

AYLMER AREA SECONDARY WATER SUPPLY SYSTEM

ASSET MANAGEMENT PLAN AND WATER RATE STUDY

NOVEMBER 29, 2013



Plaza Three
101-2000 Argentia Rd.
Mississauga, Ontario
Canada L5N 1V9

Phone: (905) 272-3600

Fax: (905) 272-3602

e-mail: info@watson-econ.ca

www.watson-econ.ca

 Planning for growth

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EXECUTIVE SUMMARY

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This report contains the Asset Management Plan and Rate Study for the Aylmer Secondary Water System (the Board) and has been organized as follows:

- Chapter 1: Introduction;
- Chapter 2: State of Local Infrastructure;
- Chapter 3: Expected Levels of Service;
- Chapter 4: Asset Management Strategy;
- Chapter 5: Financing Strategy (Rate Study); and
- Chapter 6: Recommendations.

The “state of local infrastructure” chapter provides an overview of the capital assets owned by the Board. This includes detailed information on the Board’s asset inventory, including asset attributes, accounting valuations, replacement costs, useful life, age and asset condition. This information provides the foundation for other sections of the asset management plan as well as the rate calculations.

“Expected levels of service” compares the current level of service provided by the Board to the level of service determined to be expected in each area. This analysis combines both descriptions/comments as well as performance measures in establishing service levels.

The “asset management strategy” provides a long term operating and capital forecast for asset related costs, indicating the requirements for maintaining, rehabilitating, replacing/disposing and expanding the Board’s assets, while moving towards the specified expected levels of service identified above. The goal of the asset management strategy is to have the Board in (or moving towards) a sustainable asset management position over the forecast period.

The “financing strategy” identifies a funding plan for the asset management strategy, including a review of historical results and recommendations with respect to the required amounts of each funding (revenue) source annually. Also, any infrastructure funding deficits/shortfalls are identified and recommendations are made containing potential approaches to reduce and mitigate the shortfall over the forecast period.

Overall, this asset management plan is a tool to be used by the Board for capital and operating financial decision making. It can be tied to various reports (such as the annual budget, official plan and strategic planning reports) so that when Board priorities change, the asset management plan can be updated to reflect these changes.

1. INTRODUCTION

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1.1 Overview

Watson & Associates Economists Ltd. (Watson) was retained by the Board to prepare an asset management plan and rate study. This plan (and rate study) is intended to be a tool for staff to use during various decision making processes, including the annual budgeting process and capital grant application processes. This plan will serve as a road map for sustainable infrastructure planning going forward.

The Board's goals and objectives with respect to their capital assets relate to the level of service being provided to Board customers. Services should be provided at expected levels, as defined within this asset management plan. Board infrastructure and other capital assets should be maintained at conditions that provides a safe and functional environment for its customers. Therefore, the asset management plan and its implementation will be evaluated based on the Board's ability to meet these goals and objectives.

1.2 Plan Development

The asset management plan process developed a program that leverages the Board's asset data base information, staff input and asset management principles. The development of the Board's asset management plan was based on the steps summarized below:

- 1) Develop a complete listing of capital assets to be included in the plan, including attributes such as size/material type, useful life, age, accounting valuation and current valuation. Updated current valuation to 2013 dollars, where required, using applicable inflationary indices.
- 2) Assess current condition of the assets and age analysis.
- 3) Assess the risk of asset failure for each asset, based on determining the probability of each asset failing, as well as the consequence of the asset failing. This risk analysis identified priority projects for inclusion in the asset management plan, as well as asset risk levels that require mitigation.
- 4) Determine and document current levels of service, as well as expected levels of service, based on discussions with staff.
- 5) Prepare an asset management strategy (i.e. operating and capital forecast) based on the asset inventory, identified priorities, and level of service analysis discussed above.
- 6) Determine a financing strategy (i.e. rate calculations) to support the asset management strategy, thus determining how the expenditure forecast will be funded over the forecast period.
- 7) Prepare a Final report.

1.3 Maintaining the Asset Management Plan

The asset management plan should be updated as the capital needs and priorities of the Board change. This could be in conjunction with the Board's budget process.

When updating the asset management plan, note that the state of local infrastructure, expected levels of service, asset management strategy and financing strategy are integrated and impact each other. Looking at these components in reverse order, the financing strategy (in conjunction with the rate calculations) outlines how the asset management strategy will be funded. The asset management strategy illustrates the costs required to maintain expected levels of service at a sustainable level. The expected levels of service component summarizes and links each service area to specific assets contained in the state of local infrastructure section and thus determines how these assets will be used to provide expected service levels.

While this report focuses on a specified forecast period, the full lifecycle of the Board's assets was considered in the calculations. It is suggested that more focus and attention be put on the first 5 years of the asset management plan, to ensure accurate capital planning in the short term.

1.4 Plan Integration

The municipal environment is a forever changing and demanding environment when it comes to legislation and other responsibilities. Integrating the asset management plan with the Board's budget process as well as PSAB 3150 (tangible capital asset) requirements should make updates in all three areas more efficient. As noted above, this asset management plan has already been integrated with the Board's rate study.

With respect to integrating the Board's budget process with asset management planning, both require a projection of capital and operating costs of a future period. The budget outlines total operating and capital requirements of the Board, while the asset management plan focuses in on specific asset related requirements. With this link to the annual budget, the budget update process can become an asset management plan update process.

Both asset management and Public Standards Accounting Board Section 3150 (PSAB 3150) require a complete and accurate asset inventory. The significant difference between the two lies in valuation approaches (PSAB 3150 requires historical cost valuation, while asset management requires future replacement cost valuation). Using a single asset inventory containing both valuation methods is an effective approach to maintaining the Board's asset data.

2. STATE OF LOCAL INFRASTRUCTURE

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The Aylmer Area Secondary Water Supply System provides water to users within the municipalities of Aylmer, Central Elgin (eastern area) and Malahide (east and west of Aylmer). The system consists of 13.8 km of transmission mains and a pumping station. The system is connected to the Elgin Primary System, which draws its water from Lake Erie and has the water treated in Port Stanley.

2.1 Scope and Process

This section of the plan provides an opportunity to develop a greater understanding of the capital assets owned by the Board. The state of local infrastructure analysis includes:

- An asset database documenting asset types, sub-types including quantities, materials and other similar asset attributes;
- Financial accounting valuation;
- Replacement cost valuation;
- Asset age distribution analysis and asset age as a proportion of expected useful life;
- Asset condition information;
- Data Verification and Asset Condition policies; and
- Documentation of assumptions made in creating the asset inventory.

The Board has an inventory listing, created initially for the rate study and PSAB 3150 purposes. This asset inventory is updated annually and was used as a starting point in fulfilling the requirements for this report. This inventory provides current financial accounting valuations (i.e. historical cost, accumulated amortization and net book value) as well as attributes such as useful life and age. With respect to replacement cost, historical costs were inflated in order to estimate current 2013 replacement costs.

2.2 Capital Asset Overview

The Board presently owns water capital assets with a 2013 replacement value of approximately \$11.6 million (excluding land assets as they are not included in this plan). Table 2-1 outlines the breakdown of these totals.

