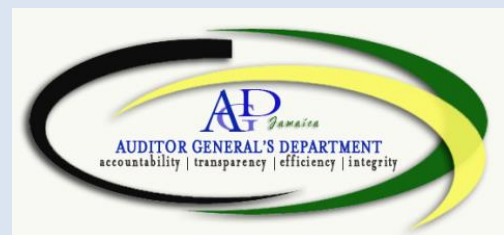


**AUDITOR GENERAL'S DEPARTMENT
SPECIAL AUDIT REPORT
NATIONAL WATER COMMISSION - K-FACTOR PROGRAMME**

The Auditor General is appointed by the Governor General and is required by the Constitution, Financial Administration and Audit Act, other sundry acts and letters of engagement, to conduct audits at least once per year of the accounts, financial transactions, operations and financial statements of central government ministries and departments, local government agencies, statutory bodies and government companies.

The Department is headed by the Auditor General, Pamela Monroe Ellis, who submits her reports to the Speaker of the House of Representatives in accordance with Section 122 of the Constitution of Jamaica and Section 29 of the Financial and Administration and Audit Act.

This report was prepared by the Auditor General's Department of Jamaica for presentation to the House of Representatives.



Auditor General of Jamaica
Auditor General's Department
40 Knutsford Boulevard
Kingston 5, Jamaica, W.I.
www.auditorgeneral.gov.jm

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Executive Summary

To facilitate the financing of capital rehabilitation projects to reduce Non-Revenue Water (NRW), NWC charges customers a percentage of their bill amount. This charge is known as K-Factor. NWC and OUR agreed on capital rehabilitation projects to be completed during each tariff period. NWC would determine the cost of the projects and recommend the K-Factor rate to meet the cost. The amounts collected should be used specifically to finance repayment of loans which are geared toward capital rehabilitation projects such as non-revenue water reduction, energy efficiency and sewage network expansion projects. It is expected that the implementation of approved capital rehabilitation projects, under the K-Factor programme would translate into an improvement in NWC's efficiency by reducing the level of NRW and energy consumption. The X-Factor was introduced as a mechanism to pass on efficiency gains from investments in projects done using the K-Factor funds. The X-Factor represents a credit on customers' bills, reducing the billed amount monthly.

The audit was conducted to determine whether NWC is using the K-Factor revenue to effectively implement projects approved under the K-Factor programme in order to reduce NRW and improve energy efficiency. The audit also seeks to determine whether NWC is complying with the established regulatory framework to ensure proper oversight of the K-Factor programme.

Key Findings

K-Factor Project and Efficiency Management

- 1. NWC did not achieve the 2008-13 Tariff Determination Notice target to reduce Non-Revenue Water (NRW) to 50 per cent.** During the 2008-2013 Tariff period, OUR approved a total of 128 projects, 64 related to NRW reduction and 64 related to sewage network. The projects entail the rehabilitation and repairs to mains at an estimated cost of \$41 billion. It is expected that the \$41 billion would finance repayments of loans secured to cover capital costs, which should be limited to a ten year tenure. However, NWC was only able to secure loans totalling US\$248 million (JA\$21.4 billion) of which US\$156.5 million was drawn down by NWC as at June 2014. Consequently, NWC had to use \$15 billion of the K-Factor cash inflows to supplement the financing of the projects, for the period April 2008 to September 2014. This resulted in NWC only being able to complete 54 (42 per cent) of the 128 projects as at November 2014. This has contributed to NWC's inability to achieve the revised NRW target of 55 established by OUR in its Tariff Determination Notice (2013-18). At March 2014, NRW stood at 71 per cent, representing 16 percentage points above OUR's target of 55 per cent.
- 2.** Over the period 2008-09 to 2013-14, NWC produced 390 billion imperial gallons at a total cost of \$354 billion. Over the same period, NRW was 270 billion imperial gallons (69 per cent) of the total water production at a cost of \$245 billion. Further, this critical state of affairs was exacerbated as it relates to NRW as NWC only collected 26 per cent (\$93.2 billion) of the remaining 31 per cent of billed water production.

Key Note

NRW includes leaks and unauthorised consumption. Of the 270 billion imperial gallons of NRW, leaks accounted for 132 billion (49 per cent), while unauthorised consumption accounted for 137 billion imperial gallons (51 per cent).

