

# The Town of Essex Water and Wastewater Rate Study

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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](mailto:info@watson-econ.ca)

[www.watson-econ.ca](http://www.watson-econ.ca)

 Planning for growth

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## List of Acronyms and Abbreviations

C.O.M.R.I.F.	Canada-Ontario Municipal Rural Infrastructure Fund
D.C.A.	Development Charges Act
F.I.R.	Financial Information Return
I.O.	Infrastructure Ontario
M.I.I.I.	Municipal Infrastructure Investment Initiative
M.O.E.	Ministry of Environment
O.M.B.	Ontario Municipal Board
O.Reg.	Ontario Regulation
O.S.I.F.A.	Ontario Strategic Infrastructure Financing Authority
O.S.T.A.R.	Ontario Small Town and Rural Development Infrastructure Initiative
P.S.A.B.	Public Sector Accounting Board
S.W.S.S.A.	Sustainable Water and Sewage Systems Act, 2002

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## Executive Summary

The Town of Essex retained Watson & Associates Economists Ltd. (Watson) to undertake a water and wastewater rate study. Watson provided a water and wastewater rate study in 2012 and a Water Financial Plan in 2009. This study extends off of those studies, updating the analysis for current capital and operating forecasts, costing for lifecycle cost requirements, current consumption and customer profiles. The results of this analysis provide updated water and wastewater base charges and volume rates for customers within the Town of Essex. The rate analysis contained herein continues to provide fiscally responsible practices that are in line with current provincial legislation at a level of rate increases that are reasonable.

The analysis presented herein, provides for the following:

- Capital spending program amounts for water are \$7.29 million for Wards 1 & 2 and \$5.78 for Wards 3 & 4 million (inflated).
- Capital spending program amounts for wastewater are \$0.5 million for Ward 1, \$72,400 for Ward 3 and \$39,900 for Ward 4 (inflated).
- Annual operating expenditures are assumed to increase by 2% per annum for most expenditures. Expenditures related to utilities, fuels, chemicals and other materials have been increased at 5% per annum.
- Union Water rates related to purchases for Wards 1 & 2 have been inflated by 2% annually.
- The present rate structure (base monthly charge and a constant volume rate for each ward) is continued.
- Existing water customers total 6,934:
  - Wards 1 & 2: 3,332 existing customers – increasing by 26 customers per year.
  - Wards 3 & 4: 3,602 existing customers – increasing by 13 customers per year.
- Existing wastewater customers total 5,013:
  - Ward 1: 2,754 existing customers – increasing by 20 customers per year.
  - Ward 3: 1,088 existing customers – increasing by 8 customers per year.
  - Ward 4: 1,171 existing customers – increasing by 5 customers per year.

Based on the above information, the following monthly base charge and volume rate increases are anticipated over the forecast period:

**Summary of Anticipated Annual Rate  
Increases**

<b>Service/Area</b>	<b>Base Charge</b>	<b>Volume Charge</b>
<b>Water:</b>		
Ward 1 & 2	1%	1%
Ward 3 & 4	1%	1%
<b>Wastewater:</b>		
Ward 1	2%	2%
Ward 3	3%	3%
Ward 4	2%	2%

Tables ES-1 and ES-2 summarize the recommended water rates and average annual bill (assuming an annual volume of 175 m<sup>3</sup> for Wards 1 & 2 and 150 m<sup>3</sup> for Wards 3 & 4) based on the analysis provided herein over the forecast period:

**Table ES-1****Average Annual Residential Water Bill - Ward 1 & 2 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	18.73	18.92	19.11	19.30	19.49	19.69	19.88	20.08	20.28	20.48	20.69
Volume Rate	1.39	1.40	1.41	1.42	1.43	1.45	1.46	1.47	1.48	1.49	1.50
Annual Base Charge	224.76	227.01	229.28	231.57	233.89	236.23	238.59	240.97	243.38	245.82	248.27
Annual Volume Rate	243.55	245.00	246.83	248.79	250.82	252.95	254.70	256.44	258.24	259.98	261.80
<b>Total Water Bill - Ward 1 &amp; 2</b>	<b>468.31</b>	<b>472.01</b>	<b>476.11</b>	<b>480.36</b>	<b>484.71</b>	<b>489.18</b>	<b>493.29</b>	<b>497.42</b>	<b>501.62</b>	<b>505.80</b>	<b>510.08</b>

**Table ES-2****Average Annual Residential Water Bill - Ward 3 & 4 (Based on 150 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	18.92	19.11	19.30	19.49	19.69	19.88	20.08	20.28	20.48	20.69
Volume Rate	1.54	1.55	1.57	1.59	1.61	1.63	1.65	1.67	1.69	1.71	1.73
Annual Base Charge	224.76	227.01	229.28	231.57	233.89	236.23	238.59	240.97	243.38	245.82	248.27
Annual Volume Rate	230.93	232.50	235.50	238.50	241.50	244.50	247.50	250.50	253.50	256.50	259.50
<b>Total Water Bill - Ward 3 &amp; 4</b>	<b>455.69</b>	<b>459.51</b>	<b>464.78</b>	<b>470.07</b>	<b>475.39</b>	<b>480.73</b>	<b>486.09</b>	<b>491.47</b>	<b>496.88</b>	<b>502.32</b>	<b>507.77</b>

Tables ES-3, ES-4 and ES-5 summarize the recommended wastewater rates and average annual bill (assuming an annual volume of 175 m<sup>3</sup> for Wards 1 & 4 and 140 m<sup>3</sup> for Wards 3) based on the analysis provided herein over the forecast period:

**Table ES-3****Average Annual Residential Wastewater Bill - Ward 1 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.10	19.49	19.88	20.27	20.68	21.09	21.51	21.95	22.38	22.83
Volume Rate	1.29	1.32	1.35	1.38	1.41	1.44	1.47	1.50	1.53	1.56	1.59
Annual Base Charge	224.76	229.26	233.84	238.52	243.29	248.15	253.12	258.18	263.34	268.61	273.98
Annual Volume Rate	225.82	231.00	236.25	241.50	246.75	252.00	257.25	262.50	267.75	273.00	278.25
<b>Total Wastewater Bill - Ward 1</b>	<b>450.58</b>	<b>460.26</b>	<b>470.09</b>	<b>480.02</b>	<b>490.04</b>	<b>500.15</b>	<b>510.37</b>	<b>520.68</b>	<b>531.09</b>	<b>541.61</b>	<b>552.23</b>

**Table ES-4****Average Annual Residential Wastewater Bill - Ward 3 (Based on 140 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.29	19.87	20.47	21.08	21.71	22.36	23.04	23.73	24.44	25.17
Volume Rate	1.91	1.96	2.02	2.08	2.14	2.20	2.27	2.34	2.41	2.48	2.55
Annual Base Charge	224.76	231.50	238.45	245.60	252.97	260.56	268.38	276.43	284.72	293.26	302.06
Annual Volume Rate	266.97	274.40	282.80	291.20	299.60	308.00	317.80	327.60	337.40	347.20	357.00
<b>Total Wastewater Bill - Ward 3</b>	<b>491.73</b>	<b>505.90</b>	<b>521.25</b>	<b>536.80</b>	<b>552.57</b>	<b>568.56</b>	<b>586.18</b>	<b>604.03</b>	<b>622.12</b>	<b>640.46</b>	<b>659.06</b>

**Table ES-5****Average Annual Residential Wastewater Bill - Ward 4 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.10	19.49	19.88	20.27	20.68	21.09	21.51	21.95	22.38	22.83
Volume Rate	1.74	1.77	1.81	1.85	1.89	1.93	1.97	2.01	2.05	2.09	2.13
Annual Base Charge	224.76	229.26	233.84	238.52	243.29	248.15	253.12	258.18	263.34	268.61	273.98
Annual Volume Rate	303.82	309.75	316.75	323.75	330.75	337.75	344.75	351.75	358.75	365.75	372.75
<b>Total Wastewater Bill - Ward 4</b>	<b>528.58</b>	<b>539.01</b>	<b>550.59</b>	<b>562.27</b>	<b>574.04</b>	<b>585.90</b>	<b>597.87</b>	<b>609.93</b>	<b>622.09</b>	<b>634.36</b>	<b>646.73</b>

# 1. Introduction

## 1.1 Background

The Town of Essex provides water service via two systems, Wards 1 and 2 in the north representing the former Essex and Colchester North communities and Wards 3 and 4 in the south representing the former Colchester South and Harrow communities. The Union Water Management Board provides the water supply for Wards 1 & 2 where the water system that provides water services to Wards 3 & 4 is an independent system with treatment and storage located within Harrow.

The Town of Essex currently services 6,934 metered water customers and 5,013 wastewater customers. The water and wastewater systems are metered and utilize rate structures with a monthly base charge as well as a volume charge on a per cubic metre basis. Table 1-1 provides the existing rates presently in effect.

**Table 1-1  
Town of Essex  
Water and Wastewater Rates - 2015**

2015 - Water Billing Rates - Monthly		2015 - Wastewater Billing Rates - Monthly	
Base Charge		Base Charge	
Ward 1 - Essex	\$18.73	Ward 1 - Essex	\$18.73
Ward 2 - Colchester North	\$18.73	Ward 2 - Colchester North	-
Ward 3 - Colchester South	\$18.73	Ward 3 - Colchester South	\$18.73
Ward 4 - Harrow	\$18.73	Ward 4 - Harrow	\$18.73
Volume Charge per m <sup>3</sup>		Volume Charge per m <sup>3</sup>	
Ward 1 - Essex	\$1.390	Ward 1 - Essex	\$1.290
Ward 2 - Colchester North	\$1.390	Ward 2 - Colchester North	-
Ward 3 - Colchester South	\$1.540	Ward 3 - Colchester South	\$1.910
Ward 4 - Harrow	\$1.540	Ward 4 - Harrow	\$1.740

With the legislative changes being made across Ontario as a result of the Walkerton crisis, Municipalities will be required to conform to new statutes governing the management of water and wastewater systems. Watson & Associates Economists Ltd. was retained by the Town of Essex to assist in addressing these changes in a proactive manner as they relate to the water and wastewater systems. The assessment provided herein addresses changes recommended to the water and wastewater rates based on the most current information and forecasts the implications over the next ten year period.

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## 1.2 Study Process

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

- Identify all current and future water and wastewater system capital needs to assess the immediate and longer-term implications;
- Identify potential methods of cost recovery from the capital needs listing. These recovery methods may include other statutory authorities (e.g. Development Charges, Municipal Act, etc.) as an offset to recovery through the water and wastewater rates;
- 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; and
- Provide staff and Committee/Council the findings to assist in gaining approval of the rates for 2016 and future years.

## 1.3 Regulatory Changes in Ontario

Resulting from the water crisis in Walkerton, significant regulatory changes have been made in Ontario over the past decade. These changes arise 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.

The legislation which would have most impacted municipal water and wastewater rates was the Sustainable Water and Sewage Systems Act (S.W.S.S.A.) which would have required municipalities to implement full cost pricing. The Act was enacted in 2002, however, had not been implemented pending the approval of its regulations. The Act was repealed as of January 1, 2013. It is expected that the provisions of the Water

Opportunities Act will implement the fundamental requirements of S.W.S.S.A. The following sections describe these various resulting changes.

## **1.4 Sustainable Water and Sewage Systems Act**

As noted earlier, 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 wastewater services. It is noted that this Act has been repealed, however, to provide broader context and understanding to other legislation discussed herein, a description of the Act is provided below.

Full costs for water service was defined in subsection 3(7) of the Act and included “source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs associated with extracting, treating or distributing water to the public and such other costs which may be specified by regulation.” Similar provisions were made for wastewater services in subsection 4(7) respecting the “collecting, treating or discharging waste water.”

The Act would have required the preparation of two reports for submission to the Ministry of the Environment (or such other member of the Executive Council as may be assigned the administration of this Act under the Executive Council Act). The first report was on the “full cost of services” and the second was the “cost recovery plan.” Once these reports were reviewed and approved by the Ministry, the municipality would have been required to implement the plans within a specified time period.

In regard to the “Full Cost of Services” report, the municipality (deemed a regulated entity under the Act) would prepare and approve a report concerning the provision of water and sewage services. This report was to include an inventory of the infrastructure, a management plan providing for the long-term integrity of the systems and address the full cost of providing the services (other matters may be specified by the regulations) along with the revenue obtained to provide them. A professional engineer would certify the inventory and management plan portion of the report. The municipality’s auditor would be required to provide a written opinion on the report. The report was to be approved by the municipality and then be forwarded to the Ministry along with the engineer’s certification and the auditor’s opinion. The regulations would stipulate the timing for this report.

The second report was referred to as a “Cost Recovery Plan” and would address how the municipality intended to pay for the full costs of providing the service. The

regulations were to specify limitations on what sources of revenue the municipality may use. The regulations may have also provided limits as to the level of increases any customer or class of customer may experience over any period of time. Provision was made for the municipality to implement increases above these limits however ministerial approval would be required first. Similar to the first report, the municipal auditor would provide a written opinion on the report prior to Council's adoption, and this opinion must accompany the report when submitted to the Province.

The Act provided the Minister the power to approve or not approve the plans. If the Minister was not satisfied with the report or if a municipality did not submit a plan, the Minister may have a plan prepared. The cost to the Crown for preparing the plan would be recovered from the municipality. As well, the Minister may direct two or more regulated municipalities to prepare a joint plan. This joint plan may be directed at the onset or be directed by the Minister after receiving the individual plans from the municipalities.

The Minister also had the power to order a municipality to generate revenue from a specific revenue source or in a specified manner. The Minister may have also ordered a regulated entity to do or refrain from doing such things as the Minister considered advisable to ensure that the entity pays the full cost of providing the services to the public.

Once the plans were approved and in place, the municipality would be required to submit progress reports. The timing of these reports and the information to be contained therein would be established by the regulations. A municipal auditor's opinion must be provided with the progress report. Municipalities would also revise the plans if they deem the estimate does not reflect the full cost of providing the services, as a result of a change in circumstances, regulatory or other changes that affect their plan, etc. The municipality would then revise its prior plan, provide an auditor's opinion, and submit the plan to the Minister.

## **1.5 Financial Plans Regulation**

On August 16, 2007, the M.O.E. passed O.Reg 453/07 which requires the preparation of financial plans for water (and wastewater) systems. The M.O.E. has also provided a Financial Plan Guidance Document to assist in 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 Municipality to obtain its Drinking 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 Drinking Water Act, the preparation of the plan is mandatory for water and encouraged for wastewater;
- 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 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);
- The financial plans must be made available to the public (at no charge) upon request and be available on the Municipality's website. The availability of this information must also be advertised; and
- The financial plans are to be approved by Resolution of the Council or governing body indicating that the drinking water system is financially viable.

In general, the financial principles of the draft regulations follow the intent of S.W.S.S.A. to move municipalities towards financial sustainability. 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 Shores - 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 stormwater 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: Lifecycle 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.

## **1.6 Water Opportunities Act, 2010**

As noted earlier, since the passage of the Safe Drinking Water Act, continuing changes and refinements to the legislation have been introduced. Some of these Bills have found their way into law while others have not been approved. Bill 72 was introduced into the legislation on May 18, 2010 and received Royal Assent on November 29, 2010.

On November 29, 2010, Bill 72, the Water Opportunities Act, 2010 received Royal Assent.

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; and
- Prepare sustainability plans for municipal water services, municipal wastewater services and municipal stormwater services.

With regard to the sustainability plans:

- The Act extends from the water financial plans and requires a more detailed review of the water financial plan and requires a full plan for wastewater and stormwater services; and
- Regulations 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;
- A financial Plan;
- For water, a water conservation plan;
- An 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 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.

As noted earlier, it is expected that this Act will implement the principles of the Sustainable Water and Sewage Systems Act once all regulations are put in place.

## **1.7 Forecast Growth and Servicing Requirements**

The Town of Essex services 3,332 metered water customers in Wards 1 & 2 and 3,602 metered water customers in Wards 3 & 4. The Town also services 2,754 wastewater customers in Ward 1, 1,088 customers in Ward 3 and 1,171 customers in Ward 4. There are currently no wastewater customers in Ward 2. Information on the existing number of customers and existing billable volumes was obtained from the Town.

For future water and wastewater customers to be added to the systems, consideration has been given to development potential within the serviced areas of the Town over the forecast period 2015-2025.

The growth forecast provided herein is somewhat lower than the forecast used for the Town's development charge study. For operating revenue purposes it would be undesirable to forecast too high as it could produce a potential operating deficit should the growth not materialize. However, forecasting higher amounts for development charge purposes ensures that capital infrastructure is in place so as not to inhibit development.

Tables 1-2 and 1-3 provides for the forecast of water users and volumes for Wards 1 & 2 and Wards 3 & 4 respectively. Tables 1-4, 1-5 and 1-6 provides for the forecast of wastewater users and volumes for Wards 1, 3 and 4 respectively.

**Table 1-2**  
**2015-2025 Water System Forecast – Wards 1 & 2**

**Water Users Forecast - Ward 1&2**

Year	Total Users	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	26	13	26	26	26	26	26	26	26	26	26	26
2016	26		13	26	26	26	26	26	26	26	26	26
2017	26			13	26	26	26	26	26	26	26	26
2018	26				13	26	26	26	26	26	26	26
2019	26					13	26	26	26	26	26	26
2020	26						13	26	26	26	26	26
2021	26							13	26	26	26	26
2022	26								13	26	26	26
2023	26									13	26	26
2024	26										13	26
2025	26											13
<b>Total</b>	<b>260</b>	<b>13</b>	<b>39</b>	<b>65</b>	<b>91</b>	<b>117</b>	<b>143</b>	<b>169</b>	<b>195</b>	<b>221</b>	<b>247</b>	<b>273</b>
m <sup>3</sup> /user	175	175	175	175	175	175	175	175	175	175	175	175
Annual Flow		2,275	6,825	11,375	15,925	20,475	25,025	29,575	34,125	38,675	43,225	47,775

Water Customer Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 1&amp;2</b>											
Existing	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332
New - Growth	13	39	65	91	117	143	169	195	221	247	273
Subtotal Ward 1&2	3,345	3,371	3,397	3,423	3,449	3,475	3,501	3,527	3,553	3,579	3,605

Water Consumption Forecast (m <sup>3</sup> )	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 1&amp;2</b>											
Existing	791,452	791,452	791,452	791,452	791,452	791,452	791,452	791,452	791,452	791,452	791,452
New	2,275	6,825	11,375	15,925	20,475	25,025	29,575	34,125	38,675	43,225	47,775
Subtotal Ward 1&2	793,727	798,277	802,827	807,377	811,927	816,477	821,027	825,577	830,127	834,677	839,227

**Table 1-3  
2015-2025 Water System Forecast – Wards 3 & 4**

**Water Users Forecast - Ward 3&4**

Year	Total Users	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	13	7	13	13	13	13	13	13	13	13	13	13
2016	13		7	13	13	13	13	13	13	13	13	13
2017	13			7	13	13	13	13	13	13	13	13
2018	13				7	13	13	13	13	13	13	13
2019	13					7	13	13	13	13	13	13
2020	13						7	13	13	13	13	13
2021	13							7	13	13	13	13
2022	13								7	13	13	13
2023	13									7	13	13
2024	13										7	13
2025	13											7
Total	130	7	20	33	46	59	72	85	98	111	124	137
m <sup>3</sup> /user	150	150	150	150	150	150	150	150	150	150	150	150
Annual Flow		1,050	3,000	4,950	6,900	8,850	10,800	12,750	14,700	16,650	18,600	20,550

Water Customer Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 3&amp;4</b>											
Existing	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602
New - Growth	7	20	33	46	59	72	85	98	111	124	137
Subtotal Ward 3&4	3,609	3,622	3,635	3,648	3,661	3,674	3,687	3,700	3,713	3,726	3,739

Water Consumption Forecast (m <sup>3</sup> )	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 3&amp;4</b>											
Existing	786,977	786,977	786,977	786,977	786,977	786,977	786,977	786,977	786,977	786,977	786,977
New	1,050	3,000	4,950	6,900	8,850	10,800	12,750	14,700	16,650	18,600	20,550
Subtotal Ward 3&4	788,027	789,977	791,927	793,877	795,827	797,777	799,727	801,677	803,627	805,577	807,527

**Table 1-4  
2015-2025 Wastewater System Forecast – Ward 1**

**Wastewater Users Forecast - Ward 1 Essex**

Year	Total Users	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	20	10	20	20	20	20	20	20	20	20	20	20
2016	20		10	20	20	20	20	20	20	20	20	20
2017	20			10	20	20	20	20	20	20	20	20
2018	20				10	20	20	20	20	20	20	20
2019	20					10	20	20	20	20	20	20
2020	20						10	20	20	20	20	20
2021	20							10	20	20	20	20
2022	20								10	20	20	20
2023	20									10	20	20
2024	20										10	20
2025	20											10
<b>Total</b>	<b>220</b>	<b>10</b>	<b>30</b>	<b>50</b>	<b>70</b>	<b>90</b>	<b>110</b>	<b>130</b>	<b>150</b>	<b>170</b>	<b>190</b>	<b>210</b>
m <sup>3</sup> /user	175	175	175	175	175	175	175	175	175	175	175	175
<b>Annual Flow</b>		<b>1,750</b>	<b>5,250</b>	<b>8,750</b>	<b>12,250</b>	<b>15,750</b>	<b>19,250</b>	<b>22,750</b>	<b>26,250</b>	<b>29,750</b>	<b>33,250</b>	<b>36,750</b>

Wastewater Customer Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 1 - Essex</b>											
Existing	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754
New - Growth	10	30	50	70	90	110	130	150	170	190	210
<b>Subtotal Ward 1</b>	<b>2,764</b>	<b>2,784</b>	<b>2,804</b>	<b>2,824</b>	<b>2,844</b>	<b>2,864</b>	<b>2,884</b>	<b>2,904</b>	<b>2,924</b>	<b>2,944</b>	<b>2,964</b>

Wastewater Flows Forecast (m <sup>3</sup> )	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 1 - Essex</b>											
Existing	665,288	665,288	665,288	665,288	665,288	665,288	665,288	665,288	665,288	665,288	665,288
New	1,750	5,250	8,750	12,250	15,750	19,250	22,750	26,250	29,750	33,250	36,750
<b>Subtotal Ward 1</b>	<b>667,038</b>	<b>670,538</b>	<b>674,038</b>	<b>677,538</b>	<b>681,038</b>	<b>684,538</b>	<b>688,038</b>	<b>691,538</b>	<b>695,038</b>	<b>698,538</b>	<b>702,038</b>

**Table 1-5  
2015-2025 Wastewater System Forecast – Ward 3**

**Wastewater User Forecast - Ward 3 Colchester South**

Year	Total Users	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	8	4	8	8	8	8	8	8	8	8	8	8
2016	8		4	8	8	8	8	8	8	8	8	8
2017	8			4	8	8	8	8	8	8	8	8
2018	8				4	8	8	8	8	8	8	8
2019	8					4	8	8	8	8	8	8
2020	8						4	8	8	8	8	8
2021	8							4	8	8	8	8
2022	8								4	8	8	8
2023	8									4	8	8
2024	8										4	8
2025	8											4
Total	88	4	12	20	28	36	44	52	60	68	76	84
m <sup>3</sup> /user	140	140	140	140	140	140	140	140	140	140	140	140
Annual Flow		560	1,680	2,800	3,920	5,040	6,160	7,280	8,400	9,520	10,640	11,760

Wastewater Customer Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 3 - Colchester South</b>											
Existing	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088
New - Growth	4	12	20	28	36	44	52	60	68	76	84
Subtotal Ward 3	1,092	1,100	1,108	1,116	1,124	1,132	1,140	1,148	1,156	1,164	1,172

Wastewater Flows Forecast (m <sup>3</sup> )	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 3 - Colchester South</b>											
Existing	149,053	149,053	149,053	149,053	149,053	149,053	149,053	149,053	149,053	149,053	149,053
New	560	1,680	2,800	3,920	5,040	6,160	7,280	8,400	9,520	10,640	11,760
Subtotal Ward 3	149,613	150,733	151,853	152,973	154,093	155,213	156,333	157,453	158,573	159,693	160,813

**Table 1-6**  
**2015-2025 Wastewater System Forecast – Ward 4**

**Wastewater User Forecast - Ward 4 Harrow**

Year	Total Users	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	5	3	5	5	5	5	5	5	5	5	5	5
2016	5		3	5	5	5	5	5	5	5	5	5
2017	5			3	5	5	5	5	5	5	5	5
2018	5				3	5	5	5	5	5	5	5
2019	5					3	5	5	5	5	5	5
2020	5						3	5	5	5	5	5
2021	5							3	5	5	5	5
2022	5								3	5	5	5
2023	5									3	5	5
2024	5										3	5
2025	5											3
Total	55	3	8	13	18	23	28	33	38	43	48	53
m <sup>3</sup> /user	175	175	175	175	175	175	175	175	175	175	175	175
Annual Flow		525	1,400	2,275	3,150	4,025	4,900	5,775	6,650	7,525	8,400	9,275

Wastewater Customer Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 4 - Harrow</b>											
Existing	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171
New - Growth	3	8	13	18	23	28	33	38	43	48	53
Subtotal Ward 4	1,174	1,179	1,184	1,189	1,194	1,199	1,204	1,209	1,214	1,219	1,224

Wastewater Flows Forecast (m <sup>3</sup> )	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Ward 4 - Harrow</b>											
Existing	273,351	273,351	273,351	273,351	273,351	273,351	273,351	273,351	273,351	273,351	273,351
New	525	1,400	2,275	3,150	4,025	4,900	5,775	6,650	7,525	8,400	9,275
Subtotal Ward 4	273,876	274,751	275,626	276,501	277,376	278,251	279,126	280,001	280,876	281,751	282,626

## 2. Capital Infrastructure Needs

### 2.1 Capital Forecast

Capital forecasts have been provided for the water systems and are presented on Tables 2-1 and 2-2 while the capital forecasts for the wastewater systems are presented on Tables 2-3, 2-4 and 2-5 (Note: the costs are in inflated dollars). The basis for these forecasts is the Town's Capital Forecasts and works identified as asset replacement needs based on the inventory data provided for the water & wastewater systems.

