EPCOR Water Services Inc

Review of 2012-2016 PBR Proposal

Contents

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Scope of work

The City of Edmonton (the "City") has engaged the services of Grant Thornton LLP ("GT") to proceed with an independent review of a request formulated by EPCOR Water Services Inc. ("EWSI") to repeal Waterworks Bylaw 12585, as amended by Bylaw 13636, and replace it with the proposed EPCOR Water Services and Wastewater Treatment Bylaw 15816 (the "Request").

Pursuant to our engagement letter, GT has been mandated to proceed with a due diligence review of the request. Specifically, the City is requesting that GT analyze the request to confirm it is consistent with the objectives outlined in Section 5 of the EPCOR Rates Procedures Bylaw 12294 with emphasis on the Rates Notice and Rates Report and Performance Based Regulation Information Package. The scope of the analysis includes:

1. Review of the components of the proposed plan and the changes from the existing plan.
2. Review of results of existing plan.
3. Analysis of how EWSI estimated costs for 2012.
4. Review of cost allocations as part of the cost of service review.
5. Review of inflation and efficiency factors and comparison to other like service providers.
6. Review and analysis of special rate adjustments.
7. Review of capital expenditures supported through rates.
8. Review of allocation of overhead and shared service costs in developing rates.
9. Assessment of water and wastewater rates, rate riders and service charges, based on reviewed underlying costs, and in comparison to other municipal water and wastewater service providers.
10. Methodology for making changes within the period of the bylaw including review of non-routine adjustment criteria.
11. Assessment of EWSI's proposed rate of return including comparison to other like service providers.
12. Risks and rewards – determination of adequate balance between the City and EWSI.
13. Review of reasonableness and appropriateness of Water and Wastewater System Service Quality (performance measures).

Our report primarily focuses on our due-diligence process to independently analyze the proposed water and wastewater rates, document our findings and recommendations.

Specifically, we have undertaken the following activities:

- A detailed review of the information provided by EWSI in support of its Rate Notice and Rate Report.
- An in-depth analysis of the revenue requirements, cross-checking the build-up of operational costs calculations over the performance based rate plan 2012-2016 period (PBR III) for both water and wastewater rates.
- A review of the cost of service model used by EWSI in allocating revenue requirements between its customers in the water operation to ensure consistency with the approach used under Performance based rate plan 2007 – 2011 period (PBR II).
- An analysis of the evolution of the rate base over the proposed period, tracking changes from 2010 to 2012 and towards 2016, and cross referencing financial data presented within the information package.
- A detailed review of the opinion on cost of debt, capital structure and return on equity provided by EWSI in support of its proposed capital structure, cost of debt and cost of equity assumptions.
- An analysis of the corporate services charges as well as transactions with Epcor Utilities Inc ("EUI") and its subsidiaries.
- A detailed analysis of the financial model developed by EWSI in support of the proposed changes to the rate structure, including the special adjustments.
- A review of the proposed changes to the quality of service measures for water operations as well as the proposed quality of service measures for the wastewater operations.

Appendix A lists the various documents that were reviewed by GT in the context of this engagement.

Summary of findings

We have structured our findings in a manner consistent with the guiding objectives defined in Section 5 of the Rates Procedures Bylaw. Within the PBR structure, we recognize the dynamic tension that exists for the City of Edmonton as both the investor that seeks to maximize the return on capital and as regulator that seeks to minimize the rate impact on various customer segments.

Through the Rates Notice, EWSI is seeking approval for a third extension of the PBR Plan. We note that EWSI has been operating under this regime for almost 8 years which provides a track record of operational and financial performance.

Under PBR II, increases in operating costs were offset by increases in revenue requirements and decrease in interest expense and depreciation. We have provided a detailed review of PBR II in the section EWSI Performance Under PBR II (page 20 – 22).

While our review focuses on the proposed changes for the PBR III period, we have adopted a pragmatic view on the performance of the current PBR regime and where applicable suggested improvements to better align with the guiding objectives set forth in the Rates Procedures Bylaw.

The decision to move forward with the proposed improvements remains at the discretion of the City and will require discussion with EWSI to assess their respective feasibility.

The following section summarizes the key findings from our review:

a) **The citizens of Edmonton must be provided with safe and reliable utility services;**

There are mechanisms within the PBR structure which support safe and reliable utility services which include appropriate levels of operating and capital expenditures as well as supporting regulatory and performance measures.

b) **Utility services are to be provided in a manner that reflects reasonable environmental management in comparison to industry benchmarks;**

The proposed changes to the consumption tiers in the residential customer group are consistent with reasonable environmental management. Under the proposed structure residential customers will continue to be incentivized to reduce their water consumption.

Reduced average customer water consumption is assumed in the proposed rate structure. If such decreases do not materialize, then EWSI will generate revenue levels higher than those proposed without a corresponding increase in costs. Similarly, growth in customer count is assumed in the proposed rate structure. If growth exceeds the levels anticipated, then EWSI will generate revenue levels higher than those proposed. While costs are legitimately expected to increase, the marginal cost of servicing additional customers should not exceed the incremental revenues. We note that under the current PBR, no mechanisms are provided to ensure incremental revenues produced are held for the benefit of and/or redistributed to ratepayers.

For a detailed analysis, refer to finding and recommendations of water treatment rate structure in Section 2 – Regulated Water Operations and wastewater treatment rate structure in Section 3 (page 55-77) – Regulated Wastewater Operations of the report (page 90 – 97).

c) **Rates will be sufficient to ensure continued development of utility infrastructure to reasonably ensure the satisfaction of the objectives of the Rates Procedures Bylaw;**

Over the term of PBR III, EWSI expects to complete over $400M in capital projects in its water operations. This level of capital spending materially exceeds the program carried under PBR II due to regulatory upgrades required at its water treatment plants and City requirements.

The various capital projects have been grouped in categories reflecting the nature of the investment. The following categories account for more than 75% of the projected spending in water operations: City requirements ($110.3M), reliability ($97.0M) and accelerated main renewal program ($100.0M).

EWSI is suggesting that its wastewater operations transferred in 2009 from the City be introduced into PBR III. The investment program during PBR III provides for $111.7M in capital projects. Over 90% of the total capital spending is dedicated to improving the reliability.

By 2016, this level of capital spending will have increased the rate base for water operations by almost 32% when compared to the 2011 rate base based on total system. While a detailed analysis of the nature and relevance of individual capital project is beyond the scope of our engagement, best practices in other North American jurisdictions suggest that the City should participate in the investment appraisal process to ensure adequate financial regulatory oversight on capital spending, particularly to the extent such spending is in excess of amounts approved through this rate making process.

Considering the magnitude of investments and in the context of the PBR mechanism, we have requested from EWSI an expanded list of capital projects contemplated during PBR III. This list is featured in Appendix **B** for future reference.

d) **EWSI is entitled to a reasonable return from operations in relation to the provision of utility services within the City of Edmonton;**

Compared to PBR II, the proposed cost of capital assumptions (i.e. cost of debt and return on equity ("ROE") have improved and result in a lower weighted average cost of capital.

EWSI produced an expert report to support the assumptions used in its rate application. We have reviewed the methodology adopted by the expert and conclude it is consistent with market practice. We must emphasize that cost of capital assumptions are and will continue to remain a debatable topic between utilities and their respective regulators. Even within the academic community there is little consensus on the appropriate approach to evaluating return requirements.

Compared to industry benchmarks, the cost of capital assumptions used by EWSI remain in the upper quartile. While EWSI is subject to commercial risks that may not be directly comparable to industry benchmarks, we note that the cost of capital assumptions used by EWSI continue to differ from the levels approved by the AUC for the RWCG. Assumptions differ on both in terms of ROE and cost of debt as well as in the relative weighting. On a combined basis, the weighted average cost of capital underlying the revenue requirements is 7.75 % compared to 6.45% for the RWCG. Our section on Cost of Service Allocation provides further details.

Specific to the wastewater operations, we note that EWSI is planning a phased increase of the ROE requirement over the term of PBR III. The ROE is set at 3.45% for 2012 and will gradually increase to 10.875% by 2016. As part of our review, we identified that revenues generated through the proposed rate structure exceeded the revenue requirements described in the wastewater information package by $2.03 million over the term of PBR III. We understand that EWSI opted to adjust its revenue requirements through an acceleration of the phasing of annual ROE increases. While we emphasize this does not impact the proposed wastewater rate structure, we note that the adjustment could also have been implemented through a reduction in the wastewater rate structure. Please see page 79-89 for further details.

e) **All customer charges will be based upon cost of service**

EWSI is currently undertaking a cost of service study and the methodology used in their rate setting aligns with industry standard practices.

We have reviewed the cost allocation methodology, which appears reasonable and consistent with industry practice. EWSI provided corporate cost methodologies and details, as well components of the corporate cost allocation model specific to EWSI, which we reviewed. EWSI was not able to provide the full cost allocation model.

PBR III allows EWSI to refresh its revenue requirements to match its current and forecasted cost structure. This effectively transitions from its revenue requirement for 2011 under PBR II of $139.2 million to $159.42 million for 2012 under PBR III. While the current rate structure already supports part of the increase, EWSI is proposing a special rate adjustment geared at re-basing the rate structure over 2012 and 2013 to account for the shortfall.

From our review, we identified variances with the information disclosed in the water information package (paragraph 129 – page 42) with respect to the projected evolution over the PBR III term of specific operating costs categories. These unexplained variances total $2.16 M over the term of PBR III and extend to the following categories: i) salaries and benefits, ii) contractors and consultant, iii) materials and supplies, iv) customer billing and v) other costs. We note that EWSI provided

additional clarifications on the nature of the increases which confirmed that certain cost categories are budgeted to increase at a rate that outpaces the expected inflation.

As part of our analysis, we independently verified the revenue calculation underlying the proposed changes to the rate structure using the consumption volumes provided by EWSI for each customer group. Section 2 – Regulated Water Operations (page 27-28) details the total system revenue requirements for regulated water operations.

We performed a similar review of the wastewater operations with limited findings. Section 3 – Regulated Wastewater Operations (page 79-80) details the total system revenue requirements for the wastewater operations.

We note that the proposed changes to the annual inflation adjustment mechanism to the water and wastewater rate-structure will result in a more transparent rate adjustment mechanism based on the reliance towards independently verifiable data sources. We also note that over the term of PBR III and compared to the adjustment mechanism under PBR II, there will be a lesser correlation in rate increases to CPI given the proposed weighting changes which increase the relative importance of labour costs.

We note that the proposed annual rate adjustment calculation continues to feature a proposed efficiency factor of 0.25%. We echo the conclusions from the independent review of PBR II that the proposed factor is modest in comparison to the industry. Given the prior year increases in operating costs as well as the extent of the capital program contemplated under PBR III, a higher efficiency factor could be justified to ensure a strong incentive to reduce and control operating and capital costs.

Consistent with our finding with respect to capital projects, we note that the City, as regulator, should contemplate an enhanced level of disclosure by EWSI over the term of PBR III with respect to its financial performance with a detailed analysis of variances between actual and forecasted values. As a further step to mitigate future cost increases, the City should contemplate mechanisms which would require prior approval of incremental expenditures before they get aggregated in the revenue requirements.

f) **Performance will be assessed by reference to industry benchmarks**

The performance measures which are being put forward for PBR III for both water and wastewater align with industry practices and are generally of an operational nature with a limited emphasis on financial measures. The critical measures and targets which focus on regulatory requirements within the water quality index are an important aspect of the performance management system which is expected. The other indices which address system reliability, customer service, environmental and safety provide the opportunity to track and monitor a variety of measures deemed important by EWSI.

The use of indices which are based on the aggregated value of a basket of individual measures dilutes the relative importance of each index and fails to properly account for the criticality of some measures. This is especially relevant in the context where not all measures share the same relative

importance and where performance on individual measures are mitigated or averaged. For selected measures that impact critical activities, consideration should be given to creating individual thresholds to ensure minimum performance is consistently achieved.

Under the customer services index for wastewater treatment, the measure of number of meetings held may not result in a meaningful measure which reflects customer service nor provide an opportunity to monitor and track improvements. A possible variation to this index could be to measure the ratio of "number of open items during the meetings over the number of items closed within the targeted period". So independently of the number of meetings, EWSI would measure the pro-activeness in responding to the community liaison committee open issues. Other variations to this measure could also be considered.

Furthermore, given the relationship between the City's Drainage Branch and the Gold Bar wastewater treatment plant on biosolids management, it would appear that the development of performance measures around biosolids production and supernatant management would be warranted.

For a detailed analysis, refer to Section 4: Performance Measures of the report (page 98-111).

g) The timing of a decision and the effective date for rates approval pursuant to this Bylaw must reflect the financial needs of EWSI

The rate setting aligns with industry standard practices and appears to meet the financial needs of EWSI.

From a philosophical perspective, the focus of PBR is on achieving predefined goals, objectives, targets and metrics and allows the utility discretion to achieve those targets and shares with ratepayers the benefits and costs within certain parameters. Under such a rate structure, the regulator / ratepayer should have less oversight of the specific activities of the utility. By allowing the utility to earn returns above the regulated rate through innovation and meeting performance targets, incentives are created to lower costs for ratepayers.

The current PBR addresses quality of service delivery through its various performance measures. Ratepayers have a reasonable level of performance for services provided. This is important when establishing any performance based system as quality service performance is an essential component.

From a financial perspective there is limited incentive for EPCOR to innovate and thus reduce the cost of service delivery to rate payers. The current model is effectively a blend of PBR for service quality related elements and traditional return on rate base for the financial component.

To create a full PBR system and incent cost reduction for ratepayers, there has to be an incentive (for EWSI) to innovate and drive down the cost of service delivery. The current efficiency factor is not an incentive for EPCOR to be innovative and more efficient.

Based on the current regulatory model, we have made recommendations above to create greater oversight in financial decision making regarding capital and operating matters. Should the rate

structure evolve towards more of a full PBR model with incentives for reducing costs to ratepayers, then these oversight mechanisms can be withdrawn.

Section 1: Background

Context

EPCOR Water Services Inc.

EPCOR Water Services Inc ("EWSI"), a direct wholly owned subsidiary of EPCOR Utilities Inc ("EUI"), provides water and wastewater services to over 60 communities across Western Canada. EUI is a wholly-owned subsidiary of the City of Edmonton.

In July 2006, the Edmonton City Council approved a Performance Based Rate ("PBR") plan that commenced on April 1, 2007 and continues for five years ("PBR II"). Under PBR, EWSI is mandated by the City to provide water services which includes the production, treatment and supply of potable water to all customers within the City. This is the second PBR plan Edmonton City Council has approved for EWSI and will be expiring on March 31st, 2012. In 2009, the City expanded the activities of EWSI to Wastewater Treatment Services which includes the treatment of wastewater and the storage, pumping and disposal of treated wastewater through the Gold Bar wastewater treatment plant.. The plant is entering into its first PBR since EWSI acquired it from the City in 2009.

EWSI operates two water treatment plants with a combined capacity of 680 million litres per day (ML/d), under average summer water conditions; and one wastewater plant. Both water treatment plants currently serve a population of more than 782,000 Edmonton customers and more than 235,000 regional area customers. The facilities operated by EWSI are the following:

- **Rossdale Water Treatment Plant:** This plant has been operating since 1903. The current plant was built in 1947 and expanded in 1955. Rossdale treats approximately 65,000 ML/year.
- **E.L. Smith Water Treatment Plant**: This plant was built in 1976 and in 2008, the plant was upgraded which increased its water treatment capability to 400 ML/d. This plant is expected to produce up to 75% of the total treated water supply for the region.
- **Gold Bar Wastewater Treatment Plant**: This plant was transferred from the City of Edmonton to EWSI in 2009.

In addition to the operation of the facilities, EWSI is also responsible for the transmission and distribution of water within the City. EWSI is responsible for 3,500 kilometers of pipelines, 17,200 hydrants, and 50,000 valves.

The primary sources of revenues for EWSI are water and wastewater treatment rates charged to its customers. The water rate structure is regulated by the City under the PBR mechanism.

EWSI Request of June 6, 2011

EWSI is seeking approval from Edmonton City Council for a five year extension of the PBR for the period from April 1, 2012 to March 31, 2017 ("PBR III"). It is important to emphasize that although EWSI provides water and wastewater treatment services to all customers within the City boundaries, the proposed PBR is applicable only to the City of Edmonton residents. As such, PBR III sets water and wastewater treatment rates for the "In-city" customers for a period of five years.

Key changes that EWSI would like to introduce in PBR III are as follows:

- Wastewater treatment services (provided at the Gold Bar wastewater treatment plant) are being included in this PBR renewal along with the renewal of existing water treatment services for customers. A separate rate on customer bills for wastewater treatment services provided by EPCOR is being proposed in this PBR. Essentially, EWSI intends to bring its wastewater treatment services under the umbrella of five-year PBR mechanism. The Gold Bar wastewater plant was recently transferred to EWSI from the City.

- A change in the residential water structure to move from a 2-tier rate (0 m^3 – 60 m^3, >60 m^3) to a 3-tier rate (0 m^3 – 10 m^3, 10 m^3 – 35 m^3, > 35 m^3). This promotes conservation of water resource among consumers. Also, 0 m^3 – 10 m^3 aligns with the usage of typical conserving North American households, 10 m^3 – 35 m^3 is the usage for the majority of Edmonton households and over 35 m^3 is the usage for a typical unmetered Canadian household.

- Water rates reflect two special rate adjustments ("SRA") above inflation (less an efficiency factor), one in 2012 and 2013 to address infrastructure investment and predicted declining volumes of water sales due to water conservation applied to the fixed and consumption charges of water services, and another adjustment each year over 2012-2016 applied to consumption charges for water services to support the $100 million Accelerated Water Main Renewal program ("AWMR").

- Wastewater treatment rates reflect a special rate adjustment above inflation (less an efficiency factor) each year (2012-2016) to support costs related to regulatory driven infrastructure investments, to address predicted declining volumes of water due to conservation, and to support a gradual increase in the return of equity from expected 3.45% in 2012 to 10.875% in 2016.

- A reduction in return of equity from 11.25% in the existing PBR term (2007-2011) to 10.875% for water services, and a gradual increase in the return on equity for wastewater treatment to reach 10.875% by 2016 from 3.45% in 2012.

- An updated cost of services allocation between in-city customers, Edmonton's Fire Rescue services and regional water customers based on an updated cost of services ("COS") study that is under progress but not finalized.

- Updates to performances measures for water services, the addition of wastewater treatment performance measures, and updates to performance penalties for both water and wastewater treatment.

In support of its application, EWSI provided the following information to the City:

- EPCOR Water Services and Wastewater treatment Bylaw Rates Notice and Rate Report;
- Water Operations Information Package and Wastewater Treatment Operation Information Package dated June 14, 2011;
- EPCOR Water Services, 2012-2016 Performance Based Water Rates – Presentation to Edmonton City Council Utility Committee;
- EPCOR Water Services Performance Based Regulation (PBR) – PBR Progress Report 2010; and
- EPCOR Water Services, Water Quality, Environmental and Safety Indices Applicable to Schedule 3 of the EPCOR Water and Wastewater Bylaw.

Performance Based Regulation

Concepts

PBR is a type of regulatory framework that fixes the customer water and wastewater charges while covering operations costs and cost of capital for EWSI for the next five years.

PBR allows a utility to earn a return for the services it provides. Philosophically, PBR provides incentives to reduce costs and to identify efficiencies and the utility has to share the efficiency gains with customers.

EWSI presents four major benefits of a PBR regulation:

1. Customers receive stable and predictable rates over the five year period.

2. EWSI bears the risk that cost increases will be higher than what was forecasted for the five-year period.

3. A five year plan eliminates the need for the City of Edmonton to process more frequent and costly regulatory filings.

4. Under PBR regulation, the utility has to maintain pre-set performance levels and penalties will occur if these performance levels are not met.

We note that the PBR approach is used in other utilities such as gas and electricity. In these sectors, we note that PBR is also meant to incentivize the utilities to implement operational efficiencies and eventually share, through the PBR cost reductions with rate payers.

EPCOR Rates Procedures Bylaw 12294

The rate review procedure defined in the EPCOR Rates Procedures Bylaw provides that at such time as EWSI seeks to set or amend rates, it must provide the City with a rates notice containing a brief description of the nature of the rates approval being sought, the proposed effective dates of the new rates, and the preferred date for a public hearing.

In addition to the rates notice, EWSI is also required to provide a rates report that includes:

- A sufficient explanation to allow Council to reasonably assess the rates in relation to the objectives set out in Section 5 of the Rates Procedures Bylaw; and

- Comparisons of rates in surrounding communities and other regions.

The guiding objectives defined in Section 5 of the Rates Procedures Bylaw are listed as follows:

a) The citizens of Edmonton must be provided with safe and reliable utility services;

b) Utility services are to be provided in a manner that reflects reasonable environmental management in comparison to industry benchmarks;

c) Rates will be sufficient to ensure continued development of utility infrastructure to reasonably ensure the satisfaction of the objectives of the Rates Procedures Bylaw;

d) EWSI is entitled to a reasonable return from operations in relation to the provision of utility services within the City of Edmonton;

e) All customer charges will be based upon cost of service;

f) Performance will be assessed by reference to industry benchmarks; and

g) The timing of a decision and the effective date for Rates approved pursuant to this Bylaw must meet the financial needs of EWSI.

EWSI Performance under PBR II

As indicated previously, EWSI is currently operating under its second PBR for water operations with the City. The current PBR Plan covers the period from April 1, 2007 to March 31, 2012. The following table summarizes EWSI operating performance, as documented in its annual performance based rates progress reports.

Table 1 – Forecast and Actual PBR II performance

All numbers in $ millions	2007		2008		2009		2010	
except otherwise stated	PBR	Actual	PBR	Actual	PBR	Actual	PBR	Actual
Revenues	119	119.7	126.9	131.9	130.8	141.9	134.7	138
Operating Costs	53.7	55.1	55.3	63.5	56.6	71.8	57.8	69.8
Franchise Fee	8.6	8.7	9.4	9.6	9.7	10.4	10.0	10.6
Depreciation	14.3	12.4	15.6	13.5	16.6	15.0	17.5	15.5
Interest Expense	20.8	18.6	22.9	21.2	24.0	20.9	24.1	20.3
Return on Equity (net income)	21.6	24.9	23.7	24.1	24.0	23.8	25.3	21.8
Water consumption* (ML)	92,654	92,638	92,839	92,869	93,507	95,486	94,182	89,550

All numbers in $ millions	2011			Total (20007-2011)		
except otherwise stated	PBR	Forecast		PBR	Forecast	Δ
Revenues	139.1	146.5		650.5	678	27.5
Operating Costs	59.1	74.2		282.5	334.4	51.9
Franchise Fee	10.3	11.4		48	50.7	2.7
Depreciation	18.4	16.4		82.4	72.8	-9.6
Interest Expense	25.3	20		117.1	101	-16.1
Return on Equity (net income)	26.1	24.5		120.7	119.1	-1.6
Water consumption* (ML)				373182	370543	2639

Source: EWSI Performance based rates reports and GT calculations; *for 2007-2010 only

We have reviewed the information disclosed by EWSI. A comparative analysis of actual and forecasted performance of EWSI suggests the following:

- EWSI collected more revenues during the period as a result of growth in its customer base as well as inflation adjustments to its rate structure and despite a decrease in consumption volumes;
- Total operating costs exceeded the PBR forecasts, primarily driven by labour costs and general inflation;
- Total depreciation is lower than PBR forecasts;
- Total cost of interest is lower than forecast as a result of reduced actual borrowing costs;
- Total return on equity is consistent with the PBR forecasts.

We also note that the rate base has grown larger over the term of PBR II. This is directly tied to the higher level of capital expenditures projects completed during the period.

We inquired about a mismatch observed in the PBR forecast for 2007-2010, capital expenditures Table 6.1-1 and Table 7.1-1. EWSI provided us with a corrected version of Table 6.1-1.

Table 2 – Capital expenditure for PBR II – Water Operations

Category ($ million)	2007-2011 Forecast	2007-2011 Actual
Capital expenditure excluding E L Smith upgrade and AWMR program	199.85	247.69
E.L Smith Upgrade	48.00	72.03
AWMR Program	-	22.75
Total	247.85	342.47

Source: EWSI

While $247.85M was expected to be spent over the term of PBR II, EWSI expects that by the end of 2011, it will have invested $342.47M. This increase of $94.62M was due to higher cost related to changing priorities primarily related to water main renewals ($10.36M), unplanned projects related to growth and City requirements ($12.70M); higher than expected construction costs related to economic conditions in Alberta ($18.70M); a delay in capital expenditures for the E.L. Smith upgraded project; cost variability of other projects ($5.96M) and additional costs related to the AMWR program noted above which was not included in EWSI's 2007-2011 PBR plan ($22.75M).

By way of context, our review of EWSI's performance under PBR II indicates that incremental revenues generated in excess of PBR levels are expected to total $27.5 million. Over the term of the PBR, EWSI also recorded lower depreciation and interest expenses. On a combined basis, these positive variances cumulated to $53.2 million. We note that these were offset by a $54.6 million increase in operating costs, including franchise fees. Specific to operating costs, the annual year over year increase totalled 8.42%. We note that the increase in operating costs is partially tied to economic conditions but also bring forth that water volumes have remained in line with levels initially anticipated under PBR II, except for 2010.