K-Factor Revenue and Control

- 3. NWC did not lodge \$0.7 billion collected from customers into the designated K-Factor Account.** Over the period April 2008 to September 2014, NWC collected approximately \$16 billion for K-Factor from customers. However, only \$15.3 billion (94 per cent) was deposited into the K-Factor bank account. The remaining \$0.7 billion was not deposited to the K-Factor bank account, but retained and utilised to finance NWC's operational activities. Further, we were unable to verify whether NWC was complying with the requirement to deposit the deemed K-Factor collection within the stipulated 45 days. The late depositing of the K-Factor funds could hinder the timely execution of non-revenue water reduction projects aimed towards increasing operational efficiency.
- 4. NWC transfer \$1 billion from K-Factor funds to finance administrative expenses.** NWC established the K-Factor Unit to manage the K-Factor programme. In a letter dated January 22, 2013, **OUR** agreed with NWC decision that the administrative activities of the K-Factor Unit would be paid by NWC. However, NWC instituted a supervision cost of 8.5 per cent of project cost, which amounted to \$1.08 billion, which was transferred to NWC operational bank accounts in August 2013. NWC did not present the requisite approval from **OUR** for the imposition of the supervision cost. NWC failure to lodge \$0.7 billion collected from customers into the designated K-Factor Account and the diversion of \$1 billion to finance administrative expenses may have impacted on the timely implementation of Non Revenue Water (NRW) reduction projects.

Recommendations

- 1.** NWC should ensure full compliance with the requirement to deposit within the stipulated timeframe, all revenues collected from customers under the K-Factor programme. In addition, all K-Factor related loan proceeds should be deposited to the K-Factor bank account. NWC should also ensure that K-Factor revenues remain in the K-Factor bank to be made available to finance the implementation of K-Factor projects at the earliest possible time.
- 2.** NWC should immediately seek to develop a comprehensive water loss management strategy to address the issue of NRW. The strategy should include a robust plan to repair 95 per cent of reported system leaks within the required one to three days. NWC should also put systems in place to complete all NRW reduction projects before the end of the 2013-18 tariff periods so as to realized expected efficiency gains.

Part One

Introduction

1.1 The National Water Commission (NWC) was formally established in 1980 through the amalgamation of the Kingston and St. Andrew Water Commission and the rurally focused, National Water Authority. This amalgamation resulted in the merging of some major systems island wide under one authority. NWC is the main institution responsible for all major water and sewerage operations, including: production of water collection, water treatment and disposal of urban sewage. The Commission is governed by the National Water Commission Act (1980); and is regulated and monitored by the Office of Utilities Regulation (**OUR**).

Explaining the K-Factor

1.2 To facilitate the financing of capital rehabilitation projects to reduce NRW, NWC charges customers a percentage of their bill amount. This charge is known as K-Factor. NWC and **OUR** agreed on capital rehabilitation projects to be completed during the tariff period. NWC would determine the cost of the projects and recommend the K-Factor rate to meet the cost. The 'K' Factor was initially implemented as part of an existing Interim Rate Adjustment, effective February 1, 1999. This arrangement, which remained in effect for two years, was used exclusively to finance NWC's Metering and Pump Replacement Programmes. In 2002, **OUR** approved another request from NWC for the reintroduction of the K-Factor mechanism. The K-Factor mechanism was reintroduced in 2003 and was included as part of the Interim Rate Adjustment; until the mechanism was adjusted, in 2008, to be reflected as a separate charge on customers' bills. Since 2008, the revenues collected from the K-Factor are used specifically to finance non-revenue water reduction, energy efficiency and sewage network expansion projects, as approved by the **OUR**.

What is the X-Factor?

1.3 The X-Factor was introduced as mechanism to pass on efficiency gains from investments in projects done using the K-Factor funds. The X-Factor represents a credit on customers' bills reducing the billed amount monthly.

