ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM

JOINT BOARD OF MANAGEMENT

Monday, October 22, 2015 at 2:00 p.m.

City Hall – Room 309

AGENDA

DISCLOSURES OF INTEREST

Minutes

Review and approval of the minutes of March 26, 2015

Reports

1. Report ES108-15, MOECC Secondary Inspection 2015

2. Report ES109-15 Overview of Secondary System 2015

3. Report ES110-15 St. Thomas ASWSS water rate for 2016

4. Report ES113-15 EMPS Pump Sizing VFD Control and Optimization

Unfinished Business

Elgin Middlesex Pumping Station Building Ownership Reconciliation - Appendix "D"
The members discussed the fact that no information relating to costs and liability is available at this time.

The Director, Environmental Services suggested that the proposed recipient municipalities would need to obtain a condition assessment of the structure and enter into a joint agreement relating to apportionment of costs and responsibilities.

The St. Thomas Area Water Supply System Board requests that the issue of the Elgin Middlesex Pumping Station building ownership and associated responsibilities be addressed through a comprehensive evaluation and review to be undertaken and paid for by the Elgin Area Primary Water Supply System Board and further, that a subsequent review take place between all involved parties (Elgin Area Primary Water Supply System, City of London, St. Thomas Area Secondary Water Supply System, Aylmer Area Secondary Water Supply System) including but not limited to building ownership, operational, maintenance, and replacement costs.

New Business

Adjournment

Corporation of the
City of St. Thomas

Report No.
ES108-15

File No.
06-100-02

Directed to:	Chairperson and the Members of the Board of Management for the St. Thomas Secondary Area Water Supply System
Meeting Date:	October 22, 2015
Date Authored:	July16, 2015
Department:	Environmental Services
Attachment	MOECC Drinking Water System Inspection Report June 5, 2015, St. Thomas Area Secondary Water Supply System
Prepared By:	Lynn Stafford, C.E.T. Compliance Coordinator
Subject:	**St. Thomas Area Secondary Water Supply System (EMPS and Transmission Mains) June 5, 2015 Ministry of Environment and Climate Change Drinking Water Inspection Report**

Recommendation:

THAT: Report ES108-15, St. Thomas Area Secondary Water Supply System (EMPS and Transmission Mains), June 5, 2015 Ministry of Environment and Climate Change (MOECC) Drinking Water Inspection Report be received for information.

Origin:
On June 5, 2015, the MOECC conducted an inspection of the St. Thomas Area Secondary Water Supply. Subsequently, a Drinking Water Inspection Report documenting the results of the inspection was received outlining a description of the drinking water system, capacity assessment, treatment processes, the distribution system, operations manuals, logbooks, contingency/emergency planning, security, consumer relations, certification and training, water quality monitoring, quality water assessment, reporting and corrective actions and other inspection findings.

An annual inspection is carried out to confirm compliance with the MOECC legislation and authorizing documents such as Orders, Certificates of Approval, as well as evaluating conformance with the Ministry drinking water related policies and guidelines during the inspection period, focusing on the source, treatment and distribution components of the system, as well as best management practices.

The Inspection Summary Rating Record, included in Appendix B of the report, is based on the principles of the MOECC Inspection and Enforcement Secretariat and advice of internal/external risk experts.

Analysis:
The inspection completed on June 5, 2015 was a “focused” inspection. This system was chosen for a focused inspection because the system’s performance met the ministry’s criteria, most importantly; there were no deficiencies as identified in O. Reg.172/03 over the past 3 years.

A summary of the inspection findings is generated in the form of an Inspection Rating Record based on an assessment of 14 possible modules of the inspection protocol, a rigorous and comprehensive program. The St. Thomas Area Water Supply System obtained an overall final inspection rating of 100%, indicating that the City is committed to excellence. The system did not have any non-compliance or best management practice recommendations and met all of the MOECC requirements.

Financial Considerations
None at this time.

Respectfully submitted,

Lynn Stafford

Lynn Stafford, C.E.T.
Compliance Coordinator, Environmental Services

Reviewed By:	Treasury	Env Services	Planning	City Clerk	HR	Other

Ministry of the Environment and Climate Change

Safe Drinking Water Branch

3232 White Oak Road, 3rd Floor
London ON N6E 1L8
Tel (519) 873-5094
Fax (519) 873-5096

Ministère de l'Environnement et de l'Action en matière de changement climatique

Direction du contrôle de la qualité de l'eau potable
Bureau du district de London
3e étage
3232, chemin White Oak
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Fax (519) 873-5096

Ontario

July 13, 2015

File no. EL-ST-SO-540

The St. Thomas Area Secondary Water Supply System Joint Board of Management
City Hall Annex
P.O. Box 520
St. Thomas, Ontario
N5P 3V7

Attention: Mr. Justin Lawrence, Director, Environmental Services and City Engineer

Re: St. Thomas Area Secondary Water Supply System Inspection Report (WW# 260078897)
Inspection conducted on June 05, 2015

Dear Mr. Lawrence,

The enclosed Drinking Water Inspection Report outlines non-compliance, if any, with Ministry legislation, and policies for the above noted water system. Violations noted in this report, if any, have been evaluated based on community risk. These violations will be monitored for compliance with the minimum standards for drinking water in Ontario as set forth under the *Safe Drinking Water Act* and associated regulations. Where risk is deemed to be high and/or compliance is an ongoing concern, violations will be forwarded to this Ministry's Investigation and Enforcement Branch.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in *"Taking Care of Your Drinking Water: A guide for members of municipal council"* found under "Resources" on the Drinking Water Ontario website at www.ontario.ca/drinkingwater.

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Tom Clubb, Drinking Water Program Supervisor, at (519) 873-5122.

If you have any questions regarding the report, please feel free to call me at (519) 873-5022.

Yours truly,

Roland Plante
Provincial Officer
London District Office
roland.plante@ontario.ca

cc. Cyril McCready, Water Wastewater Supervisor
Lynn Stafford, Compliance Coordinator
Blair Tully, OCWA Senior Operations Manager
Elgin-St. Thomas Health Unit
Catfish Creek Conservation Area
Kettle Creek Conservation Area

Ontario

Ministry of the Environment and Climate Change

ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM

Inspection Report

Site Number:	260078897
Inspection Number:	1-BZASG
Date of Inspection:	Jun 05, 2015
Inspected By:	Roland Plante

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Appendix A: Key Reference and Guidance Material for Drinking Water Systems

Appendix B: Inspection Rating Record

OWNER INFORMATION:

Company Name:	ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM JOINT BOARD OF MANAGEMENT		
Street Number:	545	**Unit Identifier:**	
Street Name:	TALBOT St		
City:	ST. THOMAS		
Province:	ON	**Postal Code:**	N5P 3V7

CONTACT INFORMATION

Type:	Owner Representative	**Name:**	Justin Lawrence
Phone:	(519) 631-1680 x4165	**Fax:**	(519) 631-2130
Email:	jlawrence@stthomas.ca		
Title:	Director, Environmental Services & City Engineer		

Type:	Supervisor	**Name:**	Cyril McCready
Phone:	(519) 631-0368 x5120	**Fax:**	(519) 631-5542
Email:	cmccready@stthomas.ca		
Title:	Water/Wastewater Supervisor		

INSPECTION DETAILS:

Site Name:	ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
Site Address:	
County/District:	St. Thomas
MOECC District/Area Office:	London District
Health Unit:	ELGIN-ST. THOMAS HEALTH UNIT
Conservation Authority	N/A
MNR Office:	N/A
Category:	Large Municipal Residential
Site Number:	260078897
Inspection Type:	Unannounced
Inspection Number:	1-BZASG
Date of Inspection:	Jun 05, 2015
Date of Previous Inspection:	Jun 04, 2014

COMPONENTS DESCRIPTION

Site (Name):	MOE DWS Mapping		
Type:	DWS Mapping Point	**Sub Type:**	
Comments:			

Not Applicable

Site (Name): St. Thomas Area Secondary Distribution System

Type: **Sub Type:**

Comments:

The St. Thomas Secondary Area Secondary Water Supply System is owned by the St. Thomas Area Secondary Water Supply System Joint Board of Management which includes the City of St. Thomas, the Municipality of Central Elgin and the Township of Southwold. Operational duties and maintenance are provided by two operating authorities the City of St. Thomas Environmental Services, Operations Division, Water Section and the Ontario Clean Water Agency (OCWA).

At the time of inspection, OCWA was responsible for the operation of the Elgin Middlesex Pumping Station and Re-chlorination Facility which includes the following:

- a reservoir and booster pumping and re-chlorination station located in Lot 9, Concession 9, former Township of Yarmouth housing storage, treatment, pumping and control facilities including: a dual-celled reservoir shared amongst the City of St. Thomas, the Town of Aylmer and the City of London/County of Middlesex, each cell 27,300 m^3 capacity;
- three (3) (two duty, one standby) high lift pumps each rated at 316 L/s at 41.1 m TDH;
- a gas chlorine disinfection system with facilities shared between the Aylmer Secondary Water Supply System (ASWSS) and the St. Thomas Area Secondary Water Supply System (STASWSS) as noted below:
- one (1) dual weigh scale with space for two (2) 68 kg cylinders (duty/standby) with automatic switchover (shared between ASWSS and STASWSS);
- one (1) 22.75 kg/d chlorinator and associated equipment (dedicated to ASWSS);
- one (1) 22.75 kg/d chlorinator and associated equipment (dedicated to STASWSS);
- one (1) 22.75 kg/d chlorinator and associated equipment (shared standby between ASWSS and STAWSS);
- instrumentation and controls as per design drawings;
- Standby Power: a 600 kW diesel engine standby power generator set and associated equipment located in a separate room shared between the St. Thomas and Aylmer Secondary Systems. The City of St. Thomas Environmental Services, Operations Division, Water Section is responsible for the operation of approximately 11 km long watermain, consisting of a 6.5 km segment of 750 mm diameter watermain and a 4.5 km segment of 500 mm diameter watermain from the Elgin Middlesex Pump Station to the Ford Metering Chamber at the intersection of Wonderland Road and Clinton Line in the Township of Southwold including all appurtenances. The City of St. Thomas is also responsible for the operations and maintenance of the Ford Tower which is an elevated water storage tank having a capacity of 763 m^3 located on Water Tower Line.

Site (Name): St. Thomas Area Secondary Water Supply System Pumping Station

Type: Treated Water POE **Sub Type:** Pumphouse

Comments:

The St. Thomas Secondary Water System Joint Board of Management is the Owner of the St. Thomas Secondary Water System Pumping Station and re-chlorination treatment equipment located at the Elgin Middlesex Pumping Station (EMPS). The potable water from the reservoir located at the EMPS is then pumped into the secondary system. Water is continuously monitored for free chlorine residual at the East Chamber. The secondary transmission water line continues westerly down South Edgeware Road to the West Chamber located at Water Works Park. The St. George Chamber in addition to the East and West Chambers also supplies potable water to the St. Thomas Distribution system and is typically only operational during system pressure events below 380 kPa. Free chlorine residuals are continuously monitored at the East Chamber (EMPS Re-Chlorination Facility) West Chamber, Southwold Chamber and the Ford Meter Chamber.

Site (Name): Ford Water Tower

Type: Treated Water POE **Sub Type:** Reservoir

Comments:

The Ford Water Tower is an elevated storage tank located at 42897 Water Tower Line which was installed to service the Ford Motor Company Assembly Plant. The tank has a storage capacity of 763 m^3 (167,840 imperial gallons), from which a pipeline extends west from the base of the tank to the Ford Meter Chamber located at the intersection of Clinton Line and Wonderland Road.

INSPECTION SUMMARY

INTRODUCTION

* **The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period.**

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg.170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This report is based on an inspection of a "stand alone connected distribution system". This type of system receives treated water from a separately owned "donor" system. This report contains the elements required to assess key compliance and conformance issues associated with a "receiver" system. This report does not contain items associated with the inspection of the donor system, such as source waters, intakes/wells and treatment facilities.

This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

Documentation reviewed in association with this report included, but were not limited to:

1. Ministry of the Environment, the Joint Board of Management of the St. Thomas Area Secondary Water Supply System, Municipal Drinking Water Licence # 190-101, dated July 30, 2012; and

2. Ministry of the Environment, the Joint Board of Management of the St. Thomas Area Secondary Water Supply System, Municipal Drinking Water Works Permit # 190-201, dated August 31, 2011.

Other operational documents maintained by the Owner for the period June 01, 2014 until May 31, 2015 were also reviewed in conjunction with this compliance evaluation.

TREATMENT PROCESSES

* **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

During the physical inspection of the water system, it appeared that all equipment listed in Schedule A of the current Drinking Water Works Permit had been installed.

TREATMENT PROCESSES

* **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

  The Owner replaced the diesel fuel storage tank with a 10,000 L double walled above ground storage tank, and replaced the diesel fuel day tank with a 455 L double walled tank including associated piping and transfer pumps. On January 10, 2015, a 30" butterfly valve on the discharge header at the EMPS facility was replaced because the valve did not operate properly. The Owner filled out a Form 2 for these minor modification and provided a copy for inspection purposes.

* **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

  Primary and secondary disinfection is provided by the Elgin Area Primary Water Supply System and there is a re-chlorination facility within the Elgin Middlesex Pump Station (EMPS). Documentation reviewed for the inspection period includes log records and SCADA records. There is a Daily Report (SCADA data) that is generated and it summarizes the chlorine analyzer data on a daily basis from various sites and an operator reviews this information within 72 hours. Records indicate that there were low chlorine readings and these readings were attributed to SCADA errors, power outages, equipment malfunction and maintenance.

* **The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.**

  The Owner and Operating Authority are responsible for assigning an operator-in-charge (OIC) and the overall responsible operator (ORO) for this system. The logbook and logsheet records indicate that an operator visits and records details of operational checks, work or sampling undertaken at each facility in the water system on a regular basis.

TREATMENT PROCESS MONITORING

* **The secondary disinfectant residual was measured as required for the distribution system.**

  Secondary disinfection is measured in the distribution system by operators on a regular basis. Several chlorine residual samples are taken each week to ensure that secondary disinfection is maintained throughout the distribution system. Chlorine residuals samples are taken during bacteriological sampling and also to verify the accuracy of the chlorine analyzers located throughout the distribution system. The SCADA system also monitors the chlorine residual in the distribution system continuously and the system will alert an operator if a specific set point is reached.

* **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

  The Owner and Operating Authority has SCADA records for chlorine residual monitoring at several points in the distribution system. An operator reviews the SCADA data at least every 72 hours and puts the time and their initials on the electronic file to show it has been reviewed and inserts comments to explain specific data points.

* **All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.**

  The chlorine analyzers are linked to the SCADA system which is capable of calling out alarms to operators when a set point is reached for low and high chlorine. The operator either acknowledges the alarm remotely or may visit the site to investigate the cause of the alarm. Details of the responses are written in the site logbook and / or on the daily summary sheets.

TREATMENT PROCESS MONITORING

- **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**

  The chlorine analyzers continuously monitor the chlorine residual in the distribution system and the SCADA system captures the data. Since more than one data point is captured every hour, the data provided included an minimum, maximum and average for each hour of every day for each chlorine analyzer in the distribution system. On the Daily Reports, the operator notes information relating to events such as low chlorine readings. The SCADA data provided was in a "xps format" and "xls format".

- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

  Operators calibrate the chlorine analyzers as per manufacturer specifications or as required during their daily checks and records are maintained of these calibrations. Also, a service technician performs maintenance on the chlorine analyzers on a yearly basis.

DISTRIBUTION SYSTEM

- **Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

  There were maintenance activities undertaken in the distribution system during this report period that included work in the distribution system and a valve replacement at the EMPS. The Owner and Operating Authority have indicated that they are aware of the AWWA procedures for the disinfection of water system components.

- **Based on the records available the owner was able to maintain proper pressures in the distribution system.**

  SCADA records and logbook entries show that pressure was maintained in the distribution system. The Owner and Operating Authority indicated that there were no consumer complaints regarding low pressure in the distribution system. There was low pressure in the distribution system related to a valve replacement and the Owner and Operating Authority were monitoring the pressure closely during the maintenance activity.

OPERATIONS MANUALS

- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

  The Operations Manual is dated May 2015 (version 3). There is a Record of Revisions page for updates to the manual. The manual contains the following sections: Introduction, System Overview, Operating Procedures, Maintenance, Record Keeping and Forms, Emergency Planning, Water Sampling and Quality Assurance, Safety, Public Relations. The Appendix Section contains the following: St. Thomas Area Secondary WSS Permit and Licence, Distribution System Map, Standard Operating Procedures, and Distribution System Sampling Requirements.

  The Operations Manual states that waterworks staff and operators also have other resources for information and training including the following: St. Thomas DWQMS, Design Guidelines for Drinking Water Systems, Engineering Standards and Specifications, AWWA Standards and Specifications, NFPA Codes and Standards, Provincial Standards and Specifications, Manufacturer Specifications, Operator Training Courses and Seminars and Conferences.

OPERATIONS MANUALS

* **The operations and maintenance manuals did meet the requirements of the Permit and Licence or Approval issued under Part V of the SDWA.**

  The St. Thomas Area Secondary Water Supply System Operations and Maintenance Manual meets the requirements stipulated in the current Municipal Drinking Water Licence, section 16.0.

LOGBOOKS

* **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

  The Owner and Operating Authority indicated that only certified operators perform drinking water tests in the water distribution system.

SECURITY

* **The owner had provided security measures to protect components of the drinking-water system.**

  All facilities remain locked at all times. The Elgin-Middlesex Pumping Station has door and motion detector alarms, the Ford Tower and East and West Chambers have door alarms and fences with signage. All facilities are visited regularly by system operators.