Table 2-1
2013 Water Assets

Asset Type	Historical Cost Dec 31, 2012	Accumulated Amortization Dec 31, 2012	Net Book Value Dec 31, 2012	Total Replacement Value
Water Facilities	2,003,961	935,963	1,067,997	3,415,525
Water Mains	4,014,162	762,691	3,251,471	8,144,036
Hydrants	24,761	9,066	15,695	41,278
Total Water	6,042,884	1,707,720	4,335,164	11,600,838

Figure 2-1
2013 Water Assets Distribution

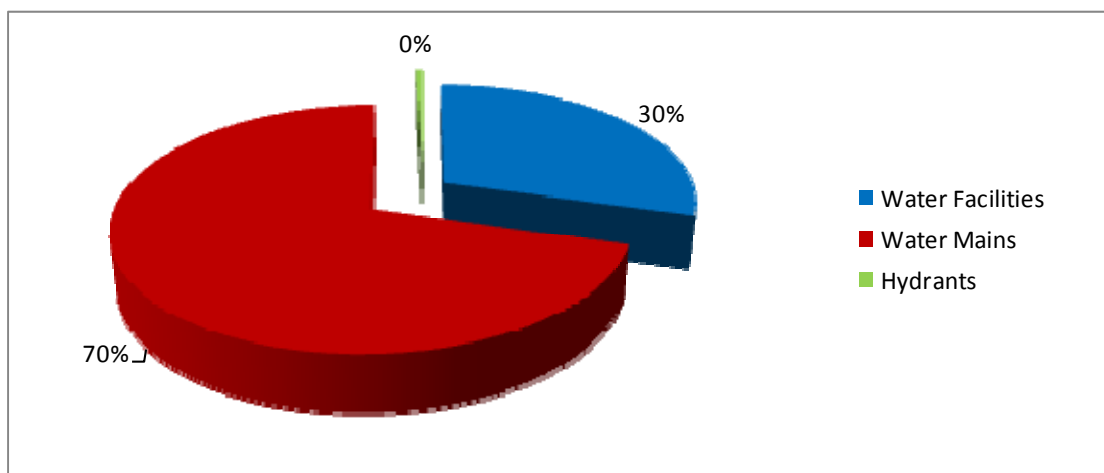


Table 2-1 also show the Board's financial accounting valuation summary by asset type. Since 2009, the Board has been required under the Public Sector Accounting Board section 3150 (PSAB 3150) to maintain asset listings complete with historical cost (i.e. the original cost to purchase or construct an asset), accumulated amortization and net book value. These values are reported on the Board's audited financial statements each year. The Board's total tangible capital asset historical cost (excluding land) is approximately \$6.0 million, this is approximately 52.1% of the total replacement cost of these assets. It is expected that historical cost totals are much smaller than replacement cost totals, given inflationary adjustments that would occur between the original asset purchase/construction date and today. Total accumulated amortization for the Board's assets is approximately \$1.7 million or 28.3% of the total asset historical cost. This represents the proportion of tangible capital assets that have been amortized (i.e. used up) to date from a financial valuation perspective.

The detailed capital asset inventory is contained in Appendix A. Assumptions pertaining to the asset inventory were documented as part of the asset management process are shown in Appendix B.

2.3 Asset Age Analysis

Each asset is tracked based on estimated total useful life and remaining service life. Using this information, an age analysis of the Board's assets can assist in identifying potential areas of focus for the rate study and asset management plan.

Table 2-2 provides a summary of the age analysis undertaken including the weighted (based on replacement cost) average useful life and weighted average remaining useful life of the Board's assets. This analysis can identify potential short-term priorities within specific asset areas.

**Table 2-2
Asset Age Analysis**

Asset Type	Weighted Average (rounded)		
	Useful Life	Remaining Useful Life	% Remaining Useful Life
Water Facilities	33	17	51.5%
Water Mains	100	80	80.0%
Hydrants	35	20	57.1%

Total useful life and remaining service life for each capital asset is documented in Appendix A.

While this analysis can be useful in looking at the overall age characteristics of specific asset areas, asset condition (see below) will assist in providing a more accurate assessment of assets reaching the end of their useful life.

2.4 Asset Condition

Including condition assessments in the asset management plan provides for a higher level of accuracy than simply relying on useful life assumptions, especially when it comes to older, highly used, or more financially significant assets. Condition assessments can provide more realistic estimates of remaining service life, which can then be used to establish rehabilitation or replacement schedules.

A condition rating out of 5 was calculated for all assets based on the asset age analysis. This rating was then converted to a condition description of "Very Poor" to "Very Good". Please refer to the table below.

Table 2-3
Asset Condition Format – All Assets

Condition Rating	Condition
1	Very Poor
2	Poor
3	Average
4	Good
5	Very Good

In the future, it is suggested that the Board include other factors in determining asset condition, such as available engineering reports, maintenance patterns and any inspection routines used.

A new policy has been proposed that will ensure all Board assets are reviewed using established engineering methods and practices. Appendix C contains the draft Condition Assessment Policy, which identifies how often Board assets should be assessed.

A high level summary of the weighted average condition in each asset category (based on the asset age analysis) is as follows:

Table 2-4
Weighted Average Condition by Asset Category

Asset Type	Weighted Condition
Water Facilities	Average
Water Mains	Good
Hydrants	Average

Further discussion on condition assessments will take place in Chapter 4 when assessing asset risk and identifying asset priorities. Furthermore, detailed asset conditions are documented in Appendix A to this report.

2.5 Data Accuracy and Completeness

An important element of this asset management plan is ensuring that tools and procedures are in place to maintain accuracy and completeness of the asset data and calculations moving forward. As time passes, assets are used, maintained, improved, disposed of, and replaced. All of these lifecycle events can trigger changes to the asset database used within the asset management plan. Therefore, tools and procedures are essential to ensure the asset data remains accurate and complete. Please refer to Appendix C to this report for the proposed

“Data Verification and Condition Assessment Policy” for the Board. This policy illustrates how the asset data will be updated and verified going forward. This includes the timing of condition assessments for each asset area and what should be included within the condition assessment procedures.

3. EXPECTED LEVELS OF SERVICE

3. EXPECTED LEVELS OF SERVICE

After the Walkerton water crisis, several pieces of legislation containing requirements and regulations regarding the supply of water have been enacted. A brief summary of some of these requirements are in Section 5.2 of this report.

3.1 Scope and Process

Level of service (LOS) is a measure used to determine the effectiveness of the services provided, in this case by the Board to its customers. A level of service analysis gives the Board an opportunity to document the level of service that is currently being provided and compare it to the level of service that is expected. This can be done through a review of current practices and procedures, an examination of trends or issues facing the Board and through an analysis of performance measures and targets that staff can use to measure performance.

Expected LOS can be impacted by a number of factors, including:

- Legislative requirements;
- Strategic planning goals and objectives;
- Resident expectations;
- Board or staff expectations; and
- Financial or resource constraints.

The previous task of determining the state of the Board's local infrastructure establishes the asset inventory and condition, as well as asset management policies and principles to guide the refinement and upkeep of the asset infrastructure. The LOS analysis utilizes this information and factors in the impact of the asset service level targets. It is important to document an expected LOS that is realistic to the Board. It is common to strive for the highest LOS, however, these service levels usually come at a cost. It is also helpful to consider the risk associated with a certain LOS. Therefore, expected LOS should be determined in a way that balances both level of investment and associated risk to the Board.

3.2 Current Levels of Service versus Expected Levels of Service

The Board's current LOS has resulted in the current state of infrastructure as discussed in the previous section of the report. This current LOS also relates to the risk assessment discussed in later report sections. Regarding the cost of this LOS, the Board has established an operating and capital budget for the current year that includes the cost of providing this LOS to its customers. Therefore in moving from the current LOS to an expected LOS, consideration has to be made for the associated cost (or impact on the Board's current budget) in moving to an expected LOS. The table below outlines broad LOS descriptions (both current and expected

LOS). This analysis was documented through discussions with staff. As this analysis relates to water related assets, the current and expected LOS are similar, given the legislative requirements for this service area.

Table 3-1
Level of Service Analysis

Service	Level of Service Description	
	Current	Expected
Water	Meet all legislative requirements.	Meet all legislative requirements.
Water	Minimize unaccounted for water/Utilize leak detection techniques.	Minimize unaccounted for water/Utilize leak detection techniques.

This LOS review can be amended and expanded based on detailed staff procedural activities in the future.

3.3 Level of Service Performance Measures

As mentioned above, using performance measures in the LOS review can also be helpful in measuring the Board's goals and objectives when it comes to capital assets. The Board is required to submit annual reports to the Province under Ontario Regulation 170/03. Table 3-2 provides a summary of the required measures from the Board's 2012 report.

The Board will continue to calculate and monitor these performance measures, both for legislative requirements and asset management purposes. As the Board's asset management plan evolves over time, new performance measures can be introduced to further measure the LOS being provided in each service area.

