - \$ 4 4 - \$ 5 2 - \$ 5 5 - \$ 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ititional sts (s) 5 Ub-Totz (cst (s) 1,791,119 5 2,411), 210,069 5 6,873, 385,638 5 314,600,681 \$ 16,604,681 \$ 16,604,399,986 \$ 11,807,408,608,608 \$ 1,807,408,608,608,608,608,608,608,608,608,608,6	ll Eng / Conting (\$ 1081 S 843,83 1476 S 2,209,9 1888 S 2,405,7 1598 S 223,5 1990 S 74,1 148,1 1598 S 541,46,5 1555 S 4,146,5 1556 S 1,146,5 1558 S 223,5 1598 S 223,5	Cost (20135) 78 3.308,003 78 8,663,050 70 9,430,426 70 290,850 70 22,568,485 Total Estimated Cost (20135) 16 2,201,651 4 5,846,857 44 5,846,857 9 \$ 876,156 70 290,850	Cost (2013\$) \$ \$ 3,310,000 \$ \$ 8,670,000 \$ \$ 9,440,000 \$ \$ 880,000 \$ \$ 300,000 \$ \$ 22,600,000 Total Estimated Cost (2013\$) \$ 2,210,000 \$ 16,260,000 \$ 16,260,000 \$ 5 880,000 \$ 5 880,000 \$ 5 880,000
Project # Project Description 3 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension on Colemaine Dr from ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-NEW ***SCREENED OUT Type WWM-NEW	#*Convey flows sou #50 mm #50 mm #50 mm #50 mm #50 mm 250 mm Unit #100 mm #100 m	Unit Cost (5/m)	Unit S per m S per m S per m S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,385 1,523 405 - 242 - 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 - 2,700 2,700 1,000 916 405 - 242 - 5,059 3,616	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 5 5 5,55 \$ 151,552 \$ 1,583,52 \$	Urban Uplift (\$) # Crcross 1	reek Crossing Rd / Raiglon Rd / Rd	Regional # Major Creek Crossing (5) (5) (5) (7) (7) (7) (8) (7) (7) (7) (8) (7)	Major Creek Crossing Length (m) Cost (§ (§) S - 0 S - 5 S - 0 S - 9	Solution Crossings Crossings S 754,000 S S 765,000 S S S S S S S S S	Construction Sub-Total (\$) C 2.148,913 \$ 5,627,608 \$ 6.126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 10,558,962 \$ 3,798,177 \$ 5,99,160 \$ 3,798,177 \$ 5,99,160 \$ 3,798,177 \$ 1,88,339 \$ 16,545,454 \$ \$ \$ 10,545,454 \$ \$ \$ 10,545,454 \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ \$ \$ \$ 10,545,454 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Contingency (S) 21.891 5 56.2,761 5 612,610 5 59,916 5 18,894 5 1,466,072 5 Construction Contingency (S) 11,058,896 5 379,818 5 56,916 5 18,894 5 1,058,965 5 379,818 5 56,916 5 18,894 5	Construction G R 2,363,804 6,190,369 5 6,798,734 5 626,076 5 207,833 5 16,126,797 \$ Construction G R 1,573,237 5 11,614,858 5 4,177,994 5 207,833 5 18,199,999 \$	eotech / Hydrog equirements (5) E i	Property / Add Co	itional sub-Totic C52 (\$1], 153,017 5 6,314, 153,017 5 6,314, 2305,063 5 6,823, 2305,063 5 6,824, 2305,063 5 6,824, 2305,063 5 11,847, 2305,063 5 1,604, 399,986 5 11,847, 2335,073 5 211,161,855 \$ 18,563,	l Eng / Conting (5 2,209,9 8 5 2,209,9 8 5 2,333 5 5,757,2 8 1	Cost (20135) 78 3.308,003 78 4.663,050 71 9,430,426 79 5 876,156 77 290,850 77 5 22,568,485 7	Cost (2013\$) 1 \$ 3,310,000 5 9,440,000 5 980,000 5 880,000 6 \$ 22,600,000 Total Estimated Cost (2013\$) 5 2,210,000 5 16,260,000 5 880,000 5 880,000 5 15,550,000 5 15,550,000
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West [All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Colenaine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colenaine Dr from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Westcwater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr from ROA3 to Kangsview Dr. Sub-Total Wastewater Option 3 - Strategy 4 Wastewater	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW	Size	Unit Cost (5/m)	Unit S per m S per m S per m S per m Unit Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405 242 - 5,059 3,616	Base Construction Uplift (5) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 252,960 \$ 252,960	Urban Uplift (\$) # Crcss 1	reek Crossing (\$)	Regional # Major Creek Crossing (5) (5) (6) (7) (7) (7) (8) (7)	Major Trenchless Trenchle	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ \$ 5 - \$ \$ \$ 2,049,000 \$ Crossings (\$) \$ 907,000 \$ \$ 9 907,000 \$ \$ 1 1,072,000 \$	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ \$ 14,660,725 \$ \$ \$ 10,558,962 \$ 5,798,177 \$ 5,569,160 \$ 5,99,160 \$ 1,488,939 \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Contingency (S) 21.891 5 56.2,761 5 612,610 5 59,916 5 18,894 5 1,466,072 5 Construction Contingency (S) 11,058,896 5 379,818 5 56,916 5 18,894 5 1,058,965 5 379,818 5 56,916 5 18,894 5	Construction Total (\$) R 8 (1.93, 1.94) Construction G 6,190,369 S 6,738,714 S 207,833 S 16,126,797 S 16,126,797 S 11,614,858 S 4,177,994 S 207,833 S 18,199,999 S 18,199,999 S Construction G Construction G Construction G C	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$ eotech / Hydrog equirements (\$) E: 31,465 5 232,297 5 83,560 5 12,522 5 4,157 5 364,000 \$	Property / Add Add Assement (5) Co	ititional sts (s) 5 Ub-Totz (cst (s) 1,791,119 5 2,411), 210,069 5 6,873, 385,638 5 314,600,681 \$ 16,604,681 \$ 16,604,399,986 \$ 11,807,408,608,608 \$ 1,807,408,608,608,608,608,608,608,608,608,608,6	Eng / Conting (\$ S	Cost (20135) 78 3.308,003 78 4.663,050 71 9,430,426 79 5 876,156 77 290,850 77 5 22,568,485 7	Cost (2013\$) \$ \$ 3,310,000 \$ \$ 8,670,000 \$ \$ 9,440,000 \$ \$ 880,000 \$ \$ 300,000 \$ \$ 22,600,000 Total Estimated Cost (2013\$) \$ 2,210,000 \$ 16,260,000 \$ 16,260,000 \$ 5 880,000 \$ 5 880,000 \$ 5 880,000
Project # Project Bescription 1. New sewer on King St, connect on Tarquini 2. Twin sewer in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project B Project Description 1. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 9. Sub-Total Wastewater Option 3 - Strategy 4 Wastewater OPT 3 - STRAT 5A (via easement-Mayfield) Project # Project Description	Type MOMN-NEW MOMN-NEW MOMN-NEW MOMN-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type	Size	Unit Cost (5/m) Vanit Cost (5/m) S 735 735 735 735 735 735 735 735	Unit S per m Unit S per m S per m Unit S per m S per m S per m Unit	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 242 4,240 2,007 Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405 242 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to for Capacity (L/s) Length (m) < 5m depth or Capacity (L/s) Length (m) 5,059 3,616	Base Construction Uplift (\$) \$ 619.961 \$ 309.98 \$ 5 2.51.51.55 \$ 1.080.58 \$ 5 4.663.420 \$ 5 5 151.152 \$ 5 1.683.52 \$ 5 1.51.52 \$ 5 1.51.52 \$ 5 1.683.52 \$ 5 1.51.	Urban Uplift (\$) # Crcss 1	reek Crossing (\$) 0 \$ -	Regional # Major Creek Crossing (5) (5) (7) (7) (8) (7)	Major Creek Crossing Length (m) Cost (\$ (\$) \$ - 0 \$ - \$ \$ - \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Crossings (\$) \$ 754,000 \$ \$ 5 765,000 \$ \$ \$ 5 30,000 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ \$ 14,660,725 \$ \$ \$ 10,558,962 \$ 5,798,177 \$ 5,599,160 \$ 1,430,103 \$ 188,939 \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 56.916 5 13.8394 5 1.466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 5,59.16 5 18,8394 5 1,654,545 5 Construction Contingency (5)	Construction G R 104,263,804 \$ 6,190,369 \$ 6,738,714 \$ 5 626,076 \$ 207,833 \$ 16,126,797 \$ \$ 16,126,797 \$ \$ 1,573,237 \$ \$ 21,614,858 \$ 4,177,994 \$ 207,833 \$ 18,199,999 \$ \$ \$ 207,833 \$ \$ 207,833 \$ \$ \$ 4,177,994 \$ \$ \$ \$ 207,833 \$ \$ \$ \$ \$ 207,833 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$ eotech / Hydrog equirements (\$) E: 31,465 5 232,297 5 83,560 5 12,522 5 4,157 5 364,000 \$	Property / Add co	ititional style (1) Sub-Totic Cost (5) (1) (2) (2) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Eng / Conting (\$ Eng / Conting (\$ S	Cost (20135)	Cost (2013\$) 1