Section 2: Regulated Water Operations

Methodology

Overview of global methodology

EWSI's PBR methodology reflects three components as given below:

1. **Cost of Service methodology**: EWSI's PBR methodology uses cost of service as the starting point for the PBR 2012-2016.

2. **Transition every 5 years**: The transition from PBR II to PBR III enables EWSI to reset its revenue requirements to match its current operating and capital related costs (depreciation, interest expense and return). Also, the capital expenditure figures are estimated at the start of PBR term and captured in the cost of service methodology. This allows EWSI the opportunity to reset the rate structure to the current cost levels , which emphasizes the importance of the City having an oversight or approval mechanism for capital expenditures in excess of levels approved through this rate making process.

3. **Rate calculations by Customer class:** EWSI operates two water treatment plants and one wastewater plant. EWSI provides water treatment services to three distinct customer segments and wastewater treatment services to the in-city segment as describe below. Note that PBR III covers only In-city customer segments for both water and wastewater treatment service

    - **In-City Segment**: The first segment is in-city customers and represents all metered customers within the municipal boundaries of the City. Water charges are broken further down into residential, multi-residential and commercial classes and wastewater charges are broken into residential and commercial classes.

    - **Fire Protection Segment:** The second segment is the City Fire Rescue Services (FRS). EWSI supplies public fire protection services throughout the City through a network of water mains, water reservoirs and fire hydrants. The fire protection services are directly charged to the City and are not paid for by any other customers.

    - **Wholesale Segment:** The third segment is the wholesale segment. This is made up of the group of communities surrounding Edmonton termed as the regional water customer group ("RWCG"). RWCG comprised of Strathcona county, the City of St. Albert, the Town of Morinville, the Capital region Northeast Water services Commission, the Capital Region Parkland Water Service Commission, the Capital Region Southwest Services Commission

and Sturgeon County. EWSI supplies bulk water to these customers and the group pays costs as determined by the Alberta Utilities Commission ("AUC").

Cost of Service Methodology

COS is the most commonly accepted approach to rate setting for water and wastewater utilities in North America. The COS methodology has been endorsed by Canadian and American water utilities and regulators, as well as the American Water Works Association ("AWWA"). EWSI ensures that the COS methodology that it follows meets the guidelines of AWWA, meets the scrutiny of the AUC in its capacity as regulator for EWSI's regional customers and Edmonton City Council in its capacity as regulator for EWSI's customers within the City.

Under the COS methodology, EWSI determines the total system revenue requirements based on thetotal cost of service to operate, maintain and invest in required infrastructure in order to provide water services to its customers. EWSI then allocates the revenue requirements across the different customer segments using a COS approach. All costs allocated to the City residents are then recovered through the water and wastewater rates, based on usage.

The different components of the total revenue requirement are:

- Operating Costs
- Revenue offsets
- Taxes and Franchise fees
- Depreciation
- Interest charges on Debt
- Return on Equity

Cost of Service Study ("COSS")

Once EWSI's revenue requirement is determined, each cost component is allocated based on the COSS to determine the relative costs to serve various customer classes. According to EWSI, the allocation process used to determine the proposed water rates is consistent with AWWA recommended practice and follows traditional practices of regulated water utilities. The COSS process is described in the cost allocation section of this report.

EWSI, along with a consultant, is in the process of completing a COSS to determine the cost of providing water services to each of its three customer segments. The COSS process has not yet been completed and the stakeholders have not yet agreed on the COSS results. The delay in this process was partly due to recently concluded proceedings before the AUC to review the wholesale rates charged by EWSI to its regional customers for years 2004-2007 in June 2011. EWSI expects to resume the COSS process shortly with the AUC in the near future. For purpose of the PBR 2012-2016, EWSI has proposed water rates that reflect its best estimates of the outcome of the COSS process.

We note that EWSI has stated it will consider a non-routine adjustment on in-City water rates if the final outcome of the COSS differs from EWSI's estimates used to support the proposed changes to its rate structure.

Total System Revenue Requirements

EWSI Total System Revenue Requirements

EWSI has proposed the following total system revenue requirements. Over the term of PBR III, EWSI revenue requirements are estimated at $1,054.35 million. Total revenue requirements account for the cost of delivering the services to EWSI's entire customer base namely; in-city customers, regional wholesale customers and public fire protection.

The following table details the build-up of annual total system revenue requirements and in-city revenue requirements. Note that this information differs slightly from the water information package given updates received from EWSI on the franchise fee and total operating costs category. Further, such changes are explained in the following pages in this section.

Table 3a – Updated Total System Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	97.26	100.58	103.60	106.94	110.90	519.28
Franchise Fee	12.45	13.11	13.74	14.31	14.95	68.56
Depreciation Expense	22.26	23.98	25.47	26.41	27.22	125.34
Interest Expense	27.14	29.87	32.17	33.83	35.58	158.59
Return on Equity	36.13	37.71	40.16	42.19	44.40	200.59
Revenue Requirement before Revenue Offsets	195.24	205.25	215.14	223.68	233.05	1,072.36
Less: Revenue Offsets	(3.61)	(3.60)	(3.60)	(3.60)	(3.60)	(18.01)
Revenue Requirement	191.63	201.65	211.54	220.08	229.45	1,054.35

Source: EWSI

Table 3b – Updated In-city Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	79.06	81.80	84.37	87.51	90.23	422.97
Franchise Fee	12.45	13.11	13.74	14.31	14.95	68.56
Depreciation Expense	17.27	18.69	19.95	20.72	21.40	98.03
Interest Expense	20.74	23.15	25.15	26.58	28.09	123.71
Return on Equity	29.80	31.17	33.35	35.15	37.11	166.58
Revenue Requirement before Revenue Offsets	159.32	167.92	176.56	184.27	191.78	879.85
Less: Revenue Offsets	(3.61)	(3.60)	(3.60)	(3.60)	(3.60)	(18.01)
Revenue Requirement	155.71	164.32	172.96	180.67	188.18	861.84

Source: EWSI

For completeness, we have provided the original set of data pertaining to total operating revenue requirements and in-city revenue requirements.

Table 3c – Original Total System Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	97.16	100.48	103.50	107.40	112.00	520.54
Franchise Fee	12.45	13.11	13.74	13.74	13.74	66.78
Depreciation Expense	22.26	23.98	25.47	26.41	27.22	125.34
Interest Expense	27.14	29.87	32.17	33.83	35.58	158.59
Return on Equity	36.13	37.71	40.16	42.19	44.40	200.59
Revenue Requirement before Revenue Offsets	195.14	205.15	215.04	223.57	232.94	1,071.84
Less: Revenue Offsets	(3.61)	(3.60)	(3.60)	(3.60)	(3.60)	(18.01)
Revenue Requirement	191.53	201.55	211.44	219.97	229.34	1,053.85

Source: EWSI

Table 3d – Original In-city Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	79.16	81.90	84.47	87.68	91.55	424.75
Franchise Fee	12.45	13.11	13.74	13.74	13.74	66.78
Depreciation Expense	17.27	18.69	19.95	20.72	21.40	98.03
Interest Expense	20.74	23.15	25.15	26.58	28.09	123.71
Return on Equity	29.80	31.17	33.35	35.15	37.11	166.58
Revenue Requirement before Revenue Offsets	159.42	168.02	176.66	183.87	191.89	879.85
Less: Revenue Offsets	(3.61)	(3.60)	(3.60)	(3.60)	(3.60)	(18.01)
Revenue Requirement	155.81	164.42	173.06	180.27	188.29	861.84

Source: EWSI

Scope of our review

We have reviewed the information provided by EWSI with respect to its revenue requirements under PBR III. We have specifically carried out the following procedures:

- We have reviewed the information provided by EWSI with a view to cross-check the projected evolution of each cost category over the PBR III period for water operations and forecast changes in various cost categories as stated in the water information package;

- We have reviewed rate-structure models developed by EWSI for water operations. Specifically, we checked the customer rate-structure with regards to inflation, and special rate adjustments including the accelerated water renewal program;

- We developed an independent customer rate structure based revenue model for water operations to reconcile revenues across each customer segments including consumption and fixed charge revenue;

- Where applicable, we have independently validated the build-up as well as the evolution of individual operating cost categories with respect to inflation assumptions used by EWSI;

- We have reviewed the asset continuity schedule provided by EWSI for the 2010 (Actual) to 2016 (Forecast) period for water operations. We have tracked the impact of the capital spending program, and the calculation of depreciation with a view to reconcile the movements in EWSI rate base;

- We have reviewed the expert opinion provided by EWSI in support of certain cost of capital assumptions as well as and tracked the evolution;

- We utilized our independent financial model to reconcile annual movements in each cost category.

Our findings and conclusions are grouped by cost category in the following section.

Operating Costs

EWSI has provided details of the different cost categories that consolidate into its operating costs. It is important to highlight that these represent the operating costs for the total system and that these costs are shared with the RWCG and the public fire protection. Details on the allocation of costs between these client groups will be discussed in Section 3.

The following table was extracted from the water information package provided by EWSI and provides an overview of the different cost categories that aggregate into operating costs. Note that operating costs was later updated by EWSI and such updated information is provided in the following pages in this section.

Table 4 – Breakdown of Total System Operating Costs

	2010	2011	2012
$ million	Actual	Forecast	Forecast
Salaries and Benefits	37.59	39.36	42.24
Power Costs	8.77	6.93	7.04
Chemical Costs	4.71	5.56	6.94
Contractors and Consultants	5.50	5.49	5.55
Materials and Supplies	2.93	2.5	2.98
Vehicle and Equipment	1.76	2.01	2.06
Customer Billing	6.78	7.03	7.37
Franchise Fees	10.57	11.37	12.45
Corporate Service Charges	17.35	18.16	19.54
Other	1.47	2.86	3.54
Sub-total	97.43	101.27	109.71

Source: Table 4.1-1 of the Water Information Package, p. 38.

We understand from the information package that between 2010 and 2011, total operating costs are budgeted to increase by $3.84 million (a 4% YOY increase) and are anticipated to increase a further $8.44 million in 2012 (an 8% increase YOY).

For traceability purposes, we have gone back to the 2011 Forecast that was filed in 2006 in support of the PBR II application. Back then, the total 2011 Forecast for operating costs was $82.45 million, $18.82 million lower than the current EWSI operating cost budget for this same period. While a detailed reconciliation of the drivers that led to this increase is beyond the scope of this engagement, we note that the growth in EWSI's operating costs structure clearly outpaced initial inflation expectations. The transition from PBR II to PR III enables EWSI to reset its revenue requirements to match its current operating costs.

We have reviewed the projected evolution of individual cost categories over the term of PBR III. Through our work, we have been able to reconcile the projected evolution of individual categories over PBR III based on the information disclosed. Over the period, individual categories will continue to grow at a rate of 2%/yr for non-labour related items and a rate of 3.56%/yr for labour related items.

We note EWSI expects that customer billing costs, materials and supplies cost, chemical costs as well as contractors and consultants will grow at a rate that exceed the applicable inflation factors.

We found a few discrepancies between the water information package (paragraph 129 – page 42) and the operating costs data submitted by EWSI. Table 5 is an original set of operational costs and Table 9 is an updated set of operational costs as submitted by EWSI. The changes are explained below.

Operating Cost by Cost category

Table 5 – Operating costs by cost category GT-EWSI-15-1

Cost Category	2010	2011	2012	2013	2014	2015	2016	2012-2016
	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast Total
Salaries and Benefits	37.59	39.36	42.24	43.83	45.50	47.07	48.67	227.31
Power Costs	8.77	6.93	7.04	7.18	7.32	7.47	7.62	36.63
Chemical Costs	4.71	5.56	6.94	7.14	7.25	7.45	7.66	36.44
Contractors and Consultants	5.50	5.49	5.55	5.85	6.01	6.24	6.24	29.89
Materials and Supplies	2.93	2.50	2.98	3.11	3.27	3.31	3.62	16.29
Vehicle and Equipment	1.76	2.01	2.06	2.09	2.15	2.18	2.22	10.70
Customer Billing	6.78	7.03	7.37	9.05	9.35	9.65	9.96	45.38
Franchise Fees	10.57	11.37	12.45	13.11	13.74	14.31	14.95	68.56
Corporate Service Charges	17.35	18.16	19.54	20.15	20.55	21.30	22.24	103.78
Other	1.47	2.86	3.54	2.17	2.22	2.28	2.67	12.88
Total EWSI Operating Costs	**97.43**	**101.27**	**109.71**	**113.68**	**117.36**	**121.26**	**125.85**	**587.86**

Source: EWSI

We have highlighted the difference between our simulation of operating costs and corresponding EWSI response below.

The water information package suggests that salaries and benefit only increase by inflation over the PBR III term. This does not match with the salaries and benefit figures supplied by EWSI. EWSI agreed that the increase in salaries and benefits above inflation had inadvertently not been highlighted in paragraph 129 of the water operations information package. The increases above inflation are summarized in the attached table and are explained further below.

Table 6 – Salaries and Benefits costs

	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast	2012-2016 Total
Salaries and Benefits per GT-EWSI-15	42.24	43.83	45.50	47.07	48.67	227.31
Salaries and Benefits, per Grant Thornton*	42.24	43.74	45.30	46.91	48.58	226.78
Difference	**-**	**0.09**	**0.20**	**0.16**	**0.09**	**0.53**

*derived by applying 3.56% inflation each year beginning with 2012 Forecast amount of $42.24 million.

Source: EWSI & GT analysis

EWSI provided a detailed response for the discrepancy with the operating cost data that results in additional costs of $0.53 million over the PBR III term related to the anticipated hiring of new employees in 2013 and 2014.

The water information package suggests that chemical costs are adjusted above inflation with a $80,000 per year special adjustment over the PBR III term. Our simulation suggests that the $80,000 is a one-time adjustment in 2013 that carries forward in subsequent years and, EWSI confirmed that this is a correct observation.

The water information package suggests that the contracts and consultant category are adjusted above inflation with a $0.03 million/year above inflation over the PBR III term. This does not match with contracts and consultant figures supplied by EWSI. The $0.03 million/year is related to the increase in contractor costs for distribution construction and maintenance ("DC&M") for all five years in the PBR III term.

EWSI provided a detailed response for such additional costs which accounts for an increase of $0.7 million over the PBR III period. The key highlights are described below.

The paragraph 129 of the water operations information package had inadvertently described the Rossdale solids handling as a $0.03 million/year increase for a total of $0.15 million over the 5 years. In fact, the increase will be a $0.15 million increase in 2013 for water treatment plant operations which carries forward in subsequent years.

In 2014, the increase of $0.02 million is to fund water quality and environment research projects undertaken at the University of Alberta. The projects represent EWSI's ongoing commitment to water industry and environmental leadership.

In 2015, increases in water treatment plant maintenance of $0.08 million are for maintenance required on pumps and water screens based on manufacturers' and reliability recommendations.

Table 7 – Contractors and Consultants costs

	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast	2012-2016 Total
Contractors & Consultants per GT-EWSI-15	5.55	5.85	6.01	6.24	6.24	29.89
Contractors & Consultants, per Grant Thornton*	5.55	5.69	5.84	5.98	6.13	29.19
Difference	**-**	**0.16**	**0.17**	**0.26**	**0.11**	**0.70**
Add back $0.03 million included in line 2 *		0.03	0.03	0.03	0.03	0.15
Cost increases above inflation		**0.19**	**0.20**	**0.29**	**0.14**	**0.85**

* Derived by applying 2% inflation each year beginning with 2012 Forecast amount of $5.55 million plus $0.03 million per year as outlined in Water Operations Information Package, paragraph 129.

Source: EWSI & GT analysis

The water information package suggests that material costs are adjusted above inflation with a $0.16 million per year special adjustment over the PBR III term. Our simulation suggests that the $0.16 million is a one-time adjustment in 2013 that carries forward in subsequent years and EWSI confirmed that this is a correct observation.

Table 8 – Materials and Supplies costs

	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast	2012-2016 Total
Materials & Supplies per GT-EWSI-15	2.98	3.11	3.27	3.31	3.62	16.29
Materials & Supplies, inflation only	2.98	3.04	3.10	3.16	3.23	15.51
Cost increases above inflation		**0.07**	**0.17**	**0.15**	**0.39**	**0.78**

Source: EWSI & GT analysis

EWSI took a total increase of $0.78 million and divided by 5 years to arrive at a $0.16 million per year increase. EWSI further elaborated on the reason for the cost increases above inflation each year. The increase is primarily due to maintenance required on pumps and water screens based on manufacturers and reliability recommendations at both the Rossdale and E.L. Smith water treatment plants. In 2016, $0.01 million of the increase is also related to filter media top up at both plants.

The water information package suggests that the revenue requirement calculation for customer billing is $45.38M. Our simulation indicated that the total cost for customer billing for the PBR period, including the special adjustment of $260 000/yr in addition to inflation, is $39.49M. EWSI reclassified part of customer billing in 2013 totalling $1.43 million to the other costs category. The misclassified amount relates to meter reading and management services provided by EPCOR Distribution & Transmission Inc. to EWSI. The amounts included in the "Customer Billing" cost category are comprised only of services provided by EPCOR Energy Alberta Inc. to EWSI so the misclassified amount should have been reported in the "Other" cost category. This explains the difference noted for customer billing. The revised operating costs table submitted by EWSI is as follows:

Table 9 – Updated Operating costs

Corrects Table GT-EWSI-15-1 for misclassification between Customer Billing and Other cost categories								
Cost Category	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2012-2016**
	Actual	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast Total**
Salaries and Benefits	37.59	39.36	42.24	43.83	45.50	47.07	48.67	227.31
Power Costs	8.77	6.93	7.04	7.18	7.32	7.47	7.62	36.63
Chemical Costs	4.71	5.56	6.94	7.14	7.25	7.45	7.66	36.44
Contractors and Consultants	5.50	5.49	5.55	5.85	6.01	6.24	6.24	29.89
Materials and Supplies	2.93	2.50	2.98	3.11	3.27	3.31	3.62	16.29
Vehicle and Equipment	1.76	2.01	2.06	2.09	2.15	2.18	2.22	10.70
Customer Billing	6.78	7.03	7.37	7.62	7.89	8.16	8.45	39.49
Franchise Fees	10.57	11.37	12.45	13.11	13.74	14.31	14.95	68.56
Corporate Service Charges	17.35	18.16	19.54	20.15	20.55	21.30	22.24	103.78
Other	1.47	2.86	3.54	3.60	3.68	3.77	4.18	18.77
Total EWSI Operating Costs	**97.43**	**101.27**	**109.71**	**113.68**	**117.36**	**121.26**	**125.85**	**587.86**

Source: EWSI

Further, EWSI confirmed that the In-city operating cost on a yearly basis and total amount of $491.54 million (comprising of sum of total operating cost and Franchise fees in Table 3b) over the PBR III period (2012-2016) remains the same after the above re-classification.

Given the magnitude of these increases in operating costs and their ultimate inclusion in the cost of service, it is important that the City consider adding some form of oversight and approval for operating spending in excess of levels approved during the rate making process.

Franchise Fees

The approach used by EWSI to budget for franchise fees is straightforward and entirely driven by revenues collected through the water sales to its various customers within City limits. The franchise fee is calculated at 8% of total revenue generated by In-city customers.

We have reviewed the supporting calculation approach developed by EWSI to estimate the franchise fees. During our review, EWSI identified a discrepancy in the total franchise fees referred to in Table 1.4-1 of the water operations information package. Total franchise fees for the PBR III period are stated at $66.78 million when they should be $ 68.56 million. This modification implies the franchise fee was understated by $1.78 million.

Corporate Service Charges

EWSI refers to the services provided by EUI, its parent corporation, as corporate services. The services provided by other affiliates to EWSI are affiliate services. EWSI also provided services to other affiliates; these revenues are included in the cost recoveries in EWSI operating costs (refer to line *Allocated to EWSI Commercial Business* in the table below).

Corporate and affiliate services costs are allocated to EWSI either by direct assignment or through an allocation process. Once these costs are allocated to EWSI, they are allocated to the customer segments through the cost allocation model. The following table presents the details of corporate service costs for 2010 and 2011, and for the period of PBR III.

Table 10 – Breakdown of Corporate Service Costs

	2010	2011	2012	2013	2014	2015	2016
$ million	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
Board and Executive	1.28	1.44	1.46	1.53	1.58	1.63	1.68
Finance	2.76	3.19	3.77	3.94	4.01	4.24	4.31
Legal and External Relations	3.45	3.78	4.05	4.17	4.26	4.41	4.52
Human Resources	1.61	2.01	1.91	1.91	1.88	1.88	1.88
Business Services	5.65	6.36	7.22	7.30	7.42	7.58	7.87
Strategic Planning and Development	0.33	0.49	0.50	0.52	0.53	0.55	0.57
At-Risk Compensation	1.23	1.81	1.87	1.93	1.99	2.05	2.11
Asset Usage Fees	2.63	3.23	3.35	3.56	3.63	3.89	4.48
Allocated to EWSI Commercial Business	(2.36)	(4.15)	(4.59)	(4.71)	(4.75)	(4.93)	(5.18)
Under applied fringe benefit	0.77	---	---	---	---	---	---
Total Allocated Corporate Services Costs	**17.35**	**18.16**	**19.54**	**20.15**	**20.55**	**21.30**	**22.24**

Source: EWSI

The increase of $1.38M from 2011 to 2012 is due to annual inflation ($0.59M), higher rent costs for the new EPCOR Tower ($0.69 M), and higher treasury costs mainly due to the loss of a retail billing customer ($0.50M).

To be able to assess the reasonability of the increase of these costs from 2010 to 2012, we asked EWSI to provide the cost allocation calculations in support of those numbers. EWSI was unable to provide us the corporate and shared services costing model. However, they were able to provide the proportion of the total costs for EWSI, as presented in the table below.

Table 11 – % of Corporate Service Costs charged to EWSI Regulated Water Operations

% of Total EWSI costs	2010 Actual	2011 Forecast	2012 Forecast
Board and Executive	29.1 %	31.2 %	31.2 %
Finance	30.8 %	32.9 %	32.5 %
Legal and External Relations	30.1 %	27.6 %	27.5 %
Human Resources	31.1 %	30.9 %	30.9 %
Business Services	28.4 %	27.4 %	27.6 %
Strategic Planning and Development	29.1 %	31.2 %	30.9 %
At-Risk Compensation	29.1 %	31.2 %	31.2 %
Asset Usage Fees	26.4 %	25.9 %	26.6 %
Allocated to EWSI Commercial Business	---	---	---
Under applied fringe benefit	---	---	---
Total Allocated Corporate Services Costs	**26.6 %**	**23.4 %**	**23.4 %**

Source: EWSI

We reviewed the cost allocators provided by EWSI (Appendix E-1 of the water operations information package) and found these allocators to be relevant.

We recommend that the City has appropriate approval oversight and review process for corporate costs allocated to EWSI regulated water operations for the term of PBR III, as they represent nearly 20 % of the operating costs.

Depreciation expense

As part of our analysis, we obtained from EWSI the continuity schedule for its rate base. We have reviewed the calculation for the annual depreciation expense as well as the capital expenditures forecasted throughout the term of PBR III for each asset category that make up EWSI's rate base. The following table summarizes the projected evolution of the EWSI rate base over the term of PBR III.

Table 12 – Rate Base for PBR III – Net of Contributions

$ millions	2010 Actual	2011 Forecast	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast
EWSI Gross Property, Opening	953.12	998.57	1,064.85	1,133.52	1,232.63	1,303.44	1,371.17
Additions	46.87	69.83	72.22	102.66	74.36	71.28	82.98
Retirements/Transfers	(1.42)	(3.55)	(3.55)	(3.55)	(3.55)	(3.55)	(3.55)
EWSI Gross Property, Closing	**998.57**	**1,064.85**	**1,133.52**	**1,232.63**	**1,303.44**	**1,371.17**	**1,450.60**
EWSI Accumulated Depreciation, Opening	(238.21)	(256.67)	(274.19)	(292.91)	(313.34)	(335.26)	(358.12)
Depreciation Expense	(20.02)	(21.06)	(22.27)	(23.98)	(25.47)	(26.41)	(27.22)
Retirements/Transfers	1.56	3.55	3.55	3.55	3.55	3.55	3.55
EWSI Accumulated Depreciation, Closing	**(256.67)**	**(274.19)**	**(292.91)**	**(313.34)**	**(335.26)**	**(358.12)**	**(381.79)**
EWSI Mid-Year Gross Property (Row 1 + 4)/2	975.85	1,031.71	1,099.19	1,183.08	1,268.04	1,337.31	1,410.89
EWSI Mid-Year Accumulated Depreciation (Row 5 + 8)/2	(247.44)	(265.43)	(283.55)	(303.13)	(324.30)	(346.69)	(369.96)
EWSI Mid-Year Net Property* (Row 9+10)	**728.40**	**766.28**	**815.64**	**879.95**	**943.74**	**990.62**	**1,040.93**
Add: Working Capital	10.48	11.21	11.42	11.00	11.00	11.00	11.00
Add: Average Materials and Supplies	1.83	1.83	1.83	1.83	1.83	1.83	1.83
EWSI Mid-Year Rate Base (Row 11+12+ 13)	**740.71**	**799.32**	**828.89**	**892.78**	**956.57**	**1,003.45**	**1,053.76**
Mid-Year Rate Base Allocated to In-City	**588.58**	**612.08**	**652.12**	**710.11**	**766.72**	**807.95**	**852.33**
% of Total EWSI Rate Base	79%	79%	79%	80%	80%	81%	81%
* Net of Contributions in Aid of Construction, net	396.31	405.07	415.27	425.40	435.57	445.78	456.03

Source: EWSI

As per the table above, we note that the rate base as of the end of 2011 and going into PBR III is forecasted to total $799.32 million. Under PBR II, the rate base was expected to total $746.64 million by the end of 2011. The difference, $52.68 million, is a direct result of a higher than anticipated level of investment. We understand from EWSI that actual capital expenditures over the term of PBR II exceeded initial levels by $94.3 million. This increase of $94.3M was due to higher costs related to changing priorities primarily related to water main renewals ($10.36M), unplanned projects related to growth and City requirements ($12.70M); higher than expected construction costs related to economic conditions in Alberta ($18.70M); a delay in capital expenditures for the E.L. Smith Upgrade project; cost variability of other projects ($5.96M) and additional costs related to the AMWR program noted above which was not included in EWSI's 2007-2011 PBR plan ($22.75M).