CERTIFICATION AND TRAINING

* **The overall responsible operator had been designated for each subsystem.**

  The St. Thomas Area Secondary Water Supply System is classed as a Water Distribution Subsystem Class 3. At the time of inspection, the designated (and back-up) ORO possessed an operator certificate that was equal or greater than the classification level of the distribution system.

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

  The Owner and Operating Authority must ensure that one or more operators are designated as operator-in-charge (OIC) for each day that the facility is in operation. An OIC can be any operator with an applicable certificate to the type of operated subsystem. An operator-in-training (OIT) cannot be designated as an OIC. Any log entries made by the OIT must be approved by the OIC and clearly documented in the log at the time of entry. There is a designated OIC and the Owner indicated that there are a number of operators that can act as OIC.

* **Only certified operators made adjustments to the treatment equipment.**

  The Owner and Operating Authority indicated that at the Elgin Middlesex Pump Station, only certified operators make adjustments to the treatment equipment for secondary disinfection.

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for distribution samples were being met.**

  Distribution water samples are being taken from pre-determined sites and analyzed on a weekly basis. On average, there are 4 bacteriological samples taken each week. During the review of documents, it was identified that several bacteriological samples that were delivered to the laboratory were above the recommended temperature range of 4.0 to 10.0 degrees Celsius. It is recommended that the Owner and Operating Authority review its sample handling and shipping procedures for bacteriological samples.

WATER QUALITY MONITORING

* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  Trihalomethane (THM) sampling is required to be undertaken on distribution water on a quarterly basis. All sample results for this inspection period show that the treated water is within acceptable limits.

* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

  The Chain of Custody forms reviewed for the inspection period indicate that a chlorine residual test is performed with each bacteriological sample taken in the distribution system.

WATER QUALITY ASSESSMENT

* **Records show that all water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O. Reg. 169/03).**

  The Owner and Operating Authority took bacteriological and chemical drinking water samples during the report period and all sample results met the Ontario Drinking Water Quality Standards.

REPORTING & CORRECTIVE ACTIONS

* **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

  There are chlorine residual analyzers at the East Valve Chamber, West Valve Chamber, Ford Meter Chamber, Southwold Meter Chamber, and the Wellington Chamber. These chlorine analyzers are linked to a dialer system to notify operators when alarm set points are reached. The Owner and Operating Authority indicated that operators acknowledge alarms but the type of response will depend on the alarm situation.

* **All changes to the system registration information were provided within ten (10) days of the change.**

  The Owner's and Operating Authority's system profile with details of the water distribution system and contact information were recently updated to reflect changes regarding contact information.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Not Applicable

SIGNATURES

Inspected By:	Signature: (Provincial Officer):
Roland Plante	Roland Plante
Reviewed & Approved By:	Signature: (Supervisor):
Tom Clubb	Tom Clubb
Review & Approval Date:	July 13, 2015.

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

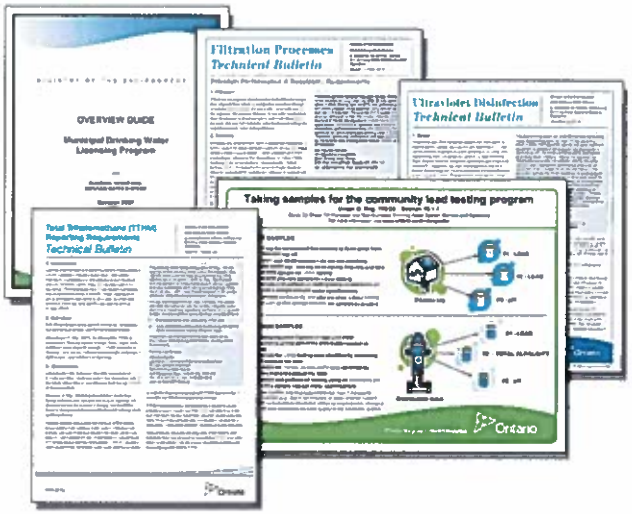
Key Reference and Guidance Material for Drinking Water Systems

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are posted on the Ministry of the Environment's **Drinking Water Ontario** website at **www.ontario.ca/drinkingwater** to help in the operation of your drinking water system.

Below is a list of key materials frequently used by owners and operators of municipal drinking water systems. To read or download these materials, go to **Drinking Water Ontario** and search in the **Resources** section by **Publication Number**.

Visit **Drinking Water Ontario** for more useful materials. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or **picemail.moe@ontario.ca**.



PUBLICATION NUMBER	PUBLICATION TITLE
4448e01	Procedure for Disinfection of Drinking Water in Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids
7467	Filtration Processes Technical Bulletin
7685	Ultraviolet Disinfection Technical Bulletin
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)
2601e	Overview Guide: Municipal Drinking Water Licensing Program
0000	Municipal Drinking Water Licensing Program Bulletin, Issue 1, January 2011
0000	Certification Guide for Operators and Water Quality Analysts
6560e	Taking Samples for the Community Lead Testing Program
7423e	Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption
7128e	Drinking Water System Contact List
4449e01	Technical Support Document for Ontario Drinking Water Quality Standards

PIBS 8990b

Ontario

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

Beaucoup de documentation sur le fonctionnement d'un réseau d'eau potable se trouve sur le site Web du **ministère de l'Environnement**.

Vous trouverez ci-dessous la liste des principaux documents que les propriétaires et les exploitants de réseaux municipaux d'eau potable utilisent fréquemment. Pour lire ou télécharger ces documents, allez sur le site Web du Ministère, et effectuez une recherche par numéro de publication dans la section RESSOURCES.

Consultez le site d'**Eau potable Ontario** pour obtenir d'autre documentation. Communiquez avec le Centre d'information du public au 1 800 565-4923 ou au 416 325-4000, ou encore à **picemail.moe@ontario.ca** si vous avez des questions ou besoin d'aide.

NUMÉRO DE PUBLICATION	TITRE DE LA PUBLICATION
4448f01	Marche à suivre pour désinfecter l'eau portable en Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)
7467	Filtration Processes Technical Bulletin (en anglais seulement)
7685	Ultraviolet Disinfection Technical Bulletin (en anglais seulement)
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (février 2011) (en anglais seulement)
2601f	Guide général - Programme de délivrance des permis de réseaux municipaux d'eau potable
0000	Bulletin du Programme des permis de réseaux municipaux d'eau potable, numéro 1, janvier 2011
0000	Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable
6560f	Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités
7423f	Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption
7128f	Liste des personnes-ressources du réseau d'eau potable
4449f01	Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario

PIBS 8990b

Ontario

Inspection Rating Record

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

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Ontario

The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	**Major** Administrative Consequence	**Minor** Environmental Consequence	**Minor** Health Consequence	**Medium** Environmental Consequence	**Major** Environmental Consequence	**Medium** Health Consequence	**Major** Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely	L=3 (Likely)	L=2 (Possible)
R=4	**R=2**	**R=6**	**R=12**	**R=15**	**R=6**	**R=21**	**R=16**

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their "yes", "no" or "not applicable" responses into the Ministry's Laboratory and Waterworks Inspection System (LWIS) database. A "no" response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

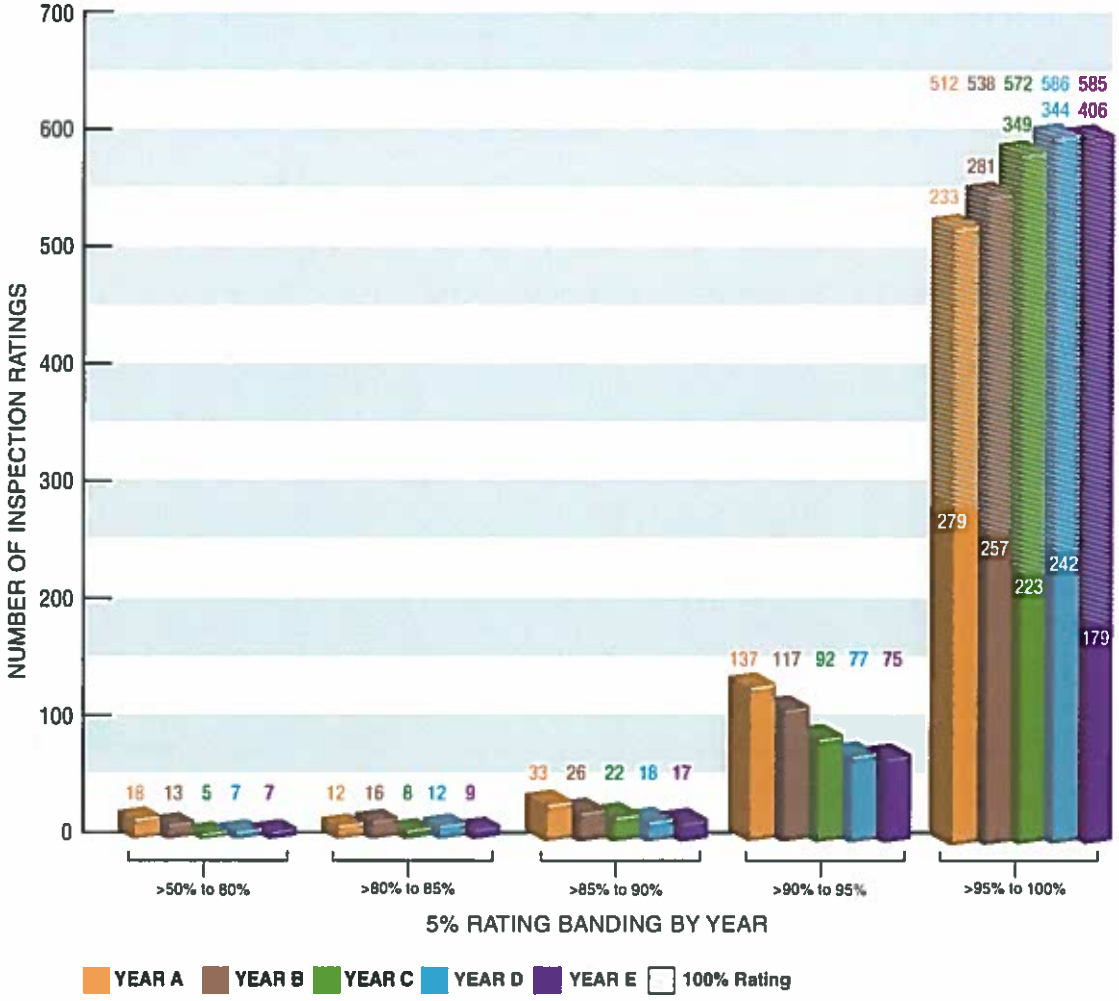
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks
9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

For further information, please visit **www.ontario.ca/drinkingwater**

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2015-2016)

DWS Name:	ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
DWS Number:	260078897
DWS Owner:	St. Thomas Area Secondary Water Supply System Joint Board Of Management
Municipal Location:	St. Thomas
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Adhoc
Inspection Date:	June 5, 2015
Ministry Office:	London District

Maximum Question Rating: 310

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 60
Distribution System	0 / 21
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 28
Water Quality Monitoring	0 / 43
Reporting & Corrective Actions	0 / 25
Treatment Process Monitoring	0 / 91
TOTAL	**0 / 310**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 13-JUL-15 (Inspection ID: 1-BZASG).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2015-2016)

DWS Name:	ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
DWS Number:	260078897
DWS Owner:	St. Thomas Area Secondary Water Supply System Joint Board Of Management
Municipal Location:	St. Thomas
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Adhoc
Inspection Date:	June 5, 2015
Ministry Office:	London District

Maximum Question Rating: 310

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 13-JUL-15 (Inspection ID: 1-BZASG).

	Corporation of the **City of St. Thomas**	**Report No.** ES109-15 **File No.** 06-048-03
Directed to:	Chairperson and the Members of the Board of Management for the St. Thomas Secondary Area Water Supply System	**Meeting Date:** October 22, 2015 **Date Authored:** September 28, 2015
Department:	Environmental Services	**Attachment**
Prepared By:	Justin Lawrence, P. Eng. Director of Environmental Services & City Engineer	**St. Thomas Area Secondary Water Supply System Map**
Subject:	**Overview of the St. Thomas Area Secondary Water Supply System (EMPS and Transmission Mains)**	

Recommendation:

THAT: Report ES109-15, Overview of the St. Thomas Area Secondary Water Supply System (EMPS and Transmission Mains), be received for information.

Origin:
In November 1998, the Ministry of the Environment transferred the pumping station and the transmission main to a Joint Board Of Management consisting of the City of St. Thomas, the Municipality of Central Elgin and the Township of Southwold.

The City of St. Thomas was delegated as the Administrating Municipality.

Analysis:
The St. Thomas Area Secondary Water Supply System receives water from the Elgin Area Water Treatment Plant which is sent to the Elgin-Middlesex Pumping Station (EMPS) and then enters the transmission main of the St. Thomas Area Secondary System.

The transmission main is of concrete pressure pipe (CCP) construction, approximately 11.2 km long and consists of a 9.2 km segment of 750 mm diameter water main and a 2.0 km segment of 500 mm diameter water main, arranged predominantly in a looped, grid based system with all efforts being made to minimize dead ends.

The 763 m^3 capacity elevated storage tank, referred to as the “Ford Tower” is located on Water Tower Line and is of steel construction and a steel pedestal.

The water level is monitored at the EMPS, which is regulated and controlled through operations of the St. Thomas Pumps. Except for re-chlorination, the EMPS and all facilities and components of the St. Thomas Area Secondary Supply System are strictly for the transmission of treated water provided by the Elgin Area Primary Water Supply.

After water leaves the EMPS along the transmission main, there is a take-off to supply the City of St. Thomas through the East Chamber, regulated through valves and monitored through the SCADA system. The West Chamber is the second take-off point from the transmission main to provide water to the City of St. Thomas. The West Chamber is regulated and monitored through the same equipment as the East Chamber. The St. George Chamber is the third take-off point from the transmission main to provide water to the City of St. Thomas. However, water is provided through this chamber only when pressures in the immediate vicinity fall below 55 psi or 380 kPa. An overview of the St. Thomas Area Secondary Water Supply System map is attached.

Financial Considerations
None at this time.

Respectfully submitted,

Justin Lawrence, P. Eng.
Director of Environmental Services & City Engineer

Reviewed By:	Treasury	Env Services	Planning	City Clerk	HR	Other

ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM MAP

N

Ford Tower

EMPS
(Shared Ownership)

West Chamber
(Water enters City's Distribution System)

East Chamber
(Water enters City's Distribution System)

LEGEND

- Chamber with meter
- Chamber without meter
- No chamber or meter (house metered individually)
- Booster Station
- Valve
- Elevated tank (Ford Tower)
- House connection
- Primary Transmission Water line
- 500 mm Ø Secondary Water Line (Secondary Board ownership)
- 750 mm Ø Secondary Water Line Secondary Board ownership)
- 1050 mm Ø Secondary Water Line (City of London ownership)
- Local Water line
- City of St. Thomas
- Municipality of Central Elgin
- Township of Southwold

0 0.5 1
kilometres

Corporation of the
City of St. Thomas

Report No. ES110-15

File No. 06-050-00

Directed to: Chairperson and the Members of the Board of Management for the St. Thomas Secondary Area Water Supply System

Meeting Date: October 22, 2015

Date Authored: September 8, 2015

Department: Environmental Services

Prepared By: Lynn Stafford, Compliance Coordinator

Attachment St. Thomas Area Secondary Water Supply System Water Rate Study

Subject: **St. Thomas Area Secondary Water Supply System – 2016 Water Rate**

Recommendation:

THAT: Report ES110-15, St. Thomas Area Secondary Water Supply System- 2016 Water Rate be received for information;

THAT: The Secondary Water Rate of $1.0948, effective January 1st 2016, be approved.

Origin:

The St. Thomas Area Secondary Water Supply System provides water to the City of St. Thomas, the Municipality of Central Elgin and the Township of Southwold.

The cost of supplying water services is recovered through the Blended Supply Rate, which forms part of the St. Thomas and Suburban Service area Rate. The Blended Supply Rate includes water purchased through the Primary and Secondary Systems. The updated rate study, attached, is based on the most current information and forecasts for the period 2015-2024.

Analysis:

Secondary Water Rate

The overall Secondary Water Rate is based on the Primary System Water Rate and the Secondary System Water Rates. The Primary System Water Rate was approved by the Elgin Area Primary Water Supply System Joint Board of Management on October 1, 2015, at a rate increase of 9%. In 2016, the rate is scheduled to be changed from $0.6761/m^3 to $0.7370/m^3.

In order the meet the requirements of the provincial water legislation and to build an adequate reserve fund balance, the Secondary System Water Rate will increase by 10. 1% from $0.3250/m^3 to $0.3578/m^3.

The table outlines the current rate increase and the projected rates.

Year	2015	**2016**	2017	2018
Secondary Rate ($/m^3)	0.3250	**0.3578**	0.3939	0.4336
Primary Rate ($/m^3)	0.6761	**0.7370**	0.7739	0.8126
Overall Secondary Water Rate (Primary & Secondary Rate)	1.0011	**1.0948**	1.1678	1.2462

The overall Secondary Water Rate is a combination of the Primary and the Secondary Rates. In 2016 the overall rate increases from $1.0011/m^3 to $1.0948/m^3, resulting in an overall rate increase of 8.3% for the Secondary Water Rate.

Financial Considerations

The 2016 St. Thomas Area Secondary Water Supply System Rate proposed, is in keeping with the approved St. Thomas Area Secondary Water Supply System Water Rate Study approved in March 2015.