A summary of the capital works related to the water and wastewater services are provided below:

**Table 2-1  
2015-2025 Water Capital Forecast Summary – Wards 1 & 2 (Inflated \$)**

Description	Total 2015-2025	Years Undertaken
<b>Capital Expenditures</b>		
Fairview Avenue Reconstruction	425,000	2015
Equipment Contingency for Wards 1 and 2 Distribution and Transmission (50%)	6,000	2015
Pickup Truck (Water Wards 1 and 2 Distribution and Transmission)	9,000	2015
Pickup Truck (Water Wards 1 and 2 Treatment)	2,400	2015
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	2015
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	2015
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	2015
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	2015
<b>Lifecycle:</b>		
Water Meters, Valves, Tower, etc. - Ward 1 & 2	8,000	2024
Water Admin Inventory - Ward 1 & 2	123,000	2016-2019, 2021-2022, 2024
Watermains - Ward 1 & 2	6,665,000	2016-2019, 2025
Water Hydrants - Ward 1 & 2	52,000	2025
<b>Total Capital Expenditures</b>	<b>7,292,400</b>	

**Table 2-2**  
**2015-2025 Water Capital Forecast Summary – Wards 3 & 4 (Inflated \$)**

Description	Total 2015-2025	Years Undertaken
<b>Capital Expenditures</b>		
Equipment Contingency for Wards 3 and 4 Distribution and Transmission (50%)	6,000	2015
Harrow Colchester South Water Treatment Plant Contingency for Wards 3 and 4	160,000	2015
Pickup Truck (Water Wards 3 and 4 Distribution and Transmission)	9,000	2015
Pickup Truck (Water Wards 3 and 4 Treatment)	2,400	2015
<b>Lifecycle:</b>		
Water Meters, Valves, Tower, etc. - Ward 3 & 4	2,000	2022
Water Treatment - Ward 3 & 4	116,000	2016-2020, 2022-2025
Water Admin Inventory - Ward 3 & 4	133,000	2017-2018, 2020-2022
Watermains - Ward 3 & 4	5,355,000	2016-2025
<b>Total Capital Expenditures</b>	<b>5,783,400</b>	

**Table 2-3**  
**2015-2025 Wastewater Capital Forecast Summary – Ward 1 (Inflated \$)**

Description	Total 2015-2025	Years Undertaken
<b>Capital Expenditures</b>		
Treatment - Ward 1 Contingency	22,000	2015
Collection and Conveyance - Ward 1 Contingency	17,000	2015
Pickup Truck ( Ward 1 Collection and Conveyance)	1,800	2015
Pickup Truck ( Ward 1 Treatment)	600	2015
Barrier Wall Culvert 100,000 (Entrance to Essex Sewage Lagoon, Water and Public Works Facility)	28,000	2015
North East Lagoon System Flow Optimization Study (carry forward SS-14-0007)	81,357	2015
<b>Lifecycle:</b>		
Wastewater Pumping Stations	5,000	2025
Wastewater Machinery & Equipment	7,000	2022
Wastewater Vehicles, Treatment & Disposal - Ward 1	44,000	2018-2020
<b>Studies:</b>		
North East Lagoon / Essex Pollution Control Plant Flow Optimization Study	200,000	2015
Ward 1 Flooding Study	94,000	2015
<b>Total Capital Expenditures</b>	<b>500,757</b>	

**Table 2-4**  
**2015-2025 Wastewater Capital Forecast Summary – Ward 3 (Inflated \$)**

Description	Total 2015-2025	Years Undertaken
<b>Capital Expenditures</b>		
Treatment - Ward 3 Contingency	22,000	2015
Collection and Conveyance - Ward 3 Contingency	25,000	2015
Pickup Truck ( Ward 3 Collection and Conveyance)	1,800	2015
Pickup Truck ( Ward 3 Treatment)	600	2015
<b>Lifecycle:</b>		
Wastewater Treatment & Disposal - Ward 2	16,000	2016, 2020
Wastewater Treatment & Disposal - Ward 3	7,000	2024
<b>Total Capital Expenditures</b>	<b>72,400</b>	

**Table 2-5**  
**2015-2025 Wastewater Capital Forecast Summary – Ward 4 (Inflated \$)**

Description	Total 2015-2025	Years Undertaken
<b>Capital Expenditures</b>		
Treatment - Ward 4 Contingency	17,000	2015
Collection and Conveyance - Ward 4 Contingency	20,500	2015
Pickup Truck ( Ward 4 Collection and Conveyance)	1,800	2015
Pickup Truck ( Ward 4 Treatment)	600	2015
<b>Total Capital Expenditures</b>	<b>39,900</b>	

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## 3. Lifecycle Costing

### 3.1 Overview of Lifecycle Costing

#### *3.1.1 Definition*

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.

#### *3.1.2 Financing Costs*

This section will focus on financing mechanisms in place to fund the costs incurred throughout the asset's life.

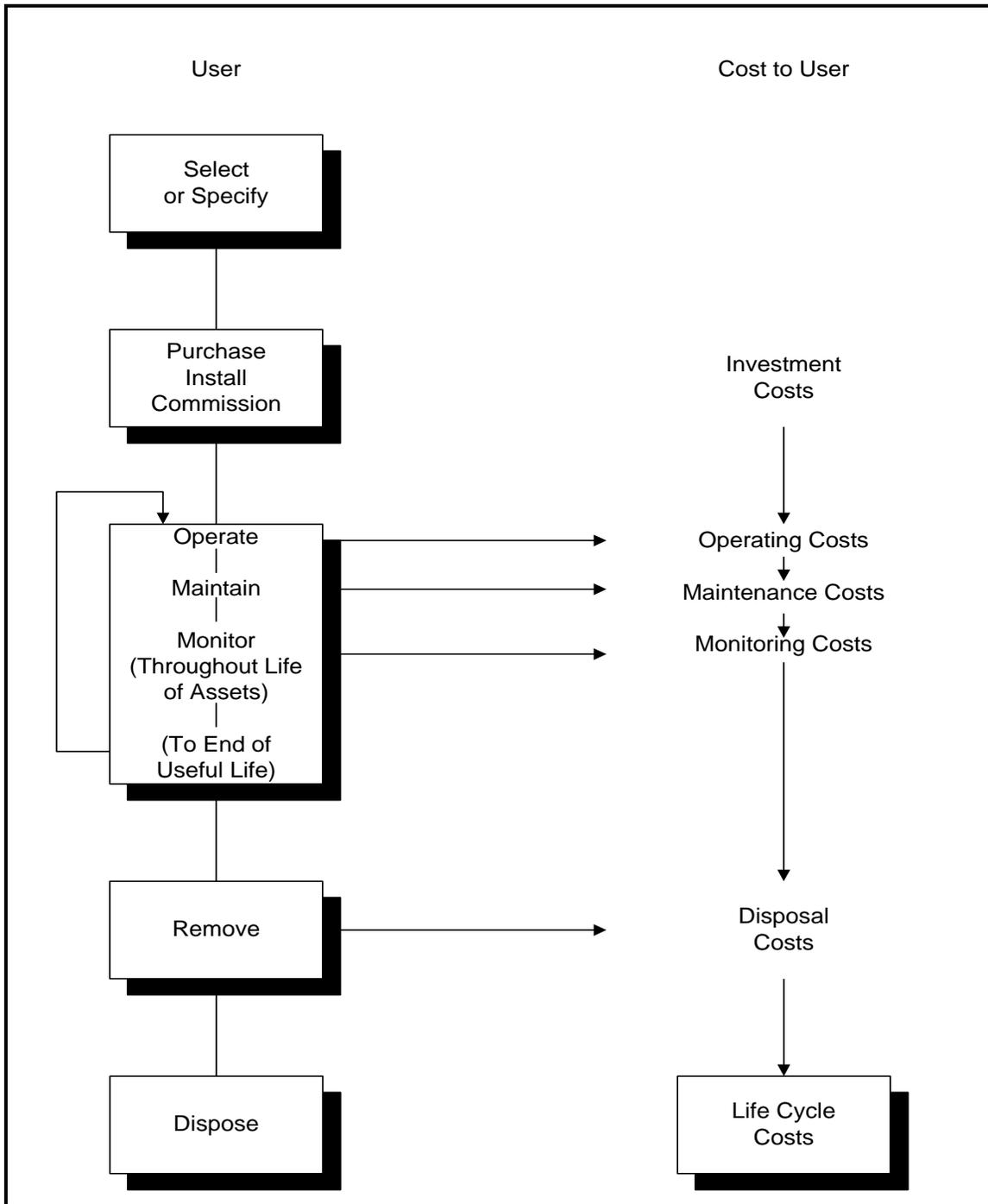
In a municipal context, services are provided to benefit tax/rate payers. Acquisition of assets is normally timed in relation to direct needs within the community. At times, economies of scale or technical efficiencies will lead to oversizing an asset to accommodate future growth within the Town. Over 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 Town to continue. As well, debentures could

be used to fund such works, with the debt charge carrying costs recouped from taxpayers in the future.

**Figure 3-1  
Lifecycle Costing**



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 will be dependent upon debentures, reserves and contributions from the operating budget to fund these works.

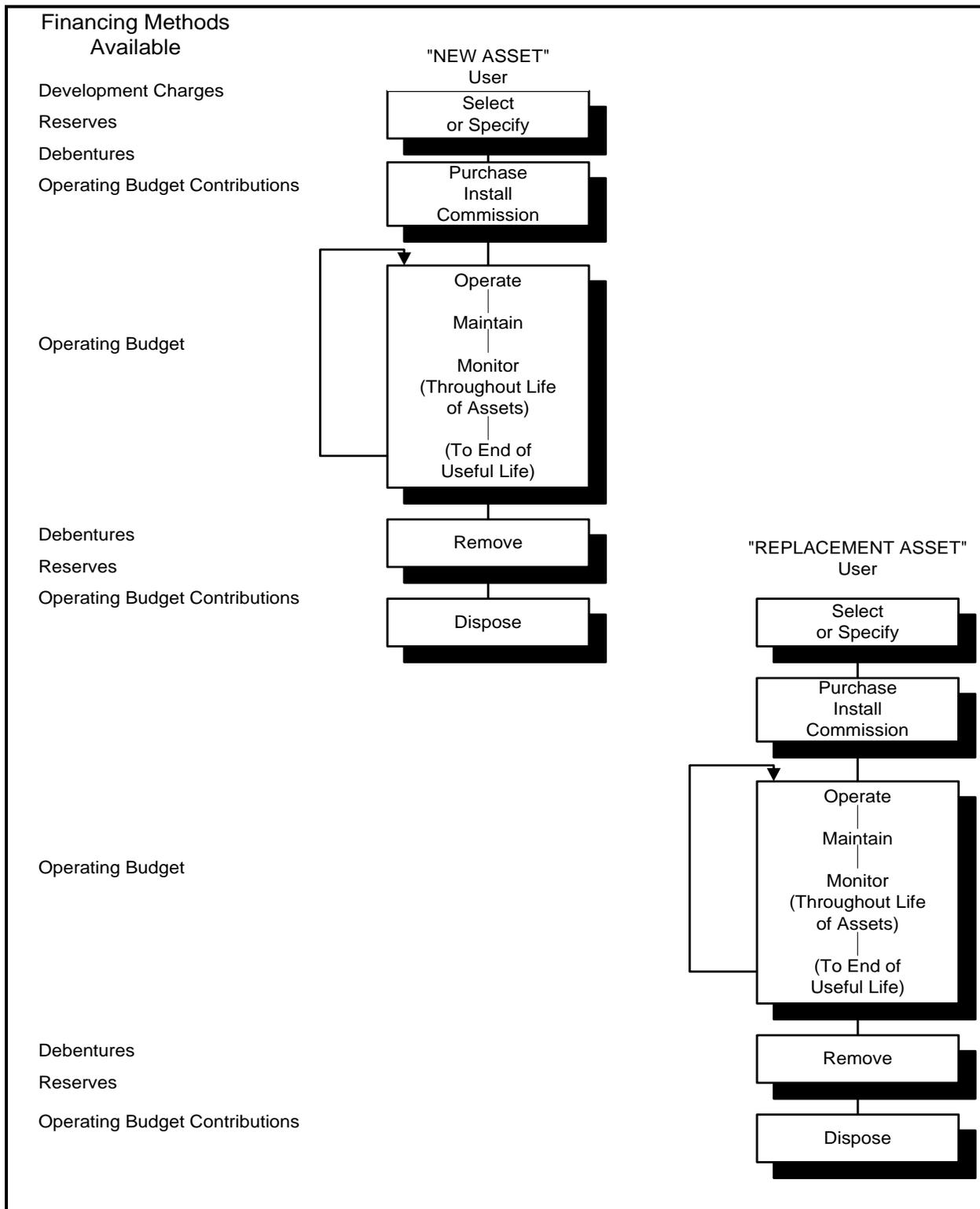
Figure 3-2 depicts the costs of an asset from its initial conception through to replacement and then continues to follow the associated costs through to the next replacement.

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; 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.

Charging for the cost of using up of 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.

**Figure 3-2  
Financing Lifecycle Costs**



### ***3.1.3 Costing Methods***

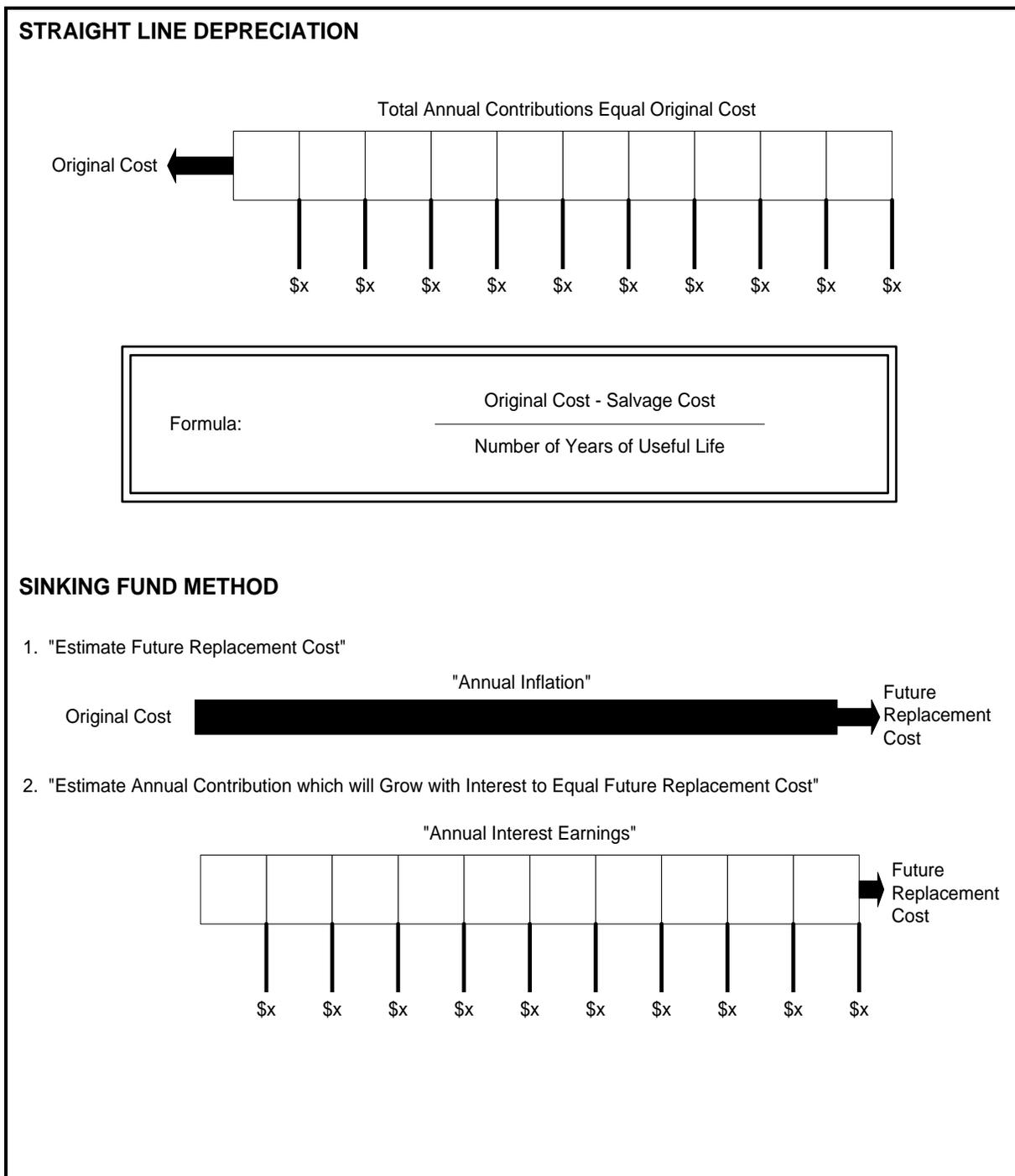
There are two fundamental methods of calculating the cost of the usage of an asset and for the provision of the revenue required when the time comes to retire and replace it. The first method is the Depreciation Method. This method recognizes the reduction in the value of the asset through wear and tear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

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.

Figure 3-3



### 3.2 Impact on Budgets

Detailed water and wastewater systems inventory information was obtained from the Town. The age of the water system dates back to the late 1950's. The water system has been expanded throughout the years. The wastewater system dates back to the

early 1970s. The total value of existing water infrastructure is \$105.1 million and the value of existing wastewater infrastructure is \$90.1 million.

The detailed water and wastewater inventory are provided in Appendices A and B, respectively. As well, the lifecycle “sinking fund” contribution amounts for each piece of infrastructure have also been included. These calculations determine the level of investment the Town may wish to consider as part of its budgeting practices. This information is summarized in Figure 3-4.

**Figure 3-4**  
**Town of Essex**  
**Summary of Water and Wastewater Infrastructure**

Area	Total Replacement Value	Suggested Amount to be funded in 10 year forecast (Based on Age)	Net Replacement for Future Lifecycle	Annual Lifecycle Replacement
<b>Water</b>				
Water Meters, Valves, Tower, etc. - Ward 1 & 2	199,290	6,950	192,340	9,346
Water Admin Inventory - Ward 1 & 2	134,170	116,050	18,120	1,499
Watermains - Ward 1 & 2	46,717,020	6,576,660	40,140,360	1,118,307
Water Hydrants - Ward 1 & 2	1,531,020	46,800	1,484,220	49,768
<b>Subtotal - Ward 1 &amp; 2</b>	<b>48,581,500</b>	<b>6,746,460</b>	<b>41,835,040</b>	<b>1,178,919</b>
Water Meters, Valves, Tower, etc. - Ward 3 & 4	5,041,160	1,650	5,039,510	253,937
Water Treatment - Ward 3 & 4	1,976,580	194,420	1,782,160	68,232
Water Admin Inventory - Ward 3 & 4	907,140	126,850	780,290	43,751
Watermains - Ward 3 & 4	47,229,840	5,074,500	42,155,340	1,389,133
Water Hydrants - Ward 3 & 4	1,377,690	-	1,377,690	46,088
<b>Subtotal - Ward 3 &amp; 4</b>	<b>56,532,410</b>	<b>5,397,420</b>	<b>51,134,990</b>	<b>1,801,141</b>
<b>Total Water</b>	<b>105,113,910</b>	<b>12,143,880</b>	<b>92,970,030</b>	<b>2,980,060</b>
<b>Wastewater</b>				
Wastewater Lagoons	3,362,880	-	3,362,880	214,490
Wastewater Pumping Stations	2,688,530	4,160	2,684,370	154,706
Wastewater Machinery & Equipment	58,010	6,860	51,150	3,412
Wastewater Forcemains	1,569,210	-	1,569,210	80,807
Wastewater Vehicles, Treatment & Disposal - Ward 1	47,140	44,030	3,110	207
Sanitary Manholes - Ward 1	2,168,390	-	2,168,390	68,000
Sanitary Sewers - Ward 1	28,688,090	-	28,688,090	875,165
<b>Subtotal - Ward 1</b>	<b>38,582,250</b>	<b>55,050</b>	<b>38,527,200</b>	<b>1,396,788</b>
Wastewater Treatment & Disposal - Ward 2	15,907,450	15,620	15,891,830	935,501
Sanitary Manholes - Ward 2	235,500	-	235,500	7,508
Sanitary Sewers - Ward 2	2,866,340	-	2,866,340	104,107
Wastewater Treatment & Disposal - Ward 3	77,460	24,650	52,810	3,071
Sanitary Manholes - Ward 3	1,262,670	-	1,262,670	38,469
Sanitary Sewers - Ward 3	16,999,250	-	16,999,250	468,021
<b>Subtotal - Ward 2 &amp; 3</b>	<b>37,348,670</b>	<b>40,270</b>	<b>37,308,400</b>	<b>1,556,677</b>
Wastewater Treatment & Disposal - Ward 4	4,740	-	4,740	316
Sanitary Manholes - Ward 4	1,243,930	-	1,243,930	42,895
Sanitary Sewers - Ward 4	12,919,090	-	12,919,090	623,617
<b>Subtotal - Ward 4</b>	<b>14,167,760</b>	<b>-</b>	<b>14,167,760</b>	<b>666,829</b>
<b>Total Wastewater</b>	<b>90,098,680</b>	<b>95,320</b>	<b>90,003,360</b>	<b>3,620,293</b>
<b>Total Water and Wastewater</b>	<b>195,212,590</b>	<b>12,239,200</b>	<b>182,973,390</b>	<b>6,600,353</b>

Average Investment per customer is \$15,031 for water and \$17,912 for wastewater

It is noted that the inventory of the complete water and wastewater systems may be required to be assessed and reported on by a professional engineer as part of the documentation required under the Water Opportunities Act. The detailed specifics of the reporting will not be known until the Province has set these standards by regulation.