Over the term of PBR III, EWSI expects capital expenditures to total $400.95 million. As part of our review, we have obtained from EWSI an enhanced version of Table 6.2.2-2 in the water information package that categorizes and lists capital projects anticipated over the period. This revised table is presented in Appendix **B** to this report for future reference. The following table summarizes the project capital program by category of investments.

Table 13 – Capital Expenditure forecast 2012-2016

Cost Category	$ millions
Regulatory	20.08
City of Edmonton requirements	92.35
Health, Safety and Environment	16.97
Reliability	48.17
Efficiency-cost	10.00
Infrastructure General	12.34
Other projects < $5 million	101.04
Sub-total	300.95
City of Edmonton requirements – AWMR program	100.00
Total	400.95

Source: EWSI

The level of capital spending anticipated by EWSI over the term of PBR III is significant and exceeds the level provided under PBR II. Excluding investments driven by the AWMR program of $100.0 million, the level of investment remains significant with only one project representing and investment larger than $20 million.

We recommend that the City has appropriate approval oversight and review process for major projects. In addition we note a significant portion of small projects under $5 million represents approximately 25% of 2012-2016 capital expenditure plan and as such appropriate measures should be in place.

Cost of Capital

Total system revenue requirements for water operations comprise of revenue for in-city customers, RWCG and fire-protection services. EWSI has estimated cost of capital (weighted average cost of capital) based on implied capital structure, cost of debt and return of equity as per the Foster Associates recommendation for in-city customers segment only as it falls under the PBR III mechanism. In-city customer cost of capital in turn drives the revenue portion for the PBR rate-setting mechanism. RWCG falls under the AUC which in-

turn uses generic cost of capital. But, the RWCG capital structure is not part of proposed cost of capital for EWSI's PBR III mechanism.

Capital Structure

Foster Associates ("Foster") is a firm hired by EWSI for recommending capital structure, cost of debt and cost of equity for EWSI operations falling under the PBR III mechanism. Foster specializes in rate of return and capital structure analysis for utilities in North American. Its president and senior consultant is Kathleen McShane has presented testimony in more than 200 proceedings on rate of return and capital structure before regulatory government offices on behalf of North American utilities

Foster proposed an implied capital structure of 60% debt and 40% equity for EWSI in PBR III (2012-2016). Note that the actual capital structure is driven by a host of factors and it might be different than the implied capital structure.

There are two approaches followed by Canadian and US regulators in setting capital structure for utilities.

Under the first approach to determining the fair return standard for electric and gas utilities, a generic rate of return on equity is determined and applied to all utilities. Differences in business risks among these utilities were accounted by using deemed capital structure. This approach was applied and approved by the AUC for EWSI's RWCG operations.

As per our research, many Canadian regulators, including the AUC, are following generic ROE formula as opposed to case-by-case determination by U.S. regulators:

$ROE_t = ROE_{t-1} + (0.75)*$ Forecast on 30 yr Canadian bond yield $(Year_t – Year_{t-1})$

Although, the AUC is reviewing its decision to use a generic cost of capital formula applicable to utilities that fall under its jurisdictions for 2011 and 2012, the AUC has used the above formula in the past. Additionally, the AUC approved a 9% ROE for 2009, 2010 and interim 2011 including ROE for the RWCG segment. The second approach to determining the fair return for EWSI's PBR III (as explained below further in the Return on Equity section) is to assess both business and financial risk of EWSI and recommend a return on equity based on the composite of those risks given EWSI's current capital structure, rather than adjusting its capital structure.

The Foster report cited that both of the above approaches are valid and accepted by Canadian regulators. Foster has used the second approach.

In May 2006, EWSI engaged Foster to prepare a cost of capital study for determining capital structure for RWCG and Foster recommended a 34%-35% Equity structure.

In October 2010, EWSI engaged cost of capital expert Dr. Robert Evans of Economic Research Limited to prepare EWSI's rebuttal evidence on cost of capital matter for purposes of the AUC proceeding. In Dr. Evans' evidence, he concluded that a capital structure containing 35% common equity is not unreasonable given the business risks of EWSI's RWCG operations.

In June 2011, the AUC held that EWSI should apply a 30% equity ratio for determining the water rate charged to the RWCG for the 2004-2007 test period.

We raised a query with Foster for reconciling the difference in capital structure and ROE for EWSI's RWCG segment and EWSI's in-city customer segment falling under PBR III.

Foster responded drawing on the fact the fair return standard determined for EWSI's RWCG operations recognize the low risk nature of the cost of service regulation under which RWCG water rates are determined. The PBR structure under which water rates are set for EWSI's in-city customers is determined considering certain additional risk and significant volume risk. Due to the different regulatory structures and the different approaches applied to determine the fair return standard for EWSI's two regulated business segments, it is appropriate to apply the proposed different capital structure (and rates of return) for determining the RWCG rates and the PBR rates.

Further, we note the unique relationship of RWCG customer segment with EWSI as per AUC June 2011 decision. RWCG rates offered by EWSI have a balancing fund mechanism where all differences between the annual actual costs and actual volumes allocated are accounted on year-end adjustment formula. While in-city customers use fixed five year rates with special rate adjustments and non-routine adjustment provisions. Hence, we view that business risk of EWSI as applicable to in-city customer segment under PBR mechanism differs from RWCG segment due to fixed five year term offered by EWSI to in-city customers.

Also, in the AUC Decision 2004-52, the board determined that setting an equity ratio is a subjective exercise that involves the assessment of several factors and the observation of past experience. In this regard, the board found that the assessment of the level of business risk of the utilities is also subjective.

Hence, we agree with the above Foster response but view that PBR III Bylaws give some flexibility to manage certain risks via SRA and non-routine adjustments in the rate-structure. As per EWSI water operations information package, the SRA covers revenue shortfalls beyond inflation of $58.05 million and AWMR program of $100 million over the PBR term of 2012-2016. SRA is applied to fixed and consumption water rate charges. Rebasing covers capital additional to rate-base planned for 2012-2016 and covers EWSI rising costs and low growth in revenues due to conservation of water by residents.

The non-routine adjustment is a special provision in the proposed PBR to cover unanticipated regulatory compliance costs, river water quality to the extent it affects EWSI operating or capital costs, changes in franchise fees, and customer or city initiated projects.

Further, our research on EUI including the latest DBRS debt rating report for EUI indicates that the target capital structure for EUI is 60% debt and 40% equity. And, EWSI is a direct subsidiary of EUI.

We also note that the capital structure used for 2010 based on actual numbers was 59% debt and 41% equity. For 2011 based on forecast numbers, the capital structure was 57% debt and 43% equity. These levels are aligned with the Foster recommendations.

Overall, we concur with Foster's proposed approach of using 60% debt and 40% equity for EWSI's PBR III term coupled with the view that EUI capital structure is the best proxy for EWSI.

Cost of Debt

Foster uses the stand-alone concept for EWSI, utilizing a rating of A (low) rating issued by DBRS and its cost of debt is equalized with that of EUI to whom EWSI issues debt. Foster estimated a cost of debt at the rate of 5.89% for 2012 based on a forecasted yield on 20-year Government of Canada bonds of 4.37% and EUI spread of 147 bps.

We view the approach of Foster in using the EUI spread is reasonable as EUI borrowing costs are the best proxy for EWSI borrowing costs.

We raised a query with Foster regarding 20-year Government of Canada bonds in terms of tenor and source for such data. Foster responded that the 20-year bond yield was used based on the expectation that EWSI would issue 20-year debt. The forecast Government of Canada long-term yield were determined based on an average of the confidential forecasts provided by two major Canadian banks.

We undertook independent research for the forecast of Canadian bond yields with TD Canada Trust and Royal Bank of Canada. As per the latest TD Economics Report, the forecast for 10-year yields are as follows:

Table 14 – Forecast yield on 10-year Govt. of Canada bond

Forecasted Year	Yield on 10-year bond
2011	3.60%
2012	4.30%
2013	4.60%
2014	4.75%
2015	4.75%

Source: TD Economics Report

As per the latest Royal Bank of Canada economic and financial forecast[5], the 10 year yield for Government of Canada bonds is 3.80% and 4.15% for 2011 and 2012 respectively. RBC forecasts the 30-year yield for Government of Canada bonds to be 4.30% and 4.55% for 2011 and 2012 respectively.

Based on the above research, a 4.37% 20-year Canada bond yield proposed by Foster appears to be reasonable.

In PBR II, it is estimated that actual interest expense is expected to be lower at $101 million over 2007-2011 compared to forecast $117.1 million during the PBR rate-setting in 2006. This is due to falling interest rates

over the past 2 years. Hence, EWSI achieved savings in interest expense and this helps to partly off-set the higher reported operating costs over PBR II.

We are satisfied with responses obtained from Foster. Additionally, EWSI uses weighted cost of debt ranging from 5.46% to 5.50% over the PBR III term as indicated in Table 15 Foster's proposed cost of debt at 5.89% reflects the cost of debt for new debt issuance over the PBR III term. There is no deferral account for the impact of changes in interest rates so EWSI takes the interest rate risk. Hence, the approach adopted by EWSI is conservative.

Return on Equity

EWSI sought an expert opinion from Foster regarding the ROE that may apply to EWSI operations of water and wastewater.

The Foster report is estimating EWSI's ROE via equity premium tests, discounted cash flow test and historic utility equity returns. Both equity premium and discounted cash flow tests follow generic ROE methodologies:

- ROE = Risk free rate + Utility Equity Risk Premium
- ROE via modified CAPM = Risk free rate + Relative Risk adjustment * (Equity Market Risk Premium)
- ROE via Discounted Cash flow = Dividend Yield + Expected Growth in Dividends

Foster determined fair ROE based on an evaluation of EWSI's business and financial risks compared to other utilities with similar risks and lines of business. These other utilities included a sample of US and Canadian gas, electric and water utilities. Foster concluded that fair return for EWSI is **10.875%.** Foster used multiple tests as discuss the above with comparable data of US and Canadian gas, electric and water utilities.

In PBR II, Foster recommended 11.25% ROE with 39% equity and 61% debt and Edmonton City Council approved such return for the rate-setting mechanism in PBR II.

The reduction of ROE from 11.25% in PBR II to 10.875% in PBR III or 37.5 basis points is primarily due to recent improvements in EWSI's credit rating. EWSI obtained a stand-alone indicated debt rating from DBRS at A (low) with a stable trend. We note that EWSI does not have publicly traded stock and therefore its business and financial risk assessment is largely qualitative in nature. Further, EWSI borrows from EUI via either short-term or long-term intercompany loans. The indicative debt rating applies to the combined water utility and wastewater treatment plant operations of EWSI and excludes non-regulated operations of EWSI and its subsidiaries.

Further, EWSI is on-track of achieving average return of equity of 11.30% for PBR II (2007-2011), close to proposed 11.25% ROE despite the fact of incurring higher capital expenditures totalling $342 million versus forecasted $248 million over the period of 2007-2011, and incurring high actual operating cost compared to the forecast in 2007 ($55.1 million actual versus $53.7 million forecast), 2008 ($63.5 million actual versus

$55.3 million forecast), and 2009 ($71.8 million actual versus $56.6 million forecast). Achieving the targeted ROE despite these operating and capital cost increases is primarily a result of the SRA, non-routine adjustments, and inflation adjustment factors combined with depreciation and interest cost savings.

We did a thorough review of Foster, its methodology, and assumptions including mathematical regression results.. Further, we inquired on reconciling difference in ROE between AUC approved generic rate of return and EWSI's ROE request for PBR term.

The Foster report is based on EWSI's in-city customers for water operations and wastewater operation. It does not account for regional water customers. Such customers fall under the AUC and the AUC determined a 9.0% ROE for 2009 and 2010.

Foster states that EWSI's ROE for in-city customers under the PBR mechanism and the generic rate of return as set by AUC for regional customers cannot be compared or reconciled because both approaches differ in key respects. Foster cited that they have used multiple tests as opposed to a single test used by the AUC, and the Government of Canada bond yields in the Foster report and the AUC approach cannot be compared without regards to its corresponding capital structure.

Lastly, we inquired of Foster's approach for estimating risk-free rate by using Consensus Economics forecast to determine the long-term Government of Canada bond yield.

For risk-free rate, Foster states that the Consensus Economics represent a widely available, easily understandable and transparent source of Government of Canada bond yield forecasts. Nearly all regulators in Canada rely on the Consensus Forecasts as a basis for establishing the allowed ROE. Also, we agree that the 30-year yield is the right tenor for EWSI given its long-term nature of services.

Based on our analysis, questions raised and responses received from Foster, we concur with their approach but note that 10.875% is in the upper quartile for comparable entities.

For water operations, EWSI applies this recommended return of 10.875% to the rate base and calculates the cost of equity as shown in Table 15. The mid-year rate base is calculated similar to above depreciation expense calculations and proposed ROE of 10.875% is multiplied with proposed capital structure to calculate return of mid-year rate base.

Table 15 – Return on mid-year rate base

	$ millions	2010 Actual	2011 F	2012 F	2013 F	2014 F	2015 F	2016 F
1	Mid-year Rate Base (From Table 7.1-1, Line 15)	588.58	612.08	652.12	710.11	766.72	807.95	852.33
2	Capital Structure: Debt Percentage	59%	57%	58%	60%	60%	60%	60%
3	Capital Structure: Equity Percentage	41%	43%	42%	40%	40%	40%	40%
4	Mid-year Rate Base: Debt (line 1 x line 2)	347.26	348.89	378.23	423.23	460.03	484.77	511.40
5	Mid-year Rate Base: Equity (line 1 x line 3)	241.32	263.19	273.89	286.88	306.69	323.18	340.93
6	Cost of Debt	5.85%	5.74%	5.48%	5.49%	5.46%	5.49%	5.50%
7	Cost of Equity	8.94%	9.31%	10.87%	10.87%	10.87%	10.87%	10.87%
8	Weighted Average Cost of Capital	7.16%	7.26%	7.75%	7.67%	7.63%	7.64%	7.65%
9	Return on Mid-year Rate Base Debt Portion (line 4 x line 6)	20.32	20.03	20.74	23.24	25.12	26.61	28.13
10	Return on Mid-year Rate Base Equity Portion (line 5 x line 7)	21.81	24.50	29.80	31.20	33.35	35.15	37.08
11	Return on Mid-year Rate Base (line 9 + line 10)	42.13	44.53	50.54	54.43	58.47	61.76	65.20

Source: EWSI

We have independently checked the underlying calculations for both return on mid-year rate base debt portion and return on mid-year rate base equity portion and agree with EWSI results as per GT-EWSI-13 response submitted by EWSI to our query.

While comparing with Table 3b, we found minor discrepancies for return on the mid-year rate base debt portion and the mid-year rate base equity portion; however, these were not material.

Extract from Table 3b $ million	2012	2013	2014	2015	2016	sub-total
Return on mid-year rate base Debt	20.74	23.15	25.15	26.58	28.09	123.71
Return on on mid-year rate base Equity	29.80	31.17	33.35	35.15	37.11	166.58

Extract from Table 15 $ million	2012	2013	2014	2015	2016	Sub-total
Return on mid-year rate base Debt	20.74	23.24	25.12	26.61	28.13	123.83
Return on mid-year rate base Equity	29.80	31.20	33.35	35.15	37.08	166.57

Source: EWSI

The above discrepancy is relatively minor and do not lead to any significant changes to assumptions behind above calculations.

Revenue Offsets

Revenue offsets reflect EWSI's non-rate revenues and include the various charges, fees, penalties and miscellaneous revenues collected from its customers.

We have reviewed the list of revenue sources and obtained from EWSI the projected evolution of revenue offsets over the term of the PBR.

We note that under PBR II, revenue offsets were forecasted at $2.3 million in 2011. EWSI's 2011 forecast budgets revenue offsets of $3.26 million. Moving into PBR III, revenue offsets are budgeted to increase to $3.60 million in 2012 and remain stable thereafter. We understand that revenue offsets are driven by the service charges described in Part III of Schedule 1 of the proposed bylaw and which are expected to remain fixed for the term of PBR III.

Given the materiality of revenue offsets in the context of total system revenue requirements, we have not further investigated these items.

Findings and Recommendations – Total System Revenue Requirements

We have performed our review of the total system revenue requirements and have satisfied ourselves with the reasonability of the approach applied by EWSI, with particular focus applied to the cost of capital section.

We note that capital and operating expenditures have increased significantly relative to PBR II. Specific to operating costs, our analysis suggests that the growth in expenditures has outpaced the annual adjustment to the rate structure. Going into PBR III, these increases are now being captured in the revenue requirements set forth by EWSI. By 2016, this level of capital spending will have increased the rate base by almost 32% when compared to the 2011 rate base based on total system. While a detailed analysis of the nature and relevance of individual capital projects is beyond the scope of our engagement, best practices in other North American jurisdictions suggest that the City should participate in the investment approval process to ensure adequate financial regulatory oversight on capital spending, particularly to the extent such spending is in excess of amounts approved through this rate making process.

Similar to the regulatory oversight on capital spending over approved levels as proposed above, a similar oversight should be created for operating spending over approved levels. This would provide the City with greater control over increases in the cost of service.

We concur with Foster approach on calculation of ROE but note that 10.875% is in the upper quartile for comparable entities.

Cost of Service Allocation

Background

As discussed in the previous section, EWSI forecasts the cost for its regulated operations and determines the allocation between in-city customers, Edmonton's fire rescue services and regional water customers, through a cost allocation model. EWSI has provided to GT the cost allocation model for the year 2012 of PBR 2012-2016, which reflects the best estimate of the outcome of the COSS process. With the final COSS yet to be completed, the assumptions of the actual COSS may or may not align with the final COSS model.

The cost allocation model defines, for each cost element, cost drivers and allocates the total cost between each line of business based on these cost drivers. As a starting point for 2012, EWSI revenue requirement for water operations is $191.5 M. Revenue requirement includes operations and maintenance expenses ("O&M"), depreciation and return on rate base. The cost allocation model applies a "Base-Extra Capacity" methodology to determine the cost responsibility for each customer class. This methodology takes into consideration the customer's demand for water over time. This demand is measured by peaking factors.

The following table provides the breakdown of the total system revenue requirement per year for PBR 2012-2016.

Table 16 Revenue requirements for PBR III

Revenue requirement ($ in millions)	2012	2013	2014	2015	2016	Total 2012-2016
RR – In City	**155.81**	**164.42**	**173.06**	**180.27**	**188.29**	**861.84**
RR – Regional , Fire	**35.72**	**37.13**	**38.38**	**39.70**	**41.05**	**192.01**
RR - Total	**191.53**	**201.55**	**211.44**	**219.97**	**229.34**	**1,053.85**

Source: EWSI

The following table provides the breakdown of the rate base – net of contributions – for PBR 2012-2016.

Table 17 – Rate base for PBR III

Rate Base ($ in millions)	2012	2013	2014	2015	2016
Mid-Year RB – In City	**652.12**	**710.11**	**766.72**	**807.95**	**852.33**
Mid –Year RB – Regional , Fire	**176.77**	**182.67**	**189.85**	**195.50**	**201.43**
Mid-year RB - Total	**828.89**	**892.78**	**956.57**	**1,003.45**	**1,053.76**

Source: EWSI

Current procedures in determining cost allocation

The following table indicates the cost allocation factors used for each of the classification components to allocate to each customer class:

Table 18 – Current procedures in determining cost allocation

Classification components	Definition of classification components	Cost drivers for allocation
Base – All Base – In-City Base – In-City + University of Alberta	**Classifies assets/costs to customer segments**	**(Annual metered sales X Loss factor) / Number of Days = Base demand per Day**
Maximum Day – All Maximum Day - In-City Maximum Day - In-City +	**Classifies assets/costs to customer segments**	**(Base demand per Day X Peaking Factor) – Base demand per Day = Extra capacity per Day**

Classification components	Definition of classification components	Cost drivers for allocation
University of Alberta		
Maximum Hour – In-City Maximum Hour - In-City + University of Alberta	**Classifies assets/costs to customer segments**	**(Base demand per Hour X Peaking Factor) – Base demand per Hour = Extra capacity per Hour**
Meters – In-City+ University of Alberta	**Classifies assets/costs to meter-related customer segments**	**Number of meters**
Services – In-City+ University of Alberta	**Classifies assets/costs to service-related customer segments**	**Number of equivalent meters**
Billing – In-City+ University of Alberta	**Classifies assets/costs to meter-related customer segments**	**Number of accounts (billings)**
Standby Fire– In-City+ University of Alberta	**Classifies assets/costs to standby-related customer segments**	**Number of Customers X Fire Protection requirements X Duration = Estimated Fire Protection requirements (m3 per minute)**
Rate Revenue– In-City+ University of Alberta	**Classifies assets/costs to revenue-related customer segments**	**Percentage of revenue, based on 2011 Forecast**
Direct Assignments	**Classifies assets/costs to specific customer segment**	**Direct allocation**

Source: EWSI and GT analysis

The cost allocation model uses a 3-step methodology. At the first step, for each category of the total revenue requirement, the expenses are categorized to appropriate systems functions: water treatment plant, reservoirs and pumphouses, transmission system, distribution system, hydrants, services and meters, customer billing and general administration. Then, these costs per function are classified as base costs, extra-capacity peak day costs, extra-capacity peak hour costs, customer costs and fire protection costs. In the final step, these costs are allocated to all customer segments based on their share of the water demand.

For example, the function water treatment plant is classified as base costs and extra-capacity peak day costs. The calculation is based on a five year average of the percentage of base and maximum day. The total for base is then allocated to customer, based on the cost driver.

The results of this methodology are then used to calculate and design rates for each customer class to recover the costs.

Comparison of cost allocation parameters between PBR II and PBR III

The cost drivers used in PBR 2007-2011 are similar to those used for PBR 2012-2016.

