Office of Utilities Regulation

National Water Commission

Review of Rates

Determination Notice

OFFICE OF UTILITIES REGULATION

April 28, 2008

DOCUMENT TITLE AND APPROVAL PAGE

DOCUMENT NUMBER: WAT 2008/01

DOCUMENT TITLE: National Water Commission Review of Rates – Determination Notice

1. PURPOSE OF DOCUMENT

This document outlines the Office's decision on the rates to be charged by the NWC for water and sewage services.

RECORD OF REVISIONS

Revision Number	Description	Date
-	-	-

APPROVAL

This Document is approved by the Office of Utilities Regulation, and the Decisions therein become effective on **May 1st, 2008.**

On behalf of the Office:

J Paul Morgan
Director General
April 28,2008

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CHAPTER 1: EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 On October 19th 2007 NWC submitted an initial set of proposals but did not satisfy the Office's minimum rate review information requirements until December 14, 2007. The proposals included an application for a 44% increase of all its rates and charges. The NWC stated that its analysis showed that in order to carry out its mandate to provide reliable service and expand its existing service a 45.8% increase is required. However, it believes that it can strive to improve efficiency in its operations but this will translate to only a 1.8% increase in revenues. Consequently, the company is applying for a tariff increase of 44% on its billed revenues. This increase was expected to become effective at the beginning of financial year 2008/09 and last for a period of three years, that is, to 2010/11. The NWC in addition submitted a proposal for further funding by way of a K-factor sufficient to finance capital costs for rehabilitation and mains repair totalling $32,265M. The K-factor would repay the financing of loans of ten year tenure. NWC did not propose any specific percentage change in rates for the K-factor but the Office estimates that this would necessitate an additional 5% in the first year.

1.2 NWC PROPOSALS

NWC estimated that its cost for the budget year 2007/2008 is as shown below:

Table 1.1 NWC proposed costs

Category/Year	**2007/08**
Salaries, wages and related cost	4,070,757
Repairs and Maintenance	1,571,238
Administration	1,692,330
Telephone	81,980
Fuel & lubricants	134,741
Electricity	2,904,093
Purchases – water	68,752
Loan interest	339,688
Depreciation	2,403,815
Other	293,726
Private cost	1,090,000
Total	**14,651,120**

1.3 NWC indicated that its total revenue required was as shown in Table 1.2

Table 1.2 NWC's Proposed Revenue Requirement

Category	NWC's Proposal ($)
Total operating costs	**14,651,120**
Return on investment	1,640,808
Taxation	0
Total	**16,291,928**

1.4 NWC also proposed that the existing tariff structure remain.

1.5 **Price Adjustment Mechanism (PAM)**

NWC accepts the price cap methodology for the 2008 to 2010 tariff regime period, but proposes an efficiency factor (X) of zero. NWC also argues that the present weights of the PAM do not adequately reflect its cost components and has proposed that it be adjusted as follows:

Table 1.3: Proposed changes in PAM weights

Index	Existing	Proposed
Exchange rate	0.175	0.25
Electricity	0.22	0.24
CPI	0.605	0.51

1.6 NWC also proposed that foreign inflation be added as an additional component to the PAM to account for risks associated with foreign inflation.

1.7 K-Factor

NWC also proposes that a K-factor be established to fund capital projects that will not generate any significant increase in revenues. In this regard the NWC has proposed that the K-factor incorporates provisions for the rehabilitation of wastewater treatment plants in order to meet the enhanced regulatory standards imposed by the National Planning and Environmental Protection Agency (NEPA). The company has also proposed that a programme be funded to reduce the level of non-revenue water (NRW) through a combination of mains replacement and other technical and commercial interventions. A third component of the K-factor as proposed by NWC would incorporate the expansion of the collection network for wastewater so as to reduce the average unit cost of treatment for the newly commissioned Soapberry wastewater treatment plant.

1.8 Z-factor

The NWC proposed that a Z-factor should be instituted to cover unforeseen events such as Acts of God.

1.9 OFFICE DETERMINATION

1.9.1 Estimated Expenditures

The Office has determined that the allowable expenditures are as shown in Table 1.4.

Table 1.4: Breakout of Office Determined Total Expenses

Category	NWC Budgeted 2007/08	OUR Determined 2007/08
Salaries, wages and related cost	4,070,757	3,238,126
Repairs and Maintenance	1,571,238	1,489,000
Administration	1,692,330	1,604,971
Telephone	81,980	81,980
Fuel & Lubricants	134,741	134,741
Electricity	2,904,093	3,500,000
Purchases – water	68,752	68,753
BOO wastewater treatment	1,090,000	840,000
Loan interest	339,688	339,688
Depreciation	2,403,815	1,915,000
OUR regulatory fee		80,000
Other	293,726	
Total	**14,651,120**	**13,292,259**

1.10 Revenue Requirement

The Office has determined that the rate base is $10,769M, When the cost of equity is applied is applied to the Office determined rate base, it yields a return on equity of $929M. The NWC proposed return on investment of $1,641M. The revenue requirement determined by the Office is $14,221M

Table 1.5: Breakout of Revenue Requirement

Category	NWC's Proposal	Office Determined
Total operating costs	14,651,120	13,292,259
Return on investment	1,640,808	929,000
Taxation	0	0
Total	**16,291,928**	**14,221,259**

1.11 Estimated Revenues

The Office has taken the actual un-audited operating revenues for the financial year 2007/08 of $9,811M and adjusted for the following factors: *ANPAM adjustment*. The local inflation component of PAM was applied in March 2008 and therefore the full impact of this is not reflected in the recorded revenues. The effective change in tariff at the Annual PAM (ANPAM) adjustment was 3.6%.

PAM since annual adjustment A further 1.97% has been made to the base rates at the ANPAM adjustment. *Customer growth,* assuming the customer growth of 2% over the period 2007/08 was spread evenly over the year an average of 1% increase in revenues would be expected with the current rates

The above adjustments to the un-audited actual 2007/08 operating revenue give an estimated normalised amount of revenues totalling $10,468M. The Office has also assigned a deemed $580M as revenues the NWC would have been receiving if efficiency targets set at the last rate review were met.

Table 1.6: OUR Estimated Revenues at Current Rates

Revenue type	NWC Projection 2007/08 at current rates (J$'000)	OUR-Determined 2007/08 normalized at current rates (J$'000)
Water	6,804,615,097	
Sewerage	1,913,501,079	
Service charge	1,168,609,372	
PAM	100,475,509	
Bulk Water	8,347,989	
Bulk Water Shipping	5,495,196	
New Installations	59,961,749	
Reconnections	103,061,064	
Total operating revenue	***10,164,067,055***	***10,467,637,310***
Cesspool & Other Sewerage	11,609,562	11,609,562
Operating Grant - Long Term	-	-
Staff Discount - Revenue	22,124,312	22,124,312
Sludge	-	-
Other income	230,719,130	230,719,130
Amortization of Capital grants	280,000,000	280,000,000
Interest	80,212,786	80,212,786
Project Revenue	140,000,000	140,000,000
Deemed efficiency gains		**580,000,000**
TOTAL REVENUE	**10,928,732,845**	**11,812,303,100**

1.12 Revenue shortfall

The Office has determined that at the current rate, there is a shortfall of $2,409M in the revenues of the NWC to meet the revenue requirement. Table 1.7 shows the revenue that is required by the NWC and the current shortfall.

Table 1.7: Revenue shortfall

Category	Amount $'000
Total operating cost	13,292,259
Return on Investment	929,000
Total required	**14,221,259**
Revenue Projected	11,812,303
Shortfall	2,408,956

The Office has determined that a 23% change in operating revenues is required to offset this shortfall.

1.13 SUMMARY OF DECISIONS

1.13 The Office has determined that the effective increase of NWC rates shall be 23% over the rates prevailing at March 2008.

The rates effective as at May 1, 2008, shall be as shown in Table 1.8

The Office has determined that in order to increase certainty in loan negotiations this tariff regime shall be in place for five years (2008-2013).

Table 1.8 Water rates

	SERVICE CHARGE	OUR determined rates
	5/8 inch/15mm	364.59
	3/4 inch/20mm	748.34
	1 inch/25mm	978.63
	1 1/4 inch/30mm	1,842.13
	1 1/2 inch/40mm	1,842.13
	2 inch/50mm	2,609.64
	3 inch/75mm	4,739.64
	4 inch/100mm	7,656.29
	6 inch/150mm	11,666.72
	CONSUMPTION CHARGE/1000 Gal	
	Commercial	779.45
	Condominiums	386.65
Domestic	00 to 03	207.86
	03 to 06	366.46
	06 to 09	395.67
	09 to 12	505.03
	12 to 20	628.97
	20 & above	809.61
	CONSUMPTION CHARGE/1000 litres	
	Commercial	171.39
	Condominiums	85.01
Domestic	00 to 14	45.70
	14 to 27	80.58
	27 to 31	87.02
	31 to 45	111.06
	45 to 81	138.30
	81 & above	178.04

Rates for Ships are to be charged at the commercial rates

1.14 Price Adjustment Mechanism (PAM)

The PAM captures the movement of the consumer price index, foreign exchange (J$/US$) and kilowatt hour charge (kwh). The formula is described below:

$$PAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, current value of each variable less the base value.

The Office has determined that the Weights for the Price Adjustment Mechanism are as shown in Table 1.9.

Table 1.9: Office Determined PAM Weights

Index	2008 Weights
Foreign exchange	0.280
CPI	0.468
Electricity (kwh)	0.252
Total	1.0

The Office will review the weights of the PAM at the end of the first three years of the tariff regime.

The Office has also determined that all the indices are to be applied on a monthly basis. The PAM will also be reset at its anniversary (1st May) at which time the new base values for the 3 components will be set. The annual reset for PAM (ANPAM) will be based on the following formula:

$$ANPAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, new base value of each variable less the old base value.

The base values for the PAM indices are as shown below:

Electricity	$18.84/kWh
Exchange Rate	J$71.62 to US$1.00
CPI	All divisions 121.5

1.15 K-factor application and recovery through X-factor

The Office has allowed works programmes to be funded by the application of the K-factor as indicated in Table 9.4.

The Office has determined that the X-factor representing efficiency gains arising from the K-factor programme shall be applied in accordance with the schedule in Table 9.4.

The X –factor is to be calculated as a deduction from the bill after the normal rates and PAM.

The K-factor is to be calculated on the bill balance after the X-factor is deducted.

The Office has determined that in order to increase certainty in loan financing negotiations this tariff regime shall be in place for 5 years.

The schedule of K-factor and X-factor shall continue across tariff regimes to ensure funds are available to service the loans.

Notwithstanding the above, the Office may make adjustments to the schedule at rate reviews to properly align cash inflows with financing requirements.

NWC shall account for the deemed K-factor cash inflow calculated on the basis of 95% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be sent to the Office within 45 days of each reporting period. K-factor revenues shall be deemed collected within 45 day after billing.

The Office shall issue further detailed guidelines on the operation of the K-factor fund.

Table 1.10

Year ending March	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
K-factor	5%	14%	20%	23%	25%	27%	27%	27%	26%	26%	24%	24%	23%
X-factor		5%	10%	10%	12%	12%	13%	15%	18%	22%	22%	23%	23%

1.16 Z-factor

The Office has determined that there shall be a *Z* factor being an allowed percentage increase in the PAM less X to facilitate events that satisfies all of the following criteria:

a) affect the Commission's costs;
b) are not due to the Commission's managerial decisions; and
c) are not captured by the other elements of the price regime.

However, the Z-factor will not become applicable in cases where insurance coverage is available and the associated premiums have been provided for in the determination of the rates.

1.17 Annual adjustment Formula

The Office has determined that the new base rates at the beginning of each year shall be derived by Old Base rate *(1 + ANPAM ±Z).

The X-factor is to be calculated as a deduction from the billed amounts at approved base rates plus PAM. The K-factor is to be treated as a separate revenue stream from that of the rates and calculated after the deduction of the X-factor.

1.18 Manufacturing Sector – Economic Development Wastewater Tariff

The Office is mindful of the importance of the manufacturing industry to the Jamaican economy. This importance is also recognized by the Commission through the establishment of the Economic Development Wastewater Tariff (EDWT), which encourages economic development by facilitating increased competitiveness, productivity and efficiency.

The Office supports the continuance of the 50% sewerage rebate under the scheme. It now requires the NWC to undertake a general review of the conditions under which the EDWT is applied to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one company and omission in another. This review should include consultations with stakeholders within the sector and shall be completed within the first three months of this Determination.

CHAPTER 2: BACKGROUND

2.0 The National Water Commission (NWC, the Commission) is the primary provider of potable water and sewerage services in Jamaica. Although, since 2005, there has been investment in the water and sewerage sector by private providers, the NWC reports that it provides 73% of the population with potable water. The company also indicates that only 23% of its customers are provided with sewerage services.

2.1 The Government's Water Sector policy recognizes the importance of the involvement of private investors in the sector to help in achieving the goal to have access to potable water access by all by 2010 and that all major towns are provided with adequate sewerage services by 2020. The participation of the Runaway Bay Water Company, a subsidiary of the Urban Development Corporation (UDC), and four (4) private companies[1] in the provision of potable water and sewage services are instrumental in the achievement of this goal.

2.2 Section 11 of the Office of Utilities Regulation (OUR) Act empowers the Office to prescribe rates for utility services. Section 5 of the OUR Act gives the Office the power to prescribe standards for measurement of quantity and quality of the utility service.

2.3 Given the overall mandate for universal access by 2010, potable water access can also be provided through wayside tanks, standpipes, trucking and other public means. This is categorized as social water and the Water Sector Policy recognizes that the cost for the provision of social water may be met through tariff and user fees, cross subsidies and direct subsidies from the GOJ Budget.

2.4 In instances where there will be capital expenditure which will result in no significant increase in revenues, the policy outlines that millage (charge levied on consumers in addition to tariff), government and private sector funding are possible sources of funding for these projects. This should be taken into account in the development of tariffs by the OUR. The policy also addresses the possible tariff structure that may be employed in order to recover the efficient cost of providing the service. This includes lifeline rate, full-cost recovery and differential tariffs.

2.5 In December 2003, the Office approved a 26.36% increase over the then existing rate for National Water Commission[2]. This increase became effective January 1st 2004 and was to be effective for a period of three years (to December 2006). It included a price cap regime which provided for adjustments in NWC's rates during this 3-year tariff period where the rates are adjusted on an annual basis by a Price

[1] They are DEML, Can-Cara, Dairy Springs and Four Rivers.
[2] See *National Water Commission Review of Rates - Determination Notice, Document No: WAT 2003/02* available at www.our.org.jm.

Adjustment Mechanism[3] (PAM) less an efficiency factor of 3.5%.

2.6 The Office also issued a revised regulatory framework at the time of the issuance of the determination notice. This document outlined the performance targets and benchmarks that the NWC should achieve in its financial, operational and customer service related areas during the 3-year period to December 2006. The determination also stated that the Office, at the next review, would assume that these targets have been met, and would take account of this in the setting of new rates.

2.7 There is a possibility that under a price cap regime, utility service providers may compromise the level of service delivered to its customers, in order to outperform the index. As such, it was critical that the Office, along with the price determination, specify quality of service standards to ensure that the customers receive acceptable service delivery. The Office developed Overall and Guaranteed Standards that the NWC should adhere to. The Guaranteed Standards attract a compensatory payment of four (4) times the service charge and customers are required to submit a claim to the company if they think a breach has occurred. The Office has reviewed the NWC's performance in regard to these Standards during the process of this rate review.

2.8 On January 10th 2007, the NWC advised the Office that it was still in the process of completing its rate application submission as certain critical capital projects (including Soapberry Wastewater Treatment Plant) which would have an impact on the application were near completion, and exclusion of these projects would be detrimental. For these reasons, the NWC requested a one year extension of the existing tariff regime. The Office reviewed the request and granted this extension to the current tariff regime to December 2007.

[3] The PAM is an adjustment index which is comprised of the weighted changes in foreign exchange, consumer price index and kilowatt hour charge.

CHAPTER 3: NWC'S PROPOSALS

3.0 INTRODUCTION

On October 19th 2007 NWC submitted an initial set of proposals but did not satisfy the Office's minimum rate review information requirements until December 14, 2007. The proposals included an application for a 44% increase of all its rates and charges. The NWC stated that:

- Its revenue from water sales has not been increasing at the expected rate over the last few years. Further, when the number of active NWC customers is compared with that of the other major utilities operating in the Jamaica, NWC's lags substantially behind. This would indicate that there are many people benefiting from its services that are not reflected in the active customer base;

- It has been operating at rates that do not allow for full cost recovery, and;

- It has been faced with increasing costs from its old physical infrastructure and has been undertaking a number of capital projects to increase its operating capacities and revenues.

3.1 NWC states that its analysis shows that in order to carry out its mandate to provide reliable service and expand its existing service a 45.8% increase is required. However, it believes that it can strive to improve efficiency in its operations but this will translate to only a 1.8% increase in revenues. Consequently, the company is applying for a tariff increase of 44%. This increase is expected to become effective at the beginning of financial year 2008/09 and lasts for a period of three years, that is, to 2010/11.

3.2 NWC also proposed that the existing tariff structure remains.

3.3 The NWC submitted its business plan, financial model, past and current budgets, projected investment and their cost structure to support its application on December 14, 2007.

3.4 PRICE ADJUSTMENTS

3.4.1 Price Adjustment Mechanism (PAM)

NWC accepts the price cap methodology for the 2008 to 2010 tariff regime period but proposes an efficiency factor (X) of zero. It also argues that the present weights of the PAM do not adequately reflect its cost components and has proposed that it be adjusted as follows:

Table 3.1: Proposed changes in PAM Weights

Index	Existing	Proposed
Exchange rate	0.175	0.25
Electricity	0.22	0.24
CPI	0.605	0.51

NWC also proposes that foreign inflation be added as an additional component to the PAM to account for risks associated with foreign inflation.

3.4.2 K-Factor

NWC also proposes that a K-factor be established to fund capital projects that will not generate any significant increase in revenues but are necessary for system reinforcement and reliability or to comply with regulatory intervention by the National Environmental and Planning Agency (NEPA). In this regard the NWC has proposed that the K-factor incorporates provisions for the rehabilitation of wastewater treatment plants in order to meet the enhanced regulatory standards imposed by NEPA. The company has also proposed that a programme be funded to reduce the level of non-revenue water (NRW) through a combination of mains replacement and other technical and commercial interventions. A third component of the K-factor as proposed by NWC would incorporate the expansion of the collection network for wastewater so as to reduce the average unit cost of treatment for the newly commissioned Soapberry Wastewater Treatment Plant. The proposed K-factor programme and financing requirements are shown in Table 3.2.

Table 3.2: K-factor programmes and financing requirements

			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
LEAKAGE																		
Loan Portion	**100%**	of Capital Cost																
Exchange Rate US$1 =	**72**																	
Rate	8%																	
No. Periods	10																	
		$M																
		22,935																
	YR1																	
	YR2	4,039		602	602	602	602	602	602	602	602	602	602					
	YR3	5,894			878	878	878	878	878	878	878	878	878	878				
	YR4	6,447				961	961	961	961	961	961	961	961	961	961			
	YR5	3,265					487	487	487	487	487	487	487	487	487	487		
	YR6	2,470						368	368	368	368	368	368	368	368	368	368	
	YR7	820							122	122	122	122	122	122	122	122	122	122
	YR8	0								0	0	0	0	0	0	0	0	0
	YR9										0	0	0	0	0	0	0	0
	YR10											0	0	0	0	0	0	0
LEAKAGE		**Financing Requirement**		**602**	**1,480**	**2,441**	**2,928**	**3,296**	**3,418**	**3,418**	**3,418**	**3,418**	**3,418**	**2,816**	**1,938**	**977**	**490**	**122**

CONSUMER METERING

Loan Portion	**100%**	of Capital Cost
Exchange Rate US$1 =	**72**	
Rate	8%	
No. Periods	10	

			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
		$M																
		960																
	YR1	320		48	48	48	48	48	48	48	48	48	48					
	YR2	320			48	48	48	48	48	48	48	48	48	48				
	YR3	320				48	48	48	48	48	48	48	48	48	48			
CONSUMER METERING		**Financing Requirement**	**-**	**48**	**95**	**143**	**143**	**143**	**143**	**143**	**143**	**143**	**143**	**95**	**48**	**0**	**0**	**0**

SEWERAGE REBAILITATION

Loan Portion	**100%**	of Capital Cost
Exchange Rate US$1 =	**72**	
Rate	8%	
No. Periods	10	

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
$M																	
1,000			149	149	149	149	149	149	149	149	149	149					
1,000																	

	SEWERAGE REHAB	**Financing Requirement**	**-**	149	149	149	149	149	149	149	149	149	149	0	0	0	0	0

SEWERING KSA																				
Loan Portion	**100%**	of Capital Cost																		
Exchange Rate US$1 =	**72**		**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Rate	8%																			
No. Periods	10																			
		7,370																		
	YR1																			
	YR2	**1,793**		267	267	267	267	267	267	267	267	267	267							
	YR3	**1,750**			261	261	261	261	261	261	261	261	261	261						
	YR4	**1,453**				217	217	217	217	217	217	217	217	217	217					
	YR5	**1,509**					225	225	225	225	225	225	225	225	225					
	YR6	**864**						129	129	129	129	129	129	129	129	129				
	SEWERING KSA	**Financing Requirement**		267	528	745	970	1,098	1,098	1,098	1,098	1,098	1,098	831	570	129				

			2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
		$M																		
	TOTAL	**32,265**																		
OVERALL FINANCING REQUIREMENT		**TOTAL Financing Requirement**	1,066	2,253	3,478	4,189	4,686	4,808	4,808	4,808	4,808	4,808	3,743	2,556	1,106	490	122	

3.4.3 Z-Factor

NWC also proposes a Z-factor to address risks to which it is exposed but are not incorporated in the PAM.

