



## METROWORKS

**M. G. Thorne, P. Eng.**  
*Commissioner*

The Municipality of  
Metropolitan Toronto  
55 John Street  
Str. 1180, 18th Flr., Metro Hall  
Toronto, ON M5V 3C6  
Fax (416)  
Telephone (416)

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June 5, 1997

TO: Environment and Public Space Committee

FROM: Commissioner of Works

SUBJECT: AGREEMENT FOR ADDITIONAL WATER SUPPLY  
TO THE REGION OF YORK

Purpose:

The purpose of this report is to obtain authorization to prepare and execute a new agreement for additional water supply to York Region in accordance with proposed principles and a revised water rate formula and to initiate a process leading to ultimate development of a Greater Toronto Area (GTA) wide water services strategy.

Funding Sources, Financial Implications and Impact Statement:

Adoption of the report's recommendation regarding a revised agreement would result in future impacts on the Water Supply Division's Capital and Operating Budgets and on revenue generated through the sale of water to York Region. Financial and hydraulic analysis has established a Capital cost-share methodology and the revised rate formula will ensure continued rate and reserve stability, full operating cost recovery and a fair return on investment.

Recommendations:

It is recommended that:

- (1) staff be authorized to prepare, in association with staff of York Region, an agreement for additional water supply to York Region in accordance with the principles outlined in Attachment A, and the revised water rate formula described in Attachment B and that the Metropolitan Clerk and Treasurer be authorized to execute the agreement; and
- (2) staff be authorized to initiate discussions with staff of the Regions of York, Peel, Durham and Halton and the Greater Toronto Services Board (GTSB) with a view to ultimate development of a GTA wide water services strategy and, with consulting support, to undertake joint system optimization studies, as required.

Council Reference/Background/History:

The current agreements for supply of water to York Region were executed on December 23, 1974, by the Province of Ontario and Metropolitan Toronto and on August 1, 1975, by York Region, the Province of Ontario and Metropolitan Toronto. The supply limit of 30 million Imperial gallons per day

(MIGD) average day, as specified in the tri-partite agreement, has been exceeded since 1988. The average day consumption which was 38 MIGD in 1996, continues to trend upwards.

Several Capital Works projects required to supply an incremental amount of water beyond the supply limit have been cost-shared by York Region, pending development of a new agreement.

Through Clause No. 2 of Environment and Public Space Committee Report No. 15, Metropolitan Council at its meeting of September 27, 1995, was informed of the status of negotiations for the supply of additional water beyond the limit specified in the existing agreement. Through this report, Council was advised that Metro and York Region staff had reached agreement on an ultimate supply limit of 57 MIGD average day and on cost-sharing of the additional infrastructure requirements as identified by the Joint Water Supply Study (JWSS) undertaken by the consulting engineering firm of Fenco-MacLaren Inc. and that the negotiations for a revised agreement were continuing.

Comments and/or Discussion and/or Justification:

The prolonged negotiations between Metro and York Region have progressed positively during the past year and have culminated in an agreement being reached at the staff level of the respective Works and Finance Departments on the principles to be incorporated in the new agreement.

The proposed principles cover general terms of the agreement, specific obligations, joint responsibilities, and the financial and legal aspects. These principles, which are summarized in Attachment A, will ensure mutual benefits to Metro and York Region.

Central to the development of the basis for a new agreement were the agreed allocation of Capital costs on a proportional use basis for the required infrastructure which are detailed in Appendix 2 of Attachment B (50 per cent. cost share of the estimated \$206 million total Capital costs) and a consensus on a revised formula for determining future water rates as summarized in Attachment B.

Pending a final agreement, the formula was applied to establish York Region's 1997 water rate at 19.5 cents per cubic metre as presented in Clause No. 2 of Report No. 26 of the Financial Priorities Committee adopted by Metropolitan Council at its meeting on November 6, 1996.

Analysis undertaken by Finance Department staff has confirmed future rate and reserve stability, full operating cost recovery and a fair return on Capital investment. Finance staff of Metro and York Region are satisfied with both the principles and the revised formula.