However, there are some changes to the cost allocation parameters. EWSI has provided comparison of the key cost allocation parameters for PBR 2007-2011 and PBR 2012-2016, as well as recalculation of 2011 based on 2012-2016 methodology. We understand from EWSI that the proposed updates to the classification factors are driven by the COSS that is currently underway and that these have been discussed in COSS meetings where all stakeholders were present. The summary of the changes are provided in the table below:

Table 19 – Comparison of cost allocation parameters between PBR II and PBR III

Cost allocation parameter	Change between PBR 2007-2011 and PBR 2012-2016	Impact (2011 vs 2011 recalculated), based on the recalculation of 2011 based on 2012-2016 methodology
1. Production volumes and water loss factors	• **Inclusion of measurement corrections to the high-lift pumping station meters at the E.L. Smith Treatment Plant**	**The impact on cost driver Base demand per day (annual metered sales X Loss factor) / Number of Days) is :** • **Total In-City: 1 %** • **Regional: (1 %)**
2. Allocation of mains to transmission and distribution	• **Classification of costs reflects 30 % as transmission mains and 70 % as distribution mains for PBR 2012-2016.** • **For PBR 2007-2011, the ratios of 30 % and 70 % were applied to opening balances, additions, closing balances for gross property, plant and equipment and accumulated depreciation.**	• **None (less than 0.00001 %)**
3. Classification of water	• **Classification of costs to meet base and maximum**	**The impact on costs allocated to**

Cost allocation parameter	Change between PBR 2007-2011 and PBR 2012-2016	Impact (2011 vs 2011 recalculated), based on the recalculation of 2011 based on 2012-2016 methodology
treatment plant	**day, with no distinction between lowlift and highlift facilities.** • **For PBR 2007-2011, costs for lowlift were classified to meet base and maximum day, and were allocated to all customer segments. Costs for highlift were classified to meet base, maximum day and maximum hour, and were allocated to all customer segments.**	**Regional and In-City are :** • **Total In-City: 0.7 %** • **Regional: (0.7 %)**
4. Classification of pumping plant (reservoirs and pumphouses)	• **Costs are allocated to benefit two customer segments (In-City customers and fire protection) to meet maximum hour demand and due to completion of the E.L.Smith plant and less reliance on field reservoirs by the external communities due to short falls in plant production capabilities** • **For PBR 2007-2011, costs are classified based on 66.2% to benefit base demand for all three customer segments; and 33.8% to benefit In-City customers and fire protection only.**	**The impact of costs allocated to customer segments are :** • **Regional : (12 %)** o **No costs allocated to Regional, was at 12 % of the costs in PBR 2007-2011** • **In-City : 8 %** • **Fire : 4 %**
5. Classification of transmission water mains	• **Costs are classified to meet base and maximum day demand and allocated to benefit all customers.** • **For PBR 2007-2011, costs are classified to meet base, maximum day and maximum hour demand. Costs classified to meet base**	**The impact of costs allocated to customer segments are :** • **Regional : 7 %** • **In-City : (5 %)**

Cost allocation parameter	Change between PBR 2007-2011 and PBR 2012-2016	Impact (2011 vs 2011 recalculated), based on the recalculation of 2011 based on 2012-2016 methodology
	and maximum day demand are allocated to all customers segments; costs classified to meet maximum hour demand are allocated to In-City customers and fire protection only.	• **Fire : (2 %)**
6. Classification of distribution water mains	• **Costs are classified to meet base, maximum day and maximum hour demand and allocated to benefit two customer segments (In-City customers and fire protection)** • **Same method for PBR 2007-2011**	• **None**
7. Classification of meters, services and hydrants	• **Costs are assigned directly to certain customer segments. Meters and services are allocated to In-City customers and hydrants are allocated to fire protection.** • **Same method for PBR 2007-2011**	• **None**
8. Classification of general plant	• **Costs are classified based on proportionate share of all other plant costs.** • **Same method for PBR 2007-2011.**	• **None**
9. Peaking factor for maximum day demand	• **The PBR 2012-2016 approach to determine peaking factor to meet maximum day demand is updated based on a 5 year rolling average based on a high 1 day maximum day demand for each year. This change reflects the impact of additional system capacity from the E.L. Smith WTP Upgrade project to meet maximum day demand.** • **For PBR 2077-2011, the approach to determine peaking factor to meet maximum day demand is updated based on a 5 year rolling average based on a**	**The impact on cost driver Maximum demand per day is :** • **In-City: 5.9 %** • **Regional: (3.8 %)** • **Fire protection : (2.1%)**

Cost allocation parameter	Change between PBR 2007-2011 and PBR 2012-2016	Impact (2011 vs 2011 recalculated), based on the recalculation of 2011 based on 2012-2016 methodology
	high 5 day maximum day demand for each year.	
10. Working capital	• **PBR 2012-2016 shows a working capital applied to cost allocation model updated to reflect the use of lead/lag approach, consistent with regulated utility practice. The working capital ratios from EWSI's 2007/08 Lead/Lag Study submitted as evidence for AUC Proceeding 151 has been applied.** • **For PBR 2007-2011, the determination of working capital based on 45 lag days applied to operating costs.**	**The working capital figures calculated as a rate base item are :** • **PBR 2012-2016 : 11 418 000 $** • **PBR 2007-2011 : 11 212 198 $** • **Variance is : 1.84 %**

Source: EWSI

Findings and Recommendations – Cost of Service Allocations

The cost drivers used are consistent with general practice. However, some of the drivers are based on data that would need to be revised should there be any changes to the proposed rate structure. Specifically, we note that the following findings are particularly sensitive to changes:

- Classification component – Base is determined by annual metered sales multiplied by loss factor. Loss factor of in-City customers is at 11 % while the loss factor for University of Alberta and regional is at 2.25 %. EWSI advised that the loss factor is lower for University of Alberta and regional as they use their own distribution system, therefore the loss factor is solely based on transmission. The percentage of 2.25 % is currently under revision. An audit was done for the total loss of the system only. A change of percentage will have an impact on the cost allocated to in-City and other customer segments. Maximum day and maximum hour will also be affected by this change.

- Rate of return is allocated based on the weighted cost of capital. The figure is a result of the mid-year capital structure multiplied by the cost rate. The figures are different for in-city (7.75 %) and regional customers (6.45 %). The following table shows the difference for 2012 :

Table 20 – Cost rate and weighted cost of capital for In-city and regional customers

	In-City Mid-Year Capital Structure (%)	In-City Cost Rate	In-City Weighted Cost of Capital	Regional Mid-Year Capital Structure (%)	Regional Cost Rate	Regional Weighted Cost of Capital
Debt	**57.96 %**	**5.49 %**	**3.18 %**	**60.39 %**	**5.84 %**	**3.53 %**
Equity	**42.04 %**	**10.875 %**	**4.57 %**	**32.52 %**	**9.00 %**	**2.93%**
Contributions	**--**	**--**	**--**	**7.09 %**	**--**	**--**
Total Capital Structure	**100.00 %**	**--**	**7.75 %**	**100.00 %**	**--**	**6.45 %**

Source: EWSI & GT analysis

We can conclude that approximately 82 % of the total system revenue requirement under PBR III is allocated to in-city. Based on our analysis, the COS methodology used by EWSI is transparent using cost drivers that are intuitive and appear appropriate. Also, the comparison of cost allocation parameters form PBR II to PBR III did not show large discrepancies.

We note that pending the conclusion of the COSS revision process, the allocation factors for certain cost categories could evolve with an impact on the total costs allocated to the in-city customers. EWSI has indicated that, depending on the results and conclusions of the COSS, it might seek a non-routine adjustment to align the rate structure to conclusions.

Water Treatment Rate Structure

PBR water rates under 2007-2011

Actual customer rates

EWSI provided us with actual consumption charge ($/m³) and fixed charges ($/month) under PBR II. This facilitates the inflation section that follows and is useful for rate-structure comparison.

The actual consumption charge ($/m³) and fixed charges ($/month) are as follows:

Table 21 – Actual consumption charges in PBR II

Actual Consumption Charge ($/m3)	*2011*	*2010*	*2009*	*2008*	*2007*	*2006*
Residential	Actual	Actual	Actual	Actual	Actual	Approved
0 m³ - 60 m³	1.6084	1.5870	1.5625	1.5362	1.3819	1.1686
Over 60 m³	1.6625	1.6404	1.6151	1.5879	1.4284	1.2079
Multi-residential	*2011*	*2010*	*2009*	*2008*	*2007*	*2006*
0 m³ - 100 m³	1.4680	1.4485	1.4262	1.4022	1.2614	1.0667
100.1 m³ - 1000 m³	1.2282	1.2119	1.1932	1.1731	1.0553	0.8924
Over 1000 m³	1.0149	1.0014	0.9860	0.9694	0.8720	0.7374
Commercial	*2011*	*2010*	*2009*	*2008*	*2007*	2006
0 m³ - 100 m³	1.1514	1.1361	1.1186	1.0998	0.9893	0.8366
100.1 m³ - 1000 m³	1.0620	1.0479	1.0317	1.0143	0.9125	0.7717
1000.1 m3 – 5000 m3	0.8405	0.8293	0.8165	0.8027	0.7221	0.6106
Over 5000 m³	0.6767	0.6677	0.6574	0.6463	0.5814	0.4917

Source: EWSI

Table 22 – Actual fixed charges in PBR II

Actual Monthly Fixed Charge ($ per month)	*2011*	*2010*	*2009*	*2008*	*2007*	*2006*
Meter sizes	Actual	Actual	Actual	Actual	Actual	Approved
15 mm	6.16	5.73	5.51	5.42	5.11	4.53
20 mm	8.45	7.72	7.37	7.25	6.83	6.57
25 mm	11.97	10.84	10.32	10.15	9.56	9.19
40 mm	20.92	18.79	17.81	17.51	16.50	15.87
50 mm	27.87	24.95	23.62	23.22	21.88	21.04
75 mm	55.33	49.33	46.61	45.82	43.17	41.51
100 mm	101.09	89.94	84.90	83.47	78.65	75.63
150 mm	189.19	168.13	158.63	155.96	146.95	141.30
200 mm	300.56	266.97	251.84	247.60	233.30	224.34
250 mm	702.36	619.59	582.72	572.90	539.80	519.06
300 mm	702.36	619.59	582.72	572.90	539.80	519.06
400 mm	839.67	745.44	703.05	691.20	651.27	626.25
500 mm	904.19	802.70	757.04	744.28	701.28	674.34

Source: EWSI

Inflation Index

EWSI computed an inflation index comprising of 79% CPI and 21% labour cost component to escalate the customer water-rate charges for both consumption rate and fixed charges for PBR II. Further, EWSI provided forecast and actual inflation rates for both CPI and the labour cost component.

EWSI computed customer-rate charges on two factors: forecasted inflation factor (based on forecasted inflation rates for a given year) and adjustment inflation factor (based on difference between actual and forecasted inflation rates for the previous year). For example, EWSI sets 2008 customer rates structures based on forecasted inflation rate for 2008 plus adjustment inflation factor based on the difference between actual and forecast inflation rates for 2007. Therefore, customers pay for higher inflation in 2008 if actual inflation for 2007 is higher than the forecast value of 2007. Likewise, customers benefit in 2008 if actual inflation for 2007 is lower than the forecast value of 2007.

For PBR III, EWSI is proposing two changes to the inflation index used to forecasting customer water rate charges: change in weightage (higher weightage) and measurement of labour index factor.

The new index will comprise of 65% based on change in Alberta Consumer Price Index ("CPI") and 35% based on change in the average hourly earnings (AHE) for Alberta, Industrial aggregate. The old index under PBR II comprises of 79% based on change in CPI and 21% based on change in labour cost component.

Our methodology for assessing the change in the inflation index factor for PBR III is a multi-step process but the key theme is to examine effects of change in inflation index factor under PBR II based on actual inflation rates. We believe the outcome of such analysis for PBR II would serve as a good proxy for PBR III customer water and wastewater rates.

Table 23 – Inflation rates in PBR II

Actual inflation rates	2011 F	2010 A	2009 A	2008 A	2007 A
CPI	1.70%	1.00%	-0.08%	3.14%	4.99%
Labour cost component	4.58%	4.59%	5.44%	5.66%	8.52%
AHE*	5.82%	5.82%	6.57%	3.08%	5.40%

EWSI data and *Statistics Canada CANSIM series – v1808689, 2011 forecast not available, hence assume same as actual 2010 value.

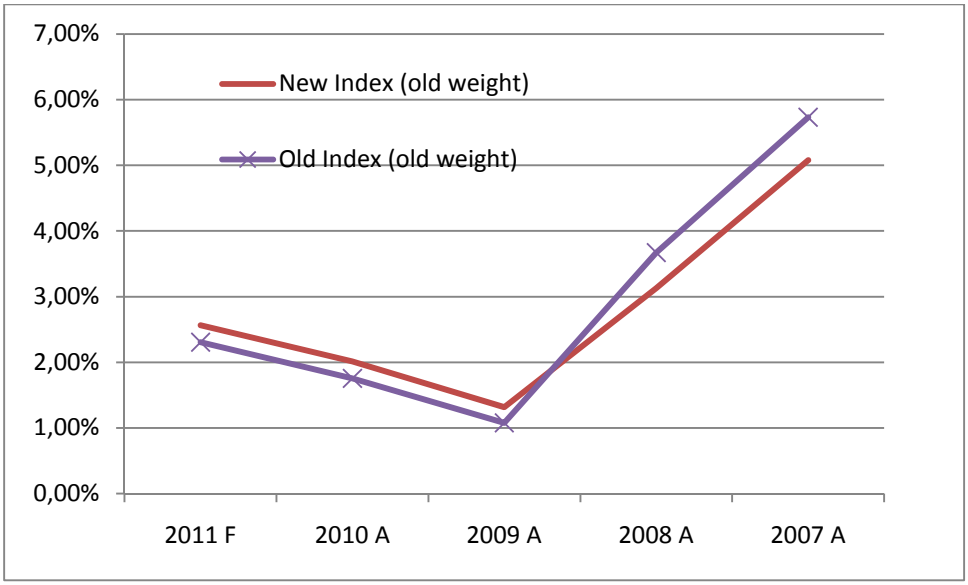
AHE is consistently higher for recent 2009-2011 and lower for super inflationary years of 2008 and 2007.

1. Comparing old index with old weightage versus new index with old weightage (i.e. substituting labour cost component with AHE rates but keeping weights of CPI at 65% and AHE at 35%).

Table 24 – Composite Inflation rates in PBR II

Composite inflation rates	2011 F	2010 A	2009 A	2008 A	2007 A
New Index (old weight)	2.57%	2.01%	1.32%	3.13%	5.08%
Old Index (old weight)	2.30%	1.75%	1.08%	3.67%	5.73%

Source: GT analysis



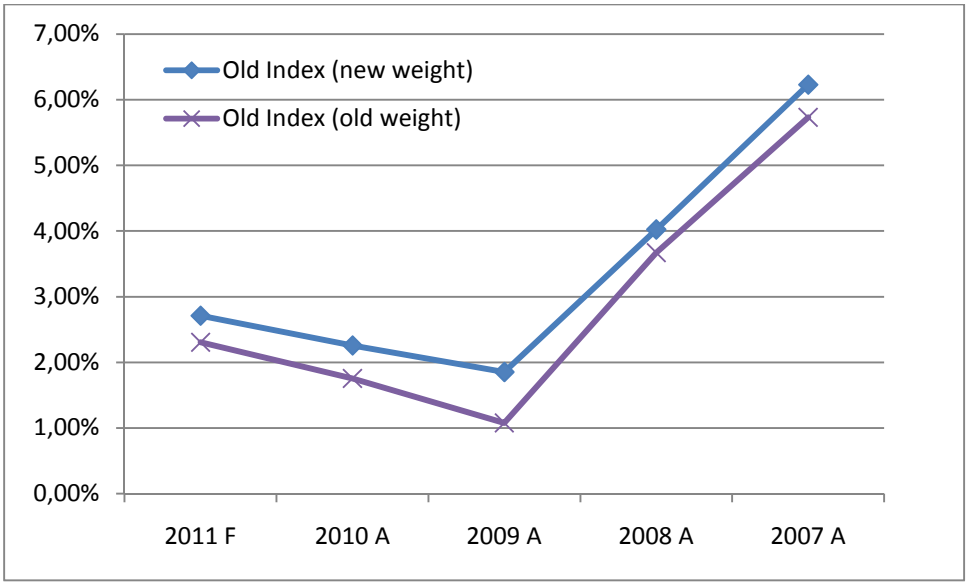
Source: GT analysis

In super-inflationary years of 2007 and 2008, old index (old weight) reports higher composite inflation rates compared to the new index (old weight). But, for 2009-2011, the new index reports consistently higher composite inflation rates.

2. Comparing old index with old weightage versus old index with new weightage (i.e. keeping labour cost component but changes weights from 21% to 35%).

Table 25 – Composite Inflation rates in PBR II

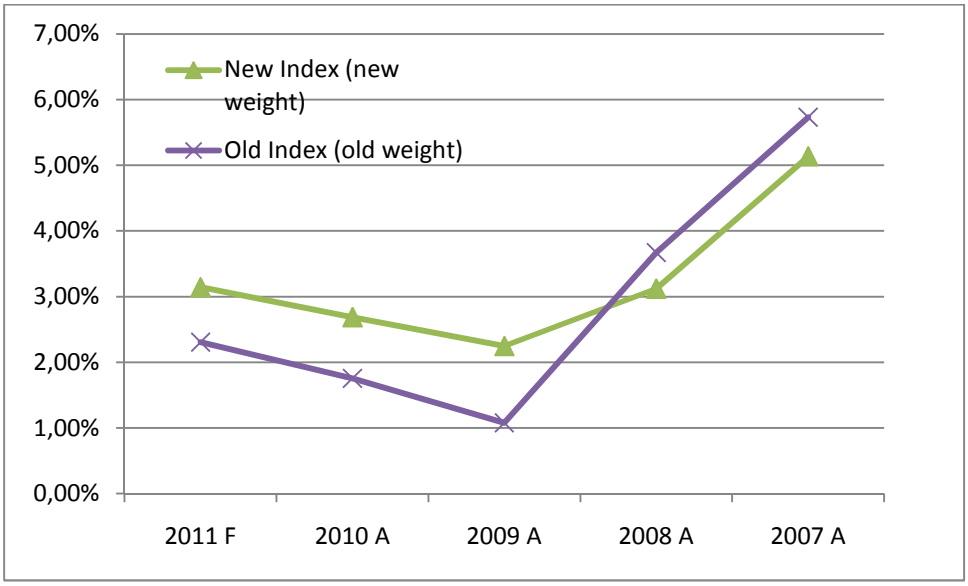
Composite Inflation rates	2011 F	2010 A	2009 A	2008 A	2007 A
Old Index (new weight)	2.71%	2.26%	1.85%	4.02%	6.23%
Old Index (old weight)	2.30%	1.75%	1.08%	3.67%	5.73%



Source: GT analysis

For 2007-2011, old index (new weight) is reporting consistently higher composite inflation rate compared to old index (old weight).

3. Comparing old index (old weight) and new index (new weight)



Source: GT analysis

Table 26 – Composite Inflation rates in PBR II

Composite inflation rates	2011 F	2010 A	2009 A	2008 A	2007 A
New Index (new weight)	3.14%	2.69%	2.25%	3.12%	5.13%
Old Index (old weight)	2.30%	1.75%	1.08%	3.67%	5.73%

Source: GT analysis

For 2009-2011, new index (new weight) is higher than old index (old weight). Hence, we conclude that new index will consistently report higher revenues than old index in PBR III. For further analysis, we have presented PBR II revenues under new index (new weight) and old index (old weight).

Table 27 – PBR II revenues under Old Index and New Index

PBR II Revenues $ millions	Old Index (Old weight)	New Index (New weight)
2007	119.7	119.0
2008	131.9	131.2
2009	141.9	143.5
2010	138.0	139.3
2011	146.5	147.7
Total	678.0	680.7

Source: GT analysis

In conclusion, the hypothetical revenues applying new index (new weight) to PBR II revenues is higher at $680.7 million compare to original PBR revenues of $678 million derived under old index (old weight). Hence, new index reports higher composite rates than old index but the impact of new inflation index on consumer water-rates for PBR III is not expected to be significant.

PBR water rates under 2012-2016

EWSI's water customers are broken down into three distinct rate classes: Residential, Multi-residential and Commercial.

Four types of water rates charges include:

- Consumption charges by customer classes based upon the volume of water used by customers.
- Fixed monthly services charges based upon the size of meters used by customers.
- Rate riders - primarily used to refund customers that privately own and operate a substantial underground water distribution systems and for those customers that receive water through more than one water service, and as a result, more than one water meter
- Miscellaneous services charges.

Routine Adjustments of PBR

In the current PBR term (2007-2011), water customers of EWSI pay consumption charges based on volume of water and fixed monthly services charges based upon the size of water-meter used.

Special Rate Adjustments for Water Services

Two SRA for water services are proposed in the bylaw:

a) EWSI will apply a SRA to consumption and fixed monthly service charges for 2012 and 2013 in part to recover the cost incurred to invest in utility infrastructure – the most significant investment being construction of a water chlorination system at Rossdale plant and construction of infrastructure that impacts residuals (solids) returned to the river from the treatment process. Please refer to the re-basing section in the financial analysis section for details.

b) EWSI will apply a SRA to the consumption charges for each customer segment for the years 2012 to 2016 related specifically to AWMR. AWMR speeds up EWSI's current program for the replacement of corroding cast iron water mains and allows for co-ordination with the City's road rehabilitation program. The current predicted cost is $100 million over five years or $20 million each year of proposed PBR term.

Inflation factor

Inflation factor is proposing two modifications for inflation measures:

a) Change in weighting of the components of inflation calculation – 65% CPI and 35% based on change in the AHE for Alberta, Industrial aggregate from existing 79% CPI and 21% labor cost component.

b) Escalation of salaries and benefits based solely on change in AHE.

Based on our analysis of the inflation index section and cost allocation procedures, the proposed new inflation index (new weight) appears reasonable and the Alberta Industrial Hourly rate index is more reflective of the Alberta labour market. Also, increasing weightage to 35% of AHE tracks the labour component of operating cost more closely than the old weightage of 21%.

Efficiency Factor

EWSI is proposing to maintain the efficiency factor of 0.25% for 2012-2016 PBR term. It represents the reduction in the inflation factor applied to the rates on an annual basis. Basically, it refers to the minimum percentage in operational efficiency that EWSI aims to achieve in the proposed PBR term.

The efficiency factor is not a significant number and it reflects the bare minimum that EWSI can achieve in efficiency gains.

Performance Penalties and Bonus Points

EWSI proposed to meet a number of performance standards related to water quality and wastewater effluent quality, system reliability, customer services and environmental safety. If EWSI fails to meet these standards, then it will be financially penalized and refund appropriate charges to customers. Further, EWSI will not receive any financial reward for exceeding performance standards.

Non Routine Adjustments of PBR

EWSI assumes all risks related to escalation of operations cost and do not pass such increase to the customers. However, EWSI propose to incorporate non-routine adjustments ("NRA") for increase in costs that are beyond scope of control for EWSI.

The nature of such NRA includes:

- Changes to Legislation, Regulation or Taxes
- Consequences of Force Majeure
- River Water Quality
- Deterioration of Waterworks or Wastewater Treatment Systems
- Customer – initiated or City – initiated System Expansion
- City – initiated Relocations of Waterworks Assets
- Franchise Fees

Methodology

Customer rate-structure based revenue model

The customer rates based revenue model is based on proposed consumption based water-rate structure for all customer segments as per the bylaw plus fixed charges per water-meter sizes.

Consumer revenues

EWSI has forecasted a rate-structure for different customer segments over the period of 2012-2016 – both consumption charges ($/m³) and consumption volume (m³) for each customer segments:

Table 28 – Consumption charges in PBR III

Consumption Charge ($/m3)						
Residential	2011 Approved	2012	2013	2014	2015	2016
0 m³ - 10 m³	1.6084	1.6449	1.7686	1.8270	1.8855	1.9451
10.1 m³ - 35 m³	1.6084	1.7966	1.9317	1.9954	2.0594	2.1245
Over 35 m³	1.6266	2.2703	2.4410	2.5216	2.6024	2.6847
Multi-residential	2011 Approved	2012	2013	2014	2015	2016
0 m³ - 100 m³	1.4680	1.5960	1.7160	1.7727	1.8295	1.8873
100.1 m³ - 1000 m³	1.2282	1.3353	1.4357	1.4831	1.5306	1.5790
Over 1000 m³	1.0149	1.1034	1.1864	1.2255	1.2648	1.3048
Commercial	2011 Approved	2012	2013	2014	2015	2016
0 m³ - 25 m³	1.1514	1.2518	1.3459	1.3904	1.4349	1.4803
25.1 m³ - 100 m³	1.1514	1.2518	1.3459	1.3904	1.4349	1.4803
100.1 m³ - 1000 m³	1.0620	1.1546	1.2414	1.2824	1.3235	1.3653
1000.1 m3 – 5000 m3	0.8405	0.9138	0.9825	1.0149	1.0475	1.0806
Over 5000 m³	0.6767	0.7357	0.7910	0.8171	0.8433	0.8700

Source: EWSI

The above consumption charges include both factors for increase in the revenue: inflation and special rate adjustment over PBR 2011-2016. Further, special rate adjustment factors include both rebasing for 2012 and 2013 and accelerated water renewal program.

Next, EWSI forecast the consumption volume based on a declining consumption pattern as shown in Table 29. Note that University of Alberta volumes are shown separately but it is treated as part of commercial customer volumes in Table 3.7.2 – 3 (page 35) of the water information package.

Table 29 – Consumption volumes in PBR III

Consumption Volume (m3)						
Residential	2011	2012	2013	2014	2015	2016
0 m³ - 10 m³	23,985	23,575	23,747	23,921	24,096	24,273
10.1 m³ - 35 m³	20,364	20,015	20,162	20,309	20,458	20,608
Over 35 m³	3,014	2,962	2,984	3,006	3,028	3,050
Multi-residential	2011	2012	2013	2014	2015	2016
0 m³ - 100 m³	3,728	3,666	3,657	3,647	3,638	3,629
100.1 m³ - 1000 m³	10,298	10,128	10,102	10,076	10,050	10,024
Over 1000 m³	3,051	3,000	2,993	2,985	2,977	2,970
Commercial	2011	2012	2013	2014	2015	2016
0 m³ - 25 m³	2,724	2,620	2,648	2,684	2,701	2,738
25.1 m³ - 100 m³	3,727	3,585	3,623	3,671	3,696	3,746
100.1 m³ - 1000 m³	9,514	9,150	9,247	9,371	9,433	9,562
1000.1 m3 – 5000 m3	5,513	5,303	5,359	5,431	5,466	5,541
Over 5000 m³	5,581	5,368	5,425	5,497	5,534	5,610
University of Alberta	2011	2012	2013	2014	2015	2016
0 m³ - 100.0 m³	1.1	1.2	1.2	1.2	1.2	1.2
100.1 m³ - 1000.0 m³	10.7	11.2	11.6	11.6	11.7	11.7
1000.1 m³ - 5000.0 m³	48.0	50.6	52.2	52.4	52.5	52.5
> 5,000m³	2,364.7	2,493.0	2,572.4	2,581.7	2,588.1	2,588.1

Source: EWSI

Next, EWSI multiplies the forecasted rate-structure with forecasted consumption volume to arrive at annual consumption revenues for the period 2012-2016. Further, EWSI has done a separate analysis for University of Alberta revenues in their revenue model. The following table provides consumption revenues based on above data of consumption volumes and University of Alberta revenues.