Respectfully submitted,

Lynn Stafford

Lynn Stafford, C.E.T.
Compliance Coordinator, Environmental Services

Reviewed By: Treasury; Env Services; Planning; City Clerk; HR; Other

St. Thomas Area Secondary Water Supply System Water Rate Study

In Association with

GM BluePlan Engineers

March 19, 2015

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Planning for growth

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1. Introduction

1.1 Background

The Elgin Area Water Supply System (commonly referred to as the Primary System) supplies water to the City of St. Thomas, City of London, Town of Aylmer, Municipality of Bayham, Municipality of Central Elgin, Township of Malahide and the Township of Southwold. The Primary System provides water directly to the City of St. Thomas distribution system at the Elgin Middlesex Booster Station. Water supplied through the Elgin Middlesex Booster Station is provided to the St. Thomas Area Secondary Water Supply System (A.S.W.S.S.), also referred to as the Secondary System.

The A.S.W.S.S. provides water to the City of St. Thomas, Municipality of Central Elgin and the Township of Southwold. The owners of the Secondary System are collectively referred to as the Board of Management and the City of St. Thomas is the administrative municipality.

The cost of supplying water services through the A.S.W.S.S. is recovered through the Blended Supply Rate, which forms part of the St. Thomas and Suburban Service Area Rate. The Blended Supply Rate includes water purchased through the Primary System and A.S.W.S.S. The current A.S.W.S.S. water supply rate was established based on a November 2010 report prepared by Watson & Associates Economists Ltd. (Watson), in association with AECOM. The present rate structure is provided below, which includes the A.S.W.S.S. (Secondary System) Rate of $0.2902 per cubic meter of consumption.

Description	2014
St. Thomas and Suburban Service Area Rate	
Primary System Rate ($/m3)	0.6203
Secondary System Rate ($/m3)	0.2902
Blended Supply Rate (2014 - 70% Primary and 30% Secondary)	**0.7074**
Common Water Rate ($/m3)	**0.1133**
St. Thomas and Suburban Service Area Rate ($/m3)	**0.8207**

The updated A.S.W.S.S. Rate Study, prepared by Watson, recommended a water rate forecast for the period 2010-2019. A periodic update every 5 years, consistent with Municipal Drinking Water Licence compliance requirements by the Province, is undertaken by the Board of Management. In 2014, Watson in association with GM BluePlan Engineers (BluePlan), were retained to prepare an updated financial plan and rate forecast for the A.S.W.S.S. The assessment provided herein addresses changes

recommended to the A.S.W.S.S. water rate based on the most current information, and forecasts the implications over the next 10-year period (2015-2024).

1.2 Study Objectives

Objectives of the study and the steps involved in carrying out this assignment are summarized below:

- Forecast future water demands, incorporating reduction of services to Dutton-Dunwich;
- Identify all current and future water system capital needs to assess the immediate and longer-term capital funding implications;
- Perform cost/benefit analysis of maintaining the Ford Water Tower vs. other options including removing the Ford Water Tower and a reconfiguration of the system;
- Identify existing operating costs by component and estimate future operating costs over the next ten years. This assessment identifies fixed and variable costs in order to project those costs sensitive to changes to the existing infrastructure inventory, as well as costs which may increase commensurate with growth;
- Forecast A.S.W.S.S. water rates for the 10-year forecast period; and
- Provide a report and presentation to the Board of Management, relative to the findings and recommendations.

1.3 Regulatory Changes in Ontario

Resulting from the water crisis in Walkerton, significant regulatory changes have been made in Ontario. These changes arose as a result of the Walkerton Commission and the 93 recommendations made by the Walkerton Inquiry Part II report. Areas of recommendation include:

- watershed management and source protection;
- quality management;
- preventative maintenance;
- research and development;
- new performance standards;
- sustainable asset management; and
- lifecycle costing.

These recommendations have informed legislation, e.g. the Sustainable Water and Sewage Systems Act and the Safe Drinking Water Act, and current Bills within the legislature. The following sections describe these legislative changes in further detail.

1.4 Sustainable Water and Sewage Systems Act

The Sustainable Water and Sewage Systems Act (S.W.S.S.A.) was passed on December 13, 2002. The intent of the Act was to introduce the requirement for municipalities to undertake an assessment of the "full cost" of providing their water and the wastewater services. In total, there were 40 areas within the Act to which the Minister may make regulations; however, regulations were never issued. On December 31, 2012, the Sustainable Water and Sewage Systems Act was repealed.

1.5 Safe Drinking Water Act

The Safe Drinking Water Act (S.D.W.A.) was passed in December, 2002. The S.D.W.A. provides for 50 of the 93 Walkerton Part II recommendations. It focuses on the administrative and operational aspects of the provision of water. The S.D.W.A. is being implemented in stages.

> "The purpose of the Safe Drinking Water Act is to protect human health through the control and regulation of drinking-water systems and drinking-water testing. Building on existing policy and practice in Ontario's treatment and distribution of drinking water, the Safe Drinking Water Act requires that all municipal drinking water systems obtain an approval from the Director of the Ministry of the Environment in order to operate. Operators are required to be trained and certified to provincial standards. The Act also provides legally binding standards for testing of drinking water and requires that testing be done in licensed and accredited laboratories."[1]

The following is a brief summary of the key elements included in the S.D.W.A.:

- Mandatory licensing and accreditation of testing laboratories;
- New standards for treatment, distribution quality and testing;
- Mandatory operator training and certification;
- Mandatory licensing of municipal water providers;
- Stronger enforcement and compliance provisions; and
- "Standard of care" requirements for municipalities.

[1] The Ministry of Environment
http://www.ene.gov.on.ca/environment/en/legislation/safe_drinking_water_act/index.html

This legislation impacts the costs of operating a water system with the need for higher skilled operators including increased training costs, increased reporting protocols and requirements, continuing enhancements to quality standards and the costs to licence each water system.

1.6 Financial Plans Regulation

On August 16, 2007, the Ministry of the Environment (M.O.E.) introduced O.Reg. 453/07 which requires the preparation of financial plans for water systems. The M.O.E. has also provided a Financial Plan Guideline to assist municipalities with preparing the plans. A brief summary of the key elements of the regulation is provided below:

- The financial plan will represent one of the key elements for the Board of Management to obtain its Drinking Water License;
- The plan is to be completed, approved by Board of Management Resolution and submitted to the Ministry of Municipal Affairs and Housing within 6 months of receiving approval of its water license;
- The financial plans shall be for a period of at least six years but longer planning horizons are encouraged;
- As the regulation is under the Safe Drinking Water Act, the preparation of the plan is mandatory for water services and encouraged for wastewater services;
- The plan is considered a living document (i.e. will be updated as annual budgets are prepared) but will need to be undertaken at a minimum of every five years;
- The plans generally require the forecasting of capital, operating and reserve fund positions, providing detailed inventories, forecasting future users and volume usage and corresponding calculation of rates. In addition, P.S.A.B. information on the system must be provided for each year of the forecast (i.e. total non-financial assets, tangible capital asset acquisitions, tangible capital asset construction, betterments, write-downs, disposals, total liabilities and net debt); and
- The financial plans must be made available to the public (at no charge) upon request and be available on the City's web site. The availability of this information must also be advertised.

In general, the financial principles of this regulation follow the intent of the S.W.S.S.A. to move municipalities towards financial sustainability for water services. However, many of the prescriptive requirements have been removed (e.g. preparation of two separate documents for provincial approval, auditor opinions, engineer certifications, etc.).

A guideline ("Towards Financially Sustainable Drinking-Water and Wastewater Systems") has been developed to assist municipalities in understanding the Province's direction and provides a detailed discussion on possible approaches to sustainability. The Province's Principles of Financially Sustainable Water and Wastewater Services are provided below:

Principle #1: Ongoing public engagement and transparency can build support for, and confidence in, financial plans and the system(s) to which they relate.

Principle #2: An integrated approach to planning among water, wastewater, and storm water systems is desirable given the inherent relationship among these services.

Principle #3: Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services.

Principle #4: Life-cycle planning with mid-course corrections is preferable to planning over the short term, or not planning at all.

Principle #5: An asset management plan is a key input to the development of a financial plan.

Principle #6: A sustainable level of revenue allows for reliable service that meets or exceeds environmental protection standards, while providing sufficient resources for future rehabilitation and replacement needs.

Principle #7: Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received.

Principle #8: Financial plans are "living" documents that require continuous improvement. Comparing the accuracy of financial projections with actual results can lead to improved planning in the future.

Principle #9: Financial plans benefit from the close collaboration of various groups, including engineers, accountants, auditors, utility staff and municipal Council.

The preparation of this study document is consistent with the principles of the S.W.S.S.A. and O.Reg. 453/07. The full accrual presentation of the financial plan for

submission to the Province will be provided under separate cover once the financial plan herein has been accepted by the Board of Management.

1.7 Water Opportunities Act

The Water Opportunities Act received Royal Assent on November 29, 2010. The Act provides for the following elements:

- Foster innovative water, wastewater and stormwater technologies, services and practices in the private and public sectors;
- Prepare water conservation plans to achieve water conservation targets established by the regulations;
- Prepare sustainability plans for municipal water services, municipal wastewater services and municipal stormwater services. With regard to the sustainability plans:
    - The Bill extends from the water financial plan and requires a more detailed review of the water financial plan and requires a full plan for wastewater and stormwater services; and
    - Regulations (when issued) will provide performance targets for each service – these targets may vary based on the jurisdiction of the regulated entity or the class of entity.

The Financial Plan shall include:

- An asset management plan for the physical infrastructure;
- Financial Plan;
- For water, a water conservation plan;
- Assessment of risks that may interfere with the future delivery of the municipal service, including, if required by the regulations, the risks posed by climate change and a plan to deal with those risks; and
- Strategies for maintaining and improving the municipal service, including strategies to ensure the municipal service can satisfy future demand, consider technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources, and increase co-operation with other municipal service providers.

Performance indicators will be established by service:

- May relate to the financing, operation or maintenance of a municipal service or to any other matter in respect of what information may be required to be included in a plan;
- May be different for different municipal service providers or for municipal services in different areas of the Province.

Regulations will prescribe:

- Timing;
- Contents of the plans;
- Identifying what portions of the plan will require certification;
- Public consultation process; and
- Limitations, updates, refinements, etc.

1.8 Forecast Growth and Servicing Requirements

The A.S.W.S.S. currently supplies water to three municipalities: St. Thomas, Central Elgin and Southwold. Information on historic water consumption was provided by the City of St. Thomas for the period 2010-2014 along with information received for the previous study for the period 2003-2010. As summarized in Table 1-1, water consumption has gradually declined over the period from a peak of 2.66 million cubic meters in 2010 to an estimate of 1.79 million cubic meters for 2014. The previous study's forecasted consumption accounted for the closure of the Ford Plant in 2011 to be partially offset by increased demand from the extension of the system into the Dutton-Dunwich area. The Ford Plant closure did occur as scheduled, however, the forecast increase in demand from Dutton-Dunwich (approximately 255,000 m^3 per year) did not occur. The Municipality of Dutton-Dunwich is in the process of assuming the existing water supply agreement from the Tri-County Management Committee that was entered into in 2003 with the Elgin Area Water Supply System (i.e. Primary System). Under the terms of the agreement, which are anticipated to remain unchanged, Dutton-Dunwich will be responsible for taking a minimum 400 cubic meters per day through the interconnection in the Community of Iona. Discussions with Dutton-Dunwich staff have revealed that they anticipate taking only the minimum of 400 cubic meters per day. As such, this level of demand has been incorporated into the forecast estimates.

Table 1-2 summarizes the forecast water consumption for the A.S.W.S.S. for the period 2015-2024. In developing this forecast, discussions were held with City staff to identify factors affecting future demand. The Township of Southwold is anticipating residential

and commercial growth in 2015 that will account for an additional 58,000 cubic meters of consumption annually. For the remainder of the system, growth is forecast to remain relatively constant over the forecast period, with provision for minor amounts of growth in the St. Thomas area based on the City's provisional medium growth projections (i.e. annual growth rate of 0.76% for 2015-2016, 1.16% for 2017-2021, and 1.22% for 2022-2024).

In total, water consumption for the A.S.W.S.S. is anticipated to increase from 1.80 million m^3 in 2015 to 1.98 million m^3 in 2024. The forecast consumption of water is anticipated to represent 95% of the water purchased from the Primary System, with approximately 5% provision for unaccounted water (e.g. water loss, maintenance water, etc.).

Table 1-1
ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
2010-2013 Consumption Actuals and 2014 Consumption Estimate (in Cubic Meters)

DESCRIPTION		Meter		2010	2011	2012	2013	2014
Reading from EMPS		C		2,611,264	2,488,557	2,082,008	1,947,745	2,082,570
St. Thomas Billing								
East Chamber		B		794,010	753,174	720,048	573,379	759,356
West Chamber		F008		700,478	551,244	571,127	628,418	385,519
Lynhurst Subdivision	Lower	F023B		-	-	-		
	Upper	F023B		-	-	-		
St. George St. and Lynhurst Park		F023C		-	-	75	110	
Subtotals				**1,494,488**	**1,304,418**	**1,291,250**	**1,201,907**	**1,144,875**
Southwold Billing								
Home on Wellington - McBain - 1 meter		F022		109	125	101	113	146
Wellington transmission main		F023A		655	1,580	1,275	1,010	1,411
St. George St. and Lynhurst Park - credit		F023C		0	0	75	-115	0
Homes - 7 - on Ford Line		F024		1,195	1,170	1,095	790	870
Ferndale Subdivision	Large	F024A		10	5	10	10	0
	Small	F024A		30,880	27,460	27,390	25,855	29,061
Home on Ford Road - Dickson - 1 meter		F026		114	109	702	436	325
Talbotville		F027A		87,690	64,675	48,435	52,230	50,312
Northstar Windows		F028A		3,939	3,416	3,811	4,245	4,415
Shedden/Fingal		S001		414,933	451,925	469,249	442,962	428,882
Homes - 3 - Andrews, etc… - 1 meter		F029		3,668	3,894	3,501	2,363	3,087
JRI - 2" meter		F030A		2,253	1,293	1,211	1,263	1,182
JRI - 5/8" meter		F030B		68	190	139	99	165
Homes - 3 - 1 meter		F033A		520	740	760	950	585
Home - Bradish - 1 meter		F033B		466	302	341	290	215
Ford & CN		F035		579,387	534,405			0
Clifton Line (Ford)						87,582	79,951	79,582
Subtotals				**1,125,887**	**1,091,289**	**645,527**	**612,452**	**600,238**
Central Elgin Billing								
Lynhurst Subdivision	Lower	F023B		889	1,716	1,470	440	317
	Upper	F023B		28,415	27,885	34,450	43,721	41,207
Dalewood Conservation Area		F014		2,765	3,485	1,895	2,005	2,720
Homes - 4 including "castle" - 1 meter		F017		655	665	685	605	782
Turner Rd - 7 homes - individual meters		F017A	10215	182	171	154	138	114
			10307	358	335	382	382	355
			10217	350	322	394	412	478
			10251	398	299	325	378	367
			10213	147	132	124	154	149
			10243	243	220	409	299	266
			10331	154	95	87	81	70
			10267	243	224	259	251	282
Homes - 2 - 1 meter		F018		253	202	194	196	173
Subtotals				**35,052**	**35,751**	**40,828**	**49,062**	**47,283**
TOTAL CONSUMPTION				**2,655,427**	**2,431,458**	**1,977,605**	**1,863,421**	**1,792,396**

Table 1-2
ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
2014-2024 Consumption Forecast (in Cubic Meters)