In order to finalize the agreement, it is proposed that the Metropolitan Solicitor prepare an agreement based on the principles established for review by York Region's Solicitor and the Metropolitan Clerk and Treasurer be authorized to execute the agreement with the respective officials from York Region.

Concurrent with the negotiations, York Region has proceeded with a long-term supply strategy by identifying alternative supply sources to enable supply beyond the 57 MIGD committed to by Metro.

On March 28, 1996, York Region Council selected Consumers Utilities as its private sector partner to develop a solution to meet long-term water supply needs. The York Region/Consumers Utilities partnership prepared a report on alternative long-term water supply solutions and recommended to York Region Council a preferred long-term solution entailing a raw water pumping station and a pipeline through Durham Region to a new water treatment plant in York Region. This source of water was approved by Regional Council as the preferred solution on December 19, 1996.

On March 13, 1997, York Region Council adopted recommendations from their Chief Administrative Officer that agreements be negotiated with Consumers Utilities to complete the next steps in their long-term strategy, which included services related to the "expansion of water supplies from Metro Toronto". Services proposed where re-examination and optimization studies of York Region's water system and Metro's water system (proposed to be cost-shared) and application of sophisticated technology to identify potential Capital cost reductions or additional capacity available to York Region based on the infrastructure identified by the JWSS. In addition to assuming a project management role in the proposed optimization studies, Consumers Utilities would be continuing in an advisory role in York Region's negotiations with Metro.

Subsequently, a proposal was submitted by York Region requesting our participation in the optimization study. While we acknowledge the potential benefits of the optimization study as proposed, we are reviewing alternative approaches in the context of a GTA wide water services scenario which will present opportunities for optimization on a larger scale which we anticipate will be part of the mandate of the GTSB.

Given the imminent release of Mr. Milt Farrell's report on the GTSB mandate and the formation of the GTSB in January 1998, a GTA view to water servicing partnerships is appropriate.

Accordingly, it is proposed that Metro staff be authorized to initiate discussions with staff of the Regions of Peel, Durham and Halton as well as York to identify mutual opportunities for efficiencies in water servicing with a view to the ultimate development of a GTA wide strategy and to undertake joint system optimization studies as required in consultation with the GTSB.

Conclusion:

Authorization is recommended for staff to prepare and execute a new agreement for additional water supply to York Region, given agreement at staff level has been achieved on the basic principles and a revised water rate formula.

Staff are proposing to extend Metro and York Region's co-operative relationship to the Regions of Peel, Durham and Halton in order to pursue opportunities for joint system optimization through a GTA wide water services strategy.

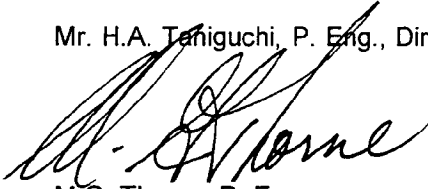
Summary Chart:

This report conforms with the following:

Council Approved Three-year Plan	( X )	Corporate Personnel and Administrative Policies	(n/a)
Approved Capital Budget	( X )	Approved Current Budget	( X )
Standing Committee Approved Program Priority	(n/a)	Metro Official Plan	( X )

Contact Name and Telephone Number:

Mr. H.A. Taniguchi, P. Eng., Director, Water Supply Division, (416) 392-8220.

A handwritten signature in black ink, appearing to read "M.G. Thorne". The signature is written in a cursive style with a large, sweeping initial "M".

M.G. Thorne, P. Eng.  
Commissioner of Works

HAT/rah

Attachment

## ATTACHMENT A

### REVISED AGREEMENT FOR SUPPLY OF WATER TO REGION OF YORK PROPOSED PRINCIPLES

#### GENERAL TERMS

- Agreement between Metro & Region of York - no provincial involvement.
- Agreement in perpetuity subject to review at mutually agreed intervals (say 10 years).
- Agreement to consider Metro and Region of York systems together as one system for future infrastructure studies.
- Terms under which agreement can be modified, as mutually agreed at any time, include:
  - volumes supplied;
  - basis for cost-share of additional Capital Works required in event projected demands are exceeded; and
  - interest rates used in water rate determination.
- Non-agreement of issues which arise following execution of agreement referred to third party dispute resolution.