Table 30 – Consumption revenues in PBR III

Consumption Revenues ($ millions)							
Residential	2011	2012	2013	2014	2015	2016	Sub-total 2012-2016
0 m³ - 10 m³	38.58	38.78	42.00	43.70	45.43	47.21	217.13
10.1 m³ - 35 m³	32.75	35.96	38.95	40.53	42.13	43.78	201.34
Over 35 m³	4.90	6.72	7.28	7.58	7.88	8.19	37.65
Multi-residential							
0 m³ - 100 m³	5.47	5.85	6.28	6.47	6.66	6.85	32.10
100.1 m³ - 1000 m³	12.65	13.52	14.50	14.94	15.38	15.83	74.18
Over 1000 m³	3.10	3.31	3.55	3.66	3.77	3.87	18.16
Commercial							
0 m³ - 25 m³	3.14	3.28	3.56	3.73	3.88	4.05	18.50
25.1 m³ - 100 m³	4.29	4.49	4.88	5.10	5.30	5.55	25.32
100.1 m³ - 1000 m³	10.10	10.56	11.48	12.02	12.48	13.06	59.60
1000.1 m3 – 5000 m3	4.63	4.85	5.27	5.51	5.73	5.99	27.34
Over 5000 m³	3.78	3.95	4.29	4.49	4.67	4.88	22.28

Source: EWSI

Consumption revenues forecast $ million	2011	2012	2013	2014	2015	2016	Sub-total
Consumption revenues	123.39	131.27	142.03	147.73	153.30	159.26	733.60
University of Alberta revenues	1.616	1.698	1.802	1.862	1.891	1.940	9.19

Source: EWSI

Fixed annual revenues

Fixed monthly revenues consist of monthly charges as per customer water-meter sizes. For annual fixed revenue calculations, EWSI multiplied the customer count with size of water-service meters to arrive at annual fixed revenue.

Table 31 –Fixed Monthly Service Charges in PBR III

($ per month)	2011 Approved	2012	2013	2014	2015	2016
Meter sizes						
15 mm	6.2	6.6	7.0	7.1	7.3	7.5
20 mm	8.5	9.0	9.6	9.8	10.0	10.3
25 mm	12.0	12.7	13.6	13.9	14.2	14.5
40 mm	20.9	22.3	23.7	24.3	24.8	25.4
50 mm	27.9	29.7	31.6	32.3	33.1	33.8
75 mm	55.3	58.9	62.8	64.2	65.7	67.1
100 mm	101.1	107.7	114.7	117.3	120.0	122.7
150 mm	189.2	201.5	214.6	219.5	224.5	229.6
200 mm	300.6	320.1	340.9	348.7	356.7	364.8
250 mm	702.4	748.0	796.6	815.0	833.5	852.4
300 mm	702.4	748.0	796.6	815.0	833.5	852.4
400 mm	839.7	894.2	952.4	974.3	996.4	1,019.0
500 mm	904.2	963.0	1,025.6	1,049.1	1,073.0	1,097.3

Source: EWSI

Based on above data of fixed monthly service charges, EWSI multiplied customer count for each year to yield the following annual fixed revenues for each customer segment:

Table 32 – Annual Fixed revenues in PBR III

Annual Fixed revenues	2011	2012	2013	2014	2015	2016	Sub-total
$ millions							
Residential	16.44	17.82	19.31	20.10	20.91	21.76	99.89
Multi-residential	0.74	0.80	0.86	0.88	0.91	0.94	4.38
Commercial	2.42	2.60	2.81	2.91	3.01	3.12	14.45
Sub-total	19.60	21.22	22.97	23.89	24.83	25.82	**118.72**

Source: EWSI

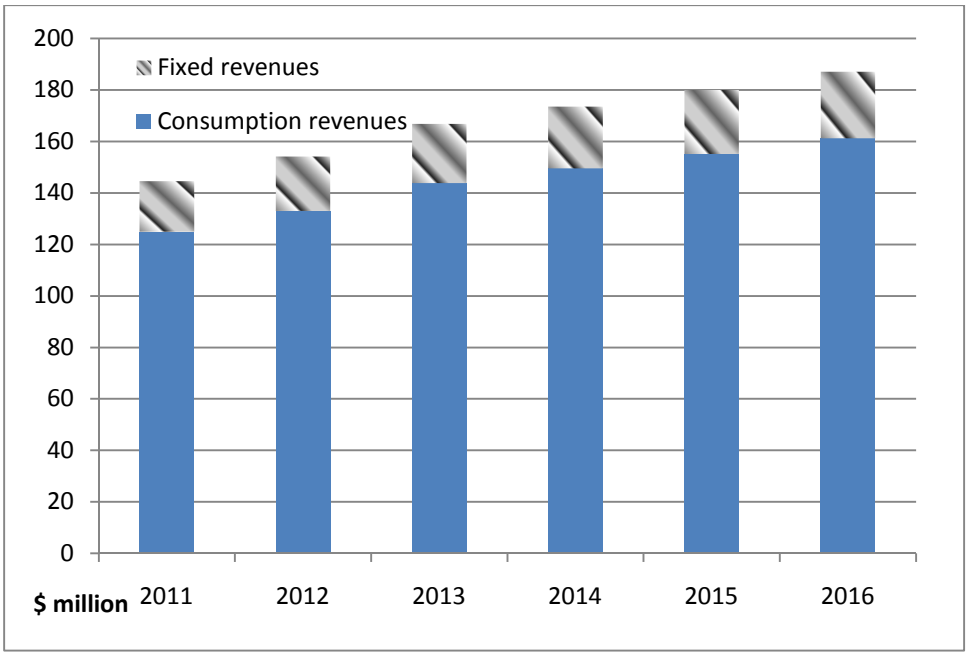
Total annual revenues

Finally, EWSI adds consumption revenue and fixed revenue to derive the total revenue for in-city customers for the 2012-2016 periods.

Table 33 – Total Fixed revenues in PBR III

Total Revenue	2011	2012	2013	2014	2015	2016	Sub-total 2012-2016
$ million							
Consumption Charges	125.01	132.97	143.84	149.59	155.19	161.20	742.79
Fixed charges	19.60	21.22	22.97	23.89	24.83	25.82	118.72
Sub-total	144.61	154.19	166.81	173.48	180.03	187.01	861.51

Source: EWSI



Source: GT analysis

Findings and Recommendations – Water Treatment Rate Structure

Our analysis independently verified the underlying calculations including various inputs such as consumption charges ($/m^3), fixed charges ($/monthly), consumption volumes, inflation factors, Rebasing and accelerated main renewal factors. We arrived at fairly close revenue to forecast by EWSI of $861.5 million after assuming University of Alberta revenues from EWSI revenue model. Also, this matches with in-city revenue requirements of $861.84 million as explained in Section 2 and Table 3b.

The following section illustrates our analysis of increase in consumption rate-structures over different customer segments and respective volume-tiers. Note that our analysis is based on actual PBR II rates versus forecasted PBR III rates.

Residential rate-structure

Two-tier rate-structure for PBR II based on actual consumption rate-structure for residential customers is as follows:

Table 34 – Residential Consumption rate-structure in PBR II

		PBR II – 2007-2011				
Consumption rates	*Approved*	*Actual*	*Actual*	*Actual*	*Actual*	*Approved*
Residential $/m³	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
0 m³ - 60 m³	1.1686	1.3819	1.5362	1.5625	1.587	1.6084
Over 60 m³	1.2079	1.4284	1.5879	1.6151	1.6404	1.6625

Source: EWSI

Three-tier rate-structure for PBR III based on actual consumption rate-structure for residential customers is as follows:

Table 35 – Residential Consumption rate-structure in PBR III

		PBR III 2011-2016				
Consumption rates	*Approved*	Forecast	Forecast	Forecast	Forecast	Forecast
Residential $/m³	*2011*	2012	2013	2014	2015	2016
0 m³ - 10 m³	1.6084	1.6449	1.7686	1.827	1.8855	1.9451
10.1 m³ - 35 m³	1.6084	1.7966	1.9317	1.9954	2.0594	2.1245
Over 35 m³	1.6266	2.2703	2.441	2.5216	2.6024	2.6847

Source: EWSI

As per EWSI water information package and EWSI revenue model, the following growth factors are applied to residential customer rates over PBR III period.

Table 36 –Residential rates Growth factors in PBR III

Residential rates Growth factors		PBR III 2011-2016				
		Forecast	Forecast	Forecast	Forecast	Forecast
		2012	2013	2014	2015	2016
Inflation*						
0 m^3- 10 m^3		2.27%	2.27%	2.27%	2.27%	2.27%
10.1 m^3 – 35 m^3		2.27%	2.27%	2.27%	2.27%	2.27%
>35 m^3		2.27%	2.27%	2.27%	2.27%	2.27%
Rebasing	Special rate adjustments					
0 m^3- 10 m^3		0.00%	4.23%	-	-	-
10.1 m^3 – 35 m^3		6.20%	4.23%	-	-	-
>35 m^3		24.47%	4.23%	-	-	-
AMWR	Special rate adjustments					
0 m^3- 10 m^3		0.00%	1.02%	1.03%	0.94%	0.89%
10.1 m^3 – 35 m^3		3.25%	1.02%	1.03%	0.94%	0.89%
>35 m^3		12.85%	1.02%	1.03%	0.94%	0.89%

* Including efficiency factor of 0.25%, Source: EWSI

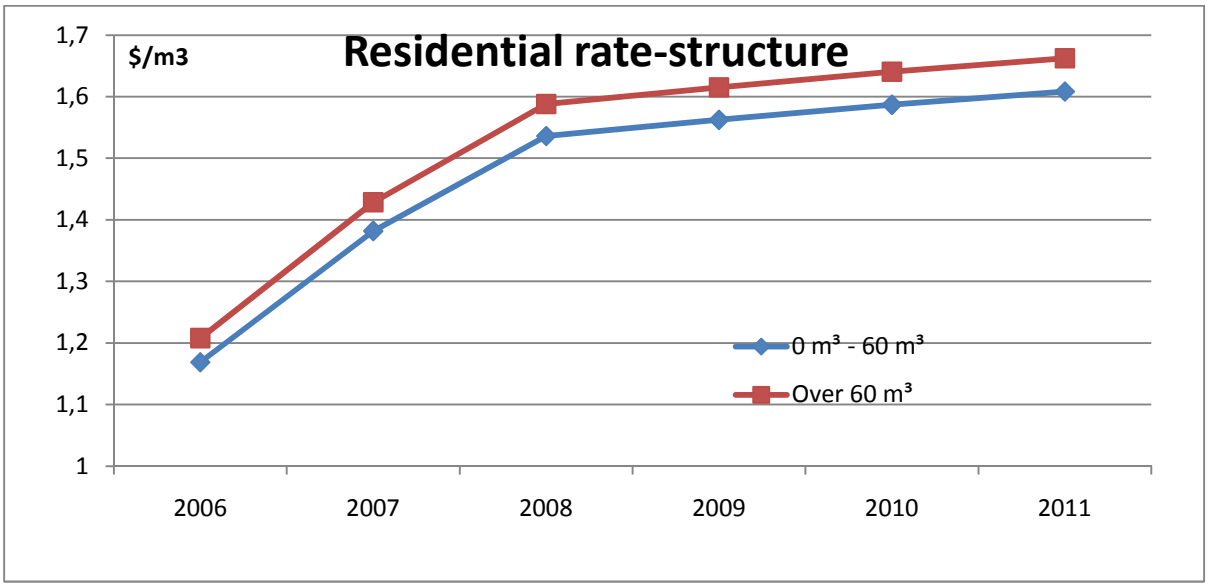
Note that % increase in third-tier (over 35 m^3) is relatively high compared to first two tiers and % increase in first-tier (0 m^3 – 10 m^3) is lowest. Mathematically, all above three growth factors can be reduced to single compounded growth on a yearly basis. The following table illustrates the actual PBR II rate increases and forecasted PBR III increases – both yearly compounded geometric increases and arithmetic over the respective PBR term.

Table 37 –Residential rates Growth factors in PBR III

PBR III Forecast increase (2011-2016)	Arithmetic increase over PBR III	Yearly compound Geometric increase
0 m^3 - 10 m^3	20.93%	3.87%
10.1 m^3 - 35 m^3	32.09%	5.72%
Over 35 m^3	65.05%	10.54%
PBR II Actual increase (2006-2011)	**Arithmetic increase over PBR II**	**Yearly Compound Geometric increase**
0 m^3 - 60 m^3	37.63%	6.60%
Over 60 m^3	37.64%	6.60%

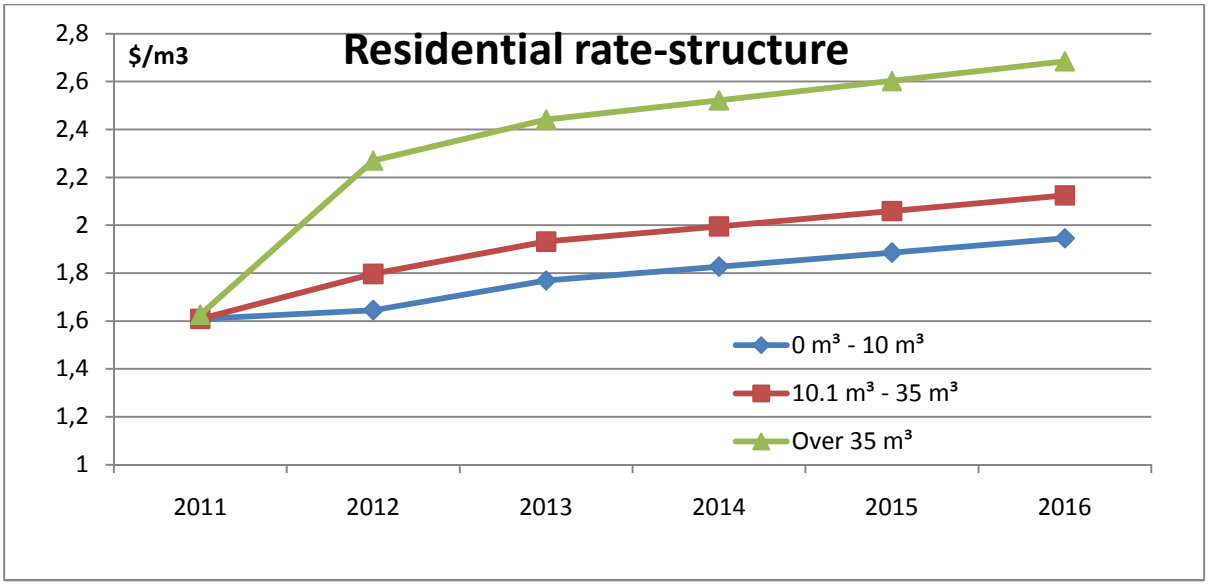
Source: GT analysis

The following graph illustrates the PBR II structure based on actual rate-structures.



Source: GT analysis

The following graph illustrates the PBR III structure based on forecast rate-structures and split of customer rate-structures from the two-tier to three-tier as per bylaw.



Source: GT analysis

EWSI presented residential water bills for an average use customer and a low use customer in a presentation to Edmonton City Council dated June 16th 2011.

The following tables are extracted from the EWSI report.

Table 38 –Residential Average Use Customers

Average Use customer	2011	2012	2013	2014	2015	2016	Average
Monthly Consumption (m^3)	17.5	17.3	17.1	17.0	16.8	16.6	
Monthly Bill ($/month)	34.31	36.12	38.39	39.39	40.17	40.95	
Monthly Bill Impact ($/month)		1.81	2.27	1.00	0.78	0.78	1.33
% Change in Total Bill		5.3%	6.3%	2.6%	2.0%	1.9%	3.6%

Source: EWSI

Table 39 – Residential Low Use Customers

Low Use customer	2011	2012	2013	2014	2015	2016	Average
Monthly Consumption (m^3)	10.0	9.9	9.8	9.7	9.6	9.5	
Monthly Bill ($/month)	22.24	22.85	24.32	24.87	25.41	25.95	
Monthly Bill Impact ($/month)		0.61	1.47	0.55	0.54	0.54	0.74
% Change in Total Bill		2.7%	6.4%	2.3%	2.2%	2.1%	3.1%

Source: EWSI

EWSI cited an average increase of 3.6% for an average use customer and a 3.1% average increase for a low use customer for the PBR III term. However, it should be noted this increase is taking into account both declining consumption and an increase in consumption charges. Our analysis is presenting only an increase in consumption charges based on EWSI which is 3.87% yearly for (0 m^3 – 10 m^3), 5.72% (10.1 m^3 – 35 m^3) and 10.74% for (over 35 m^3)% over PBR III term, higher than above data presented in EWSI presentation.

The change in tier-structure from a 2-tier to 3-tier promotes conservation of water resource among consumers. In conclusion, the proposed change in tier-structure by EWSI is appropriate.

Multi-residential rate-structure

Multi-residential rate-structure over PBR II (actual rates) and PBR III (forecast rates) are as follows:

Table 40 – Multi-residential Consumption rates over PBR II and PBR III

		PBR II – 2007-2011					PBR III – 2012-2016				
Consumption rates	*Approved*	*Actual*	*Actual*	*Actual*	*Actual*	*Approved*	Forecast	Forecast	Forecast	Forecast	Forecast
Multi-residential $/m³	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	2012	2013	2014	2015	2016
0 m³ - 100 m³	1.0667	1.2614	1.4022	1.4262	1.4485	1.468	1.596	1.716	1.7727	1.8295	1.8873
100.1 m³ - 1000 m³	0.8924	1.0553	1.1731	1.1932	1.2119	1.2282	1.3353	1.4357	1.4831	1.5306	1.579
Over 1000 m³	0.7374	0.872	0.9694	0.986	1.0014	1.0149	1.1034	1.1864	1.2255	1.2648	1.3048

*2007-2011 – Actual rate-structure, 2012-2016 – Proposed rate-structure, Source: EWSI

The multi-residential rates over PBR II increased by arithmetic 37.6% (based on actual rates) over 2006-2011 period and 6.59% geometric compounded yearly increase.

As per the EWSI water information package and the EWSI water revenue model, the multi-residential rates in PBR III are increased by three factors and a detailed breakdown of such factors are provided below

Table 41 – Multi-residential Growth factors in PBR III

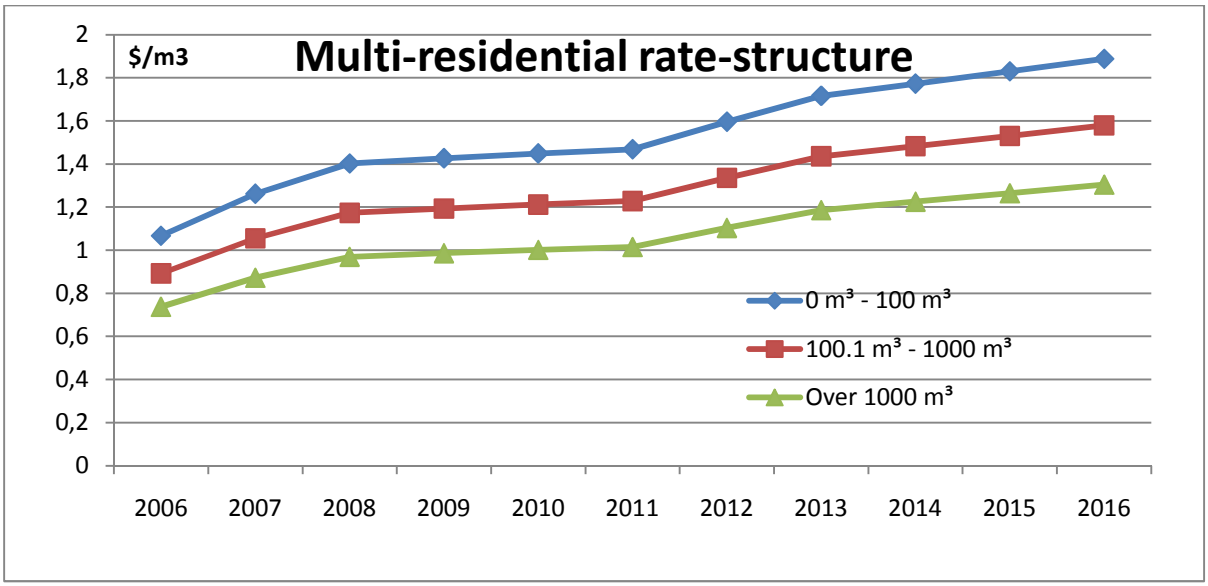
Multi-residential rates Growth factors		PBR III 2011-2016				
		Forecast	Forecast	Forecast	Forecast	Forecast
		2012	2013	2014	2015	2016
Inflation*		2.27%	2.27%	2.27%	2.27%	2.27%
Rebasing	Special rate adjustment	4.23%	4.23%	-	-	-
AMWR	Special rate adjustment	2.22%	1.02%	1.03%	0.94%	0.89%

* Including efficiency factor of 0.25%, Source: EWSI

All three growth factors (Inflation, rebasing and AMWR) combined induces an uneven growth pattern in rate-structure over the PBR III period. Mathematically, such uneven growth patterns can be deduced to an equivalent of a single annual compounded growth factor. As per our analysis, the multi-residential rates over PBR III will increase by 5.15% geometric compounded yearly or increase by an arithmetic rate of 28.6% (based on forecast rates) over the 2011-2016 period. Note that the actual customer rates for PBR III will be higher or lower depending on a host of factors such as actual inflation and non-routine adjustments.

Overall, the multi-residential rates over PBR II & III will increase by arithmetic 77%% (based on actual rates for PBR II and forecast rates for PBR III) over the decade of 2006-2016 period and 5.87% geometric compounded yearly increase.

The following charts captures the multi-residential rate-structure for PBR II and PBR III over 2006-2016.



Source: GT analysis

EWSI presented multi-residential water bills for an average use customer and a low use customer in its presentation to Edmonton City Council dated June 16th 2011.

The following tables are extracted from the report.

Table 42 –Multi-Residential Average Use Customers

Average Use customer	2011	2012	2013	2014	2015	2016	Average
Monthly Consumption (m3)	410	410	406	402	398	394	
Monthly Bill ($/month)	540	586	625	639	653	667	
Monthly Bill Impact ($/month)		46	39	14	14	14	25
% Change in Total Bill		8.5%	6.7%	2.2%	2.2%	2.1%	4.3%

Source: EWSI

EWSI cited an average increase of 4.3% for an average use customer on an annual basis, and this increase is taking into account both declining consumption and increase in consumption charges. Our analysis is presenting only an increase in consumption charges based on EWSI which is a 5.15% yearly growth over the PBR III term, higher than the above data presented in EWSI presentation.

Commercial rate-structure

Commercial rate-structure over PBR II (actual rates) and PBR III (forecast rates) are as follows. Note that the University of Alberta rate-structure is similar to commercial rate-structures

Table 43 – Commercial Consumption rates over PBR II and PBR III

		PBR II – 2007-2011					PBR III – 2012-2016				
Consumption rates	*Approved*	*Actual*	*Actual*	*Actual*	*Actual*	*Approved*	Forecast	Forecast	Forecast	Forecast	Forecast
Commercial $/m³	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	2012	2013	2014	2015	2016
0 m³ - 100 m³	0.8366	0.9893	1.0998	1.1186	1.1361	1.1514	1.2518	1.3459	1.3904	1.4349	1.4803
100.1 m³ - 1000 m³	0.7717	0.9125	1.0143	1.0317	1.0479	1.062	1.1546	1.2414	1.2824	1.3235	1.3653
1000.1 m3 – 5000 m3	0.6106	0.7221	0.8027	0.8165	0.8293	0.8405	0.9138	0.9825	1.0149	1.0475	1.0806
Over 5000 m³	0.4917	0.5814	0.6463	0.6574	0.6677	0.6767	0.7357	0.791	0.8171	0.8433	0.87

*2007-2011 – Actual rate-structure, 2012-2016 – Proposed rate-structure, Source: EWSI

The commercial rates over PBR II increased by arithmetic 37.6% (based on actual rates) over the 2006-2011 period and 6.59% geometric compounded yearly increase.

As per the EWSI water information package and the EWSI water revenue model, the commercial rates in PBR III are increased by three factors and the detailed breakdown of such factors are provided below.