Audit Rationale, Scope and Methodology

1.4 Since the programme was formalized in 2008-09, there have been public concerns about the general management of the programme. The purpose of the audit is to determine whether NWC is effectively managing revenues obtained from the K-Factor programme to improve operational efficiency. Our audit was planned and conducted in accordance with the Government Auditing Standards, which are applicable to Performance Audit and issued by the International Organization of Supreme Audit Institutions (INTOSAI). The planning process involved gaining a thorough understanding of the K-Factor programme and developing an issue analysis which focused key areas of concern. Our assessment is based on the review of internal and external documents, interviews with senior management and staff, observations and analysis of information provided by NWC.

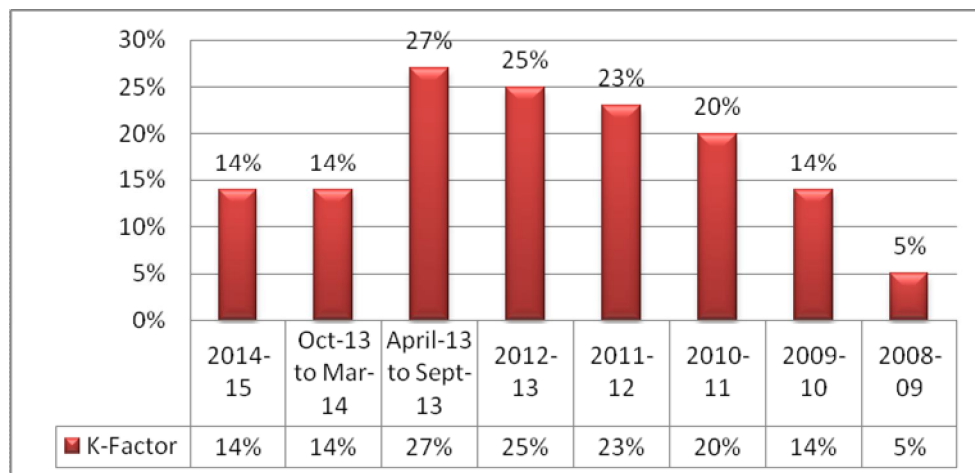
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Part Two

K-Factor Revenue and Control

2.1 The K-Factor represents a set percentage charge of NWC’s customers’ usage as approved by **OUR**. As shown in **Figure 1**, the K-factor charge increased from five per cent in 2008-09 to 27 per cent in April 2013, and then reduced to 14 per cent since October 2013. In the Determination Notice 2013-18, **OUR** approved the continuation of the K-Factor rate of 14 per cent up to 2017-18. Under the Determination Notice 2008-13, NWC is required to ensure that the management of the K-Factor programme is in compliance with regulatory requirements. These regulatory requirements include standardised reporting formats outlined in the Commission’s Regulatory Framework.

Figure 1 Actual K-Factor rates, 2008-09 and 2014-15



Source: OUR Determination Notice 2008-13 and 2013-18

K-Factor revenues amounting to \$0.7 billion not deposited to K-Factor bank account

2.2 The Tariff Determination Notice (2008-13) stipulates that 90 per cent of total K-Factor billing should be paid over to the K-factor bank account on a monthly basis. As at October 2013, the rate was increased to 92 per cent in the Tariff Determination Notice for 2013-18. Over the period April 2008 to September 2014, K-Factor amounted to approximately \$16 billion. Of this amount, NWC deposited \$15.37 billion to the K-Factor bank account. The remaining \$696 million was not deposited (**Figure 2**). Further, the Determination Notice stipulates that K-Factor revenues shall be deemed collected within 45 days after billing and deposited to the K-Factor bank account. However, we observed that NWC is not complying with the requirement to deposit the deemed K-Factor collections within the stipulated 45 days after billings. For example, in 2011-12, NWC deposited \$1.3 billion in excess of the deemed K-Factor collections for that year. This was to partly account for the \$1.9 billion NWC did not deposit between 2008-09 and 2010-11. Similarly, in 2013-14, NWC made deposits of \$1.2 billion in excess of the deemed collections to offset the previous year shortfall, 2012-13. The issue of NWC not lodging K-

Factor revenues to the K-Factor bank account was highlighted in our performance audit of **OUR** in November 2013. The late depositing of the K-Factor funds hinders the timely execution of non-revenue water reduction and sewerage improvement projects aimed towards increasing operational efficiency.