DESCRIPTION	Meter		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Reading from EMPS	C		2,082,570	1,895,892	1,966,425	1,980,618	1,994,975	2,009,499	2,024,192	2,039,055	2,054,868	2,070,873	2,087,075
St. Thomas Billing													
East Chamber	B		759,356	765,127	770,942	779,885	788,932	798,083	807,341	816,706	826,670	836,756	846,964
West Chamber	F008		385,519	388,449	391,401	395,941	400,534	405,180	409,880	414,635	419,694	424,814	429,997
Lynhurst Subdivision Lower	F023B			-	-	-	-	-	-	-	-	-	-
Upper	F023B			-	-	-	-	-	-	-	-	-	-
St. George St. and Lynhurst Park	F023C			-	-	-	-	-	-	-	-	-	-
Subtotals			**1,144,875**	**1,153,576**	**1,162,343**	**1,175,826**	**1,189,466**	**1,203,264**	**1,217,222**	**1,231,341**	**1,246,364**	**1,261,569**	**1,276,960**
Southwold Billing													
Home on Wellington - McBain - 1 meter	F022		146	146	146	146	146	146	146	146	146	146	146
Wellington transmission main	F023A		1,411	1,411	1,411	1,411	1,411	1,411	1,411	1,411	1,411	1,411	1,411
St. George St. and Lynhurst Park - credit	F023C		0	0	0	0	0	0	0	0	0	0	0
Homes - 7 - on Ford Line	F024		870	870	870	870	870	870	870	870	870	870	870
Ferndale Subdivision Large	F024A		0	0	0	0	0	0	0	0	0	0	0
Small	F024A		29,061	29,061	29,061	29,061	29,061	29,061	29,061	29,061	29,061	29,061	29,061
Home on Ford Road - Dickson - 1 meter	F026		325	325	325	325	325	325	325	325	325	325	325
Talbotville	F027A		50,312	50,312	50,312	50,312	50,312	50,312	50,312	50,312	50,312	50,312	50,312
Northstar Windows	F028A		4,415	4,415	4,415	4,415	4,415	4,415	4,415	4,415	4,415	4,415	4,415
Shedden/Fingal	S001		428,882	428,882	428,882	428,882	428,882	428,882	428,882	428,882	428,882	428,882	428,882
Homes - 3 - Andrews, etc... - 1 meter	F029		3,087	3,087	3,087	3,087	3,087	3,087	3,087	3,087	3,087	3,087	3,087
JRI - 2" meter	F030A		1,182	1,182	1,182	1,182	1,182	1,182	1,182	1,182	1,182	1,182	1,182
JRI - 5/8" meter	F030B		165	165	165	165	165	165	165	165	165	165	165
Homes - 3 - 1 meter	F033A		585	585	585	585	585	585	585	585	585	585	585
Home - Bradish - 1 meter	F033B		215	215	215	215	215	215	215	215	215	215	215
Ford & CN	F035		0	0	0	0	0	0	0	0	0	0	0
Clifton Line (Ford)			79,582	79,582	79,582	79,582	79,582	79,582	79,582	79,582	79,582	79,582	79,582
Strip Mall (Wellington Rd.)					56,449	56,449	56,449	56,449	56,449	56,449	56,449	56,449	56,449
10 Homes (Florence Court)					1,790	1,790	1,790	1,790	1,790	1,790	1,790	1,790	1,790
Subtotals			**600,238**	**600,238**	**658,478**	**658,478**	**658,478**	**658,478**	**658,478**	**658,478**	**658,478**	**658,478**	**658,478**
Central Elgin Billing													
Lynhurst Subdivision Lower	F023B		317	317	317	317	317	317	317	317	317	317	317
Upper	F023B		41,207	41,207	41,207	41,207	41,207	41,207	41,207	41,207	41,207	41,207	41,207
Dalewood Conservation Area	F014		2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720
Homes - 4 including "castle" - 1 meter	F017		782	782	782	782	782	782	782	782	782	782	782
Turner Rd - 7 homes - individual meters	F017A	10215	114	114	114	114	114	114	114	114	114	114	114
		10307	355	355	355	355	355	355	355	355	355	355	355
		10217	478	478	478	478	478	478	478	478	478	478	478
		10251	367	367	367	367	367	367	367	367	367	367	367
		10213	149	149	149	149	149	149	149	149	149	149	149
		10243	266	266	266	266	266	266	266	266	266	266	266
		10331	70	70	70	70	70	70	70	70	70	70	70
		10267	282	282	282	282	282	282	282	282	282	282	282
Homes - 2 - 1 meter	F018		173	173	173	173	173	173	173	173	173	173	173
Subtotals			**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**	**47,283**
TOTAL CONSUMPTION			**1,792,396**	**1,801,097**	**1,868,104**	**1,881,587**	**1,895,226**	**1,909,024**	**1,922,982**	**1,937,102**	**1,952,124**	**1,967,330**	**1,982,721**

2. Full Cost of Services

The following outlines the A.S.W.S.S. "Full Cost of Services" report. This section of the study is formatted to addresses cost of water service requirements and supports the complimentary cost recovery plan provided in the subsequent chapter. This chapter summarizes the capital needs assessments prepared by BluePlan to ensure a sustainable system, and provides a management plan for the long-term integrity of the water supply system. Five iterations of the capital needs forecast were considered by staff when assessing the short-term and long-term capital needs of the A.S.W.S.S.

2.1 Secondary System Capital Needs

In accordance with the Terms of Reference for this assignment, a number of options were considered to measure the impacts of the capital needs of the Ford Water Tower. Each option includes capital costs for the repair, upgrade and maintenance of the system as identified in the E.M.P.S. Capital Plan (2014-2021), E.M.P.S. replacement program prepared by BluePlan, information provided by O.C.W.A. and additional information relating to the Ford Water Tower, meter chambers, east and west chambers, and transmission main. The following options were considered when assessing the capital needs of the A.S.W.S.S.:

- **Option 1 (Maintain Ford Water Tower)**: Recoating of the Ford Water Tower in 2015 followed by the minimum course of action needed in 2030 (Decommission Ford Water Tower).
- **Option 1A (Defer Capital Needs – 2020)**: Recoating of the Ford Water Tower and subsequent decommissioning will be delayed until 2020. Major pump replacements will be delayed until 2019 because of operational flexibility provided by replacing pump #3 at the E.M.P.S. in 2015.
- **Option 1B (Defer Capital Needs - 2016)**: Recoating of the Ford Water Tower and subsequent decommissioning will be delayed until 2016. Major pump replacements will be delayed until 2028 because of operational flexibility provided by replacing pump #3 at the E.M.P.S. in 2015.
- **Option 2 – Decommission Ford Water Tower**: Decommission the Ford Water Tower in 2015.
- **Option 3 – Replace Ford Water Tower**: Decommission the Ford Water Tower in 2015 followed by replacement with a new 5 ML elevated tank in 2016.

Tables 2-1 to 2-5 summarize the capital needs identified by BluePlan for each option. The information contained in Tables 2-1 to 2-5 provides the aggregate capital needs by type and includes adjustments for capital cost inflation at 2% annually.

The Full Cost Recovery Plan identifies the use of rate-based funding for the capital needs in the forecast period and the development of lifecycle reserve funds to address stable funding for works beyond the forecast period.

2.2 Level of Risk

There is a level of risk associated with each capital forecast option. Inherent in each option are different levels of operational risks with varying associated financial impacts. The following subsections summarize the risk assessment for each option:

Option 1 – Maintain Ford Water Tower

There is very little immediate risk associated with this option. The cost of recoating the Ford Water Tower is not expected to increase significantly and the process will extend the life of the tower by an expected 15 years. There is a risk that the tower could deteriorate more quickly than expected, requiring a future intervention earlier than 15 years. At this time, the Board has not yet decided what will be the long-term future of the Ford Water Tower and is planning on the minimum required future intervention (decommissioning the Ford Water Tower). An alternate decision, additional recoating ($400,000) or a new elevated storage tank ($5 million), would add to capital needs outside the forecast period. The combined impact of these factors is a moderate probability of moderate to high cost increases outside the forecast period.

Option 1A – Defer Capital Needs - 2020

The immediate risk is that the inspection of the Ford Water Tower indicates that an immediate recoating is required which would bring the costs of recoating the tower forward to 2015 from 2020. The replacement of pump #3 at the E.M.P.S. will offer operational flexibility for the system and is of low risk. This option carries the same risks as in Option 1 concerning how long the tower will last after its first recoating and what the City decides the future intervention will be. In addition, there is a moderate risk that the costs for the first recoating will have to be incurred earlier in the forecast period than planned.

Option 1B – Defer Capital Needs - 2016

The replacement of pump #3 at the E.M.P.S. will offer operational flexibility for the system and is of low risk. This option carries the same risks as in Option 1 concerning the duration of the Ford Water Tower operation after its first recoating and what the Board decides the future intervention will be. In addition, there is a moderate risk that the major pump replacements at the E.M.P.S. will have to be incurred earlier in the forecast period than planned.

Option 2 – Decommission Ford Water Tower

To remove the Ford Water Tower instead of replacing it, the pump upgrades at the E.M.P.S. must first be in place. With the loss of the elevated storage from the system, it is possible that there will be operational problems associated with this option and that a new elevated storage tank will be required. The resultant impact is a low probability of a high cost increase ($5 million) within the forecast period.

Option 3 – Replace Ford Water Tower

This option carries very little operational risk. However, the size and cost of the replacement are current best estimates and a small increase in the size of the tank could have a large financial impact within the forecast period.

Table 2-1
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Over Due Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator -Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC -Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC -Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment -Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural -Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	400,000	400,000	-	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table 2-2
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1A - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	541,000	-	-	-	-	541,000	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	442,000	-	-	-	-	-	442,000	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000

Table 2-3
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1B - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	408,000	-	408,000	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table 2-4
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 2 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	1,814,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table 2-5
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 3 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue Works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
		-	-	-	-	-	-	-	-	-	-
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt) - Inspection not required	-	-	-	-	-	-	-	-	-	-	-
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
New ~5 ML Elevated Tank	5,100,000	-	5,100,000	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	6,914,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

2.3 Water Operating Expenditures

The 2014 operating budget was provided by the City and identifies the operating and maintenance costs for the A.S.W.S.S. Future cost estimates were developed based on current operation and maintenance costs and the potential impact of future capital needs. Through discussion with City staff, it was determined that there would not be any significant changes to the operating costs in any of the five options considered. In addition, costs for the purchase of water from the Primary System have been forecast based on the combined effect of the A.S.W.S.S. water consumption forecast and the forecast Primary System water rates.

The costs for each component of the operating budget have been reviewed with City staff to establish forecast inflationary adjustments. Table 2-6 below summarizes these assumptions.

Table 2-6
Operating Costs Inflation

Description	Inflation
City Administration Costs	3%
Job Costing Labour	3%
CMMS Support Fee	3%
Booster Statation Operation and Maintenance	3%
Misc. Contracted Services	3%
Job Costing Equipment	3%
Job Costing Subcontractors	3%
Municipal Taxes	3%
Insurance Expense	3%
Communications	3%
Office Supplies	3%
Hydro Charges	3%
Chemicals	3%
Job Costing Materials	3%
Purchase of Water	Forecasted Consumption x Primary Rate

Table 2-7 summarizes the operating costs for the forecast period.

Table 2-7
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Total Operating Expenditures	1,610,181	1,786,643	1,879,346	1,977,111	2,080,109	2,188,836	2,303,603	2,425,507	2,554,027	2,689,642

2.4 Water Infrastructure Replacement (Lifecycle Analysis)

In addition to the capital needs identified and outlined in Section 2.1, a replacement value/lifecycle analysis was completed. BluePlan has identified the total value of capital needs for the period 2014-2081 for the A.S.W.S.S. The lifecycle analysis reviews the total value of works outside the forecast period (2025-2081), the amount of capital replacement needs contained in the 10-year forecast, and an annual lifecycle contribution that would be required to fully fund the future replacement obligations in the five options.

Tables 2-8 through 2-12 summarize total lifecycle replacement costs for the A.S.W.S.S. by infrastructure category, the amount of replacement identified in the 10-year capital plan, and the annual lifecycle contribution requirement for future replacement obligations.

Table 2-8
Lifecycle Analysis
Option 1

Capital Needs (Uninflated)				
Description	Total Capital Needs (2014-2081)	Amount to be Funded in 10-year Forecast (2014-2024)	Net Replacement for Future Lifecycle (2025-2081)	Annual Lifecycle Contribution
EMPS	4,511,820	956,059	3,555,761	210,422
Meter Chambers	2,363,569	709,071	1,654,498	76,258
Ford Tower	605,000	480,000	125,000	7,183
East & West Chambers	225,102	-	225,102	14,933
Transmission Main	23,414,518	-	23,414,518	485,970
Total Infrastructure	31,120,008	2,145,129	28,974,879	794,766

Table 2-9
Lifecycle Analysis
Option 1A

Capital Needs (Uninflated)				
Description	Total Capital Needs (2014-2081)	Amount to be Funded in 10-year Forecast (2014-2024)	Net Replacement for Future Lifecycle (2025-2081)	Annual Lifecycle Contribution
EMPS	4,581,909	1,031,059	3,550,850	209,066
Meter Chambers	2,363,569	709,071	1,654,498	76,258
Ford Tower	605,000	480,000	125,000	5,337
East & West Chambers	225,102	-	225,102	14,933
Transmission Main	23,414,518	-	23,414,518	485,970
Total Infrastructure	31,190,097	2,220,129	28,969,968	791,563

Table 2-10
Lifecycle Analysis
Option 1B

Capital Needs (Uninflated)				
Description	Total Capital Needs (2014-2081)	Amount to be Funded in 10-year Forecast (2014-2024)	Net Replacement for Future Lifecycle (2025-2081)	Annual Lifecycle Contribution
EMPS	4,581,909	531,059	4,050,850	242,234
Meter Chambers	2,363,569	709,071	1,654,498	76,258
Ford Tower	605,000	480,000	125,000	7,183
East & West Chambers	225,102	-	225,102	14,933
Transmission Main	23,414,518	-	23,414,518	485,970
Total Infrastructure	31,190,097	1,720,129	29,469,968	826,578

Table 2-11
Lifecycle Analysis
Option 2

Capital Needs (Uninflated)				
Description	Total Capital Needs (2014-2081)	Amount to be Funded in 10-year Forecast (2014-2024)	Net Replacement for Future Lifecycle (2025-2081)	Annual Lifecycle Contribution
EMPS	4,511,820	956,059	3,555,761	210,422
Meter Chambers	2,363,569	709,071	1,654,498	76,258
Ford Tower	125,000	125,000	-	-
East & West Chambers	225,102	-	225,102	14,933
Transmission Main	23,414,518	-	23,414,518	485,970
Total Infrastructure	30,640,008	1,790,129	28,849,879	787,582

Table 2-12
Lifecycle Analysis
Option 3

Capital Needs (Uninflated)				
Description	Total Capital Needs (2014-2081)	Amount to be Funded in 10-year Forecast (2014-2024)	Net Replacement for Future Lifecycle (2025-2081)	Annual Lifecycle Contribution
EMPS	4,511,820	956,059	3,555,761	210,422
Meter Chambers	2,363,569	709,071	1,654,498	76,258
Ford Tower	5,125,000	5,125,000	-	-
East & West Chambers	225,102	-	225,102	14,933
Transmission Main	23,414,518	-	23,414,518	485,970
Total Infrastructure	35,640,008	6,790,129	28,849,879	787,582

3. Full Cost Recovery Plan

The following outlines the A.S.W.S.S. "Cost Recovery Plan" report. The plan identifies the strategy and sources of funding to pay for the costs of water services identified in Chapter 2. This chapter summarizes the findings of the Watson assessment, including the capital funding plan, reserve fund continuity forecast and water rate projections.

3.1 Capital Funding Plan

Historically, the powers that municipalities and local boards have had to raise alternative revenues to taxation to fund capital services have been restrictive. Legislative reforms have been introduced in recent years that have altered these circumstances somewhat. The Province passed a new Municipal Act which came into force on January 1, 2003. Part XII of the Act and O.Reg. 584/06, govern a municipality's (and local board's) ability to impose fees and charges.

In contrast to the previous Municipal Act, this Act provides municipalities with broadly defined powers and does not differentiate between fees for operating and capital purposes. It is anticipated that the powers to recover capital costs under the previous Municipal Act will continue within the new Statutes and Regulations, as indicated by s.9(2) and s.452 of the new Municipal Act. Moreover, as water fees are governed by Part XII of the Municipal Act, municipalities and local boards also have the power to use these revenues, either directly or through the creation of reserves/reserve funds, for capital purposes.

In addition to the powers conferred upon municipalities and local boards under the Municipal Act, municipalities also have the ability to impose development charges for the recovery of growth-related capital costs. Under the authority of the Development Charges Act, a municipality must prepare a development charges background study, undertake a statutory public process, and pass a by-law to impose such fees. The Board of Management for the A.S.W.S.S. does not currently have a development charges by-law, and little growth and, therefore, growth-related capital has been identified in the capital needs assessment. Therefore, development charges have not been included in the consideration of potential capital funding sources.

Since the early 1980s, the level of provincial and federal assistance toward municipal infrastructure has declined significantly. By the mid 1990s, there were very limited funds available from senior levels of government. In mid-2000, initiatives from the provincial and federal level were announced, providing for a new program (O.S.T.A.R.) to assist small cities and rural areas in addressing infrastructure improvements. In

November 2004, another program (C.O.M.R.I.F.) was introduced which also provided combined assistance from the senior governments until early 2007. Subsequently federal and provincial funding has been made available under the Build Canada Fund and Stimulus Fund Programs. Under the specific requirements of these recent programs, the projects must be “shovel-ready” and are allocated on a case-by-case basis. In developing the capital funding plan for the A.S.W.S.S., no grant funding has been identified.

3.2 Reserve Fund Continuity Forecast

For many years, lifecycle costing has been used in the field of maintenance engineering and to evaluate the advantages of using alternative materials in construction or production design. The method has gained wider acceptance and use in the areas of industrial decision-making and the management of physical assets.

By definition, lifecycle costs are all the costs which are incurred during the lifecycle of a physical asset, from the time its acquisition is first considered, to the time it is taken out of service for disposal or redeployment. The stages which the asset goes through in its lifecycle are specification, design, manufacture (or build), install, commission, operate, maintain and disposal. Figure 3-1 depicts these stages in a schematic form.

3.2.1 Financing Costs

This section will focus on financing mechanisms in place to fund the costs incurred throughout the asset's life. In a municipal context, services are provided to benefit tax/rate payers. Acquisition of assets is normally timed in relation to direct needs within the community. At times, economies of scale or technical efficiencies will lead to oversizing an asset to accommodate future growth within the A.S.W.S.S. Over the past few decades, new financing techniques such as development charges have been employed based on the underlying principle of having tax/rate payers who benefit directly from the service paying for that service. Operating costs which reflect the cost of the service for that year are charged directly to all existing tax/rate payers who have received the benefit. Operating costs are normally charged through the tax base or user rates.

Capital expenditures are recouped through several methods; operating budget contributions, development charges, reserves, developer contributions and debentures, being the most common.

New construction related to growth could produce development charges and developer contributions (e.g. works internal to a subdivision which are the responsibility of the

developer to construct) to fund a significant portion of projects, where new assets are being acquired to allow growth within the municipality to continue. As well, debentures could be used to fund such works, with the debt charge carrying costs recouped from taxpayers in the future.

However, capital construction to replace existing infrastructure is largely not growth-related and will therefore not yield development charges or developer contributions to assist in financing these works. Hence, a municipality or local board will be dependent upon debentures, reserves and contributions from the operating budget to fund these works.

Figure 3-2 depicts the costs of an asset from its initial conception through to replacement and then continues to follow the associated costs through to the next replacement.