3.5 OPERATIONAL PERFORMANCE

3.5.1 Water Supply

NWC states that it presently provides potable water to over 70% of the population and produces 5.4 billion gallons of water per month through 460 water supply systems and a network of 9,000 kilometres of pipeline.

3.5.2 Sewage Services

NWC states that it provides sewage service to 23% of its total customers and operates 68 wastewater treatment plants. About 50% of all sewage receives secondary treatment. The types of sewage treatment facilities include oxidation ditch, activated sludge, waste stabilization pond and primary treatment. The Commission is presently in the process of expanding the sewerage systems in Ocho Rios and Negril to meet the increasing need for sewerage services in those areas. The Montego Bay system is also being upgraded and expanded to meet the long-term requirements for sewage treatment in that city.

3.5.3 Water and Sewerage Infrastructure

The NWC states that over 60% of its water and wastewater facilities have exceeded their useful economic life. As such it experiences frequent breaks in the water systems mains and an unacceptable level of leakage which adversely affects the level of service provided to customers. Additionally, the sewage treatment works require significant rehabilitation to meet National Environment Protection Agency's (NEPA) revised effluent standards. In 2007 NWC estimated that it would cost six billion (J$6B) over a 10-year period to upgrade its sewage treatment facilities to meet the new NEPA standards. This expenditure, however, will not result in any increase in revenues.

3.5.4 Water Quality

NWC states that the present water quality is generally good, but is compromised in some areas by:

1. Saline intrusion
2. Nitrate contamination from fertilizer and improper sewage disposal.
3. Effluents from industries include bauxite, sugar and food processing
4. Pesticides used in catchment areas.

3.5.5 Non-Revenue Water (NRW)

NWC states that current NRW is estimated at 62% and concludes that the high level is as a result of several factors:

- A significant portion of NWC's distribution mains has been in existence for

well over the normally expected life. This has contributed to the high frequency of leakage and general unreliable supply

- Overflows from service reservoirs is relatively frequent on the system due to the large number of facilities involved and the absence of adequate monitoring and control systems
- Slow rate at which leaks are repaired due to inadequate manpower
- Inadequate work on leak detection
- Inadequate labelling of accounts on customer accounting system
- Lack of production meters – approximately 40% of sources production are estimated

3.5.6 Leak repairs

NWC argues that while its aged infrastructure has contributed to a high frequency of leaks and that it has reduced the average time to repair leaks from 8 days in 2004 to 5 days in 2006, the ultimate solution is to have wide-scale replacements of large sections of its pipelines.

3.6 CAPITAL COSTS

3.6.1 Capital Investments

NWC has stated that it has made significant investments to upgrade and extend its existing infrastructure utilizing loan financing. This included the expansion of potable water production capacity, initiatives to reduce leaks, increase system reliability and improve the quality of service and rehabilitation of the facilities. Notably, it has spent US$40M on the Great River Water Supply project to improve capacity from 10mgd to 15mgd. US$38M was spent on the Martha Brae Water Treatment facility to restore its original production capacity of 6mgd. These projects were completed in September 2004 and October 2006 respectively. There are also plans to invest an additional US$92M on water projects in rural areas and the Kingston Metropolitan Area (KMA) region. Additionally, it plans to invest US$54.7M and US$39M on sewerage projects in KMA region and Portland with scheduled completion time of 2010 and 2011 respectively. Concomitantly with the increase in loans, Government has been reducing its capital contributions to the company. NWC reported that during 2003 to 2007 period, Government contribution averaged $415M which represents a significant decline from $2.8B in 2002.

3.6.2 In addition to these projects NWC stated that it has undertaken several rehabilitation activities to its existing sewage systems to reduce adverse environmental impact and reduce inconvenience. These included Old Passage Fort Sewerage (St. Catherine), Boone Hall, Greater Portmore and several wastewater pump stations. NWC stated that the Soapberry Wastewater Project should improve the level wastewater treatment in sections of Kingston and St. Andrew. This project is being facilitated by a joint venture involving the Urban Development Corporation (UDC), the National Housing Trust (NHT), Ashtrom Development and the NWC. With regard to the Harbour

View Wastewater Treatment Plant steps are being taken to reconstruct it under a build own operate and transfer (BOOT) agreement.

3.6.3 NWC indicates that it will also implement a new customer information system (CIS). This will be completed by April 2009 and will cost US$7.5M.

3.6.4 NWC says it that its investment goals are constrained because

- the current tariffs are too low to allow a fair rate of return;
- some projects will not yield any significant increase in revenues; and
- projects will be implemented before demand is in place to fully utilize them.

3.6.5 Cost of Capital

NWC expects to raise debt in US$ at a rate of 12% if it does not get a Government guarantee. Since this is the cost of debt proposed it is therefore inferred that NWC does not expect any further guarantees from Government for any new debt incurred. The company proposes a cost of equity of 14.5%. This was derived using the capital asset pricing mechanism (CAPM). This results in after tax cost of capital of 13.3%.

3.7 FINANCIAL PERFORMANCE

3.7.1 Overview

NWC reports that during the tariff period, January 2004 to December 2007, it experienced improvements in its operating profit[4] but continued to operate at a net loss. NWC attributes this performance to the December 2003 tariff increase, improvements in operating efficiencies resulting from the organizational restructuring and process re-engineering programs and general tightening in the management of the Commission's resources.

3.7.2 The company reports that its revenues increased by an annual average of 14.7% and expenses at 10.1%, but after accounting for depreciation and interest expenses, the revenues are inadequate.

3.7.3 NWC claims that OUR projections at the last tariff review (December 2003) was grossly understated as the company's actual expenses was $8.1B compared to OUR's projection of $6.9B. Taxation was not taken into account as the OUR and the NWC could not have foreseen changes in tax requirements. Also the effective increase of 18% granted by the OUR was significantly less than what was required to move the NWC to a profit-making position. Table 3.3 shows movement in operating profit over the 4-year period.

[4] This is profit before interest expenses and taxation and any other extraordinary items are deducted.

Table 3.3: Summary of NWC's Financial Performance

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Operating Surplus ($M)	-478	-116	640	764	889
Net profit ($M)	-2,112	-1,857	-1,110	-1,210	-1,524

3.7.4 The company also states that the deteriorating financial position has adversely affected its balance sheet as its equity reserves have declined by over $5B during the period. As at the end of March 2007 the value of equity was $10.26B. NWC's liability is in excess of $7B and is expected to increase at an annual rate of over 10%. However, the cash flow showed gradual improvement over the period.

3.7.5 It also states that the pension liability and associated expense put a financial constraint on the Commission; noting that although it has introduced a contributory pension scheme only about 25% of current employees are on that scheme.

3.7.6 Operating costs

3.7.6.1 NWC reports that over the last 3 years it experienced dramatic increases in costs primarily driven by rising electricity costs (as a result of oil prices).

3.7.6.2 NWC stated that as a part of its efforts to be more efficient in its operations, it implemented a restructuring and rationalization programme in October 2003. This exercise was completed in January 2005 and achieved the following:

- Establishment and implementation of the new organizational arrangements, including the reduction in the number of regions from 5 to 2;

- Reduction in staff levels from some 2,600 persons to 2,100, resulting in an 8% decrease in employee expenses. This translates to 4.5 employees per 1,000 accounts.

3.7.6.3 The company argues that for the most part, its salaries were contained because of the MOU between the Government and the Trade Unions. However, employee costs increased by 34% as of January 2006 based on the results of an independent survey comparing NWC's salaries to that of the market. Notwithstanding this increase, its employee costs decreased from 56.3% of operating revenues in 2002/03 to 33% in 2006/07 not including the interest on pension liability which was not a factor in setting the target.

3.7.6.4 However, other aspects of its operations over which it has no control, such as electricity expense, contributed to increased operating costs. Energy cost accounts for approximately 30% of NWC's operating expenses, with the annual energy bill being of the order of $3B for the test year. Energy charges are primarily related to treatment and pumping of water and wastewater, air conditioning and lighting; with pumping and treatment processes accounting for approximately 85% of these costs. Furthermore, several of its water sources are used by the Jamaica Public service Company (JPS) for the generation of hydro electric power. As a result of this, water sources can only be accessed below the hydro plant and because of this it has to pump the water back up to its customers at higher levels. This contributes to the high electricity costs.

3.8 BREAKOUT OF OPERATING COSTS

The Table 3.4 below shows a breakout of operating costs that NWC has proposed over the next three years in constant dollars.

Table 3.4 NWC estimated operating cost

Category/Year	2007/08	2008/09	2009/10	2010/11
Salaries, wages and related cost	4,070,757	4,109,932	4,146,982	4,181,153
Repairs and Maintenance	1,571,238	1,601,110	1,675,134	1,731,816
Administration	1,692,330	1,941,344	1,961,816	1,990,958
Telephone	81,980	81,980	81,980	81,980
Fuel & lubricants	134,741	134,741	134,741	134,741
Electricity	2,904,093	2,904,093	2,904,093	2,904,093
Purchases – water	68,752	68,753	68,753	68,753
Loan interest	339,688	537,861	722,670	870,330
Depreciation	2,403,815	2,885,441	3,419,674	3,867,198
Other	293,726	488,384	603,314	670,291
Private cost	1,090,000	1,050,000	1,050,000	1,050,000
Total	**14,651,120**	**15,586,917**	**16,552,436**	**17,335,291**

3.9 CUSTOMER OPERATION

3.9.1 Customer Base

With regard to the provision of potable water service NWC states that as at March 2007 its customer base was 457,852 of which 368,456 represent active accounts. The customer base increased on average by 2.4% per year during the tariff period. Only 23% of the customer base is provided with sewage service. Table 3.5 shows the movement in the customer base.

Table 3.5: Movement in NWC customer base over 4 year period

	March 2007	March 2006	March 2005	March 2004
CATEGORIES	**Number of Accounts**			
Domestic	**423,277**	**416,161**	**406,585**	**394,783**
Commercial	**31,423**	**30,470**	**29,222**	**28,187**
Primary School	**1,123**	**1,182**	**1,168**	**1,162**
Condominium	**259**	**263**	**255**	**255**
Others	**1,770**	**1,816**	**1,789**	**1,815**
TOTAL	**457,852**	**449,892**	**439,019**	**426,202**

3.9.2 Customer Service

NWC states that to improve service reliability, it has procured additional stand-by generators for its major water supply and wastewater facilities. It has also upgraded its computer hardware and software applications and began using a geographic information system (GIS) to geographically document facilities and customers.

3.9.3 Demand Side Management (DSM)

The company indicates that over the last five years various attempts have been made to implement a DSM program. However, these programs were unsustainable because of rapid changes at the management level, lack of commitment at the senior level and lack of funding support for the program.

3.10 OTHER

3.10.1 Challenges faced by NWC during tariff period

NWC states that it experienced drought, flooding and extensive damage to its systems from 4 hurricanes. It estimates that damage from the hurricanes is in excess of $600M. However, despite these challenges, it recovered quickly. Specifically, in the aftermath of Hurricane Ivan (2004), which affected over 400 supply systems, the Commission restored 90% of its facilities within one month. It restored over 90% of its production facilities within 7 days of the passage of Hurricane Dean (2007).

3.11 MACRO-ECONOMIC REVIEW AND OUTLOOK

3.11.1 The company states that the provision of water is becoming very important in Jamaica, especially with the developments in the tourism sector. As a result of this, it has undertaken a number of water supply improvement projects in North Western Jamaica.

3.11.2 In determining its way forward, NWC considers the Gross Domestic Product (GDP), interest rate, exchange rate, and inflation, to be some of the main macro-economic variables that affect its cost structure and thus its tariff rate determination. The company considers the interest rate to be important as it will be important in the financing of its capital projects. The majority of its equipment costs are quoted in US dollar and so the exchange rate is important. The growth in GDP and the inflation rate will determine the price, cost and sales growth in revenues.

3.11.3 The NWC states that the OUR must take these factors into account when calculating the resultant risks and uncertainties.

3.12 MAKING NWC EASIER TO REGULATE

3.12.1 NWC has outlined the following which it expects will improve its relationship with the OUR and make it easier to regulate in the next tariff period:

• Continue to maintain an open book policy with the OUR;

• Seek to have more frequent dialogue with the OUR at regular intervals on all relevant matters;

• During the recent restructuring exercise, additional personnel and systems were put in place to better collect and analyze information on systems operations. An OUR liaison person has also been designated.

• Seek to agree on more reasonable targets with the OUR and keep the OUR up to date on the details of efforts to achieve these targets.

3.13 REPORTING REQUIREMENTS

NWC argues that it employed best efforts to provide the OUR with the required reports in a timely manner but is of the view that level of detail required may have been excessive and unnecessary in some instances. Consequently, it is proposing a review of the information requirement under the new regulatory framework. It will also undertake a benchmarking exercise with the aim to apply these practices, ideas and procedures to enhance the performance of the organization. It expects that this benchmarking strategy will be a continuous process of striving for and even surpassing pre-determined standards for both technical and financial performance.

3.14 NWC 3-YEAR PERFORMANCE OBJECTIVES

NWC has outlined several financial, customer service and operational objectives it expects to achieve during 2008-2011. This is provided at Appendix 2.

3.15 IMPROVEMENT IN REVENUES FROM WATER

NWC has proposed the following approaches to improve its revenue base:

- Increase the number of customers billed by increasing the growth rate of its customer base over the next 3 years. This will be done mainly by investigating and regularizing disconnected accounts. NWC estimates that it can reconnect at least 20% of the permanently disconnected and 70% of temporarily disconnected accounts over this period.

- Efforts will also be made to minimize the rate at which customers are removed from the system due to disconnection. At present over 2,000

more customers are disconnected than reconnected each month.

- Accelerating the connection of customers in the vicinity of relatively new water supply systems (constructed within the last five years) and expediting the approval of subdivisions in areas where water supply is adequate

- Increase the output from treatment plants by extensively refurbishing the Constant Spring, Mona and Seaview Treatment plants to increase reliability and improve water quality. Additionally, major systems will also be examined to determine the extent to which further backup facilities can be economically applied to reduce down time.

3.16 REDUCE NON-REVENUE WATER (NRW)

3.16.1 Non-Revenue Water (NRW) is estimated at 62%. The company states that efforts will be intensified to reduce overall level of NRW to below 50% by end 2011 and at most 45% by 2013.

3.16.2 NWC states that comprehensive programs for reducing NRW have commenced and include activities completed in Hanover, St. James and Trelawny. Also pipeline replacement and other NRW reduction activities are now being done in the Greater Spanish section of St. Catherine. The KMA Water and Sanitation Project also have provisions for a NRW project.

3.17 IMPROVEMENT IN REVENUE FROM SEWAGE

3.17.1 As it relates to increase revenue generation from sewage, the NWC states that it will:

- Fully enforce legal powers to bill customers within 100m of systems;
- Extend sewerage network in built-up areas;
- Assist with financing of customer connections;
- Rehabilitate old sewerage systems to improve treatment capability.

3.17.2 In addition to the traditional means of revenue generation, the NWC has proposed that it will explore the sale of laboratory services to the public and sale of bottled water to strengthen its revenue base.

3.18 IMPROVEMENT IN COLLECTIONS

NWC has stated that it will improve its collection rate to 94% over the next 3 years by:

- Exercising a zero tolerance for late payment of bills;
- Continuing its incentive program for early payment;
- Providing payment reminders by way of the Call Centre and later through the proposed Interactive Voice Response system;
- Utilizing community based initiatives for Red Areas to encourage better payment practices;

- Establishing a comprehensive major account executive program;
- Seeking to charge interest on late payments.

3.19 COST CONTAINMENT

In order to further contain costs NWC proposes to:

- Improve efficiency of operations of facilities by improving the water treatment and distribution efficiency as well as sewage collection and treatment efficiency. The focus of the efficiency gains will be on reducing the energy costs. NWC states that a comprehensive energy cost reduction program has been prepared and will be implemented starting with priority areas such as Mandeville and the major electromechanical facilities.

- Reduce the cost of commercial operations by decreasing the number of commercial offices from 13 to 8. The company will continue to encourage customers to pay their bills at private payment agencies and lodge complaints via its Call Centre.

- Minimize the cost of support services by reducing transportation and materials management costs. Transportation costs are expected to be reduced by outsourcing the management of the NWC's fleet. Materials purchasing and management procedures will be improved to reduce procurement costs and minimize losses.

- Minimize administration and general costs by introducing some level of self insurance for its assets and reducing security costs by office consolidation and greater use of surveillance equipment and security systems.

3.20 CUSTOMER SERVICE

3.20.1 Customer Service and Public Image

- NWC has proposed the following major activities to improve its general customer service and public image:
- Customer education to improve understanding of water bills, as a large proportion of complaints relate to billing;
- Increasing the speed of repairs of visible leaks;
- Enhancing the services provided by the Call Centre;
- General facelift of facilities and offices;
- Continued implementation of the demand side management program to assure customers that it is taking their interests seriously.

3.20.2 Demand Side Management (DSM)

NWC says that although there is sufficient water available to supply expected increases in demand, it is important to put renewed effort in DSM programs. Consequently, the company proposes to re-launch and maintain an aggressive

DSM program aimed at making consumers aware of the importance of conservation. The program will address issues such as the installation of water saving devices at customer premises, recycling of water and lobbying for legislation to support water use efficiency.

3.21 OPERATIONS

3.21.1 Water Quality

NWC states that it recognizes the need for comprehensive water quality monitoring, public awareness programs and more stringent measures aimed at protecting watershed areas. It plans to focus on improvement in its water quality by improving the monitoring and testing procedures, revisiting the operating procedures for problem facilities and upgrading plants and systems as appropriate.

3.21.2 Wastewater

In addition to the rehabilitation of its existing sewerage treatment facilities, the NWC also plans to sewer all major towns by 2020.

3.21.3 NRW Reduction

NWC indicates that during the next 2 years NRW reduction efforts will be intensely focused in Kingston and St. Andrew (KSA), Port Antonio and Greater Spanish Town. The program will be extended in a systematic manner to address the NRW problem island-wide. This includes the decentralizing of the NRW effort, with each area having its own UFW Reduction Unit comprising a UFW coordinator and support staff; and the respective Area Managers being held accountable for the level of UFW in their respective Regions. NWC proposes to reduce NRW to 45% over the next 5 years.

3.22 The strategies NWC plans to employ to reduce NRW are:

- Diagnostic study to review the results of the pilot studies and auditing of the system. This should accurately identify the extent of UFW at different phases of the company's operations, that is, production, transmission, service reservoirs, house connection, metering and billing. NWC thinks this would be beneficial as currently the company does not have a full appreciation of the breakdown of UFW according to the respective components. Information from this study will better inform the understanding of the levels of UFW on the system and the key causative factors. This in turn will allow better targeting and prioritization of UFW reduction strategies.

- Network Zoning and Zone Metering to help identify and reduce UFW throughout the island. This will involve the sectionalizing of the system such that specific sources feeding a specified area can be identified. With the information obtained from this exercise, UFW within particular geographic areas can be more accurately identified and quantified. This will also facilitate better prioritization and targeting of activities.

- Customer Survey to determine the properties connected to its systems and to validate and complete the customer records on its computerized billing system. This will be the main basis for identifying the different levels and components of UFW in respective geographic locations. This census will also identify the zone in which each customer falls so that consumption can be more accurately matched against supply.

- Increase its manpower in the leak detection and repair activities.

- Meter its entire production sources. Defective meters are also being repaired or replaced.

3.23 Energy Efficiency Improvement

NWC indicates that there are several opportunities for energy cost reduction and will be confirmed through detailed audits and analyses. Key strategies to be employed for improving energy efficiency will include the following:

1. Increasing plant efficiency, including motor and pump efficiency, ensuring that equipment is operated and maintained in accordance with specifications, and monitoring process variables to optimize operations.

2. Optimizing operation of water pumping equipment including, where possible, taking advantage of off-peak energy rates through installation of additional storage capacity.

3. Maximizing the use of gravity driven sources by placing facilities at higher elevations, where feasible.

4. Improving the monitoring and control of water transmission and distribution operations.

5. Reducing UFW.

6. Utilizing energy efficient lighting and air conditioning systems at facilities.

7. Where feasible, utilizing alternative energy sources such as wind and hydroelectric power.

3.24 Operation and Maintenance

NWC has proposed that improvements will be made to its current O&M capability by, *inter alia*, the preparation of operation and maintenance manuals for the respective facilities, and the provision of financing to acquire necessary tools and equipment. Improvements will also be made in NWC's ability to rapidly respond to, and address, system faults. It will also boost the rapid response team with the vehicles, equipment and financing needed to fix problems as they occur. This initiative will cut unplanned service outages significantly.