Figure 2 K-Factor revenues and deposits, April 2008 to September 2014

Years	Total NWC Billing \$'000	Actual Collection (\$'000)	K-Factor Billing \$'000	Deemed collections \$'000	Lodgement \$'000	Variance \$'000
Apr. to Sept-14	13,234,163	12,201,258	1,600,533	1,472,490	1,480,743	-8,253
2013-14	23,858,793	19,716,247	3,984,630	3,613,031	4,803,582	-1,190,551
2012-13	20,415,586	17,028,129	3,999,786	3,599,807	2,339,331	1,260,476
2011-12	19,488,973	16,398,205	3,457,131	3,111,418	4,388,232	-1,276,814
2010-11	15,887,469	14,318,321	2,493,757	2,244,831	1,985,934	258,897
2009-10	15,070,260	13,437,616	1,733,683	1,560,315	363,196	1,197,119
2008-09	13,877,521	12,279,626	511,865	460,678	5,250	455,428
Total	108,598,602	93,178,144	17,781,385	16,062,571	15,366,268	696,302
		86%			96%	4%

Source: AuGD analysis of information provided by NWC

NWC transfers \$1 billion from K-Factor fund to finance administrative expenditure

2.3 NWC established the K-Factor Unit to manage the activities of the K-Factor programme. In a letter to **OUR** dated December 20, 2012, NWC noted that it would undertake to finance the operations of the K-Factor Unit. Further, in a letter dated January 22, 2013, **OUR** noted its acceptance of NWC's decision to finance the operation of the K-Factor Unit from its own funds. NWC provided an undated and unsigned position paper, which indicated that "the K-Factor Unit, which has oversight responsibility for managing the K-Factor fund, will identify each approved project, following initiation and instruct the finance department to transfer the stipulated 8.5 per cent supervision cost to the NWC's account." This would off-set costs relating to project administration, monitoring, indirect and procurement costs. However, we found no evidence that this position was supported by **OUR**.

2.4 In August 2013, NWC transferred \$1.08 billion to its operational bank accounts, representing supervision costs relating to nine projects (**Figure 3**). However, we found that NWC transferred \$195 million, relating to three projects, which were not initiated up to the date of this report. We observed that the K-Factor Unit's total expenditure for 2013-14 was only \$72 million.

Figure 3 Withdrawals from K-Factor fund for project supervision costs

No.	Projects	8.5% of Project Cost	Total Withdrawn from K-Factor Account	Deposited To NWC Account	Date of Withdrawal
1	Roaring River/Savanna-lamar WSP*	JA\$132,026,398	JA\$272,715,380	JA\$272,715,380	08-Aug-13
2	KMA Water Supply Rehab. Water Project (Lot 2B)	JA\$124,538,982			
3	Palisades Peninsula Pipeline Replacement	JA\$16,150,000			
4	Essex Valley WSP (Phase 2)	JA\$20,045,798	JA\$118,200,150	JA\$118,200,150	12-Aug-13
5	Black River and Gr. Black River Pipeline Replace.*	JA\$43,150,169			
6	Non Pariel Supply Mains Replace. and Upgrading	JA\$34,826,079			
7	Mount Pleasant and Eviron's Water Supply*	JA\$20,178,104			
8	JWS Improvement Project - Category B	US\$5,400,000	US\$6,733,519	JA\$684,466,211	09-Aug-13
9	Lucea Pipe Replac. & NRW Reduction Project	US\$1,333,519			
	Total			JA\$1,075,381,741	

Note: *Three projects not yet commenced

Source: AuGD analysis of NWC's data

NWC received OUR's approval to borrow K-Factor funds to finance operational activities

2.5 We found that on two occasions, NWC received **OUR's** approval to borrow funds from the K-Factor US dollar bank account to finance NWC's operational activities. On July 2, 2012, **OUR** gave approval for NWC to borrow US\$10 million (JA\$888 million¹) from the K-Factor fund. The money was to be repaid within 60 days, but was extended to October 4, 2012. The money was to be repaid with interest at a rate which would have been earned had the funds remained in the account. NWC withdrew the funds on July 4, 2012 and repaid JA\$904 million, on October 9, 2012. We observed another instance where **OUR** approved the withdrawal of US\$650,000 on January 23, 2013 to be repaid on February 18, 2013 with interest. NWC provided evidence that US\$347,398 was taken from the bank account; US\$226,537 on February 21, 2013 and US\$120,861 on February 25, 2013. The total amount was repaid on July 5, 2013, 134 days after withdrawal, without interest.