#### METRO'S OBLIGATION

- To supply Region of York with upper limit of 57 MIGD (259 ML/d) average day and 97 MIGD (441 ML/d) maximum day as limited by available capacity in Metro system.
- To supply Region of York at projected rates of annual increase to 57 MIGD (259 ML/d) subject to completion of necessary facilities.
- To supply water at specific delivery points within volume ranges mutually agreed upon.
- To ensure accurate metering of water being delivered and provide Region of York with metering and billing records.

### **REGION OF YORK OBLIGATION**

- When upper limit is reached, to continue to take 57 MIGD (259 ML/d) average day from Metro as part of long-term requirements unless a lower amount is mutually agreeable.
- Not to exceed upper limit of 57 MIGD (259 ML/d) average day and 97 MIGD (441 ML/d) maximum day unless by mutual consent.
- To take water at specific delivery points within volume ranges mutually agreed upon.

### **JOINT RESPONSIBILITIES**

- Mutual understanding that Metro and York Region build their portions of the system as agreed.
- Facility owner assumes responsibility for construction, operation and maintenance of own system.
- Consultation on design and operation of facilities which may affect respective systems.
- Maintain water quality in accordance with Ontario Drinking Water Objectives.
- Ensure no mixing of water from different sources to minimize the potential for water quality impacts unless mutually agreed upon.
- Maintain distribution network in good working order to minimize stresses on system.
- Maintain storage systems to a common standard to provide for operational fluctuations, fire protection and emergency use.
- Optimize operations and infrastructure expansions through joint analyses.

## FINANCIAL

- Metro and York facilities:
  - identification of all Metro facilities located in Region of York;
  - identification of ownership of all cost-shared facilities.
  
- Basis for Capital cost-share:
  - schedule of Capital Works required for upper supply limit of 259 ML/d;
  - identification of Metro facilities to be cost-shared;
  - proportional use methodology for cost-share; and
  - inclusion of design and contract administration costs.
  
- Water rate determination:
  - annual revision to rate based on formula;
  - rate formula (rationale is detailed on attachment) to capture:
    - return on investment and replacement allowance on built infrastructure which was not cost-shared,
    - operating costs proportional to consumption,
    - hydro premium to cover additional cost of pumping to Region of York; and
  - peaking premium for exceeding maximum and average day upper consumption limits.

## LEGAL

- Closure of existing agreement.
- Pertinent clauses from Metro Toronto Act and other relevant legislation.
- Metro/York Region indemnified against potential problems in quality or quantity.
- Notwithstanding clause to allow for "Acts of God", emergency conditions, etc.

HAT/rah

April 15, 1997

Revised: June 5, 1997

## ATTACHMENT B

### **REVISED WATER RATE FORMULA FOR ADDITIONAL SUPPLY TO REGION OF YORK**

#### **SUMMARY OF RATIONALE AND METHODOLOGY**

##### **I BACKGROUND**

- Existing tri-partite agreement effective August, 1975 specifies supply limit of 30 MIGD (136 ML/d) average day and 51 MIGD (232 ML/d) maximum day.
- Existing agreement contains water rate formula with the following components:
  - Return on Capital investment;
  - Replacement allowance;
  - Operating cost; and
  - Readiness to serve.
- Application of rate formula has resulted in divergence of York's rate relative to Metro's rate as shown in Appendix 1.

##### **II OBJECTIVES**

- Revised agreement to specify supply limit of 57 MIGD (259 ML/d) average day and 97 MIGD (441 ML/d) maximum day as requested by Region of York.
- Development of a mutually agreeable rational rate formula to reduce rate disparity and divergence.

##### **III CAPITAL COST SHARE**

Given that significant Capital Works are required to supply Region of York with an increased average day supply from 30 to 57 MIGD, (a maximum day increase of 46 MIGD or 209 ML/d which is the more significant number as it is applied to the design of infrastructure) agreement was reached between Metro and Region of York that Capital cost share on a proportional use basis of all new projects required to supply this additional amount was appropriate.

Completed projects cost-shared to date consist of a water main from Richview Pumping Station to Keele Reservoir and extension of Richview Pumping Station.