3.25 Internal Processes

NWC states that it will improve its internal processes relating to customer service issues such as complaints management and the management of assets including asset maintenance. It will also retool and re-educate it human resources, and to the extent possible, develop compensation based on performance.

3.26 Customer Information System (CIS)

NWC states that it will replace its CIS system by mid 2009. The new CIS will allow for greater flexibility and interconnection to other information systems in the Commission. The overall billing and customer service procedures and systems will also be reviewed in order to bring them up to world class standards. This will include examination of the feasibility of establishing a centralized call centre (or a call centre in each region), which will facilitate ease of receiving and responding to customer complaints and queries.

3.27 Meter Reading

Improve its monthly meter reading from approximately 98% to 100%.

3.28 <u>DEMAND FORECASTS</u>

3.28.1 The NWC expects that there will be increased demand for potable water as a result of growth of the urban population and an increase in per capita demand in the rural areas. The company projects that by 2030 all urban areas will be provided with potable water while 75% of rural areas will get service.

3.28.2 The NWC states that whilst there is adequate raw water available to meet overall demand for at least another 15 years, it faces a major constraint as the water sources do not generally coincide with the major demand centers. This would necessitate the installation of major transmission infrastructure.

3.39 Return on Equity

NWC proposes that the return on equity should be calculated using the Capital Asset Pricing Model (CAPM). The CAPM formula specifies that

$$R_e = R_f + \beta(R_m - R_f) + \varepsilon_i$$

Where:

R_e = Rate of return for shareholders

R_f = Risk free asset return

β = Systematic risk of the asset

R_m = Market rate of return

NWC proposes that the values of the components of the CAPM formula are

R_f = 7.62% (GOJ 2017 on 21/2/08)

β = 0.62 = industry sector average*

R_m = 17.08% = using proposed opportunity cost of funds as a proxy

This results in a return on Equity (R_e) of 13.5%

CHAPTER 4: PUBLIC CONSULTATION

4.0 Introduction

Pursuant to section 11 (2) of the OUR Act which states that the OUR may consult with stakeholders on the rates or fares to be charged by a licensee, the OUR held fourteen (14) public consultation meetings across the island to hear the views of utility consumers on the NWC's application for a 44% rate increase. The meetings also served to provide feedback to the Office on NWC's service to consumers since the company's last approved tariff in 2004.

4.01 A summary of the NWC's rate application was placed in the print media along with the dates, time and location of the meetings for each parish. The NWC's application was also placed on the OUR's website and in public libraries across the country.

4.02 The OUR worked with post offices islandwide to ensure that flyers which detailed parish specific meetings were distributed to households. The schedule of meetings was further promoted through the electronic media including local subscriber television stations and were the topic of discussion during several interviews with the media involving representatives from the OUR. Where possible, the services of a 'town crier' were engaged and special interest groups such as the Parish Councils, Chambers of Commerce and churches were asked to assist with promotion. Members of staff contacted and invited to the meetings consumers whose telephone details were available in the OUR's database.

4.1 Format of the Consultations

The Office – represented by the Director General – presided over the meetings. At each meeting the NWC showed a video of projects to be undertaken by the Commission, current operational challenges and several testimonials from stakeholders and industry experts in support of their submission for the proposed increase. The NWC also made a presentation specific to its operations in each parish that the meeting was being held. At the end of the presentation, the floor was opened for questions and comments.

4.2 During each meeting, the NWC cited several reasons for their submission. Some of which were as follows:

- Existing tariff does not fully cover operating costs
- Major costs associated with hurricanes and flooding
- Aging infrastructure was in need of replacement
- The need to invest to address existing levels of Non Revenue Water (NRW)
- Significant service deterioration would likely occur in the absence of a new tariff

4.3 Views on the Proposed Tariff Increase

4.3.0 It was evident throughout the consultations that the majority of NWC customers were not opposed to the company receiving an increase in rates. In fact, the view was expressed that on an international level, the NWC has been providing 'good water' but this however did not justify the need for a 44% increase. It was the opinion of many that NWC's presentation in support of such an exorbitant increase merely reflected the Commission's operational inefficiencies. It was strongly felt that if the NWC was efficient in its operations, only a small increase would be needed.

4.3.1 Many examples of inefficiency were cited. At the Westmoreland consultation, it was noted by one consumer that NWC allowed a property that was tenanted, to accumulate arrears over several months prior to the supply being disconnected. At the time of the disconnection, over $70,000 was owed on the account which the NWC has not been able to collect. It was felt that a simple task of disconnecting the supply when amounts become overdue in this and many other cases was one of the first steps in becoming efficient.

4.3.2 Despite majority acceptance that a small increase is necessary to sustain the business, there were customers who were totally against any increase to the company at this time. In their opinion it was unfair to be asked to pay more for a service that they were currently not receiving – with the Commission making the same arguments that it had previously made when an increase was requested [and received] in 2003. These customers challenged the NWC to improve the existing service after which an increase could then be requested. One customer in particular made the statement that any increase to the NWC in its current inefficient state would only result in greater waste.

4.3.3 A chartered accountant remarked at the Kingston and St. Andrew consultation that the NWC did not have a comprehensive investment plan with detailed analysis of the costs and associated incremental benefits (revenue) that could be derived from these investment projects. It was felt that the lack of such undertaking by the NWC gave the impression that it was not operating in a prudent and efficient manner with the underlying objective of making a profit.

4.3.4 There was also the view that water rates have been moving with inflation due to the Price Adjustment Mechanism (PAM) on bills and any movement in electricity cost that is not recovered through the PAM can otherwise be recovered by operating efficiently.

4.3.5 Differential Tariffs

At the St. Mary and Trelawny consultations consumers expressed the view that there should be differential tariffs on a parish basis. It was their belief that as the costs to provide water to some parishes are higher, customers of these parishes should pay more for the service. It was also felt that if there was accounting separation per parish, this would assist in identifying different areas in which the Commission was operating inefficiently.

4.4 Non Revenue Water (NRW)

The NWC reported during the consultations that in terms of the status of NRW, thirty percent (30%) were due leaks, approximately 5% was attributed to social usage such as water at fire hydrants and the remaining 25% was due to commercial losses which included under registering meters, theft and bypass. Given the high level of NRW many consumers considered this as the single most important area that required improvement, which if achieved, would significantly reduce the Commission's operating deficit.

4.4.1 Leaks

Numerous examples were cited by customers of leaks throughout the parishes which were not addressed by NWC in a timely manner - resulting in the loss of several thousand gallons of water. Consumers felt that the delay in repairing leaks was a reflection of the Commission's lack of commitment to address this matter as in most cases the NWC was notified repeatedly of the location of leaks in the parishes. It was also stated by customers that the Commission's inefficiency in this area was magnified by the excess NWC personnel/contractors who are eventually deployed to repair leaks.

4.4.2 NRW - Commercial

As it relates to the commercial side of NRW it was felt that the NWC was negligent in verifying accounts with meters that are suspected to be under registering due to defects or tampering. The NWC stated that it was at 67% in terms of accounts with functioning meters which was below the target of 85% that was set by the OUR in the previous rate determination. Consumers were of the view that there should be no 'red areas' as stated by NWC as the Commission should utilize the services of the Constabulary and Defence forces to access these areas and communities to collect monies that are due to them for water supplied. It was their belief that it was unfair to be paying for water when others blatantly refuse to pay or stole the commodity.

4.4.3 NRW - Social

In terms of the social component of NRW, the view was expressed that this should be funded by the government especially given that the NWC no longer benefits from government subsidies.

4.5 NWC in response to the customers concerns regarding NRW stated that the Commission is committed to addressing this issue, however, to significantly reduce NRW levels necessitates the need for major investments to replace aged infrastructure. The company also said that in order to reduce commercial losses aged meters will be replaced.

4.6 Irregular Supply /Unreliability of Supply

Outside of leaks, consumers in most parishes complained bitterly about the unreliability of the supply to some districts. There were numerous complaints of water lock offs with some consumers expressing concern about the lack of notification by NWC in most instances. Consumers in parishes such as

Portland, St. Mary, St. Ann, Hanover, Manchester, St. Elizabeth, St. Catherine, and sections of St. Andrew appeared to be most affected.

4.6.1 Portland

In Portland, consumers who reside in areas such as Boston, Fair Prospect and Fairy Hill reported that the NWC did not truck sufficient water to the area whenever the piped supply became unavailable. They were also concerned that water which was normally received had been diverted to serve hotels and other commercial entities that were currently under construction.

4.6.2 St. Mary

Consumers in St. Mary stated that there was no sustainable water supply to the parish, yet the plans that were previously stated by NWC to drill wells to complement the existing supply in the parish have not materialized. They further noted that there have since been three (3) new housing schemes in the parish that are currently awaiting the supply. They also found it ironic that the NWC tanks that store water for sections of the parish have been known to overflow on numerous occasions.

4.6.3 St. Ann

Residents of Walkerswood in St. Ann reported that they previously had a continuous supply of water as they had used their own resources to drill a well to serve the community. They stated however that after the operation of the well was taken over by the NWC, water supply to the community became infrequent. The supply is reportedly received sometimes twice per week. They expressed concern that the water was being diverted to other districts and noted that the NWC was not capitalizing on the abundance of water in the parish which it can obtain by drilling wells.

4.6.4 Hanover

In Hanover, consumers complained that there was no water in areas such as Woodsville, Dryhill, Prosper and Greenland. The view was expressed by some that the water was diverted by NWC to supply tourist resorts in the Negril area to the detriment of local residents.

4.6.5 Manchester

Residents of Mandeville in the parish of Manchester were very vocal in their disapproval of any increase to NWC. Their disapproval came against the background that over the years the residents of the parish have not been satisfactorily supplied with water from the NWC. The concern was expressed that the volume of water to the parish had not increased after twenty (20) years, which is reflective of a lack of vision by NWC. Residents reported that there was no supply or insufficient supply in areas such as Willowness District, Caledonia Avenue, Bloomfield Gardens and Russell Place Meadows. A resident of Perkland Drive commented that although the community is located in close proximity to one of NWC's supply tanks, no water was received from the Commission in four years. Another resident who resides in

Georges Valley could not understand the reason that community was not receiving water given that neighbouring communities were being supplied. It was felt by many that commercial investors were avoiding the parish because of the current water woes.

4.6.6 St. Elizabeth

Consumers in St. Elizabeth complained of water wastage by the NWC in sections of North West St. Elizabeth to the detriment of other communities in the parish. A resident of Iva Cottage stated that the community has approximately 100 residents however despite the NWC main being only a mile from the community, the residents receive no water. The cry of no water was echoed by residents of Olive Park, Parrotee, Seaview and Merdon in Leeds.

4.6.7 St. Catherine

In St. Catherine there were concerns that areas such as Bogwalk and Prospect were being deprived of water as the water sourced from these locations was diverted to serve residents of Portmore. While representatives from these communities complained about lack of water, residents of Portmore were concerned about the frequency of lock offs, low pressure and poor quality.

In the Spanish Town area, residents of Greendale were also troubled by the frequency of water lock offs. The residents reported that there was infrequent trucking of water by NWC during times of water lock offs - which sometimes lasted for weeks. There was also the concern that whenever water was available, the pressure was extremely low resulting in residents resorting to the purchase of pumps in order to receive the precious commodity. Residents of Avon Park reported that water to the area was reliable prior to the Angels Estate development. They stated that they now had to wait until late at night to get water.

4.6.8 St. Andrew

In the parish of St. Andrew consumers in areas such as East Kirkland Heights, Sterling Castle and sections of Waterloo and Molynes Roads all had the same complaint of irregular supply of water by the NWC. Again the concern was raised by these consumers that there appears to be no proper procedure in place to provide information to residents on when water lock offs will occur, the areas to be likely affected and the duration. A customer who resides in the Iron River District of west rural St. Andrew reported that he has not had water in his pipes for the last 3 months as only a small section of the district is served regularly by the Commission.

4.7 Sewerage Charge

At most of the consultation meetings, the issue of the sewerage charge being 100% of water charges was of great concern to consumers. Residents of Portmore in particular were of the view that as the sewage that is collected at the treatment plant in Waterford is not processed, this charge should be

reduced to 50%.

4.7.1 The manufacturing sector had similar concerns regarding sewerage charges. In a meeting held between the OUR and representatives of the Jamaica Manufacturers Association (JMA), members of the association were of the view that special consideration should be given to the sector as water was an important input in production. As majority of the water used did not enter the sewerage system, they also felt that there should be a revision of the application of sewerage charges to the sector. In a subsequent letter to the OUR, the JMA proposed the following:

1. Sewerage charge to be calculated based on water usage minus a percentage estimate of water retained in the final product or utilized outside
2. Sewerage charge to be rebated if a company does not discharge water to the main sewers

4.7.2 The JMA was also of the view that sewerage charges should not be applicable in cases where manufacturing companies although located within the specified distance of the NWC's sewerage main, do not utilize the Commission's treatment plant or sewerage line having already invested in their own treatment plant.

4.7.3 There was also the argument by others that sewerage charges levied were being used to subsidize the overall inefficient operation of the Company at the expense of adequate maintenance and upgrading of sewer facilities. Further, it was felt that there should be accounting separation for water and sewerage systems as only then could the efficiency performance of each service be properly assessed.

4.8 Capital Improvement & Expansion Projects

Although most customers endorsed the projects highlighted by the NWC to improve its ability to provide water to some parishes, they were however of the view that the Commission should not seek to fund these ventures through a tariff increase. It was their view that the NWC has the ability to source funding internationally, make the necessary improvements to the service after which they may seek to recover a portion of these capital costs from customers. They also felt that given the importance of water, the NWC should seek the assistance of the Ministry of Foreign Affairs to source funding.

4.9 Customer Service Issues

Poor customer service by NWC representatives specifically at its commercial offices was highlighted by consumers throughout the consultations. It was the consensus that the staff at these locations needed special training in customer relations. Apart from staff's mannerisms, consumers felt that staff at the Commission's contact centres was not properly briefed on important information that has to be disseminated to consumers. There was also the issue

of the difficulty in accessing the Commission's contact centre through its toll-free number.

4.9.1 In Portland, consumers complained that NWC offices in the parish are closed early, especially on Thursdays and Fridays resulting in an inconvenience to customers who have enquires regarding billing and other services.

4.9.2 Billing punctuality was an issue of concern that was conveyed at several meetings. Parishes such as Portland and Hanover appeared to be the most affected

4.10 Water Quality Issues

Although the quality of water supplied by the NWC was thought to be acceptable overall, two concerns on this matter were expressed during the consultations. Residents of Fairy Hill in Portland complained that the water to the area had a high salt content which made it unsuitable for drinking.

4.10.1 The NWC in response to Fairy Hill residents advised, that the new Port Antonio water supply and sewerage project which involves the rehabilitation of wells and transmission and distribution systems will address the water quality problem in the area.

4.10.2 There was also the concern of some residents in the Portmore St. Catherine of the presence of high levels of chlorite and manganese in the water resulting in the need for regular repair and replacement of plumbing faucets by residents. They expressed concern that continuous intake of these substances is harmful to humans and although numerous complaints were made by the Greater Portmore community to NWC offices in Portmore and Kingston, no permanent solution is being effected by the Commission. A consumer who resides in the Portmore Pines area advised that she had lost a washing machine as a result of the high manganese content in the water received from the NWC. She stated further that occasionally NWC installs a filter at her premises to improve the quality of the water supplied, however this only provides a temporary solution as the filter becomes corroded within days.

4.10.3 The Commission gave no indication of a plan to permanently address the manganese problem as communicated by residents.

4.11 Metering

The lack of meters was an issue of concern that was communicated throughout the consultations. Approximately 366,239 customers have meters. However of this amount, 84,985 meters have become defective. The Commission also has 63,357 un-metered customers.

4.11.1 Customers who are currently un-metered and are billed by the NWC on a flat rate complained that in the absence of meters, a proper assessment of the individual household size was not conducted prior to the application of a

monthly fixed consumption for which these customers are billed.

4.11.2 There were other consumers who were of the view that the estimated consumption that was billed by the NWC far exceeded prior billings by the Commission. These consumers were metered, but in some cases the meter had become defective and had not been replaced within the time period specified under the Guaranteed Standard Scheme.

4.11.3 The methodology for estimating metered accounts for billing purposes specifies that the average of the last three meter readings should be used to derive an estimate of the consumption. However, in the absence of three recent meter readings – for example, a defective meter that was not replaced by the NWC – it was felt that the Commission should estimate the consumption based on the size of the household.

4.12 Other Issues

4.12.1 Damage to road network

Another major concern of customers was the damage to roads by the NWC to facilitate the laying of pipes. It was generally felt that the NWC did not place sufficient urgency in repaving the roads at the completion of projects, nor were these roads satisfactorily repaired. It was recommended that NWC work closely with the National Works Agency (NWA) to prevent the 'digging up' of roads shortly after they had been resurfaced.

4.12.2 Housing Development Concerns

The view was expressed that although there is private participation in the water sector, the Commission should have more of an input prior to any approval for new housing developments in areas that it currently supplies with water, especially in instances where the area is unlikely to be attractive to new water providers.

4.13 Quality of Service Standards

4.13.1 Overall Standards

Throughout the consultations concerns were expressed regarding low water pressure and interruption of supply without prior notification. As it relates to water pressure, the Commission's reports indicate an approximate 80% compliance with the specified pressure range. In terms of compliance with the minimum notification time prescribed by the standard of intention to interrupt supply, the Commission's report indicates that it is at 90%.

4.13.2 The Guaranteed Standards Scheme

It was anticipated by the Office that the consultations would provide much needed feedback from consumers on the effectiveness of the Guaranteed Standards Scheme. Unfortunately, however, not many views were expressed on the scheme throughout the parishes. Notwithstanding the minimal feedback, there was strong advocacy for the inclusion of 'wrongful disconnection' as a standard. During the last 2 years there has been an increase

in contacts to the OUR's Consumer Relations Unit regarding supplies that were inadvertently disconnected by the utilities. Consumers expressed the view that this error by the companies should not go unpunished as the companies' action inconveniences and embarrasses the customer. It was also suggested that the NWC should give notification prior to disconnection and this should form a part of the Guaranteed Standards.

4.14 Compliance of the NWC to the Guaranteed Standards

4.14.1 As part of the tariff review process, an assessment of the Guaranteed Standards was undertaken to ascertain whether they remain relevant, as well as to examine the company's level of compliance. The review also served as an indicator of whether compensation payments in some or all areas of breach should be automatic.

4.14.2 The NWC is required to submit to the Office on a quarterly basis, reports on its performance under the Guaranteed Standards Scheme. The review of NWC's performance was done using the information submitted for the calendar years 2006 and 2007 as more complete data was provided by the Commission for these periods.

4.14.3 From the reports, the NWC has been performing well in most areas covered under the scheme. The Commission's average compliance in connecting new customers within the specified 10 working days of signing the contract currently averages 90%. In the last tariff review for the NWC of 2003, the average compliance in this area was a 49%.

4.14.4 As it relates to the issuance of first bill within the specified 48 working days after connection, the Commission's average compliance at the time of the 2003 review was at 91%. The company's current compliance in this area is 99%.

4.14.5 The Commission has consistently performed well in terms of notifying customers in the event that a previously scheduled appointment cannot be accommodated. The NWC's average compliance in this area in the 2003 review stood at 98%. Since 2006 the Commission has maintained an impeccable record of 100% compliance with this standard.

4.14.6 At the 2003 review, the Commission's compliance regarding acknowledgement of written complaints – not related to billing- within 5 working days averaged 85%. The NWC currently has an average compliance of 98%. The NWC has also improved its compliance in completing non billing complaints within the 30 business days standard from a previous 75% at the previous review to a current 97%. In terms of acknowledgements of written complaints – billing related – the Commission maintains a compliance of 98%. The NWC compliance currently averages 99% compared to a previous compliance of 84% in 2003 for billing related complaints completed with the

30 business days standard. Going forward, the OUR will not require the NWC to separate its compliance with acknowledgement and investigation of complaints into billing and non – billing.

4.14.7 In terms of reconnecting customers after payment of overdue amounts, the Commission improved its compliance from 89% to a current 97%.

4.14.8 The issue of metering continues to prove challenging to the Commission. At the last review, NWC's compliance with the standard to install meters within 30 days of such a request was at 61%. Although there has been an improvement in this area to a current compliance of 77%, the Commission informed during the consultations that it faced difficulties obtaining meters within a specified time due to the procedures involved in the Government's procurement process.

4.18.9 The NWC's ability to comply with the standard to repair or replace meters within 40 business days of verification of a fault is similarly affected by the difficulty with the Government's procurement process. The Commission's previous compliance in this area averaged 68% but has since improved to a current 82%. Notwithstanding the challenges communicated by the Commission, the OUR is of the view that NWC has to find a way to acquire meters in a timely manner if it intends to reduce the current NRW level.

4.18.10 Approximately 80% of the breaches committed resulted from the Commission's failure to read some meters within 2 months of the last actual reading. On a monthly basis, the Commission is expected to read approximately 240,000 meters. The NWC has 98% compliance; however, that 2% non-compliance would translate to approximately 4,800 breaches in this area on a monthly basis.