With respect to lifecycle costing contained in the Appendices the following information was taken under consideration:

- approximate age;
- material type;
- main lengths;
- diameter of the mains;
- estimated useful life; and
- estimated replacement costs.

## 4. Capital Cost Financing Options

### 4.1 Summary of Capital Cost Financing Alternatives

Historically, the powers that municipalities had to raise alternative revenues to taxation to fund capital services have been restrictive. Over the past decade, legislative reforms have been introduced. Some of these have expanded municipal powers (e.g. Bill 26 introduced in 1996 to provide for expanded powers for imposing fees and charges), while others appear to restrict them (Bill 98 in 1997 providing amendments to the Development Charges Act).

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 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.

Under s.484 of Municipal Act, 2001, the Local Improvement Act was repealed with the in force date of the Municipal Act (January 1, 2003). The municipal powers granted under the Local Improvement Act now fall under the jurisdiction of the Municipal Act. To this end, on December 20, 2002, O.Reg. 390/02 was filed, which allowed for the Local Improvement Act to be deemed to remain in force until April 1, 2003. However, O.Reg. 119/03 was enacted on April 19, 2003 which restores many of the previous Local Improvement Act provisions; however, the authority is now provided under the Municipal Act.

The methods of capital cost recovery available to municipalities are provided as follows:

<b>Recovery Methods</b>	<b>Section Reference</b>
<ul style="list-style-type: none"> <li>• Development Charges Act, 1997</li> </ul>	4.2
<ul style="list-style-type: none"> <li>• Municipal Act               <ul style="list-style-type: none"> <li>○ Fees and Charges</li> <li>○ Sewer and Water Area Charges</li> <li>○ Connection Fees</li> <li>○ Local Improvements</li> </ul> </li> </ul>	4.3

## 4.2 Development Charges Act, 1997

In November, 1996, the Ontario Government introduced Bill 98, a new Development Charges Act. The Province's stated intentions were to "create new construction jobs and make home ownership more affordable" by reducing the charges and to "make municipal Council decisions more accountable and more cost effective." The basis for this Act is to allow municipalities to recover the growth-related capital cost of infrastructure necessary to accommodate new growth within the Municipality. Generally the new Act provided the following changes to the former Act:

- Replace those sections of the 1989 D.C.A. which govern municipal development charges. (Education development charges are not to be significantly altered at this time);
- Limit services which can be financed from development charges, specifically excluding parkland acquisition, administration buildings, and cultural, entertainment, tourism, solid waste management and hospital facilities;
- Ensure that the level of service used in the calculation of capital costs will not exceed the average level of service over the previous decade. Level of service is to be measured from both a quality and quantity perspective;
- Provide that uncommitted excess capacity available in existing municipal facilities and benefits to existing residents are removed from the calculation of the charge;
- Ensure that the development charge revenues collected by municipalities are spent only on those capital costs identified in the calculation of the development charge;
- Require municipalities to contribute funds (e.g. taxes, user charges or other non-development charge revenues) to the financing of certain projects primarily funded from development charges. The municipal contribution is 10 percent for services such as recreation, parkland development, libraries, etc;
- Permit (but apparently not require) municipalities to grant developers credits for the direct provision of services identified in the development charge calculation and, when credits are granted, require the Municipality to reimburse the developer for the costs the Municipality would have incurred if the project had been financed from the development charge reserve fund;
- Set out provisions for front-end financing capital projects (limited to essential services) required to service new development; and
- Set out provisions for appeals and complaints, and transitional rules, including that municipalities will have up to 18 months from the date of proclamation of the new Act to establish new development charge by-laws, otherwise the old by-laws will expire.

## 4.3 Municipal Act

4.3.1 Part XII of the Municipal Act provides municipalities with broad powers to impose fees and charges via passage of a by-law. These powers, as presented in s.391(1), include imposing fees or charges:

- “for services or activities provided or done by or on behalf of it;
- for costs payable by it for services or activities provided or done by or on behalf of any other municipality or local board; and
- for the use of its property including property under its control.”

Restrictions are provided to ensure that the form of the charge is not akin to a poll tax. Any charges not paid under this authority may be added to the tax roll and collected in a like manner. The fees and charges imposed under this part are not appealable to the O.M.B..

4.3.2 s.221 of the previous Municipal Act, permitted municipalities to impose charges, by by-law, on owners or occupants of land who would or might derive benefit from the construction of sewage (storm and sanitary) or water works being authorized (in a Specific Benefit Area). For a by-law imposed under this section of the previous Act:

- A variety of different means could be used to establish the rate and recovery of the costs could be imposed by a number of methods at the discretion of Council (i.e. lot size, frontage, number of benefiting properties, etc.);
- Rates could be imposed in respect to costs of major capital works, even though an immediate benefit was not enjoyed;
- Non-abutting owners could be charged;
- Recovery was authorized against existing works, where a new water or sewer main was added to such works, "notwithstanding that the capital costs of existing works has in whole or in part been paid."
- Charges on individual parcels could be deferred;
- Exemptions could be established;
- Repayment was secured; and
- O.M.B. approval was not required.

While under the new Municipal Act no provisions are provided specific to the previous s.221, the intent to allow capital cost recovery through fees and charges is embraced within s.391. The new Municipal Act also maintains the ability of municipalities to impose capital charges for water and sewer services on landowners not receiving an immediate benefit from the works. Under s.391(2) of the Act, “a fee or charge imposed

under subsection (1) for capital costs related to sewage or water services or activities may be imposed on persons not receiving an immediate benefit from the services or activities but who will receive a benefit at some later point in time.” Also, capital charges imposed under s.391 are not appealable to the O.M.B. on the grounds that the charges are “unfair or unjust”.

4.3.3 s.222 of the previous Municipal Act permitted municipalities to pass a by-law requiring buildings to connect to the Municipality's sewer and water systems, charging the owner for the cost of constructing services from the mains to the property line. Under the new Municipal Act, this power still exists under Part II, General Municipal Powers (s.9 (3) b of the Municipal Act). Enforcement and penalties for this use of power are contained in s.427 (1) of the Municipal Act.

4.3.4 Under the previous Local Improvement Act:

- A variety of different types of works could be undertaken, such as watermain, storm and sanitary sewer projects, supply of electrical light or power, bridge construction, sidewalks, road widening and paving;
- Council could pass a by-law for undertaking such work on petition of a majority of benefiting taxpayers, on a 2/3 vote of Council and on sanitary grounds, based on the recommendation of the Minister of Health. The by-law was required to go to the O.M.B., which might hold hearings and alter the by-law, particularly if there were objections;
- The entire cost of a work was assessed only upon the lots abutting directly on the work, according to the extent of their respective frontages, using an equal special rate per metre of frontage; and
- As noted, this Act was repealed as of April 1, 2003; however, O.Reg. 119/03 was enacted on April 19, 2003 which restores many of the previous Local Improvement Act provisions; however, the authority is now provided under the Municipal Act.

## 4.4 Grant Funding Availability

Since the early 1980's, the level of Provincial and Federal assistance toward municipal infrastructure has declined significantly. By the mid 1990's, 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, Municipalities 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 have been made available under the Build Canada Fund and Stimulus Fund Programs. Under the specific requirements of these programs, the projects needed to be “shovel ready” and were allocated on a case by case basis.

In August 2012, the province of Ontario initiated the Municipal Infrastructure Investment Initiative (M.I.I.I.). In supporting the efforts of communities to restore and revitalize their public infrastructure, this initiative provides one-time provincial funding to improve asset management planning in small municipalities and local service boards. In addition, funding will be made available for municipal infrastructure projects under this initiative. Any municipality or local service board seeking capital funding in the future must demonstrate how its proposed project fits within a detailed asset management plan. To assist in defining the components of an asset management plan, the Province produced a document entitled Building Together: Guide for Municipal Asset Management Plans. This guide documents the components, information and analysis that are required to be included in a municipality’s asset management plan under this initiative.

Most recently, infrastructure funding programs have been announced by both the Federal and Ontario governments. The Ontario Community Infrastructure Fund (O.C.I.F.) will provide \$100 million per year for repair or revitalization of infrastructure. 50% of this will be provided in a stable predictable formula-based allocation whereas the residual is based on an application basis. There is also the Federal Governments Small Communities Fund (S.C.F.) to which Ontario and Canada will each contribute \$272 million to support projects in municipalities of less than 100,000 people. Both programs provide support to manage infrastructure programs.

#### 4.5 Existing Reserves/Reserve Funds

The Town has established reserves and reserve funds for water and wastewater costs. The following table summarizes the water and wastewater reserves utilized in this analysis and their respective balances at December 31, 2014:

<b>Reserve</b>	<b>Ward 1/2</b>	<b>Ward 3/4</b>
<b>Water</b>		
Capital Reserve Fund	<b>2,657,439</b>	<b>659,090</b>
Development Charges Reserve Fund	-	-
Lifecycle Reserve Fund	<b>1,119,696</b>	<b>4,407,753</b>

Reserve	Ward 1	Ward 3	Ward 4
<b>Wastewater</b>			
Capital Reserve Fund	2,755,170	1,462,976	99,210
Development Charges Reserve Fund	(1,719,705)	338,654	1,222
Lifecycle Reserve Fund	30,499	323,745	832,285

## 4.6 Debenture Financing

Although it is not a direct method of minimizing the overall cost to the ratepayer, debentures are used by municipalities to assist in cash flowing large capital expenditures.

The Ministry of Municipal Affairs regulates the level of debt incurred by Ontario municipalities, through its powers established under the Municipal Act. Ontario Regulations 403/02 provides the current rules respecting municipal debt and financial obligations. Through the rules established under these regulations, a Municipality's debt capacity is capped at a level where no more than 25% of the Municipality's own purpose revenue may be allotted for servicing the debt (i.e. debt charges). The Town of Essex's 2015 calculation on Debt Capacity is shown on Schedule 81 of the Town's 2014 Financial Information Return (F.I.R.). This calculates to the Town's estimated annual repayment limit of approximately \$4.56 million. Based upon 10 year financing at an assumed 3.5%, the available debt for the Town is approximately \$38 million.

## 4.7 Infrastructure Renewal Bonds

Infrastructure Ontario (I.O.) is an arms-length crown corporation, which has been set up as a tool to offer low-cost and longer-term financing to assist municipalities in renewing their infrastructure (this corporation has merged the former O.S.I.F.A. into its operations) I.O. combines the infrastructure renewal needs of municipalities into an infrastructure investment "pool". I.O. will raise investment capital to finance loans to the public sector by selling a new investment product called Infrastructure Renewal Bonds to individual and institutional investors.

I.O. provides access to infrastructure capital that would not otherwise be available to smaller borrowers. Larger borrowers receive a longer term on their loans than they could obtain in the financial markets, and can also benefit from significant savings on transaction costs such as legal costs and underwriting commissions. Under the I.O. approach, all borrowers receive the same low interest rate. I.O. will enter into financial agreement with each Municipality subject to technical and credit reviews, for a loan up to the maximum amount of the loan request.

The first round of the former O.S.I.F.A.'s 2004-05 infrastructure renewal program was focused on municipal priorities of clean water infrastructure, sewage treatment facilities, municipal roads and bridges, public transit and waste management infrastructure. The focus of the program was expanded in 2005/2006 somewhat to include:

- clean water infrastructure;
- sewage infrastructure;
- waste management infrastructure;
- municipal roads and bridges;
- public transit;
- municipal long-term care homes;
- renewal of municipal social housing and culture; and
- tourism and recreation infrastructure.

With the merging of O.S.I.F.A. and I.O., the program was broadened in late 2006 to also include municipal administrative buildings, local police and fire stations, emergency vehicles and equipment, ferries, docks and municipal airports.

It is noted that the interest rates will vary from time to time. The following interest rates were available to municipalities for the following term, based on a serial repayment schedule as of October 30, 2015:

<b>Indicative Lending Rates as of October 30,2015</b>	
<b>Term</b>	<b>Serial</b>
5 Year	1.72%
10 Year	2.44%
15 Year	2.95%
20 Year	3.26%
25 Year	3.46%
30 Year	3.57%

To be eligible to receive these loans, municipalities must submit a formal application along with pertinent financial information. Allotments are prioritized and distributed based upon the Province's assessment of need.

## 4.8 Recommended Capital Financing Approach

Of the various funding alternatives provided in this section, the following are recommended for further consideration by the Town of Essex for the capital expenditures (inflated) provided in Chapter 2:

Description	Wards 1 & 2 2015 - 2025	Wards 3 & 4 2015 - 2025
<b>Capital Financing - Water</b>		
Provincial/Federal Grants	-	-
Development Charges Reserve Fund	-	-
Non-Growth Related Debenture Requirements	-	-
Growth Related Debenture Requirements	-	-
Operating Contributions	-	-
Lifecycle Reserve Fund	5,240,000	5,606,000
Water Reserve	2,052,400	177,400
<b>Total Capital Financing</b>	<b>7,292,400</b>	<b>5,783,400</b>

Description	Ward 1 2015 - 2025	Ward 3 2015 - 2025	Ward 4 2015 - 2025
<b>Capital Financing - Wastewater</b>			
Provincial/Federal Grants	-	-	-
Development Charges Reserve Fund	-	-	-
Non-Growth Related Debenture Requirements	-	-	-
Growth Related Debenture Requirements	-	-	-
Operating Contributions	-	-	-
Lifecycle Reserve Fund	56,000	-	-
Wastewater Reserve	444,757	72,400	39,900
<b>Total Capital Financing</b>	<b>500,757</b>	<b>72,400</b>	<b>39,900</b>

Tables 4-1 and 4-2 provide for the full capital expenditure and funding program by year for water while Tables 4-3, 4-4 and 4-5 provide for wastewater.

**Table 4-1  
Capital Budget Forecast – Water – Wards 1 & 2**

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Fairview Avenue Reconstruction	425,000	-	-	-	-	-	-	-	-	-	-	-
Equipment Contingency for Wards 1 and 2 Distribution and Transmission (50%)	6,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 1 and 2 Distribution and Transmission)	9,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 1 and 2 Treatment)	2,400	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>												
Water Meters, Valves, Tower, etc. - Ward 1 & 2	-	8,000	-	-	-	-	-	-	-	-	-	8,000
Water Admin Inventory - Ward 1 & 2	-	123,000	17,000	17,000	17,000	2,000	-	9,000	26,000	-	35,000	-
Watermains - Ward 1 & 2	-	6,665,000	364,000	367,000	371,000	375,000	-	-	-	-	-	5,188,000
Water Hydrants - Ward 1 & 2	-	52,000	-	-	-	-	-	-	-	-	-	52,000
	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>444,400</b>	<b>6,848,000</b>	<b>381,000</b>	<b>384,000</b>	<b>388,000</b>	<b>377,000</b>	<b>-</b>	<b>9,000</b>	<b>26,000</b>	<b>-</b>	<b>43,000</b>	<b>5,240,000</b>
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	5,240,000	-	-	-	-	-	-	-	-	-	5,240,000
Water Reserve	444,400	1,608,000	381,000	384,000	388,000	377,000	-	9,000	26,000	-	43,000	-
<b>Total Capital Financing</b>	<b>444,400</b>	<b>6,848,000</b>	<b>381,000</b>	<b>384,000</b>	<b>388,000</b>	<b>377,000</b>	<b>-</b>	<b>9,000</b>	<b>26,000</b>	<b>-</b>	<b>43,000</b>	<b>5,240,000</b>

**Table 4-2  
Capital Budget Forecast – Water – Wards 3 & 4**

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Equipment Contingency for Wards 3 and 4 Distribution and Transmission (50%)	6,000	-	-	-	-	-	-	-	-	-	-	-
Harrow Colchester South Water Treatment Plant Contingency for Wards 3 and 4	160,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 3 and 4 Distribution and Transmission)	9,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 3 and 4 Treatment)	2,400	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>	-	-	-	-	-	-	-	-	-	-	-	-
Water Meters, Valves, Tower, etc. - Ward 3 & 4	-	2,000	-	-	-	-	-	-	2,000	-	-	-
Water Treatment - Ward 3 & 4	-	116,000	12,000	11,000	9,000	10,000	-	-	5,000	17,000	25,000	27,000
Water Admin Inventory - Ward 3 & 4	-	133,000	-	-	31,000	-	5,000	32,000	65,000	-	-	-
Watermains - Ward 3 & 4	-	5,355,000	512,000	517,000	522,000	527,000	533,000	538,000	543,000	549,000	554,000	560,000
Water Hydrants - Ward 3 & 4	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>177,400</b>	<b>5,606,000</b>	<b>524,000</b>	<b>528,000</b>	<b>562,000</b>	<b>537,000</b>	<b>538,000</b>	<b>570,000</b>	<b>615,000</b>	<b>566,000</b>	<b>579,000</b>	<b>587,000</b>
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	5,606,000	524,000	528,000	562,000	537,000	538,000	570,000	615,000	566,000	579,000	587,000
Water Reserve	177,400	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>177,400</b>	<b>5,606,000</b>	<b>524,000</b>	<b>528,000</b>	<b>562,000</b>	<b>537,000</b>	<b>538,000</b>	<b>570,000</b>	<b>615,000</b>	<b>566,000</b>	<b>579,000</b>	<b>587,000</b>

**Table 4-3**  
**Capital Budget Forecast – Wastewater – Ward 1**

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Treatment - Ward 1 Contingency	22,000	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 1 Contingency	17,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 1 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 1 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewage Lagoon, Water and Public Works Facility)	28,000	-	-	-	-	-	-	-	-	-	-	-
North East Lagoon System Flow Optimization Study (carry forward SS-14-0007)	81,357	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>												
Wastewater Lagoons	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Pumping Stations	-	5,000	-	-	-	-	-	-	-	-	-	5,000
Wastewater Machinery & Equipment	-	7,000	-	-	-	-	-	-	7,000	-	-	-
Wastewater Forcemains	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Vehicles, Treatment & Disposal - Ward 1	-	44,000	-	-	30,000	10,000	4,000	-	-	-	-	-
Sanitary Manholes - Ward 1	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 1	-	-	-	-	-	-	-	-	-	-	-	-
<b>Studies:</b>												
North East Lagoon / Essex Pollution Control Plant Flow Optimization Study	200,000	-	-	-	-	-	-	-	-	-	-	-
Ward 1 Flooding Study	94,000	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>444,757</b>	<b>56,000</b>	-	-	30,000	10,000	4,000	-	7,000	-	-	5,000
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	56,000	-	-	30,000	10,000	4,000	-	7,000	-	-	5,000
Wastewater Reserve	444,757	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>444,757</b>	<b>56,000</b>	-	-	30,000	10,000	4,000	-	7,000	-	-	5,000

**Table 4-4  
Capital Budget Forecast – Wastewater – Ward 3**

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Treatment - Ward 3 Contingency	22,000	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 3 Contingency	25,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 3 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 3 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>												
Wastewater Treatment & Disposal - Ward 2	-	16,000	5,000	-	-	-	-	11,000	-	-	-	-
Sanitary Manholes - Ward 2	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 2	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Treatment & Disposal - Ward 3	-	7,000	-	-	-	-	-	-	-	-	7,000	-
Sanitary Manholes - Ward 3	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 3	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>49,400</b>	<b>23,000</b>	<b>5,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,000</b>
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	49,400	23,000	5,000	-	-	-	-	11,000	-	-	-	7,000
<b>Total Capital Financing</b>	<b>49,400</b>	<b>23,000</b>	<b>5,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,000</b>

**Table 4-5  
Capital Budget Forecast – Wastewater – Ward 4**

Description	Budget 2015	Total	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital Expenditures</b>													
Treatment - Ward 4 Contingency	17,000	-	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 4 Contingency	20,500	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 4 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 4 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>													
Wastewater Treatment & Disposal - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Manholes - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>39,900</b>	<b>-</b>											
<b>Capital Financing</b>													
Provincial/Federal Grants		-											
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	39,900	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>39,900</b>	<b>-</b>											

## **5. Overview of Expenditures and Revenues**

### **5.1 Water Operating Expenditures**

In this report, the forecasted water budget figures (2015-2025) are based on the 2015 Operating Budgets. The costs for each component of the operating budget have been reviewed with staff to establish forecast inflationary adjustments. Most of the expenditures have been assumed to increase at a rate of 2.0% annually. Operating expenditures which involve utilities, fuels, chemicals and hydro have been inflated by 5.0% annually. Note that annual contributions have been provided to the capital reserves in order to minimize the need for additional debt to finance the capital program. Also included are any debenture expenditures and contributions to reserve funds.

### **5.2 Water Operating Revenues**

The Town has base charges and miscellaneous revenue sources to help contribute towards operating expenditures. Some of these miscellaneous revenues, including connection charges and meter inspections, have been inflated by 2.0% for each year of the forecast period. Tables 5-1 and 5-2 provide for the operating budget for the water systems in Wards 1 & 2 and Wards 3 & 4 respectively.