¹ Converted at the prevailing exchange rate of 88.8845:1 - July 4, 2012

NWC no longer requires OUR's approval to withdraw funds from the K-Factor accounts

2.6 To ensure that K-Factor funds are only used for the intended purpose, **OUR** mandated that before the NWC can take cash from out of the K-Factor bank account, NWC should obtain **OUR's** prior approval. We observed that up to February 2013, NWC submitted all invoices to **OUR** for non-objection approval before funds are withdrawn from the K-Factor bank account. However, in a letter dated January 22, 2013, **OUR** stated that it has reviewed its position on the current arrangements whereby all withdrawals from K-Factor accounts require prior **OUR** approval. The letter further stated, "with specific reference on **OUR** approved K-Factor projects, effective Monday, January 28, 2013, the NWC may make withdrawals, without prior approval from the K-Factor funds to effect necessary payments, to the extent that such payments are routine, consistent with the project expectations, and are provided for in the approved budgets. Expenditure otherwise incurred shall continue to require the **OUR's** prior approval before withdrawals can be made from the K-Factor fund."

Part 3

K-Factor Project and Efficiency Management

3.1 NWC should use revenues from the K-Factor fund to finance capital rehabilitation programmes such as NRW reduction, energy efficiency and sewage network expansion projects, as approved by the OUR. It is expected that the implementation of approved capital rehabilitation projects, under the K-Factor programme would translate into an improvement in NWC's efficiency. These projects are expected to reduce the level of NRW and energy consumption and put NWC on the path of increased efficiency. Efficiency gains generated from the investments in these projects should be passed on, as a credit on customers' bills, under the X-Factor as approved by the OUR.

NWC did not complete 74 of the 128 K-Factor projects in the 2008-13 tariff period

3.2 NWC did not implement all the NRW projects which were slated for implementation during the 2008-13 tariff period. During this tariff period, **OUR** approved a total of 128 projects, 64 related to NRW reduction and 64 to sewage network. The projects entailed the rehabilitation and repairs to mains at an estimated cost of \$41 billion. However, NWC only completed 54 (42 per cent) of the 128 projects. The 74 projects, which were not completed, were carried forward to the new tariff period for 2013-18, of which 34 were work-in-progress as at November 2014 (**Figure 4**). No work has commenced on the other 40 projects, which have total estimated costs of \$10 billion. NWC only presented the costs for 47 of the 54 projects that were completed, at a cost of \$19.8 billion.

3.3 NWC's 2008-13 Tariff Determination requires NWC to secure funding sufficient to finance capital costs for rehabilitation and mains repairs. The K-Factor revenue would finance loans to cover the \$41 billion needed to implement the approved K-Factor projects. NWC was able to secure loans totalling US\$248 million (JA\$21.4 billion) but only US\$156.5 million was drawn down as at June 2014. Consequently, NWC had to use \$15 billion of the K-Factor cash inflows to supplement the financing of the projects, for the period April 2008 to September 2014. This has contributed to NWC's inability to achieve the revised NRW target of 55 established by OUR in its Tariff Determination Notice (2013-18). At March 2014, NRW stood at 71 per cent, representing 16 percentage points above OUR's target of 55 per cent.

Figure 4 K-Factor project status, tariff period 2008-13

Project Type	Project Status 2008-13			Carried Forward 2013-18	
	Approved	Completed	Not Completed	Work-in- Progress	Not Started
Potable Water	64	28	36	29	7
Sewage network	64	26	38	5	33
Total	128	54	74	34	40
Percentage	100%	42%	58%		