4.18.11 The information submitted by the NWC to the OUR on its performance under the scheme for the 2007 calendar year showed that the NWC committed a total of 52,418 breaches with a potential payout to customers of at least $53,000,000. The NWC reportedly paid out less than $20,000 during the period as only a few claims were submitted by customers.

4.19 Making a Claim

It was communicated during the consultation process that the current compensation amount was not sufficient incentive for customers to go through the 'hassle' of claiming for a breach of a standard. It was felt that the costs involved to do so outweigh the benefits. This response from customers was reflective of the extremely low number of claims received by the NWC.

Table 4.1: Summary of Concerns Communicated at NWC Consultations

Parish	Concerns Communicated								
	Leaks	Irregular / unreliability	Poor water Quality	Poor Customer	Damage to road network	Metering	Inefficient business	Flat Rate / Estimation	Sewerage Charge
St. Thomas	✓	✓		✓		✓	✓		
Portland	✓	✓	✓	✓	✓		✓		
St. Mary	✓	✓		✓	✓		✓	✓	
St. Ann	✓	✓			✓		✓	✓	✓
Trelawny	✓	✓		✓	✓	✓	✓		
Hanover	✓	✓		✓	✓		✓		
St. James	✓	✓		✓	✓	✓	✓		
St. Catherine	✓	✓	✓	✓	✓		✓		✓
Clarendon	✓	✓				✓	✓		
Manchester	✓	✓		✓	✓		✓	✓	
St. Elizabeth	✓	✓		✓		✓	✓		
Westmoreland	✓	✓		✓			✓	✓	
Kingston & St. Andrew	✓	✓		✓	✓	✓	✓	✓	

CHAPTER 5: OFFICE EVALUATION OF APPLICATION

5.1 Introduction

In making this determination the Office has given due consideration to several issues:

- efficient cost recovery,
- adequate service delivery,
- sustained financial viability,
- rate structure that is simple but reflects the cost of usage whilst not unfairly burdening consumers at the lower end of the consumption spectrum.
- targets set at the last rate review

5.2 At the 2003 rate review, the Office included in its determination[5], several performance benchmarks that the NWC should achieve under the 3-year tariff period (see Table 5.1). These targets addressed the operational, financial and customer service aspects of the company's operations. The regulatory framework which was developed and issued shortly after the determination included further details of the various targets as well as the reporting requirements to be met by the NWC. The Office regarded the achievements of these targets as critical to the financial sustainability of the NWC and also factored the achievement of these targets in the development of an efficiency factor. The following highlight the main targets that were set and which the Office expected the NWC to achieve over the 3-year period.

- Receivables – net receivables shall be at most 25% of revenues; bad debt provision 8% of revenues.
- Employee Costs – shall be at most 35% of revenues by March 2006
- Asset Indexation – develop an indexation mechanism to adjust the value of assets in between the years of asset revaluation. The revaluation of assets should be done every 5 years. This mechanism should be agreed with auditors and applied in the 2004/05 financial year.
- UFW – reduced to 51% by March 2007.
- Billing and collection – collection rate shall be at least 92% of billed revenues.
- Billing related complaints – complaints should be at most 5% of total bills printed.
- Meter reading – at least 97% of meters must be read in each billing cycle.
- Functioning meters – at 85% of accounts must have functioning meters.

[5] See *National Water Commission Review of Rates: Determination Notice, Document No: WAT 2003/02*. available at www.our.org.jm.

- Reports – reports should be submitted within 45 days of the end of each relevant period.

5.3 With regards to reporting, the Office is dissatisfied with the level of reporting during the 3- year period. The NWC did not meet the 45 days deadline in most instances and even with the delay in submission, there were questions raised at times as to the accuracy of the reports submitted. The NWC has argued that the reporting requirements are onerous, but the Office maintains the view that the level of detail required represents the normal level of reporting required by a company that provides water and sewerage services to inform business and management decisions.

Table 5.1 Performance Targets for NWC

Performance Measure	Target – per 2004 Tariff Review	NWC Performance – Dec 2007
Net receivables	Not more than 25% of revenues	17%
Bad Debts	Not more than 8% of revenue billed	5%
Employee cost	Not more than 35% of revenues	32%
Asset valuation	Assets re-valued and brought to books and indexation mechanism developed	Done
Billing and collection	Collection 92% of billed revenues	95%
Unaccounted for water	53% by March 2006	62%
Inactive accounts	Revisit disconnected account within 90 days to ensure no illegal connection	
Functioning meters	85% of accounts	67%
Water quality	99% compliance	
Waste water quality	MOU with NEPA to achieve compliance	99%
Billing related complaints	Not more than 5% of bills printed	3%
Meter reading	Every other month and 97% in billing cycle	95%

5.4 The NWC reports indicate that instead of reduction in UFW, level increased and at December 2007 was 62%. Additionally, functioning meters reduced to 67% over the 3 years. The Office is of the view that the performance of the NWC in this regard has been a significant contributor to the poor financial status of the company. Furthermore, the lack of functioning meters may also have prevented the NWC from determining the actual amount of water losses it experiences.

5.5 Although NWC revenues grew, it was mostly attributed to the movements in the PAM, and not additional water sales. This is so despite the average of 2.4% annual growth in its customer base.

5.6 It will be recalled that the Office determined that it will assume that the NWC will have achieved the specified the targets at the next review of the rates. The NWC has not provided any convincing arguments as to reasons why it was unable to achieve the specified targets. Consequently, in making this determination on the new rates the Office will be constrained to assume that NWC is operating in a more efficient manner by taking into account the expected impact of the achievement of the benchmarks set at the previous review.

5.7 The Office will also give due consideration to the issues raised at the public hearings.

5.8 The Office must also determine the appropriate test year that should be used as base on which the tariffs will change over the next 3 years. The Office has adopted the approach to use the most recent audited financial statements as the test year. In this case, the most recent audited data available is for the year ending March 31, 2007. The Office has determined that this will be the test year. However, the test year financial statements have been adjusted to reflect information that is known and measurable and which will occur within twelve months of this analysis. The Office has also applied the deemed efficiency adjustments based on previous targets to these statements.

5.9 TOTAL OPERATING COSTS

5.9.1 Introduction

The Office is of the opinion that the deemed operating costs should reflect the reasonable cost of providing acceptable quality of service to customers. Examination of the movement of expenses over the 4-year tariff period shows a steady increase in the level of these expenditures. This is highlighted in Table 5.2.

Table 5.2: Movement in operating cost component ($'000)

Category	2003/04	2004/05	2005/06	2006/07	Budgeted 2007/08
Salaries, wages and related cost	3,312,807	3,333,171	3,461,897	4,090,587	4,070,757
Repairs and Maintenance	619,011	1,039,284	1,134,358	1,323,774	1,571,238
Administration	975,414	1,038,814	1,290,069	1,480,758	1,692,330
Electricity	1,295,188	1,608,696	2,217,620	2,637,865	2,904,093
Purchases – water	49,982	72,653	67,335	66,874	68,752
Loan interest	175,983	75,086	134,750	192,808	339,688
Depreciation	1,453,303	1,669,403	1,769,007	1,834,368	2,403,815
Other	145,103	157,887	184,451	195,866	293,726
Total	**8,026,791**	**8,994,994**	**10,259,487**	**11,822,900**	**13,343,050**
% Change	**-**	**12.06%**	**14.06%**	**15.24%**	**12.8%**
Cumulative % change	**-**	**13.33**	**26.12**	**41.36**	

5.9.2 NWC has indicated that its budgeted operating cost for 2007/08 is $13,343M. This represents a 12.8% increase over the previous period cost.
In addition, NWC also indicates that it will be purchasing services for wastewater treatment from the new Soapberry plant built by Central Wastewater Treatment Company at Soapberry and a proposed new plant at Harbour View. When the projected operating costs for the Soapberry and Harbour View Treatment plants are added ($1,050M), this percent change moves to 21.7%.

5.9.3 Details of the Office's adjustment to the main cost items in NWC's budget are discussed below.

5.10 Repairs and Maintenance (R&M)

5.10.1 In a group of companies that provide water and sewerage services, with over 60% of its infrastructure less than 10 years old, R&M costs accounts for an average of 7% of total operating costs. NWC has stated that historically it has under maintained its assets, and this is one of the reasons why there is significant need for rehabilitation. The NWC has proposed several capital projects to undertake an extensive rehabilitation programme, but has also made provisions for repairs and maintenance cost of $1,571M. NWC states that this more adequately reflects the true cost of maintaining its assets.

5.10.2 Whilst the Office accepts that proper maintenance of the assets are necessary, the extent of R&M should reduce for the assets that have been extensively rehabilitated. If new assets are added, then the repairs and maintenance may increase, as the asset base has increased.

5.10.3 NWC has provided $202M for general repairs in the distribution network up from $111M in the test year on the basis of additional assets in the ground. The Office has made provisions in the K-factor for mains replacement and therefore would not expect this category to show such a marked increase in the period to be covered by this tariff regime. The Office will allow $120M for this expense on the basis of inflationary movement in prices. The total amount allowed for Repairs and Maintenance is therefore $1489M.

5.11 Claims

The provision for total claims is $7.08M for the 2007/08 period. NWC states that $4.99M of this amount is attributed to legal claims expected to be made against the NWC and compensation for damage to customer premises. However, in the accompanying notes to the financial statements, the report states that whilst a value has been assigned to claims and contingencies, there is no actual provision in the reports as they are unable to ascertain the likelihood of the payout. In this regard, the Office has disallowed this amount in the accounts as it would not be prudent to pass through expenses that have not been or is unlikely to be incurred in the operating costs.

5.12 Employee Costs

5.12.1 *General*

Employee related costs constitute a significant proportion of NWC's operating costs. Over a 4-year period, however, the contribution of employee costs as a percentage of total operating costs has been declining. Within the first year of the tariff regime, it constituted 41% of total cost but reduced to 35% by the end of the tariff period. The main factors that could explain this are the downsizing of NWC's staff complement as a result of internal restructuring exercise, as well as the imposition of 2 memorandum of understanding (MOU) between the government and the unions. Whilst it is important to note the contribution of salaries to the total cost of operations, the Office considered it more critical to link the NWC's performance to its revenue generation, as this would force the NWC to either grow its revenues, or contain its costs if revenues growth is flat.

5.12.2 As part of the last tariff determination, the Office set a target for employee costs to be at most 35% of the Commission's gross revenues by March 2006. The data shows that NWC has met this target

5.12.3 There are, however, specific aspects of the NWC's budgeted allocation for employee costs that the Office deems it appropriate to address.

- *Incentive Scheme*

The NWC has made provision of $80M for each of the next 8 years for an incentive scheme. This scheme is designed to compensate all employees for meeting certain performance targets. If targets are met, the provision is divided equally among all employees. The Office is of the view that if the NWC exceeds the performance targets then the additional income generated from this should be sufficient to pay for employee incentives. The decision by the NWC to offer this incentive scheme is purely a business decision and should not be a charge to customers. Consequently, the Office has disallowed this amount from the calculation of employee costs.

- *Pension Interest Cost*

NWC had not in the past operated a contributory pension scheme but, as is the case of Central Government, paid pensions out of revenues. The new accounting standard required the NWC to reflect the outstanding pension liability on its balance sheet while passing changes in its value to the profit and loss account. The difficulty NWC faces is that the liability and charges are reflected in its statement without the corresponding assets which would be in place for a contributory pension scheme. In the previous determination the Office disallowed the accrued interest on the liability which arose as a result of the non-contributory pension scheme. The Office, however, stated that it would pass through all current expenses related to the pension scheme. Subsequent to this the NWC established a contributory pension scheme but most of its employees have opted not to participate in this plan.

5.12.4 From time to time the NWC conducts an actuarial valuation of its pension plan, and includes on its books, the present value of future pension obligations. This pension obligation is based on the current salary and past service of qualified employees. The present value is determined by applying a discount rate to the future value (expected payout), but this discount rate periodically changes. Whenever this rate changes, the difference in value (interest cost[6]) is expensed to the profit and loss account. The NWC has reported that the pension interest expense is $770.631M.

5.12.5 Any adjustment to the assumptions that increases the pension obligation is treated as an expense in the profit and loss statement. With the exception of actual pension expense paid, all other pension related costs are non-cash items. However, unlike depreciation, where the value of asset declines, the interest expense results in an increase in the pension obligations, which, when netted against the fair value of the plan, is carried as a liability on NWC's books. If the Office were to pass through this pension interest cost to the total operating costs and also include the actual pension payments as they arise it would result in double counting. Since the Office has included pension liability as part of the rate base, it will disallow the pension related interest cost included as part of employee costs.

5.12.6 The Office is of the opinion that the accounting standards imposes a burden on NWC and do not allow for an accurate portrayal of the position of the company. While the standards correctly quantifies the pension liability and the balance sheet indicates that there is no fund set aside to discharge this liability, there is no reflection in the financial statement that the Office is committed to allow for the actual cost of the pension benefits in current and future tariffs. The liability serves to reduce the equity of the company as it would be the responsibility of the shareholders if ownership was being transferred.

5.12.7 The Office is of the opinion the situation would be resolved if the equity holder, in this case the government, assumes the liability and a binding commitment be given by the regulator to continue to allow the actual pension payments as they become due. This commitment could be solidified by the way of a directive or an amendment to the NWC Act.

The proposal would relieve the financial statements of the burden of reflecting the liability and any associated changes without there being the need to demonstrate the corresponding assets to discharge this liability.

5.12.8 The NWC had proposed $4,070M for employee related costs but with the above adjustments, the Office has determined that this is $3,238M.

[6] Interest cost is also defined as the additionally liability that is created as employees under the plan gets closer to receiving their pension payments.

5.13 Staff Welfare

5.13.1 The Office made adjustments to the provision for staff welfare in the determination of the total operating costs.

5.13.2 The NWC included a provision of $21.736M for employee discount for water. The Office has no objection to the NWC providing this benefit to its staff.. Consequently, the Office has allowed this amount.

5.13.3 The NWC included a provision of $7.089M for occupational health. This was a significant increase over the test year 2006/07 amount of $0.883M. No reasonable justification was provided for this significant increase. The Office has made an adjustment to this figure to reflect the expected change in inflation. The Bank of Jamaica's (BOJ) has predicted that inflation for the period will be between 13%-14%. Based on this projection, the Office has reduced the provision for occupational health from $7.089M to $1M to reflect movement in annual inflation.

5.13. There was also a provision of $18M for course seminar and conferences. Although this represents a 65% increase over the previous reported figure, the Office is of the opinion that training will be an integral factor in allowing the NWC to achieve increased efficiency. The Office will therefore allow this amount.

5.14 Loan Interest

NWC has made provisions for loan interest of $339.688M as part of its total operating costs. The actual cost of debt will be used in the revenue requirement.

5.15 Private Project Costs

5.15.1 The NWC proposed $1,050M as costs that will be incurred on an annual basis for the treatment of sewage at the Soapberry ($840M) and Harbour View ($250M) treatment plants. The NWC has argued that the cost involved to connect the Harbour View Treatment plant to the Soapberry system will be greater than building a stand alone plant, as such; there will be independent operating costs for both plants. The Office however has made provisions in this rate decision for a K-factor to refurbish and rehabilitate waste water treatment plants including that at Harbour View so that they can meet environmental standards.

5.15.2 As it relates to the Soapberry plant, however, the onus is on NWC to increase the volume of sewage flows to the Soapberry treatment plant in order to reduce the unit costs over time. Presently, there is no comprehensive sewage network in Kingston and St. Andrew (KSA)

5.15.3 The Office is of the view that an extensive programme must be implemented in the short term to facilitate the sewering of all areas that are within the KSA

region. Based on NWC's data, only 33%[7] of its customers in KSA have sewerage services. Whilst it may not be possible to connect all customers in this area to the sewerage networks, there is significant amount of revenue to be gained from connecting the greater part of the KSA area to this wastewater treatment facility. As the marginal cost of treatment at the Soapberry facility is relatively low, it must make good economic sense to expand the collection network so as to reduce the average cost of treatment.

5.16 Electricity costs

5.16.1 Electricity expense is the next largest component of total operating costs after employee costs. It represents on average 20% of total costs. Given the Jamaican topography, electricity consumption will constitute a relatively high proportion of total costs as water is required to be pumped from low to elevated areas where the population is dense. In addition, the price of oil on the world market has continually increased during the tariff period. Since this is a direct pass through to JPS customers, it also contributed to an increase in the electricity costs to the NWC. Table 5.2 shows that there was a marked increase in these costs over the 4-year period and NWC have budgeted for this cost to be $2,904M for the 2007/08 financial period. The recent trend in the price of oil suggests that this estimate is understated as the current monthly charge is in the region of $320 million. The Office does not expect any significant reduction in oil prices but is of the opinion that there could some mitigation of this increase in electricity rates if NWC were to take full advantage of the current electricity tariff structure. Data submitted to the Office indicates that only a few of NWC's facility are on the Rate 50 tariff category which offers lower rate since electricity is taken at higher voltage from the transmission network rather than from the low voltage distribution network. Moving facilities to the Rate 50 category would involve the ownership of transformers but the experience of other customers of the electric utility has been that the pay back period is less than a year.

5.16.2 In the last tariff review, the NWC had stated that it would be implementing an energy management plan over a 6-year period which would result in net savings of $324M. The Office has not seen any evidence to indicate that this plan was implemented. However, in the development of the X-factor, the Office has assumed that this project would translate to an improvement in NWC's efficiency.

5.16.3 Whilst the government is presently exploring alternate fuel sources to reduce the negative effect of increasing fuel prices on the economy, this is a medium to long-term solution. Regardless, energy costs being a significant driver of water production costs must occupy the attention of the NWC on a continuous basis where ways and means of utilising electricity on an increasingly efficient basis must be identified and implemented.

[7] There are 116,341 customers in KSA of which 38,390 are sewered.

5.16.4 The Office has reviewed NWC kilowatt hour consumption as well as its water production data, to determine whether its provision of $2,904M is reasonable. This proposal was based 10% increase over the test year expenditure of $2,658M. Based on the current price of $18.84/kWh and the present consumption of 17,726 MWh to produce 5,100 million gallons of water monthly and after taking into consideration possible efficiency gains, the Office is of the view that a provision of $3,500 M is more realistic and has allowed this amount in the total operating costs.

5.17 Administration costs

The actual total administration costs for the year ending 2007/08 was $1,369M. The NWC projects increased amounts for insurance, rental, security services and licensing and therefore projected an amount of $1,692M. NWC projects bad debts amount of $689M or about 6% of revenues. The Office has targeted bad debt as 5% of revenues and therefore will allow $603M for bad debts. Total administration cost allowed is $1,605M

5.17 Depreciation

5.17.1 Depreciation accounts for the wear and tear of assets used in the provision of service and is recorded as an expense on the NWC's profit and loss account. The provision for depreciation increased significantly, at the last tariff review, as a result of NWC's asset revaluation exercise. To avoid this jump in expense in the future, the Office mandated the NWC to develop an asset indexation mechanism (to reflect fair market value), which would adjust asset values on an annual basis.

5.17.2 The NWC has developed an indexation mechanism based on the Handy Whitman Index[8] and has stated that the gross asset values has increased by 3.8% in the 2006/07 period. As at end of 2006/07 period, total fixed assets were valued at $25,504M but this value increase to $27,209M in the current presentation as a result of the indexed adjustment. With the increase in asset values, the provision for depreciation will also increase. NWC has proposed depreciation of $2,403M. The test year depreciation amounts to $1,834M. Depreciation for the year ending March 2008 is estimated to be $1,845M. The Office will allow $1,915M in the calculation of rates after factoring the increase in asset values.

5.18 OUR regulatory fee

The regulatory fee due to the Office of Utilities Regulation is dependent on the amount allocated from its annual approved budget to the water sector. This in turn is dependent on the work programme to be undertaken each year. The Office has however instituted a self-imposed cap on the fees due

[8] The Handy Whitman Index trend changes in construction cost for building in the gas, electric and water utility sectors. The index numbers are generated for various categories of plant and equipment using construction cost data. The asset categories are source of supply, pumping plant, water treatment plant, transmission plant, distribution plant and miscellaneous items.

from the water sector of 0.6% of gross revenues. The Office will allow the fees equivalent to the cap in the approved expenses. This amounts to $80M.

5.19 Other Expenses

- *Foreign Exchange Loss*

The majority of NWC's loans are denominated in foreign currency. As a result of this, the NWC may experience a foreign exchange loss or gain on the payment of these loans. During each of the 4 years under the existing tariff regime, the NWC reported foreign exchange losses. This is as a result of the steady devaluation of the local currency as well as the lack of hedging instruments to offset losses that may be incurred. As a result, the NWC has assumed a foreign exchange loss of 3%[9] per year on the total loans outstanding[10] and has included a provision of $162.1M for foreign exchange loss.

The Office is of the opinion that the loans represent assets on the balance sheet. With a devaluation of the dollar and an increase in the Jamaican dollar value of the loans there is a corresponding increase in the asset values and the depreciation charges associated with these assets. The depreciation charge is the flip side to the principal payments as it allows for the reservation of cash to defray principal payments on loans. The PAM allows for changes in the depreciation charge and return on capital arising from movements in the foreign exchange rate. The Office has therefore disallowed this amount in the revenue requirement as it is highly speculative and the effects are provided for elsewhere.