**Table 3-2
Performance Measures Analysis**

Annual Report - Period: January 1 to December 31, 2012					
Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking Water Act or section 16(4) of Schedule 16 of O.Reg. 170/03 and reported to Spills Action Centre					
Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
N/A	N/A	N/A	N/A	N/A	N/A
Microbiological testing done under Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period					
	Number of Samples	Range of E.Coli or Fecal Results (min#)-(max#)	Range of Coliform Results (min#)-(max#)	Number of HPC Samples	Range of HPC Results (min#)-(max#)
Distribution	156	0 - 0	0 - 0	62	<10 - 70
Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the reporting period covered by this Annual Report.					
	Number of Grab Samples	Range of Results (min#)-(max#)	Unit of Measure		
Free Chlorine (Grab)	364	0.57 - 1.69	mg/L		
Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.					
Date of Legal Instrument Issued	Parameter	Date Sampled	Result	Unit of Measure	
N/A	N/A	N/A	N/A	N/A	
Summary of lead testing under Schedule 15.1 during this reporting period					
Location Type	Number of Samples	Range of Lead Results (min#)-(max#)	Unit of Measure	Number of Exceedances	
Plumbing	N/A	N/A	N/A	N/A	
Distribution	N/A	N/A	N/A	N/A	
Summary of Organic parameters sampled during this reporting period or the most					
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance	
THM	2012-01-23	11	µg/L	No	
	2012-04-16	16			
	2012-07-16	30			
	2012-10-22	34			
	Avg: 22.75				

4. ASSET MANAGEMENT STRATEGY

4. ASSET MANAGEMENT STRATEGY

4.1 Scope and Process

The asset management strategy provides the recommended course of actions required to maintain (or move towards) a sustainable asset position while delivering the expected levels of service discussed in the previous chapter. The course of actions, when combined together, form a long-term operating and capital forecast that includes:

- a) Non-infrastructure solutions: reduce costs and/or extend expected useful life estimates;
- b) Maintenance activities: regularly scheduled activities to maintain existing useful life levels, or repairs needed due to unplanned events;
- c) Renewal/Rehabilitation: significant repairs or maintenance planned to increase the useful life of assets;
- d) Replacement/Disposal: complete disposal and replacement of assets, when renewal or rehabilitation is no longer an option; and
- e) Expansion: given planned growth as outlined in the Board's capital forecast.

Priority identification becomes a critical process during the asset management strategy development. Priorities have been determined based on assessment of the overall risk of asset failure, which is determined by looking at both the probability of an asset failing, as well as the consequences of failure. The consequences of the Board not meeting desired levels of service must also be considered in determining risk. As discussed in chapter 3, moving to expected levels of service results in both operating and capital budget impacts over the forecast period. This has to be taken into consideration, with the overall objective of reaching sustainable levels while mitigating risk.

4.2 Risk Assessment

The risk of an asset failing is defined by the following calculation:

$$\text{Risk of Asset Failure} = \text{Probability of Failure} \times \text{Consequence of Failure}$$

Probability of failure has been linked to the condition assessment for each asset, assuming that an asset in "very good" condition would have a "rare" probability of failure. The following table outlines the probability factor tied to each condition rating:

**Table 4-1
Probability of Failure Matrix**

Condition Rating	Condition	Probability of Error
1	Very Poor	Almost Certain
2	Poor	Likely
3	Average	Possible
4	Good	Unlikely
5	Very Good	Rare

Consequence of failure has been determined by examining each asset type separately. Consequence refers to the impact on the Board if a particular asset were to fail. Types of impacts include the following:

- **Cost Impacts:** the cost of failure to the Board (i.e. capital replacement, rehabilitation, fines & penalties, damages, etc);
- **Social impacts:** potential injury or death to customers or staff;
- **Environmental impacts:** the impact of the asset failure on the environment;
- **Service delivery impacts:** the impact of the asset failure on the Board's ability to provide services at desired levels; and
- **Location impacts:** the varying impact of asset failure based on the asset's location.

Each type of impact was discussed with staff and consequence of failure for each asset type was determined by using the information contained in Table 4-2 as a guide to assess the level of impact. Levels of impact were documented as ranging from "catastrophic" to "insignificant".

With both probability of failure and consequence of failure documented, total risk of asset failure was determined using the matrix contained in Table 4-3. Total risk has been classified under the following categories:

- **Extreme Risk (E):** risk well beyond acceptable levels;
- **High Risk (H):** risk beyond acceptable levels;
- **Medium Risk (M):** risk at acceptable levels, monitoring required to ensure risk does not become high; and
- **Low Risk (L):** risk at or below acceptable levels.

**Table 4-2
Consequence of Failure Matrix**

Consequence	Cost	Social	Environmental	Service Delivery
Insignificant	Negligible or Insignificant Cost	No injury	No Impact	No Interruptions
Minor	Small/Minor Cost - within Budget Allocations.	Minor Injury	Short-term/Minor Impact - Fixable	Minor Interruptions
Moderate	Considerable Cost - Requires Revisions to Budget	Moderate Injury	Medium-term Impact - Fixable	Moderate Interruptions
Major	Substantial Cost - Multi-year Budget Impacts	Major Injury	Long-term Impact - Fixable	Significant Interruptions
Catastrophic	Significant Cost - Difficult to Recover	Death, Serious Injury	Long-term Impact - Permanent	Major Interruptions

**Table 4-3
Total Risk of Asset Failure Matrix**

Probability of Failure	Consequence of Failure				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	L	L	M	M	H
Unlikely	L	M	M	M	H
Possible	L	M	M	H	E
Likely	M	M	H	H	E
Almost Certain	M	H	H	E	E

Risk levels can be reduced or mitigated through planned maintenance, rehabilitation and/or replacement. An objective of this asset management plan is to reduce risk levels where they are deemed to be too high, as well as ensure assets are maintained in a way that keeps risk levels at acceptable levels.

Please refer to Appendix A for the detailed risk assessment for each of the Board's capital assets.

4.3 Priority Identification

Through discussions with staff and review of the asset risk of failure assessment, the following assets/categories were identified as being priorities of the Board:

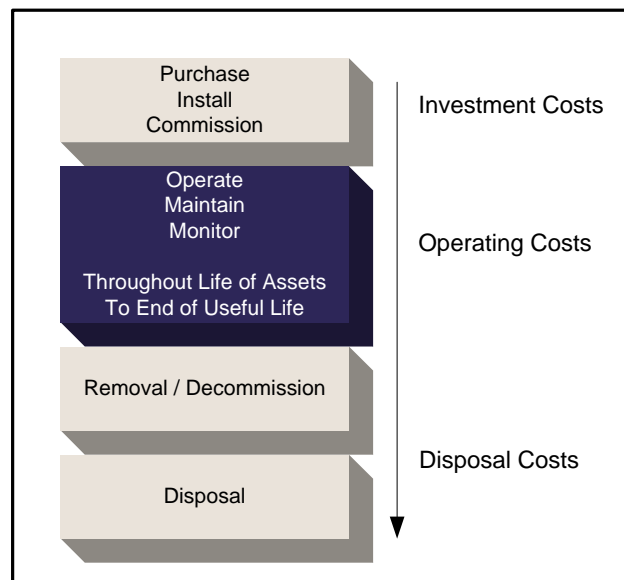
Table 4-4
Priorities Based on Asset Risk

Asset / Category	Description	Total Risk	Planned Action
Facilities	Chambers and Valves	Extreme/High	Replacement in short-term capital
Facilities	EAWSS Pumping Station	Extreme/High	Replacement in short-term capital

4.4 Long-term 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. This method has gained wider acceptance and use recently in the management of capital assets. By definition, lifecycle costs are all the costs which are incurred during the lifecycle of a capital asset, from the time it is purchased or constructed, to the time it is taken out of service for disposal. The stages which an asset goes through in its lifecycle are as follows:

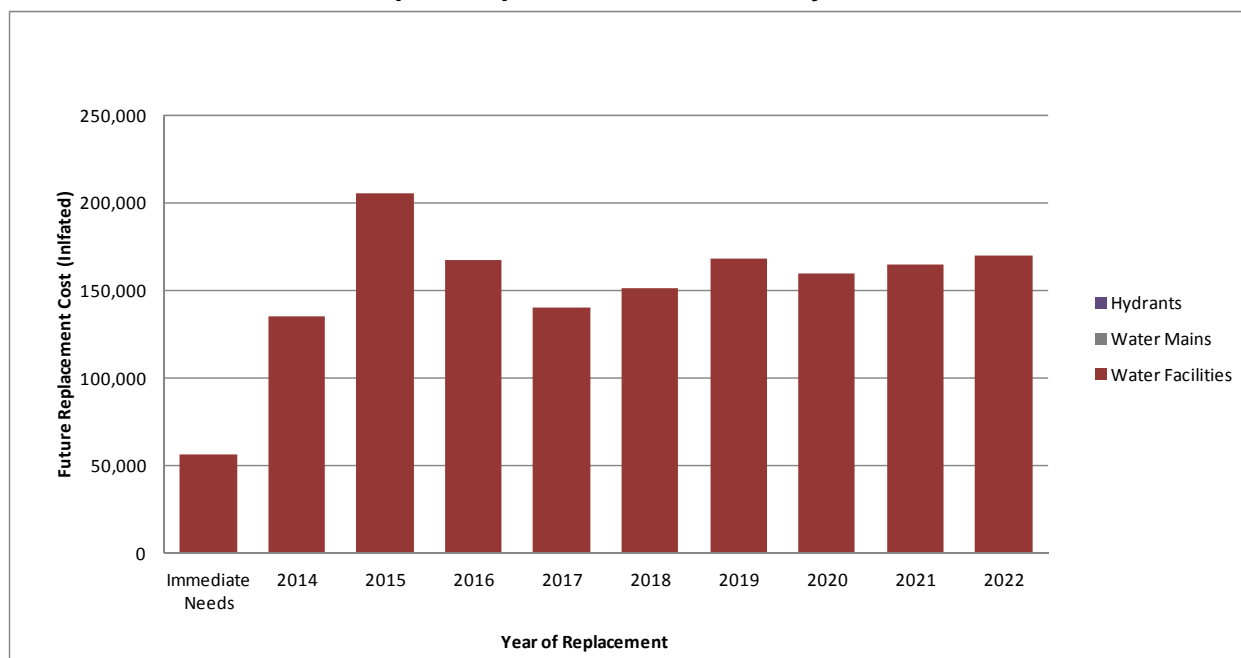
Figure 4-1
Asset Lifecycle Diagram



In defining the long-term forecast for the Board's asset management strategy, costs incurred through an asset's lifecycle were considered and documented.

A capital replacement plan was developed that takes the condition information and adjusts replacement timing based on identified priorities as well as staff's knowledge and experience. Table 4-5 below shows the capital forecast over the forecast period, where approximately \$1.5 million in projects are identified over 10 years.

**Table 4-5
Capital Replacement Schedule by Year**



Please refer to Appendix D for a breakdown of the capital forecast scenario by year and by asset type.

4.5 Procurement Methods

Section 270(1) of the Municipal Act, S.O. 2001, provides that municipalities (and local boards) shall adopt and maintain policies with respect to its procurement of goods and services. Procurement policies are developed to provide a framework to support open, fair, transparent and accountable purchasing processes, and to ensure procurement processes are consistently managed. Moreover, the establishment of a by-law adopting the procurement policy provides an opportunity for public debate and results in a document which has the approval of the Council/Board.

An effective procurement policy assists in identifying cost-effective options for providing services, while at the same time reducing risk. Innovative project management models, such as public-private partnerships (P3's) or co-operative purchasing can help bring together expertise, resources and funding opportunities. Where appropriate, bidders can be required to provide

lifecycle costing for the products and/or services being tendered. Lifecycle costs can include initial construction/purchase price, plus operating costs for a contracted period of time. Incorporating a lifecycle perspective in the procurement process can encourage effective asset management in the time period following the initial capital investment.

In order to have an effective and efficient procurement program, especially related to the purchase/construction of large capital assets, the procurement policy can include clauses to protect the Board as well as assist in receiving competitive responses. Examples include:

- Identification of the criteria used to determine the type of competitive process to be followed (i.e. tender, RFP, RFQ);
- Identification of circumstances when Sole Sourcing, Negotiation, and/or In-House Bids can be used;
- Description of the methods to be used for advertising a competitive process;
- Providing direction for purchasing in cases of emergency;
- Providing direction for purchasing as part of a co-operative purchasing group;
- Outlining any requirements related to bid deposits or other financial security;
- Inclusion of a non-discrimination clause highlighting positions such as having a 'no local preference' policy;
- Notification that any bid can be rejected by the Board;
- Identification of reasons for terminating a contract with a supplier/contractor (i.e. poor performance, unethical behaviour);
- Identification of restrictions on the types and/or amounts of damages to which bidders may be entitled, arising from their responding to a competitive process; and
- Requirement for bidders to supply proof of insurance and WSIB.

As part of the continuous asset management update process, it is recommended that the Board's procurement policies and procedures be reviewed and compared against procurement best practices to ensure resources are being allocated in an efficient manner.

5. FINANCING STRATEGY AND RATE STUDY

5. FINANCING STRATEGY AND RATE STUDY

5.1 Scope and Process

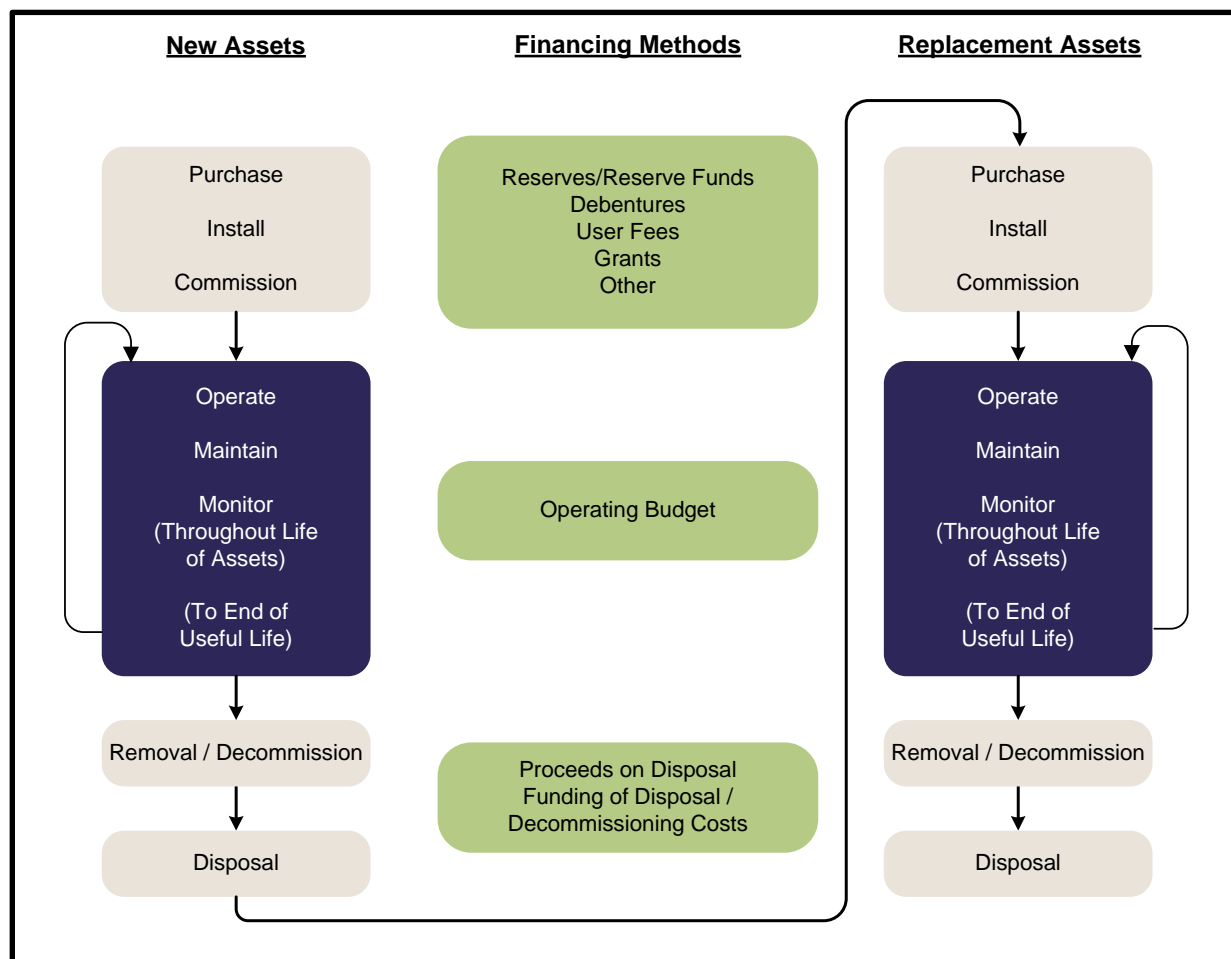
The financing strategy outlines the suggested financial approach to funding the recommended asset management strategy outlined in Chapter 4, while utilizing the Board's existing budget structure. This section of the asset management plan will include:

- Annual expenditure forecasts broken down by:
 - Maintenance/non-infrastructure solutions;
 - Renewal/rehabilitation activities;
 - Replacement/disposal activities; and
 - Expansion activities.
- Actual expenditures in the above named categories for 2012 and 2013 budgeted amounts;
- A breakdown of annual funding/revenue by source;
- Identification of the funding shortfall, including how the impact will be managed; and
- All key assumptions will be documented within Appendix B.

The long-term financing strategy forecast (including both expenditure and revenue sources) was prepared, consistent with the Board's departmental budget structure, so that it can be used in conjunction with the annual budget process. Various financing options, including water rates, reserves, reserve funds, debt and grants were considered and discussed with staff during the process. Figure 5-1 provides a visual representation of how various financing methods can be used for both initial asset purchases as well as asset replacements.

For the recommended asset management strategy, a detailed plan was generated, consistent with the Board's current budget structure. The plan identifies specific maintenance & non-infrastructure solutions, renewal & rehabilitation, replacement & disposal, and expansion activities required for the forecast period as described in Chapter 4.

Figure 5-1
Financing Methods of Lifecycle Costs



5.2 Legislative Requirements and Regulations

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 included:

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

The following sections describe significant applicable regulatory areas.

5.2.1 Sustainable Water and Sewage Systems Act

The *Sustainable Water and Sewage Systems Act* (SWSSA) was passed on December 13, 2002. The intent of the Act was to introduce the requirement 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.

5.2.2 Safe Drinking Water Act

The *Safe Drinking Water Act* (SDWA) was passed in December, 2002. The SDWA provides for 50 of the 93 Walkerton Part II recommendations. It focuses on the administrative and operational aspects of the provision of water. The SDWA 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 SDWA:

- 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.

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

5.2.3 Financial Plans Regulation

On August 16, 2007, the MOE introduced Ontario Regulation 453/07 which requires the preparation of financial plans for water systems (wastewater financial plans are encouraged). The MOE 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 to obtain a Drinking Water License.
- The plan is to be completed, approved by Resolution and submitted to the Ministry of Municipal Affairs and Housing as part of the application for receiving approval of a 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. can be updated if there are significant changes to budgets) but will need to be undertaken at a minimum every five years.
- The plans generally require the forecasting of capital, operating and reserve fund positions, and providing detailed capital inventories. In addition, PSAB full accrual 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, net debt, etc.).
- The financial plans must be made available to the public (at no charge) upon request and be available on the municipality's web site. The availability of this information must also be advertised.

In general, the financial principles of this regulation follow the intent of SWSSA 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 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.

5.2.4 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;
- 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;

- 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 which 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.

5.3 Historical Results

Table 5-1 outlines the historical maintenance/non-infrastructure costs for 2012 and 2013 budgeted results. All maintenance for assets was funded through water rate revenues.

Table 5-1
Historical Results
Maintenance & Non-Infrastructure Solutions

Description	Actual 2012	Budget 2013
Asset Maintenance	106,860	119,500
Rate Funding	106,860	119,500
Net Unfunded	-	-

Table 5-2 outlines the historical capital results for 2012 and 2013 budgeted results for renewal/rehabilitation, replacement/disposal, and expansion. All capital expenditures were fully funded from capital reserve/reserve funds.

Table 5-2
Historical Results
Renewal/Rehabilitation, Replacement/Disposal & Expansion

Description	Actual 2012	Forecast 2013
Capital Expenditures		
Chambers and Valves	-	-
Booster Station	63,620	-
Sampling Stations	9,831	-
Chlorination System at EMPS	1,751	-
SCADA	-	-
Lifecycle:	-	-
Replace Chlorine Analyzer; Rebuild Pumps/Valves	-	35,000
Replace Pressure Transmitter/Valves	-	-
Spare Pump	-	-
Repair Work at EMPS	-	-
Emergency Generator	-	9,000
Gas Chlorination System	-	3,000
Meter Chambers	14,875	-
Valves and Meters	-	6,000
Sampling Station Replacement	-	-
SCADA Replacements	-	3,000
Facility Lifecycle	-	-
Total Capital Expenditures	90,077	56,000
Capital Financing		
Provincial/Federal Grants	-	-
Debenture Requirements	-	-
Operating Contributions	-	-
Capital Reserve Fund	90,077	56,000
Total Capital Financing	90,077	56,000

5.4 Financing Strategy

Growth and Consumption

The table below provides the current number of customers and the forecasted additional users for each area the system services, based on data provided by staff. For forecasting future water volumes, an average monthly consumption per user for each of the service areas was determined based on historical consumption data and is included in Table 5-3.

**Table 5-3
Customer and Consumption Forecast**

Water Service Area	Existing Customers	Growth Forecast - Additional Users	Estimated Consumption per User (m³)
Aylmer	2,548	200	275
Malahide - East of Aylmer	76	5	220
Malahide - West of Aylmer	55	5	220
Central Elgin	166	20	220

Financing

Table 5-4 shows the expenditure forecast summary. While this summary only shows high level cost classifications of maintenance, renewal/rehabilitation, replacement and expansion categories, further detail can be obtained from Appendix F.

**Table 5-4
Expenditure Forecast Summary**

Asset Lifecycle Costs	Forecast								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Maintenance: Current Service Levels	121,890	124,328	126,814	129,351	131,938	134,576	137,268	140,013	142,814
Maintenance: LOS Adjustment	-	-	-	-	-	-	-	-	-
Total Asset Maintenance	121,890	124,328	126,814	129,351	131,938	134,576	137,268	140,013	142,814
Renewal, Rehabilitation and Replacement	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000
Renewal/Rehab/Replace - LOS Adjustment	-	-	-	-	-	-	-	-	-
Total Renewal, Rehabilitation and Replacement	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000
Total	256,890	329,328	293,814	269,351	282,938	302,576	297,268	305,013	312,814

Items in Table 5-4 labelled as “LOS Adjustment” refer to the level of service analysis discussed in Chapter 2.

Table 5-5 summarizes the recommended strategy to finance only the costs identified in Table 5-4 and is not intended to be a comprehensive operating and capital funding requirement for the Board.

**Table 5-5
Breakdown of Annual Funding (Revenue) by Source**

Funding (Revenue) by Source	Forecast								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Rates	121,890	124,328	126,814	129,351	131,938	134,576	137,268	140,013	142,814
Grants	-	-	-	-	-	-	-	-	-
Debentures	-	-	-	-	-	-	-	-	-
Capital Reserve Fund	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000
Total	256,890	329,328	293,814	269,351	282,938	302,576	297,268	305,013	312,814

These lifecycle costs are being recovered through two methods.