**Table 5-1  
Operating Budget Forecast – Water – Wards 1 & 2**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Operating Costs</b>		-	-	-	-	-	-	-	-	-	-	-
55100 - ELK Energy Incorporated - Billing and Collection Charges	83,903	85,600	87,300	89,000	90,800	92,600	94,500	96,400	98,300	100,300	102,300	
51900 - Administration Charges - Town of Essex	20,259	20,700	21,100	21,500	21,900	22,300	22,700	23,200	23,700	24,200	24,700	
58900 - Amounts Allocated from Other Departments	25,483	26,000	26,500	27,000	27,500	28,100	28,700	29,300	29,900	30,500	31,100	
51100 - Office Supplies	400	400	400	400	400	400	400	400	400	400	400	
51105 - Computer Hardware and Software	750	800	800	800	800	800	800	800	800	800	800	
51110 - Postage and Courier	20	-	-	-	-	-	-	-	-	-	-	
51115 - Memberships	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
51140 - Janitorial Supplies and Services	547	600	600	600	600	600	600	600	600	600	600	
51150 - Vehicles - Fuel	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
51190 - Materials and Supplies - Other	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	
51600 - Materials & Supplies - Water Meters	20,000	21,000	22,100	23,200	24,400	25,600	26,900	28,200	29,600	31,100	32,700	
51800 - Office Equipment	190	200	200	200	200	200	200	200	200	200	200	
51840 - Small Tools	600	600	600	600	600	600	600	600	600	600	600	
53510 - Advertising	200	200	200	200	200	200	200	200	200	200	200	
53605 - System Access Fee - Automatic Vehicle Locator	760	800	800	800	800	800	800	800	800	800	800	
56700 - Leases - Office Equipment and Computers	200	200	200	200	200	200	200	200	200	200	200	
52120 - Repairs and Maintenance - Computers and Equipment	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
52300 - Repairs and Maintenance - Vehicles (Labour)	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
52305 - Repairs and Maintenance - Vehicles (Parts)	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
52350 - Repairs and Maintenance - Equipment (Labour)	150	200	200	200	200	200	200	200	200	200	200	
52355 - Repairs and Maintenance - Equipment (Parts)	150	200	200	200	200	200	200	200	200	200	200	
52600 - Repairs and Maintenance - Watermains	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
52620 - Repairs and Maintenance - Hydrants	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,700	18,100	
52640 - Repairs and Maintenance - Valves	7,500	7,700	7,900	8,100	8,300	8,500	8,700	8,900	9,100	9,300	9,500	
52660 - Repairs and Maintenance - Water Meters	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,700	18,100	
52690 - Repairs and Maintenance - Private Water Service	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
50100 - Salaries and Wages - Full-Time	107,625	109,800	112,000	114,200	116,500	118,800	121,200	123,600	126,100	128,600	131,200	
50120 - Salaries and Wages - Part-Time	3,682	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	
50150 - Salaries and Wages - Overtime	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
50400 - Benefits and Overhead Distributed	146	100	100	100	100	100	100	100	100	100	100	
50500 - Canada Pension Plan - Employer Contribution	3,884	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	
50510 - Employment Insurance - Employer Contribution	1,932	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
50520 - Employer Health Insurance	2,170	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50530 - Workplace Safety and Insurance Board Premiums	3,035	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	6,864	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	
50550 - Health Insurance Premiums	9,494	9,700	9,900	10,100	10,300	10,500	10,700	10,900	11,100	11,300	11,500	
50560 - Life Insurance Premiums	2,174	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50700 - Clothing and Uniforms	1,140	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
50720 - Training and Tuition Refund	2,690	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	
50740 - Meals	-	-	-	-	-	-	-	-	-	-	-	
50750 - Mileage	-	-	-	-	-	-	-	-	-	-	-	
54700 - Uncollectible Accounts Receivable - Water	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
54100 - Utilities - Hydro	12,180	12,800	13,400	14,100	14,800	15,500	16,300	17,100	18,000	18,900	19,800	
54120 - Utilities - Gas	1,783	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	
54140 - Utilities - Water	515	500	500	500	500	500	500	500	500	500	500	
54200 - Communications - Telephone	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
54300 - Insurance - Buildings	270	300	300	300	300	300	300	300	300	300	300	
54310 - Insurance - Vehicles	1,202	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
54320 - Insurance - General	8,516	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300	10,500	
<b>Treatment</b>		-	-	-	-	-	-	-	-	-	-	
55300 - Union Water - Water Supply	503,184	515,727	528,379	541,141	554,014	568,261	582,856	597,808	613,125	628,815	644,888	
54300 - Insurance - Buildings	158	200	200	200	200	200	200	200	200	200	200	
54310 - Insurance - Vehicles	320	300	300	300	300	300	300	300	300	300	300	
54320 - Insurance - General	2,271	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	
<b>Sub Total Operating</b>	<b>946,746</b>	<b>969,527</b>	<b>992,079</b>	<b>1,014,841</b>	<b>1,038,014</b>	<b>1,062,661</b>	<b>1,088,056</b>	<b>1,114,008</b>	<b>1,140,925</b>	<b>1,168,415</b>	<b>1,196,688</b>	

**Table 5-1 (con't)**  
**Operating Budget Forecast – Water – Wards 1 & 2**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related												
Existing Debt (Interest) - Growth Related												
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	434											
Existing Debt (Interest) - Non-Growth Related	149											
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	550,000		75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Sub Total Capital Related	550,583	-	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
<b>Total Expenditures</b>	<b>1,497,329</b>	<b>969,527</b>	<b>1,067,079</b>	<b>1,089,841</b>	<b>1,113,014</b>	<b>1,137,661</b>	<b>1,163,056</b>	<b>1,189,008</b>	<b>1,215,925</b>	<b>1,243,415</b>	<b>1,271,688</b>	
<b>Revenues</b>												
Base Charge	751,822	765,243	778,856	792,666	806,673	820,882	835,294	849,912	864,739	879,778	895,031	
43120 - Water Frontage and Connection Charges	562	562	562	562	562	562	562	562	562	562	562	
48900 - Amounts allocated to/from other Departments	-	-	-	-	-	-	-	-	-	-	-	
47800 - Miscellaneous Revenue	200	200	200	200	200	200	200	200	200	200	200	
46420 - Water Meter Sales and Inspection	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	
46430 - Water Hook-Up Charges	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	
46450 - Watermain Buy-Ins	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	
Other Revenue		-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Reserves / Reserve Funds	725,314	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>1,494,798</b>	<b>782,905</b>	<b>796,518</b>	<b>810,328</b>	<b>824,335</b>	<b>838,544</b>	<b>852,956</b>	<b>867,574</b>	<b>882,401</b>	<b>897,440</b>	<b>912,693</b>	
Water Billing Recovery - Operating	2,531	186,622	270,561	279,514	288,679	299,117	310,100	321,434	333,524	345,975	358,995	
Lifecycle Reserve Contribution (\$)	1,102,123	930,966	861,786	868,284	875,022	881,059	884,838	888,357	891,452	894,036	896,503	
<b>Water Billing Recovery - Total</b>	<b>1,104,654</b>	<b>1,117,588</b>	<b>1,132,347</b>	<b>1,147,798</b>	<b>1,163,701</b>	<b>1,180,176</b>	<b>1,194,938</b>	<b>1,209,791</b>	<b>1,224,976</b>	<b>1,240,011</b>	<b>1,255,498</b>	

**Table 5-2  
Operating Budget Forecast – Water – Wards 3 & 4**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Operating Costs</b>												
55100 - ELK Energy Incorporated - Billing and Collection Charges	86,593	88,300	90,100	91,900	93,700	95,600	97,500	99,500	101,500	103,500	105,600	
51900 - Administration Charges - Town of Essex	21,028	21,400	21,800	22,200	22,600	23,100	23,600	24,100	24,600	25,100	25,600	
58900 - Amounts Allocated from Other Departments	25,484	26,000	26,500	27,000	27,500	28,100	28,700	29,300	29,900	30,500	31,100	
51100 - Office Supplies	400	400	400	400	400	400	400	400	400	400	400	
51105 - Computer Hardware and Software	750	800	800	800	800	800	800	800	800	800	800	
51110 - Postage and Courier	20	-	-	-	-	-	-	-	-	-	-	
51115 - Memberships	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
51140 - Janitorial Supplies and Services	547	600	600	600	600	600	600	600	600	600	600	
51150 - Vehicles - Fuel	4,500	4,700	4,900	5,100	5,400	5,700	6,000	6,300	6,600	6,900	7,200	
51190 - Materials and Supplies - Other	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
51600 - Materials & Supplies - Water Meters	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
51800 - Office Equipment	190	200	200	200	200	200	200	200	200	200	200	
51840 - Small Tools	600	600	600	600	600	600	600	600	600	600	600	
53510 - Advertising	200	200	200	200	200	200	200	200	200	200	200	
53605 - System Access Fee - Automatic Vehicle Locator	760	800	800	800	800	800	800	800	800	800	800	
56700 - Leases - Office Equipment and Computers	200	200	200	200	200	200	200	200	200	200	200	
52120 - Repairs and Maintenance - Computers and Equipment	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
52300 - Repairs and Maintenance - Vehicles (Labour)	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
52305 - Repairs and Maintenance - Vehicles (Parts)	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
52350 - Repairs and Maintenance - Equipment (Labour)	150	200	200	200	200	200	200	200	200	200	200	
52355 - Repairs and Maintenance - Equipment (Parts)	150	200	200	200	200	200	200	200	200	200	200	
52600 - Repairs and Maintenance - Watermains	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
52620 - Repairs and Maintenance - Hydrants	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,700	18,100	
52640 - Repairs and Maintenance - Valves	7,500	7,700	7,900	8,100	8,300	8,500	8,700	8,900	9,100	9,300	9,500	
52660 - Repairs and Maintenance - Water Meters	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000	
52690 - Repairs and Maintenance - Private Water Service	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
50100 - Salaries and Wages - Full-Time	107,625	109,800	112,000	114,200	116,500	118,800	121,200	123,600	126,100	128,600	131,200	
50120 - Salaries and Wages - Part-Time	3,682	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	
50150 - Salaries and Wages - Overtime	-	-	-	-	-	-	-	-	-	-	-	
50400 - Benefits and Overhead Distributed	146	100	100	100	100	100	100	100	100	100	100	
50500 - Canada Pension Plan - Employer Contribution	3,884	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	
50510 - Employment Insurance - Employer Contribution	1,932	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
50520 - Employer Health Insurance	2,170	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50530 - Workplace Safety and Insurance Board Premiums	3,035	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	6,864	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	
50550 - Health Insurance Premiums	9,494	9,700	9,900	10,100	10,300	10,500	10,700	10,900	11,100	11,300	11,500	
50560 - Life Insurance Premiums	2,174	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50700 - Clothing and Uniforms	1,140	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
50720 - Training and Tuition Refund	2,691	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	
54100 - Utilities - Hydro	12,000	12,600	13,200	13,900	14,600	15,300	16,100	16,900	17,700	18,600	19,500	
54120 - Utilities - Gas	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	
54140 - Utilities - Water	500	500	500	500	500	500	500	500	500	500	500	
54200 - Communications - Telephone	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
54300 - Insurance - Buildings	270	300	300	300	300	300	300	300	300	300	300	
54310 - Insurance - Vehicles	1,202	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
54320 - Insurance - General	8,516	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300	10,500	
<b>Treatment</b>												
55200 - Ontario Clean Water Agency - Annual Operating Costs	351,218	358,200	365,400	372,700	380,200	387,800	395,600	403,500	411,600	419,800	428,200	
55250 - Ontario Clean Water Agency - Other Operating Costs	71,400	72,800	74,300	75,800	77,300	78,800	80,400	82,000	83,600	85,300	87,000	
55265 - Ontario Clean Water Agency - Drinking Water Quality Management System	2,550	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
55450 - Contractors	17,000	17,300	17,600	18,000	18,400	18,800	19,600	20,000	20,400	20,800		
51870 - Equipment	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	
52120 - Repairs and Maintenance - Computers and Equipment	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500	
54100 - Utilities - Hydro	80,928	85,000	89,300	93,800	98,500	103,400	108,600	114,000	119,700	125,700	132,000	
54120 - Utilities - Gas	11,754	12,300	12,900	13,500	14,200	14,900	15,600	16,400	17,200	18,100	19,000	
54300 - Insurance - Buildings	18,673	19,000	19,400	19,800	20,200	20,600	21,000	21,400	21,800	22,200	22,600	
54310 - Insurance - Vehicles	320	300	300	300	300	300	300	300	300	300	300	
54320 - Insurance - General	2,270	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	
55300 - Union Water - Water Supply	219,381	-	-	-	-	-	-	-	-	-	-	
<b>Sub Total Operating</b>	<b>1,204,188</b>	<b>1,007,700</b>	<b>1,031,100</b>	<b>1,055,000</b>	<b>1,079,600</b>	<b>1,104,800</b>	<b>1,130,900</b>	<b>1,157,600</b>	<b>1,185,200</b>	<b>1,213,500</b>	<b>1,242,600</b>	

**Table 5-2 (con't)**  
**Operating Budget Forecast – Water – Wards 3 & 4**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related												
Existing Debt (Interest) - Growth Related												
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	6,192	6,407	6,628	6,857	7,094	2,054	2,124	2,196	2,271	2,348	-	-
Existing Debt (Interest) - Non-Growth Related	1,521	1,307	1,085	856	619	374	304	232	157	80	-	-
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	1,443,676	198,102	154,766	61,150	17,055	27,869	32,723	37,203	41,012	44,352	49,552	49,552
Sub Total Capital Related	1,451,390	205,816	162,480	68,864	24,769	30,297	35,151	39,631	43,440	46,780	49,552	49,552
<b>Total Expenditures</b>	<b>2,655,578</b>	<b>1,213,516</b>	<b>1,193,580</b>	<b>1,123,864</b>	<b>1,104,369</b>	<b>1,135,097</b>	<b>1,166,051</b>	<b>1,197,231</b>	<b>1,228,640</b>	<b>1,260,280</b>	<b>1,292,152</b>	<b>1,292,152</b>
<b>Revenues</b>												
Base Charge	811,159	822,222	833,424	844,769	856,257	867,891	879,671	891,601	903,681	915,913	928,300	928,300
46945 - Building Leases and Rentals	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
43120 - Water Frontage and Connection Charges	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344
47800 - Miscellaneous Revenue	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
46420 - Water Meter Sales and Inspection	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157
46430 - Water Hook-Up Charges	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800
46450 - Watermain Buy-Ins	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
46945 - Building Leases and Rentals	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329
Other Revenue		-	-	-	-	-	-	-	-	-	-	-
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	564,414	-	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,442,403</b>	<b>889,052</b>	<b>900,254</b>	<b>911,599</b>	<b>923,087</b>	<b>934,721</b>	<b>946,501</b>	<b>958,431</b>	<b>970,511</b>	<b>982,743</b>	<b>995,130</b>	<b>995,130</b>
Water Billing Recovery - Operating	1,213,175	324,464	293,325	212,264	181,281	200,377	219,550	238,801	258,130	277,537	297,022	297,022
Lifecycle Reserve Contribution (\$)		900,000	950,000	1,050,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
<b>Water Billing Recovery - Total</b>	<b>1,213,175</b>	<b>1,224,464</b>	<b>1,243,325</b>	<b>1,262,264</b>	<b>1,281,281</b>	<b>1,300,377</b>	<b>1,319,550</b>	<b>1,338,801</b>	<b>1,358,130</b>	<b>1,377,537</b>	<b>1,397,022</b>	<b>1,397,022</b>

### **5.3 Wastewater Operating Expenditures**

The wastewater operating expenditures have been adjusted over the forecast period by an annual inflationary factor of 2.0%. Operating expenditures which involve utilities, fuels, chemicals and hydro have been inflated by 5.0% annually. Also included are contributions to the capital reserve.

### **5.4 Wastewater Operating Revenues**

The operating revenue for the wastewater program comes mainly from base charges along with volumetric revenue from customers. A small amount of revenue is also generated from sewer frontage charges and rentals. Tables 5-3, 5-4 and 5-5 outline the operating budget for the Essex wastewater system for Wards 1, 3 and 4.

**Table 5-3  
Operating Budget Forecast – Wastewater – Ward 1**

Description	Budget 2015	Forecast									
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Operating Costs</b>											
55100 - ELK Energy Incorporated - Billing and Collection Charges	66,241	67,600	69,000	70,400	71,800	73,200	74,700	76,200	77,700	79,300	80,900
51900 - Administration Charges - Town of Essex	15,361	15,700	16,000	16,300	16,600	16,900	17,200	17,500	17,900	18,300	18,700
58900 - Amounts Allocated from Other Departments	16,989	17,300	17,600	18,000	18,400	18,800	19,200	19,600	20,000	20,400	20,800
51100 - Office Supplies	100	100	100	100	100	100	100	100	100	100	100
51105 - Computer Hardware and Software	250	300	300	300	300	300	300	300	300	300	300
51110 - Postage and Courier	10	-	-	-	-	-	-	-	-	-	-
51115 - Memberships	305	300	300	300	300	300	300	300	300	300	300
51140 - Janitorial Supplies and Services	115	100	100	100	100	100	100	100	100	100	100
51150 - Vehicles - Fuel	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
51190 - Materials and Supplies - Other	2,700	2,800	2,900	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,400
51800 - Office Equipment	40	-	-	-	-	-	-	-	-	-	-
51840 - Small Tools	100	100	100	100	100	100	100	100	100	100	100
53510 - Advertising	50	100	100	100	100	100	100	100	100	100	100
53605 - System Access Fee - Automatic Vehicle Locator	160	200	200	200	200	200	200	200	200	200	200
53650 - Weed Control Services	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
56700 - Leases - Office Equipment and Computers	75	100	100	100	100	100	100	100	100	100	100
52120 - Repairs and Maintenance - Computers and Equipment	400	400	400	400	400	400	400	400	400	400	400
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	200	200	200	200	200	200	200	200	200	200	200
52300 - Repairs and Maintenance - Vehicles (Labour)	500	500	500	500	500	500	500	500	500	500	500
52305 - Repairs and Maintenance - Vehicles (Parts)	600	600	600	600	600	600	600	600	600	600	600
52350 - Repairs and Maintenance - Equipment (Labour)	50	100	100	100	100	100	100	100	100	100	100
52355 - Repairs and Maintenance - Equipment (Parts)	50	100	100	100	100	100	100	100	100	100	100
52900 - Repairs and Maintenance - Other	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800	47,700	48,700
50100 - Salaries and Wages - Full-Time	22,658	23,100	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600
50120 - Salaries and Wages - Part-Time	775	800	800	800	800	800	800	800	800	800	800
50150 - Salaries and Wages - Overtime	-	-	-	-	-	-	-	-	-	-	-
50400 - Benefits and Overhead Distributed	31	-	-	-	-	-	-	-	-	-	-
50500 - Canada Pension Plan - Employer Contribution	818	800	800	800	800	800	800	800	800	800	800
50510 - Employment Insurance - Employer Contribution	407	400	400	400	400	400	400	400	400	400	400
50520 - Employer Health Insurance	457	500	500	500	500	500	500	500	500	500	500
50530 - Workplace Safety and Insurance Board Premiums	639	700	700	700	700	700	700	700	700	700	700
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	1,445	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
50550 - Health Insurance Premiums	1,999	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
50560 - Life Insurance Premiums	458	500	500	500	500	500	500	500	500	500	500
50700 - Clothing and Uniforms	240	200	200	200	200	200	200	200	200	200	200
50720 - Training and Tuition Refund	566	600	600	600	600	600	600	600	600	600	600
54100 - Utilities - Hydro	2,500	2,600	2,700	2,800	2,900	3,000	3,200	3,400	3,600	3,800	4,000
54120 - Utilities - Gas	350	400	400	400	400	400	400	400	400	400	400
54140 - Utilities - Water	125	100	100	100	100	100	100	100	100	100	100
54200 - Communications - Telephone	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
54310 - Insurance - Vehicles	240	200	200	200	200	200	200	200	200	200	200
54320 - Insurance - General	1,703	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
<b>Treatment</b>											
55200 - Ontario Clean Water Agency - Annual Operating Costs	230,741	235,400	240,100	244,900	249,800	254,800	259,900	265,100	270,400	275,800	281,300
55250 - Ontario Clean Water Agency - Other Operating Costs	54,060	55,100	56,200	57,300	58,400	59,600	60,800	62,000	63,200	64,500	65,800
55310 - Garbage Collection Fees - Ward 1	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
55400 - Garbage Disposal (Tipping Fees)	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300
51105 - Computer Hardware and Software	792	800	800	800	800	800	800	800	800	800	800
51190 - Materials and Supplies - Other	30,000	30,600	31,200	31,800	32,400	33,000	33,700	34,400	35,100	35,800	36,500
53650 - Weed Control Services	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000
53100 - Professional Fees - Legal	350	400	400	400	400	400	400	400	400	400	400
52900 - Repairs and Maintenance - Other	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000
54100 - Utilities - Hydro	82,529	84,200	85,900	87,600	89,400	91,200	93,000	94,900	96,800	98,700	100,700
54120 - Utilities - Gas	4,398	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
54140 - Utilities - Water	5,569	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600
54200 - Communications - Telephone	3,554	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500
54300 - Insurance - Buildings	13,864	14,100	14,400	14,700	15,000	15,300	15,600	15,900	16,200	16,500	16,800
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600
54400 - Payments-in-Lieu of Taxes	19,364	19,800	20,200	20,600	21,000	21,400	21,800	22,200	22,600	23,100	23,600
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700
<b>Sub Total Operating</b>	<b>669,774</b>	<b>733,500</b>	<b>748,000</b>	<b>762,700</b>	<b>777,700</b>	<b>793,100</b>	<b>808,900</b>	<b>824,900</b>	<b>841,200</b>	<b>857,900</b>	<b>875,000</b>

**Table 5-3 (con't)**  
**Operating Budget Forecast – Wastewater – Ward 1**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related	670,663	688,006	214,732	220,482	226,386	232,448	238,672	245,063	251,625	258,363	265,281	
Existing Debt (Interest) - Growth Related	95,147	77,804	63,098	57,348	51,444	45,382	39,158	32,767	26,205	19,468	12,549	
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Principal) - Non-Growth Related	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Interest) - Non-Growth Related	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital Reserve	1,316,192	306,754	235,537	164,773	144,371	124,343	104,601	85,355	66,518	48,002	79,918	
Sub Total Capital Related	2,082,002	1,072,564	513,367	442,603	422,201	402,173	382,431	363,186	344,349	325,832	357,749	
<b>Total Expenditures</b>	<b>2,751,777</b>	<b>1,806,064</b>	<b>1,261,367</b>	<b>1,205,303</b>	<b>1,199,901</b>	<b>1,195,273</b>	<b>1,191,331</b>	<b>1,188,086</b>	<b>1,185,549</b>	<b>1,183,732</b>	<b>1,232,749</b>	
<b>Revenues</b>												
Base Charge	621,237	638,246	655,688	673,572	691,910	710,711	729,987	749,751	770,012	790,785	812,080	
43220 - Sewer Frontage and Connection Charges	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	
46970 - Land Leases and Rentals	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	
Other Revenue	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	765,810	765,810	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830	
Contributions from Reserves / Reserve Funds	487,069	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>1,891,013</b>	<b>1,420,954</b>	<b>950,416</b>	<b>968,300</b>	<b>986,637</b>	<b>1,005,439</b>	<b>1,024,715</b>	<b>1,044,479</b>	<b>1,064,740</b>	<b>1,085,513</b>	<b>1,106,808</b>	
Wastewater Billing Recovery - Operating	860,763	385,110	310,951	237,002	213,264	189,835	166,616	143,607	120,808	98,219	125,940	
Lifecycle Reserve Contribution (\$)	-	500,000	599,000	698,000	747,000	795,900	844,800	893,700	942,600	991,500	990,300	
<b>Wastewater Billing Recovery - Total</b>	<b>860,763</b>	<b>885,110</b>	<b>909,951</b>	<b>935,002</b>	<b>960,264</b>	<b>985,735</b>	<b>1,011,416</b>	<b>1,037,307</b>	<b>1,063,408</b>	<b>1,089,719</b>	<b>1,116,240</b>	