Project # Project # Project Description 3. New sewer on King St. connect on Tarquini 2. Twin sewers in North Hill West (Alt 8) via Harvest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Coleraine Dr Trons ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Trunk Sewer, Roya Trunk Sewer, Healey Rd. 2. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Humber Stn Rd, From King St to Healey Rd. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Columbia Way From ROA2 to Kingsview Dr. 5. Sewer extension, on Columbia Way From ROA2 to Kingsview Dr. 5. Sewer extension on Columbia Way From ROA2 to Kingsview Dr. 6. Sub-Total Wastewater Option 3 - Strategy 4 Project # Project Becription 1. New gravity sewer on future easement, From King St east along railway, and south along concession lim 2. New gravity sewer on Mayfield, from Concession limit to future sewer on Clarkway Dr.	Type MOMN-NEW MOMN-NEW MOMN-UPG WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type Convey flows sou Type	Size	Unit Cost (5/m)	Unit S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,385 1,523 405 . 242 . 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 . 2,700 2,700 1,000 916 405 . 242 . 5,059 3,616	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 5 4,663,420 \$ 5 . 252,960 \$ 252,960 \$ 5 151,152 \$ 5 . 1,643,52 \$ 1,64	Urban Uplift (\$) # Crcss 1	reek Crossing (\$)	Regional # Major Creek Crossing (5) (5) (6) (7) (7) (7) (8) (7)	Major Creek Crossing Length (m) Cost (S	Solution Crossings Crossings S 754,000 S S 765,000 S S 530,000 S S S S S S S S S	Construction Sub-Total (\$) C 2,148,39 5 5,627,608 \$ 5,627,608 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 14,660,725 \$ \$ 10,558,962 \$ 5,798,177 \$ 5,569,160 \$ 1,430,160 \$ 10,558,962 \$ 5,798,177 \$ 5,569,160 \$ 1,839,39 \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ 16,545,454 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 55.916 5 13.894 5 1,466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 56,916 5 15,894 5 1,654,545 5	Construction Total (\$) R 8 (1.93, 1.94) Construction G 6,190,369 S 6,738,714 S 207,833 S 16,126,797 S 16,126,797 S 11,614,858 S 4,177,994 S 207,833 S 18,199,999 S 18,199,999 S Construction G Construction G Construction G C	eotech / Hydrog equirements (\$) E: 47,276 5: 123,807 5: 134,774 5: 12,522 5: 4,157 5: 322,536 5: 322,536 5: 322,297 6: 31,455 5: 232,297 6: 4,157 6: 33,465 6: 33,500 6: 33,500 6: 33,500 6: 33,500 6: 33,500 6: 33,600	Property / Add asement (5) Co - 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 Property / Add asement (5) Co - 5 1 - 5 3 3 - 5 1 - 5 5 5 - 5 6 Property / Add asement (5) Co - 5 1 - 5 5 6 Property / Add asement (5) Co - 5 1 - 5 5 6	ititional style (1) Sub-Totz (2) (2) (2) (3) (3) (4) (3) (4) (5) (6) (4) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6	Eng / Conting (\$ 176 S 2,209,9 188 S 2,405,7 188 S 2,405,7 199 S 74,1 10 Eng / Conting (\$ 155 S 4,146,5 155 S 4,146,5 155 S 4,215,5 16 Eng / Conting (\$ 170 S 56,4146,5 18 199 S 5,497,4 10 Eng / Conting (\$ 10 S 5,407,4 10 Eng / Conting (\$ 10 S 5,407,4 10 Eng / Conting (\$ 10 S 5,407,4 11 Eng / Conting (\$ 12 S 5,407,4 12 S 5,407,4 13 Eng / Conting (\$ 14 S 5,407,4 15 S 5,407,4 16 S 5,407,4 17 18 18 18 18 18 18 18	Cost (20135) 78 3.308,003 78 4.663,050 70 290,850 70 290,850 70 22,568,485 71 Total Estimated Cost (20135) 72 290,850 73 4 5,846,857 74 5,846,857 75 5 22,568,007 76 20,050 77 290,850 77 290,850 78 76,156 79 290,850 70 5 25,469,807	Cost (2013\$) 1
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All 8) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colleviaine Various Wastewater Option 3 - Strategy 4 Wastewater OPT 3 - STRAT 5A (via easement-Mayfield) Project # Project Description 1 New gravity sewer on future easement, from King St east along railway, and south along concession lim 2 New gravity sewer on Multire easement, from King St east along railway, and south along concession lim 2 New gravity sewer on Mayfield, from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr.	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type Convey flows sou Type III WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW	#*Convey flows sou #50 mm #50 mm #50 mm #50 mm #50 mm #*Convey flows sou #*Convey flows sou #50 mm	Unit Cost (5/m)	Unit S per m Unit S per m S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,552 396 1,583 405 - 242 - 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Capacity (L/s) 712 2,700 2,700 1,000 916 405 - 242 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 405 - 2,500 916 916 916 916 916 916 916 916 916 916	Base Cost (\$) Construction Uplift (\$) S 5 619,961 S 309,98 S 5 4,663,420 S 5 252,960 S	Urban Uplift (\$) # Crcross 1 \$ 464,971 1 \$ 1,520,869 5 932,684 0 \$ 63,240 1 \$ 3,119,552 ton Pkwy. Urban Uplift (\$) Crcss 5 605,529 0 \$ 63,240 1 \$ 776,557 8d. Urban Uplift (\$) Crcss # Crc Crcss # Crc Crcss # Crc	reek Crossing Rd / Raiglon Rd / Rd	Regional # Major Creek Crossing Cr	Major Creek Crossing Length (m) Cost (S	Solution Crossings Crossings S 754,000 S S 765,000 S S 530,000 S S S S S S S S S	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 188,939 \$ 14,660,725 \$ \$ 10,588,920 \$ 1,738,920 \$	Construction Contingency (S) 214.891 5 56.7.61 5 61.2.610 5 55.916 5 13.894 5 1.466.072 5 Construction Contingency (S) 143.022 5 1.058.896 5 1.8.894 5 1.658,545 5 Construction Contingency (S) 1.793.881 5 1.8.894 5	Construction G R 2,363,804 6,190,369 5 6,738,734 5 207,833 5 16,126,797 \$ Construction G R 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	eotech / Hydrog equirements (5) E: 47,276 5 123,807 5 134,774 5 12,522 5 4,157 5 322,536 \$ eotech / Hydrog equirements (8) E: 31,455 5 232,297 5 4,157 5 33,560 5 33,560 5 34,557 5 364,000 \$	Property / Add Co - S 1 - S 4 - S 5 2 - S 6 - S	ititional sub-Totic State Stat	Eng / Conting (\$ 1081 \$ 843,8 176 \$ 2,209,9 188 \$ 2,405,7 199 \$ 74,1 199 \$ 74,1 108 \$ 1,405,7 109 \$ 561,6 109 \$ 1,405,7 109 \$ 74,1 109 \$ 1,405,7 109 \$ 1,405,7 109 \$ 74,1 109 \$ 1,405,7	Cost (20135) 78 3.308,003 78 4.663,050 70 9 5 876,156 70 22,568,485 Total Estimated Cost (20135) 16 2,201,651 14 5,846,852 19 5 876,156 70 290,850 70 290,850 70 5 25,469,807 Total Estimated Cost (20135)	Cost (2013\$) 1. \$ 3,310,000 2. \$ 8,670,000 3. \$ 9,440,000 3. \$ 9,440,000 5. \$ 80,000 5. \$ 300,000 4. \$ 22,660,000 Total Estimated Cost (2013\$) 2. \$ 16,260,000 5. \$ 16,260,000 5. \$ 80,000 7. \$ 25,500,000 Total Estimated Cost (2013\$)
Project # Project # Project Description 3. New sewer on King St. connect on Tarquini 2. Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Way from ROA2 to Kingwiew Dr. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 7. Sub-Total Wastewater Option 3 - Strategy 4 Vestionated Project # Project # Project Description 1. New gravity sewer on future easement-Mayfield) Project # Project Description 1. New gravity sewer on Mayfield, from Concession limit to future sewer on Clarkway Dr. 3. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 6. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension Dr Ada Total Wastewer Dr.	Type MOMN-NEW MOMN-NEW MOMN-UPG WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type Convey flows sou Type	450 mm	Unit Cost (5/m)	Unit S per m Unit S per m S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405 242 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to f Length (m) < 5m depth or Capacity (L/s) 5,059 4,050 4,050 4,050 4,050 4,055	Base Construction Uplift (\$) \$ 619.961 \$ 309.98 \$ 2.161.159 \$ 1.080.58 \$ 4.663.420 \$ \$ 723.2960 \$ 252.96 \$ 151.152 \$ 1.643,52 an south of rail to just north of George Boil Construction Uplift (\$) \$ 523.216 \$ \$ 523.216 \$ \$ 523.216 \$ \$ 523.216 \$ \$ 131.152 \$ \$ 12.402,144 \$ Base Construction Uplift (\$) \$ 151.152 \$ \$ 12.402,144 \$ \$ 2.364,75 **Suture sewer at Clarkway Dr and Mayfield I Base Construction Uplift (\$) \$ 11.401,873 \$ \$ 5,70.94 \$ \$ 5,70.94 \$ \$ 5,70.	Urban Uplift (\$) # Cross 1	Creek Creek Region Reg	Regional # Major Creek Crossing (5) 0 0 0 0 0 0 0 0 0	Major Creek Crossing Length (m) Cost (\$ (\$) \$ - 0 \$ - \$ \$ - \$ \$ - \$ \$ \$ \$ \$ \$ \$ \$ \$	Solution Crossings Crossings S 754,000 S S 765,000 S S 530,000 S S S S S S S S S	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 18,8399 \$ 5 10,558,962 \$ 3,798,177 \$ 5 10,558,962 \$ 3,798,177 \$ 5 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 17,988,175 \$ 2,344,585 \$ 5 56,160 \$ 2,344,585 \$ 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 55.916 5 13.8394 5 1,466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 55,916 5 18,894 5 Construction Contingency (5)	Construction G R 15,236,3804 \$\frac{1}{8}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,793}\$ \$\frac{1}{8}\$ \$\frac{1}{6},127,3237}\$ \$\frac{1}{8}\$ \$\frac{1}{6},177,994}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},076}\$ \$\frac	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 322,536 \$ 322,536 \$ 222,536 \$ 222,297 5 83,560 5 12,522 5 12,522 5 12,522 5 12,522 5 12,522 5 12,523 6 232,297 5 83,560 5 24,157 5 364,000 \$	Property / Add asement (5) Co - 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 8 - 5 5 - 5 6 6 - 5 6 6 6 6 6 6 6 6 6 6 6	ititional style 5 2,411,1 153,017 5 6,334, 230,563 8 5,838, 36,00,381 \$ 16,449, 310,600,681 \$ 1,600,68	Eng / Conting (\$ S	Cost (20135) 78 3.308,003 78 4.663,050 70 9 5 876,156 70 22,568,485 Total Estimated Cost (20135) 16 2,201,651 14 5,846,852 19 5 876,156 70 290,850 70 290,850 70 5 25,469,807 Total Estimated Cost (20135)	Cost (2013\$) \$ 3.310,000 \$ 5,670,000 \$ 5,9,440,000 \$ 580,000 \$ 500,000 \$ 22,660,000 Total Estimated Cost (2013\$) \$ 12,2600,000 Total Estimated Cost (2013\$) \$ 2,210,000 \$ 12,500,000 Total Estimated Cost (2013\$) \$ 12,500,000 Total Estimated Cost (2013\$) \$ 12,500,000 Total Estimated Cost (2013\$)