Current and future projects required to provide the upper supply limit are listed on Appendix 2 attached.



#### IV REVISED RATE STRUCTURE

The increased supply to Region of York would also require continued and increased use of built infrastructure. Accordingly, a return on investment of assets in service, excluding those cost-shared, was considered appropriate to include in the revised rate structure.

In terms of the basis for pricing, consensus was achieved that cost recovery plus return on investment was the preferred approach among the alternatives considered, and that the rate structure should include the following components:

- Return on Capital investment;
- Replacement allowance;
- Operating cost proportional to consumption; and
- Additional hydro costs of pumping to Region of York.

A peaking premium for exceeding maximum and average day consumption limits was agreed to be considered.

The following summary provides the details and rationale for the above components and provides a comparison to the previous rate formula.

##### a) Return on Investment

##### i) **Rate of Return**

Existing	8½% assumed to be based on cost of debt in 1974 which was 8.55%.
Proposed	8% based on average cost of Capital over past five years which is consistent with the average yield on 10-year Government of Canada bonds.

##### ii) **Asset Valuation**

Existing:	Based on cumulative historical cost of assets with no depreciation.
Proposed:	Based on straight line depreciation of assets in service, excluding those cost-shared, at 1.25% which represents an 80-year average life.

b) **Replacement Allowance**

Existing: 2½% based on cumulative historical costs of assets with no depreciation.

Proposed: 2½% per industry standards based on depreciated assets in service, excluding those cost-shared.

c) **Operating Costs**

Existing: Operating costs exclusive of Capital financing and debt charges.

Proposed: Operating costs exclusive of Capital financing, debt charges and additional hydro costs.

d) **Operating Surcharge**

Existing: Intangible operating costs, availability and readiness to supply, and additional pumping costs fixed at .66¢/m<sup>3</sup>.

Proposed: Additional repumpage hydro cost calculated at 1.6¢/m<sup>3</sup> for 1997 - annual revision based on proportionate consumption and hydro costs in previous year.

The determination of the additional hydro cost component for the 1997 rate is contained in Appendix 3 attached.

V **CONCLUSIONS**

1. The revised rate formula addresses rate disparity and divergence as evidenced by the rate projections shown in Appendix 4.
2. The revised rate formula continues to ensure full operating cost recovery plus a fair return on investment.
3. Application of this new formula establishes the 1997 water rate to Region of York as 19.5¢/m<sup>3</sup> as detailed on attached Appendix 5.

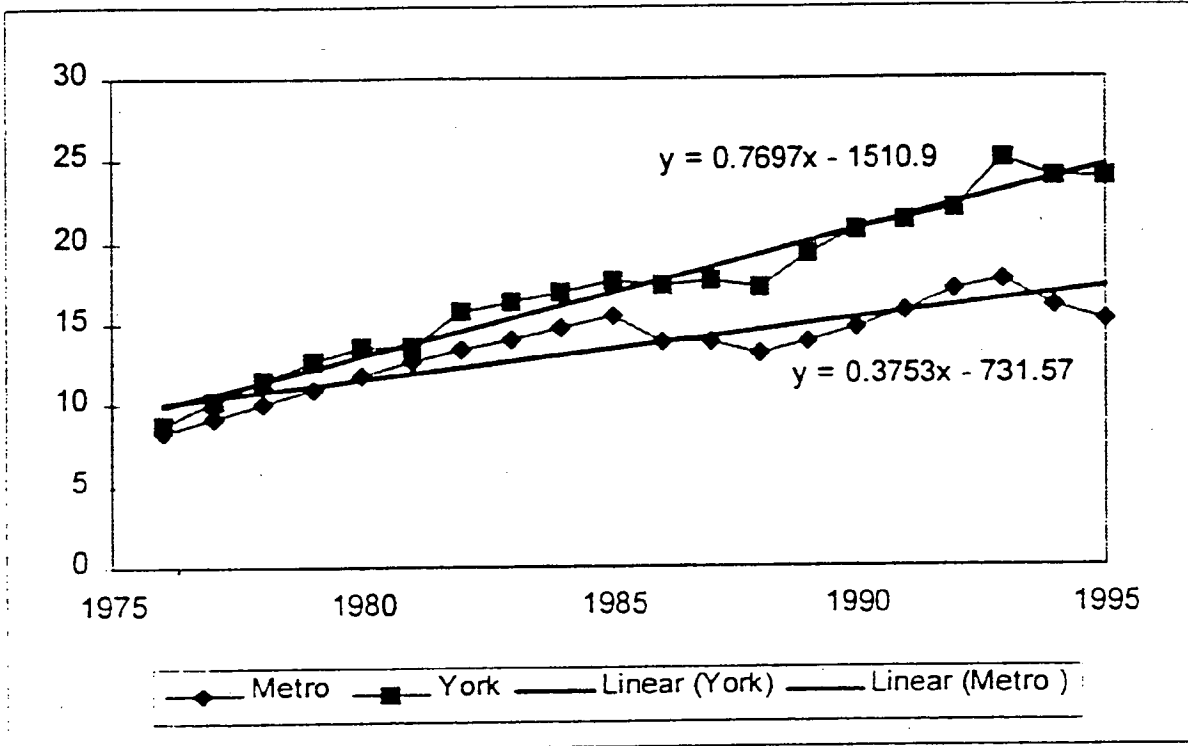
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April 17, 1997

