



Draft Report

SunWater

Irrigation Price Review: 2012-17

Volume 2

Nogoa-Mackenzie Water Supply Scheme

November 2011

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SUBMISSIONS

This report is a draft only and is subject to revision. Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (the Authority). Therefore submissions are invited from interested parties. The Authority will take account of all submissions received.

Written submissions should be sent to the address below. While the Authority does not necessarily require submissions in any particular format, it would be appreciated if two printed copies are provided together with an electronic version on disk (Microsoft Word format) or by e-mail. Submissions, comments or inquiries regarding this paper should be directed to:

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The **closing date** for submissions is **23 December 2011**.

Confidentiality

In the interests of transparency and to promote informed discussion, the Authority would prefer submissions to be made publicly available wherever this is reasonable. However, if a person making a submission does not want that submission to be public, that person should claim confidentiality in respect of the document (or any part of the document). Claims for confidentiality should be clearly noted on the front page of the submission and the relevant sections of the submission should be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two copies of each version of these submissions (i.e. the complete version and another, excising confidential information) could be provided. Again, it would be appreciated if each version could be provided on disk. Where it is unclear why a submission has been marked “confidential”, the status of the submission will be discussed with the person making the submission.

While the Authority will endeavour to identify and protect material claimed as confidential as well as exempt information and information disclosure of which would be contrary to the public interest (within the meaning of the *Right to Information Act 2009 (RTI)*), it cannot guarantee that submissions will not be made publicly available. As stated in s187 of the *Queensland Competition Authority Act 1997* (the QCA Act), the Authority must take all reasonable steps to ensure the information is not disclosed without the person’s consent, provided the Authority is satisfied that the person’s belief is justified and that the disclosure of the information would not be in the public interest. Notwithstanding this, there is a possibility that the Authority may be required to reveal confidential information as a result of a RTI request.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at the Brisbane office of the Authority, or on its website at www.qca.org.au. If you experience any difficulty gaining access to documents, please contact the office (07) 3222 0555.

Information about the role and current activities of the Authority, including copies of reports, papers and submissions can also be found on the Authority’s website.

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GLOSSARY

Refer to Volume 1 for a comprehensive list of acronyms, terms and definitions.

EXECUTIVE SUMMARY

Ministerial Direction

The Authority has been directed by the Minister for Finance and The Arts and the Treasurer for Queensland to recommend irrigation prices to apply to particular SunWater water supply schemes (WSS) from 1 July 2012 to 30 June 2017 (the 2012-17 regulatory period). A copy of the Ministerial Direction forms **Appendix A** to Volume 1.

Summary of Price Recommendations

The Authority's recommended irrigation prices to apply to the Nogo-Mackenzie WSS for the 2012-17 regulatory period are outlined in Table 1, together with actual prices since 1 July 2006.

Table 1: Prices for the Nogo-Mackenzie WSS (\$/ML)

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
River – Medium Priority											
Fixed (Part A)	5.12	5.28	5.52	5.72	5.88	6.08	10.05	10.30	10.55	10.82	11.09
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21
River – High Priority											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	21.29	23.87	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21

Source: *Actual Prices (SunWater, 2011a)* and *Recommended Prices (QCA, 2011)*.

Draft Report

Volume 1 of this Draft Report addresses key issues relevant to the regulatory and pricing frameworks, renewals and operating expenditures and cost allocation, which apply to all schemes.

Volume 2, which comprises scheme specific reports, should be read in conjunction with Volume 1. Also relevant is the Draft Report on Emerald Distribution System.

Consultation

The Authority has consulted extensively with SunWater and other stakeholders throughout this review. Consultation has included: inviting submissions from, and meeting with, interested parties, the commissioning of independent reports on key issues; and, publication of Issues Papers.

Comments on the Draft Report are due by **23 December 2011**. All submissions will be taken into account by the Authority in preparing its Final Reports due by 30 April 2012.

1. NOGOA-MACKENZIE WATER SUPPLY SCHEME

1.1 Scheme Description

The Nogo-Mackenzie WSS is located near the town of Emerald. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the Nogo-Mackenzie WSS

<i>Nogo-Mackenzie WSS</i>	
Business Centre	Biloela
Irrigation Uses of Water	Cotton, citrus and grapes, wheat, pulse crops, sorghum, maize, lucerne, oats, barley and sunflowers
Urban water supplies	Various towns and townships, including Emerald and Blackwater
Industrial Water Supplies	Coal mines

Source: Synergies Economic Consulting (2010).

The Nogo-Mackenzie WSS has a total of 351 bulk customers (some of whom are also customers of the Emerald Distribution System which draws its supply from Nogo-Mackenzie). Medium and high priority water access entitlements (WAE) are outlined in Table 1.2.

Table 1.2: Water Access Entitlements

<i>Customer Group</i>	<i>Irrigation WAE (ML)</i>	<i>Total WAE (ML)</i>
Medium Priority	163,375	190,925
High Priority	2,801	44,398
Total	166,176	235,323

Source: SunWater (2011a).

1.2 Bulk Water Infrastructure

Bulk water services involve the management of storages and WAEs in accordance with regulatory requirements, and the delivery of water to customers in accordance with their WAE.

The full supply storage capacity and age of the key infrastructure are detailed in Table 1.3.

Table 1.3: Bulk Water Infrastructure in the Nogo-Mackenzie WSS

<i>Storage Infrastructure</i>	<i>Capacity (ML)</i>	<i>Age (years)</i>
Fairbairn Dam	1,301,000	39
Bedford Weir	22,900	42
Tartrus Weir	12,000	24
Bingegang Weir	8,060	34
Selma Weir	1,180	58

Source: SunWater (2011) and QCA (2011).

The characteristics of the bulk water assets are:

- (a) Fairbairn Dam consists of an earth and rock fill clay-core embankment complemented by six secondary earth and rock fill saddle dams across low-lying areas. Fairbairn Dam has two outlets, one on each bank. The right bank outlet releases into the Weemah Main Channel and the Nogo River. The left bank outlet releases into Selma Channel;
- (b) Bedford Weir is a mass concrete weir, augmented in 1997 with the installation of two rubber bags, which currently are not being used;
- (c) Tartrus Weir is located downstream of the convergence of the Upper Mackenzie River and the Isaac River;
- (d) Bingegang Weir is a mass concrete weir, and was raised in 1998; and
- (e) Selma Weir is a mass concrete weir. The weir is kept full and supplies downstream requirements by overtopping (SunWater, 2011).

The location of the Nogo-Mackenzie WSS and key infrastructure is shown in Figure 1.1.

1.3 Network Service Plans

The Nogo-Mackenzie WSS network service plan (NSP) presents SunWater's:

- (a) existing service standards;
- (b) forecast operating and renewals costs, including the proposed renewals annuity; and
- (c) risks relevant to the NSP and possible reset triggers.

SunWater has also prepared additional papers on key aspects of the NSPs and this price review, which are available on the Authority's website.

Figure 1.1: Nogoa-Mackenzie WSS Locality Map



Source: SunWater (2011).

1.4 Consultation

The Authority has consulted extensively with SunWater and other stakeholders throughout this review on the basis of the NSPs and supporting information. To facilitate the review, the Authority has:

- (a) invited submissions from interested parties;
- (b) met with stakeholders to identify and discuss relevant issues (two rounds of consultation);
- (c) published notes on issues arising from each round of consultation;
- (d) commissioned independent consultants to prepare Issues Papers and review aspects of SunWater's submissions;
- (e) published all issues papers and submissions on its website; and
- (f) considered all submissions and reports in preparing this Draft Report for comment.

The Authority has also received a number of submissions from stakeholders on matters such as capacity to pay, rate of return on existing assets, contributed assets, dam safety upgrades, nodal pricing, national metering standards and whether or not to recover recreation management costs from SunWater customers.

Following the amendment to the original Ministerial Direction of 19 March 2010 and further advice from the Minister of 23 September 2010 and 9 June 2011, these issues are outside the scope of the current investigation and have therefore not been addressed.

The Ministerial Direction forms **Appendix A** to Volume 1.

2. REGULATORY FRAMEWORK

2.1 Introduction

Under the Ministerial Direction, the Authority must recommend the appropriate regulatory arrangements, including price review triggers and other mechanisms, to manage the risks associated with identified allowable costs.

During the negotiations that preceded the 2006-11 price path, the Nogo-Mackenzie WSS Tier 2 group indicated that they were in favour of retaining the existing price cap regulatory arrangement. In the 2011-12 interim price period the price cap arrangement was continued.

2.2 Stakeholder Submissions

SunWater

SunWater identified a range of generic risks considered relevant to allowable costs across all schemes (see Volume 1). SunWater also considered that it should not bear the risk of water availability (volume risk). The following are scheme specific risks identified by SunWater in the NSP associated with the Nogo-Mackenzie WSS:

- (a) the introduction of schemes relating to the reduction of greenhouse gases that may have implications for electricity prices;
- (b) damage to SunWater's assets, to the extent that such damage is not recoverable under insurances;
- (c) metering costs related to changes in regulatory standards;
- (d) replacement of Bedford Weir inflatable rubber dam¹;
- (e) unplanned frequency of installing and operating pumps to access low storage levels;
- (f) levies or charges made in relation to the regulation of irrigation prices by the Authority;
- (g) the availability of chemicals to control submerged weeds and algae in channels; and
- (h) outbreak of noxious weeds.

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders noted that SunWater argued it should not bear volume risk. Irrigators argued that if they are to bear volume risk, then price should decrease and that the nature of volume risk depends on which costs vary with water use.

Cotton Australia/Queensland Farmers' Federation (QFF, 2011a) questioned SunWater's statement that customers' demand is a risk that cannot be managed by SunWater.

Cotton Australia/QFF (2011b) submitted that:

- (a) if the demand risk is placed wholly on irrigators if pricing is based on WAE and not use, prices should go down; and

¹ In its Annual Report 2009-10, SunWater noted that in November 2008, one of the two inflatable rubber dams on top of Bedford Weir failed. In the ensuing unexpected release of water downstream, a fatality occurred. The court action commenced during 2009-10 and is ongoing.

- (b) to better understand demand risk, there needs to be a better separation of fixed and variable costs.

The Central Highlands Cotton Growers and Irrigators Association (CHCGIA, 2010b) stated that most irrigators are operating under unsigned deemed contracts which clearly state that SunWater is under no obligation to guarantee supply to water users. Effectively SunWater has minimised all its risk in regard to timing, volume, quality and reliability of water supply. CHCGIA submitted that the Authority should examine these deemed contracts to determine the actual risk or uncertainty that SunWater faces.

2.3 Authority's Analysis

The Authority has, in Volume 1, analysed the general nature of the risks confronting SunWater and recommended that an adjusted price cap apply to all WSSs. The proposed allocation of risks and the means for addressing them are outlined in Table 2.1.