Table 44 – Commercial Growth factors in PBR III

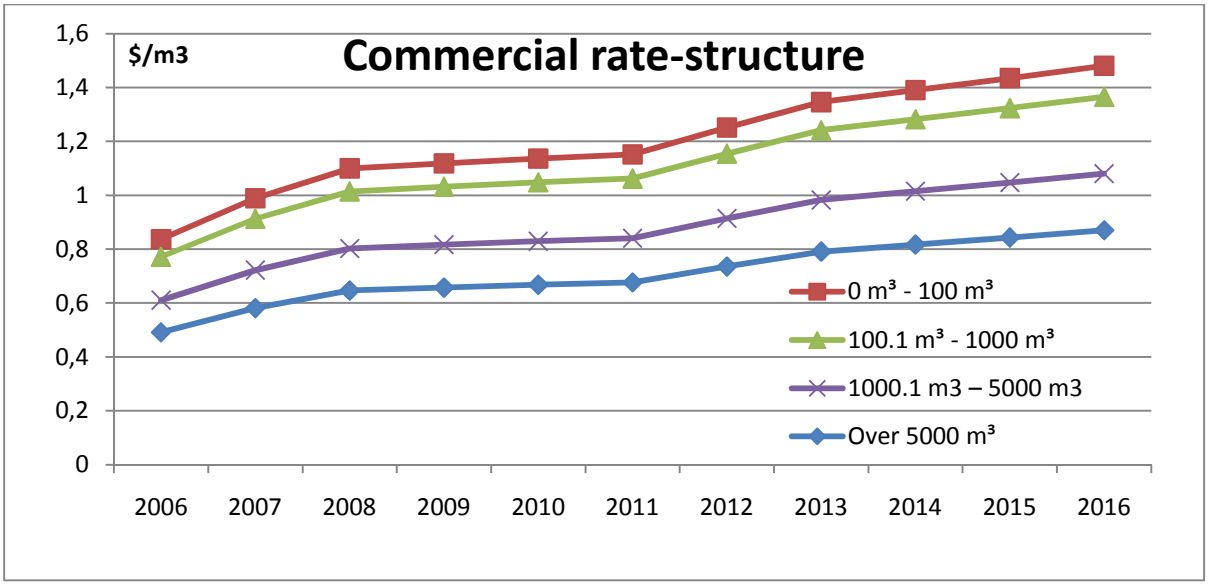
Commercial rates Growth factors		PBR III 2011-2016				
		Forecast	Forecast	Forecast	Forecast	Forecast
		2012	2013	2014	2015	2016
Inflation*		2.27%	2.27%	2.27%	2.27%	2.27%
Rebasing	Special rate adjustment	4.23%	4.23%	-	-	-
AMWR	Special rate adjustment	2.22%	1.02%	1.03%	0.94%	0.89%

* Including efficiency factor of 0.25%, Source: EWSI

Mathematically, the above multiple factors could be deduced to a single % compounded factor on a yearly basis. The commercial rates over PBR III will increase by 5.15% geometric compounded yearly increase or by arithmetic 28.6% (based on forecast rates) over the 2011-2016 period. Note that actual customer rates for PBR III will be higher or lower depending on host of factors such as actual inflation and non-routine adjustments.

The commercial rates over PBR II & III will increase by arithmetic 77% (based on actual rates for PBR II and forecast rates for PBR III) over the decade of 2006-2016 period and 5.87% geometric compounded yearly increase.

The following chart captures commercial rate-structure for PBR II and PBR III over 2006-2016.



Source: GT analysis

EWSI presented commercial water bills for an average use customer and a low use customer in a presentation to Edmonton City Council dated June 16th 2011.

The following table is extracted from the report.

Table 45 – Commercial Average bills in PBR III

Commercial water bills	Average monthly Bill change	Approx. monthly Bill
325 m3/month (car wash)	$20	$430
6000 m3/month (hotel/shopping center)	$290	$6,150
20000 m3/month Industrial facility	$840	$17,700

Source: EWSI

EWSI cited an average increase of 5.2% annually. Our analysis is presenting only an increase in consumption charges based on EWSI which is a 5.15% yearly growth over PBR III term, similar to the above data presented in the EWSI presentation.

Further, the commercial rate-structure has 5 consumption blocks in PBR III as opposed to the 4 consumption blocks in PBR II. Block 0 m^3 – 100 m^3 is split into two blocks of 0 m^3 – 25 m^3 and 25.1 m^3 – 100 m^3 and both these blocks will have identical rates. As per EWSI, the addition of the smaller rate block appearing on customer bills will signal to small commercial water users that EWSI is considering, prior to the next PBR renewal in 2017, a higher water rate for this lowest block of users because small commercial customers are typically located in residential areas requiring more infrastructure to provide fire protection requirements, which is more costly to maintain due to their location, and exhibit consumption patterns similar to residential customers.

Fixed Monthly charges

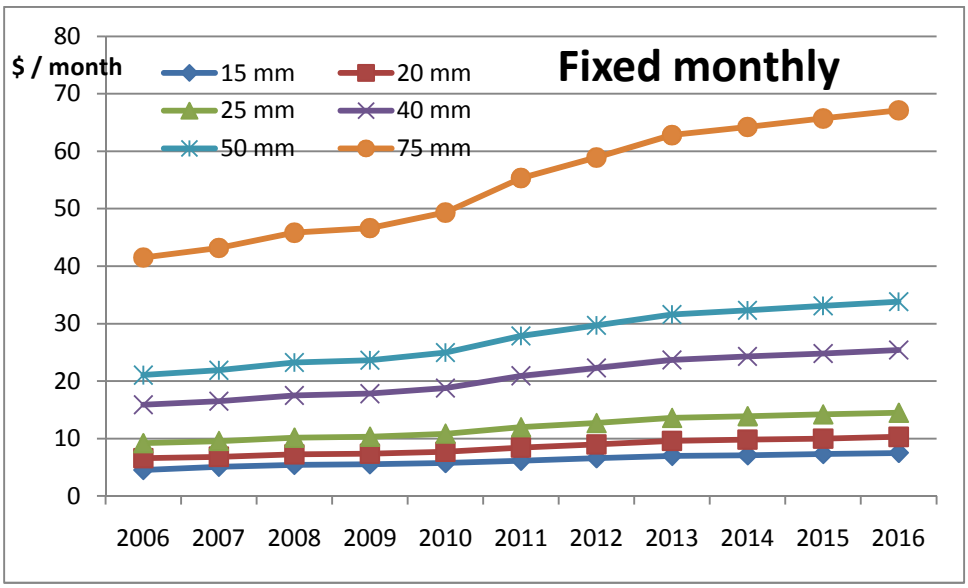
Fixed monthly charges are common across all customer segments and across all tiers. The charge depends on customer's installed water meter sizes. The following table captures the rates prevalent in PBR II (actual) and forecasted over PBR III.

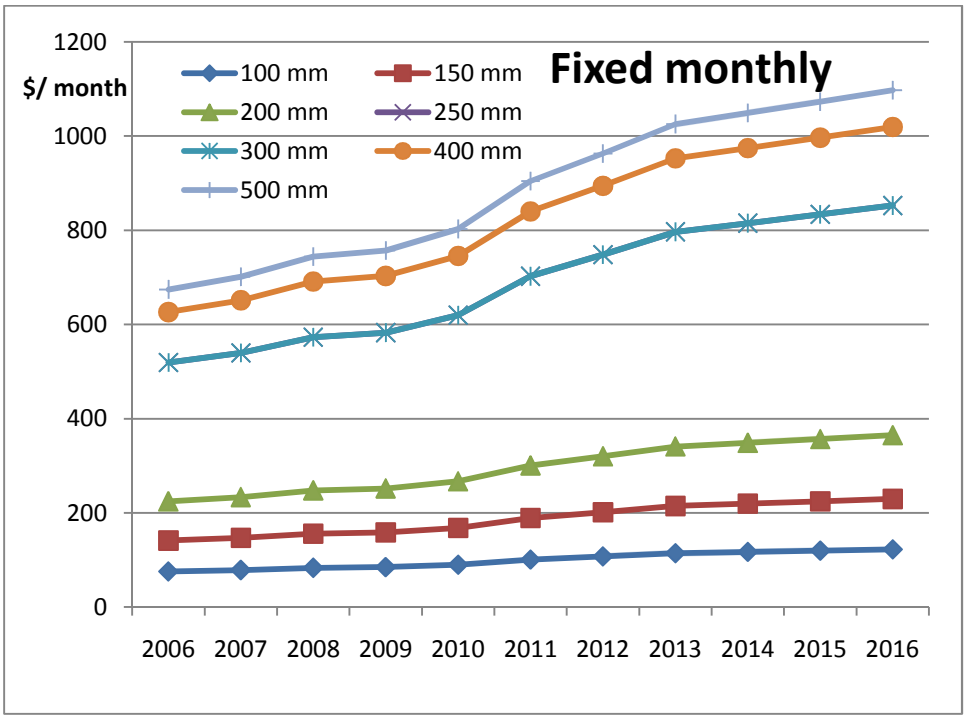
Table 46 – Fixed monthly changes in PBR II and PBR III

		PBR II (2006-2011)					*PBR III (2012-2016)*				
Actual Monthly Fixed Charge ($ per month)	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	2012	2013	2014	2015	2016
Meter sizes	Approved	Actual	Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast
15 mm	4.5	5.1	5.4	5.5	5.7	6.2	6.6	7.0	7.1	7.3	7.5
20 mm	6.6	6.8	7.3	7.4	7.7	8.5	9	9.6	9.8	10.0	10.3
25 mm	9.2	9.6	10.2	10.3	10.8	12.0	12.7	13.6	13.9	14.2	14.5
40 mm	15.9	16.5	17.5	17.8	18.8	20.9	22.3	23.7	24.3	24.8	25.4
50 mm	21.0	21.9	23.2	23.6	25.0	27.9	29.7	31.6	32.3	33.1	33.8
75 mm	41.5	43.2	45.8	46.6	49.3	55.3	58.9	62.8	64.2	65.7	67.1
100 mm	75.6	78.7	83.5	84.9	89.9	101.1	107.7	114.7	117.3	120.0	122.7
150 mm	141.3	147.0	156.0	158.6	168.1	189.2	201.5	214.6	219.5	224.5	229.6
200 mm	224.3	233.3	247.6	251.8	267.0	300.6	320.1	340.9	348.7	356.7	364.8
250 mm	519.1	539.8	572.9	582.7	619.6	702.4	748	796.6	815.0	833.5	852.4
300 mm	519.1	539.8	572.9	582.7	619.6	702.4	748	796.6	815.0	833.5	852.4
400 mm	626.3	651.3	691.2	703.1	745.4	839.7	894.2	952.4	974.3	996.4	1019.0
500 mm	674.3	701.3	744.3	757.0	802.7	904.2	963	1025.6	1049.1	1073.0	1097.3

Source: EWSI

The following graphs captures trend for fixed monthly charges over PBR II (actual) and PBR III (forecast).





Source: GT analysis

As part of EWSI's rate notices and rates report, a comparison of water rates to other communities was provided. This comparison illustrated both current 2011 rates and proposed 2012 rates. An independent benchmarking exercise was not undertaken; however a review of EWSI's analysis indicates the comparison appears reasonable.

We note that the efficiency factor is modest relative to industry standards. A more aggressive efficiency factor should be consider to apply greater downward pressure on the overall rates.

Section 3: Regulated Wastewater Operations

Gold Bar WWTP Revenue Requirements

EWSI Gold Bar WWTP Revenue requirements

EWSI has proposed the following total revenue requirements for Gold Bar WWTP operations. Over the term of PBR III, EWSI's, revenue requirements are estimated at $356.52 million. Total revenue requirements account for the cost of delivering the services only to In-city customers only.

We found a discrepancy in revenue requirements for operations versus revenue generated by customer rate-structure. And, EWSI submitted to us revised information related to capital structure, cost of debt and cost of equity to eliminate the discrepancy. Both original and revised revenue requirements are shown in table 47a and 47b respectively. Further, we have explained the effect of such revision in related sections below.

The following table details the build-up of original annual total revenue requirements.

Table 47a – Original Gold Bar WWTP Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	39.09	40.17	41.71	43.11	44.45	208.53
Franchise Fee	4.76	5.18	5.64	6.12	6.66	28.36
Depreciation Expense	9.09	9.23	9.78	10.45	10.98	49.53
Interest Expense	7.91	9.36	10.62	11.21	11.46	50.56
Return on Equity	3.11	5.20	7.03	9.92	13.93	39.19
Revenue Requirement before Revenue Offsets	63.96	69.14	74.78	80.81	87.48	376.17
Less: Revenue Offsets	(4.46)	(4.40)	(4.34)	(4.28)	(4.22)	(21.70)
Revenue Requirement – In-City	59.50	64.74	70.44	76.53	83.26	354.47

Source: EWSI

The following table details the build-up of revised annual total revenue requirements.

Table 47b – Revised Gold Bar WWTP Revenue Requirements

Cost Component	2012	2013	2014	2015	2016	2012-2016
$ million	Forecast	Forecast	Forecast	Forecast	Forecast	Total
Total Operating Costs	39.10	40.17	41.71	43.10	44.45	208.53
Franchise Fee*	4.79	5.23	5.74	6.19	6.56	28.52
Depreciation Expense	9.09	9.23	9.78	10.45	10.97	49.53
Interest Expense	7.61	8.27	9.00	9.58	9.81	44.26
Return on Equity	3.74	6.99	9.92	12.45	14.27	47.38
Revenue Requirement before Revenue Offsets	64.3	69.9	76.2	81.8	86.1	378.22
Less: Revenue Offsets	(4.46)	(4.4)	(4.34)	(4.28)	(4.22)	(21.70)
Revenue Requirement – In-City	59.9	65.5	71.8	77.5	81.8	356.52

Source: EWSI and GT calculations on franchise fee*,

Scope of our review

In the context of our due diligence, we have reviewed the information provided by EWSI with respect to its revenue requirements under PBR III. We have specifically carried out the following procedures:

- We have reviewed the information provided by EWSI with a view to reconcile the projected evolution of each cost category over the PBR III period for Gold Bar WWTP operations;
- We have reviewed rate-structure model developed by EWSI for Gold Bar WWTP operations with specific focus on the customer rate-structure with regards to inflation, and special rate adjustments.
- We reconciled with our independent customer rate structure based Gold Bar WWTP revenue model to revenue across each customer segments including consumption and fixed charge revenue.
- Where applicable, we have independently validated the build-up as well as the evolution of individual Operating Cost categories with respect to inflation assumptions used by EWSI;
- We have reviewed the asset continuity schedule provided by EWSI for the 2010 (Actual) to 2016 (Forecast) period for Gold Bar WWTP operations. We have tracked the impact of the capital spending program, the calculation of depreciation with a view to reconcile the movements in EWSI Rate Base.
- We have reviewed the expert opinion provided by EWSI in support of certain cost of capital assumptions as well as and tracked the evolution.
- We reconciled our independent financial model to annual movements in each cost category;

Our findings and conclusions are grouped by cost category in the following section.

Operating Costs

EWSI has provided details of the different cost categories that consolidate into its operating costs. It is important to highlight that these represent the operating costs for In-city customers only. The following table was extracted from the wastewater information package provided by EWSI and provides an overview of the different cost categories that aggregate into operating costs.

Table 48 – Breakdown of Total Operating Costs

Cost Category	2010	2011	2012	2013	2014	2015	2016	2012-2016
	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast Total
Salaries and Benefits	12.27	14.17	15.91	16.52	17.13	17.74	18.37	85.67
Power Costs and Other Utilities	4.07	4.78	4.87	4.97	5.39	5.55	5.66	26.44
Contractors and Consultants	3.23	3.69	3.76	3.69	3.66	3.71	3.79	18.61
Materials and Supplies	1.54	1.76	1.79	1.82	1.86	1.90	1.94	9.31
Chemical Costs	0.72	0.95	1.02	1.10	1.38	1.57	1.60	6.67
Customer Billing	3.73	4.19	4.28	4.36	4.45	4.54	4.63	22.26
Franchise Fees	3.96	4.46	4.79	5.23	5.74	6.19	6.56	28.52
Corporate Service Costs	5.23	5.07	5.55	5.73	5.83	6.04	6.30	29.45
Other	1.16	1.40	1.92	1.98	2.01	2.05	2.16	10.12
Total EWSI Operating Costs	35.91	40.47	43.89	45.40	47.45	49.29	51.01	237.04

Source: EWSI and GT analysis on Franchise fees

We understand from the information package that between 2010 and 2011, total operating costs are budgeted to increase by $4.56 million (a 12.7% YOY increase) and are anticipated to increase a further $3.42 million in 2012 (an 8% increase YOY).

We have reviewed the projected evolution of individual cost categories over the term of PBR III. Through our work, we have been able to reconcile the projected evolution of individual categories over PBR III based on the information disclosed. Over the period, individual categories will continue to grow at a rate of 2%/yr for non-labour related items and a rate of 3.56%/yr for labour related items.

We note EWSI expects that chemical cost, power and natural gas will grow at a rate that exceed the applicable inflation factors. Based on our calculation, the projected increase over and above the forecasted inflation aggregate to $2.5 million over the PBR III term 2012-2016.

The wastewater information package page 35 – point 117 incorrectly lists that the increase in chemical cost and power & natural gas includes an additional adjustment of $0.45 million/year and $0.35 million/year

above inflation factors over the PBR III 2012-2016 term. We found a discrepancy using our analysis and inquired with EWSI..

EWSI responded that chemical costs include adjustments in addition to inflation of $500,000 spread over 2012 to 2015. Power and natural gas include adjustments in addition to inflation of $350,000 spread over 2014 and 2015.

Given the magnitude of these increases in operating costs and their ultimate inclusion in the cost of service, it is important that the City consider adding some form of oversight and approval for operating spending in excess of levels approved during the rate making process.

Franchise Fees

The approach used by EWSI to budget for franchise fees is straightforward and entirely driven by revenues collected through the wastewater treatment to its various customers within City limits. Franchise fee is calculated at 8% of total revenue generated.

We have reviewed the supporting calculation approach developed by EWSI to estimate the franchise fees and support the reported number. Note that franchise cost was updated from $28.36 million as per Table 1.4-1 (page 7) of the wastewater information package to $28.52 million as per table 47b – a relatively minor change. This change was due to changes in cost of debt and cost of equity as explained below in the following section.

Corporate Services Costs

The methodology of allocations of corporate services cost was covered in detail in Section 2. The same principles are applied for wastewater operations.

Depreciation expense

As part of our analysis, we obtained from EWSI the continuity schedule for its rate base. We have reviewed the calculation for the annual depreciation expense as well as the capital expenditures forecasted throughout the term of PBR III for each asset category that make up EWSI's rate base. The following table summarizes the projected evolution of the EWSI rate base over the term of PBR III.

Table 49 – Rate Base for PBR III term – Net of contributions

	$ millions	2010	2011	2012	2013	2014	2015	2016
		Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
1	EWSI Gross Property, Opening	277.58	323.94	345.14	364.57	382.97	411.80	440.76
2	Additions	47.14	21.21	19.42	18.41	28.83	28.96	19.72
3	Retirements/Transfers	(0.78)	-	-	-	-	-	-
4	**EWSI Gross Property, Closing**	**323.94**	**345.15**	**364.57**	**382.98**	**411.80**	**440.76**	**460.48**
5	EWSI Accumulated Depreciation, Opening	(68.32)	(76.26)	(84.90)	(93.99)	(103.22)	(113.00)	(123.45)
6	Depreciation Expense	(7.84)	(8.65)	(9.09)	(9.23)	(9.78)	(10.45)	(10.97)
7	Retirements/Transfers	(0.09)	-	-	-	-	-	-
8	**EWSI Accumulated Depreciation, Closing**	**(76.25)**	**(84.91)**	**(93.99)**	**(103.22)**	**(113.00)**	**(123.45)**	**(134.42)**
9	EWSI Mid-Year Gross Property (Row 1 + 4)/2	300.76	334.54	354.86	373.78	397.39	426.28	450.62
10	EWSI Mid-Year Accumulated Depreciation (Row 5 + 8)/2	(72.29)	(80.58)	(89.45)	(98.61)	(108.11)	(118.23)	(128.94)
11	**EWSI Mid-Year Net Property* (Row 9+10)**	**228.47**	**253.96**	**265.41**	**275.17**	**289.28**	**308.06**	**321.69**
12	Add: Working Capital	4.20	4.29	4.25	5.08	5.40	5.37	5.15
13	Add: Average Materials and Supplies	0.83	0.80	0.80	0.80	0.80	0.80	0.80
14	**EWSI Mid-Year Rate Base (Row 11+12+ 13)**	**233.50**	**259.05**	**270.46**	**281.05**	**295.48**	**314.23**	**327.64**
15	* Net of Contributions in Aid of Construction	30.31	29.41	28.50	27.59	26.68	25.77	24.86

Source: EWSI

As per the table above, we note that the rate base as of the end of 2011 and going into PBR III is forecasted to total $259.05 million.

Over the term of PBR III, EWSI expects capital expenditures to total $111.69 million. As part of our review, we have obtained from EWSI an enhanced version of Table 6.2-1 that categorizes and lists capital projects anticipated over the period. This revised table is presented in Appendix B to this report for future reference. The following table summarizes the project capital program by category of investments.

Table 50 – Capital expenditure for wastewater in PBR III

Cost Category	$ millions
Reliability	$92.90
Health, Safety and Environment	$4.53
Efficiency/Cost	$9.49
Infrastructure-General	$4.77
Total	111.69

Source: EWSI

The level of capital spending anticipated by EWSI over the term of PBR III is primarily related to reliability related projects and with the aim to improve the robustness of the Gold Bar WWTP, including enhanced primary treatment (EPT) for addressing increased solids handling. EPT is related to the capital expenditure program that requires upgrades in the Gold Bar WWTP to treat combined sewer flows during rainfall events. Edmonton has combined sewers (one sewage pipe for both sanitary and storm water), and required a solution to prevent untreated sewage from entering the river during high rainfall events. Since building new storm water pipeline is expensive, Gold Bar treatment capability including EPT is upgraded.

In conclusion, we recommend that the City have appropriate approval oversight and review processes for major capital expenditure projects related to wastewater projects.

Cost of Capital

EWSI proposed PBR III mechanism covers wastewater treatment rates for in-city customers – residential, multi-residential and commercial customers – similar to the in-city customer segment for water treatment services (volumes treated are different for water and wastewater customers). EWSI has estimated the cost of capital based on implied capital structure, cost of debt and return of equity as per Foster recommendation for in-city customers segment only as it falls under PBR III mechanism.

Capital Structure

Wastewater operations are brought under the PBR III mechanism for the first time, as these assets were recently acquired. As per the Foster report, the inclusion of wastewater does not alter business risk for EWSI. Hence, the proposed capital structure for water operations of 60% debt and 40% equity holds for wastewater operations and is applicable for the rate-setting mechanism under PBR III. Further, PBR II results are not applicable for wastewater operations, as they were not part of EWSI at that time.

As per original data submitted by EWSI, EWSI was using a different capital structure in 2012-2016 as indicated in the table 51a for return on mid-year rate base but within the proximity of 60% debt and 40% equity. We found a discrepancy in revenue generated from customer rate-structure and revenue required for operations. Upon our inquiry, EWSI submitted a revised capital structure, cost of debt and cost of equity as indicated below in table 51b, 52b and 53 b respectively.

Table 51 a – Original Capital structure for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Mid-year Rate Base (From Table 7.1-1, Line 15)	259.05	270.46	281.05	295.48	314.23	327.64
Capital Structure: Debt Percentage	59%	60%	61%	62%	62%	61%
Capital Structure: Equity Percentage	41%	40%	39%	38%	38%	39%

Source: EWSI

Table 51b – Revised Capital structure for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Mid-year Rate Base (From Table 7.1-1, Line 15)	259.05	270.46	281.05	295.48	314.23	327.64
Capital Structure: Debt Percentage	59%	59.91%	59.88%	59.78%	60.17%	59.94%
Capital Structure: Equity Percentage	41%	40.09%	40.12%	40.22%	39.83%	40.06%

Source: EWSI

Overall, we concur with Foster's proposed approach of using 60% equity and 40% debt for EWSI's wastewater operations similar to water operations for PBR III term based upon the similar risk and reward profiles of the businesses.

Cost of Debt

As explained in water operations, Foster uses of the stand-alone concept for EWSI, utilizing a rating of A (low) rating issued by DBRS and its cost of debt is equalized with that of EUI to whom EWSI issues debt. Foster estimated the cost of debt at the rate of 5.89% for 2012 based on the forecasted yield on 20-year Government of Canada bonds of 4.37% and EUI spread of 147 bps.

As analyzed and concluded in water operations, both 20-year Canadian government bond yield of 4.37% and EUI spreads of 147 bps are reasonable and, we conclude that cost of debt of 5.89% is applicable to EWSI wastewater operations.

As mentioned in the capital structure section, EWSI submitted a revised cost of debt and we have provided the original cost of debt and revised amount as submitted by EWSI.

Table 52a – Original Cost of Debt for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Cost of Debt	4.17%	4.77%	4.94%	5.06%	5.12%	5.16%

Source: EWSI

Table 52b – Revised Cost of Debt for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Cost of Debt	4.17%	4.69%	4.91%	5.09%	5.07%	4.99%

Source: EWSI

EWSI has used a lower cost of debt in calculating the return on mid-year rate base debt portion as indicated in the table below, which is a conservative approach.