5.20 After incorporating the above adjustments, **the Office has determined that total operating costs to be included as part of the revenue requirement is $13,292M.**

[9] This is derived from computing past foreign exchange losses as a proportion of total loan outstanding.
[10] This value of the loan portfolio is $5,166M and includes the new loans of $2,287M to fund capital projects and is 80% greater than that of 2006/07 ($2,879M).

CHAPTER 6: CAPITAL EXPENDITURE

6.1 Introduction

In the performance of its duties, the Office has a responsibility to ensure that service providers are provided with resources to ensure that assets used in providing service are in good condition. In this context, these may include a mix of (a) capital expenditure to rehabilitate, (b) replace inefficient or defective plants and; (c) efficiency improvements in organization and operations. Having satisfied itself that, despite best efforts, the service provider will sustain losses and will not be able to meet its obligations, the Office has a duty to prescribe such remedies, as it considers as reasonable to enable the company to maintain viability.

6.1.1 The major vehicle for the recovery of capital investments should be through depreciation. If NWC is required to service the loans used to finance capital projects, then this will be recovered through the return on investment. The NWC submitted an extensive capital works programme in its tariff application. NWC has not presented robust information in regards to the added revenues which will flow from these investments. Consequently the Office is not in a position to include costs and revenues associated with most of these projects.

6.2 Meters

6.2.1 The NWC has included as part of its capital projects, $1,224M spread over an eight year period for customer metering programme. NWC states that 373,740 meters will be installed over this period. The NWC states that this project will be financed internally. The Office is of the view that the meter programme is not primarily geared towards metering new customers as the NWC projects that its customer base will grow by 3% (just about 13,000 customers) whereas 31,145 meters proposed to be installed per year. As it relates to metering or replacing meters for existing customers, the Office is of the view that metering is an ongoing business practice activity and provisions for depreciation on the value of meters in NWC's asset base has already been made to take care of replacements. If the Office were to allow this project in the calculation of the rates, NWC rate base would increase and it will get a return on this investment, as well as depreciation on value of meters in its asset base without the added revenue flows being taken into account. In addition the Office had instituted a K-factor in a previous tariff regime (2001 to 2003) geared at improving the level of metering. At the end of the regime the target of 85% functioning meters was attained. This has subsequently slipped to 67%. The Office is of the opinion that the payback period for the provisioning of properly working meters is very short. The NWC's own analysis also points to this. The Office will not make any further provisions in this regard.

6.3 NRW

6.3.1 Between 2005 and 2007, US$12M was expended to implement NRW reduction measures for commercial losses in Western parishes, but this

resulted in only a 5% reduction in NRW. The NWC argues that it is on this basis that capital is necessary to undertake a comprehensive mains replacement programme island wide. The NRW component of the Martha Brae Water supply project revealed that water losses were mainly due to commercial (50%) and physical (50%) losses. In the parish of St. James, NRW is reported at 66%. It was revealed that commercial losses constituted the majority of this amount as 65% of temporarily disconnected accounts were illegally reconnected. Only 5% of active accounts had illegal connections. The NWC stated that at the completion of this project there was a 39% actual (30% real) increase in billing.

6.3.2 Between 2003 and 2004 a leak detection and repair programme was completed in Hellshire, St. Catherine. NRW reduced from 66% to 49% and the amount of water produced in the area was reduced by 33%. In the Ensom City area of Spanish Town, however, where NRW is reported at 67%, NWC states that most of the losses are associated with physical losses. Consequently a mains replacement programme, to target physical losses, and increased monitoring of active accounts are NWC's listed plan of action. At the end of this programme, NWC expects a 50% increase in billed consumption and a 10% reduction in daily water production. It is also anticipated that NRW will reduce to 46% by 2010.

6.3.3 The KSA and Port Antonio projects are focused on mains and pipelines replacement to address physical losses. At the completion of the Kingston Water and Sanitation project in 2012, NRW is expected to be 40%. The Port Antonio Water Supply and Sewerage Project includes as a NRW reduction programme but the targeted NRW was not specified. The major aspect of the mains replacement project is scheduled to be completed during 2008.

6.3.4 The GOJ and EU co-financed a $10M euro project to carry out extensive rehabilitative and extension works in several rural areas[11]. The activities commenced in 2004. As it relates to Milk River, NRW reduced from 93% to 39% within 18 months, billed consumption increased by 300% and the number of active customers increased by over 200%. Hope Bay's NRW reduced from 64% to 47% and in Manchester, NRW reduced by 26% (to 59%).

6.4 Capital programme

6.4.1 The NWC has proposed that it will undertake capital programme as listed in Table 6.1 below.

[11] This included Milk River (Clarendon), Hope Bay (Portland), Christiana/Spaulding (Manchester) and Shettlewood (Hanover).

PROJECT	START	DUR.	Project Cost kJ$	Amount to be Spent kJ$	2007	2008	2009	2010	2011	2012
Kingston Water & Sanitation	**2007**	**5**	**2,970,000**	**2,970,000**	**0**	**161,832**	**822,492**	**993,974**	**991,703**	
	2007	5	2,640,000	2,640,000	0	141,832	731,104	883,532	883,532	
	2007	5	330,000	330,000	0	20,000	91,388	110,442	108,171	
Mandeville Water Supply	**2009**	**2**	**396,000**	**396,000**			**198,000**	**198,000**		
50%	2009	2		198,000			99,000	99,000		
	2009	2		198,000			99,000	99,000		
Constant Spring Sewerage	**2010**	**1**	**150,000**	**150,000**				**150,000**		
50%	2010	1		75,000				75,000		
	2010	1		10,000				10,000		
		1		65,000				65,000		
KSA Sewerage Extensions	**2007**	**6**	**660,000**	**660,000**	**80,000**	**85,000**	**192,500**	**192,500**	**192,500**	**192,500**
50%	2007	6		330,000		55,000	55,000	55,000	55,000	55,000
	2007	6		330,000	80,000	30,000	137,500	137,500	137,500	137,500
Customer Meter Installation	**2007**	**12**	**1,181,417**	**1,181,417**	**125,000**	**125,000**	**127,500**	**130,050**	**132,651**	**135,304**
100%	2007	12		1,181,417	0	125,000	127,500	130,050	132,651	135,304
	2007	12		-	125,000	0	0	0	0	0
Motor Vehicle Procurement	**2007**	**12**	**1,276,000**	**1,276,000**	**-**	**144,000**	**144,000**	**144,000**	**144,000**	**100,000**
75%	2007	12		957,000	0	108,000	108,000	108,000	108,000	75,000
	2007	12		319,000	0	36,000	36,000	36,000	36,000	25,000
In-house Capital Program - compute	**2007**	**12**	**905,754**	**905,754**	**-**	**46,000**	**49,450**	**53,159**	**57,146**	**100,000**
0%	2007	12		-	0	0	0	0	0	0
	2007	12		905,754	0	46,000	49,450	53,159	57,146	100,000
Martha Brae to Braco	**2007**	**1**	**2,398,476**	**369,026**	**369,026**					
	2007	1	**478,934**	**196,869**	196,869					
	2007	1	**392,971**	**160,402**	160,402					
	2007	1	**228,578**	**11,755**	11,755					
	2007	1	**315,567**	**0**	0					
	2007	1	**982,427**	**0**	0					
	2007	1	**-**	**-**	0					
NEW CIS SYSTEM	**2008**	**2**	**495,000**	**495,000**		**247,500**	**247,500**			
75%	2008	2	371,250	371,250		185,625	185,625			
	2008	2	123,750	123,750		61,875	61,875			
					5.4%	*27.7%*	*33.5%*	*33.5%*		
KMA Water Supply & Rehabilitation	**2007**	**4**	**5,643,000**	**4,932,597**	**265,000**	**1,366,000**	**1,650,799**	**1,650,799**		
	2007	4	3,960,000	3,293,097	257,500	1,016,000	1,009,799	1,009,799		
	2007	4	1,518,000	1,474,500	7,500	295,000	586,000	586,000		
	2007	4	165,000	165,000	0	55,000	55,000	55,000		

PROJECT	START	DUR.	Project Cost kJ$	Amount to be Spent kJ$	2007	2008	2009	2010	2011	2012
Milk River Water Supply	**2007**	**1**	**90,000**	**40,000**	**40,000**					
	2007	1		40,000	40,000					
	2007	1		-	0					
Christiana-Spaldings	**2007**	**2**	**198,000**	**138,000**	**124,200**	**13,800**				
	2007	2		138,000	124,200	13,800				
	2007	2		-	0	0				
Santa Cruz Water Supply	**2007**	**1**	**99,000**	**34,000**	**30,600**	**3,400**				
	2007	1		34,000	30,600	3,400				
	2007	1			0	0				
Port Antonio Water Supply	**2008**	**3**	**396,000**	**396,000**		**138,600**	**257,400**			
	2008	3	330,000	330,000		115,500	214,500			
	2008	3	66,000	66,000		23,100	42,900			
Green Pond Sewerage	**2008**	**2**	**260,000**	**200,000**		**100,000**	**100,000**			
	2008	2		100,000		50,000	50,000			
	2008	2		100,000		50,000	50,000			
Well Rehbilitation	**2009**	**12**	**377,000**	**377,000**	**-**	**-**	**58,000**	**58,000**	**58,000**	**29,000**
	2009	12		301,600	0	0	46,400	46,400	46,400	23,200
	2009	12		75,400	0	0	11,600	11,600	11,600	5,800
East Action Plan	**2007**	**12**	**1,120,000**	**1,120,000**	**40,000**	**200,000**	**200,000**	**200,000**	**60,000**	**60,000**
	2007	12		896,000	0	160,000	160,000	160,000	48,000	48,000
	2007	12		224,000	100,000	40,000	40,000	40,000	12,000	12,000
West Action Plan	**2007**	**12**	**960,000**	**960,000**	**40,000**	**200,000**	**200,000**	**200,000**	**40,000**	**40,000**
	2007	12		768,000	0	160,000	160,000	160,000	32,000	32,000
	2007	12		192,000	100,000	40,000	40,000	40,000	8,000	8,000
Soapberry Sewerage	**2007**	**2**	**3,339,600**	**-**	**0**	**0**				
	2007	2		-	0	0				
	2007	2		-	0	0				
Harbour View WWTP	**2008**	**3**	**396,000**	**-**		**0**	**0**	**0**		
	2008	3		-		0	0	0		
	2008	3		-		0	0	0		

PROJECT	START	DUR.	Project Cost kJ$	Amount to be Spent kJ$	2007	2008	2009	2010	2011	2012
Ferry Water Supply	**2009**	**2**	**2,406,360**	**2,406,360**			**1,203,180**	**1,203,180**	**0**	
80%	2009	2	1,925,088	1,925,088			962,544	962,544		
	2009	2	481,272	481,272			240,636	240,636		
Constant Spring System Rehabilitat	**2009**	**2**	**1,494,240**	**1,494,240**			**747,120**	**747,120**	**0**	
80%	2009	2	1,195,392	1,195,392			597,696	597,696	0	
	2009	2	298,848	298,848			149,424	149,424	0	
Commercial Service Improvement (KSA & Ocho Rios)	2009	2	**1,128,600**	**1,128,600**			**564,300**	**564,300**		
80%	2009	2	902,880	902,880			451,440	451,440		
	2009	2	225,720	225,720			112,860	112,860		
			5,029,200							
Old Harbour Water Supply	**2009**	**3**	**330,000**	**330,000**			**110,000**	**110,000**	**110,000**	
50%	2009	3		165,000			55,000	55,000	55,000	
	2009	3		165,000			55,000	55,000	55,000	
Darliston Water Supply	**2007**	**2**	**-**	**-**	**0**	**0**				
	2007	2		-	0	0				
	2007	2		-	0	0				
Savana-la-mar Water Supply	**2011**	**3**	**660,000**	**660,000**					**0**	**0**
50%	2011	3		330,000					0	0
	2011	3		330,000					0	0
Braco to Pear Tree Bottom	**2008**	**2**	**1,251,360**	**1,251,360**		**702,762**	**539,025**			
	2008	2		641,328		320,664	320,664			
	2008	2		436,721		218,361	218,361			
	2008	2		163,738		163,738	0			
Ocho Rios to Port Maria	**2011**	**3**	**2,310,000**	**2,310,000**					**0**	**0**
80%	2011	3		1,848,000					0	0
	2011	3		462,000					0	0
Eastern St. Mary Water Supply	**2009**	**2**	**330,000**	**330,000**			**0**	**0**		
50%	2009	2		165,000			0	0		
	2009	2		165,000			0	0		
Port Antonio Sewerage	**2007**	**2**	**660,000**	**660,000**		**165,000**	**247,500**	**247,500**		
	2007	2		660,000		165,000	247,500	247,500		
	2007	2		-		0	0	0		

PROJECT	START	DUR.	Project Cost kJ$	Amount to be Spent kJ$	2007	2008	2009	2010	2011	2012
Kingston Sewerage Rehabilitation	**2008**	**4**	**660,000**	**660,000**			**165,000**	**165,000**	**165,000**	**165,000**
80%	2008	4		528,000			132,000	132,000	132,000	132,000
	2008	4		132,000			33,000	33,000	33,000	33,000
Other Water Supply Projects	**2007**	**12**	**6,000,000**	**6,000,000**	**-**	**-**	**-**	**-**	**-**	**-**
80%	2007	12		4,800,000	0	0	0	0	0	0
20%	2007	12		1,200,000	0	0	0	0	0	0
Other Wastewater Projects	**2013**	**12**	**6,000,000**	**6,000,000**	**-**	**-**	**-**	**-**	**-**	**-**
80%	2013	12		4,800,000	0	0	0	0	0	0
20%	2013	12		1,200,000	0	0	0	0	0	0
TOTAL CAPITAL COST			**27,593,036**	**20,882,583**	**1,113,826**	**3,698,894**	**7,259,465**	**6,443,281**	**3,154,179**	**821,804**
CUMULATIVE CAPITAL COST					1,113,826	4,812,720	12,072,185	18,515,466	21,669,645	22,491,449

CHAPTER 7: RATE BASE AND RETURN ON CAPITAL

7.1 The Office will use the CAPM model to determine the cost of equity from the perspective of an international investor. The cost of equity will also be specified in real terms as the PAM allows for foreign exchange and inflation adjustments.

7.2 The return on equity will be determined by multiplying the cost of equity by the rate base.

7.3 WACC Calculation by UK Water Utility Companies

Table 7.1 outlines the conventional estimate of the WACC.

Table 7.1: Estimates of WACC

Inputs:	**Percentage**
Proportion of debt	26%
Nominal risk free rate	4.8%
Debt Spread	1.25%
Corporate tax rate	30%
Equity beta	0.75
Market Risk Premium	9.2%
Cost of equity	11.4%
After tax cost of debt	4.2%
Nominal WACC	9.5%
Real[12] WACC	6.6%

Source: Regulation Initiative Discussion Paper Series Number 28.

7.3.1 Office of Water Services (OFWAT) has also estimated the value of the WACC for regulated companies. Table 7.2 provides this data.

Table 7.2: OFWAT estimate of the Cost of Capital of the Water Sector

Inputs	**Percentage**
Proportion of debt	54%
Risk free rate	2.75%
Corporate tax rate	30%
Equity beta Undisclosed	imputed as 1.28 adjusted to reflect gearing
Market risk premium	3.25%
Real Cost of equity	6.9%
Real After tax cost of debt	2.9%
Real WACC	4.75%

Source: Regulation Initiative Discussion Paper Series Number 28.

[12] The inflation rate is subtracted from nominal WACC to get the real WACC.

7.3.2 It is important to note that calculations of WACC will vary based on the assumptions used in the calculation of Cost of Equity and Cost of Debt.

7.4 WACC Calculation by US Water Utility Companies

In the United States, commission-authorized rates of return on equity for water utilities range from 9% to 13.65% in California to 7.2% in Arizona. However, some experts in utility finance believe that water utilities' cost of capital for ratemaking purposes is too low given the risks particularly for small water utilities.

7.5 Office Determined Cost of debt

7.5.1 There are two ways to account for interest expense. The actual loan interest can be included as part of the total operating costs, and the return on investment would be the equivalent to the return on equity only. Alternately, a WACC, which comprised of the average cost of debt (interest) and equity can be calculated and applied to the total asset base. Both methods cannot be used in the determination of return on investment as loan interest would be accounted for twice.

Since adequate information is available on the loan portfolio, and the gearing ratio is comparable to international standards in the water and sewerage sectors, the Office will use the actual cost of debt.

7.6 Office Determined Cost of equity

7.6.1 The Office is of the opinion that the appropriate rate of return is that which should be sufficient to attract a global investor into the water business in Jamaica. The Office has determined that a proxy is that of a US investor making a decision on whether to invest in a business in Jamaica. The rate of return is therefore calculated in US dollar terms. NWC revenues and asset base are indexed to account for movements in the rate of exchange of Jamaican dollars to US dollars. The revaluation of NWC's assets and the inclusion of a Price Adjustment Mechanism in the tariffs mean that the NWC is assured of real returns on its equity. The appropriate rate of return should therefore be expressed in real terms.

The NWC states that it has used the Capital Asset Pricing Model (CAPM) to derive the cost of equity. The CAPM model is comprised of risk free rate and market risk premium as set out in the formula below. The Government US dollar bond is used as a proxy for the risk free rate (r_f) and the risk premium (RP), which is the compensation to an investor for taking on additional risk is added to the risk free rate to get the cost of equity.

$$CAPM = R_f + \beta(R_m - R_f)$$

where R_f is the risk free rate
R_m is the market rate and
β is the riskiness of the investment relative to the market.

7.6.2 The NWC has assigned β of 0.62 and a risk free rate of 7.62% being the

current on GOJ 2017 US bond. NWC proposes a market return of 17% resulting in a cost of equity of 13.5%.

7.6.3 The Office agrees with the NWC that the company is less risky than the market, and as such a beta value of less than 1 is appropriate

7.6.4 The risk free rate used should be equivalent to a long term (greater than 10 years) government issued US dollar denominated bond. This long term rate is used as the Office assumes that NWC will be a going concern in the foreseeable future The Office will use the 2017 bond yield 7.62%) to determine the risk free rate. In 2007 the US inflation rate was reported at 2.85%. This means that the real risk free rate is 4.77%.

7.6.5 The market return on equities has been low for the past 2 years because the stock market is in a bearish mode. The data in Table 7.2 above shows that the market risk premium ranges from 3.25% to 9.2% across the UK, US and the Caribbean. The average of 6.225% is used to represent the international benchmark. When this value is included in the CAPM, the resultant cost of equity is 11.48% in nominal terms and 8.63% in real terms.

7.6.6 NWC has proposed an equity base of $10,769M. The company states that this amount represents NWC's investment in the business and excludes government contributions. As stated in the last tariff review, the Office will only calculate a return on equity that is invested by the NWC, as the government's contribution to the capital base serves to offset the rates that are passed through the customers. The Office has reviewed NWC's accounts and has allowed the company's proposal of $10,769M. When the cost of equity of 8.63% is applied to the equity base, it yields a return on equity of $929M.

CHAPTER 8: REVENUE REQUIREMENT

8.1 Revenue requirement is the amount of money a company requires to be financially viable whilst delivering an acceptable quality of service to its customers. The Office will determine the revenue requirement on an accrual basis, where the incorporation of cash and non-cash items will be included in its budgeted operating expenses.

8.2 Revenue requirement is the sum of total operating expenses, taxation and return on the rate base.

8.3 In order to derive this, the total operating costs of the company is examined and the assumptions as discussed in Chapter 5 are incorporated to determine the total operating costs[13].

8.4 The return on investment is to compensate NWC for making investments in its water and sewerage infrastructure.

8.5 In the previous rate review determination no provision was made for corporation tax as NWC was exempted. However, in January 2004, the NWC was required to pay corporation tax and as such this must now be given due consideration in determining the revenue requirement.

8.6 The NWC has included the sum of total operating costs, loan interest expense, taxes and return on investment as its revenue requirement but the Office has excluded loan interest since return on investment is based on the WACC.

8.7 The Office has determined that the total operating costs for the 2007/08 financial period is $13,294M. The NWC has proposed that its total expenses would be $14,651M over the similar period. Table 8.1 outlines the estimated operating costs.

Table 8.1: Breakout of Office determined total expenses

Category	NWC Budgeted 2007/08 - $'000	OUR Determined 2007/08 - $'000
Salaries, wages and related cost	4,070,757	3,238,126
Repairs and Maintenance	1,571,238	1,489,000
Administration	1,692,330	1,604,971
Telephone	81,980	81,980
Fuel & Lubricants	134,741	134,741
Electricity	2,904,093	3,500,000
Purchases – water	68,752	68,753
BOO wastewater treatment	1,090,000	840,000
Loan interest	339,688	339,688
Depreciation	2,403,815	1,915,000
OUR Regulatory Fee		80,000
Other	293,726	
Total	**14,651,120**	**13,292,259**

[13] Total operating costs includes depreciation charges.