Revised: June 5, 1997

# APPENDIX I

Figure 1 - Metro Water Rate vs. York Region Water Rate 1975 - 1995



# APPENDIX 2

## METRO TORONTO AND YORK REGION CAPITAL COST SHARING PROPOSAL CAPITAL WORKS REQUIREMENTS TO MEET 2011 WATER DEMANDS

Capital Works Requirements	Limited Supply With Conservation		Full Supply With Conservation		York's Cost Based On User Pay	
	33 MIGD to York (Avg. Day)		57 MIGD to York (Avg. Day)		Approach	
	Size	Cost \$ Millions	Size	Cost \$ Millions	% Share	Cost \$ Millions
<b>WATER MAINS (mm)</b>						
PEL to Nielson Rd.	1350	\$1.006	1800	\$1.342	53.1%	\$0.712
Markham Rd-N Shep'd to Kennedy	1500	\$18.519	2100	\$25.926	58.7%	\$15.225
Kennedy to Bayview	1050	\$20.742	1650	\$29.170	69.5%	\$20.285
Kennedy to PKN Suction			1200	\$2.285	100.0%	\$2.285
MacPherson, Davenport to Damell PD2	1050	\$1.999	1050	\$1.999	0.0%	\$0.000
Steeles, Keele to Dufferin PD5			1200	\$5.998	100.0%	\$5.998
Dufferin HWY 7 to Finch	1200	\$12.566	1200	\$12.566	0.0%	\$0.000
Warden to TWA	750	\$6.844	750	\$6.844	0.0%	\$0.000
Motorized Control Valves						
PD5 main between PTH and PMI 1350mm		\$0.060		\$0.060		\$0.000
PD2 main at Lessard Park 1650mm		\$0.060		\$0.060		\$0.000
PD2 main at Jane and Weatherall 900mm		\$0.000		\$0.060		\$0.060
PD3E Eglinton P.S. to Warden 750mm		\$0.060		\$0.060		\$0.000
<b>Sub Total</b>		\$61.856		\$86.370	51.6%	\$44.565
<b>WATER TREATMENT PLANTS</b>						
F.J. Horgan Expansion (ML/d)	152	\$44.521	341	\$84.975	55.4%	\$47.098
(MIGD)	33		75			
<b>Sub Total</b>		\$44.521		\$84.975	55.4%	\$47.098
<b>PUMPING STATIONS</b>						
Lawrence(PD5) upgrade 3 pumps		\$0.100		\$0.100		\$0.000
Keele(PD5) replace 2 pumps and upgrade 1		\$0.500		\$0.500		\$0.000
Keele(PD6) replace 1 pump		\$0.250		\$0.250		\$0.000
Ellesmere(PD4) add 2 pumps & upgrade existing				\$2.000		\$2.000
Kennedy(PD5) replace 4 pumps		\$0.750		\$0.750		\$0.000
Milliken(PD5) expand & add 2 pumps				\$5.489		\$5.489
Thornhill(PD5) add 1 pump		\$0.250		\$0.250		\$0.000
F.J. Horgan(PD1E) add 2 pumps				\$0.800		\$0.800
F.J. Horgan(PD2E) remove 2 pumps & add 3 pumps				\$0.750		\$0.750
Eglinton (PD3E) Variable speed drive		\$0.170		\$0.170		\$0.000
Scarborough(PD3E) Variable speed drive		\$0.170		\$0.170		\$0.000
Standby Power Supply PEG		\$2.500		\$2.500	0	\$0.000
<b>Sub Total</b>		\$4.690		\$13.729	65.8%	\$9.039
<b>RESERVOIR EXPANSIONS</b>						
Dufferin (ML)	119	\$18.447	135	\$20.665	11.9%	\$2.449
<b>Sub Total</b>		\$18.447		\$20.665	11.9%	\$2.449
<b>TOTAL</b>		\$129.514		\$205.739	50.1%	\$103.151