- Water Rates are suggested for all maintenance costs as well as any level of service adjustment related costs.
- The Board will be dependent upon maintaining healthy capital reserves/reserve funds in order to provide the remainder of the required lifecycle funding over the forecast period. This will require the Board to proactively increase amounts being transferred to these capital reserves during the annual budget process.

While the annual funding requirement may fluctuate, it is important for the Board to implement a consistent, yet increasing annual investment in capital so that the excess annual funds can accrue in capital reserve funds.

In order to fund the recommended asset related costs over the forecast period, an increase to the Board's water rates would be required in each year of the forecast. Table 5-6 presents the required rates by year. These rates incorporate the following:

- Inflationary adjustments were made to the Board's operating budget requirements.
- Transfers to capital reserve(s) are established to allow for adequate funding for existing capital, as well as, proactively starting to fund future capital needs.
- Assumed growth based on customers and consumption levels as noted at the beginning of this chapter were included and factored into the calculations.

**Table 5-6
Forecasted Water Rates**

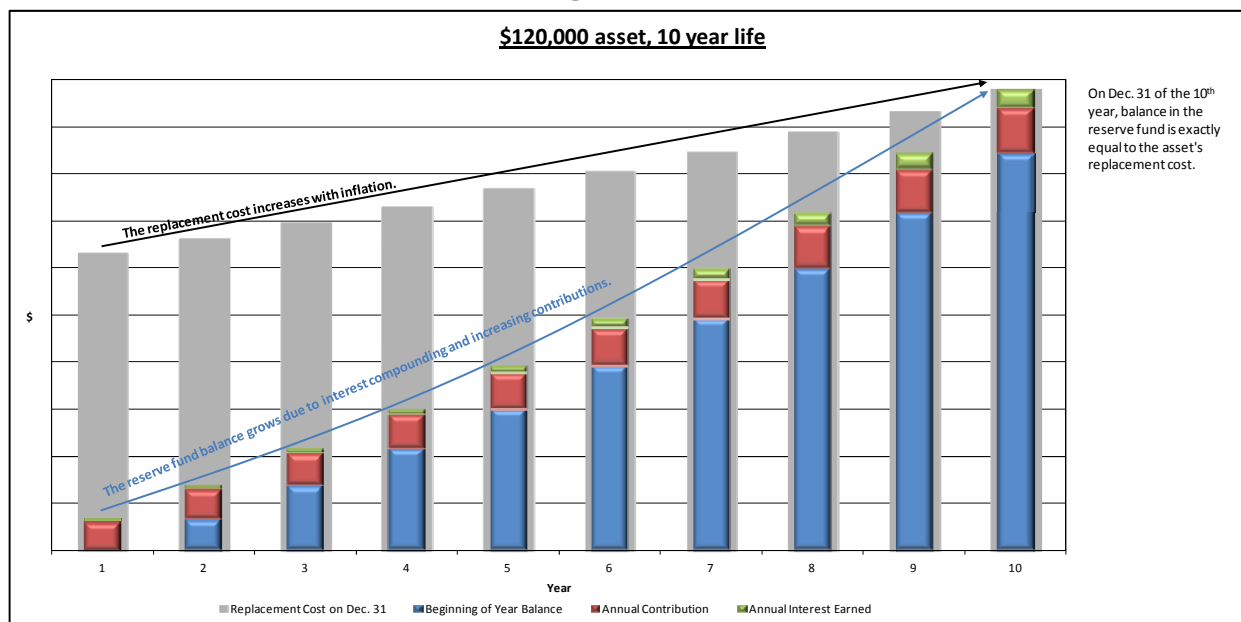
Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Rate (per m ³)	\$ 0.84	\$ 0.90	\$ 0.97	\$ 1.04	\$ 1.08	\$ 1.12	\$ 1.15	\$ 1.18	\$ 1.22	\$ 1.25

Please refer to further details provided in Appendix E.

5.5 Funding Shortfall

A fundamental approach to calculating the cost of using a capital asset and for the provision of the revenue required when the time comes to retire and replace it is the “sinking fund method”. This method first estimates the future value of the asset at the time of replacement, by inflating the current value of the asset at an assumed annual capital inflation rate. A calculation is then performed to determine annual contributions which, when invested in a reserve fund, will grow with interest to a balance equal to the future replacement cost. The contributions are calculated such that they also increase annually with inflation. Under this approach, an annual capital investment amount is calculated where funds are available for short-term needs while establishing a funding plan for long-term needs. Annual contributions in excess of capital costs in a given year would be transferred to a “capital replacement reserve fund” for future capital replacement needs. This approach provides for a stable funding base, eliminating variances in annual funding requirements, particularly in years when capital replacement needs exceed typical capital levy funding. Please refer to Figure 5-2 for an illustration of this method.

Figure 5-2
Sinking Fund Method



From an asset base perspective, the estimated annual sinking fund requirement, based on using the calculations discussed above, is approximately \$243,000 (in 2013 dollars). Based on the Board’s 2013 budget, current annual capital investment is approximately \$56,000, however \$26,000 of this represents the use of the prior year reserve balances. This would provide a high level estimate of the Board’s current annual infrastructure funding deficit at \$187,000 (in 2013 dollars).

Under the recommended financing strategy, the Board would be eliminating this gap over the forecast period.

To further mitigate the potential infrastructure funding deficit, the Board could consider:

- Actively seeking out and applying for grants; or
- Implementing operating efficiencies (i.e. reduced operating costs to allow more capital investment).

6. RECOMMENDATIONS

6. RECOMMENDATIONS

The following recommendations have been provided for staff (and the Board's) consideration:

- That the Aylmer Area Secondary Water Supply System Asset Management Plan and Rate Study be received and approved by the Board;
- That the Board consider the Capital Plan for water and the associated Capital Financing Plan as set out in Chapter 5 and Appendix E.
- That the Board provides for the recovery of all water costs through full recovery rates.
- That the Board consider the rates (and allocation of rates) provided in Section 5 and Appendix E.

The analysis contained within this asset management plan report is being provided for the Board's consideration in establishing the necessary funding to sustain its assets.

It is anticipated that the final asset management plan adopted by the Board will be monitored and updated frequently by staff as part of the budget process, with refinements and specific recommendations being provided with respect to the priority of each individual project.

APPENDIX A

DETAILED ASSET INVENTORY

Table A-1
Aylmer Area Secondary Water Supply System
Water Facilities

Item	Description	Year Installed	Estimated Life	Replacement Year	Years until Replacement	Replacement Cost (Inflated HC) 2013\$	Historical Cost Dec 31, 2012	Accumulated Amortization Dec 31, 2012	Net Book Value Dec 31, 2012	Condition Rating (Age Based)	Asset Condition	Probability of Failure	Consequence of Failure	Risk of Failure
EAWSS Pump Stn	2 Pumps - 17,280 m3/day	1993	50	2043	30	869,691	428,667	162,887	265,780	3	Average	Possible	Major	H
	Structural Component	1993	20	2013	0	835,124	411,629	391,042	20,587	0	Very Poor	Almost Certain	Major	E
	Mechanical Component	2009	20	2029	16	16,137	14,900	2,235	12,665	4	Good	Unlikely	Major	M
	Surge Elimination Valve	2011	20	2031	18	17,719	17,018	851	16,167	5	Very Good	Rare	Major	M
	Surge Elimination Valve - Upgrade	2010	20	2030	17	121,762	112,352	11,060	101,292	4	Good	Unlikely	Major	M
	Rechlorination System	2010	20	2030	17	121,762	112,352	11,060	101,292	4	Good	Unlikely	Major	M
Air Drain Chambers														
	Air - 8; Drain - 10;	1993	50	2043	30	391,373	192,906	73,302	119,604	3	Average	Possible	Major	H
	Mechanical/Electrical&C	1993	20	2013	0	391,373	192,906	183,255	9,651	0	Very Poor	Almost Certain	Major	E
3 Boundary Meter Chambers														
	3 - A0001, A-13, #16	1993	50	2043	30	93,184	45,930	17,453	28,477	3	Average	Possible	Major	H
	Mechanical/Electrical&C	1993	20	2013	0	93,184	45,930	43,634	2,297	0	Very Poor	Almost Certain	Major	E
Other Meter Chambers														
	Civil/Structural	2009	50	2059	46	181,807	167,875	10,073	157,802	5	Very Good	Rare	Major	M
	Mechanical/Electrical&C	2009	20	2029	16	50,432	46,568	8,932	37,636	4	Good	Unlikely	Major	M
	Mechanical/Electrical&C	2012	20	2032	19	15,173	14,875	-	14,875	5	Very Good	Rare	Major	M
	Meters and Display Units	2010	20	2030	17	338,568	312,405	31,240	281,164	4	Good	Unlikely	Major	M
SCADA														
						\$ 3,415,525	\$ 2,003,961	\$ 935,963	\$ 1,067,997					