Project # Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in North Hill West (All 8) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Colemaine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Colleviaine Various Wastewater Option 3 - Strategy 4 Wastewater OPT 3 - STRAT 5A (via easement-Mayfield) Project # Project Description 1 New gravity sewer on future easement, from King St east along railway, and south along concession lim 2 New gravity sewer on Multire easement, from King St east along railway, and south along concession lim 2 New gravity sewer on Mayfield, from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr. 3 Sewer extension, on Coleraine Dr from Concession limit to future sewer on Clarkway Dr.	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW Type Convey flows sou Type III WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW WWM-NEW	Size	Unit Cost (5/m)	Unit S per m Unit S per m S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405 242 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to f Length (m) < 5m depth or Capacity (L/s) 5,059 4,050 4,050 4,050 4,050 4,055	Base Construction Uplift (\$) \$ 619.961 \$ 309.98 \$ 5 2.05.15.15 \$ 1.080.58 \$ 5 4.663.420 \$ 5 5.51.152 \$ 5 5.5	Urban Uplift (\$) # Cross 1	Creek Cressing Region	Regional # Major Creek Crossing (5) 0 0 0 0 0 0 0 0 0	Major Creek Crossing Length (m) Cost (§ (§) S - 0	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ 5 5 2,049,000 \$ \$ 5 907,000 \$ \$ 9 907,000 \$ \$ 1 105,000 \$ \$ 1	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 18,8399 \$ 5 10,558,962 \$ 3,798,177 \$ 5 10,558,962 \$ 3,798,177 \$ 5 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 17,988,175 \$ 2,344,585 \$ 5 56,160 \$ 2,344,585 \$ 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 55.916 5 13.8394 5 1,466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 55,916 5 18,894 5 Construction Contingency (5)	Construction G R 15,236,3804 \$\frac{1}{8}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{2}07,833}\$ \$\frac{1}{6}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,793}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},27,833}\$ \$\frac{1}{6}\$ \$1	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 322,536 \$ 322,536 \$ 222,536 \$ 222,297 5 83,560 5 12,522 5 12,522 5 12,522 5 12,522 5 12,522 5 12,523 6 232,297 5 83,560 5 24,157 5 364,000 \$	Property / Add asement (5) Co - 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 8 - 5 5 - 5 6 6 - 5 6 6 6 6 6 6 6 6 6 6 6	ititional style 5 2,411,1 153,017 5 6,334, 230,563 8 5,838, 36,00,381 \$ 16,449, 310,600,681 \$ 1,600,68	Eng / Conting (\$ S	Cost (20135) 78	Cost (2013\$) \$ 3.310,000 \$ 5,670,000 \$ 5,9,440,000 \$ 580,000 \$ 500,000 \$ 22,660,000 Total Estimated Cost (2013\$) \$ 12,2600,000 Total Estimated Cost (2013\$) \$ 2,210,000 \$ 12,500,000 Total Estimated Cost (2013\$) \$ 12,500,000 Total Estimated Cost (2013\$) \$ 12,500,000 Total Estimated Cost (2013\$)
Project 8 Project Description 1 New sewer on King St, connect on Tarquini 2 Twin sewers in Korth Hill West (All B) via Harvest Moon to railway connection on Coleraine 3 Twinning of Coleraine Trunk Sewer, from Harvest Moon to tro 700 in north of George Bolton Pkwy 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project B Project Description 1 New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2 New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3 Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5 Sewer extension, on Coleraine Way from ROA2 to Kingsview Dr. Sub-Total Wastewater Option 3 - Strategy 4 Wastewater OPT 3 - STRAT SA (via easement-Mayfield) Project B Project Description 1 New gravity sewer on future easement, from King St east along railway, and south along concession lim 2 New gravity sewer on Mayfield, from Concession Imm to future sewer on Clarkway Dr. 3 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 4 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 4 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 4 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 5 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr 6 Sewer extension, on Coluraine Dr from ROA3 to Harvest Moon Dr	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW	## Convey flows sou ## Convey	Unit Cost (5/m)	Unit S per m S per m S per m S per m Unit S per m S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,651 396 1,285 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 1,22 2,700 2,700 1,000 1,000 916 405 2,42 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to for Length (m) < 5m depth or Capacity (L/s) 4,240 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to for Length (m) < 5m depth or Capacity (L/s) 4,055 3,70 4,055 3,70 4,055 3,70 4,055 3,70 4,514	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 5 5,551,52 \$ 5 7,848,652 \$ 5 1,643,52 \$ 1,643,668 \$ 1,643,668	Urban Uplift (\$) # Cross 1	Creek Cressing Region	Regional # Major Creek Crossing (5) 0 0 0 0 0 0 0 0 0	Major Creek Crossing Length (m) Cost (§ (§) S - 0	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ 5 5 2,049,000 \$ \$ 5 907,000 \$ \$ 9 907,000 \$ \$ 1 105,000 \$ \$ 1	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 18,8399 \$ 5 10,558,962 \$ 3,798,177 \$ 5 10,558,962 \$ 3,798,177 \$ 5 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 17,988,175 \$ 2,344,585 \$ 5 56,160 \$ 2,344,585 \$ 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 55.916 5 13.8394 5 1,466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 55,916 5 18,894 5 Construction Contingency (5)	Construction G R 15,236,3804 \$\frac{1}{8}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{2}07,833}\$ \$\frac{1}{6}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,793}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},27,833}\$ \$\frac{1}{6}\$ \$1	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 322,536 \$ 322,536 \$ 222,536 \$ 222,297 5 83,560 5 12,522 5 12,522 5 12,522 5 12,522 5 12,522 5 12,523 6 232,297 5 83,560 5 24,157 5 364,000 \$	Property / Add asement (5) Co - 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 8 - 5 5 - 5 6 6 - 5 6 6 6 6 6 6 6 6 6 6 6	ititional style 5 2,411,1 153,017 5 6,334, 230,563 8 5,838, 36,00,381 \$ 16,449, 310,600,681 \$ 1,600,68	Eng / Conting (\$ S	Cost (20135) 78	Cost (20135) \$ \$ 3.310,000 \$ \$ 867,0000 \$ \$ 860,0000 \$ \$ 800,0000 \$ \$ 22,660,0000 Total Estimated Cost (20135) \$ \$ 2,210,000 \$ \$ 300,0000 \$ \$ 300,0000 \$ \$ 25,560,0000 Total Estimated Cost (20135) \$ \$ 16,260,0000 \$ \$ 25,500,0000 Total Estimated Cost (20135) \$ \$ 300,0000 \$ \$ 300,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ 33,690,0000 \$ \$ \$ 33,690,0000 \$ \$ \$ \$ \$ 880,0000 \$ \$ \$ \$ \$ \$ 880,0000 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
Project 8 Project B Project Description 3. New sewer on King St. connect on Tarquini 2. Twin sewers in North Hill West (Alt B) via Harvest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Columbia Way from ROA2 to Kingwiew Dr. 5. Sewer extension, on Columbia Way from ROA2 to Kingwiew Dr. 5. Sewer extension, on Columbia Way from ROA2 to Kingwiew Dr. 5. Sewer extension, on Columbia Way from ROA2 to Kingwiew Dr. 6. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project 8 Project Description 1. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr for Dr. 5. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr. 5. Sever extension, on Coleraine Dr from BOA3 to Harvest Moon Dr. 7. Westcowlet OPT 3 - STRAT SA (via easement-Mayfield) Project 8 Project B Proje	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW	450 mm 250 mm 2	Unit Cost (5/m) 5	Unit S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 916 405 242 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to f Length (m) < 5m depth or Capacity (L/s) 5,059 4,050 4,050 4,050 4,050 4,055	Base Construction Uplift (\$) \$ 619,961 \$ 309,98 \$ 2,161,159 \$ 1,080,58 \$ 4,663,420 \$ 5 5 5,551,52 \$ 5 7,848,652 \$ 5 1,643,52 \$ 1,643,668 \$ 1,643,668	Urban Uplift (\$) # Cross 1	reek Crossing (\$)	Regional # Major Creek Crossing (5) 0 0 1 537,000 0 0 1 537,000 0 0 0 0 0 0 0 0 0	Major Creek Crossing Length (m) Cost (§ (§) S - 0	Crossings (\$) \$ 754,000 \$ \$ \$ 765,000 \$ \$ \$ 5 30,000 \$ \$ 5 5 2,049,000 \$ \$ 5 907,000 \$ \$ 9 907,000 \$ \$ 1 105,000 \$ \$ 1	Construction Sub-Total (\$) C 2,148,913 \$ 5,627,608 \$ 6,126,103 \$ 5,69,160 \$ 188,939 \$ 14,660,725 \$ \$ 18,8399 \$ 5 10,558,962 \$ 3,798,177 \$ 5 10,558,962 \$ 3,798,177 \$ 5 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 16,545,454 \$ \$ 17,988,175 \$ 2,344,585 \$ 5 56,160 \$ 2,344,585 \$ 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5,244,585 \$ 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5,244,585 \$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 55.916 5 13.8394 5 1,466,072 5 Construction Contingency (5) 143,022 5 1,055,896 5 379,818 5 55,916 5 18,894 5 Construction Contingency (5)	Construction G R 15,236,3804 \$\frac{1}{8}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},190,369}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{2}07,833}\$ \$\frac{1}{6}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,797}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,793}\$ \$\frac{1}{8}\$ \$\frac{1}{6},126,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{8}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},25,79,044}\$ \$\frac{1}{6}\$ \$\frac{1}{6},26,076}\$ \$\frac{1}{6}\$ \$\frac{1}{6},27,833}\$ \$\frac{1}{6}\$ \$1	eotech / Hydrog equirements (\$) E: 47,276 5 123,807 5 134,774 5 322,536 \$ 322,536 \$ 222,536 \$ 222,297 5 83,560 5 12,522 5 12,522 5 12,522 5 12,522 5 12,522 5 12,523 6 232,297 5 83,560 5 24,157 5 364,000 \$	Property / Add asement (5) Co - 5 1 1 - 5 4 - 5 2 - 5 5 - 5 8 8 - 5 5 - 5 6 6 - 5 6 6 6 6 6 6 6 6 6 6 6	ititional style 5 2,411,1 153,017 5 6,334, 230,563 8 5,838, 36,00,381 \$ 16,449, 310,600,681 \$ 1,600,68	Eng / Conting (\$ S	Cost (20135) 78	Cost (20135) S
Project # Project Description 3. New sewer on King St. connect on Targuini 2. Twin sewers in North Hill West (Alt 8) via Harnest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Coleraine Dr Trom ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr Trom ROA2 to Kingwiew Dr. 5. Sewer extension, on Coleraine Dr Trom ROA2 to Kingwiew Dr. 5. Sewer extension, on Coleraine Dr Trom ROA2 to Kingwiew Dr. 7. Sub-Total Wastewater Option 3 - Strategy 38 Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project # Project Description 1. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Halley Rd, from Humber Stn Rd to Coleraine Dr. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sub-Total Wastewater Option 3 - Strategy 4 Westewater OPT 3 - STRAT SA (via easement-Mayfield) Project # Project Description 1. New gravity sewer on Mayfield, from Concession limit to future sewer on Clarkway Dr. 3. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 4. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 6. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 7. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 8. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from ROA3	Type WWM-NEW WWM-NEW WWM-NEW WWM-NEW **SCREENED OUT Type WWM-NEW	450 mm 250 mm 2	Unit Cost (5/m) S 2,394 S 735 S 2,394 S 735 S 2,394 S 735 S 2,394 S 625 S 2,111 Atheast via new sewers along Humber (5/m) S m depth Unit Cost (5/m) S m depth S 735 S 2,394 S 736 S 2,454 S 625 S 2,111 collector along a potential future est Unit Cost (5/m) Voint Cost (5/m) S m depth S 735 S 2,394 S 735 S 2,394 S 736 S 2,454 S 625 S 2,111 collector along a potential future est Unit Cost (5/m) Voint Cost (5/m) S 755 S 2,294 S 736 S 2,2454 S 737 S 2,2454 S 625 S 2,111 collector along Humber Stn Rd, fror Unit Cost (5/m) Unit Cost (5/m) Collector along Humber Stn Rd, fror Unit Cost (5/m) Unit Cost (5/m) Unit Cost (5/m) Unit Cost (5/m)	Unit S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,551 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,770 2,700 1,000 916 405 242 5,059 3,616 Coleraine Dr, to Mayfield Rd and west to f Length (m) < 5m depth or Capacity (L/s) 5,059 1,000	Base Construction Uplit (\$) \$ 619.961 \$ 309.98 \$ 2.161.159 \$ 1,080.58 \$ 4.663.420 \$ 5.25.960 \$ 252.960 \$ 5 151.152 \$ 1.643,52 when the first of	Urban Uplift (\$) # Crcss 1	Creek Cressing Region	Regional # Major Creek Crossing (5) (5) (6) (7)	Major Creek Crossing Length (m) Cost (§ (§) S - 0	S	Construction Sub-Total (\$) 2,148,913 5,627,608 6,126,103 5,69,160 5,188,939 14,666,725 \$ Construction Sub-Total (\$) 1,430,216 1,0558,962 5,798,177 5,569,160 5 188,939 16,545,454 \$ Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction Construction	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 5.9,16 5 13.894 5 1,466,072 5 Construction Contingency (5) 13.894 5 1,559,565 5 13.894 5 1,559,565 5 13.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 1,598,565 5 1,5	Construction G R 103,036,036 S R 103,036,036 S R 103,036,036 S R 104,036,036 S	eotech / Hydrog equirements (\$) E E 123,807 5 124,774 5 125,207 5 125,	Property / Add Co - 5 1 - 5 4 - 5 2 - 5 8 - 5 8 - 5 1 - 5 6 1	itional Sub-Totic	Eng / Conting (5 176	Cost (20135) 78 3,308,003 78 3,308,003 78 9,430,426 79 5 876,156 70 290,850 70 5 22,568,485 70 290,850 70 4 16,254,297 70 4 5,846,852 70 290,850 70 25,469,807 70 290,850 70 33,681,139 70 33,681,139 71 33,681,139 72 33,681,139 73 3,681,139 75 376,156 76 33,692,17 77 5 290,850 77 5 290,850 78 38,457,362	Cost (20135) S
Project 8 Project Boscription 3. New sewer on King St. connect on Tarquini 2. Twin sewers in North Hill West (Alt 8) via Harvest Moon to railway connection on Coleraine 3. Twinning of Coleraine Trunk Sewer, from Harvest Moon Dr to 700 m north of George Bolton Pkwy 4. Sewer extension, on Coloraine Or Trom ROA3 to Harvest Moon Dr 5. Sewer extension, on Coloraine Or Trom ROA2 to Kingwiew Dr. 5. Sewer extension, on Coloraine Or Trom ROA2 to Kingwiew Dr. 5. Sewer extension, on Coloraine Or Trom ROA2 to Kingwiew Dr. 6. Sub-Total Wastewater Option 3 - Strategy 3B Wastewater OPT 3 - STRAT 4 (Humber Stn-Healey-Coleraine) Project 8 Project Boscription 1. New gravity sewer on Humber Stn Rd, from King St to Healey Rd. 2. New gravity sewer on Healey Rd, from Humber Stn Rd to Coleraine Dr. 3. Twinning of Coleraine Trunk Sewer, Healey Rd to north of George Bolton Pkwy. 4. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 5. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 6. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 7. Sewer extension on Coleraine Dr from BOA3 to Harvest Moon Dr 7. Sewer extension on Coleraine Dr from BOA3 to Harvest Moon Dr 8. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. New gravity sewer on Muyfield, from Concession limit to future sewer on Clarkway Dr. 9. New gravity sewer on Muyfield, from Concession limit to future sewer on Clarkway Dr. 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension, on Coleraine Dr from BOA3 to Harvest Moon Dr 9. Sewer extension Dr.	Type WMM-NEW WMM-NEW WMM-NEW WMM-NEW **SCREENED OUT Type WMM-NEW WMM-NEW	Size	Unit Cost (5/m) 5	Unit S per m Unit S per m	Length (m) < 5m depth or Capacity (L/s) 557 88 1,051 396 1,385 1,523 405 242 4,240 2,007 Healey Rd. Twin Coleraine Trunk Sewer, fro Length (m) < 5m depth or Capacity (L/s) 712 2,700 2,700 1,000 316 405 242 5,059 3,616 FColeraine Dr, to Mayfield Rd and west to f Length (m) < 5m depth or Capacity (L/s) 5,059 3,616	Base Construction Uplift (\$) \$ 619,961 \$ 309,88 \$ 2,161,159 \$ 1,080,58 \$ 4,665,420 \$ 5 \$ 515,152 \$ 5 7,848,652 \$ 1,643,52 \$	Urban Uplift (\$) # Cross 1 \$ 464.971 0 \$ 1,620,869 0 \$ 932,684 0 \$ 63,240 0 \$ 37,788 1 \$ 3,119,552 ton Pkwy. Urban Uplift (\$) # Cross 2 \$	Creek Cressing Region	Regional # Major Creek Crossing (5) (5) (5) (6) (7)	Major Creek Trenchless Trenchless Trenchless S S S S S S S S S	S	Construction Sub-Total (\$) 2,148,193 \$ 5,627,608 \$ 6,126,103 \$ 569,160 \$ 188,939 \$ 14,660,725 \$ Construction Sub-Total (\$) 1,430,216 \$ 10,558,962 \$ 3,798,177 \$ 569,160 \$ 188,939 \$ 16,545,454 \$ Construction Sub-Total (\$) 188,939 \$ 16,545,454 \$ Construction	Construction Contingency (5) 21.891 5 56.2,761 5 61.2610 5 5.9,16 5 13.894 5 1,466,072 5 Construction Contingency (5) 13.894 5 1,559,565 5 13.894 5 1,559,565 5 13.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 12.894 5 1,559,565 5 1,598,565 5 1,5	Construction G R 103,036,036 G R 103,036,036 G R 103,036,036 G R 103,036 G R 1	eotech / Hydrog equirements (5) E: 123,807 S 134,774 S 125,22 S 4,157 S 322,536 S 12,522 S 4,157 S 322,297 S 134,560 S 12,522 S 12,526 S 12,527 S 1	Property / Add Co - 5 1 - 5 4 - 5 2 - 5 8 - 5 8 - 5 1 - 5 6 1	itional sub-Totic Cost (1), 153,017 S 6,314, 153,017 S 6,314, 130,058 S 6,838, 1560,681 S 160,681 S 180,681 S 180,68	Eng / Conting (5 176	Cost (20135) 78	Cost (20135) S
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All costs expressed in 20135 dollars.
 Costs do not include internal servicing.
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 Costs do not include D clevel trunk infrastructure.