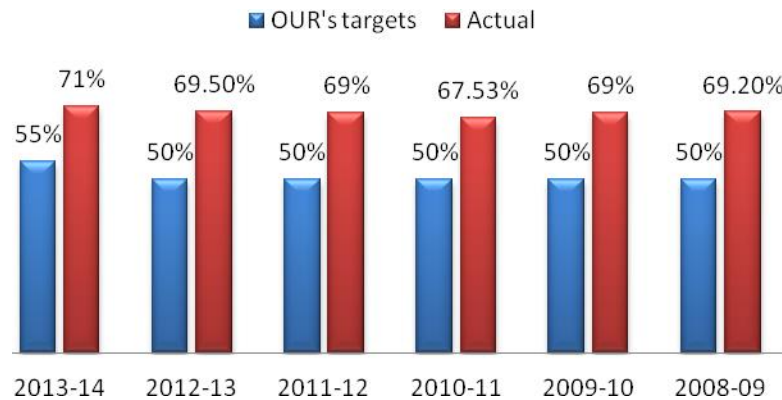
Source: AuGD analysis of information provided by NWC

3.4 We observed that NWC identified another 32 projects for completion by December 2019 for which it sought **OUR**'s approval. However, **OUR** did not grant approval on the basis that no new projects will be approved for direct financing from the K-Factor fund until NWC provides a comprehensive assessment of the funding requirements to complete the existing approved projects and service the relevant loans.

NWC did not improve efficiency in 2008-13 as NRW and repair cost increased

3.5 NWC's failure to complete the 36 NRW projects during the 2008-13 tariff period was one of the factors preventing it from achieving the efficiency targets set by **OUR**. The reduction in NRW is the main indicator of efficiency gains. NWC did not achieve the targets set by **OUR** in the 2008-13 Tariff Determination Notice, to reduce NRW by 50 per cent between 2008-09 and 2012-13 and 55 per cent thereafter. NRW fluctuated between 67.53 and 69.5 per cent over the period. NRW stood at 71 per cent at March 2014, representing 16 percentage points above **OUR**'s target of 55 per cent (**Figure 5**).

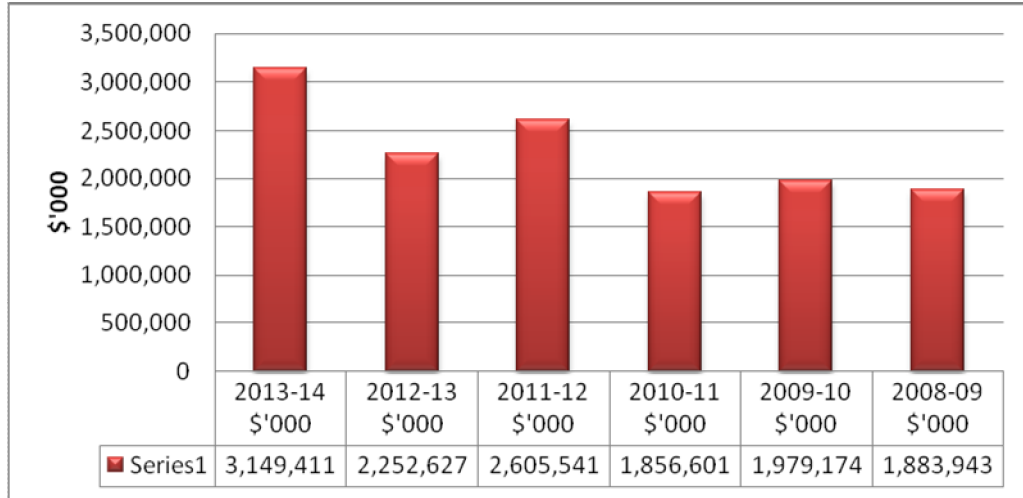
Figure 5 NRW stood at 71 per cent at the end of 2013-14



Source: AuGD analysis of data provided by NWC

3.6 Another indicator of efficiency gains is the reduction in general repairs and maintenance costs. Our analysis of NWC’s general repairs and maintenance costs shows an increasing trend. NWC’s repair and maintenance cost increased by 67 per cent over the six year period, moving from \$1.9 billion in 2008-09 to \$3 billion in 2013-14 (**Figure 6**).