Return on Equity

As explained in water operations, Foster recommended 10.875% ROE for EWSI and such return is applicable to wastewater operations. We concur with this approach of using water operations recommended ROE for wastewater operations given similar business and financial risk profile for both business segments.

As mentioned in the capital structure and cost of debt sections, EWSI submitted revised data related to cost of debt and cost of equity. We have indicated both original data and revised data in table 53a and table 53b.

But, as cited in table 53a and 53b below, EWSI was proposing to use a step-up increase in the ROE starting at 2.86% in 2012, increasing on average by 2% each year for the remainder of the PBR period to achieve the target return on equity at 10.875% by 2016 to minimize the customer rate bill impact. This results in an average ROE of 7.8% for Gold Bar WWTP operations over the PBR period. Further, Gold Bar WWTP was a City operation prior to 2010. Hence, maintaining a high ROE was not a priority for a municipality-owned facility.

However, as per revised data, EWSI is now proposing to use a step-up increase in the cost of equity starting at 3.45% and gradually approaching 10.875% by 2016.

Table 53a – Original Cost of Equity and WACC for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Cost of Debt	4.17%	4.77%	4.94%	5.06%	5.12%	5.16%
Cost of Equity	5.57%	2.86%	4.75%	6.26%	8.24%	10.875%
Weighted Average Cost of Capital	4.74%	4.00%	4.87%	5.52%	6.31%	7.39%

Source: EWSI

Table 53b – Revised Cost of Equity and WACC for wastewater – PBR III

	2011	2012	2013	2014	2015	2016
	F	F	F	F	F	F
Cost of Debt	4.17%	4.69%	4.91%	5.09%	5.07%	4.99%
Cost of Equity	5.57%	3.45%	6.20%	8.35%	9.95%	10.87%
Weighted Average Cost of Capital	4.74%	4.00%	5.43%	6.40%	7.01%	7.35%

Source: EWSI

EWSI has chosen to earn an average ROE over the PBR III term which is below the recommended return in order to manage the impact on customer rates. Therefore, using low ROE during the initial years is a conservative approach by EWSI and we have no objection of EWSI using the lower ROE rate for initial periods. Further, due to changes in capital structure, cost of debt and cost of equity, the return on mid-year rate-base debt portion and equity portion changed as indicated in table 53c and 53d.

Table 53c – Original return on mid-year rate-base

		2011	2012	2013	2014	2015	2016
		F	F	F	F	F	F
1	Mid-year Rate Base (From Table 7.1-1, Line 15)	259.05	270.46	281.05	295.48	314.23	327.64
2	Capital Structure: Debt Percentage	59%	60.00%	61.00%	62.00%	61.70%	60.90%
3	Capital Structure: Equity Percentage	41%	40.00%	39.00%	38.00%	38.30%	39.10%
4	Mid-year Rate Base: Debt (line 1 x line 2)	152.84	162.28	171.44	183.19	193.88	199.53
5	Mid-year Rate Base: Equity (line 1 x line 3)	106.21	108.18	109.61	112.28	120.35	128.11
6	Cost of Debt	4.17%	4.77%	4.94%	5.06%	5.12%	5.16%
7	Cost of Equity	5.57%	2.86%	4.75%	6.26%	8.24%	10.875%
8	Weighted Average Cost of Capital	4.74%	4.00%	4.87%	5.52%	6.31%	7.39%
9	Return on Mid-year Rate Base Debt Portion (line 4 x line 6)	6.37	7.74	8.47	9.27	9.93	10.30
10	Return on Mid-year Rate Base Equity Portion (line 5 x line 7)	5.92	3.09	5.21	7.03	9.92	13.93
11	Return on Mid-year Rate Base (line 9 + line 10)	12.29	10.83	13.68	16.30	19.84	24.23

Source: EWSI

Table 53d – Revised return on mid-year rate-base

		2011	2012	2013	2014	2015	2016
		F	F	F	F	F	F
1	Mid-year Rate Base (From Table 7.1-1, Line 15)	259.05	270.46	281.05	295.48	314.23	327.64
2	Capital Structure: Debt Percentage	59%	59.91%	59.88%	59.78%	60.17%	59.94%
3	Capital Structure: Equity Percentage	41%	40.09%	40.12%	40.22%	39.83%	40.06%
4	Mid-year Rate Base: Debt (line 1 x line 2)	152.84	162.28	168.30	176.63	189.07	196.39
5	Mid-year Rate Base: Equity (line 1 x line 3)	106.21	108.18	112.75	118.85	125.15	131.24
6	Cost of Debt	4.17%	4.69%	4.91%	5.09%	5.07%	4.99%
7	Cost of Equity	5.57%	3.45%	6.20%	8.35%	9.95%	10.87%
8	Weighted Average Cost of Capital	4.74%	4.00%	5.43%	6.40%	7.01%	7.35%
9	Return on Mid-year Rate Base Debt Portion (line 4 x line 6)	6.37	7.61	8.27	9.00	9.58	9.81
10	Return on Mid-year Rate Base Equity Portion (line 5 x line 7)	5.92	3.74	6.99	9.92	12.45	14.27
11	Return on Mid-year Rate Base (line 9 + line 10)	12.29	10.83	15.26	18.92	22.03	24.08

Source: EWSI

Revenue Offsets

Revenue offsets reflect EWSI's non-rate revenues and include the various charges, fees, penalties and miscellaneous revenues collected from its customers.

We have reviewed the list of revenue sources and obtained from EWSI the projected evolution of revenue offsets over the term of the PBR.

We note that revenue offsets are increased from $4.14 million in 2010 (actual) to $5.19 million in 2011 (forecasted) but expected to decrease over the 2012-2016 period with an average of $4.34 million per year over the PBR III term. Given the materiality of revenue offsets in the context of Gold Bar WWTP revenue requirements, we have not proceeded with a detailed assessment of these items.

Findings and Recommendations – Gold Bar WWTP Revenue Requirements

We have performed our review of the Gold Bar WWTP revenue requirements and have satisfied ourselves with the reasonability of the approach applied by EWSI, with particular focus applied to the cost of capital section.

All revisions cited in tables 47b, 51b, 52b, 53b, 53d related to capital structure, cost of debt, cost of equity and return on mid-year rate base results in aligning the revenue requirement from operations with revenue generated by customer rate-structure. We have cross-checked the related calculations confirmed proposed changes by EWSI.

We did note that capital and operating expenditures may be exposed to actual operating and capital cost increases relative to the PBR forecasts which would ultimately be captured in the cost of service.

While a detailed analysis of the nature and relevance of individual capital project is beyond the scope of our engagement, best practices in other North American jurisdictions suggest that the City should participate in the investment approval process to ensure adequate financial regulatory oversight on capital spending, particularly to the extent such spending is in excess of amounts approved through this rate making process.

Similar to the regulatory oversight on capital spending over approved levels as proposed above, a similar oversight should be created for operating spending over approved levels. This would provide the City with greater control over increases in the cost of service.

Wastewater Treatment Rates Structure

PBR wastewater rates under 2012-2016

EWSI's wastewater treatment customers are categorized into two rate classes: residential and commercial.

- Fixed monthly services charges.
- Consumption charges by customer classes based upon of the volume of water used by customers.
- A wastewater overstrength surcharge is also charged to customers who release wastewater to the sewer system that contains one or more constituents that exceed specific concentration levels.

Special Rate Adjustments for Wastewater treatment services

EWSI will charge Special Rate Adjustment (SRA) for Wastewater treatment services in each year (2012-2016) related to achieving the goal of step-increases in ROE of 10.875% in 2016. The SRA will apply to both consumption charges and fixed monthly service charges.

Methodology

Customer rate-structure based Revenue model

Consumer revenues are based on the following two sources:

- Consumption charges by customer classes based upon the volume of water used by customers.
- Fixed monthly services charges based upon the size of meters used by customers.

Consumer revenues

EWSI has forecasted a rate-structure for different customer segments over the period 2012-2016 – both consumption charges ($/m^3) and consumption volume (m^3) for each customer segments:

Table 54 – Consumption charge for wastewater – PBR III

Consumption Charge ($/m3)						
	2011 Approved	2012	2013	2014	2015	2016
Residential	0.5526	0.5969	0.6449	0.6966	0.7526	0.8130
Multi-residential	0.5526	0.5969	0.6449	0.6966	0.7526	0.8130
Commercial	2011 Approved	2012	2013	2014	2015	2016
0 m^3 - 10,000.0 m^3	0.5526	0.5969	0.6449	0.6966	0.7526	0.8130
10,000.1 m^3 - 100,000.0 m^3	0.4275	0.4618	0.4989	0.5390	0.5822	0.6290
>100,000 m^3	0.2230	0.2409	0.2603	0.2811	0.3037	0.3281

Source: EWSI

The above consumption charges include both factors for increase in the revenue: inflation and special rate adjustment over PBR 2011-2016.

Next, EWSI forecast the consumption volume for 2012-2016.

Table 55 – Consumption volume for wastewater – PBR III

Consumption Volume (m3)					
	2012	2013	2014	2015	2016
Residential	44,594,071	44,943,986	45,296,859	45,652,713	46,011,580
Multi-residential	16,794,420	16,751,087	16,708,147	16,665,186	16,622,201
Commercial	2012	2013	2014	2015	2016
0 m^3 - 10,000.0 m^3	18,763,757	18,956,714	19,213,317	19,342,374	19,612,018
10,000.1 m^3 - 100,000.0 m^3	1,942,744	1,962,722	1,989,290	2,002,652	2,030,570
>100,000 m^3	1,608,170	1,624,708	1,646,700	1,657,761	1,680,871
University of Alberta	2,556,011	2,637,417	2,646,981	2,653,537	2,653,538

Source: EWSI

Next, EWSI multiplies the forecasted rate-structure with forecasted consumption volume to arrive at annual consumption revenue for the period 2012-2016. For the University of Alberta, all three rate tier consumption rates (0 m^3 – 10,000 m^3, 10,000 m^3 - 100,000 m^3 and >100,000 m^3) are applied on a volumetric basis to arrive at revenue numbers. The following table captures revenues generated across all customer segments.

Table 56 – Consumption revenue for wastewater – PBR III

Consumption revenues forecast $ million	2012	2013	2014	2015	2016	Sub-total 2012-2016
Residential	26.62	28.98	31.56	34.36	37.41	158.92
Multi-Residential	10.03	10.80	11.64	12.54	13.51	58.52
Commercial	13.04	14.23	15.58	16.94	18.56	78.35
U of A	0.90	0.99	1.07	1.16	1.25	5.37
Total	50.58	55.00	59.85	65.00	70.74	301.17

Source: EWSI

Fixed annual revenues

Fixed monthly revenues consist of monthly charges as per customer water-meter sizes. For annual fixed revenue calculations, EWSI multiplied customer count with size of water-service meters to arrive at annual fixed revenue.

Table 57 – Fixed charges for wastewater – PBR III

($ per month)	2011 Approved	2012	2013	2014	2015	2016
Monthly fixed charge	2.89	3.12	3.37	3.64	3.94	4.25

Source: EWSI

Table 58 – Customer count monthly for wastewater – PBR III

Customer count monthly	2012	2013	2014	2015	2016	Sub-total 2012-2016
Residential	224,080	228,004	231,996	236,058	240,192	1,160,330
Multi-Residential	3,414	3,439	3,465	3,491	3,517	17,326
Commercial	15,285	15,476	15,670	15,866	16,064	78,361
Total	242,779	246,919	251,131	255,415	259,773	1,256,017

Source: EWSI

Based on the above data of fixed monthly service charges, EWSI multiplied the customer count for each month to yield the following annual fixed revenues for each customer segment:

Table 59 – Fixed service revenues for wastewater – PBR III

Fixed service revenues $ millions	2012	2013	2014	2015	2016	Sub-total 2012-2016
Residential	8.40	9.23	10.14	11.15	12.26	51.17
Multi-Residential	0.13	0.14	0.15	0.16	0.18	0.76
Commercial	0.57	0.63	0.69	0.75	0.82	3.45
Total	9.10	9.99	10.98	12.06	13.26	55.39

Source: EWSI

Note that fixed charges are negligible for the University of Alberta. And, EWSI has calculated fixed charges for wastewater on the basis of total customer count and one fixed monthly charge rather than specific meter-sizes and customer counts computed for water operations.

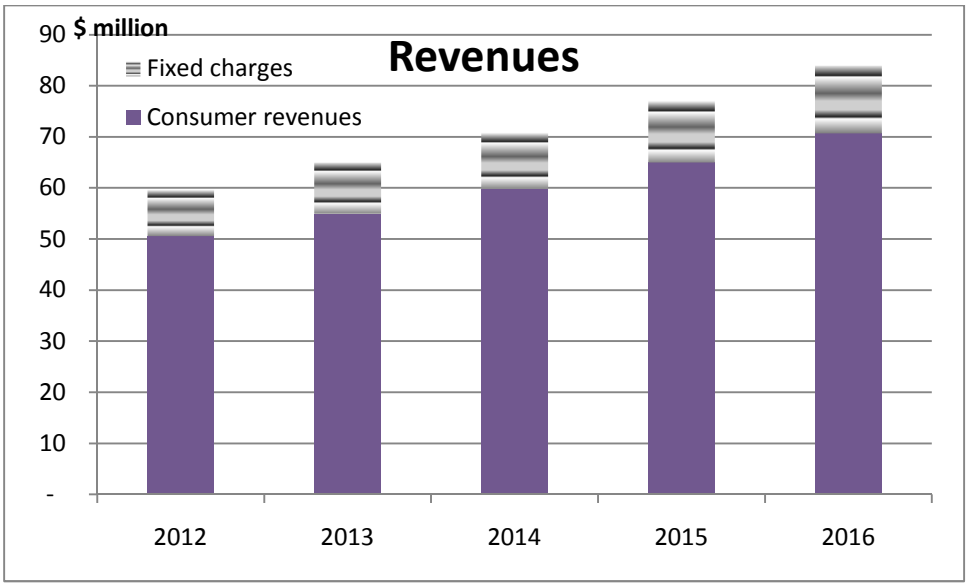
Total annual revenues

Finally, consumer revenues and fixed charges are added together to arrive at total revenue forecast as shown in table given below.

Table 60 – Total revenues for wastewater – PBR III

Total revenues forecast $ million	2012	2013	2014	2015	2016	Sub-total 2012-2016
Residential	35.01	38.21	41.70	45.51	49.66	210.10
Multi-Residential	10.15	10.94	11.79	12.71	13.69	59.29
Commercial	13.61	14.86	16.27	17.69	19.38	81.80
U of A	0.90	0.99	1.07	1.16	1.25	5.37
Total	59.68	65.00	70.83	77.07	83.99	356.56

Source: EWSI



Source: GT analysis

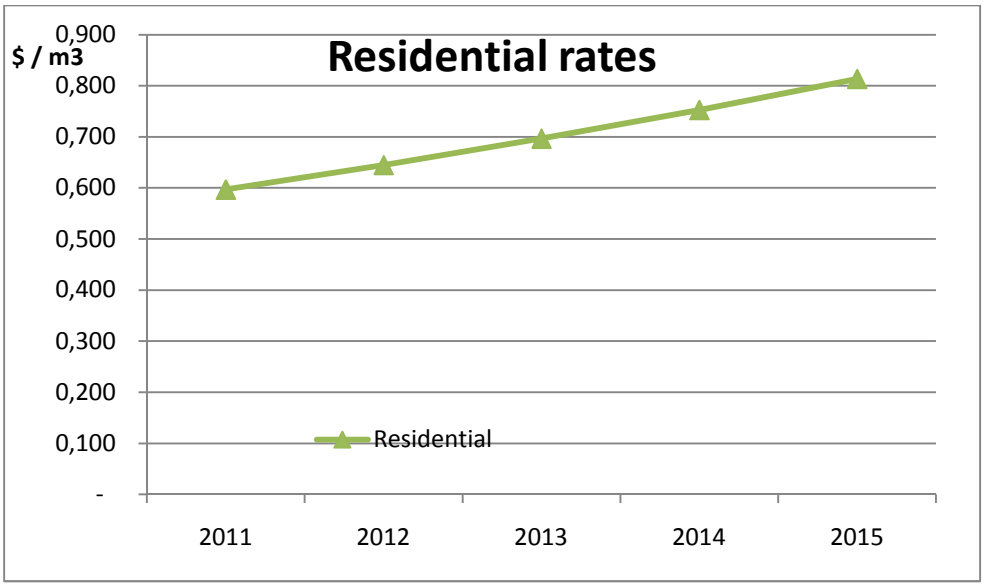
Findings and recommendations

Our analysis independently verified the underlying calculations including various inputs such as consumption charges ($/m^3), fixed charges ($/monthly), consumption volumes, inflation factor and special adjustment factors. And, we arrived at fairly close revenue to forecast by EWSI of $356.56 million within a reasonable margin of error.

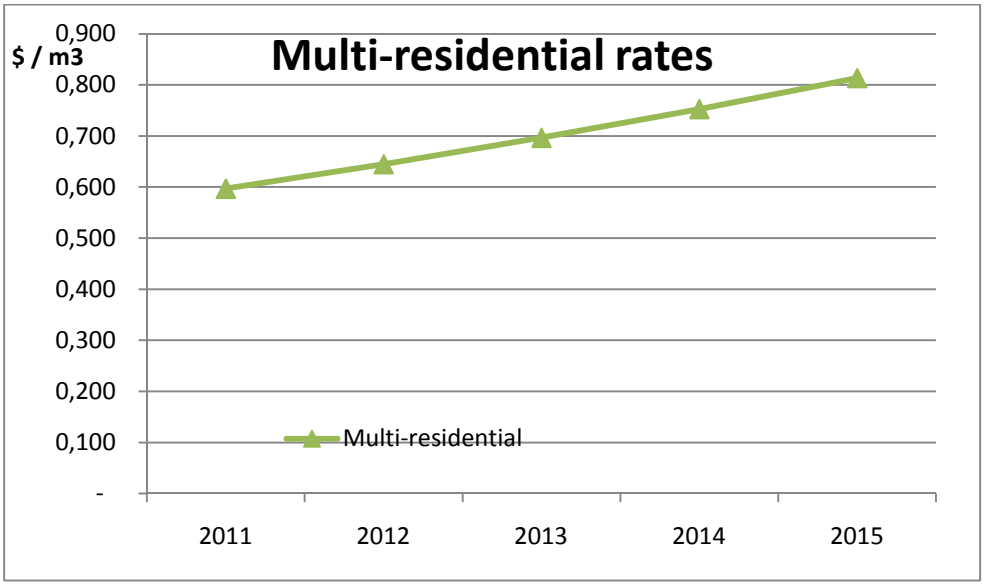
Consumption rates

Residential, multi-residential and commercial rates (0 m3 – 10,000 m3) are identical. The graph below captures the trend in commercial rates across different customer groups.

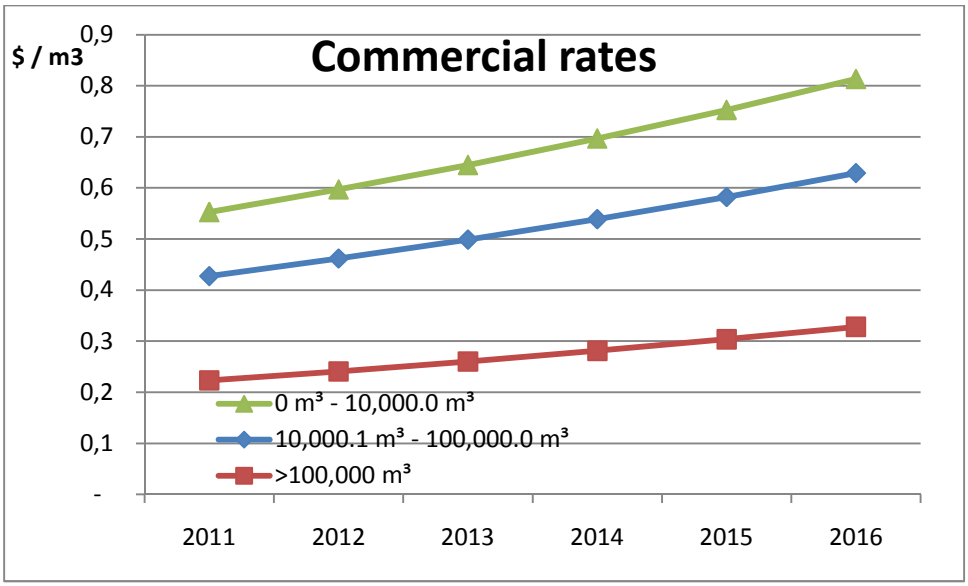
The following graphs illustrate the rate-structure trend for residential, multi-residential and commercial groups.



Source: GT analysis



Source: GT analysis



Source: GT analysis

The consumer rates grow at a compound rate of 8.03% per year or 47.1% increase over the PBR III period of five years. Inflation (including efficiency factor) contributes 2.27% per year and special rate adjustments contribute 5.76% per year to the consumer charges. This is consistent with information presented in Section 1.4 and 1.5 of wastewater information package and Table 1.5-1 (page 9 of the wastewater information package).

EWSI presented residential wastewater bills for an average use customer and a low use customer in its presentation to Edmonton City Council dated June 16th 2011.

The following tables are extracted from the report.

Table 61 – Average use customer for wastewater – PBR III

Average Use customer	2011	2012	2013	2014	2015	2016	Average
Monthly Consumption (m^3)	16.5	16.6	16.4	16.3	16.1	16.0	
Monthly Bill ($/month)	12.01	13.02	13.96	14.98	16.05	17.21	
Monthly Bill Impact ($/month)		1.01	0.94	1.02	1.09	1.16	1.04
% Change in Total Bill		8%	7.2%	7.3%	7.3%	7.2%	7.4%

Source: EWSI

Table 62 – Low use customer for wastewater – PBR III

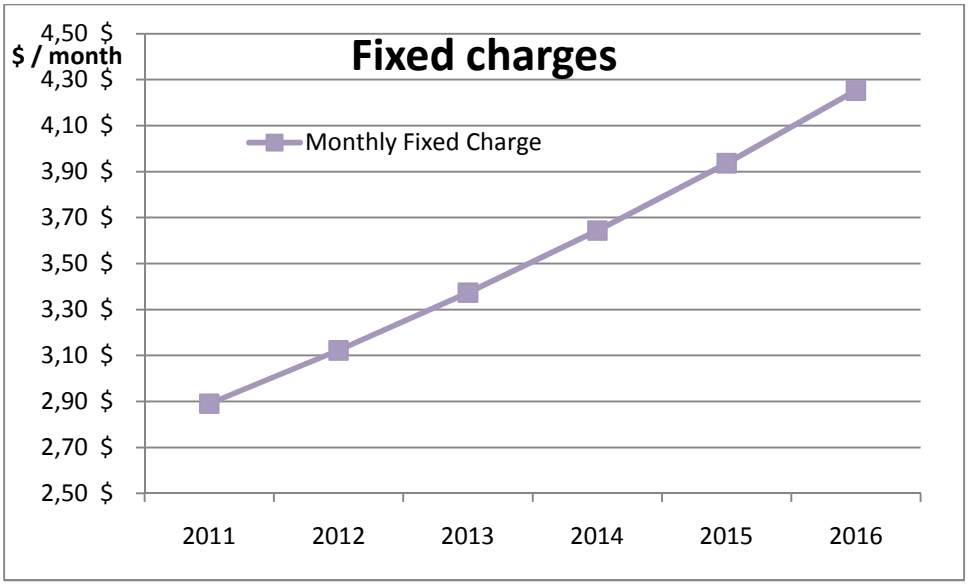
Low Use customer	2011	2012	2013	2014	2015	2016	Average
Monthly Consumption (m^3)	9.5	9.5	9.4	9.3	9.2	9.1	
Monthly Bill ($/month)	8.14	8.79	9.43	10.12	10.86	11.65	
Monthly Bill Impact ($/month)		0.65	0.64	0.69	0.74	0.79	0.70
% Change in Total Bill		8%	7.3%	7.3%	7.4%	7.3%	7.5%

Source: EWSI

EWSI cited an average annual increase of 7.4% for an average use customer and 7.5% for a low use customer for the PBR III term. However, this increase is taking into account both a declining consumption and an increase in consumption charges. Our analysis is presenting only increase in consumption charges based on EWSI which is an average of 8.03% over the PBR III term, higher than the above data presented in EWSI data. The increase in consumption charges is due to a higher special adjustment factor of 5.76% in wastewater operations as compared to the special adjustment factor of 5.15% in water operations over the PBR III term.

Fixed monthly rates

Fixed monthly rates are accelerated at a compounded rate of 8.03% per year or 47.1% increase over the PBR III period of five years. Inflation contributes 2.27% per year and special rate adjustments contribute 5.76% per year to the consumer rate.