Table A-2
 Aylmer Area Secondary Water Supply System
 Infrastructure - Water Mains, Hydrants

Item	Description	Year Installed	Estimated Life	Replacement Year	Age	Years until Replacement	Replacement Cost (Inflated HC) 2013\$	Historical Cost Dec 31, 2012	Accumulated Amortization Dec 31, 2012	Net Book Value Dec 31, 2012	Condition Rating (Age Based)	Asset Condition	Probability of Failure	Consequence of Failure	Risk of Failure	
																\$
Water Mains	13,800' of 450 mm PVC	1993	100	2093	20	80	\$ 8,185,313 8,144,036	\$ 4,038,923 4,014,162	\$ 771,757 762,691	\$ 3,267,166 3,251,471	4	Good	Unlikely	Moderate	M	
Hydrants																
	Hydrant - 4	1995	35	2030	18	17	23,885	12,460	6,052	6,408	2	Average	Possible	Moderate	M	
	Hydrant - 1	1998	35	2033	15	20	5,972	3,301	1,316	1,985	3	Average	Possible	Moderate	M	
	Hydrant - 1	2002	35	2037	11	24	5,971	3,870	1,110	2,760	3	Average	Possible	Moderate	M	
	Hydrant - 1	2008	35	2043	5	30	5,450	5,130	588	4,542	4	Good	Unlikely	Moderate	M	

APPENDIX B

ASSET MANAGEMENT ASSUMPTIONS

APPENDIX B: ASSET MANAGEMENT PLAN ASSUMPTIONS

The following assumptions were made during the creation of the Board's asset management plan.

1. STATE OF LOCAL INFRASTRUCTURE

- a) Indexing: When inflating an asset value to a 2013 replacement value, the Non-Residential Building Construction Price Index (NRBCPI) was used for all water assets.
- b) In order to establish an initial condition assessment, calculations were performed to link condition to asset age. This was done to establish condition ratings for this report and it is recommended that the Board follow the "Condition Assessment Policy" shown in Appendix C in the future.

2. ASSET MANAGEMENT STRATEGY

- a) Capital inflation rate will be assumed to be 3% annually.
- b) Operating budget inflation rate will be assumed to be 2% annually.
- c) Regarding operating expenses included in the Board's current budget, it is assumed that they will increase at an operating inflation rate annually, unless staff provided alternative requirements.

3. FINANCING STRATEGY

- a) Interest rate earned on a Capital Replacement Reserve Fund will be 2% annually.

APPENDIX C
DATA VERIFICATION AND CONDITION ASSESSMENT
POLICY

APPENDIX C

Aylmer Area Secondary Water Supply System Data Verification and Condition Assessment Policy

Data Verification

1. The main source of asset data updating and editing will be through the Board's PSAB 3150 compliance procedures.
2. Asset additions, disposals, betterments, and write-offs will be recorded based on the Board's PSAB 3150 Compliance Policies.
3. Verification of the correct treatment of asset revisions will be completed through frequent annual reviews by the Board staff as well as an annual review by the Board's external auditor.
4. During years in which condition assessments are not being performed, asset replacement cost will be determined based on a combination of inflating previous current values or thorough the use of the current year's historical invoice data. Where indices are being used, the Non-Residential Building Construction Price Index (NRBCPI) shall be used.

Condition Assessment

1. Condition assessments shall be determined as outlined in Table C-1 below. Condition assessments shall be performed by qualified individuals (or companies) and shall include a review of the following:
 - Current asset condition (consistent with the rating format used within this report, unless staff stipulate a new format);
 - i. Identify any unusual wear from asset use that may hinder asset performance and eventually reduce useful life.
 - ii. Assess asset performance and identify (if any) capital improvements that can be applied to extend the asset's useful life and/or bring the asset back to proper service levels.
 - Current asset replacement cost. This is to be based on replacing the asset under current legislation/requirements using the Board's specifications; and
 - Remaining service life, assuming current maintenance and usage levels.

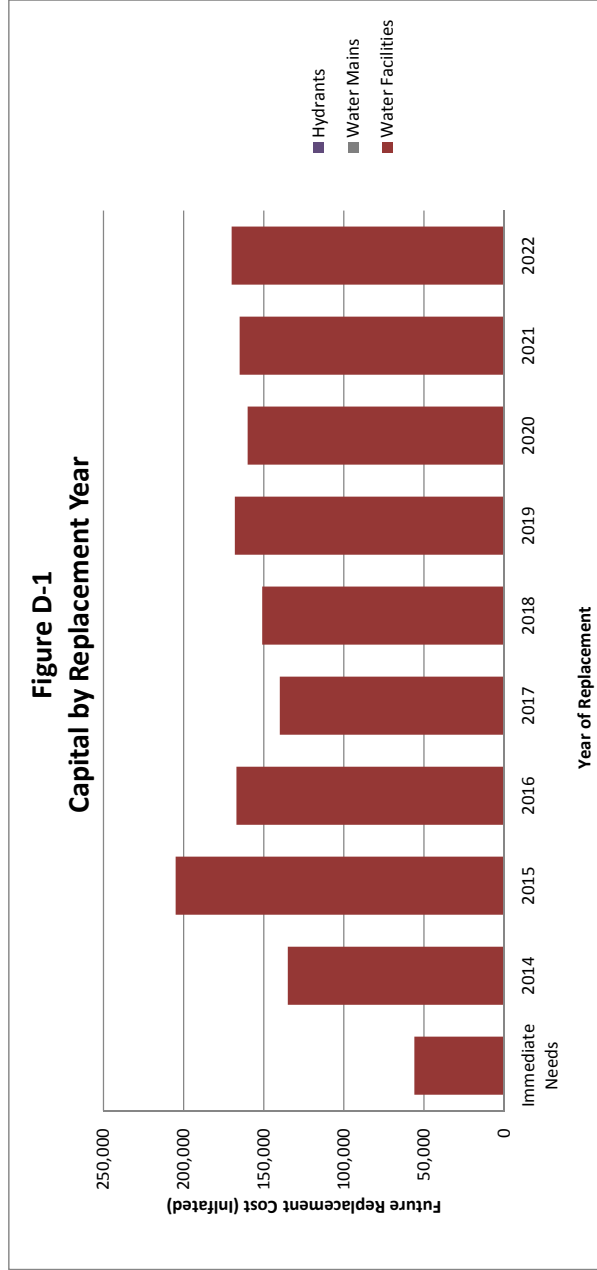
Table C-1
Condition Assessment Time Table

Asset Type	Frequency of Condition Assessment
Water Related	Every 5 years, based on applicable legislation

APPENDIX D CAPITAL FORECAST

Table D-1
 Aylmer Area Secondary Water Supply System
 2013 Asset Management Plan and Rate Study
 Scheduled Capital Replacement - Inflated
 Capital by Replacement Year

Asset Type	Immediate Needs	2014	2015	2016	2017	2018	2019	2020	2021	2022	TOTAL
Total Scheduled Capital - Inflated	56,000	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000	1,517,000
Water Facilities	56,000	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000	1,517,000
Water Mains	-	-	-	-	-	-	-	-	-	-	-
Hydrants	-	-	-	-	-	-	-	-	-	-	-