As referred to earlier, growth-related financing methods such as development charges and developer contributions could be utilized to finance the growth-related component of the new asset. These revenues are collected (indirectly) from the new homeowner who benefits directly from the installation of this asset. Other financing methods may be used as well to finance the non-growth-related component of this project, including reserves which have been collected from past tax/rate payers, operating budget contributions which are collected from existing tax/rate payers and debenturing which will be carried by future tax/rate payers. Ongoing costs for monitoring, operating and maintaining the asset will be charged annually to the existing tax/rate payer.

When the asset requires replacement, the sources of financing will be limited to reserves, debentures and contributions from the operating budget. At this point, the question is raised: "If the cost of replacement is to be assessed against the tax/rate payer who benefits from the replacement of the asset, should the past tax/rate payer pay for this cost or should future rate payers assume this cost?" If the position is taken that the past user has used up the asset, hence, he should pay for the cost of replacement, then a charge should be assessed annually, through the life of the asset, to have funds available to replace it when the time comes. If the position is taken that the future tax/rate payer should assume this cost, then debenturing and, possibly, a contribution from the operating budget should be used to fund this work.

Figure 3-1
Life Cycle Costing

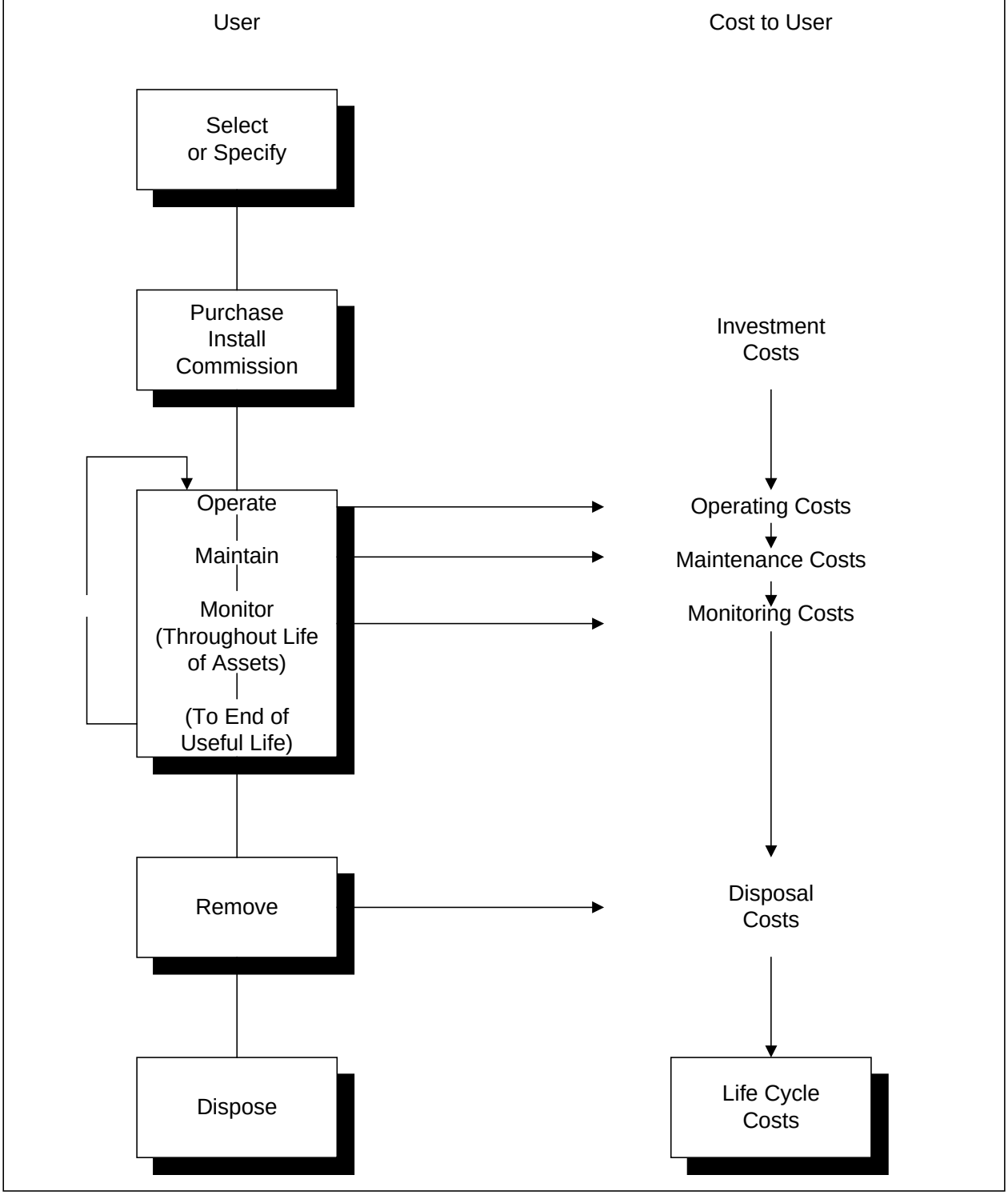
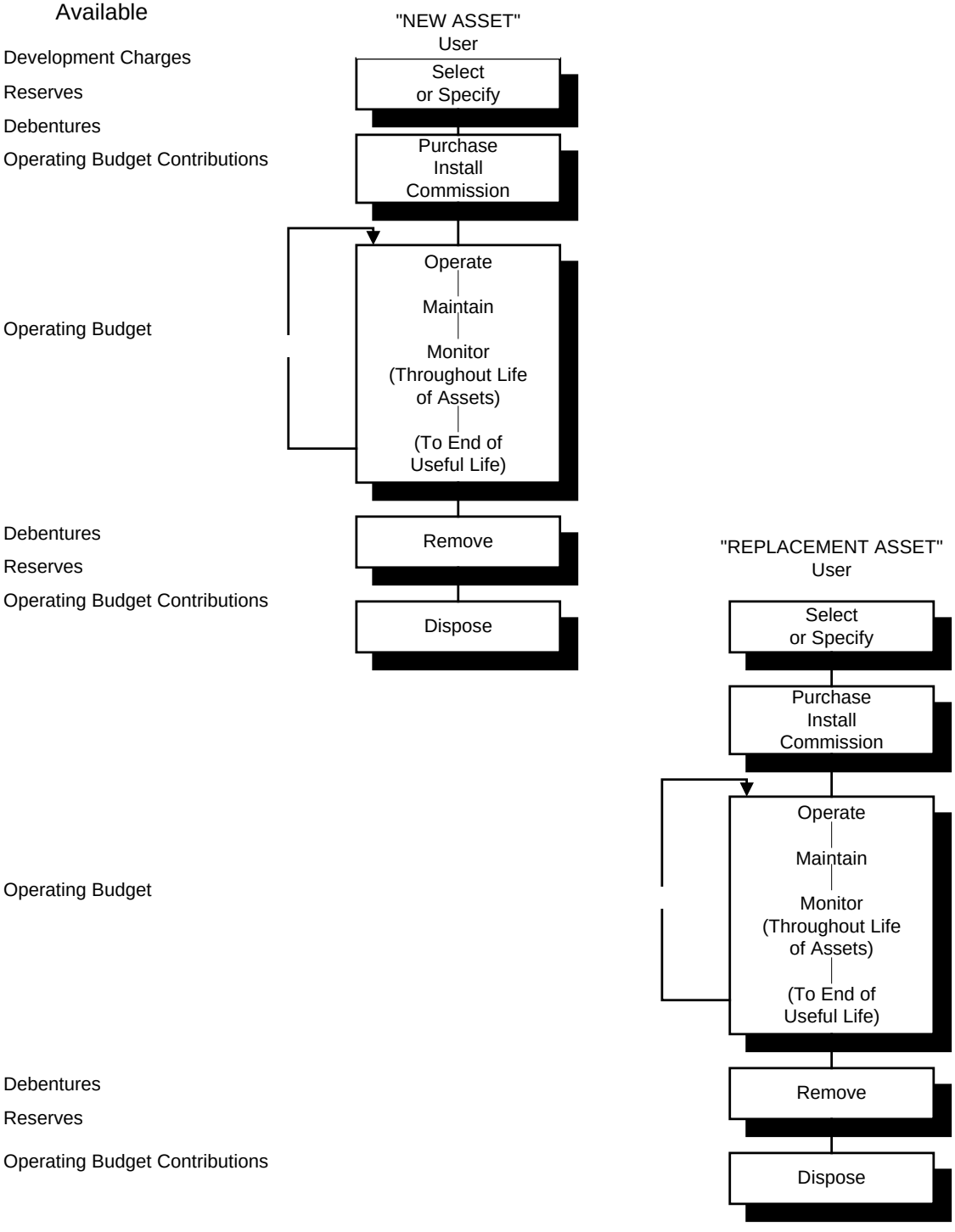


Figure 3-2
Financing Life Cycle Costs



Charging for the cost of using up an asset is the fundamental concept behind depreciation methods utilized by the private sector. This concept allows for expending the asset as it is used up in the production process. The tracking of these costs forms part of the product's selling price and, hence, end users are charged for the asset's depreciation. The same concept can be applied in a municipal setting to charge existing users for the asset's use and set those funds aside in a reserve to finance the cost of replacing the asset in the future.

3.2.2 Costing Methods

There are two fundamental methods of calculating the cost of the usage of an asset and for the provision of the revenue required when the time comes to retire and replace it. The two methods are illustrated in Figure 3-3. The first method is the Depreciation Method. This method recognizes the reduction in the value of the asset through wear and tear, and aging. There are two commonly used forms of depreciation: the straight-line method and the reducing balance method.

The straight line method is calculated by taking the original cost of the asset, subtracting its estimated salvage value (estimated value of the asset at the time it is disposed of) and dividing this by the estimated number of years of useful life. The reducing balance method is calculated by utilizing a fixed percentage rate and this rate is applied annually to the undepreciated balance of the asset value.

The second method of lifecycle costing is the sinking fund method. This method first estimates the future value of the asset at the time of replacement. This is done by inflating the original cost of the asset at an assumed annual inflation rate. A calculation is then performed to determine annual contributions (equal or otherwise) which, when invested, will grow with interest to equal the future replacement cost.

The preferred method used herein for forecasting purposes is the sinking fund method of lifecycle costing.

3.3 Preferred Scenario

The Consultation Committee decided that the preferred scenario would be Option 1B – Defer Capital Needs - 2016. This scenario provides the A.S.W.S.S. with the operational flexibility and security that is desired while delaying some of the front-end heavy capital requirements of the other scenarios. The Committee indicated a preference to avoid the use of debt, as historically they had not done so on the system. However, it is recommended that a minor amount of debt ($312,000) be issued in 2015 and 2016 to allow for a more gradual increase in water rates than would occur if relying solely on

annual water rate revenues. Table 3-1 summarizes the rate increases that would be required under each scenario with and without the use of debt financing. Rate increases in each scenario are sufficient to allow a sustainable level of capital funding by 2024 (i.e. the level capital funding is equal to the long-term annual lifecycle needs). The following subsections discuss the funding plan details of the assumptions within Option 1B. Full details regarding Options 1, 1A, 2 and 3 are contained in Appendix B.

3.3.1 Capital Funding

Direct capital recoveries through the water rate and indirectly through capital reserves will be the predominate funding source for the A.S.W.S.S. capital needs forecast. Table 3-2 summarizes the capital funding plan for A.S.W.S.S. under the preferred option, with approximately $1.58 million in contributions from the operating fund (i.e. rate based) and $312,000 in debt being required over the forecast period.

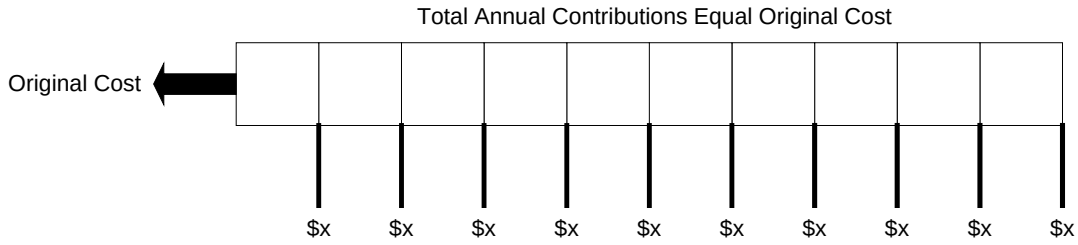
3.3.2 Reserve Fund Continuity Forecast

The Board has established capital reserves for the A.S.W.S.S. The projected year-end balance for 2014 is estimated at a deficit of $43,757. As such the rate forecast must account not only for the funding of capital needs over the forecast period but also to repay the current deficit. Moreover, consistent with the principles of full cost pricing, the rate analysis assumes that the Board of Management will make these discretionary reserves obligatory reserve funds so that the fund will be utilized exclusively for this purpose and that interest will be accumulated on future reserve fund balances. As such, the rate analysis assumes an annual interest rate of 3% for reserve fund balances and in determining the annual lifecycle reserve fund contributions.

Table 3-3 provides the forecast reserve fund continuity statement for the forecast period.

FIGURE 3-3

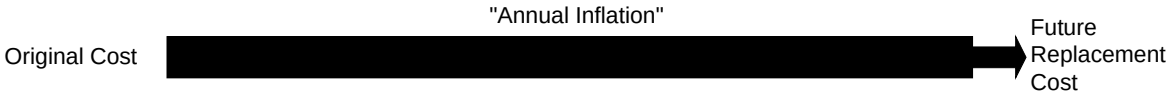
STRAIGHT LINE DEPRECIATION



Formula: $\frac{\text{Original Cost - Salvage Cost}}{\text{Number of Years of Useful Life}}$

SINKING FUND METHOD

1. "Estimate Future Replacement Cost"



2. "Estimate Annual Contribution which will Grow with Interest to Equal Future Replacement Cost"

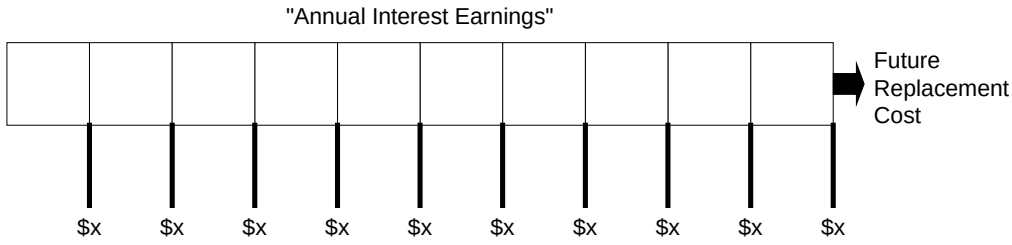


Table 3-1
Required Rate Increases

Scenario	Debt Use	Debt Requirements ($)	Required Rate Increase									
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Option 1	Yes	845,842	12%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Option 1	No		174%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Option 1A	Yes	20,842	12%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Option 1A	No		16%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Option 1B	**Yes**	**311,788**	**12%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**
Option 1B	**No**		**16%**	**52%**	**5%**	**5%**	**5%**	**5%**	**5%**	**5%**	**5%**	**5%**
Option 2	Yes	566,342	12%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Option 2	No		120%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Option 3	Yes	4,983,780	40%	40%	5%	5%	5%	5%	5%	5%	0%	0%
Option 3	No		120%	367%	0%	0%	0%	0%	0%	0%	0%	0%

*2015 Interim Secondary rate increase is 12%

Table 3-2
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1B - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	408,000	-	408,000	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	311,788	20,842	290,946	-	-	-	-	-	-	-	-
Water Reserve	1,581,712	146,658	253,054	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table 3-3
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	-	235,329	576,664	1,008,894	1,509,998	2,092,354	2,856,860	2,750,904
Transfer from Operating	191,728	253,267	273,475	338,539	411,844	494,124	586,414	690,297	806,921	937,622
Transfer to Capital	146,658	253,267	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	-	228,475	559,868	979,508	1,466,017	2,031,411	2,773,650	2,670,781	3,678,526
Interest	-	-	6,854	16,796	29,385	43,981	60,942	83,210	80,123	110,356

3.4 Operating Budget and Water Rate Forecast

The annual operating expenditures have been forecast for the 2015-2024 period based on the 2014 A.S.W.S.S. operating budget, with adjustment for cost inflation. In addition, the Primary System water purchase costs have been forecast based on the underlying water consumption demands of the A.S.W.S.S. and forecast water rates. It should be noted that the Primary System water purchases represent the largest portion of the annual operating budget for the Secondary System (i.e. approximately 78% of annual net expenditures).

The Board of the Elgin Area Primary Water Supply System has set their rate to increase 9% in 2015 and 2016, followed by a 5% increase in 2017. This study assumes that a 5% annual increase will continue throughout the remainder of the forecast period to 2024. As a result, Primary System water purchases represent 91% of the increase in the A.S.W.S.S.'s net expenditures over the forecast period. Lastly, the capital-related expenditures and lifecycle reserve fund contributions have been forecast to provide funding for the existing system deficit, the capital needs for the 10-year forecast period, and to phase-in lifecycle contributions to address the capital replacement needs beyond 2024.

In total, annual operating expenditures are anticipated to increase from $1.80 million in 2015 to $3.67 million by 2024. Table 3-4 summarizes the annual operating budget and net water billing recovery annually.

Table 3-5 forecasts the total A.S.W.S.S. water billing recovery annually and divides this amount by the forecast water consumption to calculate the A.S.W.S.S. Water Rate. It is noted that this rate comprises both the Primary System Water Rate and the A.S.W.S.S. Water Rate. As noted above, the Primary System Water Rate is forecast to increase at an annual rate of 5% annually from 2017. Thus, the A.S.W.S.S. Water Rate is forecast to increase by 12% in 2015, from a 2014 rate of $0.2902/$m^3$ to a rate of $0.3250/$m^3$ in 2015 followed by a 10.1% annual increase thereafter to a rate of $0.7718 in 2024.