Source: GT analysis

Section 4: Performance measures

Quality standards for Water

Performance measures under PBR II

EWSI is completing its second 5-year PBR plan (2006-2011) andthe quality of service performance is measured using the same method as for the previous PBR plan (2001-2005). The performance is assessed using five indices measuring the overall performance with a total of 100 available points, plus 10 bonus points. Since PBR I, each of the indices are weighted based on a customer survey, as well as ongoing review by the EWSI Community Advisory Panel and other water industry references. Weightings between indices are the same under PBR I and II:

- System Reliability Index: 25 points (+3.5 bonus);
- Water Quality Index: 25 points (+0.5 bonus);
- Customer Service Index: 20 points (+3 bonus);
- Environmental Index: 15 points (+1.5 bonus); and
- Safety Index: 15 points (+1.5 bonus).

On a yearly basis, there is no reward if EWSI exceeds the targets, but a financial penalty will be enforced if the company fails to meet the benchmark: achieving 100 points.

For PBR II, the maximum penalty is $800,000. EWSI has met overall performance to the extent that no penalties have been incurred. Although some of the targets were increased from PBR I to PBR II, the results achieved so far shows that all targeted values will be met again under PBR II for all five years of the plan.

The indices proposed cover common industry practices. The weightings also support a primary focus on system reliability and water quality which is to be expected for a water utility. Other measures which focus on customer service, environmental and safety also align with industry practices.

Nevertheless, we note that the weighting of the different indices and the available bonuses being aggregated in the final benchmark result could have a distortion effect. For example, one of the indices having an easier target could mask the result of another index which did not reach its target and still have an aggregated result above the 100 points.

Target benchmarking

Benchmarking the targets proposed by EWSI with other similar water and wastewater utilities is difficult due to the different factors composing the measure having a wide variation in target values. EWSI notes to this effect are reasonable and we agree.

Numerous measurements are available to evaluate performance in water treatment and wastewater facilities. EWSI has chosen a basket of measures which appear reasonable and the monitoring and tracking of those measures will support a culture of continuous improvement which is the primary focus of any performance management system. EWSI notes however the performance measures selected for the PBR were determined to maintain an acceptable level of performance under the PBR structure, ensuring that cost reductions would not be achieved through deterioration of performance levels.

As proposed for the current PBR targets, EWSI has identified targets for the 2012-2016 PBR that are based on the last10 years' of experience. Most of the targets are set using the 10-year average. For some measurement factors the target is proposed at 10-year average plus 10% to allow year-to-year variations. In general, the targets are generally achievable since most of them are already reached or surpassed over the last number of years because of averaging and as a result the use of targets to stretch behaviour is limited. On the other hand, since quality has a cost, the targets assure a constant quality of services, while not putting too much pressure on the service costs.

Proposed changes to Quality of Service Standards for Water treatment

EWSI is proposing to use the same weighting between indices for the 2012-2016 period. However, EWSI proposes to increase the maximum penalties for Water services from $800,000 to $1,000,000.

Each of these performance categories contains individual performance measures that represent activities and results within each of the areas. . Comments on some of the indices are given in the following paragraphs.

System Reliability Index

The system reliability index target used by EWSI is calculated from the following measures:

Table 63 – System Reliability Index

#	Measure	2002-2006	2007-2011	Proposed for 2012-2016
	Table 63			
	System Reliability Index			
1	Main breaks – # / yr.	640	630	574
2	Main break repair <24 hrs.	93.0%	93.6%	93.7%
3 OLD	Planned interruptions within schedule	95.0%	95.0%	n/a
3 NEW	Planned Construction Impact	-	-	95.0%
4	Water pressure <20 PSI – incidents / yr.	5	5	5
5 OLD	Water loss factor	4.9%	4.9%	n/a
5 NEW	ILI (Industrial Leakage Index)	-	-	3.0

Factor #1: Main breaks – # / yr

The target for 2012-2016 is set based on the last 10-year average plus 10% for year-to-year variation.

This factor as proposed by EWSI reflects the number of water main breaks that have occurred in the waterworks system and is a measure of the frequency of unplanned interruptions that customers may experience over the course of a year.

This reliability measurement relates to how many times the system fails and is a common industry measure, A possible variation on this measure from a customer perspective is a measurement of the number of "customer-hour down time period" over a year which is the availability of water to customer.

Factor #2: Main break repair < 24 hrs

The target for 2012-2016 is set based on the last 10-year average.

This factor defines the maintainability of the system or how easily and fast repairs could be affected. For the 2012-2016 PBR the target is slightly increased, EWSI proposes that this performance measure exclude water main repairs on arterial and collector roadways in cases where a work suspension has been requested by the City, since the time required to complete these repairs may increase. This measure reflects an efficiency factor to enable repairs and therefore service in a shorter time period.

Factor #3: Planned interruptions within schedule replaced by planned construction impact

For the proposed PBR 2012-2016, EWSI proposes to modify this factor: #3 planned interruptions within schedule, by #3 planned construction impact. The change will set a more stringent factor. EWSI indicates the current planned interruption factor measure focuses only on the interruption to customers' water service and does not address the interruption to customers' local roads and property. Therefore, for the 2012-2016 PBR, EWSI is proposing a planned construction impact factor to better address customer concerns.

The target for 2012-2016 is set based on the last 10-year average, at 95%. This target should be achievable as the last 5 year average reflects performance off 97.2%.

Factor #4: Water pressure <20 PSI – incidents / yr.

The target for 2012-2016 is unchanged from previous targets, at 5 incidents per year where water pressure is below 20 PSI (140 kPa) for two or more consecutive 15 minute periods. This equates to one incident per geographic pressure zone in Edmonton.

Although the average number of incident per year is less than 1 and during the last 10 years the maximum number of incident in one year is 2, EWSI indicates the increased number of water pressure monitoring sites increases the opportunity to discover incidents of lower water pressure. In addition, it is expected that additional pressure monitoring sites commissioned from 2011 onwards will be added to the site count for performance tracking purposes. EWSI believes that a maximum of 5 incidents per year target can be achieved.

Factor #5: Water loss factor replaced by ILI (Industrial Leakage Index).

EWSI proposes changes from the previous method of measuring water losses. The ILI is a performance indicator quantifying how well a distribution system is managed (maintained, repaired, and rehabilitated) for the control of real (leakage) losses at the current operating pressure. ILI is the ratio of current annual real losses ("CARL") to unavoidable annual real losses ("UARL"). The smaller the number the better a utility manages its leakage down toward the level of UARL, or the theoretical technical low limit of leakage achievable in a water system.

The Alberta Provincial Government recently recommended, as part of their Water for Life strategy, that utilities in Alberta use the ILI method of reporting water losses. No performance target has been set yet by the Province.

The target for 2012-2016 is set at 3.0. This target is derived from the AWWA Water Research Foundation and is based on the financial, operational and water resource considerations within a community. Based on Edmonton's characteristics a target range of >3.0 to 5.0 would match the recommended ILI guidelines. If however the Province sets a more stringent standard in the future, this should be reflected in the PBR III.

The change from the previous measurement to this ILI method will allow benchmarking in the future.

Water Quality Index

The measures of water quality are set by Health Canada and cover multiple parameters. Alberta Environment adopts these guidelines as regulation and sets stricter limits for certain parameters in the Approval to Operate. EWSI indicates it sets much higher standards for itself. In the last several years, it has achieved the higher standards almost all the time.

The Water Quality index target of 99.6% is calculated from the percentage of tests meeting all objectives. This index provides a measure of overall water quality in the City as it is delivered to the customers. The tests included in this index are done only on treated drinking water samples. Samples are taken at the plant finished water reservoirs, field reservoirs across the city and distribution system samples.

This index is based on tests performed on multiple parameters. The following measures are included in the index and are tested more frequently and/or are the ones that vary the most:

Table 64 – Water Quality Index

	Table 64 Water Quality Index (measured parameters*)		
#	Measure	Alberta Environment Violation Limit	EWSI Internal Variance Limit
1	Turbidity	No limit	>1.0
2	Chlorine, total residual	< 0.5 or >2.5	< 1.0 or >2.4
3	Colour (TCU)	>15	>10
4	pH	< 6.5 or >8.5	< 7.3 or >8.3
5	Total Aluminium (mg/l)	No limit	> 0.1
6	Iron (mg/l)	> 0.3	> 0.3
7	Odour	No limit	Inoffensive
8	Pipe Lubricant (UV scan)	No limit	Any positive
9	Fluoride (mg/l)	< 0.5 or >0.9	< 0.6 or >0.8
10	Coliforms,Total (cfu/100 ml)	2 consecutive positive	Any positive
11	E. Coli (cfu/100 ml)	Any positive	Any positive
12	Trihalomethanes (µg/l)	>100 based on 12-month location running average	>50 based on single result
13	Bromodicholomethanes (µg/l)	No limit	>16
14	Haloacetic acids (µg/l)	>80 based on 12-month location running average	>40 based on single result
15	N-nitrodimethylamine (µg/l)	No limit	>10
16	Giardia (cysts/1000 litres)	No limit	Detection of 1 or more cysts / 1000 litres
17 18	Cryptosporidium (oocysts/1000 litres)	No limit	Detection of 1 or more oocysts / 1000 litres

* The Water Quality index also includes violations of any other parameters listed in the latest edition of the Canadian Drinking Water Guidelines or in the current Alberta Environment Approval.

EWSI indicates their standard measurement levels are constantly higher and more stringent than the Alberta Environment levels. EWSI's Quality Assurance Laboratory conducts over 100,000 tests a year on more than 330 physical, chemical, and microbiological parameters.

Measurements and targets in these areas are typically regulatory in nature and are aligned to common industry practices.

Customer Service Index

The customer service index is qualified using the following measures:

Table 65 – Customer service Index

#	Measure	2002-2006	2007-2011	Proposed for 2012-2016
	Table 65			
	Customer Service Index			
1	% satisfied past service	71.6%	72.6%	74.0 %
2	Response time	22 minutes	22 minutes	25 minutes
3	Home sniffing survey	92.5%	93.4%	93.8%

The choice of customer service standards is consistent with industry practice.

% Satisfied past service

EWSI will assess the level of customer satisfaction of those customers who have called the EWSI Emergency Response group. The historical data for the last 10-year period shows an average result of 73.4% and EWSI is confident in achieving its target.

Response time

EWSI proposes to increase the performance standard from 22 minutes (which has been maintained since 2002) to 25 minutes for the 2012-2016 period. The rationale behind the proposed increase is as follows:

- The new safety rule for their employees who are prohibited from using any telecommunications devices while driving on EPCOR business;

- The expansion and population growth during the 2007 PBR period Edmonton resulting in a greater variety of service calls, a greater geographic distance and increased traffic volumes.

We understand the rationale, however new telecommunication technologies could result in lowering response times while keeping the utmost safety level. EWSI notes they have been evaluating a number of different dispatching technologies and that all of them require pulling to the side of the road to respond.

Home sniffing survey

The target for 2012-2016 is slightly increased from the previous PBR period and is based on the last 10-year average which appears to be reasonable.

Environmental Index

EWSI proposes to continue with the existing standard based upon meeting established targets with the exception of vehicle fuel efficiency. EWSI plans to replace this with a Watershed Management Activity measure as EWSI believes that most of the gains from vehicle fuel efficiency initiatives implemented by them have been achieved. Given the importance of watershed management, this change seems reasonable.

Table 66 – Environmental Index

Table 66

Environmental Index

#	Measure	Results 2002-2006	Results 2007-2011	Proposed for 2012-2016
1	Conduct 4 Emergency response Training exercises each year	n/a	4	4
2	Completeness and timeliness of Environmental reporting (25 reports / year)	n/a	100%	100%
3	Environmental Incident Management: No more than 7 reportable and preventable incidents	n/a	<8	<8
4	Water conservation: average monthly City residential water consumption per household in m3	19.58	18.08	19.0
5	Watershed program activity: 5 initiatives supported by reports	n/a	n/a	5

EWSI is committed to follow all applicable provincial and federal environmental laws, and maintain its ISO 14001 certifications. They have developed a basket of environmentally focused measures which align with their environmental management program and which appear reasonable.

Safety Index

The safety performance "score card" that EWSI uses is focused on training and reporting.

Table 67 – Safety Index

#	Measure	Results 2002-2006	Results 2007-2011	Proposed for 2012-2016
	Table 67			
	Safety Index			
1	Leadership and Administration: Safety Meetings (held per year)	-	40	36
2	Hazard Management: Formal Safe Work Plans (nb per year)	-	3,313	3,100
3	Competency and Training: First Aid Certified (% of permanent employee)	-	53%	33%
4	Monitor and Promotion: Work Site Inspections/Observations per year	-	933	800
5	Results Based Outcomes			
	• Lost Time Frequency Rate	-	0.64*	0.59
	• All Injury Frequency Rate	-	2.33*	2.40
	• Injury Severity Rate	-	16.16*	8.92

* 2005-2010 results

It includes measurement of the most commonly found measures in the industry that are: Loss Time Injuries; Loss Time Frequency; All Injury Frequency. The performance "score card" used as a continuous improvement tool is standard in world class organisations and is common within the industry. Specific measures can vary, however the "score card" based on prevention as a key parameter is an industry standard.
.

EWSI indicates having received Safety Awards from the AWWA for its superior safety record within the industry.

Quality standards for Wastewater

EWSI Proposal

EWSI is proposing the use of the same performance measures as for its water services with a different weight distribution between the indices to align to the different type of operation. The weighting and associated bonuses available are as follow:

- System Reliability Index: 15 points (+1 bonus);
- Water Quality Index: 40 points (+4 bonus);
- Customer Service Index: 5 points (+0 bonus);
- Environmental Index: 20 points (+2 bonus); and
- Safety Index: 20 points (+3 bonus).

The maximum penalty proposed by EWSI is $400,000 for the wastewater plant.

Similar to water services the indices proposed cover common industry practices. The weightings also support a primary focus on water quality which is to be expected for a wastewater utility. Other measures which focus on system reliability, customer service, environmental and safety also align with industry practices. Although the Gold Bar plant is newly included in the PBR process, historical operational data at the treatment plant has been used by EWSI to set target values. As typical in the industry the intent of the performance management framework is to not only ensure compliance to regulatory requirements but also to implement a continuous improvement approach.

As with water services the weighting of the different indices and the available bonuses being aggregated in the final benchmark could have a distortion effect. For example, one of the indices having an easier target could mask the result of another index which did not reach its target and still have an aggregated result above the 100 points.

System Reliability Index

EWSI is proposing an Enhanced Primary Treatment ("EPT") Runtime Index as its system reliability measure. The value of the EPT Runtime Index measures the ratio of the amount of time that the EPT facility runs during an EPT Event to the EPT Event duration. There is no historical data at the Gold Bar wastewater treatment plant to base the new PBR target value on and there was no basis provided in the Rates Notice and Rates Report for this target.

EWSI is proposing a target EPT Runtime of 75.0% for the 2012-2016 period. Since no benchmark for this measure from other organisations is available, we find it reasonable to set this value and monitor.

In addition, for the purposes of establishing possible performance measures for future PBR periods, EWSI will track the following parameters during the 2012-2016 period:

- Percentage of Total Suspended Solids Removal
- Time/duration of dosing EPT Chemicals
- Total EPT Capacity available for service during wet weather events
- Total Flow Treated through EPT processes

With additional information and historical data, future measures and benchmark could be used to compose the System Reliability Index. This will assist in developing the measure beyond a singular focus on the EPT Runtime Index and develop solid operational measures that will support the regulatory measures defined below.

Furthermore, given the relationship between the City's Drainage Branch and the Gold Bar wastewater treatment plant on biosolids management, it would appear that the development of performance measures around biosolids production and supernatant management would be warranted.

Water Quality Index

EWSI has defined the Wastewater Effluent Limit Performance Index ("WELPI") to demonstrate the overall effectiveness of the Gold Bar wastewater treatment processes. The following measures are composing the WELPI:

Table 68 –Water Quality Index

#	Table 68 Water Quality Index Measure	Approval to Operate*	Proposed for 2012-2016
1	Total suspended solid (TSS) (mg/l)	20	20
2	Biochemical Oxygen Demand (BOD) (mg/l)	20	20
3	E.coli (cfu/100 ml)	200[a]	200
4	Total Phosphorus (mg/l)	1.0	1.0
5	Ammonia Summer (mg/l)	5	5
	Ammonia Winter (mg/l)	10	10

* Discharge limits as per Alberta Environment's Approval to Operate
a) Measured as geometric mean

These measures reflect industry practices and the measures and targets are typically regulatory in nature as defined by the Approval to Operate. The WELPI calculates a percentage value representing the percentage of the discharge limit for each parameter measured in the final effluent. Each value is given equal weighting in the calculation of the index. Target values for the index are based on statistical analyses of 2005 to 2010 operating data which demonstrates that on average, the Gold Bar plant discharges effluent at 27% of the Alberta Environment discharge limits. EWSI is proposing to use the upper 95% confidence limit of each parameter as the limit of this performance measure, which is 46% of the discharge limit. In other words, if EWSI maintains the same level of plant performance, this index should be less than 46% of the discharge limit 95% of the time. We have reviewed the calculation method and find it acceptable. Historically, Gold Bar has typically operated at levels better than its regulatory requirements.

Customer Service Index

This index is based on the number of meeting held with the Community Liaison Committee. The target is set at two meetings per year and this target is intended to preserve the current level of engagement with the local community stakeholders.

The measure of number of meetings held may not result in a meaningful measure which reflects customer service nor provide an opportunity to monitor and track improvements. A possible variation to this index could be to measure the ratio of "number of open items during the meetings over the number of items closed within the targeted period". So independently of the number of meetings, EWSI would measure the pro-activeness in responding to the Community Liaison Committee open issues. Other variations to this measure could also be considered.

Environmental Index

EWSI proposes the use of the existing standard established, applicable to all sites owned by the company.

Table 69 – Environmental Index

#	Measure	Historical results	Proposed for 2012-2016
	Table 69 Environmental Index		
1	Conduct 1 Emergency response Training exercises each year	n/a	1
2	Completeness and timeliness of Environmental reporting (14 reports / year)	100%	100%
3	Environmental Incident Management: No more than 18 reportable and preventable incidents	15	18

Similar to Water Services, EWSI is committed to follow all applicable provincial and federal environmental laws, and maintain its ISO 14001 certifications. They have developed a basket of environmentally focused measures which align with their environmental management program and which appear reasonable.

Safety Index

The safety performance "score card" that EWSI uses for Water Services will also be used for Wastewater Treatment operation at Gold Bar.

Table 70 – Safety Index

Table 9 Safety Index			
#	Measure	Historical results	Proposed for 2012-2016
1	Leadership and Administration: Safety Meetings (held per year)	-	12
2	Hazard Management: Formal Safe Work Plans (nb per year)	-	1,100
3	Competency and Training: First Aid Certified (% of permanent employee)	-	33%
4	Monitor and Promotion: Work Site Inspections/Observations per year	-	270
5	Results Based Outcomes*		
	• Lost Time Frequency Rate	-	0.81
	• All Injury Frequency Rate	-	2.42
	• Injury Severity Rate	-	8.88

* Based on the Canadian Electrical Association Work Injury / Illness Experience Standards

The performance "score card" used as a continuous improvement tool is standard in world class organisations. The "score card" is based on prevention as a key parameter which is typical in the industry and the measurement method and targets appear reasonable.

Findings and recommendations

The performance measures which are being put forward for PBR III for both water and wastewater align with industry practices and are generally of an operational nature. There are no financial measures. The critical measures and targets which focus on regulatory requirements within the water quality index are an important aspect of the performance management system which is expected. The other indices which address system reliability, customer service, environmental and safety provide the opportunity to track and monitor a variety of measures deemed important by EWSI with the objective of performance improvement.

The use of indices which are based on a basket of measures however, can have the result of camouflaging underperforming specific measures, so care must be taken to also manage on an individual measure basis. This is also the case when the weighting of the different indices and the available bonuses are aggregated for the final benchmark total of 100 points which could mask the result of one index not reaching its target but still have an aggregated result above the 100 point target.

Appendix A

List of sources of documents:

- EPCOR Water Services and Wastewater Treatment Bylaw – Rates Notice & Rates Report
- EPCOR Water Services Inc., 2012-2016 Performance Based Regulation – Water Operations Information Package and Wastewater Treatment Information Package
- EPCOR Water Services, 2012-2016 Performance Based Water Rates – Presentation to Edmonton City Council Utility Committee
- EPCOR Water Services Performance Based Regulation (PBR) – PBR Progress Report 2007, 2008, 2009, 2010
- Additional information received by EPCOR as per GT information requests :
    - GT-EWSI-01 to GT-EWSI-08;
    - GT-ESWI-10 to GT-EWSI-19;
    - GT-EWSI-GB-01 to GT-EWSI-GB-11;
    - GT-EWSI-20 to GT-EWSI-26
    - GT-EWSI-GB-12 to GT-EWSI-GB-15
- EPCOR Water Services, Water Quality, Environmental and Safety Indices Applicable to Schedule 3 of the EPCOR Water and Wastewater Bylaw.

Appendix B

Table GT-EWSI-17-1
Capital Programs and Projects for Water operations
2012-2016

($ millions)

	A **Category**	B **Project**	C **2012–2016 Forecast Total**
1	Regulatory	Alum Sludge Treatment – Rossdale and E.L. Smith	12.09
2	City of Edmonton Requirements	Water Main Reactive Renewal Program	56.00
3	City of Edmonton Requirements	Private Development Transmission Mains	15.92
4	Water Service Connections	Water Service Connections [1]	4.17
5	Health, Safety and Environment	Rossdale Sodium Hypochlorite System	16.97
6	Reliability	Water Main Proactive Renewal Program	13.00
7	Reliability	Water Meter Change Outs	11.68
8	Efficiency-Cost	Water Main Cathodic Protection	10.00
9	Infrastructure-General	Water Quality Assurance Laboratory and Office Building	12.34
10	Regulatory	Blow Off Cross Connection Control Program	7.99
11	City of Edmonton Requirements	LRT Relocates	8.41
12	City of Edmonton Requirements	New Meter Purchases and Installations	6.32
13	City of Edmonton Requirements	Private Development Construction Coordination	5.70
14	City of Edmonton Requirements	Water Main Cost Sharing Program	4.51
15	City of Edmonton Requirements	Distribution System Modifications	3.56
16	Reliability	Plants Mechanical and Structural Systems, Instrumentation	16.99
17	Reliability	Plants Chemical Feed System Upgrades Program	8.89
18	Reliability	Plants Electrical Upgrades Program	8.45
19	Reliability	Transmission Mains Replacement / Refurbishment	7.96
20	Reliability	Reservoir Mechanical, Electrical, Facility, and Structural	6.56
21	Reliability	Distribution Valves, Hydrants, Appurtenances	5.06

	A **Category**	B **Project**	C **2012–2016 Forecast Total**
22	Reliability / HSE	Plants HVAC, Lighting and Fire Alarm upgrades	4.84
23	Reliability / COEReq	New Booster Stations and Pump Changes	8.10
24	Infras-Eff-Reliability	IT Systems (Business and SCADA)	9.23
25	Infrastructure-General	Vehicles and Fleet Addition	4.45
26	Infrastructure-General	ELS, Ross, McCauley Site Facilities and Bldg Upgrade	7.37
27		Other projects	24.39
28		**Total Capital Expenditures, excluding AWMR Program**	**300.95**
29	City of Edmonton Requirements	AWMR Program	100.00
30		**Total Capital Expenditures**	**400.95**

The following table provides additional details on capital project expenditure forecasts under $10 million over 2012-2016. It should be noted that the schedule below provides a forecast of capital expenditures over the 5-year period. During the five years, unexpected but required projects may arise, forecasted projects may be deferred, and there may be changes in both timing and cost estimates. Some projects were grouped in the table below if they were individually insignificant but similar in nature; however, the natures of the project or projects in each line item below are described in the "Project Name" column.

Table 6.2-2
List of Capital Projects over $10 million for wastewater operations
2012-2016
($ millions)

	Category	Project Name	2012-2016 Total Capital Expenditures
1	Reliability	Digester Upgrades (1-6)	22.04
2	Reliability	Pretreatment Upgrade #1: Grit Tanks 4-7	11.42
3	Reliability	Pretreatment Upgrade #2: Sludge Thickening/Storage	19.42
4	Reliability	Pretreatment Upgrade #3: Influent Pre-Screen	12.05
5	Reliability	Scum & Primary Sludge Screening / De-gritting, and Grit Tanks 4&5 and Screens	8.76
6	Reliability	Mechanical Rehab Program	6.64
7	Reliability	Structural Rehab Program	5.26
8	Reliability	Process Control System, Process Control Equipment and Electrical Instrumentation Program	6.10
9	Reliability	Disinfected Filtered Effluent Utilization	0.57
10	Reliability	Work Management Software Upgrade and Lab Equipment	0.65
11	HSE	Plant Emergency and Security Systems	4.53
12	Efficiency-Cost	Lagoon Supernatant Treatment and Vehicle & Fleet Additions	9.48
13	Infrastructure-Gen	Buildings and Site Rehabilitation Program, Overall Site Restoration, Microcomputers	3.17
14	Infrastructure-Gen	Center Point Entrance/New Maintenance & Stores Bldg.	1.60
23		**Total**	**111.69**