Table 2.1: Summary of Risks, Allocation and Authority's Recommended Response

<i>Risk</i>	<i>Nature of the Risk</i>	<i>Allocation of Risk</i>	<i>Authority's Recommended Response</i>
Short Term Volume Risk	Risk of uncertain usage resulting from fluctuating customer demand and/or water supply.	SunWater does not have the ability to manage these risks and, under current legislative arrangements, these are the responsibility of customers. Allocate risk to customers.	Cost-reflective tariffs.
Long Term Volume Risk (Planning and Infrastructure)	Risk of matching storage capacity (or new entitlements from improving distribution loss efficiency) to future demand.	SunWater has no substantive capacity to augment bulk infrastructure (for which responsibility rests with Government). SunWater does have some capacity to manage distribution system infrastructure and losses provided it can deliver its WAEs.	SunWater should bear the risks, and benefit from the revenues, associated with reducing distribution system losses.
Market Cost Risks	Risk of changing input costs.	SunWater should bear the risk of its controllable costs. Customers should bear the risks of uncontrollable costs.	End of regulatory period adjustment for over-or under-recovery. Price trigger or cost pass through on application from SunWater (or customers), in limited circumstances.
Risk of Government Imposts	Risk of governments modifying the water planning framework imposing costs on service provider.	Customers should bear the risk of changes in water legislation though there may be some compensation associated with National Water Initiative (NWI) related government decisions.	Cost variations may be immediately transferred to customers using a cost pass-through mechanism, depending on materiality.

Source: QCA (2011).

Consistent with the Authority's allocation of risks (Table 2.1), it is proposed that risks identified by SunWater in items (a), (b), (e), (g) and (h) above will be dealt with an end-of-period adjustment, or price trigger or cost pass through upon application by SunWater or customers.

It should be noted that anticipated prudent and efficient electricity costs are reviewed as part of the Authority's analysis of efficient operating costs, and it is only if they are materially different to those forecast would there be a case to consider price triggers or cost pass throughs.

Metering upgrades (c) are outside the scope of the investigation. Replacement of Bedford Weir inflatable rubber dam (d) is addressed in Chapter 4 – Renewals Expenditure. No levies or charges (f) are to be applied by the Authority as a result of this irrigation review.

The Authority notes stakeholders' (Round 2 Consultation, Cotton Australia/QFF) comments regarding volume risk. The Authority has concluded in Volume 1 that SunWater does not have the ability to manage volume risks and under current water planning framework these risks are the responsibility of customers. In principle, if SunWater were allocated that risk, then they would need to be compensated for holding it through higher prices.

Short-term volume risks will therefore need to be managed, and their cost borne, by customers. Costs that vary with water use (variable), and may cause volume risk, are addressed in more detail in the chapter on operating expenditures. Which costs are considered to be fixed or variable is addressed further below.

In response to CHCGIA submissions, the Authority understands that Section 122A of the *Water Act 2000* that a standard supply contract applies unless the WAE holder has another water supply contract. The Authority has reviewed the standard contracts and found that the standard supply contract between SunWater and its customers requires SunWater to only supply water to customers to satisfy customer requirements when there is a sufficient level of water availability.

Section 12.1(d) of the standard supply contract allows SunWater to suspend or restrict releases of water from the works of SunWater due to force majeure, which includes drought. Therefore, the standard water supply contract does attribute supply risk to WAE holders. This is consistent with the legislative framework and requirements of the Ministerial Direction which requires SunWater to maintain the capacity to deliver the total nominal WAEs and for prices to incorporate the efficient costs of doing so.

3. PRICING FRAMEWORK

3.1 Tariff Structure

Introduction

During the 2005-06 price negotiations, it was generally agreed to adopt a 70:30 ratio of fixed costs to variable costs. However, due to the prevailing Government policy that there should be no real price decreases, the Part A fixed charge was set at 47% and Part B variable charges at 53% of total revenues in this scheme.

Stakeholder Submissions

SunWater

SunWater (2011d) submitted that the fixed charge should recover fixed costs and the variable charge should recover variable costs.

Other Stakeholders

CHCGIA (2010b) submitted that:

- (a) while recognising that capital value of water drives the best end use of the resource, if the capital value of water is lowered [by raising water prices] this will undermine the water market that has taken 10 years to establish; and
- (b) the costs reflected in Part A charges should recognise water reliability. For example, if average reliability is 50% and Part A costs recover the full efficient [total] operating costs, then water users are incurring the capital cost of owning allocation while receiving only half of their WAEs.

B. Anderson (2010) submitted that paying Part A charges whether or not water is used is not appropriate or fair.

Cotton Australia/QFF (2011a) submitted that if SunWater charges for 100% of WAEs regardless of use (and thus removes all references to storage rental fees), the value of spending money on water use efficiency will be put into question where carry-over or continuous accounting is not in place. Cotton Australia/QFF suggested that SunWater should therefore review all scheme rules for the prospect of carry-over or continuous accounting. Further, if SunWater charges for 100% of bulk WAEs, it should be charged in arrears not in advance as is currently the case.

During Round 2 consultation in April 2011, irrigators with a history of high water use raised concerns that [under the 2006-11 tariff structure] they are subsidising others in the scheme that have low water use. Also during Round 2 consultation and as submitted by Cotton Australia/QFF (2011b), irrigators submitted there is a need to develop a process that better aligns cost allocation methodologies with operating and trading rules and the Authority cannot look at water pricing on its own without considering the impacts on trading.

Authority's Analysis

The Authority has, in Volume 1, analysed the tariff structure and the efficiency implications of the tariff structure, to apply to SunWater's schemes.

The Authority considers that, in general, aligning the tariff structure with fixed and variable costs will manage volume risk over the regulatory period and send efficient price signals. To

signal the efficient level of water use, the Authority recommends that all, and only, variable costs be recovered through a volumetric charge.

In respect of stakeholders' concerns, the Authority notes that:

- (a) the impact of the Authority's recommendations on the capital value of water and water trading are addressed in a subsequent chapter; and
- (b) regarding water reliability and Part A charges, the Authority notes that under current legislative and contractual arrangements (and the Ministerial Direction), customers must bear all the costs of water supply incurred by SunWater, irrespective of whether it is made available or not (provided the costs of supply are efficient and prudent).

In response to Cotton Australia/QFF's comments about introducing continuous accounting or carry-over to address their concerns about water efficiency (relating to SunWater charging for 100% of WAEs regardless of use), the Authority notes that this WSS allows for carry-over and therefore this concern does not apply. Moreover, high fixed costs mitigate unnecessary carry-over of WAEs.

In response to comments on efficiency, it is noted that the Authority's recommended tariff structure promotes efficiency as:

- (a) the volumetric charge is set to equal the anticipated costs of using an additional unit of water (the marginal cost), as this informs decisions by users. That is, the cost of supplying the additional unit of water is clear and customers can establish whether the benefit of using it exceeds its cost (PricewaterhouseCoopers (PwC), 2010a). Increasing the volumetric charge beyond its marginal cost will mean less water is used than available for consumptive purposes and farm output would be reduced;
- (b) the tariff structure signals the full fixed costs of holding WAE and provides an incentive for customers to reduce their WAEs, if they currently hold more than is necessary. This incentive also applied to SunWater where it holds WAEs (other than where held for distribution losses);
- (c) in respect of setting tariffs to meet environmental objectives, the Authority notes that the institutional arrangements in Queensland administered by DERM establish the quantum, and allocation of water, between environmental and consumptive use. The Authority has been required to establish prices to recover SunWater's efficient business costs – to seek to achieve other broader goals would require a clear specification of those goals to enable the Authority to respond with relevant pricing recommendations.

Setting prices of delivered water at its true cost will also allow irrigators to make appropriate decisions about the need for, and nature of, any further on-farm initiatives to improve water use efficiency (which will in turn ensure that total farm costs, including associated environmental costs, are minimised over the longer term). The water planning framework needs to take into account and adjust allocations for consumptive purposes if the broader effects of current allocations for consumption are considered inappropriate; and

- (d) where a volumetric charge is relatively low (or zero) and, as a result, fixed costs are high, then there are incentives for customers to utilise all of an announced allocation. However, the appropriate degree of utilisation of capacity allocated for consumption can only be determined by irrigators (and other customers) in the light of market conditions for their products, in the knowledge of the cost of water delivered (including on-farm costs) and the understanding of the impact of changed water consumption on their farms.

The Authority also recognises that tariff structures are only part of a mix of institutional arrangements in Queensland designed to direct water to its highest and best use from the overall community perspective. In addition to these institutional arrangements, normal commercial profit motives and water trading are relevant to ensuring water is directed to its highest and best use.

The volumes of permanent and temporary water traded for the Nogo-Mackenzie WSS (including the Emerald Distribution System) are identified in Table 3.1.

Table 3.1: Permanent and Temporary Water Traded (ML)

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Permanent	0	985	3,397	213	2,890	3,987	1,814	2,769
Temporary	42,904	29,883	31,276	46,905	33,876	29,801	94,532	57,795

Note: The trading data above reflects total trading in the bulk and distribution system combined. Source: SunWater (2003–2010g) and Queensland Valuation Services (2010).

The Authority further notes that if SunWater charges for 100% bulk WAEs in arrears, rather than in advance, the additional financing costs arising from an increased need for working capital will need to be included in prices. Therefore, the Authority proposes to retain the existing arrangements of charging Part A in advance. The Authority also notes SunWater's advice that this is a requirement of current standard (deemed) service contracts.

In response to concerns that high water users are subsidising low water users, there is no cross-subsidy where the tariff structure reflects appropriate estimates of fixed and variable costs and costs are appropriately allocated.

The Authority's analysis of whether service delivery costs are fixed or variable is addressed in a subsequent chapter as is cost allocation.

3.2 Water Use Forecasts

Introduction

During the 2006-11 price paths, water use forecasts played an essential role in the determination of the tariff structure.

In the previous review, up to 25 years of historical data was collated for nominal WAE, announced allocations and volumes delivered. The final water usage forecasts were based on the long term average actual usage level. Where there was a clear trend away from the long term average, SunWater adjusted the forecast in the direction of that trend. Usage forecasts also took into account SunWater's assessment of future key impacts on water usage, such as changes in industry conditions, impact of trading and scheme specific issues (SunWater, 2006a).

For the Nogo-Mackenzie WSS, SunWater (2006b) assumed a water usage forecast of 85% of WAEs in the river system. Water usage for high and medium priority irrigation WAEs were not separately identified (SunWater, 2006b).

Stakeholder Submissions

SunWater

The available supply of water is determined by the announced allocations which are set according to rules contained in the resource operations plan (ROP).