75 International Blvd., Suite 304 Toronto, Ontario M9W 6L9 Phone: 416.703.0667 Fax: 416.703.2501 www.blueplan.ca

Memorandum

Organization:	The Town of Caledon	BluePlan Project No: C001-0021
Attention:	File	Date: June 18, 2014
Project:	Bolton Residential Expansion Study	
RE:	Servicing Evaluation Considerations	

Introduction

This technical memorandum is intended to further enhance the evaluation process presented in the BRES Infrastructure Study Report, including further considerations that factored into the decision making of the preferred growth option (Option 1 vs Option 3).

Objectives

The identification and evaluation of servicing strategies is a critical component of the infrastructure planning process because it will enable a comprehensive review of a reasonable range of alternatives while documenting the process in a transparent manner.

Servicing Evaluation Approach

The BRES Infrastructure Servicing evaluation follows a similar approach as the Municipal Engineers Association (MEA) Class EA process typically used in master planning projects. Principles taken from the overall BRES evaluation criteria evaluation criteria have been integrated within the five-point evaluation, such as:

- making best use of existing infrastructure;
- minimizing the cost of new infrastructure;
- considering operation and maintenance costs to ensure financial sustainability;
- ensuring the long term reliability and security of the water and wastewater systems; and,
- performing financial evaluation including lifecycle costing.

Evaluation Matrices

Each servicing strategy, as it was developed, is considered a complete solution. Detailed evaluation matrices supporting the evaluation of each servicing strategy were developed and are included in the BRES Infrastructure Study.

These matrices describe each servicing strategy and provides a break down into its servicing components as follows:

- Pumping requirements
- Storage requirements
- Length of watermain, sewermain/twinning requirements
- Number and nature of environmental crossings (major creeks, minor creeks, Greenbelt areas)
- Number of Regional Road and/or railway crossings

- Land acquisition requirements for proposed facilities (pumping stations, elevated tanks, easements)
- Visual impacts caused by new facilities
- Transportation impacts (due to construction of infrastructure)
- Permit requirements (TRCA approvals, C.N. Railway)
- Financial cost
- Key issues and constraints

This helped highlight key differences between the strategies as there were lots of commonalities shared between each servicing strategy for each growth option. Where the only difference between some of the servicing strategies was alignment, a separate alignment evaluation was undertaken to present the evaluation in a clear and concise manner.

Key Issues and Considerations

In addition to cost, other key issues and considerations that factored into the decision making process included:

- Opportunity to service future potential growth areas (identified through the BRES process or not)
- Impact of the additional flows on the existing system and extent of upgrade requirements
- Foreseeable construction challenges that could be presented with the various alignments/sites
- Impact to local residents and traffic due to construction



Table 16. Water Servicing Strategies (Option 1) Evaluation Table

OPTION 1	WATER SERVICING STRATEGY DESCRIPTION	/ 1	Jupic stores	ichtents Etteltung	Ediketherts Friedrich	ildis Suics Attenda	Lickos sines	dustronts duktukut	ACTS TRANSPORT	kilori Actis Rift	ant enterts	cial cost	outer.
STRATEGY 1	Supply from Tullamore Zone 6 Pumping Station, via Coleraine Dr / Chickadee Ln to the new booster pumping station to service Option 1, supply along Coleraine Dr / B.A.R., with floating storage provided by an elevated tank located within the Option 1 lands.		Zone 6A E.T TWL @ 315m - Cap = 5.1 ML (potential for shorter pedestal height than Option 3).	400mm, on Coleraine / B.A.R., requires total of 6.11km of feedermain.	One (1) major creek crossing, Four (4) minor creek crossings. One (1) Greenbelt crossing.	No rail crossings. One (1) Regional Rd crossing (King).	PS ~ 0.50 ha E.T. ~ 1.25 ha Total ~ 1.75 ha	Potential for perceived visual impact caused by elevated tank within service area.	Construction could cause temporary traffic disruption to the following roads: Coleraine Dr (north limit), King St, and the B.A.R.	B.A.R. feedermain will potentially require permitting and approvals from TRCA.	\$38.92M (open-cut) \$48.22 M (trenchless)	Ability to augment existing Zone 6 local Northwest area and potentially North Hill. High contingency related to B.A.R. feedermain and Humber River crossing. B.A.R. feedermain will likely require trenchless (~1080m) installation.	High
STRATEGY 2	Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street, supply along King St / B.A.R., with pumped storage provided by in-ground Zone 5 reservoir to service Option 1 lands.		turnover, which could	600mm, on Innis Lake / King / B.A.R., requires total of 15.94km of feedermain.	One (1) major creek crossing, Fourteen (14) minor creek crossings. Two (2) Greenbelt crossings.	One (1) rail crossing. Two (2) Regional Rd crossings (King, Gore & Hwy 50)	PS ~ 0.50 ha RES ~ 2.00 ha Total ~ 2.50 ha	None.	Construction could cause temporary traffic disruption to the following roads: Innis Lake Rd, King St, and the B.A.R.	B.A.R. feedermain will potentially require permitting and approvals from TRCA.	\$88.11 M	Leverages opportunity to service future potential west Caledon expansion areas. Pumped storage not considered favourable from a storage and life cycle standpoint.	Low
STRATEGY 3	Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street, supply along King St / B.A.R., with in-ground storage provided by Zone 5 reservoir and floating storage provided by an elevated tank located within the Option 1 lands.	BPS, Cap=80 L/s	Zone 5 RES - Cap = 7.0 ML Zone 6A E.T TWL @ 315m - Cap = 5.1 ML (potential for shorter pedestal height than Option 3).	Lake Rd / King St	One (1) major creek crossing, Fourteen (14) minor creek crossings. Two (2) Greenbelt crossings.	One (1) rail crossing. Two (2) Regional Rd crossings (King & Gore)	E.T. ~ 1.25 ha RES ~ 2.00 ha Total ~ 3.75	visual impact caused by	traffic disruption to the following roads:	B.A.R. feedermain will potentially require permitting and approvals from TRCA.	\$81.90 M	Leverages opportunity to service future potential west Caledon expansion areas.	Medium

OPTION 1	- WAT	ER -	SUMMARY	OF	SCORING
			The second second second		

STRATEGY 1	Good	Good	Good	Good	Good	Good	Good	Neutral	Neutral	Poor
STRATEGY 2	Good	Neutral	Neutral	Poor	Poor	Poor	Poor	Poor	Poor	Poor
STRATEGY 3	Good	Neutral	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor



	Overall Good
	Overall Poor
î	Overall Poor



Table 19. Wastewater Servicing Strategies (Option 1) Evaluation Table

OPTION 1	DESCRIPTION	gung. gung	ACCUPATION SET OF SET O	Engleck	Merinics Acestric	ROPEINGS /	cultified in the control of the cont	RAISE OF TRAISE	z grin	RELIEUTS FILLE	cial cost	OUERAL
STRATEGY 1	Growth flows from the BRES area would be conveyed via twinned sewers in the existing system to the Bolton SPS. A major expansion at the Bolton SPS would be required, ir addition to twinning of existing forcemain, and twinning of existing sewers to Queensgate Blvd and Landsbridge St.		3.3 km of sewer twinning (450mm, Taylorwood Ave) in North Hill, 0.98km of forcemain twinning (400mm), 1.0 km of downstream sewer twinning (450mm), 0.24km of local sewer extension (250mm) on Columbia Way Total 5.43km (sewer & forcemain)	Three (3) minor creek crossings, and crossing of Humber River north of King St.	One (1) Regional	None.	Potential for perceived visual impact caused by new local SPS.	Construction could cause temporary traffic disruption to numerous residential roads in the North Hill, Columbia Way, and other local roads such as Bond St, Strawberry Hill Ct, and Fountainbridge Dr.	Sewer twinning across Humber River, north of King St, will require permitting and approvals from TRCA.	\$37.47 M	Longest sewer twinning route. Twinning of existing forcemain crosses residential area. Upgrades would benefit growth areas north of Columbia Way only.	Medium
STRATEGY 2A	Growth flows from the BRES area would be conveyed via twinned sewers in the existing system (via Taylorwood Ave) to the Bolton SPS. A major expansion at the Bolton SPS would be required, in addition to a new forcemain to convey flow east to the future Albion-Vaughan Trunk Sewer at Nunnville Rd and Bateman Ln.	One (1) internal SPS required & major expansion required at Bolton SPS, Cap=100 L/s	3.3 km of sewer twinning (450mm, Taylorwood Ave) in North Hill, 1.24km of new forcemain (400mm) on Old King Rd, 0.24km of local sewer extension (250mm) on Columbia Way Total 4.95km (sewer & forcemain)	Three (3) minor creek crossings, and crossing of Humber River north of King St.	No rail crossings. One (1) Regional Rd crossing, ~110m trenchless crossing.		Potential for perceived visual impact caused by new local SPS.	Construction could cause temporary traffic disruption to numerous residential roads (Kingsview Dr/Taylorwood Ave) in the North Hill, Columbia Way, Old King Rd, and Nunnville Rd.	Sewer twinning across Humber River, north of King St, will require permitting and approvals from TRCA.		Longest sewer twinning route. Upgrades would benefit growth areas north of Columbia Way only.	High
STRATEGY 2B	Growth flows from the BRES area would be conveyed via a new sewer along Hwy 50 and Bolton Heights Dr, twinning of existing sewers east of Hwy 50 (Kingsview Dr), and twinning of sewers along the Humber River to the Bolton SPS. A major expansion at the Bolton SPS would be required, in addition to a new forcemain to convey flow east to the future Albion-Vaughan Trunk Sewer at Nunnville Rd and Bateman Ln.	One (1) internal SPS required & major expansion required at Bolton SPS, Cap=100 L/s	0.80km of new sewer (450mm) on Queen St N, 2.44km of sewer twinning (450mm, Kingsview Dr) in North Hill, 1.24km of new forcemain (400mm) on Old King Rd Total 4.66km (sewer & forcemain)	Humber River	No rail crossings. One (1) Regional Rd crossing, ~110m trenchless crossing.	None.	Potential for perceived visual impact caused by new local SPS.	Construction could cause temporary traffic disruption to Queen Street North, as well as numerous residential roads (starting from Kingsview Dr) in the North Hill, Columbia Way, Old King Rd, and Nunnville Rd.	Sewer twinning across Humber River, north of King St, will require permitting and approvals from TRCA.	\$31.10 M	New sewer on Queen Street North (Highway 50) could cause significant disruption and delays to local traffic. Upgrades would benefit growth areas north of Columbia Way only.	High
STRATEGY 2C	Growth flows from the BRES area would be conveyed via a new sewer along Hwy 50 and Bolton Heights Dr, twinning of existing sewers west of Hwy 50 (Cross Country Blvd), and twinning of sewers to the Bolton SPS. A major expansion at the Bolton SPS would be required, in addition to a new forcemain to convert flow east to the future Albion-Vaughan Trunk Sewer at Nunnville Rd and Bateman Ln.	One (1) internal SPS required & major expansion required at Bolton SPS, Cap=100 L/s	0.80km of new sewer (450mm) on Queen St N, 2.49km of sewer twinning (450mm, Cross Country Blvd) in North Hill, 1.24km of new forcemain (400mm) on Old King Rd Total 4.70km (sewer & forcemain)	Crossing of Humber River north of King St.	No rail crossings. Two (2) Regional Rd crossings, ~110m trenchless crossing.	None.	Potential for perceived visual impact caused by new local SPS.	Construction could cause temporary traffic disruption to Queen Street North, as well as numerous residential roads (in the North Hill, Columbia Way, Old King Rd, and Nunnville Rd.	Sewer twinning across Humber River, north of King St, will require permitting and approvals from TRCA.	\$33.99 M	New sewer on Queen Street North (Highway 50) could cause significant disruption and delays to local traffic. Upgrades would benefit growth areas north of Columbia Way only.	High
STRATEGY 3	Growth flows from the BRES area would be conveyed via new sewers along Columbia Way to Albion Vaughan Rd. Flow to the existing system would be bypassed. Two pumping stations and forcemains would be required to overcome topography on Columbia Way and Albion Vaughan Rd.	One (1) internal SPS required, and two (2) new pumping stations required on Columbia Way & Albion-Vaughan Rd	3.8km of new sewer (450mm), 1.73km of new forcemain (400mm) Total 5.88km (sewer& forcemain)	Five (5) minor creek crossings.	No rail crossings. One (1) Regional Rd crossings, ~220m trenchless crossing.	ha x 2	Potential for perceived visual impact caused by new local SPS, and two new SPS on Columbia Way and Albion Vaughan Rd.	Construction could cause temporary traffic disruption to Columbia Way and Albion-Vaughan Rd.	Sewer twinning across Humber River, north of King St, will require permitting and approvals from TRCA.	\$48.05 M	Requires several pumping stations and involves more Humber River crossings.	Low

OPTION 1 - WAS	TEWATER -	SUMMARY OF	SCORING

STRATEGY 1	Good	Pleutral	Mondrell	Nondral	Neutral	Neutral	Nondriel	Poor	Poor
STRATEGY 2A	Good	Good	Good	Neutral	Neutral	Neutral	Parutral	Neutral	Poor
STRATEGY 2B	Good	Good	Good	Good	Neutral	Nestral	Neutral	Poor	Poor
STRATEGY-2C	Good	Good	Good	Good	Good	Neutral	Principal	Neutral	Poor
STRATEGY 3	Good	Neutral	Poor	Poor	Poor	Poor	Poor	Poor	Poor



Overall Neutral
Overall Good
Overall Good
Overall Good
Overall Poor



Table 17. Water Servicing Strategies (Option 3) Evaluation Table

OPTION 3	WATER SERVICING STRATEGY DESCRIPTION	/ *·	String the His Store of the Country	te Herris	Lediketik ki z	ilais Sancs Record	A ROAD HE'S	Schefforts Usual Inf	ACI'S RANEFORM	ATION PER	int cinetic	ACUAL COST	outeral ex
STRATEGY 1	Supply from Tullamore Zone 6 Pumping Station, via Coleraine Dr/Chickadee Ln to the new booster pumping station to service Option 3, supply along King St/Gore Rd, with floating storage provided by an elevated tank located outside Option 3 lands.	BPS,	- Cap = 5.1 ML (potential for taller	400mm, on Coleraine / King / Gore, requires total of 7.78km of feedermain.	Seven (7) minor creek crossings. No Greenbelt crossings.	One (1) rail crossing. Two (2) Regional Rd crossings (King St & The Gore Rd).	PS ~ 0.50 ha E.T. ~ 1.25 ha Easement ~ 2.00 ha Total ~ 3.75 ha	Potential for perceived visual impact caused by elevated tank on surrounding landowners. Closest potential site is just west off Gore Rd.	Construction could cause temporary traffic disruption to the following roads: Coleraine Dr (north limit), King St, and Gore Rd.	None.	\$36.56 M	Ability to augment existing Zone 6 local Northwest area. Opportunity to service existing land uses, specifically industrial lands adjacent to Option 3 area.	High
STRATEGY 2	Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street, supply along King St/Gore Rd, pumped storage provided by in-ground Zone 5 reservoir to service Option 3 lands.	Zone 6A/7 BPS, Cap=300 L/s	Zone 5 RES - Cap = 7.0 ML (potential for low turnover, which could lead to water quality issues).	600mm, on Innis Lake / King St / Gore, requires 10.08km of feedermain.	No major creek crossings. Seven (7) minor creek crossings. One (1) Greenbelt crossing.	No rail crossings. One (1) Regional Rd crossing (King).	PS ~ 0.50 ha RES ~ 2.00 ha Total ~ 2.50 ha	None.	Construction could cause temporary traffic disruption to the following roads: Innis Lake Rd, King St, and Gore Rd.	None.	\$51.51 M	Leverages opportunity to service future potential west Caledon expansion areas. Pumped storage not considered favourable from a storage and life cycle standpoint.	Medium
STRATEGY 3	Supply from Tullamore Zone 5 Pumping Station, via Innis Lake Rd to a new pumping station on King Street, supply along King St/Gore Rd, in-ground storage provided by Zone 5 reservoir, with floating storage provided by an elevated tank located within the Option 3 lands.	BPS, Cap=80 L/s	Zone 5 RES - Cap = 7.0 ML Zone 7 E.T TWL @ 327.7m - Cap = 5.1 ML (potential for taller pedestal height than Option 1).	400mm, on Innis Lake / King / Gore, requires 13.56km of feedermain.	No major creek crossings. Seven (7) minor creek crossings. One (1) Greenbelt crossing.	No rail crossings. Two (2) Regional Rd crossings (King St & The Gore Rd).	E.T. ~ 1.25 ha	Potential for perceived visual impact caused by a elevated tank on surrounding landowners. Closest potential site is just west off Gore Rd. If reservoir is partially inground, minimal potential for visual impact.	Construction could cause temporary traffic disruption to the following roads: Innis Lake Rd, King St, and Gore Rd.	None.	\$62.10 M	Leverages opportunity to service future potential west Caledon expansion areas.	Low

OF HOR 3 - HAL	Cit - GOMMONT	OF SCORUNG								
STRATEGY 1	Good	Good	Good	Good	Good	Good	Good	Good	Neutral	Neutral
STRATEGY 2	Good	Good	Good	Neutral	Neutral	Neutral	Neutrali	Neutral	Neutral	Poor
STRATEGYS	Good	Const	Montral	Montrol	Manhol	Pour	Pov	Poor	Poor	Poor