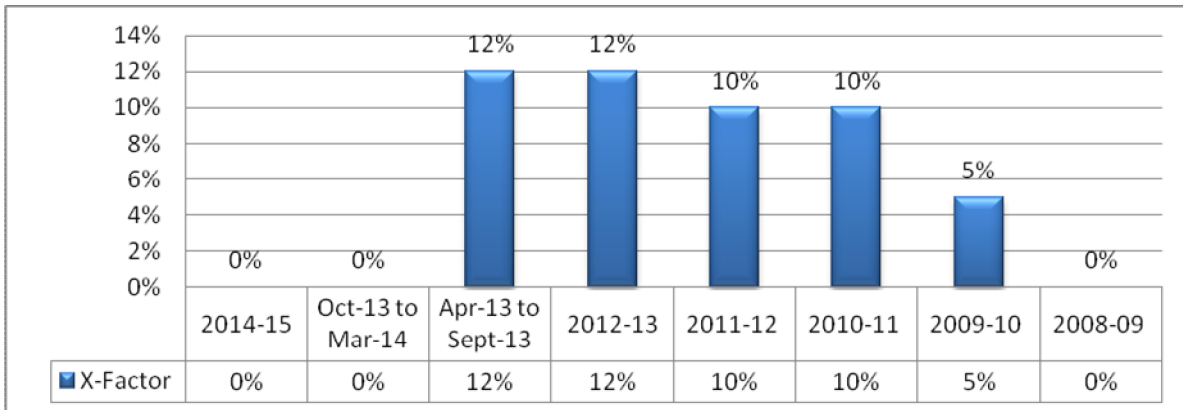
Figure 6 R&M costs increased by 67 per cent between 2009 and 2014



Source: AuGD analysis of data provided by NWC

3.7 Although NWC did not achieve the expected efficiency targets, NWC passed on the anticipated efficiency gains as a credit on customers’ bills. NWC credited \$7 billion to customers, between June 2009 and September 2013, in compliance with the approved rates. The approved rates are shown in **Figure 7**.

Figure 7 Actual X-Factor rates applied between 2008-09 and 2014-15



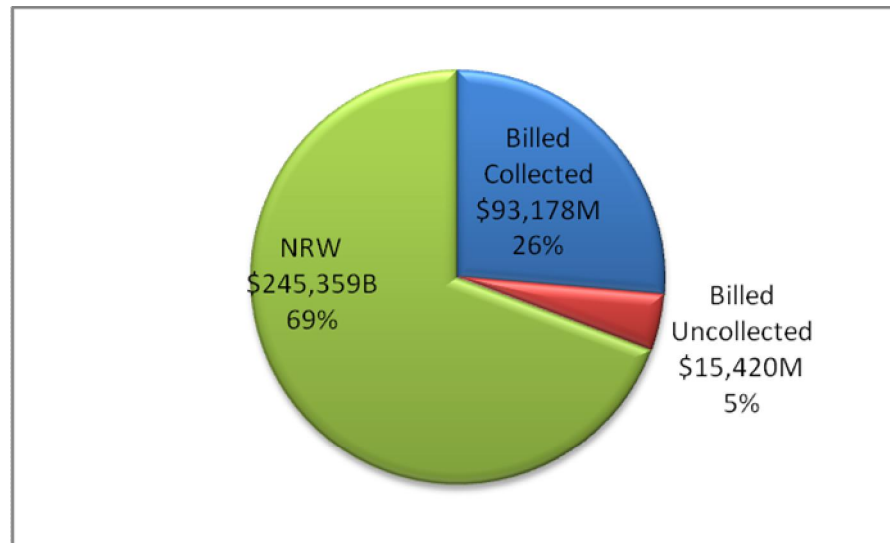
Source: OUR Determination Notice, 2008-13 and 2013-18

3.8 During the tariff period 2013-18, NWC should reduce NRW to the targeted 55 per cent. Customers are to start benefiting from expected efficiency gains in 2015-16, under the X-Factor, at a rate of 9.7 per cent. The X-Factor rate should further increase to 12.5 per cent in 2016-17 and then 15.2 per cent in the final year of the K-factor programme, 2017-18. This means that NWC would be paying out more under the X-Factor than the gains realized from the K-Factor. Therefore, it is incumbent upon NWC to manage effectively the implementation of K-Factor projects, over the period 2013-18, so as to achieve the expected efficiency gains.

NWC revenue impacted by its failure to collect for 74 per cent of total water produced

3.9 We found that NWC’s financial viability was severely affected by its inability to recover 74 per cent of the cost of the total water produced over the period 2008-09 to 2013-14. Sixty-nine per cent of water produced over the period represents NRW; while five per cent represents uncollected billed water (**Figure 8**).