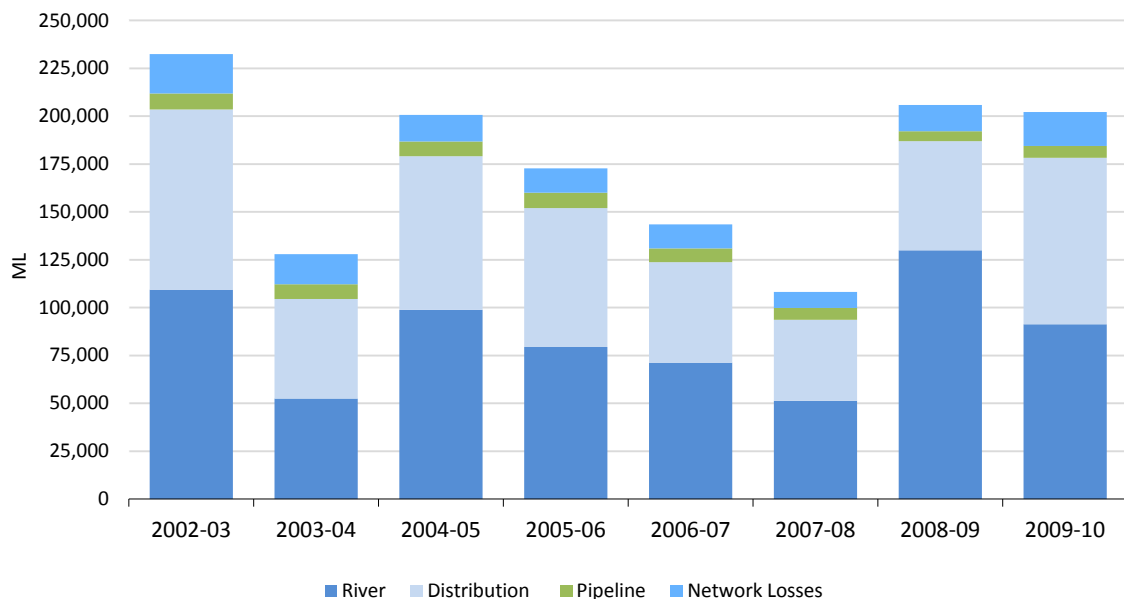
SunWater (2011d) has noted that demand forecasts are not relevant for price setting under SunWater's proposed tariff regime.

SunWater's usage forecasts for 2012-17 are made with regard to historic averages over an eight-year period and the usage forecast applied for the current price path. However, SunWater advised that usage of high priority and medium priority irrigation water cannot be separately identified, as holders of high priority WAEs also hold medium priority WAEs which passes through the same meter.

Based on the last eight years observations, SunWater has forecast use as follows:

- (a) at a whole scheme level (all sectors) – an average of 71% of total WAEs (including SunWater's distribution loss WAEs and its other WAEs); and
- (b) for the irrigation sector only – an average of 76% of irrigation WAEs (including forecast usage of 80% of distribution system WAEs). This compares with the use assumption adopted in the 2006-11 price paths of 85% of WAEs.

Figure 3.1 shows the historic usage information for the Nogo-Mackenzie WSS submitted by SunWater (2011). The river category includes all irrigation and other usage sourced from the river. Distribution volumes refer to irrigation use only. Pipeline volumes refer to sales to industrial customers.

Figure 3.1: Water Usage for the Nogoa-Mackenzie WSS

Source: SunWater (2011).

Other Stakeholders

During Round 1 consultation in May 2010, stakeholders were concerned about the approach to projecting future water use, as it was considered at that time to be central to water pricing. Stakeholders stated that modelling showed 83-87% average usage. Related issues raised included the need for schemes to be able to review updated historical use data, concern about how alternatives to historic use forecasting could be implemented (for example, taking account of inter and intra seasonal water availability), implications of uncertain prices, and distinguishing between agriculture and other uses.

CHCGIA (2010a) submitted that a water use forecast of 85% of WAEs is strongly supported as it best represents the long-term usage figures. CHCGIA noted that under the current ROP all unused WAE at water year-end is carried over into the following year (unless the dam spills, when all carry-over is cancelled) and a storage rental charge is levied. Further, that data on the water year-end announced allocation [and use] can misrepresent the available water for irrigators as it implies that 100% of WAEs was available for the production of income for the whole water year. When these figures are viewed on a monthly basis, the picture of water availability to irrigators is quite different.

Cotton Australia/QFF (2011) noted that projected water use becomes irrelevant if pricing is based on WAEs not use. Cotton Australia/QFF questioned how efficient and customer focussed does a service provider become where its income is not determined by the service it provides and is fixed. Cotton Australia/QFF stated that this would only work if SunWater had close interaction with customers, and this does not currently occur.

Authority's Analysis

As noted in Volume 1, the Authority does not consider water use forecasts are relevant to establishing cost-reflective prices for SunWater WSSs.

Nonetheless, the Authority has considered past water use in calculating cost-reflective volumetric charges that recover variable costs (see Chapter 6 – Draft Prices).

Under the Direction, the Authority must recommend prices that maintain revenues in real terms where current prices are above the level required to recover prudent and efficient costs. For this purpose, the Authority has considered forecast irrigation water use (see Chapter 6 – Draft Prices).

3.3 Tariff Groups

The amended Ministerial Direction specifically directs the Authority to adopt the tariff groups proposed in SunWater's NSPs.

The previous SunWater Irrigation Price Paths Final Report (SunWater, 2006b) nominated two tariff groups for the river segment of the Nogoa-Mackenzie WSS:

- (a) River – Medium Priority; and
- (b) River – High Priority.

SunWater proposed in its NSP that the current bulk tariff groups continue.

In accordance with the Ministerial Direction, the Authority will adopt the proposed tariff groups for this WSS.

3.4 Storage Rental Fees

Introduction

Storage rental (carry-over) fees are charged in the Nogoa-Mackenzie WSS. The original intent of these fees was to provide disincentives for irrigators to carry over water when they do not intend to use the water in the future.

Previous Review

The previous review did not review storage rental fees but did require that the expected revenue from these fees be used as revenue offset.

In 2010-11, the storage rental fee for the Nogoa-Mackenzie WSS was \$1.95 per ML and the average annual revenue between 2005-06 and 2009-10 was \$122,000. In 2011-12, the fee was rolled forward to \$2.02 per ML.

Stakeholder Submissions

SunWater

For the three schemes (Nogoa-Mackenzie, Callide Valley and Dawson Valley) with storage rental fees, SunWater submitted that it assumed [if SunWater's proposed tariff structure reforms are adopted by the Authority] that storage rental fees would no longer apply. However, SunWater indicated that it is not opposed to a charge for storage rental should the Authority recommend the continuation of this approach. SunWater's (2011o) submission on storage rental fees and carry-over water is analysed in more detail in Volume 1.

Other Stakeholders

Cotton Australia/QFF (2011a) submitted that if SunWater charges for 100% of WAEs regardless of use and thus removes all references to storage rental fees, the value of spending money on water use efficiency will be put into question.

During Round 1 consultation in April 2010, stakeholders noted that 8-12% of water charges are not in Part A or Part B tariffs. In particular, charges apply to carry-over water and this revenue needs to be taken into account.

Authority's Analysis

The Authority has, in Volume 1, proposed to accept SunWater's proposal to cease charging storage rental fees.

In response to Cotton Australia/QFF, the Authority considers that a cost-reflective tariff structure with high fixed costs will signal the costs of holding a WAE and provides sufficient incentive to minimise the carry-over of water. The cost of delivering carry-over water will be met by the Part B variable tariff for bulk water.

Other water use efficiency incentives provided by the Authority's recommended tariff structure are discussed above.

Under the Authority's proposals total costs incurred in any year will be recouped through fixed and variable charges. There would be no carry-over to the next year.

Essentially, therefore, there will be no revenue from this source to be taken into account during the 2012-17 regulatory period.

3.5 Allocation of Costs between Bulk and Distribution

Fairbairn Dam has two separate outlets, one on each bank. The Left Bank Outlet releases into the Selma Main Channel by means of an open channel system. At low water levels, water must be pumped from the dam into Selma channel. The Right Bank Outlet works releases into the Weemah Main Channel and the Nogoia River.

The bulk supply system includes downstream weirs that serve no role for distribution customers.

Submissions

As part of the Round 2 consultation in April 2011, stakeholders sought clarification of whether the costs associated with the operation, maintenance and renewal of the outlet for Fairbairn Dam to the Selma distribution system are allocated to the bulk or distribution scheme.

Cotton Australia/QFF (2011) submitted that distribution customers are paying for operations twice – for example paying for the costs of operating downstream weirs that have no relevance to distribution customers. They further submitted that there is a major flaw in the split of operations costs between bulk and distribution.

Authority's Analysis

SunWater indicated to Halcrow that while costs associated with releases of water to the distribution schemes are typically included under bulk supply costs, this is not the case for the outlet to the Selma distribution system. SunWater confirmed to Halcrow that these costs are allocated to the distribution system. It noted that costs for the Selma pump station, which is physically located in Fairbairn Dam, are allocated to the distribution system, as is the electricity associated with the Selma pumping station.

Allocating the expenditure in this way means that distribution customers will be charged for releases of water from Fairbairn Dam (from the right bank outlet) as part of the bulk charge in

addition to being directly charged for operation of the outlet to the Selma distribution system as part of the distribution charge.

Halcrow noted that it has not been possible to identify the forecast costs associated with the operation of the Selma outlet, as the forecast expenditure is not available to this level of disaggregation.

To be fully cost-reflective, the Authority acknowledges that a differentiated bulk charge would be required for river and distribution system irrigators. The two bulk charges would incorporate:

- (a) for river irrigators, a share of Fairbairn Dam storage, a share of the right bank outlet works and the full cost of the downstream weirs; and
- (b) for distribution system irrigators, a share of Fairbairn Dam storage costs, full costs for the Selma pump station and left bank outlet works, and a share of right bank outlet works (excluding costs of downstream weirs).

Further, the Selma and Weemah channel systems are physically separated and have different cost structures. Separate charges for the two systems would be more cost-reflective, with the costs of Selma pump station and left bank outlet works being allocated to the Selma channel system and a share of the costs of the right bank outlet works allocated to the Weemah channel system.

However, the Authority notes that under the current tariff groupings permissible for the scheme, separate bulk charges and separate distribution system charges are not possible. Both charges take the form of 'postage stamp' charges.

This aside, the Authority agrees that the costs of the Selma pump station and outlet works should be allocated to distribution system costs as these are exclusively used for distribution services. The right bank outlet works costs should be allocated to the bulk segment, and effectively therefore shared between bulk and distribution.