8.8 The Office has determined that the rate base is $10,769M, When the cost of equity is applied is applied to the Office determined rate base, it yields a return on equity of $929M. The NWC proposed return on investment of $1,641M.

8.9 NWC has received tax exemption from the government for at least the next five years. NWC has therefore projected that it will not pay any tax during the next 5 years and as such has not made any provisions for taxation in the revenue requirement. The Office has accepted this proposal, and has not made any provisions for taxes in its calculations.

8.10 The Office has determined that the total revenue required is $14,221M (see Table 8.2).

Table 8.2: Breakout of Revenue Requirement

Category	**NWC's Proposal**	**Office Determined**
Total operating costs	**14,651,120**	13,292,259
Return on investment	1,640,808	929,000
Taxation	0	0
Total	**16,291,928**	**14,221,259**

8.11 The NWC has not provided a credible demand forecast and/or any rationale for its revenue, less the adjustment for PAM, to be at best flat over the last tariff regime. This is in the face of average customer growth of over 2%. The Office had set the X-factor at 3.5% in the last tariff regime with the expectation that this would be achieved by a combination of increase in revenues arising from a reduction in NRW and a reduction in the real level of expenses. Data submitted by NWC indicates that it has achieved neither.

8.12 Office had indicated in its 2003 determination that it would take the expectations flowing from performance against the set targets into account in subsequent tariff determinations. The sample NRW projects submitted by NWC indicate that with a more widespread effort in NRW reduction the target revenues could have been achieved. The Office has addressed the future of the NRW programme in the K-factor. If the NWC had achieved its targeted level of efficiency its current profitability would have been higher by an amount equivalent to 14% of it current revenues or by about $1,400M.

8.13 NWC has indicated that there have been mitigating circumstances contributing to the targets not being achieved. There were outlined in Chapter 3.

8.14 The Office has taken these into consideration and will assume a deemed $500M to the projected revenues to represent where it ought to be if the targets were achieved. This will have the effect of reducing the return on equity by the equivalent amount.

8.15 The Office has taken the actual un-audited operating revenues for the financial year 2007/08 of $9,811M and adjusted for the following factors,
ANPAM adjustment. The local inflation component of PAM was applied in March 2008 and therefore the full impact of this is not reflected in the recorded revenues. The effective change in tariff at the Annual PAM (ANPAM) adjustment was 3.6%.

PAM since annual adjustment A further 1.97% adjustment has been made to the base rates at the ANPAM adjustment .

Customer growth Assuming the customer growth of 2% over the period 2007/08 was spread evenly over the year an average of 1% increase in revenues.

would be expected with the current rates. This assumes that there is no change in demand side management activities.

The above adjustments to the un-audited actual 2007/08 operating revenue gives an estimated normalised amount of revenues totalling $10,468M *Deemed revenue.* As discussed above a deemed revenue of $580M is being assumed to account for efficiency gains that the Office had expected NWC to make.

8.16 Table 8.3 summarizes the estimated revenues at current rates

Table 8.3: Estimated Revenues

Revenue type	**2006/07 (J$'000)**	**NWC projection 2007/08 at current rates (J$'000)**	**OUR-determined 2007/08 normalized at current rates (J$'000)**
Water	6,325,008,000	6,804,615,097	
Sewerage	1,880,361,000	1,913,501,079	
Service charge	1,108,485,000	1,168,609,372	
PAM	102,242,000	100,475,509	
Bulk Water	25,229,000	8,347,989	
Bulk Water Shipping	5,128,000	5,495,196	
New Installations	59,332,000	59,961,749	
Reconnections	97,478,000	103,061,064	
Total operating revenue	***9,603,263,000***	***10,164,067,055***	***10,467,637,310***
Cesspool & Other Sewerage	8,903,000	11,609,562	11,609,562
Operating Grant -	-	-	-

Long Term			
Staff Discount - Revenue	19,760,000	22,124,312	22,124,312
Sludge	-	-	-
Other income	292,847,000	230,719,130	230,719,130
Amortization of Capital grants	268,470,000	280,000,000	280,000,000
Interest	99,088,000	80,212,786	80,212,786
Project Revenue	7,854,000	140,000,000	140,000,000
Deemed efficiency gains			**580,000,000**
TOTAL REVENUE	**10,300,185,000**	**10,928,732,845**	**11,812,303,100**

8.17 At this current rate, there is a shortfall of $2,411M in the revenues of the NWC to meet the revenue requirement. Table 8.4 shows the expected revenue shortfall.

Table 8.4: Revenue Shortfall

Category	**Amount $'000**
Total operating cost	13,292,259
Return on Investment	929,000
Total required	**14,221,259**
Revenue Projected	11,812,303
Shortfall	2,408,956

8.18 A 23% change in operating revenues is required to offset this shortfall.

Chapter 9: RATE STRUCTURE

9.0 WATER RATES

9.1 The Office has determined that the effective increase of NWC rates shall be 23%.

9.2 The rates effective as at May 1, 2008, shall be as shown in Table 9.1

Table 9.1 Water Rates

		Base 2007 Rates	Rate as at March 2008	OUR Determined Rates
	SERVICE CHARGE			
	5/8 inch/15mm	290.69	296.42	364.59
	3/4 inch/20mm	596.65	608.40	748.34
	1 inch/25mm	780.26	795.63	978.63
	1 1/4 inch/30mm	1,468.73	1,497.66	1,842.13
	1 1/2 inch/40mm	1,468.73	1,497.66	1,842.13
	2 inch/50mm	2,080.67	2,121.66	2,609.64
	3 inch/75mm	3,778.92	3,853.36	4,739.64
	4 inch/100mm	6,104.37	6,224.63	7,656.29
	6 inch/150mm	9,301.89	9,485.14	11,666.72
	CONSUMPTION CHARGE/1000 Gal			
	Commercial	621.46	633.70	779.45
	Condominiums	308.28	314.35	386.65
Domestic	00 to 03	165.73	168.99	207.86
	03 to 06	292.18	297.94	366.46
	06 to 09	315.47	321.68	395.67
	09 to 12	402.66	410.59	505.03
	12 to 20	501.48	511.36	628.97
	20 & above	645.50	658.22	809.61
	CONSUMPTION CHARGE/1000 litres			
	Commercial	136.65	139.34	171.39
	Condominiums	67.78	69.12	85.01
Domestic	00 to 14	36.44	37.16	45.70
	14 to 27	64.25	65.52	80.58
	27 to 31	69.38	70.75	87.02
	31 to 45	88.55	90.29	111.06
	45 to 81	110.27	112.44	138.30
	81 & above	141.95	144.75	178.04

9.3 Shipping rates are to be charged at the commercial rates

9.4 Sewerage Rates

For several years, the customers have raised concerns about the linkage of their sewerage rates to water consumption. The Office instructed the NWC to develop a set of accounts that will adequately separate the cost of providing water services from that of conveyance, treatment and disposal of sewage. The NWC has yet to segregate these accounts to reflect this.

9.5 Notably, in several countries where the rates for water and sewerage are de-linked, the cost of sewage services is greater than that of water supply. Although the data shows that sewerage services are more costly to provide, the Office, at this time, cannot determine what this would be. Consequently, the Office will continue the practice of allowing NWC to bill for sewerage services at 100% of water charges. This is not a unique approach as water regulators in some major states in Australia[14] have linked sewerage billing to water consumption.

9.6 The Office will initiate a consultation on accounting separation in the latter part of 2008, and which it expects to complete by the end of 2009. It is therefore expected that by the next tariff review, NWC's accounts will be in a form prescribed by the Office. This will enable detailed analysis of both business streams and provide a more informed basis on which to chart the future regime for tariffs for sewerage services.

9.7 Z factor

9.7.1 Historically, NWC's tariffs are adjusted by the movements in electricity costs, foreign exchange and consumer price index. Given the recent frequency within which Jamaica has experienced natural disasters (5 hurricanes in 3 years), NWC has proposed that a Z factor be included in the price cap to account for unforeseen expenses over which it has no control. The two questions that have to be addressed is whether uncontrollable costs should be a direct pass through to customers, and if this is the case, the mode by which the Office should determine such cost.

9.7.2 The Office accepts that in normal business environment, there are events that may arise from time to time over which the company has no control. These events could range from Acts of God to government imposed obligations arising from change in regulation/legislation. These changes will be beyond the control of the company and would be unfair to require it to absorb the costs unless there are other provisions to cover these events. This would ultimately affect the service delivery as it would compromise the future financial viability of the company. The Office therefore has no objection to the pass through of uncontrollable costs.

[14] See http://www.esc.vic.gov.au/NR/rdonlyres/84C8B4DB-32AB-4B21-ADC7-FD8E2B5F0E17/0/RPT_WaterTariffStructuresReviewFinalReport20071220.pdf

9.7.3 In Jamaica the Z factor is a part of price cap regime for the Jamaica Public Service Co Ltd. In order to reduce the access to the Z-factor, the Office directed JPS to develop a self-insurance fund for assets for which it is difficult or uneconomical to obtain. The Office has allowed the insurance expense in the NWC tariffs. NWC has reported some difficulties in the timeliness of the recovery of insurance claims. With the recent years experience of natural disasters NWC should be in a position to do a risk analysis on the option of gradually moving a portion of this insurance expense to a self-insurance fund.

9.7.4 The *Z* factor will be treated is an allowed percentage increase in the PAM less X to facilitate events that satisfy all the following criteria,
a) affect the Commission's costs;
b) are not due to the Commission's managerial decisions; and
c) are not captured by the other elements of the price regime.
However, the Z factor will not become applicable in cases where insurance is available and has been included by the Office in the determination of the rates.

9.7.5 The Office will issue Guidelines as to the procedure for activating the Z factor provisions under a separate proceeding.

9.8 Price Adjustment Mechanism (PAM)

9.8.1 The PAM is an indexation mechanism that is applied to the base rates and charges for water and sewerage services to preserve the real revenue of the NWC. The PAM captures the movement of the consumer price index, foreign exchange (J$/US$) and kilowatt hour charge (kwh). The formula is described below:

$$PAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, current value of each variable less the base value

9.8.2 The weights are derived from the proportion of the NWC's total operating cost that is affected by the three variables. Because the structure of NWC's operating costs change from time to time, the Office revisits the weights at each review. The NWC has argued that whilst the CPI effect on its operating costs has decreased, the electricity and foreign exchange weights have increased. The NWC has proposed that the weights be adjusted to reflect this. Table 3.1 shows the NWC's proposal for adjusting the weights to reflect these impacts. The Office has recalculated the weights based on the last audited financial statements (2006/07) and has realigned the weights accordingly. Table 9.2 shows the existing and new weights.

Table 9.2: Office determined PAM weights

Index	2003 Weights	2008 Weights
Foreign exchange	0.175	0.280
CPI	0.605	0.468
Electricity (kwh)	0.22	0.252
Total	1.0	1.0

9.8.3 In the 2003 review, the Office also changed the components to be included in the monthly application of the PAM. The NWC adjusted the rates on a monthly basis by the movements in the foreign exchange rate and price/kwh but the CPI changes were applied on an annual basis. Additionally, the new values for each of the three components were reset for the upcoming year. The X factor was deducted from the annual PAM adjustment to determine the cap in yearly increases in the water and sewerage rates.

9.8.4 The NWC has also proposed that foreign inflation be included as an additional component of the PAM to account for risks associated with foreign (US) inflation. The company also argued that the PAM weights should be recalculated on a yearly basis.

9.8.5 The Office has some difficulties with these proposals at this time. The weights of the PAM are set based on determination of the prudent level of expenses at the rate review. In order to be satisfied that the same level of prudence holds, the Office may have to review the operating costs of the NWC on an annual basis but this would be tantamount to having a rate review on a yearly basis as all other aspects of the business operations would have to be evaluated. Furthermore, if this approach were to be adopted, it would defeat the purpose of a price cap mechanism in which time is allowed for the company to reorganise its business to achieve a greater level of efficiency.

9.8.6 A foreign inflation factor would be applicable to that portion of the foreign exchange component that is affected by movement in external level of prices and not covered by other factors of the PAM. This would exclude loan interest, return on equity and electricity. The depreciation expense contains elements that would qualify but a disaggregation of local and foreign content of the assets would be necessary. The NWC has not provided the historical costing records of the assets to allow for this. However in lieu of the foreign exchange component the Office has accepted an un-audited revaluation of the based on the Handy Whitman Index which assumes that all the operating assets were constructed with 100% foreign content and thus is revalue based on US inflation.

9.8.7 The Office has also determined that all the indices are to be applied on a monthly basis. The PAM will also be reset at its anniversary (1st May) at which time the new base values for the 3 components will be set. The annual reset for PAM (ANPAM) will be based on the following formula:

$$ANPAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, new base value of each variable less the old base value

9.8.8 The CPI values shall be that published by the Statistical Institute of Jamaica (STATIN) at the end of the preceding month. The foreign exchange value shall be the average monthly rate as reported by the Bank of Jamaica (BOJ).

9.8.9 The base values for the PAM indices are as shown below

Electricity	$18.84/kWh
Exchange Rate	J$71.62 to US$1.00
CPI	All divisions 121.5

9.8.10 The rates at the beginning of each year shall be derived by Base rate *(1 + ANPAM ±Z). The X-factor is to be calculated as a deduction from the billed amounts at approved base rates plus PAM. The K-factor is to be treated as a separate revenue stream from that of the rates and calculated after the deduction of the X-factor.

9.9 K-Factor

9.9.1 A K-factor was introduced in February 1999 to help fund the replacement of meters and pumps as part of a rehabilitation programme. The funds were collected via the monthly billing. The K-factor was fixed as 4% of the sum of the customers' bills and these funds were placed in a separate account to fund the designated programmes. The funds were also audited to ensure that all expenditure was accounted for and that there was full accountability for the use of the funds. The funds were not available to be used to fund capital expansion programmes. The execution of the programme was successful and achieved the intended results. Essentially the K-factor can be used to fund capital rehabilitation programmes or capital works that will not yield any significant increase in revenues for the NWC but is required to comply with a specific regulatory direction. The Office is also of the opinion that a K-factor is appropriate to fund a capital intensive programme of efficiency improvement inclusive of mains replacement and other NRW activities. This is necessary to reverse the effects of years of under and inadequate funding and set aside specific funding to put NWC on the path of increased efficiency. This portion of the K-factor will be recovered through the X-factor which captures the efficiency gains.

9.9.2 The Office has an obligation under the OUR Act to ensure that the prescribed utility service operates efficiently and in a manner designed to

(i) protect the health and well being of users of the service and such elements of the public as would normally be expected to be affected by its operation; and
(ii) protect and preserve the environment;

9.9.3 The NWC sewerage infrastructure has not been properly maintained, and was built for secondary treatment only. Because of lack of maintenance the systems are currently in a state of disrepair, but they also cannot accommodate additional volume flows from population growth and cannot treat sewage at a tertiary level. NEPA has also become more stringent in its enforcement and has been in dialogue with the NWC to upgrade its plants to meet the new sewerage effluent standards. At the last tariff review (December 2003), the Office mandated the NWC enter into a memorandum of understanding with NEPA, which would outline the specific timeframes for upgrade of the existing plants to tertiary treatment level as well as the rehabilitation of existing treatment facilities. The NWC developed a 10-year action plan which outlined the timeframe for implementation of the various projects. The company has estimated that the total capital cost is $6B.

9.9.4 NEPA, however, disagreed with this timeframe and was of the view that NWC was not treating with urgency, the matter of compliance in the shortest possible time. The Office met with NEPA on this issue and the environmental regulator subsequently provided a list of the priority areas that should be rehabilitated and the criteria[15] that was used to assess this. Appendix 1 provides this list. The NWC has stated that it would take $947.7M to fund the works associated with these listed projects. Given the urgency, and the lack of funds to upgrade these plants, NEPA has stated that for plants that were built to accommodate secondary treatment, the NWC should rehabilitate these plants to facilitate at least this level of treatment as an interim measure. However, NEPA wants these plants to become compliant by the end of 2008. A list of plant for immediate action was submitted by NWC requiring a sum of $490M.

[15] The criteria used are: (a) population served by the facility using the volume of daily sewage inflows; (b) Discharge into sensitive water bodies or ecosystems and cause a public nuisance; (c) level of complaints from the community; (d) compliance of Effluent with NRCA Sewage Effluent Standards; and (e) cost to comply.

Table 9.3_: List of NWC Wastewater Treatment Plant for Immediate Attention

Name of Facility	Capacity (gpd)	Type of Plant	Estimated Project Cost ($M)
East Prospect	-	package plant	5.6
Springfield	-	tile field	33.6
Bay Farm Villas	50,000	package plant	27.4
Barbican Mews	25,000	package plant	60
College Green	-	oxidation ditch	80
Elleston Flats	70,000	package plant	44.4
Hughenden	500,000	package plant	28.3
Bridgeport	500,000	package plant	30
Greater Portmore Ponds	4,650,000	waste stabilization pond	8.2
Horizon Park	-	oxidation ditch	31.9
Independence City	1,000,000	package plant	35
Nightingale Grove	-	oxidation ditch	21.5
Lionel Town	1,140,000	aerated lagoon	23.9
Longville	-	oxidation ditch	11.8
Mineral Heights	1,330,000	package plant	48.6
TOTAL			**490.2**

9.9.5 The Office will set a timeframe of 3 years within which the NEPA priority plants are to be upgraded/rehabilitated. Because these plants will not yield any significant revenue for the NWC, a K-factor fund will be established to fund these programmes.

9.9.6 The administration and monitoring of the programme will be done by the OUR and NEPA. The Office will issue further guidelines on the procedures for the administration of the fund as a separate proceeding.

9.9.7 The Office has determined that it will cost $1,000M to fund the approved capital programme to rehabilitate existing treatment facilities. With the implementation of these projects over a 3-year period, and assuming that the K-factor will be used to repay a US dollar denominated loan with a ten year repayment period, it will require cash of $1,490 from the billing to adequately fund the programme. This money shall be collected on a monthly basis for a period of 12 years from customers that receive water and sewage services.

9.9.8 It should be noted however that although the Harbour View Treatment Plant has been included as a priority plant on NEPA's list, the Office has made special provision for the funding of this project under this tariff regime in the K-factor. Based on a proposal received for a treatment solution, NWC would be required to pay some US$202,180 per month (J$14.2M per month) i.e. $170M per year. It should be noted that the billed revenue in Harbour View

for sewerage services now averages just over $30M per year. In the last review (2003), the Office had indicated that there was sufficient cash flow to facilitate the rehabilitation of this project. The NWC has stated that it is currently evaluating bids and is in negotiation with prospective bidders to commence this project. In order to ensure that this work programme is completed, the Office has included it the K-factor allowance. An estimated $535M of capital cost is needed with loan servicing cash requirement of $805M over 10 years

9.9.9 The commissioning of the Soapberry waste water treatment plant is just the first step in a comprehensive solution to the sewage disposal problem in the KSA region. The collection network must be extended not only to improve flows to the plant and reduce average costs but also to arrest the environmental damage to the Kingston Harbour. In the longer term there is the possibility of the recovery of the Liguanea Plains aquifer for domestic water production. The K-factor fund will provide capital to build out these networks. An estimated $7,370M in capital works is required with a cash requirement of $10,630M from the K-factor

9.9.10 In December 2003, NWC's NRW was reported at 57%. Consequent on that rate review, the Office stated that NWC should implement programmes that would result in NRW being at most 40% over a 10 year period. However, in the interim, NRW level should reduce by at least 2 percentage points each year. The data however shows that the level of NRW increased, instead of declining. As at the end of 2006/07 period, NWC reported NRW at 65%. The NWC has described several projects it has undertaken to reduce NRW. However, this piecemeal approach to NRW reduction cannot continue as it is not sufficient to achieve the targets.

9.9.11 NWC proposes that the K-factor be used to support a major effort to achieve a breakthrough in NRW reduction. An estimated $22,935M is required in capital cost for the initial effort in mains replacement and other NRW activities. This would have a cash requirement for debt servicing from the K-factor of $34,179M.