**Table 5-4  
Operating Budget Forecast – Wastewater – Ward 3**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Operating Costs</b>												
55100 - ELK Energy Incorporated - Billing and Collection Charges	21,742	22,200	22,600	23,100	23,600	24,100	24,600	25,100	25,600	26,100	26,600	
55250 - Ontario Clean Water Agency - Other Operating Costs	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
51900 - Administration Charges - Town of Essex	5,445	5,600	5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	
58900 - Amounts Allocated from Other Departments	16,989	17,300	17,600	18,000	18,400	18,800	19,200	19,600	20,000	20,400	20,800	
51100 - Office Supplies	100	100	100	100	100	100	100	100	100	100	100	
51105 - Computer Hardware and Software	250	300	300	300	300	300	300	300	300	300	300	
51110 - Postage and Courier	10	-	-	-	-	-	-	-	-	-	-	
51115 - Memberships	305	300	300	300	300	300	300	300	300	300	300	
51140 - Janitorial Supplies and Services	115	100	100	100	100	100	100	100	100	100	100	
51150 - Vehicles - Fuel	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	
51190 - Materials and Supplies - Other	950	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	
51800 - Office Equipment	40	-	-	-	-	-	-	-	-	-	-	
51840 - Small Tools	100	100	100	100	100	100	100	100	100	100	100	
53510 - Advertising	50	100	100	100	100	100	100	100	100	100	100	
53605 - System Access Fee - Automatic Vehicle Locator	160	200	200	200	200	200	200	200	200	200	200	
53650 - Weed Control Services	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	
56700 - Leases - Office Equipment and Computers	75	100	100	100	100	100	100	100	100	100	100	
52120 - Repairs and Maintenance - Computers and Equipment	400	400	400	400	400	400	400	400	400	400	400	
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	200	200	200	200	200	200	200	200	200	200	200	
52300 - Repairs and Maintenance - Vehicles (Labour)	500	500	500	500	500	500	500	500	500	500	500	
52305 - Repairs and Maintenance - Vehicles (Parts)	600	600	600	600	600	600	600	600	600	600	600	
52350 - Repairs and Maintenance - Equipment (Labour)	50	100	100	100	100	100	100	100	100	100	100	
52355 - Repairs and Maintenance - Equipment (Parts)	50	100	100	100	100	100	100	100	100	100	100	
52900 - Repairs and Maintenance - Other	25,000	25,500	26,000	26,500	27,000	27,500	28,100	28,700	29,300	29,900	30,500	
50100 - Salaries and Wages - Full-Time	22,658	23,100	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600	
50120 - Salaries and Wages - Part-Time	775	800	800	800	800	800	800	800	800	800	800	
50150 - Salaries and Wages - Overtime	-	-	-	-	-	-	-	-	-	-	-	
50400 - Benefits and Overhead Distributed	31	-	-	-	-	-	-	-	-	-	-	
50500 - Canada Pension Plan - Employer Contribution	818	800	800	800	800	800	800	800	800	800	800	
50510 - Employment Insurance - Employer Contribution	407	400	400	400	400	400	400	400	400	400	400	
50520 - Employer Health Insurance	457	500	500	500	500	500	500	500	500	500	500	
50530 - Workplace Safety and Insurance Board Premiums	639	700	700	700	700	700	700	700	700	700	700	
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	1,445	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
50550 - Health Insurance Premiums	1,999	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
50560 - Life Insurance Premiums	458	500	500	500	500	500	500	500	500	500	500	
50700 - Clothing and Uniforms	240	200	200	200	200	200	200	200	200	200	200	
50720 - Training and Tuition Refund	566	600	600	600	600	600	600	600	600	600	600	
54100 - Utilities - Hydro	2,500	2,600	2,700	2,800	2,900	3,000	3,200	3,400	3,600	3,800	4,000	
54120 - Utilities - Gas	350	400	400	400	400	400	400	400	400	400	400	
54140 - Utilities - Water	125	100	100	100	100	100	100	100	100	100	100	
54200 - Communications - Telephone	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
54310 - Insurance - Vehicles	240	200	200	200	200	200	200	200	200	200	200	
54320 - Insurance - General	1,702	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	
<b>Treatment</b>												
55200 - Ontario Clean Water Agency - Annual Operating Costs	87,733	89,500	91,300	93,100	95,000	96,900	98,800	100,800	102,800	104,900	107,000	
55250 - Ontario Clean Water Agency - Other Operating Costs	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
55450 - Contractors	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800	47,700	48,700	
51190 - Materials and Supplies - Other	30,000	31,500	33,100	34,800	36,500	38,300	40,200	42,200	44,300	46,500	48,800	
53650 - Weed Control Services	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	
52900 - Repairs and Maintenance - Other	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
54100 - Utilities - Hydro	57,223	60,100	63,100	66,300	69,600	73,100	76,800	80,600	84,600	88,800	93,200	
54300 - Insurance - Buildings	3,719	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100	
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600	
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	
<b>Sub Total Operating</b>	<b>346,162</b>	<b>406,100</b>	<b>416,900</b>	<b>428,200</b>	<b>439,700</b>	<b>451,700</b>	<b>464,200</b>	<b>477,000</b>	<b>490,100</b>	<b>503,600</b>	<b>517,600</b>	

**Table 5-4 (con't)**  
**Operating Budget Forecast – Wastewater – Ward 3**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related												
Existing Debt (Interest) - Growth Related												
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related												
Existing Debt (Interest) - Non-Growth Related												
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-											
Transfer to Capital Reserve	415,895	2,057	3,667	5,340	7,077	8,879	10,747	12,681	14,684	16,755	18,941	
Sub Total Capital Related	415,895	2,057	3,667	5,340	7,077	8,879	10,747	12,681	14,684	16,755	18,941	
<b>Total Expenditures</b>	<b>762,057</b>	<b>408,157</b>	<b>420,567</b>	<b>433,540</b>	<b>446,777</b>	<b>460,579</b>	<b>474,947</b>	<b>489,681</b>	<b>504,784</b>	<b>520,355</b>	<b>536,541</b>	
<b>Revenues</b>												
Base Charge	245,438	254,653	264,200	274,091	284,338	294,952	305,948	317,338	329,135	341,356	354,013	
46970 - Land Leases and Rentals	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Reserves / Reserve Funds	231,322	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>476,760</b>	<b>254,653</b>	<b>264,200</b>	<b>274,091</b>	<b>284,338</b>	<b>294,952</b>	<b>305,948</b>	<b>317,338</b>	<b>329,135</b>	<b>341,356</b>	<b>354,013</b>	
Wastewater Billing Recovery - Operating	285,297	153,504	156,366	159,449	162,439	165,627	168,999	172,344	175,648	178,999	182,528	
Lifecycle Reserve Contribution (\$)		141,933	150,377	158,735	167,320	175,842	185,877	196,096	206,513	217,039	227,545	
<b>Wastewater Billing Recovery - Total</b>	<b>285,297</b>	<b>295,437</b>	<b>306,743</b>	<b>318,184</b>	<b>329,759</b>	<b>341,469</b>	<b>354,876</b>	<b>368,440</b>	<b>382,161</b>	<b>396,039</b>	<b>410,073</b>	

**Table 5-5**  
**Operating Budget Forecast – Wastewater – Ward 4**

Description	Budget 2015	Forecast									
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Operating Costs</b>											
55100 - ELK Energy Incorporated - Billing and Collection Charges	31,648	32,300	32,900	33,600	34,300	35,000	35,700	36,400	37,100	37,800	38,600
51900 - Administration Charges - Town of Essex	8,031	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
58900 - Amounts Allocated from Other Departments	16,989	17,300	17,600	18,000	18,400	18,800	19,200	19,600	20,000	20,400	20,800
51100 - Office Supplies	100	100	100	100	100	100	100	100	100	100	100
51105 - Computer Hardware and Software	250	300	300	300	300	300	300	300	300	300	300
51110 - Postage and Courier	10	-	-	-	-	-	-	-	-	-	-
51115 - Memberships	305	300	300	300	300	300	300	300	300	300	300
51140 - Janitorial Supplies and Services	115	100	100	100	100	100	100	100	100	100	100
51150 - Vehicles - Fuel	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
51190 - Materials and Supplies - Other	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700
51800 - Office Equipment	40	-	-	-	-	-	-	-	-	-	-
51840 - Small Tools	100	100	100	100	100	100	100	100	100	100	100
53510 - Advertising	50	100	100	100	100	100	100	100	100	100	100
53605 - System Access Fee - Automatic Vehicle Locator	160	200	200	200	200	200	200	200	200	200	200
53650 - Weed Control Services	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
56700 - Leases - Office Equipment and Computers	75	100	100	100	100	100	100	100	100	100	100
52120 - Repairs and Maintenance - Computers and Equipment	400	400	400	400	400	400	400	400	400	400	400
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	200	200	200	200	200	200	200	200	200	200	200
52300 - Repairs and Maintenance - Vehicles (Labour)	500	500	500	500	500	500	500	500	500	500	500
52305 - Repairs and Maintenance - Vehicles (Parts)	600	600	600	600	600	600	600	600	600	600	600
52350 - Repairs and Maintenance - Equipment (Labour)	50	100	100	100	100	100	100	100	100	100	100
52355 - Repairs and Maintenance - Equipment (Parts)	50	100	100	100	100	100	100	100	100	100	100
52900 - Repairs and Maintenance - Other	30,000	30,600	31,200	31,800	32,400	33,000	33,700	34,400	35,100	35,800	36,500
50100 - Salaries and Wages - Full-Time	22,658	23,100	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600
50120 - Salaries and Wages - Part-Time	775	800	800	800	800	800	800	800	800	800	800
50150 - Salaries and Wages - Overtime	-	-	-	-	-	-	-	-	-	-	-
50400 - Benefits and Overhead Distributed	31	-	-	-	-	-	-	-	-	-	-
50500 - Canada Pension Plan - Employer Contribution	818	800	800	800	800	800	800	800	800	800	800
50510 - Employment Insurance - Employer Contribution	407	400	400	400	400	400	400	400	400	400	400
50520 - Employer Health Insurance	457	500	500	500	500	500	500	500	500	500	500
50530 - Workplace Safety and Insurance Board Premiums	639	700	700	700	700	700	700	700	700	700	700
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	1,445	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
50550 - Health Insurance Premiums	1,999	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
50560 - Life Insurance Premiums	458	500	500	500	500	500	500	500	500	500	500
50700 - Clothing and Uniforms	240	200	200	200	200	200	200	200	200	200	200
50720 - Training and Tuition Refund	566	600	600	600	600	600	600	600	600	600	600
54100 - Utilities - Hydro	2,500	2,600	2,700	2,800	2,900	3,000	3,200	3,400	3,600	3,800	4,000
54140 - Utilities - Water	475	500	500	500	500	500	500	500	500	500	500
54200 - Communications - Telephone	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
54310 - Insurance - Vehicles	240	200	200	200	200	200	200	200	200	200	200
54320 - Insurance - General	1,703	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
<b>Treatment</b>											
55200 - Ontario Clean Water Agency - Annual Operating Costs	99,578	101,600	103,600	105,700	107,800	110,000	112,200	114,400	116,700	119,000	121,400
55250 - Ontario Clean Water Agency - Other Operating Costs	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
55340 - Garbage Collection Fees - Ward 4	215	200	200	200	200	200	200	200	200	200	200
51190 - Materials and Supplies - Other	10,000	10,500	11,000	11,600	12,200	12,800	13,400	14,100	14,800	15,500	16,300
53650 - Weed Control Services	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900	7,000
52900 - Repairs and Maintenance - Other	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000
54100 - Utilities - Hydro	90,567	95,100	99,900	104,900	110,100	115,600	121,400	127,500	133,900	140,600	147,600
54200 - Communications - Telephone	954	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
54300 - Insurance - Buildings	1,104	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700
<b>Sub Total Operating</b>	<b>346,349</b>	<b>406,700</b>	<b>417,900</b>	<b>429,700</b>	<b>441,700</b>	<b>454,200</b>	<b>467,200</b>	<b>480,600</b>	<b>494,400</b>	<b>508,500</b>	<b>523,300</b>

**Table 5-5 (con't)**  
**Operating Budget Forecast – Wastewater – Ward 4**

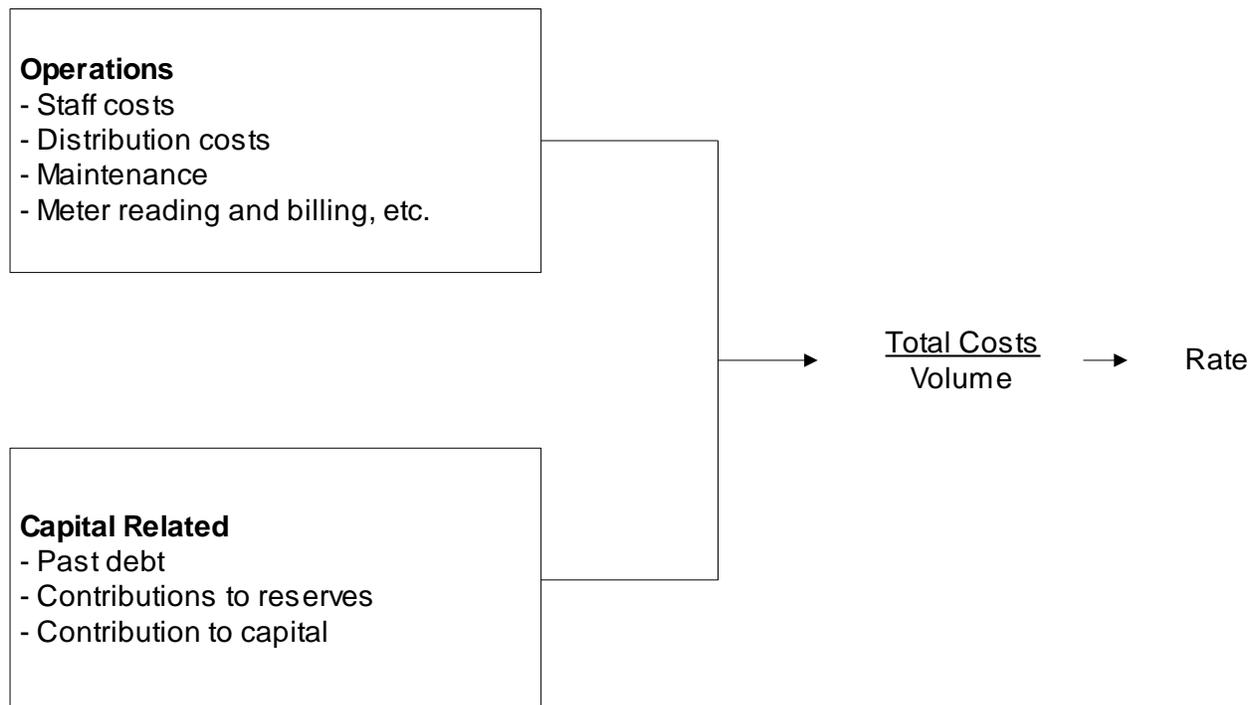
Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related	36,865	37,856	38,873	39,918	40,991	42,093	43,224	44,386	45,579	46,804	23,872	
Existing Debt (Interest) - Growth Related	11,516	10,525	9,507	8,463	7,390	6,288	5,157	3,995	2,802	1,577	319	
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Principal) - Non-Growth Related	196,346	201,856	207,523	213,350	219,342	225,504	231,840	238,356	245,057	251,949	105,959	
Existing Debt (Interest) - Non-Growth Related	64,104	58,593	52,927	47,100	41,108	34,946	28,610	22,093	15,392	8,501	1,415	
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Development Charge - Discounts	7,840	12,105	-	-	-	-	-	-	-	-	-	
Transfer to Capital Reserve	620,010	52,346	47,400	29,974	12,576	9,910	6,980	3,890	5,643	2,344	6,672	
Sub Total Capital Related	936,680	373,282	356,230	338,804	321,406	318,741	315,811	312,720	314,474	311,174	138,237	
Total Expenditures	1,283,029	779,982	774,130	768,504	763,106	772,941	783,011	793,320	808,874	819,674	661,537	
<b>Revenues</b>												
Base Charge	263,868	270,292	276,867	283,597	290,485	297,536	304,752	312,138	319,697	327,434	335,353	
43220 - Sewer Frontage and Connection Charges	63,979	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	24,190	
Contributions from Reserves / Reserve Funds	431,314	-	-	-	-	-	-	-	-	-	-	
Total Operating Revenue	807,541	318,672	325,247	331,977	338,866	345,916	353,132	360,518	368,078	375,815	359,543	
Wastewater Billing Recovery - Operating	475,488	461,309	448,883	436,527	424,241	427,024	429,878	432,802	440,796	443,860	301,993	
Lifecycle Reserve Contribution (\$)	-	25,000	50,000	75,000	100,000	110,000	120,000	130,000	135,000	145,000	300,000	
<b>Wastewater Billing Recovery - Total</b>	<b>475,488</b>	<b>486,309</b>	<b>498,883</b>	<b>511,527</b>	<b>524,241</b>	<b>537,024</b>	<b>549,878</b>	<b>562,802</b>	<b>575,796</b>	<b>588,860</b>	<b>601,993</b>	

## 6. Pricing Structures

### 6.1 Introduction

Rates, in their simplest form, can be defined as total costs to maintain the utility function divided by the total expected volume to be generated for the period. Total costs are usually a combination of operating costs (e.g. staff costs, distribution costs, maintenance, administration, etc.) and capital-related costs (e.g. past debt to finance capital projects, transfers to reserves to finance future expenditures, etc.). The schematic below provides a simplified illustration of the rate calculation for water.

#### “Annual Costs”



These operating and capital expenditures will vary over time. Examples of factors which will affect the expenditures over time are provided below.

#### Operations

- Inflation;
- Increased maintenance as system ages; and
- Changes to provincial legislation.

## Capital Related

- New capital will be built as areas expand;
- Replacement capital needed as system ages; and
- Financing of capital costs are a function of policy regarding reserves and direct financing from rates (pay as you go), debt and user pay methods (development charges, Municipal Act).

## **6.2 Alternative Pricing Structures**

Throughout Ontario, and as well, Canada, the use of pricing mechanisms varies between municipalities. The use of a particular form of pricing depends upon numerous factors, including Council preference, administrative structure, surplus/deficit system capacities, economic/ demographic conditions, to name a few.

Municipalities within Ontario have two basic forms of collecting revenues for water purposes, those being through incorporation of the costs within the tax rate charged on property assessment and/or through the establishment of a specific water rate billed to the customer. Within the rate methods, there are five basic rate structures employed along with other variations:

- Flat Rate (non-metered customers);
- Constant Rate;
- Declining Block Rate;
- Increasing (or Inverted) Block Rate;
- Hump Back Block Rate; and
- Base Charges.

The definitions and general application of the various methods are as follows:

**Property Assessment:** This method incorporates the total costs of providing water into the general requisition or the assessment base of the Municipality. This form of collection is a "wealth tax", as payment increases directly with the value of property owned and bears no necessary relationship to actual consumption. This form is easy to administer as the costs to be recovered are incorporated in the calculation for all general services, normally collected through property taxes.

**Flat Rate:** This rate is a constant charge applicable to all customers served. The charge is calculated by dividing the total number of user households and other entities (e.g. businesses) into the costs to be recovered. This method does not recognize differences in actual consumption but provides for a uniform spreading of costs across

all users. Some municipalities define users into different classes of similar consumption patterns, that is, a commercial user, residential user and industrial user, and charge a flat rate by class. Each user is then billed on a periodic basis. No meters are required to facilitate this method, but an accurate estimate of the number of users is required. This method ensures set revenue for the collection period but is not sensitive to consumption, hence may cause a shortfall or surplus of revenues collected.

**Constant Rate:** This rate is a volume-based rate, in which the consumer pays the same price per unit consumed, regardless of the volume. The price per unit is calculated by dividing the total cost of the service by the total volume used by total consumers. The bill to the consumer climbs uniformly as the consumption increases. This form of rate requires the use of meters to record the volume consumed by each user. This method closely aligns the revenue recovery with consumption. Revenue collected varies directly with the consumption volume.

**Declining Block Rates:** This rate structure charges a successively lower price for set volumes, as consumption increases through a series of "blocks". That is to say that within set volume ranges, or blocks, the charge per unit is set at one rate. Within the next volume range the charge per unit decreases to lower rate, and so on. Typically, the first, or first and second blocks cover residential and light commercial uses. Subsequent blocks normally are used for heavier commercial and industrial uses. This rate structure requires the use of meters to record the volume consumed by each type of user. This method requires the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect revenue from rate payers.

**Increasing or Inverted Block Rates:** The increasing block rate works essentially the same way as the declining block rate, except that the price of water in successive blocks increases rather than declines. Under this method the consumer's bill rises faster with higher volumes used. This rate structure also requires the use of meters to record the volume consumed by each user. This method requires, as with the declining block structure, the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect from rate payers.

**The Hump Back Rate:** The hump back rate is a combination of an increasing block rate and the declining block rate. Under this method the consumer's bill rises with higher volumes used up to a certain level and then begins to fall for volumes in excess of levels set for the increasing block rate.

### 6.3 Assessment of Alternative Pricing Structures

The adoption by a Municipality or utility of any one particular pricing structure is normally a function of a variety of administrative, social, demographic and financial factors. The number of factors and the weighting each particular factor receives can vary between municipalities. The following is a review of some of the more prevalent factors:

#### Cost Recovery

Cost recovery is a prime factor in establishing a particular pricing structure. Costs can be loosely defined into different categories: operations, maintenance, capital, financing and administration. These costs often vary between municipalities and even within a municipality, based on consumption patterns, infrastructure age, economic growth, etc.

The pricing alternatives defined earlier can all achieve the cost recovery goal, but some do so more precisely than others. Fixed pricing structures, such as Property Assessment and Flat Rate, are established on the value of property or on the number of units present in the municipality, but do not adjust in accordance with consumption. Thus, if actual consumption for the year is greater than projected, the municipality incurs a higher cost of production, but the revenue base remains static (since it was determined at the beginning of the year), thus potentially providing a funding shortfall. Conversely, if the consumption level declines below projections, fixed pricing structures will produce more revenue than actual costs incurred.

The other pricing methods (declining block, constant rate, increasing block) are consumption based and generally will generate revenues in proportion to actual consumption.

#### Administration

Administration is defined herein as the staffing, equipment and supplies required to support the undertaking of a particular pricing strategy. This factor not only addresses the physical tangible requirements to support the collection of the revenues, but also the intangible requirements, such as policy development.

The easiest pricing structure to support is the Property Assessment structure. As municipalities undertake the process of calculating property tax bills and the collection process for their general services, the incorporation of the water costs into this calculation would have virtually no impact on the administrative process and structure.

The Flat Rate pricing structure is relatively easy to administer as well. It is normally calculated to collect a set amount, either on a monthly, quarterly, semi-annual or annual basis and is billed directly to the customer. The impact on administration centres mostly on the accounts receivable or billing area of the municipality, but normally requires minor additional staff or operating costs to undertake.

The three remaining methods, those being Increasing Block Rate, Constant Rate and Declining Block Rate, have a more dramatic effect on administration. These methods are dependent upon actual consumption and hence involve a major structure in place to administer. First, meters must be installed in all existing units in the municipality and units to be subsequently built must be required to include these meters. Second, meter readings must be undertaken periodically. Hence staff must be available for this purpose or a service contract must be negotiated. Third, the billings process must be expanded to accommodate this process. Billing must be done per a defined period, requiring staff to produce the bills. Lastly, either through increased staffing or by service contract, an annual maintenance program must be set up to ensure meters are working effectively in recording consumed volumes.