At this stage, the Authority considers that the lack of disaggregation of costs will limit the ability to estimate differences in a manner which does not distort prices more than current arrangements.

4. RENEWALS ANNUITY

4.1 Introduction

Ministerial Direction

Under the Ministerial Direction, the Authority is required to recommend a revenue stream that allows SunWater to recover prudent and efficient expenditure on the renewal and rehabilitation of existing assets through a renewals annuity.

The Ministerial Direction also requires the Authority to have regard to the level of service provided by SunWater to its customers.

Previous Review

In 2000-06 and 2006-11, a renewals annuity approach was used to fund asset replacement for SunWater WSSs.

As discussed in Volume 1, the renewals annuity for each WSS was developed in accordance with the Standing Committee for Agriculture and Resource Management (SCARM) Guidelines (Ernst & Young, 1997) and was based on two key components:

- (a) a detailed asset management plan, based on asset condition, that defined the timing and magnitude of renewals expenditure; and
- (b) an asset restoration reserve (ARR) to manage the balance of the unspent (or overspent) renewals annuity (including interest).

The determination of the renewals annuity was then based on the present value of the proposed renewals expenditure minus the ARR balance.

The allocation of the renewals annuity between high and medium priority users was based on water pricing conversion factors (WPCFs). Separate ARR balances were not identified for bulk and distribution systems.

Issues

In general, a renewals annuity seeks to provide funds to meet renewals expenditure necessary to maintain the service capacity of infrastructure assets through a series of even charges. SunWater's renewals expenditure and ARR balances include direct, indirect and overhead costs (unless otherwise specified).

The key issues for the 2012-17 regulatory period are:

- (a) the establishment of the opening ARR balance (at 1 July 2012), which requires:
 - (i) an assessment of whether renewals expenditure in 2007-11 was prudent and efficient. This affects the opening ARR balance for the 2012-17 regulatory period;
 - (ii) the unbundling of the opening ARR balance for bulk and distribution systems (where applicable); and
 - (iii) the extension of the opening ARR balance (calculated for 1 July 2011) to 1 July 2012 to account for the adjusted timelines specified in the amended Ministerial Direction;

- (b) the prudence and efficiency of SunWater's forecast renewals expenditure;
- (c) the methodology for apportioning bulk and distribution renewals between medium and high priority WAEs; and
- (d) the methodology to calculate the renewals annuity.

The Authority's general approach to addressing these issues is outlined in Volume 1.

The Authority notes that SunWater has estimated that it has under management about 50,000 assets relevant to irrigators and, given this number of assets, has developed an asset planning methodology designed to cost-effectively identify assets requiring renewal or refurbishment.

Some of the assets were renewed during the 2006-11 price paths. Others are eligible for renewal over the 2012-17 regulatory period. Depending on their asset life, some are renewed several times during the Authority's recommended 20-year planning period.

It was therefore not practicable within the timeframe for the review, nor desirable given the potential costs, to assess the prudence and efficiency of every individual asset.

The Authority initially relied on its four principal scheme consultants – Arup, Aurecon, GHD and Halcrow – to identify and comment upon SunWater's renewals expenditure items. However, the Authority's four consultants expressed concerns about the lack of timely information relating to the past and proposed expenditures at the time of their reviews.

Subsequently, the Authority liaised directly with SunWater to obtain further information, and commissioned Sinclair Knight Merz (SKM) to address material expenditure items (that is, those renewals items which represented more than 5% of the present value of forecast expenditure) and/or those of particular concern (usually in response to customers' submissions). Across all schemes, a total of 36 past and forecast renewals items were reviewed by SKM.

The Authority's assessment of the prudence and efficiency of proposed renewals expenditures therefore draws upon the contributions of all of these sources as detailed below.

4.2 SunWater's Opening ARR Balance (1 July 2006)

The 2006-11 price paths were based on the opening ARR balance at 1 July 2006.

SunWater submitted that the opening balance for the Nogoia-Mackenzie WSS (including the Emerald Distribution System) was \$480,000.

The Authority has accepted SunWater's unbundled opening ARR balance for Nogoia-Mackenzie (excluding the Emerald Distribution System) \$242,000.

The Authority's unbundled ARR balance reflects SunWater's proposed methodology for the separation of bulk and distribution system assets, which takes into account past and future renewals expenditure (see Volume 1).

In October 2011, Indec advised that it had uncovered actual renewals expenditure for 2000-06. The Authority has not been able to review this information or quality assure it for the purposes of the Draft Report, but intends to do so for the Final Report.

4.3 Past Renewals Expenditure

As noted in Volume 1, the Authority has reviewed the prudence and efficiency of selected renewals expenditures over the 2006-11 price path. The Authority has also sought to compare

the original expenditure forecasts underlying the 2006-11 price path with actual expenditure, to establish the accuracy of SunWater's forecasts.

Submissions

SunWater

SunWater (2011an) submitted actual renewals expenditure for the Nogoia-Mackenzie WSS for 2006-11 (Table 4.1). This expenditure included indirect and overhead costs which are subject to a separate review by the Authority (see Chapter 5 – Operating Costs). SunWater advised that it was unable to provide the forecast renewals expenditure (approved for the 2005-06 review) for this period.

These estimates reflect SunWater's most recent information (including that received by the Authority in September 2011 relating to renewals expenditure) and differ from SunWater's NSP.

Table 4.1: Past Total Renewals Expenditure 2006-11 (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11
Past Renewals Expenditure	1,169	899	468	949	460

*Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011.
Source: SunWater (2011an).*

Other Stakeholders

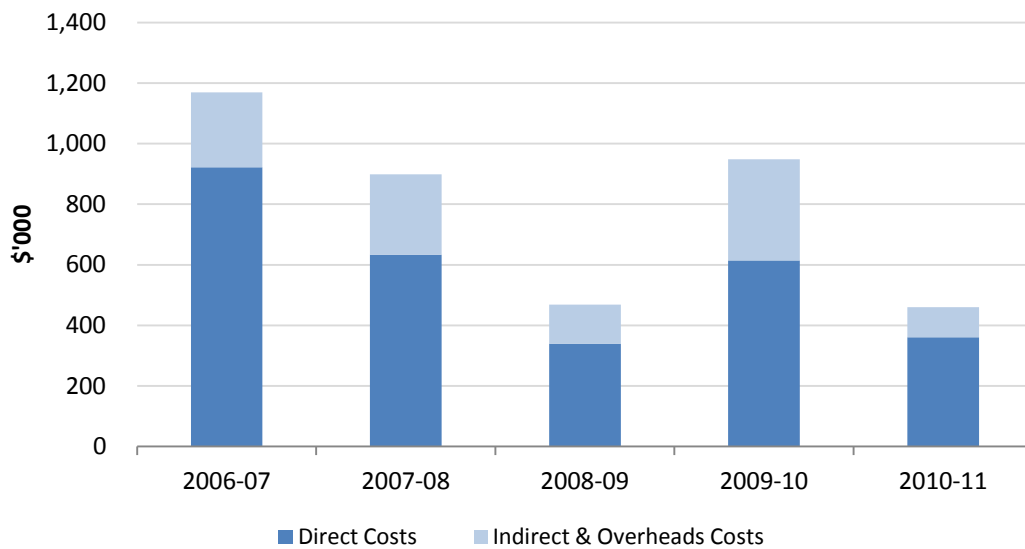
No other stakeholders have commented on this item.

Authority's Analysis

Total Renewals Expenditure

The total renewals expenditure over 2006-11 is detailed in Figure 4.1. Indirect and overhead costs are addressed in the following chapter.

Figure 4.1: Past Total Renewals Expenditure 2006-11 (Real \$)



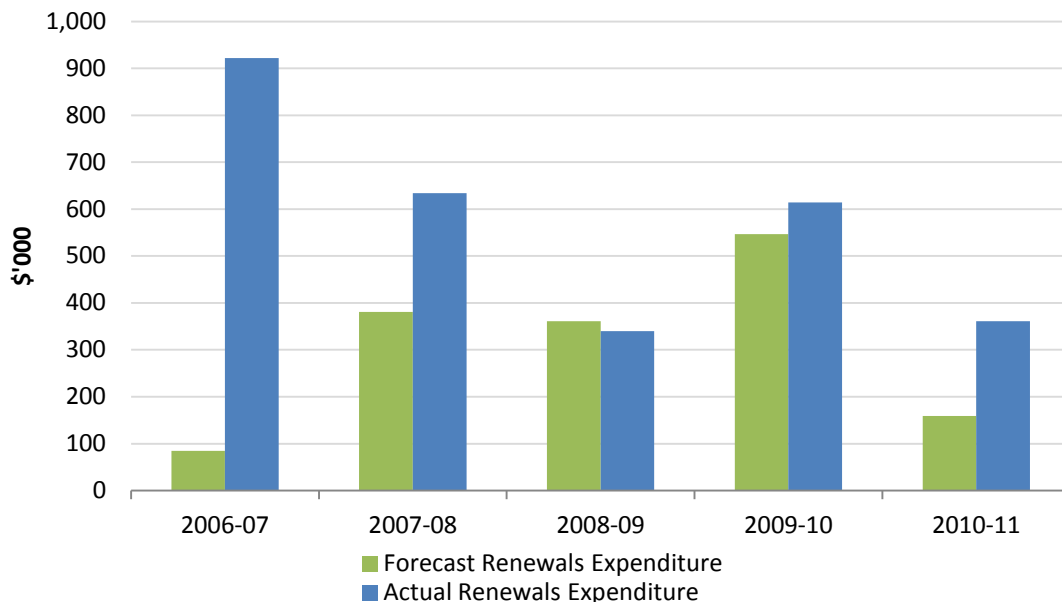
Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011. Source: SunWater (2011a).

Comparison of Forecast and Actual Costs

The Authority was able to source forecast direct renewals expenditure at a scheme level from Indec, who undertook the analysis for the 2005-06 review.

A comparison of forecast and actual direct renewals expenditure in the Nogoa-Mackenzie WSS for 2006-11 is shown in Figure 4.2.

Figure 4.2: Direct Renewals Expenditure 2006-11 (Real \$)



Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011. Source: Forecast (Indec, 2011f) and Actuals (SunWater, 2011n).

Actual renewals expenditure was \$2.5 million (direct costs) higher than forecast over the period. This was due in part to:

- (a) unplanned expenditure on Intersafe projects (of \$144,440, including indirect and overhead costs);
- (b) unplanned expenditure on the Fabridam Post Deflation Incident 23 November 2008 (Bedford Weir) (of \$1.5 million, including indirect and overhead costs); and
- (c) unplanned expenditure on Fairbairn Dam Right Bank Outlet (RBO) Upgrade river release capacity (of \$1.3 million, including indirect and overhead costs).