Figure 8 NWC did not collect for 74 per cent of water produced, 2008-14



Years	Authorised Consumption- (IG Million)	Authorised Consumption (\$'000)	Actual Collection (\$'000)	Not Collected (\$'000)
2013-14	18,968	23,858,793	19,716,247	4,142,546
2012-13	19,796	20,415,586	17,028,129	3,387,457
2011-12	20,675	19,488,973	16,398,205	3,090,768
2010-11	20,822	15,887,469	14,318,321	1,569,148
2009-10	20,237	15,070,260	13,437,616	1,632,644
2008-09	19,829	13,877,521	12,279,626	1,607,895
Total	120,329	108,598,602	93,178,144	15,420,458
Percentage			86%	14%

Source: AuGD analysis of data provided by NWC

3.10 Data provided by NWC shows that, over the six-year period, 2008-09 to 2013-14, NWC produced 390 billion imperial gallons (IG) of water at a cost of \$354 billion. However, we noted that NWC only collected \$93 billion in revenue. Of the 390 billion imperial gallons produced, 270 billion (69 per cent) represents NRW. It cost NWC \$245 billion to produce the 270 billion imperial gallons of water for which it derived no revenue. **Figure 9** shows a continued increase in the levels of NRW, moving from 44.5 billion imperial gallons in 2008-09 to 46 billion in 2013-14. In contrast, there is a decline in the amount of water billed to customers over the period, reducing from 19.8 billion imperial gallons in 2008-09 to 18.9 billion in 2013-14. This indicates that although NWC is producing more water, less water is being billed to customers.

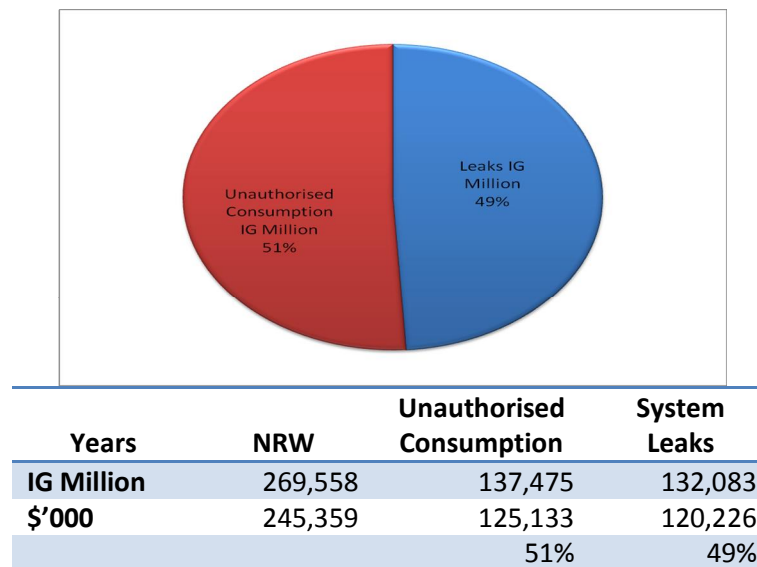
Figure 9 NRW amounts to 69 per cent over six years

Years	\$'000	System Input (IG Million)	Authorised Consumption (IG Million)	Non-Revenue Water (IG Million)
2013-14	\$84,040	65,223	18,968	46,255
2012-13	\$67,094	65,060	19,796	45,264
2011-12	\$62,923	66,752	20,675	46,077
2010-11	\$48,935	64,135	20,822	43,313
2009-10	\$47,910	64,335	20,237	44,098
2008-09	\$45,055	64,378	19,829	44,549
Total	\$353,958	389,887	120,329	269,558
Percentage			31%	69%

Source: AuGD analysis of data provided by NWC

3.11 NWC informed us that NRW is as a result of leaks and unauthorised consumption. Of the 270 billion imperial gallons of NRW, leaks accounted for 132 billion (49 per cent), while unauthorised consumption accounted for 137 billion imperial gallons (51 per cent) **Figure 10**.

Figure 10 Leaks account for 41 per cent of NRW



Source: AuGD analysis of data provided by NWC

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