APPENDIX E
WATER ASSET MANAGEMENT STRATEGY & FINANCING
STRATEGY (RATE STUDY CALCULATIONS)

Table E-1
Aylmer Area Secondary Water Supply System
Water Service
Capital Budget Forecast
 Inflated \$

Description	Total	Forecast																			
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022										
Capital Expenditures																					
Chambers and Valves	286,000	-	15,000	90,000	17,000	18,000	20,000	21,000	34,000	35,000	36,000										
Booster Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampling Stations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorination System at EMPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCADA	5,000	-	5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle:																					
Replace Chlorine Analyzer; Rebuild Pumps/Valves	35,000	35,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Replace Pressure Transmitter/Valves	20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spare Pump	38,000	-	-	-	38,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repair Work at EMPS	6,000	-	-	-	-	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emergency Generator	13,000	9,000	-	-	-	-	-	4,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Chlorination System	3,000	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meter Chambers	1,000	-	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Valves and Meters	6,000	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampling Station Replacement	6,000	-	-	6,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCADA Replacements	23,000	3,000	8,000	-	-	-	-	-	-	-	-	12,000	-	-	-	-	-	-	-	-	-
Facility Lifecycle	1,075,000	-	106,000	109,000	112,000	116,000	119,000	123,000	126,000	130,000	134,000										
Total Capital Expenditures	1,517,000	56,000	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000										
Capital Financing																					
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debtenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Capital Reserve Fund	1,517,000	56,000	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000										
Total Capital Financing	1,517,000	56,000	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000										

Table E-2
Aylmer Area Secondary Water Supply System
Water Service
Reserve Fund Continuities
 Inflated \$

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Reserve Fund - Operating											
Opening Balance	150,341	150,341	153,348	156,415	159,543	162,734	165,989	169,308	172,695	176,148	179,671
Transfer from Operating	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	150,341	150,341	153,348	156,415	159,543	162,734	165,989	169,308	172,695	176,148	179,671
Interest	-	3,007	3,067	3,128	3,191	3,255	3,320	3,386	3,454	3,523	3,593
Water Reserve Fund - Capital											
Opening Balance	-	655,092	-	-	-	-	-	-	-	-	-
Transfer from Operating	-	19,600	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	56,000	-	-	-	-	-	-	-	-	-
Transfer to Lifecycle Reserve Fund	-	618,692	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	655,092	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-
Water Lifecycle Reserve Fund											
Opening Balance	-	-	642,423	652,340	639,026	710,094	826,154	927,531	1,000,285	1,108,382	1,239,119
Transfer from Capital Reserve	-	618,692	-	-	-	-	-	-	-	-	-
Transfer from Operating	-	11,134	132,127	179,156	224,144	239,861	234,190	221,141	246,364	271,441	296,426
Transfer to Capital	-	-	135,000	205,000	167,000	140,000	151,000	168,000	160,000	165,000	170,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	-	629,826	639,549	626,496	696,171	809,955	909,344	980,671	1,086,649	1,214,822	1,365,545
Interest	-	12,597	12,791	12,530	13,923	16,199	18,187	19,613	21,733	24,296	27,311

Table E-3
Aylmer Area Secondary Water Supply System
Water Services
Operating Budget Forecast
 Inflated \$

Description	Forecast										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Expenditures											
Operating Costs											
Primary Cost of Water	722,423	734,220	774,679	817,297	862,228	909,649	959,656	978,800	998,400	1,018,400	
Line Maintenance Contract	68,000	69,500	71,000	73,000	75,000	77,000	77,000	78,500	80,100	81,700	
Electricity for Chambers 13 and 16	1,700	1,750	1,800	1,850	1,900	1,950	2,000	2,000	2,000	2,000	
EMPS Operations	95,000	96,000	99,000	102,000	104,000	106,000	108,000	110,200	112,400	114,600	
EMPS Maintenance	3,000	3,500	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	
SCADA Operations and Maintenance	12,000	12,800	13,000	13,500	14,000	14,500	15,000	15,300	15,600	15,900	
Water Operations Wages	18,000	19,000	20,000	21,053	22,000	23,000	24,000	24,500	25,000	25,500	
Admin Fees	10,500	11,000	11,500	12,000	12,500	13,000	13,500	13,800	14,100	14,400	
Audit Fee	15,500	5,500	5,600	6,905	5,800	5,900	7,200	7,300	7,400	7,500	
Insurance	13,900	15,000	15,400	15,700	16,000	16,500	17,000	17,300	17,600	18,000	
Other Miscellaneous Costs	2,000	2,000	2,000	2,000	2,000	2,200	2,400	2,400	2,400	2,400	
Property Taxes	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,100	2,100	2,100	
Small Tools	550	550	600	655	700	750	800	800	800	800	
Repairs	25,000	25,000	25,000	25,000	25,000	25,500	26,000	26,500	27,000	27,500	
Water Efficiency Program	5,500	6,000	6,500	7,000	7,500	8,000	8,500	8,700	8,900	9,100	
Reports and Studies	41,000	14,000	8,800	9,000	9,500	9,500	15,500	15,800	16,100	16,400	
Sub Total Operating	1,035,573	1,017,420	1,060,279	1,112,560	1,163,928	1,219,449	1,282,756	1,308,200	1,334,200	1,360,700	
Capital-Related											
Transfers											
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital Reserve	19,600	-	-	-	-	-	-	-	-	-	
Transfer to Lifecycle Reserve	11,134	132,127	179,156	224,144	239,861	234,190	221,141	246,364	271,441	296,426	
Sub Total Capital Related	30,734	132,127	179,156	224,144	239,861	234,190	221,141	246,364	271,441	296,426	
Total Expenditures	1,066,307	1,149,546	1,239,436	1,336,704	1,403,789	1,453,638	1,503,897	1,554,564	1,605,641	1,657,126	
Revenues											
Other Revenue	-	-	-	-	-	-	-	-	-	-	
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-	
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-	
Water Billing Recovery	1,066,307	1,149,546	1,239,436	1,336,704	1,403,789	1,453,638	1,503,897	1,554,564	1,605,641	1,657,126	

Table E-4
Aylmer Area Secondary Water Supply System
Water Services
Water Rate Forecast
 Inflated \$

Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Water Billing Recovery	1,066,307	1,149,546	1,239,436	1,336,704	1,403,789	1,453,638	1,503,897	1,554,564	1,605,641	1,657,126
Total Consumption (m ³)	1,269,413	1,275,573	1,281,733	1,287,893	1,294,053	1,300,213	1,306,373	1,312,533	1,318,693	1,324,853
Constant Rate	0.84	0.90	0.97	1.04	1.08	1.12	1.15	1.18	1.22	1.25
Annual Percentage Change	0.0%	7.3%	7.3%	7.3%	4.5%	3.1%	3.0%	2.9%	2.8%	2.7%
Costs Per Service Area:										
Aylmer	918,881	990,785	1,068,444	1,152,491	1,210,535	1,253,732	1,297,294	1,341,222	1,385,515	1,430,173
Central Elgin	42,852	46,371	50,182	54,318	57,250	59,494	61,767	64,070	66,402	68,762
Malahide - East of Aylmer	89,393	96,005	103,121	110,796	115,922	119,592	123,270	126,956	130,648	134,348
Malahide - West of Aylmer	15,180	16,386	17,688	19,099	20,082	20,819	21,564	22,316	23,076	23,843
Total	1,066,307	1,149,546	1,239,436	1,336,704	1,403,789	1,453,638	1,503,897	1,554,564	1,605,641	1,657,126
Percentage										
Aylmer	86.2%	86.2%	86.2%	86.2%	86.2%	86.2%	86.3%	86.3%	86.3%	86.3%
Central Elgin	4.0%	4.0%	4.0%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
Malahide - East of Aylmer	8.4%	8.4%	8.3%	8.3%	8.3%	8.2%	8.2%	8.2%	8.1%	8.1%
Malahide - West of Aylmer	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%