Halcrow was appointed to review the prudence and efficiency of past renewals expenditure items. In the absence of forecast renewals expenditure for 2006-11 from SunWater (as noted above), Halcrow sought to identify variances between annually budgeted and actual expenditure for certain items. However, due to information deficiencies, Halcrow was unable to conclude on the prudence and efficiency of past renewals expenditure.

A sample of material renewals expenditure items was then identified by the Authority and Indec (2011), with further more detailed analysis undertaken by SKM on selected projects (2011). The sample also included items identified by customers as being of particular concern.

Item 1: Intersafe

SunWater

SunWater indicated that this project was not included in the 2006-11 price paths, however, SunWater decided to undertake the work following a report from Intersafe recommending that SunWater take action to reduce the safety risk to staff.

Other Stakeholders

During the Round 2 consultations in April 2011, customers noted that \$14.4 million [state-wide] was spent on unplanned expenditure on the Intersafe Program and questioned whether this expenditure was peer reviewed.

Consultant's Review

Intersafe expenditure on Fairbairn Dam at a cost of \$144,440 in 2010-11 was not included in the 2006-11 price path for this WSS. Halcrow (2011) supported SunWater's submission on the basis that the SunWater Board approved the work to reduce the safety risk to staff.

As noted in Volume 1, the Authority has accepted Halcrow's (2011) findings on the overall Intersafe Program (actual expenditure of \$13.6 million) which found that:

- (a) the expenditure was prudent on the basis that SunWater has a legal obligation to ensure the workplace health and safety of its employees;
- (b) costs represent market rates as SunWater sought competitive tenders and used contractors to deliver the program; and
- (c) the program was completed on time and within budget.

Similarly, SKM (2011) concluded that:

- (a) SunWater's procedures were robust and, by developing standard infrastructure, implementation costs will have been reduced through economies of scale;

- (b) given the nature of the works, it was appropriate for SunWater to develop a program of works to implement the identified solutions as swiftly as reasonably possible; and
- (c) the costs incurred by SunWater in implementing the works have been subjected to competitive forces and hence can be considered as market costs.

Authority's Analysis

The Authority accepts the recommendation of its consultants that expenditure on Intersafe was prudent and efficient.

Item 2: Fabridam Post Deflation Incident 23 November 2008 (Bedford Weir)

SunWater²

A substantial portion of the unforeseen renewals costs incurred in this scheme during 2006-11 relate to the Bedford Weir Fabridam Post Deflation Incident of 23 November 2008.

On 23 November 2008, there was an unexpected rapid deflation of one of the inflatable rubber dams on Bedford Weir. In the ensuing release of water, a fatality occurred. In response to this event, SunWater has decommissioned the inflatable rubber dam at Bedford Weir and has deflated rubber dams in two other schemes (Pioneer River WSS and Upper Burnett WSS).

SunWater has received a complaint and summons from Workplace Health and Safety Queensland (WHSQ) alleging a failure to comply with the provisions of the *Workplace Health and Safety Act 1995* (Qld) (WHS Act) in relation to this incident. The manufacturer of the rubber dam (Trelleborg Engineered System Australia Pty Ltd) has also been charged by the WHSQ on similar terms.

SunWater advised that this matter is presently before the Industrial Magistrates Court, and it is also possible that this matter may be the subject of a coronial inquest.

SunWater advised that there were a range of costs in relation to the incident:

- (a) legal costs were incurred in responding to the charges made by WHSQ. SunWater has incurred \$1.87 million in responding to this matter up to 30 June 2011, and a further \$781,631 is forecast for 2011-12;
- (b) incident response costs arose from complying with the directives issued by WHSQ under the WHS Act, including removal of the rubber dam at Bedford Weir and its transport to and secure storage in Brisbane. These costs total \$605,607 to 30 June 2011 and relate solely to the Bedford Weir; and
- (c) costs of developing and assessing options for restorative measures including legal and engineering advice, to place the weir in its previous position in terms of long term service levels (or water allocation security objectives), of \$98,988 to 30 June 2011 (Table 4.2).

² In response to Authority requests for further information in relation to the costs of this incident, SunWater provided a background paper to the Authority in September 2011 on the Treatment of Costs Related to Inflatable Rubber Dams. Thus, the Authority's Draft Report includes material from SunWater's paper that was not available for Halcrow's review and could not be included in its report.

Table 4.2: Fabridam Costs for the Nogoia-Mackenzie WSS 2008-12

	2008-09	2009-10	2010-11	2011-12 (forecast)	Total
Legal Costs	55,712	806,317	1,008,147	781,631	2,651,807
Incident Response	501,493	72,077	32,038	0	605,607
Investigation and option development	0	0	98,988	-	98,988
Total	557,205	878,394	1,139,173	781,631	3,356,402
Proposed for Cost Recovery	501,493	72,077	131,026	-	704,595

Note: Costs include indirect and overhead costs. Only investigation and option development costs have been included in SunWater's proposed ARR balance for the Nogoia-Mackenzie WSS. Source: SunWater (2011ai).

In relation to the recovery of these past costs, SunWater submitted that:

- (a) legal costs should not be included in its renewals expenditures, as SunWater bears the risk of operating costs over the 2006-11 price path (and by extension for 2011-12). SunWater noted that past legal costs have been borne by SunWater, net of insurance proceeds, and have not been included in SunWater's proposed ARR balance;
- (b) incident response costs should be included as renewals expenditures, as they are required to comply with workplace health and safety (WHS) legal obligations and were the first step in restoring the service capacity of the WSS. SunWater noted that the Ministerial Direction specifically allows for the recovery of costs relating to compliance with WHS. SunWater submitted that the ARR for Nogoia-Mackenzie should be restated with this renewal expenditure included. SunWater stated that the costs were not deducted from renewals and none of these costs are recoverable under insurance; and
- (c) the costs of developing and assessing options for restorative measures have been treated as renewals expenditure and included in SunWater's proposed ARR balance. SunWater noted that it is possible that some of these costs may be recoverable under insurance, and any future insurance proceeds will be applied as revenue offset to the ARR.

In relation to the recovery of future costs in relation to this incident, SunWater submitted that:

- (a) it does not accept that it should bear the risks of legal costs into the 2012-17 regulatory period, including any continuation of legal costs to the WHSQ charge or any subsequent coronial inquest. Any costs beyond 1 July 2012 should be dealt with in accordance with the arrangements set for the next regulatory period;
- (b) there will be no future incident response costs; and
- (c) more significant restoration costs will need to be incurred in future to restore the long-term service levels (or water allocation security objectives) of the scheme, as this is required under the resource operations licence (ROL). SunWater advised that it is in the final stages of assessing options, and expects a decision will be made over the coming months. Once decided, SunWater submitted that consequential changes will be required to the existing renewals program.

Furthermore, SunWater noted that – while proceeds from the previous sale of water allocations in 1997-98 can be viewed as capital contributions, and SunWater had previously proposed to deduct the entire sale proceeds from the asset value for the Nogoia-Mackenzie scheme –

SunWater did not accept that there was ever any intention for the proceeds from that sale to be applied to future renewals or compliance related expenditure.

Other Stakeholders

During Round 1 consultation in April 2010, stakeholders questioned how the Bedford Weir will be valued (charged for) as the inflatable device to increase storage has now gone and upstream irrigators are penalised. Currently, water has to be released from the dam to make up for the lower weir storage.

Cotton Australia/QFF (2011b) also questioned the \$1.35 million spent by SunWater in 2008-09 and 2009-10 for investigations of the Bedford Weir incident, the \$1.5 million for legal costs budgeted for 2010-11 relating to the incident and the \$75,000 forecast to be spent in 2011-12 for repair of the Bedford Weir³. Cotton Australia/QFF submitted that these costs should be shared across the total of SunWater schemes or schemes with fabridam and sought clarification on whether SunWater's insurance covers these costs.

Cotton Australia/QFF (2011b) suggested that profit from the sale of allocations provided by the augmentation of the fabridam should be used for these costs.

CHCGIA (2010a) also submitted that the sale of supplemented allocation due to the Bedford Weir augmentation enabled a 200% return on the cost of the infrastructure to the State Government. CHCGIA submitted that in buying allocations, irrigators purchase the right of access to water, not water itself. As access to water is created by infrastructure, they submitted the purchase of allocations by irrigators pays for the construction of infrastructure by SunWater.

CHCGIA submitted that where water users' investment in water allocation exceeds the total value of the infrastructure, irrigators should not be asked to pay a rate of return (CHCGIA, 2010b). They noted that the sale of allocation in Nogo-Mackenzie also enabled SunWater to complete a range of channel lining projects.

CHCGIA (2010a) also submitted that if their position is not accepted then water allocations are not a share of infrastructure assets/ balance sheet item, they must be an expense item. In this case, they sought an Australian Taxation Office (ATO) ruling on this issue.

They also submitted that purchase of water allocations by water users in the Bedford Weir exceeded the cost of infrastructure required to provide that allocation, but now the weir has failed, all water users will be called on to fund rebuilding of the failed infrastructure, effectively paying for it three times over. They questioned the purpose and intent of the sale of allocations and whether they should be paying a rate of return on assets funded through the sale of allocations.

Similar issues relating to the Bedford Weir were also raised by stakeholders during the Round 2 consultation meetings held in Emerald during April 2011.

Consultant's Review

While Halcrow sought additional information on the nature of expenditure, SunWater indicated at the time that for commercial-in-confidence reasons, it was unable to provide any information on this matter.

Halcrow questioned whether legal fees should be classified as renewals expenditure and whether some of this expenditure could be recouped through insurance coverage. However,

³ The Authority notes that these costs align with those reported by Halcrow, prior to SunWater's provision of more accurate cost data as noted in the preceding section.

Halcrow was unable to review the prudence or efficiency of the expenditure due to information deficiencies at the time of its review.

Authority's Analysis

As noted above, Halcrow and the Authority sought further advice from SunWater on its proposed treatment of the costs of responding to the Bedford Weir incident. SunWater provided further information subsequent to Halcrow's review and report, which has been summarised above.

After reviewing this information, the Authority concurs with SunWater's view that unexpected legal costs should not be recovered from users, as unexpected operating expenditure from 2006-12 is for SunWater to bear under the arrangements struck for the previous price path.

The Authority also notes that legal action is ongoing and insurance payments are yet to be determined.

The Authority considers that the outcomes of legal action are likely to be an important factor in determining whether SunWater's actions were prudent and efficient and where the risks and costs should lie. Any insurance payments can offset any costs that should be passed through to irrigators.

Pending this information, the Authority is not inclined to opine at this stage on whether other (non-legal) costs arising from the Bedford Weir incident should be recovered from users or SunWater.