The benefit derived from the installation of meters is that information on consumption patterns becomes available. This information provides benefit to administration in calculating rates which will ensure revenue recovery. Additionally, when planning what services are to be constructed in future years, the municipality or utility has documented consumption patterns distinctive to its own situation, which can be used to project sizing of growth-related works.

### Equity

Equity is always a consideration in the establishment of pricing structures but its definition can vary depending on a municipality's circumstances and based on the subjective interpretation of those involved. For example: is the price charged to a particular class of rate payer consistent with those of a similar class in surrounding municipalities; through the pricing structure does one class of rate payer pay more than another class; should one pay based on ability to pay, or on the basis that a unit of water costs the same to supply no matter who consumes it; etc. There are many interpretations. Equity therefore must be viewed broadly in light of many factors as part of achieving what is best for the municipality as a whole.

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## Conservation

In today's society, conservation of natural resources is increasingly being more highly valued. Controversy continuously focuses on the preservation of non-renewable resources and on the proper management of renewable resources. Conservation is also a concept which applies to a municipality facing physical limitations in the amount of water which can be supplied to an area. As well, financial constraints can encourage conservation in a municipality where the cost of providing each additional unit is increasing.

Pricing structures such as property assessment and flat rate do not, in themselves, encourage conservation. In fact, depending on the price which is charged, they may even encourage resource "squandering," either because consumers, without the price discipline, consume water at will, or the customer wants to get his money's worth and hence adopts more liberal consumption patterns. The fundamental reason for this is that the price paid for the service bears no direct relationship to the volume consumed and hence is viewed as a "tax," instead of being viewed as the price of a purchased commodity.

The Declining Block Rate provides a decreasing incentive towards conservation. By creating awareness of volumes consumed, the consumer can reduce his total costs by restricting consumption; however the incentive lessens as more water is consumed, because the marginal cost per unit declines as the consumer enters the next block pricing range. Similarly, those whose consumption level is at the top end of a block have reduced incentive to reduce consumption.

The Constant Rate structure presents the customer with a linear relationship between consumption and the cost thereof. As the consumer pays a fixed cost per unit, his bill will vary directly with the amount consumed. This method presents tangible incentive for consumers to conserve water. As metering provides direct feedback as to usage patterns and the consumer has direct control over the total amount paid for the commodity, the consumer is encouraged to use only those volumes that are reasonably required.

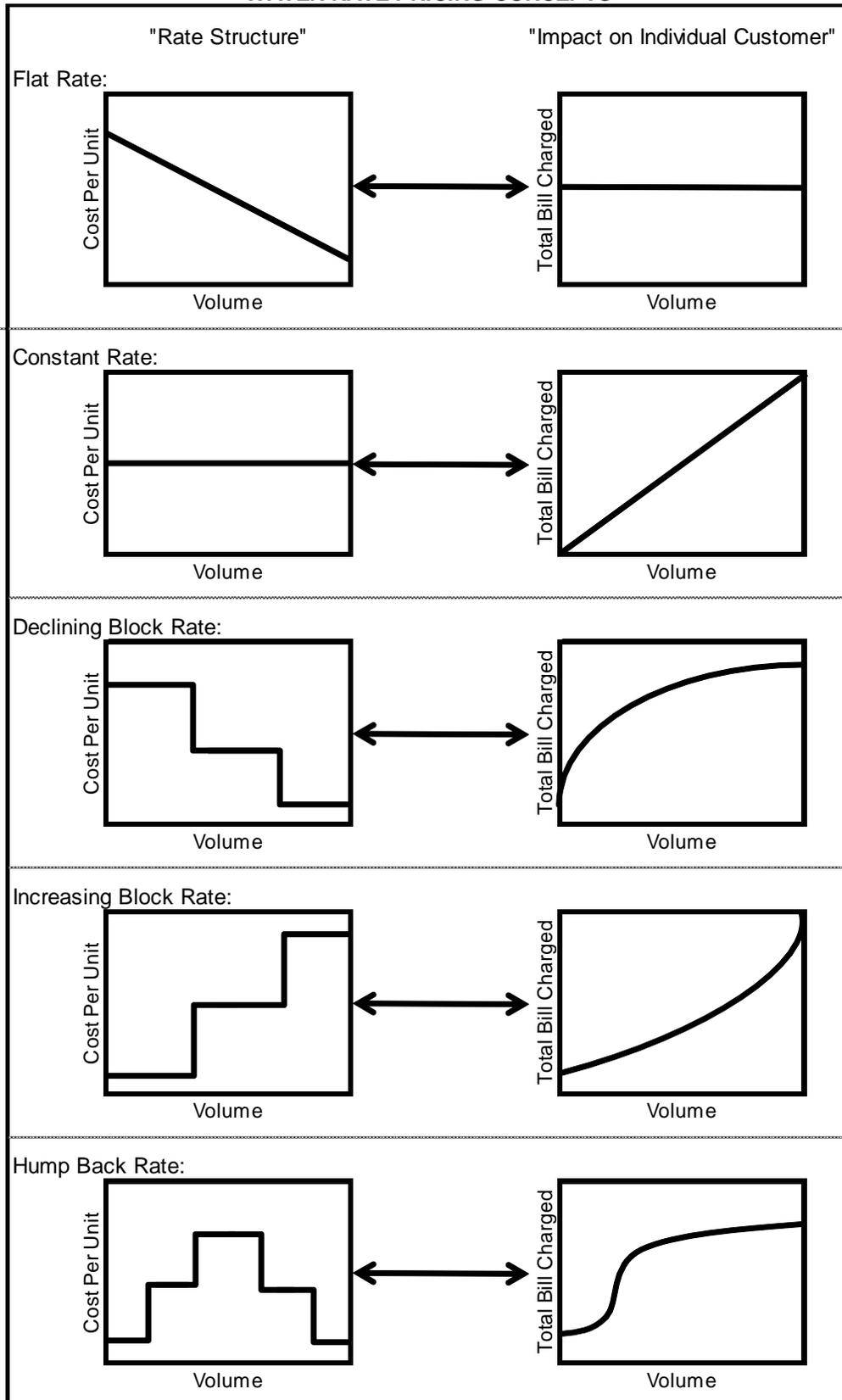
The Inverted Block method presents the most effective pricing method for encouraging conservation. Through this method, the price per unit consumed increases as total volumes consumed grow. The consumer becomes aware of consumption through metering with the charges increasing dramatically with usage. Hence, there normally is awareness that exercising control over usage can produce significant savings. This

method not only encourages conservation methods, but may also penalize legitimate high volume users if not properly structured.

Figure 6-1 provides a schematic representation of the various rate structures (note property tax as a basis for revenue recovery has not been presented for comparison, as the proportion of taxes paid varies in direct proportion to the market value of the property). The graphs on the left-hand side of the figure present the cost per unit for each additional amount of water consumed. The right-hand side of the figure presents the impact on the customer's bill as the volume of water increases. The schematic is summarized below for each rate structure.

Figure 6-1

WATER RATE PRICING CONCEPTS



RATE STRUCTURE	COST PER UNIT AS VOLUME CONSUMPTION INCREASES	IMPACT ON CUSTOMER BILL AS VOLUME CONSUMPTION INCREASES
Flat Rate	Cost per unit decreases as more volume consumed	Bill remains the same no matter how much volume is consumed
Constant Rate	Cost per unit remains the same	Bill increases in direct proportion to consumption
Declining Block	Cost per unit decreases as threshold targets are achieved	Bill increases at a slower rate as volumes increases
Increasing Block	Cost per unit increases as threshold targets are achieved	Bill increases at a faster rate as volumes increase
Hump Back Rate	Combination of an increasing block at the lower consumption volumes and then converts to a declining block for the high	Bill increases at a faster rate at the lower consumption amounts and then slows as volumes increase

## 6.4 Rate Structures in Ontario

In a past survey of over 170 municipalities (approximately half of the municipalities who provide water and/or sewer), all forms of rate structures are in use by Ontario municipalities. The most common rate structure is the constant rate (for metered municipalities). Most municipalities (approximately 92%) who have volume rate structures also impose a base monthly charge.

Historically, the development of a base charge often reflected either the recovery of meter reading/billing/collection costs, plus administration or those costs plus certain fixed costs (such as capital contributions or reserve contributions). More recently, many municipalities have started to establish base charges based on ensuring a secure portion of the revenue stream which does not vary with volume consumption. Selection of the quantum of the base charge is a matter of policy selected by individual municipalities.

## 6.5 Recommended Rate Structures

Based on the foregoing, it is recommended that the Town's existing rate structures be continued in the future.

In regards to water, it is recommended that the base charges be increased by 1% per year over the forecast period (2016-2025) for Wards 1 & 2 and Wards 3 & 4. The volume rates (as calculated in Chapter 7) are also anticipated to increase at 1% per year over the forecast period (2016-2025). The forecasted base charges are presented in Table 6-1.

Similar to water, it is recommended that wastewater base charges for Ward 1 and Ward 4 increase by 2% per year over the forecast period (2016-2025). The base charges for Ward 3 are recommended to increase by 3%. The wastewater volume rates (calculated in Chapter 7) are anticipated to increase by the same percentage as the base charges for each ward. This translates to a 2% increase per year for Wards 1 & 4 and a 3% increase for Ward 3 over the forecast period of 2016-2025. The forecasted base charges and corresponding revenue are provided in Table 6-2.

**Table 6-1  
Base Charge Forecast – Water**

Town of Essex  
Base Charge - Water

Ward 1 & 2	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332	3,332
New	13	39	65	91	117	143	169	195	221	247	273
<b>Subtotal Customers</b>	<b>3,345</b>	<b>3,371</b>	<b>3,397</b>	<b>3,423</b>	<b>3,449</b>	<b>3,475</b>	<b>3,501</b>	<b>3,527</b>	<b>3,553</b>	<b>3,579</b>	<b>3,605</b>
Monthly Base Charge	\$18.73	\$18.92	\$19.11	\$19.30	\$19.49	\$19.69	\$19.88	\$20.08	\$20.28	\$20.48	\$20.69
Annual Base Charge	\$224.76	\$227.01	\$229.28	\$231.57	\$233.89	\$236.23	\$238.59	\$240.97	\$243.38	\$245.82	\$248.27
<b>Total Annual Revenue</b>	<b>\$751,822</b>	<b>\$765,243</b>	<b>\$778,856</b>	<b>\$792,666</b>	<b>\$806,673</b>	<b>\$820,882</b>	<b>\$835,294</b>	<b>\$849,912</b>	<b>\$864,739</b>	<b>\$879,778</b>	<b>\$895,031</b>

Ward 3 & 4	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602	3,602
New	7	20	33	46	59	72	85	98	111	124	137
<b>Subtotal Customers</b>	<b>3,609</b>	<b>3,622</b>	<b>3,635</b>	<b>3,648</b>	<b>3,661</b>	<b>3,674</b>	<b>3,687</b>	<b>3,700</b>	<b>3,713</b>	<b>3,726</b>	<b>3,739</b>
Monthly Base Charge	\$18.73	\$18.92	\$19.11	\$19.30	\$19.49	\$19.69	\$19.88	\$20.08	\$20.28	\$20.48	\$20.69
Annual Base Charge	\$224.76	\$227.01	\$229.28	\$231.57	\$233.89	\$236.23	\$238.59	\$240.97	\$243.38	\$245.82	\$248.27
<b>Total Annual Revenue</b>	<b>\$811,159</b>	<b>\$822,222</b>	<b>\$833,424</b>	<b>\$844,769</b>	<b>\$856,257</b>	<b>\$867,891</b>	<b>\$879,671</b>	<b>\$891,601</b>	<b>\$903,681</b>	<b>\$915,913</b>	<b>\$928,300</b>

**Table 6-2  
Base Charge Forecast – Wastewater**

Town of Essex  
Base Charge - Wastewater

Ward 1 - Essex Meter Size	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754	2,754
New	10	30	50	70	90	110	130	150	170	190	210
<b>Subtotal Customers</b>	<b>2,764</b>	<b>2,784</b>	<b>2,804</b>	<b>2,824</b>	<b>2,844</b>	<b>2,864</b>	<b>2,884</b>	<b>2,904</b>	<b>2,924</b>	<b>2,944</b>	<b>2,964</b>
Monthly Base Charge	\$18.73	\$19.10	\$19.49	\$19.88	\$20.27	\$20.68	\$21.09	\$21.51	\$21.95	\$22.38	\$22.83
Annual Base Charge	\$224.76	\$229.26	\$233.84	\$238.52	\$243.29	\$248.15	\$253.12	\$258.18	\$263.34	\$268.61	\$273.98
<b>Total Annual Revenue</b>	<b>\$621,237</b>	<b>\$638,246</b>	<b>\$655,688</b>	<b>\$673,572</b>	<b>\$691,910</b>	<b>\$710,711</b>	<b>\$729,987</b>	<b>\$749,751</b>	<b>\$770,012</b>	<b>\$790,785</b>	<b>\$812,080</b>

Ward 3 - Colchester South Meter Size	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088	1,088
New	4	12	20	28	36	44	52	60	68	76	84
<b>Subtotal Customers</b>	<b>1,092</b>	<b>1,100</b>	<b>1,108</b>	<b>1,116</b>	<b>1,124</b>	<b>1,132</b>	<b>1,140</b>	<b>1,148</b>	<b>1,156</b>	<b>1,164</b>	<b>1,172</b>
Monthly Base Charge	\$18.73	\$19.29	\$19.87	\$20.47	\$21.08	\$21.71	\$22.36	\$23.04	\$23.73	\$24.44	\$25.17
Annual Base Charge	\$224.76	\$231.50	\$238.45	\$245.60	\$252.97	\$260.56	\$268.38	\$276.43	\$284.72	\$293.26	\$302.06
<b>Total Annual Revenue</b>	<b>\$245,438</b>	<b>\$254,653</b>	<b>\$264,200</b>	<b>\$274,091</b>	<b>\$284,338</b>	<b>\$294,952</b>	<b>\$305,948</b>	<b>\$317,338</b>	<b>\$329,135</b>	<b>\$341,356</b>	<b>\$354,013</b>

Ward 4 - Harrow Meter Size	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171
New	3	8	13	18	23	28	33	38	43	48	53
<b>Subtotal Customers</b>	<b>1,174</b>	<b>1,179</b>	<b>1,184</b>	<b>1,189</b>	<b>1,194</b>	<b>1,199</b>	<b>1,204</b>	<b>1,209</b>	<b>1,214</b>	<b>1,219</b>	<b>1,224</b>
Monthly Base Charge	\$18.73	\$19.10	\$19.49	\$19.88	\$20.27	\$20.68	\$21.09	\$21.51	\$21.95	\$22.38	\$22.83
Annual Base Charge	\$224.76	\$229.26	\$233.84	\$238.52	\$243.29	\$248.15	\$253.12	\$258.18	\$263.34	\$268.61	\$273.98
<b>Total Annual Revenue</b>	<b>\$263,868</b>	<b>\$270,292</b>	<b>\$276,867</b>	<b>\$283,597</b>	<b>\$290,485</b>	<b>\$297,536</b>	<b>\$304,752</b>	<b>\$312,138</b>	<b>\$319,697</b>	<b>\$327,434</b>	<b>\$335,353</b>

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## **7. Analysis of Water and Wastewater Rates and Policy Matters**

### **7.1 Introduction**

To summarize the analysis undertaken thus far, Chapter 2 reviewed capital-related issues and responds to the provincial directives to maintain and upgrade infrastructure to required levels. Chapter 4 provided a review of capital financing options to which water and wastewater reserve contributions will be the predominant basis for financing future capital replacement. Chapter 5 established the 10-year operating forecast of expenditures including an annual capital reserve contribution. The base charge revenues are to ensure that fixed costs are recovered regardless of the amount of volume used by customers. This chapter will provide for the calculation of the volume rates over the forecast period. These calculations will be based on the net operating expenditures (the variable costs) provided in Chapter 5, divided by the water consumption forecast and wastewater volumes provided in Section 1.7.

### **7.2 Water Rates**

Based on the discussion of rate structures provided in section 6.5 and the recommendation to continue with the present structures, the rates are calculated by taking the net recoverable amounts from Tables 5-1 and 5-2 (the product of total expenditures less non-rate revenues and deduct the base charge amounts provided in section 6.5) and completes the calculation by dividing them by the volumes resulting in the forecasted rates. The volume rates are anticipated to increase by 1% per year over the forecast period (2016-2025). The volume rates are presented in Tables 7-1 and 7-2 for Wards 1 & 2 and Wards 3 & 4 respectively.

Detailed calculations of the volume rates are provided in Appendix C. A summary of the recommended base charge and volume rates along with the total annual bill for an average residential user who consumes 175m<sup>3</sup> per year for Wards 1 & 2 and 150m<sup>3</sup> for Wards 3 & 4 are as follows:

**Table 7-1****Average Annual Residential Water Bill - Ward 1 & 2 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	18.73	18.92	19.11	19.30	19.49	19.69	19.88	20.08	20.28	20.48	20.69
Volume Rate	1.39	1.40	1.41	1.42	1.43	1.45	1.46	1.47	1.48	1.49	1.50
Annual Base Charge	224.76	227.01	229.28	231.57	233.89	236.23	238.59	240.97	243.38	245.82	248.27
Annual Volume Rate	243.55	245.00	246.83	248.79	250.82	252.95	254.70	256.44	258.24	259.98	261.80
<b>Total Water Bill - Ward 1 &amp; 2</b>	<b>468.31</b>	<b>472.01</b>	<b>476.11</b>	<b>480.36</b>	<b>484.71</b>	<b>489.18</b>	<b>493.29</b>	<b>497.42</b>	<b>501.62</b>	<b>505.80</b>	<b>510.08</b>

**Table 7-2****Average Annual Residential Water Bill - Ward 3 & 4 (Based on 150 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	18.92	19.11	19.30	19.49	19.69	19.88	20.08	20.28	20.48	20.69
Volume Rate	1.54	1.55	1.57	1.59	1.61	1.63	1.65	1.67	1.69	1.71	1.73
Annual Base Charge	224.76	227.01	229.28	231.57	233.89	236.23	238.59	240.97	243.38	245.82	248.27
Annual Volume Rate	230.93	232.50	235.50	238.50	241.50	244.50	247.50	250.50	253.50	256.50	259.50
<b>Total Water Bill - Ward 3 &amp; 4</b>	<b>455.69</b>	<b>459.51</b>	<b>464.78</b>	<b>470.07</b>	<b>475.39</b>	<b>480.73</b>	<b>486.09</b>	<b>491.47</b>	<b>496.88</b>	<b>502.32</b>	<b>507.77</b>

### **7.3 Wastewater Rates**

Similar to water, the calculation of the wastewater rates takes the net recoverable amounts from Tables 5-3, 5-4 and 5-5 and completes the calculation by dividing them by the volumes in each ward, resulting in the forecasted rates. Detailed calculations are provided in Appendix D. It is recommended that the wastewater volume rates for Wards 1 and 4 increase by 2% per year over the forecast period while Ward 3 increases by 3% per year over the forecast period (2016-2025)

Tables 7-3, 7-4 and 7-5 summarize the recommended rates for wastewater and provide the average annual bill for a residential customer who uses 175m<sup>3</sup> per year for Ward 1 and Ward 4, and 140m<sup>3</sup> per year for Ward 3:

**Table 7-3****Average Annual Residential Wastewater Bill - Ward 1 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.10	19.49	19.88	20.27	20.68	21.09	21.51	21.95	22.38	22.83
Volume Rate	1.29	1.32	1.35	1.38	1.41	1.44	1.47	1.50	1.53	1.56	1.59
Annual Base Charge	224.76	229.26	233.84	238.52	243.29	248.15	253.12	258.18	263.34	268.61	273.98
Annual Volume Rate	225.82	231.00	236.25	241.50	246.75	252.00	257.25	262.50	267.75	273.00	278.25
<b>Total Wastewater Bill - Ward 1</b>	<b>450.58</b>	<b>460.26</b>	<b>470.09</b>	<b>480.02</b>	<b>490.04</b>	<b>500.15</b>	<b>510.37</b>	<b>520.68</b>	<b>531.09</b>	<b>541.61</b>	<b>552.23</b>

**Table 7-4****Average Annual Residential Wastewater Bill - Ward 3 (Based on 140 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.29	19.87	20.47	21.08	21.71	22.36	23.04	23.73	24.44	25.17
Volume Rate	1.91	1.96	2.02	2.08	2.14	2.20	2.27	2.34	2.41	2.48	2.55
Annual Base Charge	224.76	231.50	238.45	245.60	252.97	260.56	268.38	276.43	284.72	293.26	302.06
Annual Volume Rate	266.97	274.40	282.80	291.20	299.60	308.00	317.80	327.60	337.40	347.20	357.00
<b>Total Wastewater Bill - Ward 3</b>	<b>491.73</b>	<b>505.90</b>	<b>521.25</b>	<b>536.80</b>	<b>552.57</b>	<b>568.56</b>	<b>586.18</b>	<b>604.03</b>	<b>622.12</b>	<b>640.46</b>	<b>659.06</b>

**Table 7-5****Average Annual Residential Wastewater Bill - Ward 4 (Based on 175 m<sup>3</sup> per year)**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Base Charge	\$18.73	19.10	19.49	19.88	20.27	20.68	21.09	21.51	21.95	22.38	22.83
Volume Rate	1.74	1.77	1.81	1.85	1.89	1.93	1.97	2.01	2.05	2.09	2.13
Annual Base Charge	224.76	229.26	233.84	238.52	243.29	248.15	253.12	258.18	263.34	268.61	273.98
Annual Volume Rate	303.82	309.75	316.75	323.75	330.75	337.75	344.75	351.75	358.75	365.75	372.75
<b>Total Wastewater Bill - Ward 4</b>	<b>528.58</b>	<b>539.01</b>	<b>550.59</b>	<b>562.27</b>	<b>574.04</b>	<b>585.90</b>	<b>597.87</b>	<b>609.93</b>	<b>622.09</b>	<b>634.36</b>	<b>646.73</b>

## 8. Recommendations

As presented within this report, capital and operating expenditures have been identified and forecasted over a ten-year period for water and wastewater services.

Based upon the foregoing, the following recommendations are identified for consideration by Town Council:

1. That Council provide for the recovery of all water and wastewater costs through full cost recovery rates.
2. That Council consider the Capital Plan for water and wastewater as provided in Tables 2-1 to 2-5 and the associated Capital Financing Plan as set out in Tables 4-1 to 4-5.
3. That Council consider the base charges provided in Table 6-1 for water and Table 6-2 for wastewater.
4. That Council consider the rates for water and wastewater as provided in Tables 7-1 and 7-2 for water and Tables 7-3, 7-4 and 7-5 for wastewater.