Based On Incremental Cost Difference  
Between Limited and Full Supply  
37.0%

# APPENDIX 3

## DETERMINATION OF ADDITIONAL HYDRO COSTS FOR PUMPAGE TO REGION OF YORK

Use the following formula:

$$H_{uc} = (H_m) (D_m) + (H_y) (D_y)$$

Where:  $H_{uc}$  = Estimated average hydro unit cost  
 $H_m$  = Metro's unit rate hydro cost (\$/m<sup>3</sup>)  
 $H_y$  = Region of York's unit rate hydro cost (\$/m<sup>3</sup>)  
 $D_m$  = Metro's demand as % of system demand (%)  
 $D_y$  = Region of York's demand as % of system demand (%)

and

$$H_m = (M_{epd}) (P)$$

$$H_y = (Y_{epd}) (P)$$

$M_{epd}$  = An equivalent pressure district for Metro, represented as metres above lake level (m)

$Y_{epd}$  = An equivalent pressure district for Region of York represented as metres above lake level (m)

$P$  = Average pumping cost per cubic metre of water per metre above lake level (\$/m<sup>3</sup>/m)

Assume equivalent pressure districts for centroids of consumption as:

Metro: District 3

York: District 5

District	TWL (m)	Individual District Lift (m)	District 3-5 Lift (m)	District 5 Lift (m)
Lake	75			
1	141	66		
2	158	17		
3	184	26	109	
4	210	26		
5	230	20	46	155

Additional lift District 3 → District 5

= 46/109

= 42.2%

1995

CONSUMPTIONS

Metro	446.7	(87.61%)
York	<u>63.2</u>	(12.40%)
TOTAL	509.9 x 10 <sup>6</sup> m <sup>3</sup>	

$$H_{uc} = \$20.9M/509.9 = \$.0410/m^3$$

$$\begin{aligned} .0410 &= (109P) (.8761) + (155P) (.124) \\ &= 114.715P \end{aligned}$$