Therefore, at this stage, the Authority proposes that SunWater's proposed renewal expenditures – including incident response costs, the costs of developing and assessing options for restorative measures and the costs of any actual restorative measures – should be excluded from prices. Past renewals expenditure should therefore be adjusted to exclude the cost of developing and assessing options for restorative measures (\$98,988 in total, as only these costs have been included by SunWater).

When legal action and insurance payouts are resolved, any prudent and efficient costs can be addressed by an application to the Authority for an end-of-period adjustment, or in limited circumstances, a within period review. This approach aligns with the Authority's Volume 1 recommendation that SunWater should bear the risk of controllable costs and customers should bear the risks of uncontrollable costs.

The cost to be met by irrigators should reflect the replacement cost less any insurance payout, or if SunWater is shown to be imprudent, the replacement cost less the full cost of the fabridam.

Sufficient information would need to be provided by SunWater to substantiate its application. Any expenditure would be assessed under the Authority's prudence and efficiency criteria as adopted in this review, and after consideration of any contractual obligations and insurance payouts.

For further reference, the Authority provided some guidance on extraordinary circumstances in its Draft Report on General Pricing Principles for Infrastructure Investments Made in Response to Extraordinary Circumstances (QCA, 2004).

This Report stated that, notwithstanding the need to consider the particular characteristics of each extraordinary circumstance, service providers are in general entitled to pass costs through to users to the extent that the risk is commercially relevant, the provider is (and has been) prudent, the response is cost-effective, the provider is best able to manage the risk, and there is no double charging.

In relation to any concerns on insurance, the Authority addressed some aspects of this issue in the 2009 QR Network Draft Access Undertaking (DAU), where the Authority accepted QR Network's claimed self-insurance costs as being reasonable, on the basis that QR Network's claim included:

- (a) the identification of the specific risks to be self-insured;
- (b) quantification of the expected incidence and costs of the risks by a method consistent with an actuarial assessment;
- (c) confirmation of a board resolution to self-insure;
- (d) explicit confirmation that the regulated entity will not recover costs covered by self-insurance through other regulatory cash-flows; and
- (e) evidence that the regulated entity has the financial capacity to assume the self-insured risks.

The Authority is prepared to work with SunWater to provide further guidance on the information required for such an application.

Item 3: Fairbairn Dam Right Bank Outlet Works Upgrade

SunWater

SunWater indicated that the Fairbairn Dam RBO upgrade project was not included in the forecast expenditures underpinning the 2006-11 price paths. SunWater expects that the project will cost approximately \$2,000,000 as per its target budget, which was approved by SunWater's Board during the price path.

Other Stakeholders

No submissions were received from stakeholder regarding this project.

Halcrow's Analysis

Halcrow noted that this project was required under the Fitzroy ROP. Its purpose was to upgrade the river release capacity of this dam, in order to release the first post-winter flow. Halcrow noted that expenditure on the Fairbairn Dam RBO was incurred in 2006-07 (\$716,986), 2007-08 (\$245,426) and 2009-10 (\$368,146).

SKM's Analysis

This project was an upgrade of the Fairbairn Dam outlet capacity by installing a siphon within the Selma Pump Station on the right bank. The upgrade is in compliance to the mandate published in the Fitzroy Basin ROP by the Department of Natural Resources and Mines (NRM) requiring an increase of the outlet capacity from 600 MI/d to between 1,500 MI/d and 1,600 MI/d at EL 199.0m within three years for the release of the first post-winter flow.

(a) Available Information

SKM accessed and viewed SunWater's SAP Works Management System (WMS), and asset condition and risk assessment policy and procedures and drew on 31 documents provided by SunWater and listed in the SKM report.

(b) Prudency Review

Project History

SKM compiled a timeline of major decisions and findings:

- (a) The Department of Natural Resources and Mines (NRM) developed a Water Allocation Management Plan (WAMP) for the Fitzroy Basin during the 1990's. The WAMP contemplated a significant increase in the outlet capacity/release from the Fairbairn Dam to improve environmental outcomes;
- (b) in 2003, SunWater undertook a feasibility study to increase the river outlet capacity at Fairbairn Dam. The preliminary capital cost estimates for the options investigated ranged between \$2.6 million and \$6.6 million. SunWater indicated that it would seek Government Funding for the upgrade;
- (c) in January 2004, DNRM published the Fitzroy Basin ROP which mandated that: the discharge capacity of the outlet of Fairbairn Dam will be increased from its current (approximately) 600 ML/day limit to up to about 1,500 ML/day to achieve the first post-winter flow objectives at Bedford and Binegang Weirs. The ROP further imposed a time limit of three years in which SunWater has to achieve this increase of flow rate;
- (d) during 2004 and 2005, SunWater undertook a series of option studies to determine the most cost-effective solution. Installing an additional outlet pipe and valve passing through the diversion tunnel on the right bank was the preferred option and a call for tenders was announced;
- (e) in August 2005, a recommendation was made within a progress report to establish the magnitude of the losses in the Bull-Ring riser and orifice plate before any further design was undertaken;
- (f) in September 2005, a cost blowout to \$4 million was indicated by the tendering exercise. SunWater's estimate was \$2.4 million;
- (g) in December 2005, testing determined that the RBO is inlet controlled and the extent of the vibration of the Bull-Ring was determined. It was then recommended that the Bull-Ring was to be modified and that an alternative arrangement be sought to deliver the environmental releases. Significant modification to the Inlet Tower was needed to ensure that the flow rate could be reached;
- (h) in April 2006, a new strategy was outlined, the first step being to undertake a probabilistic analysis of flows to determine the gap between the current situation and the compliance requirements;
- (i) in July 2006, a new project was initiated to undertake an options investigation to make use of the Selma Pump Station to augment the release from the RBO; and
- (j) in September 2006, a site investigation recorded three viable options for further investigation as to how the Selma Pump Station can be modified to augment the releases from the RBO. One of these included the option of installing a siphon.

Asset Replacement/Refurbishment Date Determination

SKM noted that this project was in compliance to a mandate made in the Fitzroy Basin ROP of January 2004. The mandate gave SunWater a three-year period (up until December 2006) to

comply, but SunWater was not able to meet this deadline. SunWater informed NRM (now DERM) of the time constraints that it faced at that time and a time extension was applied for.

Options Evaluation

SKM focussed their review on the costs incurred between 2006-07 and 2010-11 associated with the upgrade of the Selma Pump Station to augment the environmental release from the RBO.

The system capacity curve of the RBO prepared by the designers determined that the RBO can deliver a maximum of 1,470 ML/day at EL 199.0m. The peak customer demand for Weemah was 300 ML/day. Therefore, a minimum of 1,170 ML/day can be released from the RBO to pass the first post winter flow.

The documentation available to SKM showed the increase in the flow rate that had to be achieved to augment the flow of the RBO. The SunWater River Releases from Fairbairn Dam Report, dated June 2006, stated that: 'The maximum shortfall in the required capacity of the outlet is 343 ML/day if the Weemah irrigators and the environmental flows are made simultaneously.' The SunWater Projects Details Sheet containing the Project Brief, dated 24 July 2006, refers to a preliminary design for a 250 ML/day capacity pumping facility.

A Memorandum prepared by SunWater in relation to the Submersible Pump/s, Fairbairn Dam to Meet ROP Requirements for Post Winter Flow, dated 18 July 2006 stated the current maximum capacity of the Right Bank Tower, Tunnel and River Outlet is approximately 1585ML per day. This is with Fairbairn Dam above EL 199.50 and utilising two siphon breakers, the river outlet gate and the 100 ML/day valve at the base of the diversion tunnel.

SKM did not have access to the design information and therefore could not comment on the validity of the last statement. SKM noted there may be merit in investigating the nature of the three statements and confirm that the post winter flow release imposed by the ROP was achieved.

SKM noted SunWater had various options investigated for this project. The original options revolved upgrading the RBO by installing an additional pipe through the diversion tunnel but these options were discarded due to the inlet tower being the control and therefore limiting the flow and that extensive work would be required to increase the flow rate of the inlet tower.

The second set of options concerned adapting the Selma Pump Station to augment flow in order to achieve the environmental releases required. The three alternative ways of augmenting flow through the Selma Pump Station were as follows:

- (a) 250 ML/day siphon to river,
- (b) 250 ML/day to the spillway via an existing pump set, and
- (c) 250 ML/day to the channel via a new pump station.

SKM noted that SunWater chose to construct the first of these ((a) above) due to its simplicity and cost effectiveness. SKM did not consider the other alternatives would be cheaper to construct and maintain.

The last phase of ensuring the full flow rate can be realised was for SunWater to upgrade the work planned for the RBO Bull-Ring. However, this component was not within the scope of the SKM consultancy.⁴

⁴ The Authority notes this component is reviewed by Halcrow in forecast expenditure below.

Timing of Renewal/Refurbishment

SunWater initiated this project to fulfil a mandate by NRM that stated that SunWater had three years to comply. The three-year period lapsed and SunWater applied for extension of time. The installation of the siphon at Selma Pump Station is the first phase of complying with this mandate. The second phase is the upgrading of the RBO Bull-Ring structure which is scheduled for 2012.

SKM considered the installation of a siphon at the Selma Pump Station to have taken place in a timely manner.

Conclusion on Prudency Evaluation

SKM considered that this installation is key to fulfilling the regulatory mandate placed on SunWater by NRM and therefore concluded that it was prudent to undertake this project.

(c) Efficiency Evaluation

Renewal/Replacement Item Cost Evaluation

SKM noted that the first design was tested in the market and enabled a rethink of the optimum solution to ensure compliance as noted above.

In implementing the procurement of the constructed siphon option, SunWater acted as the Principal Contractor making use of sub-contractors and specialists to undertake the various components. The reasons provided by SunWater for this decision were:

- (a) the relative small scale of the construction works;
- (b) the risk of interruption to works due to flow conditions; and
- (c) the complex nature of the works, and the internal engineering knowledge held within SunWater.

SunWater stated that its procurement processes conformed to the State Purchasing Policy. The total amount spent to date for labour and materials is \$688,875.42.

In determining the efficiency of the cost spent to date SKM compared the total spent to date by SunWater with what would be expected if SunWater appointed an independent Principal Contractor (see below).

Table 4.3: SKM Estimate vs SunWater Cost Expended

<i>No.</i>	<i>Description</i>	<i>SKM Expected Cost (\$)</i>	<i>SunWater Actual Cost to date (\$)</i>
1	Construction Cost		
1.1	Materials and Labour	688,875	688,875
1.3	Contractors Profit (10% of Materials and Labour)	68,888	
1.4	Contractors Overheads (10% of Materials and Labour)	68,888	
1.5	Contractors Preliminary Items (10%)	68,888	
1.6	SunWater Management of Sub-Contractors Cost (Including setting up an environmental management plan, traffic management plan and safety plan and implementation thereof)		509,692
2	<i>Sub-Total A</i>	895,539	1,198,564
3.1	SunWater Design Cost		148,320
3.2	SunWater Project Management Cost and Internal Labour Components		135,514
3.3	SunWater Indirect Cost (45% of Sub-Total A)	402,993	
	Risk (10% of Materials and Labour)	68,888	
4	Total	1,367,420	1,482,398

Source: SKM (2011).