Table 3-4
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	1,657	24,854	26,097	27,402	28,772	30,211	31,721	33,307	34,973
New Debt (Interest)	-	1,042	15,496	14,253	12,948	11,578	10,140	8,629	7,043	5,378
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	191,728	253,267	273,475	338,539	411,844	494,124	586,414	690,297	806,921	937,622
Sub Total Capital Related	191,728	255,966	313,825	378,889	452,194	534,474	626,764	730,647	847,271	977,972
Total Expenditures	1,801,909	2,042,609	2,193,171	2,356,000	2,532,304	2,723,310	2,930,366	3,156,154	3,401,298	3,667,614
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,801,909	2,042,609	2,193,171	2,356,000	2,532,304	2,723,310	2,930,366	3,156,154	3,401,298	3,667,614
Water Billing Recovery - Total	**1,801,909**	**2,042,609**	**2,193,171**	**2,356,000**	**2,532,304**	**2,723,310**	**2,930,366**	**3,156,154**	**3,401,298**	**3,667,614**

Table 3-5
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery	**1,801,909**	**2,042,609**	**2,193,171**	**2,356,000**	**2,532,304**	**2,723,310**	**2,930,366**	**3,156,154**	**3,401,298**	**3,667,614**
Total Consumption (m3)	1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)	**1.0011**	**1.0948**	**1.1678**	**1.2462**	**1.3306**	**1.4214**	**1.5192**	**1.6246**	**1.7382**	**1.8607**
Forecast Rates ($/m^3)										
Primary Rate ($/m3)	0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)	0.3250	0.3578	0.3939	0.4336	0.4773	0.5255	0.5785	0.6368	0.7011	0.7718
Constant Rate (Primary and Secondary Rate)	**1.0011**	**1.0948**	**1.1678**	**1.2462**	**1.3306**	**1.4214**	**1.5192**	**1.6246**	**1.7382**	**1.8607**

3.5 Water Rate Impact

As noted in the introduction, the A.S.W.S.S. water rate is calculated as a portion of the overall Blended Supply Rate for the St. Thomas and Suburban Service Area. The forecast Blended Supply Rate is calculated to reflect 70% of the overall supply to the area being purchased directly from the Primary System with 30% being purchased from the Secondary System (i.e. a rate comprising both the Primary and A.S.W.S.S. rates).

In addition to the Blended Supply Rate, the St. Thomas and Suburban Service Area Rate also includes the Common Water Rate and monthly base charge, which is designed to fund common water system infrastructure works over 300 mm in diameter. Lastly, each municipality is responsible for funding their respective infrastructure needs smaller than 300 mm in diameter within their respective jurisdictions. The City of St. Thomas imposes a Capital Charge Rate for this funding component.

Table 3-6 summarizes the impact of the forecast A.S.W.S.S. rate on typical residential customers in the municipalities of St. Thomas, Central Elgin and Southwold. For illustration purposes, it is assumed that the typical residential customer consumes 179 m^3 annually. Focusing on the St. Thomas and Suburban Service Area component of the overall rate, which is comprised of the Blended Supply Rate and the Common Water Rate, the impact on a typical residential customer is forecast to increase at 6.4% annually (or approximately $11 per customer annually). However, the annual water bill increase attributable to increases in the Secondary System water rate amount to approximately $2.59 annually of the total $11 annual increase.

Table 3-6
St. Thomas and Suburban Service Area Blended Supply Rate
Residential Customer Water Rate Impact

Description	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
St. Thomas and Suburban Service Area Blended Supply Rate											
Primary System Rate ($/m3)	0.6203	0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary System Rate ($/m3)	0.2902	0.3250	0.3578	0.3939	0.4336	0.4773	0.5255	0.5785	0.6368	0.7011	0.7718
Blended Supply Rate (70% Primary and 30% Secondary)	**0.7074**	**0.7736**	**0.8443**	**0.8921**	**0.9427**	**0.9964**	**1.0535**	**1.1142**	**1.1788**	**1.2474**	**1.3205**
Annual Water Bill Impact (179 m3/year)	**126.62**	**138.47**	**151.14**	**159.68**	**168.74**	**178.36**	**188.58**	**199.45**	**211.00**	**223.29**	**236.37**
Total Annual Water Bill Increase	**-**	**11.86**	**12.66**	**8.54**	**9.06**	**9.62**	**10.22**	**10.86**	**11.55**	**12.29**	**13.08**
Annual Water Bill Increase (attributable to ASWSS)	**-**	**1.87**	**1.76**	**1.94**	**2.13**	**2.35**	**2.59**	**2.85**	**3.13**	**3.45**	**3.80**

4. Recommendations

As presented within this report, capital, operating and lifecycle expenditures have been identified and forecast over the 2015-2024 period for water services. This information is contained in the Full Cost of Services section. In addition, a Full Cost Recovery Plan for the annual costs of service has been developed, including a long-term lifecycle plan consistent with the principles of O.Reg. 453/07 and the former Sustainable Water and Sewage Systems Act. The forecast rates are provided for consideration by the Board of Management each budget year.

Based upon the foregoing, the following recommendations are put forth for consideration by the St. Thomas Area Secondary Water Supply System Board of Management:

1. That the Board of Management consider the capital plan for water as provided in Chapter 2 under the "Full Cost of Services" section and the associated capital funding plan as set out in Chapter 3 under the "Full Cost Recovery Plan" section;

2. That the Board of Management approve the adoption of lifecycle costs for the replacement of water infrastructure, subject to the requirements of legislation;

3. That the Board of Management provide for the recovery of all water costs through full cost recovery rates and establish reserve funds for that purpose; and

4. That the Board of Management consider and adopt the recommended A.S.W.S.S. Water Rate provided in Section 3.4 to fund the costs of water supply for the A.S.W.S.S.

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Appendix A – Secondary Water Rate Scenarios – Capital Programs

Scenario 1
Capital Replacement Plan/ Capital Budget Forecast

COMPONENT	ACTION REQUIRED	2014	2015	2016	2017	2018	2020	2021	2023	2025	2028	2030	2035	2036	2038	2040	2042	2046	2058	2068	2081
EMPS Capital Plan (2014 - 2021)																					
Pumps - All	VFD's and Right Sizing (TBD)		$ 500,000																		
Chlorination Equipment	Chlorine Analyzer Replacement					$ 5,000															
Process, Electrical & HVAC	Replace Discharge Header Valve and Actuator	$ 60,000																			
Process, Electrical & HVAC	Electrical Room Air Conditioning		$ 8,500																		
Process, Electrical & HVAC	Pump Discharge Control Valve Rebuilding		$ 10,000	$ 10,000	$ 10,000																
Process, Electrical & HVAC	SCADA PLC Server and HMI upgrades, replacements			$ 25,000																	
Diesel Generator	Generator engine major reconditioning						$ 25,000														
Process, Electrical & HVAC	St Thomas Equipment Sub-metering				$ 10,000																
Chlorination Equipment	Chlorinator System (Chlorinators, pumps) (shared w Aylmer)							$ 50,000													
Process, Electrical & HVAC	PLC/Control Panel Wiring				$ 15,000																
Diesel Generator	Diesel Storage Demolition and Make Good			$ 15,000																	
Process, Electrical & HVAC	Replace 1960 flood and pump control sensors, new floats, etc		$ 11,000																		
Structure	Roof Replacement - St Thomas Section		$ 50,000																		
Replacement Program																					
EMPS																					
Pump #1	Replacement															$ 79,911					
Pump #2	Replacement															$ 79,911					
Pump #3	Replacement															$ 79,911					
Diesel Generator	Replacement														$ 472,714						
MCC	Replacement								$ 129,434												
Process, Electrical & HVAC	Replacement									$ 704,848		$ 1,350,611									
Chlorination Equipment	Replacement												$ 225,102								
Building Structural	Replacement										$ 562,754										
Meter Chambers																					
Structure											$ 709,071										
Pipe																	$ 945,427				
Valves									$ 709,071												
Ford Tower																					
	Ford Tower Inspection (2010 Rpt)		$ 5,000																		
Painting/Re-coating 1	Re-coating		$ 400,000									$ 125,000									
	Valve Installation			$ 75,000																	
East and West Chambers											$ 225,102										
Transmission Main										$ 150,000				$ 3,444,678				$ 150,000	$ 16,075,162	$ 150,000	$ 3,444,678
TOTAL		**$ 60,000**	**$ 984,500**	**$ 125,000**	**$ 35,000**	**$ 5,000**	**$ 25,000**	**$ 50,000**	**$ 838,504**	**$ 854,848**	**$ 1,496,927**	**$ 1,475,611**	**$ 225,102**	**$ 3,444,678**	**$ 472,714**	**$ 239,733**	**$ 945,427**	**$ 150,000**	**$ 16,075,162**	**$ 150,000**	**$ 3,444,678**

Scenario 1-A
Capital Replacement Plan/ Capital Budget Forecast

COMPONENT	ACTION REQUIRED	2014	2015	2016	2017	2018	2019	2020	2021	2023	2025	2028	2030	2035	2036	2038	2042	2044	2046	2058	2068	2081
EMPS Capital Plan (2014 - 2021)																						
Pumps - All	VFD's and Right Sizing (TBD) - *Deferred*					$ -	$ 500,000															
Chlorination Equipment	Chlorine Analyzer Replacement					$ 5,000																
Process, Electrical & HVAC	Replace Discharge Header Valve and Actuator	$ 60,000																				
Process, Electrical & HVAC	Electrical Room Air Conditioning		$ 8,500																			
Process, Electrical & HVAC	Pump Discharge Control Valve Rebuilding		$ 10,000	$ 10,000	$ 10,000																	
Process, Electrical & HVAC	SCADA PLC Server and HMI upgrades, replacements			$ 25,000																		
Diesel Generator	Generator engine major reconditioning							$ 25,000														
Process, Electrical & HVAC	St Thomas Equipment Sub-metering				$ 10,000																	
Chlorination Equipment	Chlorinator System (Chlorinators, pumps) (shared w Aylmer)								$ 50,000													
Process, Electrical & HVAC	PLC/Control Panel Wiring				$ 15,000																	
Diesel Generator	Diesel Storage Demolition and Make Good			$ 15,000																		
Process, Electrical & HVAC	Replace 1960 flood and pump control sensors, new floats, etc		$ 11,000																			
Structure	Roof Replacement - St Thomas Section		$ 50,000																			
Replacement Program																						
EMPS																						
Pump #1	Replacement																	$ 79,911				
Pump #2	Replacement																	$ 79,911				
Pump #3	Replacement with Smaller ~150 L/s Pump		$ 75,000															$ 75,000				
Diesel Generator	Replacement															$ 472,714						
MCC	Replacement									$ 129,434												
Process, Electrical & HVAC	Replacement										$ 704,848		$ 1,350,611									
Chlorination Equipment	Replacement													$ 225,102								
Building Structural	Replacement											$ 562,754										
Meter Chambers																						
Structure												$ 709,071										
Pipe																	$ 945,427					
Valves										$ 709,071												
Ford Tower																						
	Ford Tower Inspection (2010 Rpt)		$ 5,000																			
Painting/Re-coating 1	Re-coating							$ 400,000						$ 125,000								
	Valve Installation			$ 75,000																		
East and West Chambers												$ 225,102										
Transmission Main											$ 150,000				$ 3,444,678				$ 150,000	$ 16,075,162	$ 150,000	$ 3,444,678
TOTAL		**$ 60,000**	**$ 159,500**	**$ 125,000**	**$ 35,000**	**$ 5,000**	**$ 500,000**	**$ 425,000**	**$ 50,000**	**$ 838,504**	**$ 854,848**	**$ 1,496,927**	**$ 1,350,611**	**$ 350,102**	**$ 3,444,678**	**$ 472,714**	**$ 945,427**	**$ 234,822**	**$ 150,000**	**$ 16,075,162**	**$ 150,000**	**$ 3,444,678**

Scenario 1-B
Capital Replacement Plan/ Capital Budget Forecast

COMPONENT	ACTION REQUIRED	2014	2015	2016	2017	2018	2020	2021	2023	2025	2028	2030	2035	2036	2038	2042	2044	2046	2058	2068	2081
EMPS Capital Plan (2014 - 2021)																					
Pumps - All	VFD's and Right Sizing (TBD) - *Deferred*										$ 500,000										
Chlorination Equipment	Chlorine Analyzer Replacement					$ 5,000															
Process, Electrical & HVAC	Replace Discharge Header Valve and Actuator	$ 60,000																			
Process, Electrical & HVAC	Electrical Room Air Conditioning		$ 8,500																		
Process, Electrical & HVAC	Pump Discharge Control Valve Rebuilding		$ 10,000	$ 10,000	$ 10,000																
Process, Electrical & HVAC	SCADA PLC Server and HMI upgrades, replacements			$ 25,000																	
Diesel Generator	Generator engine major reconditioning						$ 25,000														
Process, Electrical & HVAC	St Thomas Equipment Sub-metering				$ 10,000																
Chlorination Equipment	Chlorinator System (Chlorinators, pumps) (shared w Aylmer)							$ 50,000													
Process, Electrical & HVAC	PLC/Control Panel Wiring				$ 15,000																
Diesel Generator	Diesel Storage Demolition and Make Good			$ 15,000																	
Process, Electrical & HVAC	Replace 1960 flood and pump control sensors, new floats, etc		$ 11,000																		
Structure	Roof Replacement - St Thomas Section		$ 50,000																		
Replacement Program																					
EMPS																					
Pump #1	Replacement																$ 79,911				
Pump #2	Replacement																$ 79,911				
Pump #3	Replacement with Smaller ~150 L/s Pump		$ 75,000														$ 75,000				
Diesel Generator	Replacement														$ 472,714						
MCC	Replacement								$ 129,434												
Process, Electrical & HVAC	Replacement									$ 704,848		$ 1,350,611									
Chlorination Equipment	Replacement												$ 225,102								
Building Structural	Replacement										$ 562,754										
Meter Chambers																					
Structure											$ 709,071										
Pipe																$ 945,427					
Valves									$ 709,071												
Ford Tower																					
	Ford Tower Inspection (2010 Rpt)		$ 5,000																		
Painting/Re-coating 1	Re-coating			$ 400,000								$ 125,000									
	Valve Installation			$ 75,000																	
East and West Chambers											$ 225,102										
Transmission Main										$ 150,000				$ 3,444,678				$ 150,000	$ 16,075,162	$ 150,000	$ 3,444,678
TOTAL		**$ 60,000**	**$ 159,500**	**$ 525,000**	**$ 35,000**	**$ 5,000**	**$ 25,000**	**$ 50,000**	**$ 838,504**	**$ 854,848**	**$ 1,996,927**	**$ 1,475,611**	**$ 225,102**	**$ 3,444,678**	**$ 472,714**	**$ 945,427**	**$ 234,822**	**$ 150,000**	**$ 16,075,162**	**$ 150,000**	**$ 3,444,678**

Scenario 2
Capital Replacement Plan/ Capital Budget Forecast

COMPONENT	ACTION REQUIRED	2014	2015	2016	2017	2018	2020	2021	2023	2025	2028	2030	2035	2036	2038	2040	2042	2046	2058	2068	2081
EMPS Capital Plan (2014 - 2021)																					
Pumps - All	VFD's and Right Sizing (TBD)	$ -	$ 500,000																		
Chlorination Equipment	Chlorine Analyzer Replacement					$ 5,000															
Process, Electrical & HVAC	Replace Discharge Header Valve and Actuator	$ 60,000																			
Process, Electrical & HVAC	Electrical Room Air Conditioning		$ 8,500																		
Process, Electrical & HVAC	Pump Discharge Control Valve Rebuilding		$ 10,000	$ 10,000	$ 10,000																
Process, Electrical & HVAC	SCADA PLC Server and HMI upgrades, replacements			$ 25,000																	
Diesel Generator	Generator engine major reconditioning						$ 25,000														
Process, Electrical & HVAC	St Thomas Equipment Sub-metering				$ 10,000																
Chlorination Equipment	Chlorinator System (Chlorinators, pumps) (shared w Aylmer)							$ 50,000													
Process, Electrical & HVAC	PLC/Control Panel Wiring				$ 15,000																
Diesel Generator	Diesel Storage Demolition and Make Good			$ 15,000																	
Process, Electrical & HVAC	Replace 1960 flood and pump control sensors, new floats, etc		$ 11,000																		
Structure	Roof Replacement - St Thomas Section		$ 50,000																		
Replacement Program																					
EMPS																					
Pump #1	Replacement															$ 79,911					
Pump #2	Replacement															$ 79,911					
Pump #3	Replacement															$ 79,911					
Diesel Generator	Replacement														$ 472,714						
MCC	Replacement								$ 129,434												
Process, Electrical & HVAC	Replacement									$ 704,848		$ 1,350,611									
Chlorination Equipment	Replacement												$ 225,102								
Building Structural	Replacement										$ 562,754										
Meter Chambers																					
Structure											$ 709,071										
Pipe																	$ 945,427				
Valves									$ 709,071												
Ford Tower																					
	Ford Tower Inspection (2010 Rpt) - *Inspection not required*		$ -																		
Decommissioning	Decommissioning		$ 125,000																		
East and West Chambers											$ 225,102										
Transmission Main										$ 150,000				$ 3,444,678				$ 150,000	$ 16,075,162	$ 150,000	$ 3,444,678
TOTAL		**$ 60,000**	**$ 704,500**	**$ 50,000**	**$ 35,000**	**$ 5,000**	**$ 25,000**	**$ 50,000**	**$ 838,504**	**$ 854,848**	**$ 1,496,927**	**$ 1,350,611**	**$ 225,102**	**$ 3,444,678**	**$ 472,714**	**$ 239,733**	**$ 945,427**	**$ 150,000**	**$ 16,075,162**	**$ 150,000**	**$ 3,444,678**