Overall Good
Overall Neutral
Overall Poor



Table 20. Wastewater Servicing Strategies (Option 3) Evaluation Table

OPTION 3	DESCRIPTION	2 interior	ENERGE SENERGE SEEDE SEE	in the state of th	Outer Record	AUG HES	QUISTION QUISTION QUIRENEN	its like acts range of the first	Zelenik Zelenik	MENTS FI	AND THE SERVE STRAIMS	Outhall
STRATEGY 1	Growth flows from the BRES area would be conveyed via new sewer along future easement from King St W to Coleraine Drive. Twinning of the existing Coleraine Trunk Sewer would also be required from the rail line to just north of George Bolton Pkwy.	None.	1.94km of new sewer (450mm) on easement, 2.63km of sewer twinning on Coleraine (525mm) Total 4.57km (sewer & forcemain)	Two (2) minor creek crossings.	One (1) rail crossing. One (1) Regional Rd crossing. No trenchless crossings.	Easement ~ 4.85 ha	None.	Construction could cause temporary traffic disruption to Coleraine Drive and King St (to lesser extent than Strategy 2).	None.	\$15.61 M	Future easement required south of C.N. railway, narrow working conditions could present signicant construction challenges. Coleraine Trunk Sewer twinning could provide greater flexibility to coordinate with post-period servicing needs.	High
STRATEGY 2	Growth flows from the BRES area would be conveyed via new sewers along King St W and Coleraine Dr. Twinning of the existing Coleraine Trunk Sewer would also be required from the rail line to just north of George Bolton Pkwy.	None.	2.62km of new sewer (450mm) on King/Coleraine, 2.91km of sewer twinning on Coleraine (525mm) Total 5.53km (sewer & forcemain)	Five (5) minor creek crossings.	Two (2) rail crossings. One (1) Regional Rd crossing. No trenchless crossings.	None.	None.	Construction could cause temporary traffic disruption to Coleraine Drive and King St (to greater extent than Strategy 1).	Sewer alignment across King St rail crossing and Coleraine Drive rail crossing will require permitting and approvals from C.N.R.	\$18.70 M	Facilitates servicing of Rounding Out Areas 1 and 3. Coleraine Trunk Sewer twinning could provide greater flexibility to coordinate with post-period servicing needs.	High
STRATEGY 3A	Growth flows from the BRES area would be conveyed via twinning of existing sewers in the North Hill West system. Twinning of the existing Coleraine Trunk Sewer would also be required from the rail line to just north of George Bolton Pkwy.	None.	2.40km of new/twinned sewers (450mm) on King/Cedargrove/Harvest Moon/Coleraine, 2.91km of sewer twinning on Coleraine (525mm) Total 5.31km (sewer & forcemain)	Five (5) minor creek crossings.	Two (2) rail crossings. One (1) Regional Rd crossing. No trenchless crossings.	None.	None.	Construction could cause temporary traffic disruption to Coleraine Drive and King St (to lesser extent than Strategy 2), as well as local residential roads including Cedargrove Ave.	Sewer alignment across King St rail crossing and Coleraine Drive rail crossing will require permitting and approvals from C.N.R.	\$26.03 M	Crosses through residential area. Coleraine Trunk Sewer twinning could provide greater flexibility to coordinate with post-period servicing needs.	Medium
STRATEGY 3B	Growth flows from the BRES area would be conveyed via twinning of existing sewers in the North Hill West system. Twinning of the existing Coleraine Trunk Sewer would also be required from the rail line to just north of George Bolton Pkwy.	None.	2.40km of new/twinned sewers (450mm) on King/Harvest Moon/Coleraine, 2.91km of sewer twinning on Coleraine (525mm) Total 5.31km (sewer & forcemain)	Six (6) minor creek crossings.	Two (2) rail crossings. One (1) Regional Rd crossing. No trenchless crossings.	None.	None.	Construction could cause temporary traffic disruption to Coleraine Drive and King St (to lesser extent than Strategy 2), as well as local residential roads including Harvest Moon Dr.	Sewer alignment across King St rail crossing and Coleraine Drive rail crossing will require permitting and approvals from C.N.R.	\$22.60 M	Crosses through residential area. Coleraine Trunk Sewer twinning could provide greater flexibility to coordinate with post-period servicing needs.	Medium
STRATEGY 5A	Growth flows from the BRES area would be conveyed via a new trunk sewer south along a potential future easement, west of Coleraine Drive, to Mayfield Rd and west to connect to the future 525 mm sewer at Clarkway Dr and Mayfield Rd.	None.	6.36km of new sewers (450mm) on easement/Concession limit, 0.83km of new sewer on Mayfield (525mm) Total 7.19km (sewer & forcemain)	Four (4) minor creek crossings.	No rail crossings. Two (2) Regional Rd crossings. No trenchless crossings.	Easement ~ 13.50 ha required	None.	Construction could cause temporary traffic disruption on Mayfield Rd.	None.	\$38.48 M	Extensive easement required. New primary collector along easement could provide greater flexibility to coordinate with post-period servicing needs.	Low
STRATEGY 5B	Growth flows from the BRES area would be conveyed south via Humber Station Rd to connect to the future 525 mm sewer at Clarkway Dr and Mayfield Rd.	None.	6.12km of new sewers (450mm) on Humber Station Rd Total 6.12km (sewer & forcemain)	Two (2) minor creek crossings.	No rail crossings. Two (2) Regional Rd crossings. No trenchless crossings.	None.	None.	Construction could cause temporary traffic disruption on Humber Station Rd.	None.	\$20.13 M	New primary collector along Humber Station Rd could provide greater flexibility to coordinate with post-period servicing needs.	Medium

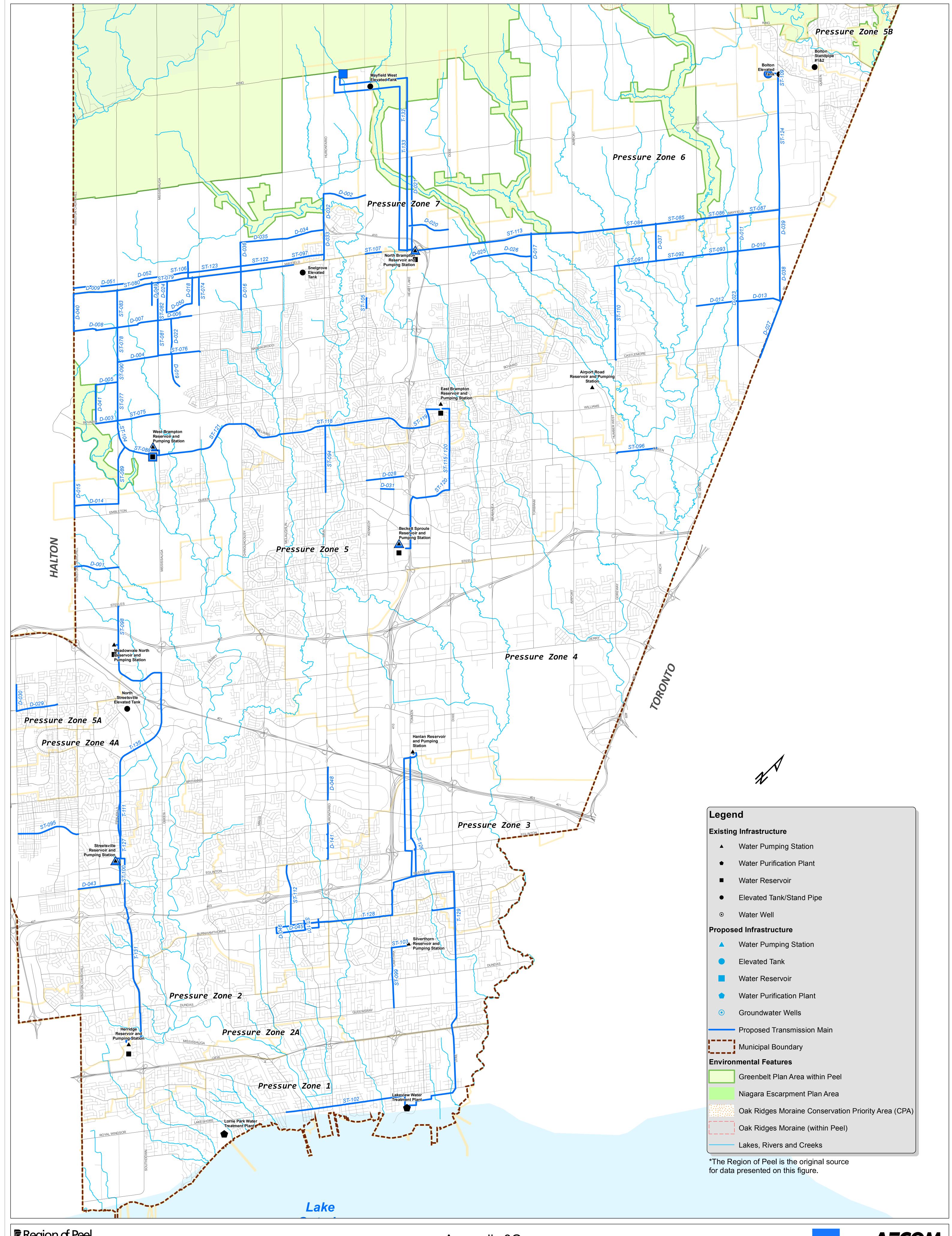
PTION	3 - WAST	EWATER	- SHIMM	ARYO	DE S	ROORING	

STRATEGY 1	Good	Good	Good	Good	Good	Good	Neutral	Neutral	Neutral
STRATEGY 2	Good	Good	Good	Good	Neutral	Neutral	Neutral	Poor	Poor
STRATEGY SA	Good	Good	Good	Noutral .	Neutral	Neutral	Poor	Poor	Poor
TRATEGY 38	Good	Good	Good	Neutral	Neutral	Poor	Poor	Poor	Poor
TRATEGY SA	Good	Good	Good	Good	Neutral	Poor	Poor	Poor	Poor
TRATEGY 58	Good	Good	Good	Good	Good	Good	Neotral	Poor	Poor