SKM noted that SunWater's actual cost was 8.4% higher than its (SKM's) estimate. However, SKM was unclear whether normal project completion costs (associated with commissioning, rectifying defects during the defect liability period, continuing work through the defects liability period, etc) were included in SunWater's actual cost to date.

In summary, SKM considered the overall cost of the works is within range of what SKM would expect the price to be should the traditional method of procuring a Principal Contractor have been followed, and SKM considered SunWater's incurred costs to be efficient.

(d) Summary and Conclusions

SKM considered that the installation of a siphon at Selma Pump Station was prudent and efficient, based on available information.

Authority's Analysis

The Authority accepts SKM's recommendation that this renewals expenditure item is prudent and efficient.

Conclusion

In summary, three items for the Nogo-Mackenzie WSS were reviewed. On the basis of the consultants' reviews, the Authority considers that:

- (a) two items are prudent and efficient and have been retained as past expenditure;
- (b) one item has been excluded, pending the resolution of legal action and insurance payouts.

Further, as noted in Volume 1, after a consideration of all its consultants' reviews, the Authority has recommended that a 10% saving be applied to all non-sampled and sampled items for which there was insufficient information.

In total, the Authority recommends the expenditure be adjusted by as summarised in Table 4.4.

Table 4.4: Review of Selected Past Renewals Expenditure 2006-11 (\$'000)

<i>Item</i>	<i>Date</i>	<i>SunWater (\$'000)</i>	<i>Authority's Findings</i>	<i>Recommended (\$'000)</i>
Sampled Projects				
1. Intersafe Project	2010-11	\$144	Prudent and efficient	\$144
2. Fabridam Post Deflation Incident 23 November 2008 (Bedford Weir)	2010-11	\$99	Excluded, pending legal action and insurance payout	0
3. Fairbairn Dam Right Bank Outlet Works Upgrade	2006-07	\$1482	Prudent and Efficient	\$1482
Non-Sampled Projects				10% saving applied

Note: Totals provided for indicative purposes only as all data were in nominal terms. Source: SunWater (2011), Halcrow (2011) and SKM (2011).

4.4 Opening ARR Balance (at 1 July 2012)

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was negative \$480,000 for the Nogoia-Mackenzie WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and may differ from the NSP.

Based on the Authority's assessment of the prudence and efficiency of past renewals expenditure, and the proposed methodology for unbundling ARR balances, the recommended opening ARR balance for 1 July 2011 for Nogoia-Mackenzie is negative \$286,000.

The Authority calculated the opening ARR balance at 1 July 2011 by:

- (a) adopting the opening balance as at 1 July 2006;
- (b) adding 2006-11 renewals annuity revenue;
- (c) subtracting 2006-11 renewals expenditure; and
- (d) adjusting interest over the period consistent with the Authority's recommendations detailed in Volume 1.

To establish the closing ARR balance as at 30 June 2012 of negative \$1,279,000, the Authority:

- (a) added forecast 2011-12 renewals annuity revenue;
- (b) subtracted forecast 2011-12 renewals expenditure; and

- (c) adjusted for interest over the year.

The closing ARR balance for 30 June 2012 is the opening ARR balance for 1 July 2012.

4.5 Forecast Renewals Expenditure

Planning Methodology

The Authority has reviewed SunWater's Asset Management Planning Methodology in Volume 1 and recommended improvements to its current approach, including:

- (a) high-level options analysis for all material renewals expenditures expected to occur over the Authority's recommended planning period (20 years), with a material renewals expenditure being defined as one which accounts for 10% or more in present value terms of total forecast renewals expenditure; and
- (b) detailed options analysis (which also take into account trade-offs and impacts on operational expenditures) for all material renewals expenditures expected to occur within the first five-years of each planning period.

Prudence and Efficiency of Forecast Renewals Expenditure

Submissions

SunWater

SunWater's forecast renewals expenditure for 2011-16 for the Nogo-Mackenzie WSS, as provided in its NSP, is presented in Table 4.5 (this was submitted prior to the Government's announced interim prices for 2011-12).

Table 4.5: Forecast Renewals Expenditure 2011-16 (Real \$'000)

<i>Facility</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>
Bedford Weir	75		10		
Bingegang Weir			56		12
Fairbairn Dam	1,163	99	252	529	237
Fairbairn Dam Waste Water	68				
Fairbairn Dam Water Treatment Plant	78	5		6	
Tartus Weir	33		10		
Total	1,417	104	328	535	249

Note: Includes indirect and overhead costs. Source: SunWater (2011).

The major items incorporated in the above estimates are:

- (a) Fairbairn Dam – refurbish RBO works at an estimated cost of \$749,000 in 2011-12. A large diameter pipe and regulative valve will be installed to meet the release capability requirements set out in the Resource Operations Plan. This project is in progress and the expenditure allowance is for completion of the works;
- (b) Fairbairn Dam – replace damaged concrete on spillway at an estimated cost of \$357,000 in 2011-12. An inspection identified the need for these repairs following flood damage to the dissipater;
- (c) Fairbairn Dam – refurbish gates at an estimated cost of \$252,000 in 2014-15. Four outlet gates at Fairbairn Dam will be refurbished to maintain their condition; and
- (d) Fairbairn Dam – replace cables and cableways at an estimated cost of \$116,000 in 2015-16. Cables at Fairbairn Dam will be replaced based on their age and condition.

The major expenditure items from 2016-17 are:

- (a) replacement of hydraulic system at Bedford Weir and replacement of control system at Fairbairn Dam Water Treatment Plant at an estimated cost of \$487,000 in 2016-17; and
- (b) replacement of winches on 8 gates at Fairbairn Dam at an estimated cost of \$742,000 in 2023-24.

SunWater's forecast renewal expenditure items greater than \$10,000 in value, for the years 2011-12 to 2035-36 in 2010-11 dollar terms are provided in **Appendix A**.

Other Stakeholders

During Round 1 consultation in April 2010, stakeholders:

- (a) sought clarity on the difference between renewals annuity and depreciation, and the impact on charges;
- (b) sought clarity on the ability of customers to scrutinise expenditure and adjustments at the end of the renewals term if assets have a longer life;

The CHCGIA (2010a) submitted the only way to establish efficient lower bound costs is to examine locally managed water supply schemes in other states. If accurate, properly disaggregated cost data is not available from SunWater, the Authority must compare aggregated data with comparable schemes.

During the Round 2 consultation in April 2010, stakeholders submitted that the methodology used to allocate the renewals annuity between bulk and distribution puts all the renewals up for question. The allocation should have been a simple accounting exercise on what was spent and what was due to be spent. Transparency of renewals annuity funds is now very important. A similar point was made by Cotton Australia/QFF (2011b).

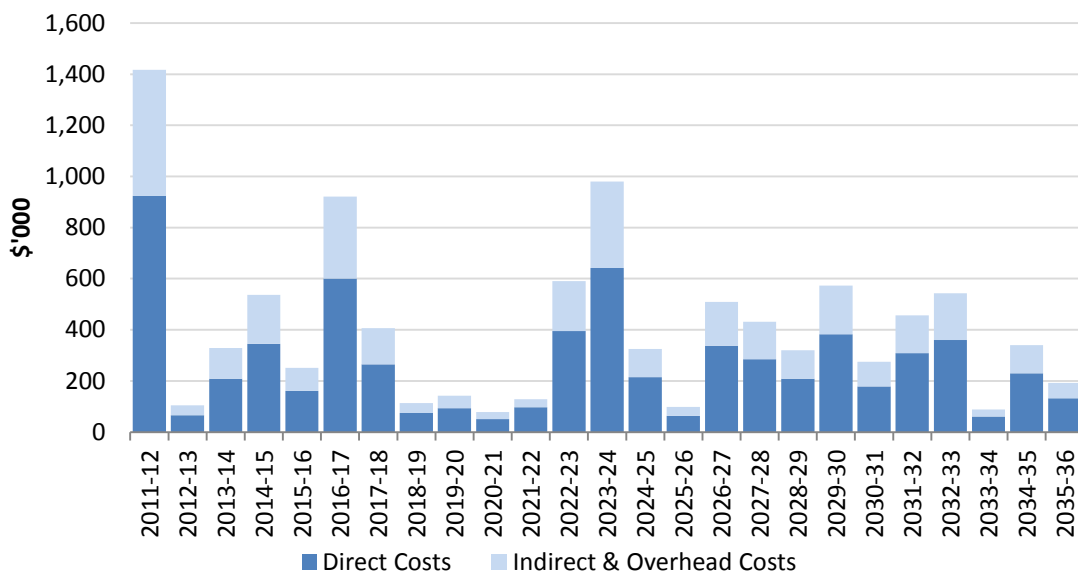
Stakeholders further queried during the Round 2 consultation whether there was any bulk infrastructure that was used by bulk customers only and not channel customers. If so, these costs should be allocated to bulk customers only.

Authority’s Analysis

Total Costs

SunWater’s proposed renewals expenditure for 2011-36 for the Nogo-Mackenzie WSS is shown in Figure 4.4. This reflects the most recent renewals information provided by SunWater to the Authority in September 2011 and differs from the NSP. The Authority has identified the direct cost component of this expenditure, which is review below. The indirect and overheads component of expenditure relating to these projects are reviewed in Chapter 5 – Operating Costs.

Figure 4.3: Forecast Renewals Expenditure 2011-36 (Real \$)



Source: SunWater (2011a).

Item Review

Halcrow and SKM have reviewed the prudence and efficiency for a sample of projects.

Item 1: Fairbairn Dam – Replace Damaged Concrete on Spillway

SunWater

This item to replace damaged concrete on spillway in Fairbairn Dam is estimated to cost \$357,000 (\$231,000 direct cost) in 2011-12. An inspection identified the need for these repairs following flood damage to the dissipater. SunWater indicated that the forecast expenditure, which allows for both a detailed investigation and assessment of all defects as well as implementation of repairs, should be considered an upper limit and was determined by the SunWater Asset Planning staff on the basis of known historical costs.

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that it understood that these works for ROP compliance were already completed. The budget appears to be duplicating a project already completed.

Consultant's Review

Halcrow observed that the impact of the damaged concrete on spillway flows was apparent during the site visit, at which time the dam was spilling. The damage will be exacerbated as a result of the spillway flows. The planned repair works were therefore considered prudent.