Scenario 3
Capital Replacement Plan/ Capital Budget Forecast

COMPONENT	ACTION REQUIRED	2014	2015	2016	2017	2018	2020	2021	2023	2025	2028	2030	2035	2036	2038	2040	2042	2046	2058	2068	2081
EMPS Capital Plan (2014 - 2021)																					
Pumps - All	VFD's and Right Sizing (TBD)		$ 500,000																		
Chlorination Equipment	Chlorine Analyzer Replacement					$ 5,000															
Process, Electrical & HVAC	Replace Discharge Header Valve and Actuator	$ 60,000																			
Process, Electrical & HVAC	Electrical Room Air Conditioning		$ 8,500																		
Process, Electrical & HVAC	Pump Discharge Control Valve Rebuilding		$ 10,000	$ 10,000	$ 10,000																
Process, Electrical & HVAC	SCADA PLC Server and HMI upgrades, replacements			$ 25,000																	
Diesel Generator	Generator engine major reconditioning						$ 25,000														
Process, Electrical & HVAC	St Thomas Equipment Sub-metering				$ 10,000																
Chlorination Equipment	Chlorinator System (Chlorinators, pumps) (shared w Aylmer)							$ 50,000													
Process, Electrical & HVAC	PLC/Control Panel Wiring				$ 15,000																
Diesel Generator	Diesel Storage Demolition and Make Good			$ 15,000																	
Process, Electrical & HVAC	Replace 1960 flood and pump control sensors, new floats, etc		$ 11,000																		
Structure	Roof Replacement - St Thomas Section		$ 50,000																		
Replacement Program																					
EMPS																					
Pump #1	Replacement															$ 79,911					
Pump #2	Replacement															$ 79,911					
Pump #3	Replacement															$ 79,911					
Diesel Generator	Replacement														$ 472,714						
MCC	Replacement								$ 129,434												
Process, Electrical & HVAC	Replacement									$ 704,848		$ 1,350,611									
Chlorination Equipment	Replacement												$ 225,102								
Building Structural	Replacement										$ 562,754										
Meter Chambers																					
Structure											$ 709,071										
Pipe																	$ 945,427				
Valves									$ 709,071												
Ford Tower																					
	Ford Tower Inspection (2010 Rpt) - *Inspection not required*		$ -																		
Decommissioning	Decommissioning		$ 125,000																		
New Elevated Tank	New ~5 ML Elevated Tank			$ 5,000,000																	
East and West Chambers											$ 225,102										
Transmission Main										$ 150,000				$ 3,444,678				$ 150,000	$ 16,075,162	$ 150,000	$ 3,444,678
TOTAL		**$ 60,000**	**$ 704,500**	**$ 5,050,000**	**$ 35,000**	**$ 5,000**	**$ 25,000**	**$ 50,000**	**$ 838,504**	**$ 854,848**	**$ 1,496,927**	**$ 1,350,611**	**$ 225,102**	**$ 3,444,678**	**$ 472,714**	**$ 239,733**	**$ 945,427**	**$ 150,000**	**$ 16,075,162**	**$ 150,000**	**$ 3,444,678**

Appendix B – Secondary Water Rate Scenarios – Supporting Information

Option 1 (Debt Use)

Table B-1
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Over Due Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator -Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC -Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC -Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment -Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural -Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	400,000	400,000	-	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	845,842	845,842	-	-	-	-	-	-	-	-	-
Water Reserve	1,464,658	146,658	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-2
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	9,294	170,472	433,360	782,310	1,194,685	1,682,154	2,344,797	2,129,065
Transfer from Operating	191,728	145,023	201,213	264,266	335,164	414,578	503,475	603,348	715,257	840,459
Transfer to Capital	146,658	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	9,023	165,507	420,738	759,524	1,159,888	1,633,159	2,276,502	2,067,054	2,959,525
Interest	-	271	4,965	12,622	22,786	34,797	48,995	68,295	62,012	88,786

Table B-3
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	67,248	70,611	74,141	77,848	81,741	85,828	90,119	94,625	99,356
New Debt (Interest)	-	42,292	38,930	35,399	31,692	27,800	23,713	19,421	14,915	10,184
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	191,728	145,023	201,213	264,266	335,164	414,578	503,475	603,348	715,257	840,459
Sub Total Capital Related	191,728	254,564	310,753	373,806	444,704	524,119	613,015	712,888	824,797	950,000
Total Expenditures	1,801,909	2,041,207	2,190,099	2,350,917	2,524,814	2,712,955	2,916,618	3,138,395	3,378,824	3,639,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,801,909	2,041,207	2,190,099	2,350,917	2,524,814	2,712,955	2,916,618	3,138,395	3,378,824	3,639,642
Water Billing Recovery - Total	**1,801,909**	**2,041,207**	**2,190,099**	**2,350,917**	**2,524,814**	**2,712,955**	**2,916,618**	**3,138,395**	**3,378,824**	**3,639,642**

Table B-4
St Thomas
Water Services
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,801,909**	**2,041,207**	**2,190,099**	**2,350,917**	**2,524,814**	**2,712,955**	**2,916,618**	**3,138,395**	**3,378,824**	**3,639,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0940**	**1.1661**	**1.2435**	**1.3266**	**1.4160**	**1.5120**	**1.6154**	**1.7267**	**1.8466**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3250	0.3570	0.3922	0.4309	0.4734	0.5201	0.5714	0.6277	0.6896	0.7576
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0940**	**1.1661**	**1.2435**	**1.3266**	**1.4160**	**1.5120**	**1.6154**	**1.7267**	**1.8466**

Option 1 (No Debt)

Table B-5
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Over Due Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS	-	-	-	-	-	-	-	-	-	-	-
Pump #1 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 -Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator -Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC -Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC -Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment -Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural -Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	400,000	400,000	-	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	2,310,500	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-6
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	963,878	2,045,733	3,186,779	4,361,677	5,536,896	6,711,878	7,973,114	8,251,606
Transfer from Operating	1,037,570	1,071,804	1,067,270	1,062,227	1,056,859	1,050,951	1,044,490	1,038,010	1,031,154	1,023,807
Transfer to Capital	992,500	136,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	935,804	1,986,148	3,093,960	4,234,637	5,375,628	6,516,386	7,740,887	8,011,268	9,265,413
Interest	-	28,074	59,584	92,819	127,039	161,269	195,492	232,227	240,338	277,962

Table B-7
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	1,037,570	1,071,804	1,067,270	1,062,227	1,056,859	1,050,951	1,044,490	1,038,010	1,031,154	1,023,807
Sub Total Capital Related	1,037,570	1,071,804	1,067,270	1,062,227	1,056,859	1,050,951	1,044,490	1,038,010	1,031,154	1,023,807
Total Expenditures	2,647,751	2,858,447	2,946,616	3,039,338	3,136,968	3,239,787	3,348,092	3,463,517	3,585,181	3,713,449
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	2,647,751	2,858,447	2,946,616	3,039,338	3,136,968	3,239,787	3,348,092	3,463,517	3,585,181	3,713,449
Water Billing Recovery - Total	**2,647,751**	**2,858,447**	**2,946,616**	**3,039,338**	**3,136,968**	**3,239,787**	**3,348,092**	**3,463,517**	**3,585,181**	**3,713,449**

Table B-8
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**2,647,751**	**2,858,447**	**2,946,616**	**3,039,338**	**3,136,968**	**3,239,787**	**3,348,092**	**3,463,517**	**3,585,181**	**3,713,449**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.4710**	**1.5320**	**1.5689**	**1.6076**	**1.6483**	**1.6909**	**1.7357**	**1.7828**	**1.8321**	**1.8840**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.7949	0.7950	0.7950	0.7950	0.7950	0.7950	0.7950	0.7950	0.7950	0.7950
Constant Rate (Primary and Secondary Rate)		**1.4710**	**1.5320**	**1.5689**	**1.6076**	**1.6483**	**1.6909**	**1.7357**	**1.7828**	**1.8321**	**1.8840**

Option 1-A (Debt Use)

Table B-9
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1A - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	541,000	-	-	-	-	541,000	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	442,000	-	-	-	-	-	442,000	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	20,842	20,842	-	-	-	-	-	-	-	-	-
Water Reserve	2,447,658	146,658	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Total Capital Financing	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000

Table B-10
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	119,136	393,204	772,070	682,892	745,543	1,327,556	2,086,990	1,970,260
Transfer from Operating	191,728	251,666	307,615	370,379	440,932	519,936	608,347	707,648	818,885	943,273
Transfer to Capital	146,658	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	115,666	381,751	749,583	663,002	723,828	1,288,889	2,026,204	1,912,874	2,903,533
Interest	-	3,470	11,453	22,487	19,890	21,715	38,667	60,786	57,386	87,106

Table B-11
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	1,657	1,740	1,827	1,918	2,014	2,115	2,221	2,332	2,448
New Debt (Interest)	-	1,042	959	872	781	685	584	479	368	251
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	191,728	251,666	307,615	370,379	440,932	519,936	608,347	707,648	818,885	943,273
Sub Total Capital Related	191,728	254,365	310,314	373,078	443,631	522,635	611,046	710,347	821,584	945,972
Total Expenditures	1,801,909	2,041,008	2,189,660	2,350,189	2,523,740	2,711,471	2,914,648	3,135,854	3,375,611	3,635,614
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,801,909	2,041,008	2,189,660	2,350,189	2,523,740	2,711,471	2,914,648	3,135,854	3,375,611	3,635,614
Water Billing Recovery - Total	**1,801,909**	**2,041,008**	**2,189,660**	**2,350,189**	**2,523,740**	**2,711,471**	**2,914,648**	**3,135,854**	**3,375,611**	**3,635,614**

Table B-12
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,801,909**	**2,041,008**	**2,189,660**	**2,350,189**	**2,523,740**	**2,711,471**	**2,914,648**	**3,135,854**	**3,375,611**	**3,635,614**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0939**	**1.1659**	**1.2431**	**1.3261**	**1.4152**	**1.5110**	**1.6141**	**1.7251**	**1.8445**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3250	0.3569	0.3920	0.4305	0.4728	0.5193	0.5703	0.6264	0.6880	0.7556
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0939**	**1.1659**	**1.2431**	**1.3261**	**1.4152**	**1.5110**	**1.6141**	**1.7251**	**1.8445**

Option 1A (No Debt)

Table B-13
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1A - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	541,000	-	-	-	-	541,000	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	442,000	-	-	-	-	-	442,000	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Total Capital Financing	2,468,500	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000

Table B-14
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	143,626	442,169	845,110	779,135	863,553	1,465,216	2,241,378	2,137,494
Transfer from Operating	212,570	275,442	330,664	392,326	461,333	538,265	623,987	719,879	826,858	946,000
Transfer to Capital	167,500	136,000	45,000	14,000	550,000	479,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	139,442	429,290	820,495	756,442	838,401	1,422,540	2,176,095	2,075,237	3,073,494
Interest	-	4,183	12,879	24,615	22,693	25,152	42,676	65,283	62,257	92,205

Table B-15
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	212,570	275,442	330,664	392,326	461,333	538,265	623,987	719,879	826,858	946,000
Sub Total Capital Related	212,570	275,442	330,664	392,326	461,333	538,265	623,987	719,879	826,858	946,000
Total Expenditures	1,822,751	2,062,085	2,210,010	2,369,437	2,541,442	2,727,101	2,927,590	3,145,386	3,380,885	3,635,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,822,751	2,062,085	2,210,010	2,369,437	2,541,442	2,727,101	2,927,590	3,145,386	3,380,885	3,635,642
Water Billing Recovery - Total	**1,822,751**	**2,062,085**	**2,210,010**	**2,369,437**	**2,541,442**	**2,727,101**	**2,927,590**	**3,145,386**	**3,380,885**	**3,635,642**

Table B-16
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,822,751**	**2,062,085**	**2,210,010**	**2,369,437**	**2,541,442**	**2,727,101**	**2,927,590**	**3,145,386**	**3,380,885**	**3,635,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0127**	**1.1052**	**1.1767**	**1.2533**	**1.3354**	**1.4233**	**1.5177**	**1.6190**	**1.7277**	**1.8445**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3366	0.3682	0.4028	0.4407	0.4821	0.5275	0.5771	0.6313	0.6906	0.7556
Constant Rate (Primary and Secondary Rate)		**1.0127**	**1.1052**	**1.1767**	**1.2533**	**1.3354**	**1.4233**	**1.5177**	**1.6190**	**1.7277**	**1.8445**

Option 1B (Debt Use)

Table B-17
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1B - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	408,000	-	408,000	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-18
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	-	235,329	576,664	1,008,894	1,509,998	2,092,354	2,856,860	2,750,904
Transfer from Operating	191,728	253,267	273,475	338,539	411,844	494,124	586,414	690,297	806,921	937,622
Transfer to Capital	146,658	253,267	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	-	228,475	559,868	979,508	1,466,017	2,031,411	2,773,650	2,670,781	3,678,526
Interest	-	-	6,854	16,796	29,385	43,981	60,942	83,210	80,123	110,356

Table B-19
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	1,657	24,854	26,097	27,402	28,772	30,211	31,721	33,307	34,973
New Debt (Interest)	-	1,042	15,496	14,253	12,948	11,578	10,140	8,629	7,043	5,378
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	191,728	253,267	273,475	338,539	411,844	494,124	586,414	690,297	806,921	937,622
Sub Total Capital Related	191,728	255,966	313,825	378,889	452,194	534,474	626,764	730,647	847,271	977,972
Total Expenditures	1,801,909	2,042,609	2,193,171	2,356,000	2,532,304	2,723,310	2,930,366	3,156,154	3,401,298	3,667,614
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,801,909	2,042,609	2,193,171	2,356,000	2,532,304	2,723,310	2,930,366	3,156,154	3,401,298	3,667,614
Water Billing Recovery - Total	**1,801,909**	**2,042,609**	**2,193,171**	**2,356,000**	**2,532,304**	**2,723,310**	**2,930,366**	**3,156,154**	**3,401,298**	**3,667,614**

Table B-20
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,801,909**	**2,042,609**	**2,193,171**	**2,356,000**	**2,532,304**	**2,723,310**	**2,930,366**	**3,156,154**	**3,401,298**	**3,667,614**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0948**	**1.1678**	**1.2462**	**1.3306**	**1.4214**	**1.5192**	**1.6246**	**1.7382**	**1.8607**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3250	0.3578	0.3939	0.4336	0.4773	0.5255	0.5785	0.6368	0.7011	0.7718
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0948**	**1.1678**	**1.2462**	**1.3306**	**1.4214**	**1.5192**	**1.6246**	**1.7382**	**1.8607**

Option 1B (No Debt)

Table B-21
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1B - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	408,000	-	408,000	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main	-	-	-	-	-	-	-	-	-	-	-
Studies:											
Total Capital Expenditures	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-22
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	-	557,823	1,211,047	1,939,036	2,713,337	3,538,856	4,507,900	4,557,862
Transfer from Operating	212,570	544,000	586,576	631,950	680,513	732,271	787,446	846,747	910,208	978,000
Transfer to Capital	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	-	541,576	1,175,774	1,882,560	2,634,307	3,435,782	4,376,602	4,425,108	5,525,862
Interest	-	-	16,247	35,273	56,477	79,029	103,073	131,298	132,753	165,776

Table B-23
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	212,570	544,000	586,576	631,950	680,513	732,271	787,446	846,747	910,208	978,000
Sub Total Capital Related	212,570	544,000	586,576	631,950	680,513	732,271	787,446	846,747	910,208	978,000
Total Expenditures	1,822,751	2,330,643	2,465,922	2,609,061	2,760,622	2,921,107	3,091,048	3,272,254	3,464,235	3,667,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,822,751	2,330,643	2,465,922	2,609,061	2,760,622	2,921,107	3,091,048	3,272,254	3,464,235	3,667,642
Water Billing Recovery - Total	**1,822,751**	**2,330,643**	**2,465,922**	**2,609,061**	**2,760,622**	**2,921,107**	**3,091,048**	**3,272,254**	**3,464,235**	**3,667,642**

Table B-24
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,822,751**	**2,330,643**	**2,465,922**	**2,609,061**	**2,760,622**	**2,921,107**	**3,091,048**	**3,272,254**	**3,464,235**	**3,667,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0127**	**1.2492**	**1.3130**	**1.3801**	**1.4505**	**1.5246**	**1.6025**	**1.6843**	**1.7703**	**1.8608**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3366	0.5122	0.5391	0.5675	0.5973	0.6287	0.6618	0.6966	0.7332	0.7718
Constant Rate (Primary and Secondary Rate)		**1.0127**	**1.2492**	**1.3130**	**1.3801**	**1.4505**	**1.5246**	**1.6025**	**1.6843**	**1.7703**	**1.8608**

Option 2 (Debt Use)

Table B-25
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 2 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	1,814,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	566,342	566,342	-	-	-	-	-	-	-	-	-
Water Reserve	1,387,658	146,658	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	1,954,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-26
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	125,454	326,409	629,597	1,019,254	1,472,607	2,001,159	2,704,791	2,529,722
Transfer from Operating	191,728	180,800	236,448	298,850	368,971	447,461	535,266	633,852	744,249	867,656
Transfer to Capital	146,658	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	121,800	316,902	611,259	989,567	1,429,716	1,942,873	2,626,011	2,456,041	3,387,378
Interest	-	3,654	9,507	18,338	29,687	42,891	58,286	78,780	73,681	101,621