## **Appendix A – Water System Inventory Data (Under Separate Cover)**

# Appendix A – Water System Inventory Data

## **Appendix B – Wastewater System Inventory Data (Under Separate Cover)**

# **Appendix B –Wastewater System Inventory Data**

## **Appendix C – Detailed Water Rate Calculations**

**Table C-1-2**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Capital Budget Forecast**  
 Inflated \$

Description	Budget 2015	Total	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital Expenditures</b>													
Fairview Avenue Reconstruction	425,000	-	-	-	-	-	-	-	-	-	-	-	-
Equipment Contingency for Wards 1 and 2 Distribution and Transmission (50%)	6,000	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 1 and 2 Distribution and Transmission)	9,000	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 1 and 2 Treatment)	2,400	-	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	-	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	-	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	789	-	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewge Lagoon, Water and Public Works Facility)	211	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>													
Water Meters, Valves, Tower, etc. - Ward 1 & 2	-	8,000	-	-	-	-	-	-	-	-	-	-	-
Water Admin Inventory - Ward 1 & 2	-	123,000	17,000	17,000	17,000	2,000	-	9,000	26,000	-	8,000	-	-
Watermains - Ward 1 & 2	-	6,665,000	364,000	367,000	371,000	375,000	-	-	-	-	-	5,188,000	-
Water Hydrants - Ward 1 & 2	-	52,000	-	-	-	-	-	-	-	-	-	-	52,000
	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>444,400</b>	<b>6,848,000</b>	<b>381,000</b>	<b>384,000</b>	<b>388,000</b>	<b>377,000</b>	<b>-</b>	<b>9,000</b>	<b>26,000</b>	<b>-</b>	<b>43,000</b>	<b>5,240,000</b>	<b>-</b>
<b>Capital Financing</b>													
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	5,240,000	-	-	-	-	-	-	-	-	-	-	5,240,000
Water Reserve	444,400	1,608,000	381,000	384,000	388,000	377,000	-	9,000	26,000	-	43,000	-	-
<b>Total Capital Financing</b>	<b>444,400</b>	<b>6,848,000</b>	<b>381,000</b>	<b>384,000</b>	<b>388,000</b>	<b>377,000</b>	<b>-</b>	<b>9,000</b>	<b>26,000</b>	<b>-</b>	<b>43,000</b>	<b>5,240,000</b>	<b>-</b>

**Table C-1-3**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Schedule of Non-Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-									
2017		-											
2018		-											
2019		-											
2020		-											
2021		-											
2022		-											
2023		-											
2024		-											
2025		-											
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table C-1-4**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Schedule of Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-									
2017		-											
2018		-											
2019		-											
2020		-											
2021		-											
2022		-											
2023		-											
2024		-											
2025		-											
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table C-1-5**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Water Reserve Funds Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	2,657,439	2,063,196	1,703,224	1,411,652	1,112,385	820,515	906,708	984,867	1,046,791	1,135,813	1,182,411
Transfer from Operating	550,000	-	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Transfer to Capital	444,400	381,000	384,000	388,000	377,000	-	9,000	26,000	-	43,000	-
Transfer to Operating	725,314	-	-	-	-	-	-	-	-	-	-
Closing Balance	2,037,725	1,682,196	1,394,224	1,098,652	810,385	895,515	972,708	1,033,867	1,121,791	1,167,813	1,257,411
Interest	25,472	21,027	17,428	13,733	10,130	11,194	12,159	12,923	14,022	14,598	15,718

**Table C-1-6**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Water Lifecycle Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	1,119,696	2,249,591	3,220,314	4,133,126	5,063,928	6,013,187	6,980,423	7,963,577	8,962,583	9,977,211	11,007,138
Transfer from Operating	1,102,123	930,966	861,786	868,284	875,022	881,059	884,838	888,357	891,452	894,036	896,503
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	5,240,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	2,221,818	3,180,557	4,082,100	5,001,410	5,938,950	6,894,245	7,865,261	8,851,934	9,854,036	10,871,247	6,663,641
Interest	27,773	39,757	51,026	62,518	74,237	86,178	98,316	110,649	123,175	135,891	83,296

**Table C-1-7**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Operating Budget Forecast**  
**Inflated \$**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Expenditures</b>												
<b>Operating Costs</b>												
55100 - ELK Energy Incorporated - Billing and Collection Charges	83,903	85,600	87,300	89,000	90,800	92,600	94,500	96,400	98,300	100,300	102,300	
51900 - Administration Charges - Town of Essex	20,259	20,700	21,100	21,500	21,900	22,300	22,700	23,200	23,700	24,200	24,700	
58900 - Amounts Allocated from Other Departments	25,483	26,000	26,500	27,000	27,500	28,100	28,700	29,300	29,900	30,500	31,100	
51100 - Office Supplies	400	400	400	400	400	400	400	400	400	400	400	
51105 - Computer Hardware and Software	750	800	800	800	800	800	800	800	800	800	800	
51110 - Postage and Courier	20	-	-	-	-	-	-	-	-	-	-	
51115 - Memberships	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
51140 - Janitorial Supplies and Services	547	600	600	600	600	600	600	600	600	600	600	
51150 - Vehicles - Fuel	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
51190 - Materials and Supplies - Other	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	
51600 - Materials & Supplies - Water Meters	20,000	21,000	22,100	23,200	24,400	25,600	26,900	28,200	29,600	31,100	32,700	
51800 - Office Equipment	190	200	200	200	200	200	200	200	200	200	200	
51840 - Small Tools	600	600	600	600	600	600	600	600	600	600	600	
53510 - Advertising	200	200	200	200	200	200	200	200	200	200	200	
53605 - System Access Fee - Automatic Vehicle Locator	760	800	800	800	800	800	800	800	800	800	800	
56700 - Leases - Office Equipment and Computers	200	200	200	200	200	200	200	200	200	200	200	
52120 - Repairs and Maintenance - Computers and Equipment	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	
52200 - Repairs and Maintenance - Buildings and Miscellaneous Structures	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
52300 - Repairs and Maintenance - Vehicles (Labour)	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
52305 - Repairs and Maintenance - Vehicles (Parts)	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
52350 - Repairs and Maintenance - Equipment (Labour)	150	200	200	200	200	200	200	200	200	200	200	
52355 - Repairs and Maintenance - Equipment (Parts)	150	200	200	200	200	200	200	200	200	200	200	
52600 - Repairs and Maintenance - Watermains	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
52620 - Repairs and Maintenance - Hydrants	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,700	18,100	
52640 - Repairs and Maintenance - Valves	7,500	7,700	7,900	8,100	8,300	8,500	8,700	8,900	9,100	9,300	9,500	
52660 - Repairs and Maintenance - Water Meters	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,700	18,100	
52690 - Repairs and Maintenance - Private Water Service	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
50100 - Salaries and Wages - Full-Time	107,625	109,800	112,000	114,200	116,500	118,800	121,200	123,600	126,100	128,600	131,200	
50120 - Salaries and Wages - Part-Time	3,682	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	
50150 - Salaries and Wages - Overtime	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
50400 - Benefits and Overhead Distributed	146	100	100	100	100	100	100	100	100	100	100	
50500 - Canada Pension Plan - Employer Contribution	3,884	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	
50510 - Employment Insurance - Employer Contribution	1,932	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
50520 - Employer Health Insurance	2,170	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50530 - Workplace Safety and Insurance Board Premiums	3,035	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	
50540 - Ontario Municipal Employees Retirement Savings - Employer Contribution	6,864	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	
50550 - Health Insurance Premiums	9,494	9,700	9,900	10,100	10,300	10,500	10,700	10,900	11,100	11,300	11,500	
50560 - Life Insurance Premiums	2,174	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	
50700 - Clothing and Uniforms	1,140	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
50720 - Training and Tuition Refund	2,690	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	
50740 - Meals	-	-	-	-	-	-	-	-	-	-	-	
50750 - Mileage	-	-	-	-	-	-	-	-	-	-	-	
54700 - Uncollectible Accounts Receivable - Water	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
54100 - Utilities - Hydro	12,180	12,800	13,400	14,100	14,800	15,500	16,300	17,100	18,000	18,900	19,800	
54120 - Utilities - Gas	1,783	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	
54140 - Utilities - Water	515	500	500	500	500	500	500	500	500	500	500	
54200 - Communications - Telephone	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
54300 - Insurance - Buildings	270	300	300	300	300	300	300	300	300	300	300	
54310 - Insurance - Vehicles	1,202	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
54320 - Insurance - General	8,516	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300	10,500	
<b>Treatment</b>												
55300 - Union Water - Water Supply	503,184	515,727	528,379	541,141	554,014	568,261	582,856	597,808	613,125	628,815	644,888	
54300 - Insurance - Buildings	158	200	200	200	200	200	200	200	200	200	200	
54310 - Insurance - Vehicles	320	300	300	300	300	300	300	300	300	300	300	
54320 - Insurance - General	2,271	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	
<b>Sub Total Operating</b>	<b>946,746</b>	<b>969,527</b>	<b>992,079</b>	<b>1,014,841</b>	<b>1,038,014</b>	<b>1,062,661</b>	<b>1,088,056</b>	<b>1,114,008</b>	<b>1,140,925</b>	<b>1,168,415</b>	<b>1,196,688</b>	

**Table C-1-7**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Operating Budget Forecast**  
**Inflated \$**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related												
Existing Debt (Interest) - Growth Related												
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	434											
Existing Debt (Interest) - Non-Growth Related	149											
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	550,000		75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Sub Total Capital Related	550,583	-	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
<b>Total Expenditures</b>	<b>1,497,329</b>	<b>969,527</b>	<b>1,067,079</b>	<b>1,089,841</b>	<b>1,113,014</b>	<b>1,137,661</b>	<b>1,163,056</b>	<b>1,189,008</b>	<b>1,215,925</b>	<b>1,243,415</b>	<b>1,271,688</b>	
<b>Revenues</b>												
Base Charge	751,822	765,243	778,856	792,666	806,673	820,882	835,294	849,912	864,739	879,778	895,031	
43120 - Water Frontage and Connection Charges	562	562	562	562	562	562	562	562	562	562	562	
48900 - Amounts allocated to/from other Departments	-	-	-	-	-	-	-	-	-	-	-	
47800 - Miscellaneous Revenue	200	200	200	200	200	200	200	200	200	200	200	
46420 - Water Meter Sales and Inspection	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	
46430 - Water Hook-Up Charges	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	
46450 - Watermain Buy-Ins	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	
Other Revenue	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Reserves / Reserve Funds	725,314	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>1,494,798</b>	<b>782,905</b>	<b>796,518</b>	<b>810,328</b>	<b>824,335</b>	<b>838,544</b>	<b>852,956</b>	<b>867,574</b>	<b>882,401</b>	<b>897,440</b>	<b>912,693</b>	
Water Billing Recovery - Operating	2,531	186,622	270,561	279,514	288,679	299,117	310,100	321,434	333,524	345,975	358,995	
Lifecycle Reserve Contribution (\$)	1,102,123	930,966	861,786	868,284	875,022	881,059	884,838	888,357	891,452	894,036	896,503	
<b>Water Billing Recovery - Total</b>	<b>1,104,654</b>	<b>1,117,588</b>	<b>1,132,347</b>	<b>1,147,798</b>	<b>1,163,701</b>	<b>1,180,176</b>	<b>1,194,938</b>	<b>1,209,791</b>	<b>1,224,976</b>	<b>1,240,011</b>	<b>1,255,498</b>	

**Table C-1-8**  
**Town of Essex**  
**Water Service - Wards 1 & 2**  
**Water Rate Forecast**  
**Inflated \$**

Description	2015	Existing	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Water Billing Recovery	1,104,654		1,117,588	1,132,347	1,147,798	1,163,701	1,180,176	1,194,938	1,209,791	1,224,976	1,240,011	1,255,498
Total Consumption (m <sup>3</sup> )	793,727		798,277	802,827	807,377	811,927	816,477	821,027	825,577	830,127	834,677	839,227
<b>Constant Rate</b>	<b>1.39</b>	<b>1.39</b>	<b>1.40</b>	<b>1.41</b>	<b>1.42</b>	<b>1.43</b>	<b>1.45</b>	<b>1.46</b>	<b>1.47</b>	<b>1.48</b>	<b>1.49</b>	<b>1.50</b>
<b>Annual Percentage Change</b>			<b>1%</b>									

**Table C-2-2**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Capital Budget Forecast**  
 Inflated \$

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Equipment Contingency for Wards 3 and 4 Distribution and Transmission (50%)	6,000	-	-	-	-	-	-	-	-	-	-	-
Harrow Colchester South Water Treatment Plant Contingency for Wards 3 and 4	160,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 3 and 4 Distribution and Transmission)	9,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck (Water Wards 3 and 4 Treatment)	2,400	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>												
Water Meters, Valves, Tower, etc. - Ward 3 & 4	-	2,000	-	-	-	-	-	-	-	2,000	-	-
Water Treatment - Ward 3 & 4	-	116,000	12,000	11,000	9,000	10,000	-	-	5,000	17,000	25,000	27,000
Water Admin Inventory - Ward 3 & 4	-	133,000	-	-	31,000	-	5,000	32,000	65,000	-	-	-
Watermains - Ward 3 & 4	-	5,355,000	512,000	517,000	522,000	527,000	533,000	538,000	543,000	549,000	554,000	560,000
Water Hydrants - Ward 3 & 4	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>177,400</b>	<b>5,606,000</b>	<b>524,000</b>	<b>528,000</b>	<b>562,000</b>	<b>537,000</b>	<b>538,000</b>	<b>570,000</b>	<b>615,000</b>	<b>566,000</b>	<b>579,000</b>	<b>587,000</b>
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	5,606,000	524,000	528,000	562,000	537,000	538,000	570,000	615,000	566,000	579,000	587,000
Water Reserve	177,400	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>177,400</b>	<b>5,606,000</b>	<b>524,000</b>	<b>528,000</b>	<b>562,000</b>	<b>537,000</b>	<b>538,000</b>	<b>570,000</b>	<b>615,000</b>	<b>566,000</b>	<b>579,000</b>	<b>587,000</b>

**Table C-2-3**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Schedule of Non-Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table C-2-4**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Schedule of Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table C-2-5**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Water Reserve Funds Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	659,090	1,377,964	1,595,768	1,772,416	1,856,485	1,896,960	1,948,889	2,006,382	2,069,130	2,136,519	2,208,131
Transfer from Operating	1,443,676	198,102	154,766	61,150	17,055	27,869	32,723	37,203	41,012	44,352	49,552
Transfer to Capital	177,400	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	564,414	-	-	-	-	-	-	-	-	-	-
Closing Balance	1,360,952	1,576,067	1,750,534	1,833,566	1,873,540	1,924,829	1,981,612	2,043,585	2,110,142	2,180,870	2,257,683
Interest	17,012	19,701	21,882	22,920	23,419	24,060	24,770	25,545	26,377	27,261	28,221

**Table C-2-6**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Water Lifecycle Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	4,407,753	4,462,850	4,899,335	5,387,852	5,949,300	6,593,704	7,245,150	7,872,340	8,461,806	9,108,254	9,749,620
Transfer from Operating	-	900,000	950,000	1,050,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Transfer to Capital	-	524,000	528,000	562,000	537,000	538,000	570,000	615,000	566,000	579,000	587,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	4,407,753	4,838,850	5,321,335	5,875,852	6,512,300	7,155,704	7,775,150	8,357,340	8,995,806	9,629,254	10,262,620
Interest	55,097	60,486	66,517	73,448	81,404	89,446	97,189	104,467	112,448	120,366	128,283

**Table C-2-7**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Operating Budget Forecast**  
 Inflated \$

Description	Budget 2015	Forecast									
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
54100 - Utilities - Hydro	12,000	12,600	13,200	13,900	14,600	15,300	16,100	16,900	17,700	18,600	19,500
54120 - Utilities - Gas	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400
54140 - Utilities - Water	500	500	500	500	500	500	500	500	500	500	500
54200 - Communications - Telephone	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
54300 - Insurance - Buildings	270	300	300	300	300	300	300	300	300	300	300
54310 - Insurance - Vehicles	1,202	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
54320 - Insurance - General	8,516	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,300	10,500
<b>Treatment</b>											
55200 - Ontario Clean Water Agency - Annual Operating Costs	351,218	358,200	365,400	372,700	380,200	387,800	395,600	403,500	411,600	419,800	428,200
55250 - Ontario Clean Water Agency - Other Operating Costs	71,400	72,800	74,300	75,800	77,300	78,800	80,400	82,000	83,600	85,300	87,000
55265 - Ontario Clean Water Agency - Drinking Water Quality Management System	2,550	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500
55450 - Contractors	17,000	17,300	17,600	18,000	18,400	18,800	19,200	19,600	20,000	20,400	20,800
51870 - Equipment	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000
52120 - Repairs and Maintenance - Computers and Equipment	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500
54100 - Utilities - Hydro	80,928	85,000	89,300	93,800	98,500	103,400	108,600	114,000	119,700	125,700	132,000
54120 - Utilities - Gas	11,754	12,300	12,900	13,500	14,200	14,900	15,600	16,400	17,200	18,100	19,000
54300 - Insurance - Buildings	18,673	19,000	19,400	19,800	20,200	20,600	21,000	21,400	21,800	22,200	22,600
54310 - Insurance - Vehicles	320	300	300	300	300	300	300	300	300	300	300
54320 - Insurance - General	2,270	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
55300 - Union Water - Water Supply	219,381	-	-	-	-	-	-	-	-	-	-
<b>Sub Total Operating</b>	<b>1,204,188</b>	<b>1,007,700</b>	<b>1,031,100</b>	<b>1,055,000</b>	<b>1,079,600</b>	<b>1,104,800</b>	<b>1,130,900</b>	<b>1,157,600</b>	<b>1,185,200</b>	<b>1,213,500</b>	<b>1,242,600</b>
<b>Capital-Related</b>											
Existing Debt (Principal) - Growth Related											
Existing Debt (Interest) - Growth Related											
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	6,192	6,407	6,628	6,857	7,094	2,054	2,124	2,196	2,271	2,348	-
Existing Debt (Interest) - Non-Growth Related	1,521	1,307	1,085	856	619	374	304	232	157	80	-
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-
Transfer to Capital		-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	1,443,676	198,102	154,766	61,150	17,055	27,869	32,723	37,203	41,012	44,352	49,552
<b>Sub Total Capital Related</b>	<b>1,451,390</b>	<b>205,816</b>	<b>162,480</b>	<b>68,864</b>	<b>24,769</b>	<b>30,297</b>	<b>35,151</b>	<b>39,631</b>	<b>43,440</b>	<b>46,780</b>	<b>49,552</b>
<b>Total Expenditures</b>	<b>2,655,578</b>	<b>1,213,516</b>	<b>1,193,580</b>	<b>1,123,864</b>	<b>1,104,369</b>	<b>1,135,097</b>	<b>1,166,051</b>	<b>1,197,231</b>	<b>1,228,640</b>	<b>1,260,280</b>	<b>1,292,152</b>
<b>Revenues</b>											
Base Charge	811,159	822,222	833,424	844,769	856,257	867,891	879,671	891,601	903,681	915,913	928,300
46945 - Building Leases and Rentals	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
43120 - Water Frontage and Connection Charges	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344	24,344
47800 - Miscellaneous Revenue	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
46420 - Water Meter Sales and Inspection	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157	6,157
46430 - Water Hook-Up Charges	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800
46450 - Watermain Buy-Ins	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
46945 - Building Leases and Rentals	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329	8,329
Other Revenue		-	-	-	-	-	-	-	-	-	-
Contributions from Development Charges Reserve Fund		-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	564,414	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,442,403</b>	<b>889,052</b>	<b>900,254</b>	<b>911,599</b>	<b>923,087</b>	<b>934,721</b>	<b>946,501</b>	<b>958,431</b>	<b>970,511</b>	<b>982,743</b>	<b>995,130</b>
Water Billing Recovery - Operating	1,213,175	324,464	293,325	212,264	181,281	200,377	219,550	238,801	258,130	277,537	297,022
Lifecycle Reserve Contribution (\$)		900,000	950,000	1,050,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
<b>Water Billing Recovery - Total</b>	<b>1,213,175</b>	<b>1,224,464</b>	<b>1,243,325</b>	<b>1,262,264</b>	<b>1,281,281</b>	<b>1,300,377</b>	<b>1,319,550</b>	<b>1,338,801</b>	<b>1,358,130</b>	<b>1,377,537</b>	<b>1,397,022</b>

**Table C-2-8**  
**Town of Essex**  
**Water Service - Wards 3 & 4**  
**Water Rate Forecast**  
 Inflated \$

Description	2015	Existing	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Water Billing Recovery	1,213,175		1,224,464	1,243,325	1,262,264	1,281,281	1,300,377	1,319,550	1,338,801	1,358,130	1,377,537	1,397,022
Total Consumption (m <sup>3</sup> )	788,027		789,977	791,927	793,877	795,827	797,777	799,727	801,677	803,627	805,577	807,527
<b>Constant Rate</b>	<b>1.54</b>	<b>1.54</b>	<b>1.55</b>	<b>1.57</b>	<b>1.59</b>	<b>1.61</b>	<b>1.63</b>	<b>1.65</b>	<b>1.67</b>	<b>1.69</b>	<b>1.71</b>	<b>1.73</b>
<b>Annual Percentage Change</b>			1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

## **Appendix D – Detailed Wastewater Rate Calculations**

**Table D-1-2**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Capital Budget Forecast**  
 Inflated \$

Description	Budget 2015	Total	Forecast									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Capital Expenditures</b>												
Treatment - Ward 1 Contingency	22,000	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 1 Contingency	17,000	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 1 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 1 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-
Barrier Wall Culvert 100,000 (Entrance to Essex Sewage Lagoon, Water and Public Works Facility)	28,000	-	-	-	-	-	-	-	-	-	-	-
North East Lagoon System Flow Optimization Study (carry forward SS-14-0007)	81,357	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>												
Wastewater Lagoons	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Pumping Stations	-	5,000	-	-	-	-	-	-	-	-	-	5,000
Wastewater Machinery & Equipment	-	7,000	-	-	-	-	-	-	7,000	-	-	-
Wastewater Forcemains	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Vehicles, Treatment & Disposal - Ward 1	-	44,000	-	-	30,000	10,000	4,000	-	-	-	-	-
Sanitary Manholes - Ward 1	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 1	-	-	-	-	-	-	-	-	-	-	-	-
<b>Studies:</b>												
North East Lagoon / Essex Pollution Control Plant Flow Optimization Study	200,000	-	-	-	-	-	-	-	-	-	-	-
Ward 1 Flooding Study	94,000	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>444,757</b>	<b>56,000</b>	<b>-</b>	<b>-</b>	<b>30,000</b>	<b>10,000</b>	<b>4,000</b>	<b>-</b>	<b>7,000</b>	<b>-</b>	<b>-</b>	<b>5,000</b>
<b>Capital Financing</b>												
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	56,000	-	-	30,000	10,000	4,000	-	7,000	-	-	5,000
Wastewater Reserve	444,757	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>444,757</b>	<b>56,000</b>	<b>-</b>	<b>-</b>	<b>30,000</b>	<b>10,000</b>	<b>4,000</b>	<b>-</b>	<b>7,000</b>	<b>-</b>	<b>-</b>	<b>5,000</b>

**Table D-1-3**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Schedule of Non-Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-1-4**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Schedule of Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-1-5**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Wastewater Reserve Funds Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	2,755,170	786,396	458,114	550,231	574,444	580,940	569,920	541,519	496,066	433,828	354,966
Transfer from Operating	1,316,192	306,754	235,537	164,773	144,371	124,343	104,601	85,355	66,518	48,002	79,918
Loan to DC Reserve Fund	2,362,849	640,692	150,213	147,652	145,047	142,399	139,688	136,932	134,112	131,247	128,315
Transfer to Capital	444,757	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	487,069	-	-	-	-	-	-	-	-	-	-
Closing Balance	776,687	452,458	543,438	567,353	573,768	562,884	534,833	489,942	428,472	350,584	306,569
Interest	9,709	5,656	6,793	7,092	7,172	7,036	6,685	6,124	5,356	4,382	3,832