$$P = \$.000357/m^3/m$$

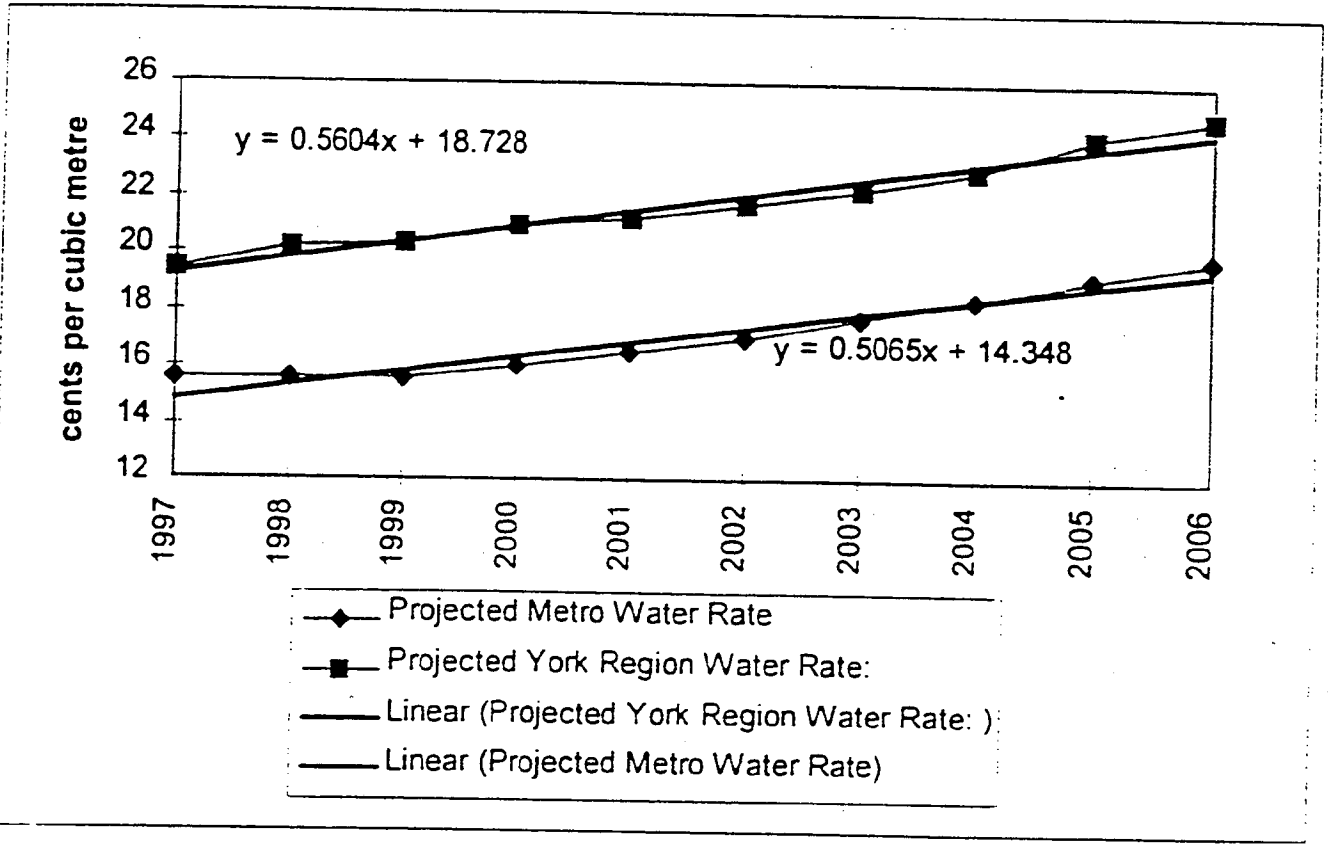
$$H_m = 109 (.000357) = \$.039/m^3$$

$$H_y = 155 (.000357) = \$.055/m^3$$

$$\text{Additional Unit Hydro Cost} = \$.016/m^3$$

# APPENDIX 4

## Figure 3 - Divergence in Rate Minimized Under Revised Formula



# APPENDIX 5

## Determination of 1997 York Region Rate Using New Formula

(\$000's)

A.	Leasing and Replacement Allowance Component	
(i)	Net capital spending to Dec. 31, 1996 = \$438,452	
	Depreciated asset value (1.25% depreciation) = \$312,171	
	Metro/York Region consumption 1996 = 64/505 = 12.67%	
	Net asset used by York = 12.67% x 312,710 = \$39,620	
	Return on Investment = 8.0% x \$39,620 = \$3,169	
	= \$3,169/64 =	4.95 cents per cubic metre
(ii)	Replacement Allowance = 12.67% x \$312,171 x 2.5% = \$989	
	= \$989/64 =	1.55 cents per cubic metre
B.	Operating Component	
	1996 operating cost / 1996 total cost = \$62,500/\$85,770 = 0.7287	
	(adjusted to exclude York hydro premium component of \$1.02 million)	
	Operating Component = 0.7287 x 15.56 =	11.34 cents per cubic metre
C.	Hydro Component =	<u>1.60 cents per cubic metre</u>
	1997 YORK REGION RATE BASED ON NEW FORMULA	<u>19.44 cents per cubic metre</u>