Table B-27
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	45,027	47,278	49,642	52,124	54,730	57,467	60,340	63,357	66,525
New Debt (Interest)	-	28,317	26,066	23,702	21,220	18,614	15,877	13,004	9,987	6,819
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	191,728	180,800	236,448	298,850	368,971	447,461	535,266	633,852	744,249	867,656
Sub Total Capital Related	191,728	254,144	309,792	372,194	442,314	520,805	608,610	707,196	817,593	941,000
Total Expenditures	1,801,909	2,040,787	2,189,137	2,349,304	2,522,424	2,709,641	2,912,212	3,132,703	3,371,620	3,630,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,801,909	2,040,787	2,189,137	2,349,304	2,522,424	2,709,641	2,912,212	3,132,703	3,371,620	3,630,642
Water Billing Recovery - Total	**1,801,909**	**2,040,787**	**2,189,137**	**2,349,304**	**2,522,424**	**2,709,641**	**2,912,212**	**3,132,703**	**3,371,620**	**3,630,642**

Table B-28
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,801,909**	**2,040,787**	**2,189,137**	**2,349,304**	**2,522,424**	**2,709,641**	**2,912,212**	**3,132,703**	**3,371,620**	**3,630,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0938**	**1.1656**	**1.2427**	**1.3254**	**1.4142**	**1.5098**	**1.6125**	**1.7230**	**1.8420**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.3250	0.3568	0.3917	0.4301	0.4721	0.5184	0.5691	0.6248	0.6859	0.7530
Constant Rate (Primary and Secondary Rate)		**1.0011**	**1.0938**	**1.1656**	**1.2427**	**1.3254**	**1.4142**	**1.5098**	**1.6125**	**1.7230**	**1.8420**

Option 2 (No Debt)

Table B-29
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 2 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	1,814,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	1,954,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	1,954,000	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-30
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	767,039	1,588,073	2,482,414	3,425,877	4,386,141	5,363,917	6,446,976	6,567,735
Transfer from Operating	758,070	803,698	819,779	836,038	852,680	869,513	886,545	904,283	922,465	941,000
Transfer to Capital	713,000	59,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	744,698	1,541,818	2,410,111	3,326,094	4,258,390	5,207,686	6,259,200	6,376,442	7,498,735
Interest	-	22,341	46,255	72,303	99,783	127,752	156,231	187,776	191,293	224,962

Table B-31
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	758,070	803,698	819,779	836,038	852,680	869,513	886,545	904,283	922,465	941,000
Sub Total Capital Related	758,070	803,698	819,779	836,038	852,680	869,513	886,545	904,283	922,465	941,000
Total Expenditures	2,368,251	2,590,341	2,699,125	2,813,149	2,932,789	3,058,349	3,190,148	3,329,791	3,476,493	3,630,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	2,368,251	2,590,341	2,699,125	2,813,149	2,932,789	3,058,349	3,190,148	3,329,791	3,476,493	3,630,642
Water Billing Recovery - Total	**2,368,251**	**2,590,341**	**2,699,125**	**2,813,149**	**2,932,789**	**3,058,349**	**3,190,148**	**3,329,791**	**3,476,493**	**3,630,642**

Table B-32
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**2,368,251**	**2,590,341**	**2,699,125**	**2,813,149**	**2,932,789**	**3,058,349**	**3,190,148**	**3,329,791**	**3,476,493**	**3,630,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.3157**	**1.3884**	**1.4372**	**1.4880**	**1.5410**	**1.5962**	**1.6538**	**1.7139**	**1.7766**	**1.8420**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.6396	0.6514	0.6633	0.6754	0.6878	0.7004	0.7132	0.7262	0.7395	0.7530
Constant Rate (Primary and Secondary Rate)		**1.3157**	**1.3884**	**1.4372**	**1.4880**	**1.5410**	**1.5962**	**1.6538**	**1.7139**	**1.7766**	**1.8420**

Option 3 (Debt Use)

Table B-33
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 3 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue Works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
		-	-	-	-	-	-	-	-	-	-
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt) - Inspection not required	-	-	-	-	-	-	-	-	-	-	-
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
New ~5 ML Elevated Tank	5,100,000	-	5,100,000	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	6,914,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	4,983,780	420,044	4,563,736	-	-	-	-	-	-	-	-
Water Reserve	2,070,220	292,956	595,264	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	7,054,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-34
St Thomas
Area Secondary Water Supply System
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	-	3,155	86,152	227,658	398,469	602,686	931,793	249,585
Transfer from Operating	338,026	595,264	48,063	94,488	143,875	196,205	251,663	310,968	303,523	295,577
Transfer to Capital	292,956	595,264	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	-	3,063	83,643	221,027	386,863	585,132	904,653	242,315	535,162
Interest	-	-	92	2,509	6,631	11,606	17,554	27,140	7,269	16,055

Table B-35
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	33,395	397,903	417,798	438,688	460,623	483,654	507,836	533,228	559,890
New Debt (Interest)	-	21,002	247,519	227,624	206,734	184,800	161,769	137,586	112,194	85,533
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	338,026	595,264	48,063	94,488	143,875	196,205	251,663	310,968	303,523	295,577
Sub Total Capital Related	338,026	649,662	693,486	739,910	789,298	841,627	897,085	956,390	948,945	941,000
Total Expenditures	1,948,207	2,436,304	2,572,831	2,717,020	2,869,407	3,030,463	3,200,688	3,381,897	3,502,972	3,630,642
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	1,948,207	2,436,304	2,572,831	2,717,020	2,869,407	3,030,463	3,200,688	3,381,897	3,502,972	3,630,642
Water Billing Recovery - Total	**1,948,207**	**2,436,304**	**2,572,831**	**2,717,020**	**2,869,407**	**3,030,463**	**3,200,688**	**3,381,897**	**3,502,972**	**3,630,642**

Table B-36
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**1,948,207**	**2,436,304**	**2,572,831**	**2,717,020**	**2,869,407**	**3,030,463**	**3,200,688**	**3,381,897**	**3,502,972**	**3,630,642**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.0824**	**1.3058**	**1.3699**	**1.4372**	**1.5077**	**1.5817**	**1.6593**	**1.7408**	**1.7901**	**1.8420**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.4063	0.5688	0.5960	0.6246	0.6545	0.6858	0.7186	0.7530	0.7530	0.7530
Constant Rate (Primary and Secondary Rate)		**1.0824**	**1.3058**	**1.3699**	**1.4372**	**1.5077**	**1.5817**	**1.6593**	**1.7408**	**1.7901**	**1.8420**

Option 3 (No Debt)

Table B-37
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 3 - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)	-	-	-	-	-	-	-	-	-	-	-
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD)	500,000	500,000	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	9,000	9,000	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section		50,000	-	-	-	-	-	-	-	-	-
Overdue Works		8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
		-	-	-	-	-	-	-	-	-	-
Replacement Program	-	-	-	-	-	-	-	-	-	-	-
EMPS	-	-	-	-	-	-	-	-	-	-	-
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement		-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers	-	-	-	-	-	-	-	-	-	-	-
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe		-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower	-	-	-	-	-	-	-	-	-	-	-
Ford Tower Inspection (2010 Rpt) - Inspection not required	-	-	-	-	-	-	-	-	-	-	-
Decommissioning	125,000	125,000	-	-	-	-	-	-	-	-	-
New ~5 ML Elevated Tank	5,100,000	-	5,100,000	-	-	-	-	-	-	-	-
East and West Chambers		-	-	-	-	-	-	-	-	-	-
Transmission Main		-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	6,914,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	7,054,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	7,054,000	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000

Table B-38
St Thomas
Water Service
Water Reserves/ Reserve Funds Continuity
Inflated $

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Opening Balance	(45,070)	-	-	5,290,537	10,794,667	16,492,038	22,354,263	28,386,084	34,681,125	40,176,110
Transfer from Operating	758,070	5,159,000	5,181,444	5,203,722	5,226,020	5,248,130	5,270,042	5,293,911	5,317,807	5,341,617
Transfer to Capital	713,000	5,159,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	-	5,136,444	10,480,259	16,011,687	21,703,168	27,559,305	33,670,995	39,005,932	45,507,727
Interest	-	-	154,093	314,408	480,351	651,095	826,779	1,010,130	1,170,178	1,365,232

Table B-39
St Thomas
Area Secondary Water Supply System
Operating Budget Forecast
Inflated $

Description	Forecast									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditures										
Operating Costs										
City Administration Costs	36,100	37,200	38,300	39,400	40,600	41,800	43,100	44,400	45,700	47,100
Job Costing Labour	43,300	44,600	45,900	47,300	48,700	50,200	51,700	53,300	54,900	56,500
CMMS Support Fee	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Booster Station Operation and Maintenance	51,900	53,500	55,100	56,800	58,500	60,300	62,100	64,000	65,900	67,900
Misc. Contracted Services	15,500	16,000	16,500	17,000	17,500	18,000	18,500	19,100	19,700	20,300
Job Costing Equipment	6,200	6,400	6,600	6,800	7,000	7,200	7,400	7,600	7,800	8,000
Job Costing Subcontractors	10,300	10,600	10,900	11,200	11,500	11,800	12,200	12,600	13,000	13,400
Municipal Taxes	5,200	5,400	5,600	5,800	6,000	6,200	6,400	6,600	6,800	7,000
Insurance Expense	21,600	22,200	22,900	23,600	24,300	25,000	25,800	26,600	27,400	28,200
Communications	20,600	21,200	21,800	22,500	23,200	23,900	24,600	25,300	26,100	26,900
Office Supplies	-	-	-	-	-	-	-	-	-	-
Hydro Charges	111,200	114,500	117,900	121,400	125,000	128,800	132,700	136,700	140,800	145,000
Chemicals	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
Job Costing Materials	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
Sub Total Operating	329,200	339,200	349,400	360,000	370,800	382,000	393,600	405,600	417,800	430,300
Purchase of Water										
Purchase of Water	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Sub Total Purchase	1,280,981	1,447,443	1,529,946	1,617,111	1,709,309	1,806,836	1,910,003	2,019,907	2,136,227	2,259,342
Capital-Related										
Existing Debt (Principal)										
Existing Debt (Interest)										
New Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Projects										
Transfer to Secondary Water Reserve Fund	758,070	5,159,000	5,181,444	5,203,722	5,226,020	5,248,130	5,270,042	5,293,911	5,317,807	5,341,617
Sub Total Capital Related	758,070	5,159,000	5,181,444	5,203,722	5,226,020	5,248,130	5,270,042	5,293,911	5,317,807	5,341,617
Total Expenditures	2,368,251	6,945,643	7,060,789	7,180,832	7,306,130	7,436,966	7,573,644	7,719,418	7,871,834	8,031,259
Revenues										
Other Revenue	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery - Operating	2,368,251	6,945,643	7,060,789	7,180,832	7,306,130	7,436,966	7,573,644	7,719,418	7,871,834	8,031,259
Water Billing Recovery - Total	**2,368,251**	**6,945,643**	**7,060,789**	**7,180,832**	**7,306,130**	**7,436,966**	**7,573,644**	**7,719,418**	**7,871,834**	**8,031,259**

Table B-40
St Thomas
Area Secondary Water Supply System
Water Rate Forecast
Inflated $

Description		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Water Billing Recovery		**2,368,251**	**6,945,643**	**7,060,789**	**7,180,832**	**7,306,130**	**7,436,966**	**7,573,644**	**7,719,418**	**7,871,834**	**8,031,259**
Total Consumption (m3)		1,799,929	1,865,768	1,878,083	1,890,554	1,903,184	1,915,974	1,928,926	1,942,780	1,956,818	1,971,041
Constant Rate (Primary and Secondary Rate)		**1.3157**	**3.7227**	**3.7596**	**3.7983**	**3.8389**	**3.8816**	**3.9264**	**3.9734**	**4.0228**	**4.0746**
Forecast Rates ($/m^3)											
Primary Rate ($/m3)		0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate ($/m3)		0.6396	2.9857	2.9857	2.9857	2.9857	2.9857	2.9857	2.9857	2.9857	2.9857
Constant Rate (Primary and Secondary Rate)		**1.3157**	**3.7227**	**3.7596**	**3.7983**	**3.8389**	**3.8816**	**3.9264**	**3.9734**	**4.0228**	**4.0746**

Corporation of the
City of St. Thomas

Report No. ES113-15

File No.

Directed to:	**Mayor Grant Jones and the Members of The Board of Management for The St. Thomas Area Secondary Water Supply System**	**Date Authored:** Sept 11, 2015 **Meeting Date:** October 22, 2015
Department:	Environmental Services	**Attachment**
Prepared By:	Cyril McCready Manager of Sewer and Water	Table 3-2 Watson Report
Subject:	**Elgin-Middlesex Pumping Station, Pump Sizing VFD Control and Optimization**	

Recommendation:

THAT: Report ES113-15 Elgin-Middlesex Pumping Station, Pump Sizing VFD Control and Optimization be received for information;

THAT: The proposed Budget from the Watson & Associates Rate Study Report and capital budget forecast be adjusted to defer to a later date the water tower coating and install the VFD pump first in order to be capable of operating the water system without the Water Tower in operation.

THAT: The Estimated Capital expenditure for Engineering, purchase and installation costs for the Elgin-Middlesex Pumping Station, pump sizing VFD control and optimization in the amount of $300,000 be approved for 2016

Origin:

The Elgin-Middlesex Pumping Station (EMPS) has 3 large pumps that are not variable speed drive, are oversized for the water consumption required since The Ford Motor Company has ceased to operate. These pumps are due to be refurbished. The existing pumps are too large and without variable speed capabilities, therefore unable to supply water to the Secondary System when the water tower is down for repair or inspection.

Analysis:

In order to operate the Secondary Water System when the water tower is down for repairs, a smaller variable speed drive pump is required. London's pump 5 can be used at this time if London agrees to operate pump 5 to supply water to London with their smallest pump. Once the South East Reservoir is in operation this will be difficult to accomplish or not an option at all.

Financial Considerations:

The estimated Engineering costs would be approximately $75,000 excluding HST and the estimated construction and installation costs would be approximately $225,000, both to be completed in 2016. The costs could be offset with applicable rebates for Energy Conservation.

Respectfully,

Cyril McCready
Manager of Sewer Water

Reviewed By:

Treasury	Env Services	Planning	City Clerk	Human Resources	Other

Table 3-2
St Thomas
Area Secondary Water Supply System
Capital Budget Forecast
Option 1B - Inflated $

Description	Total	Forecast									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capital Expenditures											
EMPS Capital Plan (2014 - 2021)											
Pump 2 - Rebuild and Replace Motor	-	-	-	-	-	-	-	-	-	-	-
Pumps - All - VFD's and Right Sizing (TBD) - Deferred	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Chlorine Analyzer Replacement	5,000	-	-	-	5,000	-	-	-	-	-	-
Process, Electrical & HVAC - Replace Discharge Header Valve and Actuator	-	-	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Electrical Room Air Conditioning	8,500	8,500	-	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Pump Discharge Control Valve Rebuilding	30,000	10,000	10,000	10,000	-	-	-	-	-	-	-
Process, Electrical & HVAC - SCADA PLC Server and HMI upgrades, replacements	26,000	-	26,000	-	-	-	-	-	-	-	-
Diesel Generator - Generator engine major reconditioning	28,000	-	-	-	-	-	28,000	-	-	-	-
Process, Electrical & HVAC - St Thomas Equipment Sub-metering	10,000	-	-	10,000	-	-	-	-	-	-	-
Chlorination Equipment - Chlorinator System (Chlorinators, pumps) (shared w Aylmer)	56,000	-	-	-	-	-	-	56,000	-	-	-
Process, Electrical & HVAC - PLC/Control Panel Wiring	16,000	-	-	16,000	-	-	-	-	-	-	-
Diesel Generator - Diesel Storage Demolition and Make Good	15,000	-	15,000	-	-	-	-	-	-	-	-
Process, Electrical & HVAC - Replace 1960 flood and pump control sensors, new floats, etc	11,000	11,000	-	-	-	-	-	-	-	-	-
Structure - Roof Replacement - St Thomas Section	50,000	50,000	-	-	-	-	-	-	-	-	-
Overdue Works	90,000	8,000	8,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	10,000
Replacement Program											
EMPS											
Pump #1 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #2 - Replacement	-	-	-	-	-	-	-	-	-	-	-
Pump #3 - Replacement with Smaller ~150 L/s Pump	75,000	75,000	-	-	-	-	-	-	-	-	-
Diesel Generator - Replacement	-	-	-	-	-	-	-	-	-	-	-
MCC - Replacement	152,000	-	-	-	-	-	-	-	-	152,000	-
Process, Electrical & HVAC - Replacement	-	-	-	-	-	-	-	-	-	-	-
Chlorination Equipment - Replacement	-	-	-	-	-	-	-	-	-	-	-
Building Structural - Replacement	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers											
Structure	-	-	-	-	-	-	-	-	-	-	-
Pipe	-	-	-	-	-	-	-	-	-	-	-
Valves	831,000	-	-	-	-	-	-	-	-	831,000	-
Ford Tower											
Ford Tower Inspection (2010 Rpt)	5,000	5,000	-	-	-	-	-	-	-	-	-
Re-coating	408,000	-	408,000	-	-	-	-	-	-	-	-
Valve Installation	77,000	-	77,000	-	-	-	-	-	-	-	-
East and West Chambers	-	-	-	-	-	-	-	-	-	-	-
Transmission Main											
Total Capital Expenditures	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Capital Financing											
Provincial/Federal Grants	-										
Debenture Requirements	311,788	20,842	290,946	-	-	-	-	-	-	-	-
Water Reserve	1,581,712	146,658	253,054	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000
Total Capital Financing	1,893,500	167,500	544,000	45,000	14,000	9,000	37,000	65,000	9,000	993,000	10,000