9.9.12 Table 9.4 sets out the works programme that has been approved by the Office to be funded through the K – Factor.

Table 9.4: Allowed K-factor programmes																				
				2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	TOTAL
LEAKAGE																				**FINAN-CING**
	Loan Portion	**100%**	of Capital Cost																	
	Exchange Rate US$1 =	**72**																		
	Rate	8%																		
	No. Periods	10																		
			$M																	
			22,935																	
		YR1																		
		YR2	4,039		602	602	602	602	602	602	602	602	602	602						
		YR3	5,894			878	878	878	878	878	878	878	878	878	878					
		YR4	6,447				961	961	961	961	961	961	961	961	961	961				
		YR5	3,265					487	487	487	487	487	487	487	487	487	487			
		YR6	2,470						368	368	368	368	368	368	368	368	368	368		
		YR7	820							122	122	122	122	122	122	122	122	122	122	
		YR8	0								0	0	0	0	0	0	0	0	0	
		YR9										0	0	0	0	0	0	0	0	
		YR10											0	0	0	0	0	0	0	
		LEAKAGE	**Financing Require-ment**		**602**	**1,480**	**2,441**	**2,928**	**3,296**	**3,418**	**3,418**	**3,418**	**3,418**	**3,418**	**2,816**	**1,938**	**977**	**490**	**122**	**34,179**
HARBOUR VIEW WTP																				
	Loan	**100%**	of Capital																	

	Portion		Cost																	
	Exchange Rate US$1 =	72																		
	Rate	8%																		
	No. Periods	10																		
				2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
			$M																	
			540																	
		YR1	180		27	27	27	27	27	27	27	27	27	27						
		YR2	180			27	27	27	27	27	27	27	27	27	27					
		YR3	180				27	27	27	27	27	27	27	27	27	27				
		HARBOUR VIEW WTP	Financing Require-ment	-	27	54	80	80	80	80	80	80	80	80	54	27	0	0	0	805
SEWERAGE REBAILITATION																				
	Loan Portion	100%	of Capital Cost																	
	Exchange Rate US$1 =	72																		
	Rate	8%																		
	No. Periods	10																		
				2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	

			$M																	
			1,000		149	149	149	149	149	149	149	149	149	149						
			1,000																	
		SEWERAGE REHAB	**Financing Requirement**	**-**	149	149	149	149	149	149	149	149	149	149	0	0	0	0	0	**1,490**
					149	149	149	149	149	149	149	149	149	149	0	0	0	0	0	
SEWERING KSA																				
	Loan Portion	**100%**	of Capital Cost																	
	Exchange Rate US$1 =	**72**		**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	
	Rate	8%																		
	No. Periods	10																		
			7,370																	
		YR1																		
		YR2	**1,793**		267	267	267	267	267	267	267	267	267	267						
		YR3	**1,750**			261	261	261	261	261	261	261	261	261	261					
		YR4	**1,453**				217	217	217	217	217	217	217	217	217	217				
		YR5	**1,509**					225	225	225	225	225	225	225	225	225				
		YR6	**864**						129	129	129	129	129	129	129	129	129			
		SEWERING KSA	**Financing Require-ment**		267	528	745	970	1,098	1,098	1,098	1,098	1,098	1,098	831	570	129			**10,630**

				2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	
			$M																	
		TOTAL	**31,845**																	
OVERALL FINANCING REQUIRE-MENT			**TOTAL Financing Require-ment**		1,045	2,211	3,415	4,127	4,624	4,746	4,746	4,746	4,746	4,746	3,701	2,535	1,106	490	122	**47,104**

9.13 K-factor application and recovery through X-factor

9.13.1 The Office has allowed the above K-factor programmes to be funded by the application of the K-factor as indicated in Table 9.4

9.13.2 The Office has determined that the X-factor representing efficiency gains arising from the K-factor programme shall be applied in accordance with the schedule in Table 9.5.

The X –factor is to be calculated as a deduction from the bill after the normal rates and PAM.

The K-factor is to be calculated on the bill balance after the X-factor is deducted.

9.13.3 The Office has determined that in order to increase certainty in loan negotiations this tariff regime shall be in place for 5 years

9.13.4 The schedule of K-factor and X-factor shall continue across tariff regimes to ensure funds are available to service the loans.

9.13.5 Notwithstanding the above, the Office may make adjustments to the schedule at subsequent rate reviews to properly align cash inflows with financing requirements

9.13.6 NWC shall account for the deemed K-factor cash inflow calculated on the basis of 95% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be submitted to the Office within 45 days of each reporting period. K-factor revenues shall be deemed collected within 45 day after billing

9.13.7 The Office will issue further detailed guidelines on the operation of the K-factor fund in a separate proceeding.

Table 9.4 Year ending March	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
K-factor	5%	14%	20%	23%	25%	27%	27%	27%	26%	26%	24%	24%	23%
X-factor		5%	10%	10%	12%	12%	13%	15%	18%	22%	22%	23%	23%
Operating revenues	12,253	13,111	14,028	15,010	16,061	17,185	18,388	19,675	21,053	22,526	24,103	25,791	27,596
K-factor inflows	613	1,744	2,525	3,107	3,533	4,083	4,319	4,516	4,488	4,568	4,512	4,766	4,887
X-factor recovery		656	1,403	1,501	1,927	2,062	2,390	2,951	3,789	4,956	5,303	5,932	6,347
Financing requirement		1,066	2,253	3,478	4,189	4,686	4,808	4,808	4,808	4,808	4,808	3,743	2,556
Cumulative K-factor inflows	613	2,356	4,881	7,989	11,522	15,605	19,925	24,440	28,929	33,497	38,009	42,775	47,662
Cumulative Financing requirement		1,066	3,319	6,796	10,986	15,672	20,480	25,289	30,097	34,906	39,714	43,456	47,730
Cumulative X-factor Recovery		656	2,058	3,559	5,487	7,549	9,939	12,891	16,680	21,636	26,939	32,871	39,218

9.14 Impact Fees

9.14.1 Impact fees[16] were first adopted in the 1920s by cities in the United States seeking an alternative method of infrastructure financing. It is defined as a one-time charge imposed on new development to offset capital costs associated with providing the necessary infrastructure to that new service area. Impact fees are not a new phenomenon as across the world, persons who directly causes a company to incur additional costs, which it would not ordinarily incur in its regular course of business, are asked to pay the marginal cost of providing the additional infrastructure to facilitate the expansion in service[17]. These developers, in turn recover these sums from their customers.

9.14.2 With continued growth in the tourism and housing markets in Jamaica, the NWC resources are placed under additional strain. The NWC is required, where it is the designated service provider, to connect the trunks and pipes to its main water supply network. This investment require significant capital expenditure, if the NWC were to absorb all the capital costs associated with this investment, it would be unfair to burden all of NWC's customers with this cost, as only a discrete number of persons would benefit. With this background, impact fees are increasingly being considered and applied in areas where the Commission deems it necessary.

9.14.3 There are two basic ways of calculating the impact fees: the average cost pricing method that sets a flat connection fee and a marginal cost pricing system which is in the form of a three-part tariff. In the latter case, one part of the tariff would be a charge to recover the capital costs of the facilities installed to provide water and/or sewerage services, the second part is to recover the costs of delivering the new service, such as connections or extensions and the third part of the tariff is a charge for actual usage based on the short-run costs of producing the service.

9.14.4 The Office, until now, has not issued its official position on the matter. The Office is not proposing to specify the impact fee that NWC should charge developers but it will use this opportunity provided by this tariff review to set out the principles (rules) to which it expects the NWC to adhere when calculating the amount to be charged to a developer:

- There must be a reasonable connection between the fees levied on the developers and the demand generated by the development.

- The fees charged to the developer must be linked to the specific development.

- The amount charged to the developer must be proportional to the type and amount of demand for facilities generated by the development. The developer

[16] The UK uses the term commuted sums or Section 106 agreements.

[17] http://books.google.com/books?id=OJDOzdkdJZAC&pg=PA56&lpg=PA56&dq=water+system+impact+fee&source=web&ots=ox-gEFYXqS&sig=jc5FYg5xjSsBJkGQ_xPP2LfFf1E#PPA55,M1

should not bear the cost of excess facilities. Where the developer fund the total initial investment, there should be a mechanism for the developer to recover some of this capital where additional customers benefit from the facilities.

- The fees should be fair and directly linked to the cost involved in providing the service.

- In the event that there are similar developments, then all appurtenances should be made available to all developers, and the costs should be similar.

9.14.5 In the event that there is no agreement to the impact fee that should be applicable between NWC and any other party, any of these parties may refer the matter to the Office for arbitration.

9.14.6 The Office, however, expects that in instances where impact fee is applicable, the revenues generated from this will be used to offset the capital costs in the rate base.

CHAPTER 10: PERFORMANCE BENCHMARKS

10.0 OPERATIONAL EFFICIENCY

10.1 Collection of Revenues and Net Receivables

The NWC has stated that its level of receivables are overstated as its customer accounting system contains information on all accounts with outstanding sums, even if these accounts are permanently disconnected or deactivated as a result of death or relocation of customers. At year end March 2003 gross receivables were $3,654M. At the end of the 2006/07 period, the amount was $4,220M. The government contributed 10% to this amount.

NWC had set part of it performance targets that net receivables should be at most 25% of gross revenues by end of March 2006. As at March 2006, the NWC reported 16.7%. Whilst the NWC's has achieved this target it is of note that the current level represents 61 days of sales.

10.1.1 The 2003 rate determination also stated that the NWC should maintain at least 92% collection rate. The NWC reported that by the 2005/06 period it met this target and has used this collection rate in the projection of revenues under the new tariff regime (2008/2011). The Office is of the view that with the implementation of geographic information system, a new customer information system, and plans to continuously monitor all service areas, these efforts should result in an improvement in the collection rate.

10.1.2 Since the government has expressly stated that the NWC should operate as a commercial entity, it should ensure that it improves its collection rate The private providers in the sector have estimated that they will collect 95% of revenues within the month that they become due and the remaining within 45 days. The NWC must be as efficient as the private providers and therefore the Office has used a collection rate of 95% to project cash inflows.

Table 10.1: NWC's Receivables from 2003 to 2008

Year	2002/03	2003/04	2004/05	2005/06	2006/07
Net receivables ($M)	1,223.	782	1,156	1,133	1,602
% of operating revenues	23.8%	12.8%	15.3%	13.3%	16.7%

10.1.3 In addition to improving the collection rate, the NWC should also focus on the timeframe within which it collects sums owed. As at 2002/03 period

days sales outstanding (DSO)[18] was 23 days but this increased to 61 days at the end of the 2006/07 period. Some water companies, with similar structure to that of Jamaica, collect outstanding revenues within 30 days[19]. The private providers in the local water sector, collects outstanding sums within 30 days. The World Bank has stated that the best practice for the sector in developing countries is at most 3 months. The Office is of the view that the longer it takes for the NWC to collect its revenues, the more likely it is that these debts become bad debts. It is therefore imperative that the NWC minimize the time period within which it collects its debts. The current DSO of 61 days should be reduced to at most 45 days by the end of the tariff period.

10.1.4 With the expected improvement in revenue collection, the Office has determined that bad debt provision should be no more than 5% of billings. Given the nature of NWC's customer base and the expansive service area, it may be difficult to collect all billed revenues, but this should be capped at 5% of billed revenues.

10.2 Metering

10.2.1 In 1999, the Office established a K-factor fund to help improve the level of metering of NWC's customers. At the end of this metering programme, NWC should have at least 85% of accounts with functioning meters at all times. Up until 2004, the NWC achieved this target, but its performance progressively declined and at end of the 2006/07 period, was at 67%. NWC has stated that it does not have sufficient funds to replace defective meters, or to improve the metering of its customer base, but the Office is of the view that metering should be a normal part of NWC's business and should not require special funding every time its metering performance deteriorates. The Office is concerned that sufficient importance is not placed on this target, as it is the only way to accurately determine the level of consumption for each account and billing.

10.2.2 During the public hearings, the NWC stated that the metering of its customers was discretionary. NWC also outlined the difficulties imposed by the government procurement process in obtaining the approval for purchasing necessary inputs to production. In one instance it took over 12 months from the evaluation of tenders to the approval of the procurement. While the Office has no remit to prescribe or vary the procurement process to which the NWC is subjected, the situation needs urgent review and if necessary amendment to enable the NWC to respond to its business needs in a manner befitting a commercial enterprise.

[18] This is defined as the number of days a company takes to collect from its debtors. It is calculated as net receivables divided by total sales times number of days in the year.

[19] See http://www.worldbank.org.vn/publication/pub_pdf/Other%20reports%20-%20BECHMARKING.pdf

10.2.3 The Office is firmly of the view that it is in the best interest of customers and the NWC for customers to be metered. This gives a more accurate measure of consumption patterns, accurate billing and helps with the detection and improvement in the level of NRW. The Office is however cognizant that there are instances whereby it is impractical to meter some customers. These cases however should be treated as exceptional. The regulation pursuant to the NWC Act requires metering except in cases where the customer agrees to an estimated consumption.

10.2.4 Even though the NWC has not met the target that addresses accounts with functioning meters, the Office is of the view that metering is a critical component of NWC's operations. Consequently, the NWC should have at least 90% of accounts with functioning meters by March 2011.

10.3 Employees

During the 2003 rate review, NWC conducted and implemented an institutional strengthening exercise which, *inter alia*, resulted in the reduction of the number employees by 500. Over the last 3 years, the Commission has maintained a staff complement of 2,100. With about 457,852 accounts the number of staff per 1,000 customers is 4.58. Government operated entities are within the range of 2 to 4 persons[20]. The World Bank study suggests that less than 5 employees per 1,000 connections is best practice target. Based on this information the Office is of the view that NWC should have at most 4.5 employees per 1,000 accounts.

10.4 NRW

10.4.1 In December 2003, NWC's UFW was reported at 57%. Consequent on that rate review, the Office stated that NWC should implement programmes that would result in UFW being at most 40% over a 10 year period. However, in the interim, UFW level should reduce by at least 2 percentage points each year. The Office also stated that it would assume that NWC has achieved this target at the next tariff review. The data however showed that the level of UFW increased, instead of declining. As at the end of 2006/07 period, NWC reported UFW at 65%. The company further states that 40% of the reported UFW is related to leaks. The other 60% is due to commercial losses (such as theft). The NWC stated that a customer survey revealed that up to 70% of temporary disconnected customers were illegally reconnected. .

10.4.2 The NWC stated that it has taken various measures to reduce UFW including leak repairs, regularizing and or removing illegal connections, replacement and or installation of new pipelines and customer and production/zone meters. The NWC also stated that it has undertaken several capital projects (water) where NRW reduction is a strong feature.

10.4.3 The NWC indicates that an estimated 30% of its pipelines is in need of

replacement but indicates it would need over $100B in capital works. The NWC proposes to expand its current interventions in Kingston and St. Andrew, Greater Spanish Town and Port Antonio and Greater Mandeville as the personnel and knowledge base is already in place and would ensure the maximum benefits. While the Office will not pronounce of the programmes that should be undertaken, prudence would suggest that the NWC should prioritise areas that will provide the highest return. The NRW programme is also focussed on mains replacement and metering. Whilst this is important, the Office is of the view that attention must also be paid to commercial losses which in fact represent 60% of the NRW.. If this is not adequately addressed, then after the completion of the mains replacement programme, the commercial losses will replace physical losses. In fact, both projects should complement each other.

10.4.4 The results of the various NRW programmes prove that target NRW of 45% is not unachievable within the next 6 years. The Office maintains the view that investments in NRW can pay for itself, as water is an essential commodity.

10.4.5 The NWC projects that it can reduce NRW to 45% within 6 years. The company also stated that it will be increasingly difficult to reduce NRW below this level. NWC has stated that it will also undertake a meter installation programme at production and customer sides to help with NRW reduction. NWC proposes to install 217 source meters and 150,000 customer meters over the period at a cost of US$140M and $600M respectively. The proposed K-factor programme will provide some funding in this regard.

10.4.6 The Office is of the view that within a 3 year period, NRW should be at most 55%.

10.4.7 The Office will incorporate the above efficiency targets with those proposed by NWC at Appendix 2 in the Regulatory Framework to be issued subsequent to this Determination

Chapter 11: QUALITY OF SERVICE STANDARDS

11.1 Given the concerns of stakeholders with regard to quality of service, the Office has included as part of its decision, Guaranteed and Overall Standards to which NWC must adhere.

11.2 As it relates to the quality of service standards, the Office has included two new Guaranteed Standards and has amended some existing standards. To drive NWC to improve service levels in some areas covered under the scheme, the payment mechanism for breaches in these areas will be made automatic. The customer will however be required to claim for breach of a standard in all other areas. The changes are outlined as follows:

11.3 Guaranteed Standards

11.3.1 New Guaranteed Standards

1. ***Wrongful Disconnection*** – Where a customer has no overdue amount on an account, yet NWC in error disconnects the supply associated with that account.

2. ***Reconnection after Wrongful Disconnection*** – NWC must reconnect a customer's supply that it inadvertently disconnected within 12 hours of notification of the error. A written apology must also be extended.

3. ***Changing meters -*** NWC must provide consumers with details of the date of the change, meter readings on the day and serial number of the new meter

11.3.2 The Office has changed the compensation mechanism to automatic credit by the NWC in instances where the company breaches the following standards:

- ***WGS7 – Meter Installation***
- ***WGS11&12 – Reconnection***
- ***WGS5 – Wrongful disconnection***

11.3.3 The Office has amended the standards below as follows:

- ***WGS8 – Meter repair/replacement*** *– maximum of 30 working days to respond to repair or replacement after verification that meter is faulty after being informed of the defect.*
- ***WGS11 – Reconnection*** *– maximum of 24 hours to restore supply.*

- ***WGS4 – Complaints –*** *the standard for 'Response to Complaints' will no longer be separated into billing and no- billing.*

- ***WGS13 – Compensation*** *– NWC will have a maximum of 30 working days to process and make payment. Automatic credits must also be made within this period. The customer must submit claim within sixty (60) days of a breach.*

11.4 Compensation

The Office has determined that the compensation for breach of a standard will remain four (4) times the applicable service charge when a claim is made and two (2) times the service charge when automatic payment is made.

11.5 Overall Standards

To impel the NWC to reduce the current levels of NRW, the Office has included the following Overall Standard:

- ***WOS7 – Leaks*** *– NWC must repair 90% of leaks within 3 days and keep auditable records of its repair programme*

11.6 <u>Reports and Additional Requirements</u>

11.6.1 Guaranteed Standard Claim Form

To make the procedure of submitting a claim more customer friendly, the Office has determined that NWC must design a customer friendly claim form which will be used by customers for performance areas under the scheme that requires a claim for compensation.

A draft of this form must be submitted to the OUR within 60 days of this Determination such that it can be introduced within 90 days of this Determination.

11.6.2 Along with displaying these forms at its commercial offices, the NWC must include an advisory about the existence of the claim form with the customer's bill at least once per quarter. The Office expects that the Commission will use all reasonable facilities to receive claims including over the phone by its Call Centre representatives as well as via its website.

11.7 Quality of Service Report

The quarterly report on the Quality of Service standards must now include an appendix which provides details of automatic credits – the number of breaches committed the affected accounts and the credit applied.

11.8 Call Centre Reports

The NWC must submit on a quarterly basis reports on its call centre performance against key service level indicators to be agreed on with the OUR

within two months of this determination. The Commission's performance will be publicized through the OUR's Quarterly Performance Report.

11.9 Leak Repairs

The NWC must submit to the Office on a quarterly basis a report on leaks identified/reported across the island and the timeframe within which they were repaired, or are to be repaired.

11.10 Customer Service

The Commission must re-train frontline staff within the first year of this Determination and a report in this regard should be submitted at the end of the 7^{th} and 12^{th} months.

11.11 Health

Within one month of this Determination, the NWC must submit to the Office, a report which details the Commission's plan to effectively address the manganese problem affecting some residents in St. Catherine – specifically in the Portmore Pines and Old Harbour areas.

11.12 Hydrant Repairs

Although the NWC has represented that the responsibility for hydrant repair rests with the Fire Brigade, the reality is such that the longer they remain in disrepair, the more water that is wasted. Consequently the NWC must within three months of this Determination develop a programme/plan to repair leaking hydrants and engage in dialogue with the fire brigade authorities to establish a Memorandum of Understanding (MOU) with regard to payments for these repairs. From the Office's perspective the basis for this is the concern that leakage from hydrants contribute to NRW and waste and inefficiency generally.

11.13 Social Water

The financing of the costs for the delivery of other social water continues to be of concern to the Office. There is no question that the social imperatives associated with access to potable water are overwhelming. The question of whether the NWC customer should bear the full burden for these costs or whether it would be more equitable for the wider society to contribute is a matter for ongoing policy consideration. Indeed, these costs must be quantified and the economic and financial impact assessed. In the present arrangements, being a matter of social policy, the Office has no remit to impose these costs on NWC's customers in a specific way but it is recognised that they are a real charge to the NWC's operations and cannot be ignored. Similar to the MOU to be established between the Commission and the fire brigade authorities for hydrant repairs, the NWC must engage the Central/Local Government in talks to ensure that a regime is formalised to identify and generate the revenue streams to pay for social water.

11.14 Metering

With the exception of 'special contract situations' the NWC must meter new connections. In the event that meters are not readily available, the NWC must give the customer a reasonable timeline within which the customer's property will be metered. The Commission must restore itself to 85% metering within fifteen (15) months.

11.15 Bill Notification /Reminder

To foster good customer relations, the NWC should establish a database of customers' mobile numbers – this is a strategy being adopted in other sectors – to facilitate bill alerts and reminder of past due amounts.

11.16 Manufacturing Sector – Economic Development Wastewater Tariff

The OUR is mindful of the importance of the manufacturing industry to the Jamaican economy. This importance is also recognized by the Commission through the establishment of the Economic Development Wastewater Tariff (EDWT), which encourages economic development by facilitating increased competitiveness, productivity and efficiency.

11.17 The Office supports the continuance of the sewerage rebate under the present scheme. It now requires the NWC to undertake a general review of the conditions under which the EDWT is applied and to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one company and omission in another. This review should include consultations with stakeholders within the sector and should occur within the first three months of this Determination.

Chapter 12: REGULATORY IMPACT ANALYSIS

12.1 Social and economic impact

An across the board change in the water and sewerage rates of 23% and the implementation of a K-factor of 5% in the 2008/09 fiscal year will cause an effective 29.15% change in customer bills. Table 12.1 shows the impact of the new rate regime on domestic customer bills for various levels of consumption. Data from NWC indicates that around 60% of customers consume less than 3000 gallons of water per month. These customers would experience an increase in the bills of less than $245 per month.