**Table D-1-6**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Wastewater Development Charges Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	(1,719,705)	-	-	-	-	-	-	-	-	-	-
Development Charge Proceeds	122,666	125,118	127,617	130,179	132,783	135,431	138,142	140,898	143,718	146,584	149,515
Loan from Wastewater Reserve Fund	2,362,849	640,692	150,213	147,652	145,047	142,399	139,688	136,932	134,112	131,247	128,315
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	765,810	765,810	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830
Closing Balance	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-
Required from Development Charges	-	-	-	-	-	-	-	-	-	-	-

**Table D-1-7**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Wastewater Lifecycle Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	30,499	30,880	537,516	1,150,722	1,841,457	2,610,687	3,445,120	4,343,544	5,295,622	6,316,199	7,399,046
Transfer from Operating	-	500,000	599,000	698,000	747,000	795,900	844,800	893,700	942,600	991,500	990,300
Transfer to Capital	-	-	-	30,000	10,000	4,000	-	7,000	-	-	5,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	30,499	530,880	1,136,516	1,818,722	2,578,457	3,402,587	4,289,920	5,230,244	6,238,222	7,307,699	8,384,346
Interest	381	6,636	14,206	22,734	32,231	42,532	53,624	65,378	77,978	91,346	104,804

**Table D-1-8**  
**Town of Essex**  
**Wastewater Service - Ward 1**  
**Operating Budget Forecast**  
 Inflated \$

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Treatment</b>		-	-	-	-	-	-	-	-	-	-	-
55200 - Ontario Clean Water Agency - Annual Operating Costs	230,741	235,400	240,100	244,900	249,800	254,800	259,900	265,100	270,400	275,800	281,300	
55250 - Ontario Clean Water Agency - Other Operating Costs	54,060	55,100	56,200	57,300	58,400	59,600	60,800	62,000	63,200	64,500	65,800	
55310 - Garbage Collection Fees - Ward 1	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
55400 - Garbage Disposal (Tipping Fees)	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300	
51105 - Computer Hardware and Software	792	800	800	800	800	800	800	800	800	800	800	
51190 - Materials and Supplies - Other	30,000	30,600	31,200	31,800	32,400	33,000	33,700	34,400	35,100	35,800	36,500	
53650 - Weed Control Services	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000	
53100 - Professional Fees - Legal	350	400	400	400	400	400	400	400	400	400	400	
52900 - Repairs and Maintenance - Other	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000	
54100 - Utilities - Hydro	82,529	84,200	85,900	87,600	89,400	91,200	93,000	94,900	96,800	98,700	100,700	
54120 - Utilities - Gas	4,398	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	
54140 - Utilities - Water		5,700	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,600	
54200 - Communications - Telephone	3,554	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	
54300 - Insurance - Buildings	13,864	14,100	14,400	14,700	15,000	15,300	15,600	15,900	16,200	16,500	16,800	
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100	
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600	
54400 - Payments-in-Lieu of Taxes	19,364	19,800	20,200	20,600	21,000	21,400	21,800	22,200	22,600	23,100	23,600	
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	
<b>Sub Total Operating</b>	<b>669,774</b>	<b>733,500</b>	<b>748,000</b>	<b>762,700</b>	<b>777,700</b>	<b>793,100</b>	<b>808,900</b>	<b>824,900</b>	<b>841,200</b>	<b>857,900</b>	<b>875,000</b>	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related	670,663	688,006	214,732	220,482	226,386	232,448	238,672	245,063	251,625	258,363	265,281	
Existing Debt (Interest) - Growth Related	95,147	77,804	63,098	57,348	51,444	45,382	39,158	32,767	26,205	19,468	12,549	
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Principal) - Non-Growth Related	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Interest) - Non-Growth Related	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital Reserve	1,316,192	306,754	235,537	164,773	144,371	124,343	104,601	85,355	66,518	48,002	79,918	
<b>Sub Total Capital Related</b>	<b>2,082,002</b>	<b>1,072,564</b>	<b>513,367</b>	<b>442,603</b>	<b>422,201</b>	<b>402,173</b>	<b>382,431</b>	<b>363,186</b>	<b>344,349</b>	<b>325,832</b>	<b>357,749</b>	
<b>Total Expenditures</b>	<b>2,751,777</b>	<b>1,806,064</b>	<b>1,261,367</b>	<b>1,205,303</b>	<b>1,199,901</b>	<b>1,195,273</b>	<b>1,191,331</b>	<b>1,188,086</b>	<b>1,185,549</b>	<b>1,183,732</b>	<b>1,232,749</b>	
<b>Revenues</b>												
Base Charge	621,237	638,246	655,688	673,572	691,910	710,711	729,987	749,751	770,012	790,785	812,080	
43220 - Sewer Frontage and Connection Charges	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	12,971	
46970 - Land Leases and Rentals	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	3,927	
Other Revenue	-	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	765,810	765,810	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830	277,830	
Contributions from Reserves / Reserve Funds	487,069	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>1,891,013</b>	<b>1,420,954</b>	<b>950,416</b>	<b>968,300</b>	<b>986,637</b>	<b>1,005,439</b>	<b>1,024,715</b>	<b>1,044,479</b>	<b>1,064,740</b>	<b>1,085,513</b>	<b>1,106,808</b>	
Wastewater Billing Recovery - Operating	860,763	385,110	310,951	237,002	213,264	189,835	166,616	143,607	120,808	98,219	125,940	
Lifecycle Reserve Contribution (\$)		500,000	599,000	698,000	747,000	795,900	844,800	893,700	942,600	991,500	990,300	
<b>Wastewater Billing Recovery - Total</b>	<b>860,763</b>	<b>885,110</b>	<b>909,951</b>	<b>935,002</b>	<b>960,264</b>	<b>985,735</b>	<b>1,011,416</b>	<b>1,037,307</b>	<b>1,063,408</b>	<b>1,089,719</b>	<b>1,116,240</b>	

**Table D-1-9  
Town of Essex  
Wastewater Service - Ward 1  
Wastewater Rate Forecast  
Inflated \$**

<b>Description</b>	<b>2015</b>	<b>Existing</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Total Wastewater Billing Recovery	860,763		885,110	909,951	935,002	960,264	985,735	1,011,416	1,037,307	1,063,408	1,089,719	1,116,240
Total Consumption (m <sup>3</sup> )	667,038		670,538	674,038	677,538	681,038	684,538	688,038	691,538	695,038	698,538	702,038
<b>Constant Rate</b>	<b>1.29</b>	<b>1.29</b>	<b>1.32</b>	<b>1.35</b>	<b>1.38</b>	<b>1.41</b>	<b>1.44</b>	<b>1.47</b>	<b>1.50</b>	<b>1.53</b>	<b>1.56</b>	<b>1.59</b>
<b>Annual Percentage Change</b>			<b>2%</b>									

**Table D-2-2**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Capital Budget Forecast**  
 Inflated \$

Description	Budget 2015	Total	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital Expenditures</b>													
Treatment - Ward 3 Contingency	22,000	-	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 3 Contingency	25,000	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 3 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 3 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>													
Wastewater Treatment & Disposal - Ward 2	-	16,000	5,000	-	-	-	-	11,000	-	-	-	-	-
Sanitary Manholes - Ward 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Treatment & Disposal - Ward 3	-	7,000	-	-	-	-	-	-	-	-	-	7,000	-
Sanitary Manholes - Ward 3	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 3	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>49,400</b>	<b>23,000</b>	<b>5,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,000</b>	<b>-</b>
<b>Capital Financing</b>													
Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	49,400	23,000	5,000	-	-	-	-	11,000	-	-	-	7,000	-
<b>Total Capital Financing</b>	<b>49,400</b>	<b>23,000</b>	<b>5,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,000</b>	<b>-</b>

**Table D-2-3**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Schedule of Non-Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-2-4**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Schedule of Growth Related Debenture Repayments**  
 Inflated \$

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-2-5**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Wastewater Reserve Funds Continuity**  
 Inflated \$

Description	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	1,462,976		1,618,127	1,635,373	1,659,528	1,685,679	1,713,915	1,733,191	1,765,737	1,800,649	1,838,024	1,870,876
Transfer from Operating	415,895		2,057	3,667	5,340	7,077	8,879	10,747	12,681	14,684	16,755	18,941
Transfer to Capital	49,400		5,000	-	-	-	11,000	-	-	-	7,000	-
Transfer to Operating	231,322		-	-	-	-	-	-	-	-	-	-
Closing Balance	1,598,150		1,615,184	1,639,040	1,664,868	1,692,756	1,711,794	1,743,938	1,778,418	1,815,333	1,847,779	1,889,817
Interest	19,977		20,190	20,488	20,811	21,159	21,397	21,799	22,230	22,692	23,097	23,623

**Table D-2-6**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Wastewater Development Charges Reserve Fund Continuity**  
 Inflated \$

Description	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	338,654		357,095	376,050	395,533	415,559	436,136	457,277	478,999	501,316	524,236	547,775
Development Charge Proceeds	14,033		14,312	14,600	14,896	15,192	15,496	15,808	16,128	16,448	16,776	17,112
Transfer to Capital	-		-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	352,687		371,407	390,650	410,429	430,751	451,632	473,085	495,127	517,764	541,012	564,887
Interest	4,409		4,643	4,883	5,130	5,384	5,645	5,914	6,189	6,472	6,763	7,061
Required from Development Charges	-		-	-	-	-	-	-	-	-	-	-

**Table D-2-7**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Wastewater Lifecycle Reserve Fund Continuity**  
 Inflated \$

Description	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	323,745		327,791	475,596	633,797	802,439	981,880	1,172,194	1,375,047	1,590,782	1,819,761	2,062,260
Transfer from Operating	-		141,933	150,377	158,735	167,320	175,842	185,877	196,096	206,513	217,039	227,545
Transfer to Capital	-		-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	323,745		469,724	625,972	792,532	969,759	1,157,722	1,358,071	1,571,143	1,797,295	2,036,800	2,289,805
Interest	4,047		5,872	7,825	9,907	12,122	14,472	16,976	19,639	22,466	25,460	28,623

**Table D-2-8**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Operating Budget Forecast**  
**Inflated \$**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
54140 - Utilities - Water	125	100	100	100	100	100	100	100	100	100	100	100
54200 - Communications - Telephone	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
54310 - Insurance - Vehicles	240	200	200	200	200	200	200	200	200	200	200	200
54320 - Insurance - General	1,702	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
<b>Treatment</b>												
55200 - Ontario Clean Water Agency - Annual Operating Costs	87,733	89,500	91,300	93,100	95,000	96,900	98,800	100,800	102,800	104,900	107,000	
55250 - Ontario Clean Water Agency - Other Operating Costs	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
55450 - Contractors	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800	47,700	48,700	
51190 - Materials and Supplies - Other	30,000	31,500	33,100	34,800	36,500	38,300	40,200	42,200	44,300	46,500	48,800	
53650 - Weed Control Services	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	
52900 - Repairs and Maintenance - Other	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	
54100 - Utilities - Hydro	57,223	60,100	63,100	66,300	69,600	73,100	76,800	80,600	84,600	88,800	93,200	
54300 - Insurance - Buildings	3,719	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100	
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600	
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	
Sub Total Operating	346,162	406,100	416,900	428,200	439,700	451,700	464,200	477,000	490,100	503,600	517,600	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related												
Existing Debt (Interest) - Growth Related												
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related												
Existing Debt (Interest) - Non-Growth Related												
New Non-Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	415,895	2,057	3,667	5,340	7,077	8,879	10,747	12,681	14,684	16,755	18,941	
Sub Total Capital Related	415,895	2,057	3,667	5,340	7,077	8,879	10,747	12,681	14,684	16,755	18,941	
Total Expenditures	762,057	408,157	420,567	433,540	446,777	460,579	474,947	489,681	504,784	520,355	536,541	
<b>Revenues</b>												
Base Charge	245,438	254,653	264,200	274,091	284,338	294,952	305,948	317,338	329,135	341,356	354,013	
46970 - Land Leases and Rentals	-	-	-	-	-	-	-	-	-	-	-	-
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	231,322	-	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	476,760	254,653	264,200	274,091	284,338	294,952	305,948	317,338	329,135	341,356	354,013	
Wastewater Billing Recovery - Operating	285,297	153,504	156,366	159,449	162,439	165,627	168,999	172,344	175,648	178,999	182,528	
Lifecycle Reserve Contribution (\$)		141,933	150,377	158,735	167,320	175,842	185,877	196,096	206,513	217,039	227,545	
<b>Wastewater Billing Recovery - Total</b>	<b>285,297</b>	<b>295,437</b>	<b>306,743</b>	<b>318,184</b>	<b>329,759</b>	<b>341,469</b>	<b>354,876</b>	<b>368,440</b>	<b>382,161</b>	<b>396,039</b>	<b>410,073</b>	

**Table D-2-9**  
**Town of Essex**  
**Wastewater Service - Ward 3**  
**Wastewater Rate Forecast**  
 Inflated \$

Description	2015	Existing	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Wastewater Billing Recovery	285,297		295,437	306,743	318,184	329,759	341,469	354,876	368,440	382,161	396,039	410,073
Total Consumption (m <sup>3</sup> )	149,613		150,733	151,853	152,973	154,093	155,213	156,333	157,453	158,573	159,693	160,813
<b>Constant Rate</b>	<b>1.91</b>	<b>1.91</b>	<b>1.96</b>	<b>2.02</b>	<b>2.08</b>	<b>2.14</b>	<b>2.20</b>	<b>2.27</b>	<b>2.34</b>	<b>2.41</b>	<b>2.48</b>	<b>2.55</b>
<b>Annual Percentage Change</b>			3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

**Table D-3-2  
Town of Essex  
Wastewater Service - Ward 4  
Capital Budget Forecast  
Inflated \$**

Description	Budget 2015	Total	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Capital Expenditures</b>													
Treatment - Ward 4 Contingency	17,000	-	-	-	-	-	-	-	-	-	-	-	-
Collection and Conveyance - Ward 4 Contingency	20,500	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 4 Collection and Conveyance)	1,800	-	-	-	-	-	-	-	-	-	-	-	-
Pickup Truck ( Ward 4 Treatment)	600	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Lifecycle:</b>													
Wastewater Treatment & Disposal - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Manholes - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary Sewers - Ward 4	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>39,900</b>	<b>-</b>											
<b>Capital Financing</b>													
Provincial/Federal Grants		-											
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	39,900	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Financing</b>	<b>39,900</b>	<b>-</b>											

**Table D-3-3  
Town of Essex  
Wastewater Service - Ward 4  
Schedule of Non-Growth Related Debenture Repayments  
Inflated \$**

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-3-4  
Town of Essex  
Wastewater Service - Ward 4  
Schedule of Growth Related Debenture Repayments  
Inflated \$**

Debenture Year	2015	Principal (Inflated)	Forecast										
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2016		-		-	-	-	-	-	-	-	-	-	-
2017		-			-	-	-	-	-	-	-	-	-
2018		-				-	-	-	-	-	-	-	-
2019		-					-	-	-	-	-	-	-
2020		-						-	-	-	-	-	-
2021		-							-	-	-	-	-
2022		-								-	-	-	-
2023		-									-	-	-
2024		-										-	-
2025		-											-
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table D-3-5**  
**Town of Essex**  
**Wastewater Service - Ward 4**  
**Wastewater Reserve Funds Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	99,210	232,606	264,042	302,861	325,249	331,044	334,974	336,764	336,239	338,291	337,850
Transfer from Operating	620,010	52,346	47,400	29,974	12,576	9,910	6,980	3,890	5,643	2,344	6,672
Loan to DC Reserve Fund	18,272	24,170	12,320	11,601	10,868	10,115	9,348	8,566	7,768	6,956	-
Transfer to Capital	39,900	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	431,314	-	-	-	-	-	-	-	-	-	-
Closing Balance	229,735	260,782	299,122	321,233	326,957	330,839	332,606	332,088	334,114	333,679	344,522
Interest	2,872	3,260	3,739	4,015	4,087	4,135	4,158	4,151	4,176	4,171	4,307

**Table D-3-6**  
**Town of Essex**  
**Wastewater Service - Ward 4**  
**Wastewater Development Charges Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	1,222	(0)	-	-	-	-	-	-	-	-	-
Development Charge Proceeds	21,047	12,105	36,060	36,779	37,512	38,265	39,032	39,815	40,612	41,425	42,252
Transfer from Operating - Discounts	7,840	12,105	-	-	-	-	-	-	-	-	-
Loan from Wastewater Reserve Fund	18,272	24,170	12,320	11,601	10,868	10,115	9,348	8,566	7,768	6,956	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	24,190
Closing Balance	(0)	-	-	-	-	-	-	-	-	-	18,062
Interest	(0)	-	-	-	-	-	-	-	-	-	226
Required from Development Charges	-	-	-	-	-	-	-	-	-	-	-

**Table D-3-7**  
**Town of Essex**  
**Wastewater Service - Ward 4**  
**Wastewater Lifecycle Reserve Fund Continuity**  
 Inflated \$

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Opening Balance	832,285	842,689	878,535	940,142	1,027,831	1,141,929	1,267,578	1,404,923	1,554,109	1,710,223	1,878,414
Transfer from Operating	-	25,000	50,000	75,000	100,000	110,000	120,000	130,000	135,000	145,000	300,000
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-	-
Closing Balance	832,285	867,689	928,535	1,015,142	1,127,831	1,251,929	1,387,578	1,534,923	1,689,109	1,855,223	2,178,414
Interest	10,404	10,846	11,607	12,689	14,098	15,649	17,345	19,187	21,114	23,190	27,230

**Table D-3-8  
Town of Essex  
Wastewater Service - Ward 4  
Operating Budget Forecast  
Inflated \$**

Description	Budget 2015	Forecast										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
<b>Treatment</b>												
55200 - Ontario Clean Water Agency - Annual Operating Costs	99,578	101,600	103,600	105,700	107,800	110,000	112,200	114,400	116,700	119,000	121,400	
55250 - Ontario Clean Water Agency - Other Operating Costs	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	
55340 - Garbage Collection Fees - Ward 4	215	200	200	200	200	200	200	200	200	200	200	
51190 - Materials and Supplies - Other	10,000	10,500	11,000	11,600	12,200	12,800	13,400	14,100	14,800	15,500	16,300	
53650 - Weed Control Services	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800	6,900	7,000	
52900 - Repairs and Maintenance - Other	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	6,000	
54100 - Utilities - Hydro	90,567	95,100	99,900	104,900	110,100	115,600	121,400	127,500	133,900	140,600	147,600	
54200 - Communications - Telephone	954	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
54300 - Insurance - Buildings	1,104	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	
54310 - Insurance - Vehicles	80	100	100	100	100	100	100	100	100	100	100	
54320 - Insurance - General	568	600	600	600	600	600	600	600	600	600	600	
Flooding Mitigation	-	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	
<b>Sub Total Operating</b>	<b>346,349</b>	<b>406,700</b>	<b>417,900</b>	<b>429,700</b>	<b>441,700</b>	<b>454,200</b>	<b>467,200</b>	<b>480,600</b>	<b>494,400</b>	<b>508,500</b>	<b>523,300</b>	
<b>Capital-Related</b>												
Existing Debt (Principal) - Growth Related	36,865	37,856	38,873	39,918	40,991	42,093	43,224	44,386	45,579	46,804	23,872	
Existing Debt (Interest) - Growth Related	11,516	10,525	9,507	8,463	7,390	6,288	5,157	3,995	2,802	1,577	319	
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Existing Debt (Principal) - Non-Growth Related	196,346	201,856	207,523	213,350	219,342	225,504	231,840	238,356	245,057	251,949	105,959	
Existing Debt (Interest) - Non-Growth Related	64,104	58,593	52,927	47,100	41,108	34,946	28,610	22,093	15,392	8,501	1,415	
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-	-	
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Capital	-	-	-	-	-	-	-	-	-	-	-	
Transfer to Development Charge - Discounts	7,840	12,105	-	-	-	-	-	-	-	-	-	
Transfer to Capital Reserve	620,010	52,346	47,400	29,974	12,576	9,910	6,980	3,890	5,643	2,344	6,672	
<b>Sub Total Capital Related</b>	<b>936,680</b>	<b>373,282</b>	<b>356,230</b>	<b>338,804</b>	<b>321,406</b>	<b>318,741</b>	<b>315,811</b>	<b>312,720</b>	<b>314,474</b>	<b>311,174</b>	<b>138,237</b>	
<b>Total Expenditures</b>	<b>1,283,029</b>	<b>779,982</b>	<b>774,130</b>	<b>768,504</b>	<b>763,106</b>	<b>772,941</b>	<b>783,011</b>	<b>793,320</b>	<b>808,874</b>	<b>819,674</b>	<b>661,537</b>	
<b>Revenues</b>												
Base Charge	263,868	270,292	276,867	283,597	290,485	297,536	304,752	312,138	319,697	327,434	335,353	
43220 - Sewer Frontage and Connection Charges	63,979	-	-	-	-	-	-	-	-	-	-	
Contributions from Development Charges Reserve Fund	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	48,380	24,190	
Contributions from Reserves / Reserve Funds	431,314	-	-	-	-	-	-	-	-	-	-	
<b>Total Operating Revenue</b>	<b>807,541</b>	<b>318,672</b>	<b>325,247</b>	<b>331,977</b>	<b>338,866</b>	<b>345,916</b>	<b>353,132</b>	<b>360,518</b>	<b>368,078</b>	<b>375,815</b>	<b>359,543</b>	
Wastewater Billing Recovery - Operating	475,488	461,309	448,883	436,527	424,241	427,024	429,878	432,802	440,796	443,860	301,993	
Lifecycle Reserve Contribution (\$)	-	25,000	50,000	75,000	100,000	110,000	120,000	130,000	135,000	145,000	300,000	
<b>Wastewater Billing Recovery - Total</b>	<b>475,488</b>	<b>486,309</b>	<b>498,883</b>	<b>511,527</b>	<b>524,241</b>	<b>537,024</b>	<b>549,878</b>	<b>562,802</b>	<b>575,796</b>	<b>588,860</b>	<b>601,993</b>	

**Table D-3-9**  
**Town of Essex**  
**Wastewater Service - Ward 4**  
**Wastewater Rate Forecast**  
 Inflated \$

Description	2015	Existing	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Wastewater Billing Recovery	475,488		486,309	498,883	511,527	524,241	537,024	549,878	562,802	575,796	588,860	601,993
Total Consumption (m <sup>3</sup> )	273,876		274,751	275,626	276,501	277,376	278,251	279,126	280,001	280,876	281,751	282,626
<b>Constant Rate</b>	<b>1.74</b>	<b>1.74</b>	<b>1.77</b>	<b>1.81</b>	<b>1.85</b>	<b>1.89</b>	<b>1.93</b>	<b>1.97</b>	<b>2.01</b>	<b>2.05</b>	<b>2.09</b>	<b>2.13</b>
<b>Annual Percentage Change</b>			<b>2%</b>									