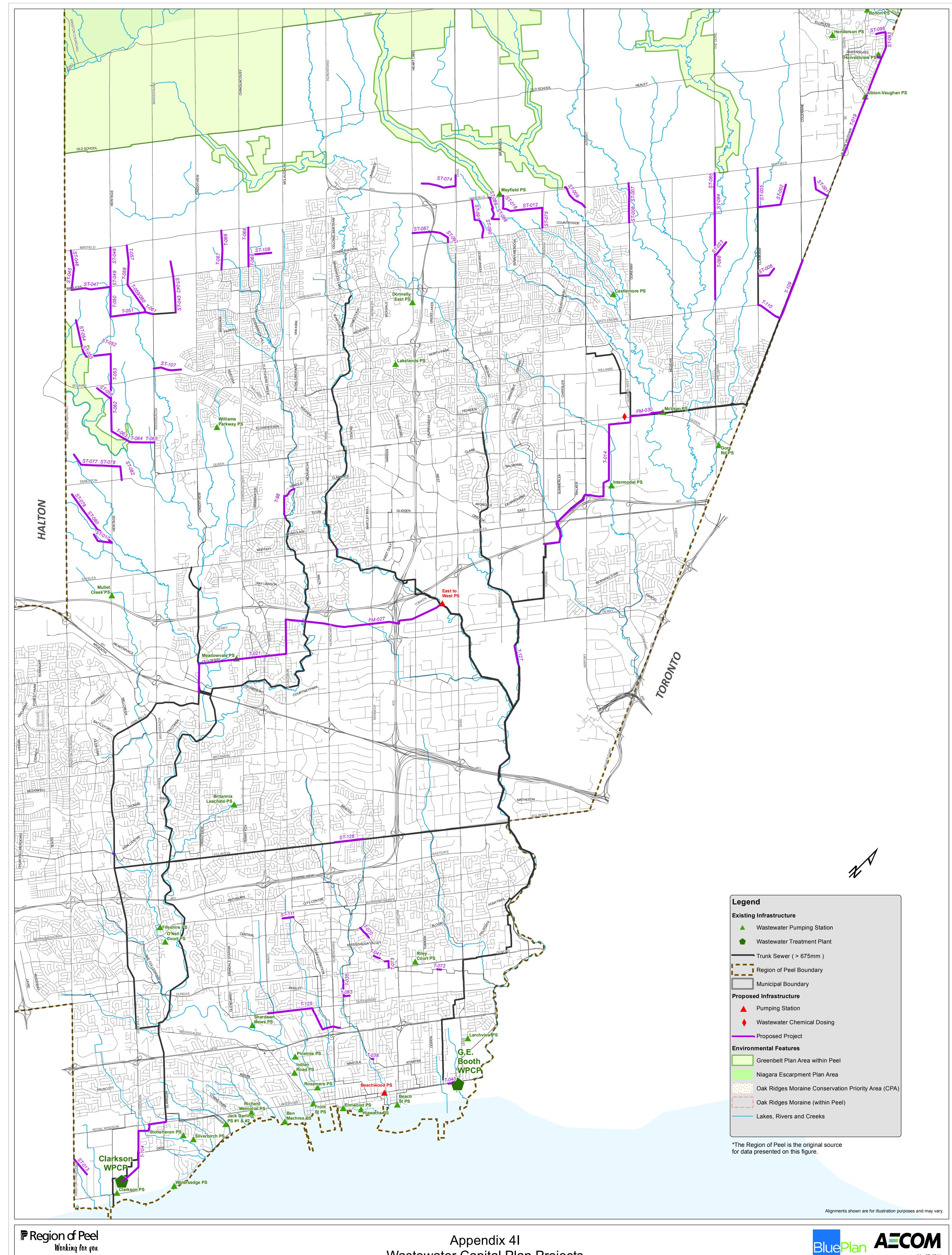




Appendix E - 2014 DC Water & Wastewater Maps









2013 Water and Wasewater Master Plan for the Lake-Based systems





June 2014



BRES SERVICING COSTS - OPTION 1

Option 1 - North of Columbia Way

1.48% 13.29% 85.23%

Water																	
OPT 1 - STR	PT 1 - STRAT 1 **PREF** (Tunnel on B.A.R. w/ E.T.)																
Project #	Project Description	Туре	Size	Unit		tal Estimated cost (2013\$)	Funding Year	In Service Year	Class EA Schedule	Study Duration (yrs)	Design Duration (yrs)	Construction Duration (yrs)	Ctudy (Cost (\$)	Design Cost (\$)	Cons	nstruction Cost (\$)
1	Z6 Feedermain, from ex. 1050 mm at Coleraine-King to Z6A BPS	WM	400	mm	\$	4,150,000	2020	2022	A+/B		1	1	\$	61,420	\$ 551,535	\$	3,537,045
2	Z6A BPS, at King & Coleraine (greenfield)	PS	79.0	L/s	\$	6,080,000	2019	2022	В	1	1	1	\$	89,984	\$ 808,032	\$	5,181,984
3	Z6A Feedermain on BAR, from Z6A BPS to E.T. in Option 1	WM	400	mm	\$	26,630,000	2018	2022	С	1	1	2	\$ 3	94,124	\$ 3,539,127	\$	22,696,749
4	E.T. for Option 1 (TWL = 315m)	ET	5.1	ML	\$	8,570,000	2019	2022	С	1	1	1	\$ 1	26,836	\$ 1,138,953	\$	7,304,211
5	Z6A Feedermain, from E.T. to distribution (south & west)	WM	400	mm	\$	2,790,000	2021	2022	A+		0.5	0.5	\$	41,292	\$ 370,791	\$	2,377,917
-	Total			•	\$	48,220,000							\$ 7	13,656	\$ 6,408,438	\$	41,097,906

	Vastewater OPT 1 - STRAT 2A **PREF** (via Taylorwood)														
Project #		Туре	Size	Unit	Total Estimated Cost (2013\$)	Funding Year	In Service Year	Class EA Schedule	Study Duration (yrs)	Design Duration (yrs)	Construction Duration (yrs)	I Study Cost (S)	Design Cost (\$)	Construction Cost (\$)	
1	Twinning of local collection sewers through North Hill (Alt A)	WWM-UPG	450	mm	\$ 15,460,000	2019	2023	В	1	1	2	\$ 228,808	\$ 2,054,634	\$ 13,176,558	
2	Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250	mm	\$ 300,000	2019	2022	A+/B	1	1	1	\$ 4,440	\$ 39,870	\$ 255,690	
3	Bolton SPS upgrade	SPS-UPG	166.1	L/s	\$ 12,280,000	2021	2024	В	1	1	1	\$ 181,744	\$ 1,632,012	\$ 10,466,244	
4	New forcemain from Bolton SPS east to Albion-Vaughan Trunk Sewer	FM-NEW	400	mm	\$ 4,100,000	2020	2024	В	1	1	1	\$ 60,680	\$ 544,890	\$ 3,494,430	
5	Sewer extension, on Coleraine Dr from ROA3 to Harvest Moon Dr	WWM-NEW	250	mm	\$ 880,000	2021	2022	A+		0.5	0.5	\$ 13,024	\$ 116,952	\$ 750,024	
	Total				\$ 33,020,000							\$ 488,696	\$ 4,388,358	\$ 28,142,946	

- 1. All costs expressed in 2013\$ dollars.
- 2. Costs do not include manhole costs for trenchless and/or valve costs for forcemains.
- 3. Costs do not include internal servicing (all sewers up to Columbia Way).
- 4. Costs do not include DC level trunk infrastructure.





June 2014



BRES SERVICING COSTS - OPTION 3

Option 3 - North Hill West

Water	Vater															
OPT 3 - STF	PT 3 - STRAT 1 **PREF** (King-Gore WM, w/ E.T.)															
Project #	Project Description	Туре	Size	Unit		l Estimated st (2013\$)	Funding Year	In Service Year	Class EA Schedule	Duration Study (yrs)	Duration Design (yrs)	Duration Construction (yrs)	Study Cost (\$)	Design Cost (\$)		struction ost (\$)
1	Z6 Feedermain, from ex. 1050 mm at Coleraine-King, east to Future Z7 BPS	WM	400 n	mm	\$	4,150,000	2020	2022	A+		1	1	\$ 61,420	\$ 551,535	\$	3,537,045
2	Z7 BPS, at King & Coleraine (greenfield)	PS	79.0 L	_/s	\$	6,080,000	2019	2022	B/C	1	1	1	\$ 89,984	\$ 808,032	\$	5,181,984
3	Z7 Feedermain on King/Gore, from Z7 BPS to E.T. outside Option 3	WM	400 n	mm	\$	13,520,000	2018	2022	С	1	1	2	\$ 200,096	\$ 1,796,808	\$ 1	.1,523,096
4	E.T. for Option 3 (TWL = 327.7m)	ET	5.1 N	ML	\$	9,120,000	2019	2022	С	1	1	1	\$ 134,976	\$ 1,212,048	\$	7,772,976
5	Z7 Feedermain, from E.T. to distribution	WM	400 n	mm	\$	3,690,000	2021	2022	A+/B		0.5	0.5	\$ 54,612	\$ 490,401	\$	3,144,987
	Total				\$	36,560,000							\$ 541,088	\$ 4,858,824	\$ 3	1,160,088

Wastewate	Vastewater Control of the Control of														
OPT 3 - STR	OPT 3 - STRAT 2 (King-Coleraine, twin @450, ex. prof.)														
Project #	Project Description	Туре	Size	Unit	Total Estimated Cost (2013\$)	Funding Year	In Service Year	Class EA Schedule	Duration Study (yrs)	Duration Design (yrs)	Duration Construction (yrs)	Study Cost (\$)	Design Cost (\$)	Construction Cost (\$)	
1	New gravity sewer on King & Coleraine, from Option 3 to ex. Coleraine Trunk Sewer	WWM-NEW	450	mm	\$ 9,410,000	2018	2022	A+/B	1	1	1.5	\$ 139,268	\$ 1,250,589	\$ 8,020,143	
2	Twinning of Coleraine Trunk Sewer, from south of rail to 700 m north of George Bolton Pkwy	WWM-UPG	525	mm	\$ 8,990,000	2025	2028	A+		1	2	\$ 133,052	\$ 1,194,771	\$ 7,662,177	
3	Sewer extension, on Columbia Way from ROA2 to Kingsview Dr.	WWM-NEW	250	mm	\$ 300,000	2021	2022	A+		0.5	0.5	\$ 4,440	\$ 39,870	\$ 255,690	
	Total				\$ 18,700,000							\$ 276,760	\$ 2,485,230	\$ 15,938,010	

- 1. All costs expressed in 2013\$ dollars.
- 2. Costs do not include manhole costs for trenchless and/or valve costs for forcemains.
- 3. Costs do not include internal servicing (all sewers up to Humber Station Rd/King St).
- 4. Costs do not include DC level trunk infrastructure.