Table 12.1: Impact of new rates on customer bills

	Typical Residential Customer bills				
Without sewerage					
		Current bill		**New bill**	*Change*
		$		**$**	
1000 gallons					
Service Charge		290.69		364.59	
Water charge		165.73		207.86	
PAM		8.99			
K-factor				28.62	
Total bill		**465.41**		**601.08**	*29.15%*
3000 gallons					
Service Charge		290.69		364.59	
Water charge		497.19		623.59	
PAM		15.52			
K-factor				49.41	
Total bill		**803.40**		**1,037.59**	*29.15%*
7000 gallons					
Service Charge		290.69		364.59	
Water charge		1,689.20		2,118.65	
PAM		39.00			
K-factor				124.16	
Total bill		**2,018.89**		**2,607.40**	*29.15%*
15000 gallons					
Service Charge		290.69		364.59	
Water charge		5,032.56		6,311.99	
PAM		104.87			
K-factor				333.83	

Total bill		**5,428.12**		**7,010.41**	*29.15%*
With sewerage					
		Current bill		**New bill**	*Change*
		$		**$**	
1000 gallons					
Service Charge		290.69		364.59	
Water charge		165.73		207.86	
Sewerage charge		165.73		207.86	
PAM		12.26			
K-factor				39.02	
Total bill		**634.41**		**819.34**	*29.15%*
3000 gallons					
Service Charge		290.69		364.59	
Water charge		497.19		623.59	
Sewerage charge		497.19		623.59	
PAM		25.32			
K-factor				80.59	
Total bill		**1,310.39**		**1,692.36**	*29.15%*
7000 gallons					
Service Charge		290.69		364.59	
Water charge		1,689.20		2,118.65	
Sewerage charge		1,689.20		2,118.65	
PAM		72.28			
K-factor				230.09	
Total bill		**3,741.37**		**4,831.98**	*29.15%*
15000 gallons					
Service Charge		290.69		364.59	
Water charge		5,032.56		6,311.99	
Sewerage charge		5,032.56		6,311.99	
PAM		204.01			
K-factor				649.43	
Total bill		**10,559.82**		**13,638.01**	*29.15%*

12.1.1 The Office has considered the potential impact of the increased tariff on the lower socio economic groups and notes that the tariff structure already provides for delivery of the service at less that costs. The Office is of the view however that it may be possible to further refine the tariffs to further cushion the effect on these users and would therefore be minded to consider a mid term

restructuring of the tariffs if deemed feasible after proper study.

12.2 IMPACT ON NWC

12.2.1 Financial impact

NWC has been sustaining losses for a number of years - as indicated in Table 12.2. This is inclusive of interest on pension liabilities of an average of $750M per annum. Even if interest on pension liabilities is removed, NWC's deteriorating financial position will not allow it to carry out its mandate of providing safe and efficient water and sewerage services to the nation. It will also not provide sufficient funds for the expansion of services and will make it difficult to attract the financing to carry out such programmes.

Table 12.2 Summary of NWC's Financial Performance

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Operating surplus ($M)	-478	-116	640	764	889
Net profit ($M)	-2,112	-1,857	-1,110	-1,210	-1,524

The new tariffs will provide an additional $2B to the operating revenues and thus put the NWC in a position to provide a sustainable level of efficient and reliable service. Assuming the pension liability issue is resolved NWC financial performance for the year ending March 2009, based on implementation of the tariff on May 1, 2008, is projected to be as in Table 12.3.

Table 12.3 NWC Projected Financial Performance

YEAR ending March …	**2009**
Total revenues	13,639,859
Total operating costs	10,844,916
Operating surplus	**2,794,943**
Depreciation expense	2,109,654
Earnings before finance charges & tax	685,289
Finance charges	343,427
Earnings before tax	341,861
Taxation	0
Net Profit	**341,861**

12.2.2 Operational impact

The K-factor will address specific rehabilitation programmes designed to reduce the impact on the environment and improve efficiency.

- The mains replacement programme along with appropriate commercial interventions will have a major impact on the level of NRW and go a far way in allowing NWC to achieve its targeted level of 45% by 2013; down from the level of 62% as at December 2007.

- An improved level of NRW will lower costs, increase revenues and delay the need for capital expansion.

- Almost all of NWC's wastewater treatment plants are in need of substantial rehabilitation. NEPA has submitted a list of plants that are in urgent need of attention in order to bring them into compliance with NEPA's effluent standards. The K-factor will provide the cash flow to service the financing of the necessary capital works. This means that as soon as the financing agreements are in place work can begin on all the plants subject to the institutional capacity available to the NWC.

- The expansion of the collection network for sewage in the KSA will increase revenues and lower the per-unit cost of treatment of the new wastewater treatment plant at Soapberry.

There is a real possibility that the response to the higher tariff may be an increased rate of disconnection, bad debt and theft. This could influence the results expected from the introduction of the new tariff to the extent that the NWC would be challenged to achieve the targets set.

12.2.3 Environmental impact

Non-functioning wastewater treatment plants are a direct health hazard as untreated effluent is oftentimes discharged close to highly populated areas. In addition damage to Jamaica's coastal environment may be permanent and will have a serious impact, if left unchecked, on the tourism product. The K-factor financed programme for the rehabilitation of the 44 plants to comply with effluent standards set by NEPA will reverse the effect of years of neglect of these plants.

12.2.4 Gender impact

Women are more affected by the lack of access to adequate water supply than men as they are the ones more likely to do the fetching from rivers to carry out domestic functions and other special needs for proper sanitation. An increased capacity of the NWC to carry out expansion programmes and to adequately serve existing customers will enhance the welfare of women. The new tariff provides the NWC with an increased level of financial sustainability while the NRW programme will recover additional capacity to serve new areas.

Chapter: 13: SUMMARY OF DECISIONS

13.1 The Office has determined that the effective increase of NWC rates shall be 23%.

The rates effective as at May 1, 2008, shall be as shown in Table 13.1:

Table 13.1 Water rates

	SERVICE CHARGE	OUR Determined Rates
	5/8 inch/15mm	364.59
	3/4 inch/20mm	748.34
	1 inch/25mm	978.63
	1 1/4 inch/30mm	1,842.13
	1 1/2 inch/40mm	1,842.13
	2 inch/50mm	2,609.64
	3 inch/75mm	4,739.64
	4 inch/100mm	7,656.29
	6 inch/150mm	11,666.72
	CONSUMPTION CHARGE/1000 Gal	
	Commercial	779.45
	Condominiums	386.65
Domestic	00 to 03	207.86
	03 to 06	366.46
	06 to 09	395.67
	09 to 12	505.03
	12 to 20	628.97
	20 & above	809.61
	CONSUMPTION CHARGE/1000 litres	
	Commercial	171.39
	Condominiums	85.01
Domestic	00 to 14	45.70
	14 to 27	80.58
	27 to 31	87.02
	31 to 45	111.06
	45 to 81	138.30
	81 & above	178.04

13.2 Price Adjustment Mechanism (PAM)

The PAM captures the movement of the consumer price index, foreign exchange (J$/US$) and kilowatt hour charge (kwh). The formula is described below:

$$PAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, current value of each variable less the base value

13.3 The Office has determined that the weights for the Price adjustment Mechanism are as shown in Table 13.2

Table 13.2: **Office Determined PAM Weights**

Index	**2008 Weights**
Foreign exchange	0.280
CPI	0.468
Electricity (kwh)	0.252
Total	1.0

13.4 The Office has also determined that all the indices are to be applied on a monthly basis. The PAM will also be reset at its anniversary at which time the new base values for the 3 components will be set. The annual reset for PAM (ANPAM) will be based on the following formula:

$$ANPAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$$

Where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, new base value of each variable less the old base value

The base values for the PAM indices are as shown below:

Electricity	$18.84/kWh
Exchange Rate	J$71.62 to US$1.00
CPI	All divisions 121.5

13.5 K-factor application and recovery through X-factor

The Office has allowed works programmes to be funded by the application of the K-factor as indicated in Table 9.4.

The Office has determined that the X-factor representing efficiency gains arising from the K-factor programme shall be applied in accordance with the schedule in Table 9.4.

The X –factor is to be calculated as a deduction from the bill after the normal rates and PAM.

The K-factor is to be calculated on the bill balance after the X-factor is deducted.

The Office has determined that in order to increase certainty in loan financing negotiations this tariff regime shall be in place for 5 years.

The schedule of K-factor and X-factor shall continue across tariff regimes to ensure funds are available to service the loans.

Notwithstanding the above, the Office may make adjustments to the schedule at rate reviews to properly align cash inflows with financing requirements.

NWC shall account for the deemed K-factor cash inflow calculated on the basis of 95% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be sent to the Office within 45 days of each reporting period. K-factor revenues shall be deemed collected within 45 day after billing.

The Office shall issue further detailed guidelines on the operation of the K-factor fund.

Table 13.3

Year ending March	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
K-factor	5%	14%	20%	23%	25%	27%	27%	27%	26%	26%	24%	24%	23%
X-factor		5%	10%	10%	12%	12%	13%	15%	18%	22%	22%	23%	23%

13.6 Z-factor

The Office has determined that there shall be provision for a "Z-factor" in the tariff formula being an allowed percentage increase in the PAM less X to facilitate events that satisfy all the following criteria:

a) affect the Commission's costs;
b) are not due to the Commission's managerial decisions; and
c) are not captured by the other elements of the price regime.

However, the Z-factor will not be applicable in cases where insurance is available and has been included by the Office in the determination of the rates.

13.7 Annual Adjustment Formula

The Office has determined that the new base rates at the beginning of each year shall be derived by: Old Base rate *(1 + ANPAM ±Z).

The X-factor is to be calculated as a deduction from the billed amounts at approved base rates plus PAM. The K-factor is to be treated as a separate revenue stream from that of the rates and calculated after the deduction of the X-factor.

13.8 Manufacturing Sector – Economic Development Wastewater Tariff

The OUR is mindful of the importance of the manufacturing industry to the Jamaican economy. This importance is also recognized by the Commission through the establishment of the Economic Development Wastewater Tariff (EDWT), which encourages economic development by facilitating increased competitiveness, productivity and efficiency.

13.9 The Office supports the continuance of the sewerage rebate under the present scheme. It now requires the NWC to undertake a general review of the conditions under which the EDWT is applied and to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one company and omission in another. This review should include consultations with stakeholders within the sector and should occur within the first three months of this Determination.

13.10 Summary of Quality of Service Standards

The Office determined quality of service standards are outlined in the tables below. These Standards are effective May 1st unless otherwise stated in the Standards.

Table 13.4: Guaranteed Standards

CODE	FOCUS	DESCRIPTION	PERFORMANCE MEASURE
WGS1	Access	Connection to supply	Maximum time of 10 working days **Compensation type: CLAIM**
WGS2	Delivery of bills	Issue of first bill	Maximum time of 48 working days after connection **Compensation type: CLAIM**
WGS3	Appointments	Keeping appointments	Must make and keep an appointment at customers request and must notify customer prior to appointed time, if cannot keep appointment. **Compensation type: CLAIM**
WGS4	Complaints	Response to complaints	Maximum of 5 working days to acknowledge customer complaints, after receipt. Maximum time of 30 working days to complete investigation and respond, from date of receipt of complaint **Compensation type: CLAIM**
WGS5	Disconnection	Wrongful Disconnection	Where NWC in error disconnects a supply associated with an account which has no overdue amount. **Compensation type: AUTOMATIC**
WGS6	Account status	Issue of account status	Meter to be read on same day customer is moving, if on a weekday (within 2 days of move if on a weekend) providing 5 days notice of move is given. Maximum time of 15 working days to provide final bill after move **Compensation type: CLAIM**
WGS7	Water meters	Meter installation	Maximum of 30 working days to install meter on customer's request **Compensation type: AUTOMATIC**
WGS8	Water meters	Repair or replacement of faulty meters	Maximum time of 30 working days to repair or replace meter after being informed of defect **Compensation type: CLAIM**
WGS9	Water Meters	Changing meters	NWC must provide consumers with details of the date of the change, meter readings on the day and serial number of the new meter effective September 2008 **Compensation type: CLAIM**
WGS10	Water meters	Meter reading	Maximum of 2 months between each meter reading and between bill issues **Compensation type: CLAIM**
WGS11	Reconnection	Reconnection after payment of overdue amount	Maximum of 24 hours to restore supply. **Compensation type: AUTOMATIC**
WGS12	Reconnection	Reconnection after wrongful disconnection	NWC must reconnect a supply it inadvertently disconnected within 12 hours of being notified of the error and a written apology extended to the affected customer. **Compensation type: AUTOMATIC**
WGS13	Compensation	Payment of compensation	Maximum of 30 days after claim is received to process and make payment - automatic credits should also be made within this period. Customer must make claim within 90 days **Compensation type: CLAIM/AUTOMATIC**

13.11 Compensation

The Office has determined that the compensation for breach of a standard will remain four (4) times the applicable service charge when a claim is made and two (2) times the service charge when automatic payment is made.

If the payment due under a particular standard is not paid within the specified period, the NWC is liable for additional compensation, which will repeat itself for subsequent periods until payment is made. Breaches of the individual standard will, however, attract only one payment.

Table 13.4: Overall Standards

CODE	FOCUS	DESCRIPTION	PERFORMANCE MEASURE
WOS1	Water Quality	Testing samples for impurities	Ensure that water is within standards as specified by MOH
WOS2	Water Pressure	Minimum/maximum water pressure	Must maintain a pressure ranging from 20 to 60 psi
WOS3	Reliability of Supply	Notify public of intention to interrupt supply – planned interruptions	Minimum notification time of 12 hours for short interruptions (not more than 4 hours) and 24 hours for longer interruptions (more than 4 hours)
WOS4	Reliability of Supply	Restoration after emergency lock-off	Maximum time to restore supply: 24 hours - Urban 48 hours - Rural
WOS5	Sewerage	Correction of sewerage problems	Maximum of 24 hours to correct sewerage problems after being informed
WOS6	Sewerage	Sewerage effluent quality	Ensure that sewerage effluent is within the standards specified by NEPA
WOS7	Leaks	Repair of Leaks	NWC must achieve a 90% target for the repair of leaks within 5 days up to 2010 and within 3 days after 2010.

APPENDIX 1: NEPA's List of Priority Sewage Plants

Plant Name	Parish	Capacity (gpd)	Type of Plant	Cost $'000
Grove Manor	KSA	60,000 gpd	Oxidation Ditch	2,250
Elletson Flat	"	70,000 gpd	Package Plant	8,500
Harbour View	"	1,000,000	Package Plant	3,100
Acadia	"	35,000	Package Plant	2,250
Hughenden	"	500,000	Package Plant	2,300
College Green	"		Oxidation Ditch	2,234
Barbican Mews	"	25,000	Package Plant	2,500
Bay Farm Villa	"	50,000	Package Plant	2,175
Yallahs Pond	St. Thomas	_	Waste Stabilization Tank	1,200
Springfield	"	_	Tile Field	400
East Albion	"	_	Package Plant	
Independence City	St. Catherine	1,000,000	Package Plant	4,400
Greater Portmore	"	4,650,000	Waste Stabilization Tank	2,050
Nightingale Grove	"	_	Oxidation Ditch	1,950
Horizon Park	"	_	Oxidation Ditch	2,500
Hamilton Gardens	"	_	Oxidation Ditch	2,920
Old Harbour Villas	"		Waste Stabilization Tank	5,000
Ensom City Package Unit	"	_	Extended Aeration	4,100
Bridgeport Package Units	"	500,000	Package Plant	7,063
Claremont	"	_	Waste Stabilization Tank	2,500
De La Vega City	"	350,000	Waste Stabilization Tank	7,000
Eltham Park	"	990,000	Oxidation Ditch	2,300
Twickenham Park	"	209,000	Extended Aeration	2,500
Blackwood Gardens	"	125,000	Waste Stabilization Tank	850
Tawes Pen	"	_	Contact Stabilization	1,500
Caymanas Gardens	"	_	Waste Stabilization Tank	1,755
New Works	"	_	Sand Filter	3,000
Innswood Village	"	_	Waste Stabilization Tank	No cost provided
Hayes Phase I	Clarendon	274,000	Waste Stabilization Tank	NWC states that this meets standard, just need capital ($1,750M) for fencing. The Office has disallowed this amount
Hayes Phase 2		_	Waste Stabilization Tank	NWC states that this meets standard, just need capital ($1,250M) for fencing. The Office has disallowed this amount

Plant Name	Parish	Capacity (gpd)	Type of Plant	Cost $'000
Longville Park	"	_	Oxidation Ditch	No cost provided
Lionel Town	"	1,140,000	Aerated Lagoon	2,550
Bushy Park	"	570,000	Aerated Lagoon	2,750
Crofts Hill	"	710,000	Oxidation Ditch	600
Paisley Pen	"	700,000	Oxidation Ditch	2,400
Mineral Heights	"	1,330,000	Package Plant	System being financed by NHT
Falmouth Gardens	Trelawny	160,000	Oxidation Ditch	No cost provided
Cornwall Courts	St. James	1,500,000	Contact Stabilization Tank	5,950
Negril	Westmoreland	_	Waste Stabilization Tank	186,000
Llandilo Phase 1	"	_	Oxidation Ditch	No cost provided. NWC states that it is a new facility
Anchovy H.S. Pt. Antonio	Portland	_	Oxidation Ditch	1,475
Woodstock	"	_	Oxidation Ditch	2,150
Boscobel	St. Mary		Septic Tank And Tile field	325
Stockholm Park	"		Oxidation Ditch	1,370
Total				**283,867**

Appendix 2: NWC proposed Performance Objectives

PERSPEC-TIVE	OBJECTIVES	CRITICAL MEASURES	DEFINITION	TARGETS		
				2008/09	2009/10	2010/11
FINANCIAL	Become a viable, bankable utility	Current Ratio (Min.)	Current Assets/Current Liabilities	*1.3*	1.4	1.5
		Quick Ratio (Min.)	Current Assets - Inventories/ Current Liabilities	*1.0*	1.1	1.2
		Net Fixed Asset Turnover (Min.)	Revenue (P&L)/Net Fixed Assets	29%	33%	37%
		Net Profit Margin (Min.)	Operating (loss) profit/Revenues (P&L)	5%	7%	9%
		Debt to Capital Ratio (Max.)	Current liabilities + Current due of long term liabilities/ Net fixed Assets	*30%*	33%	36%
	Dramatically grow revenue and collections	Real growth in revenues (including tariff adjustment)	Amended Revenue Total less PAM YTD/ Amended Revenue Total less PAM YTD previous Year	***18%***	**4%**	**4%**
		Increase collection efficiency	Collections YTD/ Revenue YTD linked to collections	92%	93%	94%
	Increase productivity and contain operating costs	Staff costs as % of revenue	Employee Expenses/ Revenue (Income & Expense)	35%	32%	30%
		Operating Costs / Revenue	Operating Costs/Revenue (Income & Expense)	**75%**	**73%**	**70%**
CUSTOMER	Ranked as the number one utility in Jamaica in terms of customer service	Ranking based on OUR quarterly reports		*1*	1	1
		Ranking based on OUR annual survey		*1*	1	1
	Improve general service delivery and public image	Average performance based on NWC survey		60%	70%	90%
	Maintain high quality of water supply and sewerage services	Supply average availability in urban and rural areas (hours / day)		*24/18*	24/18	24/18
	Efficiently comply with regulatory standards	Compliance with agreed NEPA Standards		20%	30%	40%
		Compliance with MOH Standards		**95%**	**97%**	**99%**
		Compliance with OUR Standards		***95%***	**97%**	**99%**
INTERNAL PROCESSES	Improve billing and collection procedures	Percentage of active customers billed each month	Number of active customers billed with service charge/Total number of active customers	*95%*	98%	100%

PERSPEC-TIVE	OBJECTIVES	CRITICAL MEASURES		TARGETS		
			DEFINITION	2008/09	2009/10	2010/11
		Average receivable days	Gross Receivables YTD/ (Collections YTD/ No of days in collection period)	*180*	120	90
	Expeditiously treat with customer queries and complaints	Average time to resolve complaints (Days)		86%	88%	90%
		Average time to repair reported leak (Days)		***5***	**7**	**9**
	Ensure effective management of fixed assets	Average condition of fixed assets (1-10)		*5*	7	9
		Average project overrun on budget and schedule		15%	10%	5%
		Accuracy and completeness of asset inventory based on sample survey		85%	90%	95%
	Reduce NRW and increase operating efficiencies	NRW as % of production		***60%***	**55%**	**50%**
LEARNING AND GROWTH	All staff understand and deliver on mission and strategy	Staff awareness of mission and strategy based on internal survey		75%	85%	95%
	Develop requisite skills and orientation	Average training hours per staff/year	Total Training hrs YTD/ No of employees all converted to a yearly basis	*15*	25	35
	Provide appropriate technology and resources	Resource availability based on internal survey		50%	75%	95%
	Implement performance management system with incentives	Number of employees explicitly on performance management system		100%	100%	100%