Works will involve removal of damaged concrete, and the reinstatement of subsoil drainage, substrate and the concrete spillway structure. On the basis of high level indicative quantities, Halcrow considered the estimated cost (\$231,000 direct) of an appropriate order (approximately \$2,000 per cubic metre placed), and therefore efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient. The Authority notes that any insurance payout to restore flood damage should be applied to this expenditure.

Item 2: Fairbairn Dam – Refurbish Right Bank Outlet Works

SunWater

This item to refurbish the RBO works in the Fairbairn Dam is estimated at \$749,000 (\$486,000 direct cost) in 2011-12. A large diameter pipe and regulative valve will be installed to meet the release capability requirements set out in the ROP. This item is in progress and the expenditure allowance is for completion of the works.

SunWater advised that an increase in the capacity of the existing outlet works to the Nogoa River and Weemah Channel (the "Bull-Ring") is required to meet increased demands and satisfy the requirements of the ROL. An interim solution, comprising construction of a siphon on the left bank, was implemented in 2008.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Halcrow's Analysis

Halcrow reviewed a Preliminary Design Report (1998) which outlined the need for the works, discussed options and presented a recommendation for the works, including a preliminary (high level) cost estimate of \$600,000.

Although Halcrow accepts that the Preliminary Design Report supports the prudence of this item, Halcrow considered that there is no clear definition (in that Preliminary Design Report) of the final form or estimated cost of the proposed works and that it is therefore difficult to assess the efficiency of the proposed expenditure. Halcrow noted that the total cost of the works over 2007-10 was \$1.33 million.

Halcrow considered that the required augmentation to river release capacity will have been provided by the siphon on the left bank. Halcrow stated that in the absence of further justification of the need to also augment the capacity of the RBO the proposed expenditure to refurbish the "Bull-Ring" is not justified [and therefore not prudent].

SKM's Analysis

In compliance to the NRM mandate, SunWater has implemented this project for the last three years and had applied for extension of time. The first phase of complying with this mandate was the installation of the siphon at Selma Pump Station which was completed during the 2006-

11 price path. The second phase is the upgrade of the RBO Bull-Ring structure in 2011-12 at an estimated cost of \$630,000.

(a) Available Information

SKM accessed and viewed SunWater's SAP-WMS, and asset condition and risk assessment policy and procedures and drew on the following Annuity Item specific replacement/refurbishment report (Table 4.6) provided by SunWater:

Table 4.6: Documents Reviewed Specific to the Fairbairn Dam - Right Bank Outlet

<i>Document No.</i>	<i>Document Name</i>	<i>Document Title</i>	<i>Date</i>
1110591	1110591 – v1B – FBD-RBO-Fairbairn Dam Right Bank Outlet Upgrade Justification	Fairbairn Right Bank Outlet (RBO) Upgrade – river release capacity - \$2m over a number of years from 2007 onwards	6 September 2011

Source: SKM (2011).

(b) Prudency Review

Asset Replacement/Refurbishment Date Determination

SKM considered that SunWater has largely followed the policies and procedures it has in place to determine annuity item replacement/refurbishment dates and costs based on their review of the SAP data and the report provided by SunWater above and had made the following comments/observations:

- (a) SunWater's SAP-WMS indicated that the standard run to failure life for an outlet works is 80 years and the standard refurbishment period is 20 years. SKM also confirmed that this asset has been in service since 1974. Thus, SKM considered the applied run to failure asset life and refurbishment period for this asset to be appropriate for this asset type and in keeping with good industry practice;
- (b) SKM viewed the WMS record for this asset and confirmed that the existing risk evaluation, as recorded in SAP, determined that the asset's WHS criterion risk is 'Critical' with the consequence rating being a score of 100. The consequence rating together with a probability (likelihood of occurrence) score of 3 results in an overall risk score of 300 which places this asset in a 'Medium' risk category. For this asset type, an overall risk category of "Medium" reduces the run to failure asset life from 80 years to 70 years and the standard refurbishment period from 20 years to 18 years. SKM considered this reduction in run to failure asset life to be appropriate and in keeping with good industry practice; and
- (c) SunWater's Asset Management Planning Methodology Paper stated that an asset with a Asset/Business Risk rating of 'Medium' should be replaced or refurbished once the maximum condition score reaches 5 (Major deterioration such that asset is virtually inoperable). The condition assessment interval is set at 10 year for this object type.

SKM noted that this project is the second phase to the larger project initiated and completed during the 2006-11 price path in compliance to the NRM mandate under the Fitzroy Basin ROP. The increase in the outlet capacity during Phase 1 after the left bank works were undertaken in preceding years enabled SunWater to release a total of 1,170 ML/day from the RBO to pass the first post-winter flow [which is the difference between the maximum of 1,470 ML/day at EL 199.0m delivered by the RBO and the peak customer demand for Weemah of 300 ML/day].

A progress report prepared by SunWater in regard to the RBO upgrade indicated that at flows of greater than 880 ML/day, the Bull-Ring vibrates dramatically and a leak on the southern side of the wall in summer of 1997-98 have been attributed to these vibrations. To address these operational concerns, the Bull-Ring inflow has been limited to avoid vibration. Thus, at present the RBO only delivers half of its capacity due to these operations limitation.

Options Evaluation

Subsequent to the upgrade of the Fairbairn Dam outlet capacity, a redesign of the RBO was needed to be done to minimise the vibration and to limit the overtopping issues so that the release through the RBO could be maximised. At present, the maximum inflow to the Bull-Ring is limited to 880 ML/day to limit the vibration as discussed in the previous section.

SunWater undertook testing of the RBO Bull-Ring to determine the source of vibration. Based on the Investigation Report in October 2005, the testing indicated that the vibration is likely to be the result of water impacting on the concrete walkway attached to the downstream wall. Thus, SunWater proposed that the downstream wall and walkway be moved so that the tunnel riser is more centrally located. SunWater, further concluded that since most of the headloss occurs upstream of the riser, modifications at the Bull-Ring are unlikely to provide the discharge required to satisfy both ROP and peak customer demand to Weemah.

Based on the information presented, SKM considered the option of removing the walkway and moving the wall to be the practical solution and considered that there is no alternative option.

Timing of Renewal/Refurbishment

This project was initiated to fulfil a mandate by NRM under the Fitzroy Basin ROP. SunWater completed the first phase of this project within the three years stipulated by the mandate and requested for an extension to upgrade the RBO Bull-Ring structure fulfil the flow rate requirement placed by NRM. SKM, therefore, considered the timing of this replacement to be prudent.

Conclusion on Prudency Evaluation

On the basis that a regulatory mandate has been placed on SunWater and that this upgrade is key to fulfilling this, SKM concluded that the need for the upgrade of this annuity asset has been demonstrated.

(c) Efficiency Evaluation

Renewal/Replacement Project Cost Evaluation

SKM developed a benchmark cost for the proposed upgrade to the Bull-Ring based on analysis of as built drawings for the RBO of the Fairbairn Dam and dimensions of the proposed structure. SKM compared its estimated cost with SunWater's estimate in Table 4.7.

Table 4.7: Summary of SKM and SunWater Cost Estimate

<i>No.</i>	<i>Description</i>	<i>SKM Cost Estimate (\$)</i>	<i>SunWater Cost Estimate (\$)</i>
1	Labour and Materials	237,586	272,000
1.2	Contractors Preliminary and General Items (17%)	40,390	
2	Sub-Total A	277,976	272,000
3	SunWater Indirect Cost (45% of Sub-Total A)	125,089	
4	Design and Drafting	58,000	58,000
5	Project Management and Commissioning		76,000
6	Sub-Total B	461,065	406,000
7	Contingency (30%)	138,320	
8	Contingency (50%)		203,000
9	Total	599,385	609,000

Source: SKM (2011).

SKM's estimate was very close to SunWater's and SKM therefore considered the estimate to be efficient.

(d) Summary and Conclusions

SKM considered the regulatory mandate required SunWater to undertake this upgrade and concluded that the timing and need for the upgrade of this item has been demonstrated and hence is prudent.

SKM also considered the estimate to be efficient.

Authority's Analysis

The Authority notes that Halcrow recommended this item not to be prudent, in contrast with SKM's findings that the project was both prudent and efficient.

The Authority considers that SKM's analysis has been based on a more thorough review, using more information than was available to Halcrow. The Authority therefore proposes to accept the recommendation that the expenditure is prudent and efficient.

Item 3: Fairbairn Dam – Refurbish Baulks

SunWater

This activity involves the refurbishment of baulks for outlet works (designed for use in both the right bank and Selma Channel Outlets). Expenditure of \$38,000 (\$24,000 direct cost) is forecast in 2011-12 and \$39,000 (\$26,000 direct cost) is forecast in 2031-32.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that the refurbishment frequency is 20 years for these seldom used items of equipment. On this basis, the expenditure was considered prudent.

Halcrow also considered that the forecast expenditure is consistent with other gate/baulk refurbishment costs and is therefore efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 4: Fairbairn Dam – Five-Year Dam Comprehensive Inspection

SunWater

Scheduled for 2012-13 and then at five-yearly intervals, expenditure of \$99,000 (\$63,000 direct cost) is forecast in 2012-13, and then remains consistent at \$65,000 (direct) in future years (2017-18, 2022-23, 2027-28, and 2032-33).

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that this work is required for statutory compliance purposes in accordance the Queensland Dam Safety Management Guidelines.

The cost of the last review, undertaken in 2007-08, was in the order of \$69,600 (\$2007-08), i.e. \$77,400 in real terms (which was approximately 10% greater than budgeted), but the proportion of indirect and overhead costs is unknown.

In the absence of a breakdown of the historical costs and given the consistent nature of these programmed reviews, Halcrow assumed that the direct cost has been and will remain relatively consistent in real terms and is deemed to be efficient. Halcrow also noted that the variance in the cost of these reviews across other dams in the Biloela cluster of schemes was broadly consistent with the size of the dam and complexity of associated infrastructure at each site.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 5: Fairbairn Dam – Refurbish: Repair and Armour Lower Downstream Slope of Embankment

SunWater

This activity, which comprises remedial works to the downstream lower slope of the embankment, is scheduled to be undertaken in 2013-14 at an estimated cost of \$63,000 (\$40,000 direct cost).

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

During the site visit, Halcrow noted that some general maintenance of the lower embankment may well be required by 2013-14. The lower embankment has recently been subjected to flooding; whilst in generally acceptable condition, some signs of deterioration were evident.

It is noted that in the Fairbairn Dam Operations and Maintenance Manual these refurbishment works are scheduled to be undertaken every 10 years. Provided the need for refurbishment is confirmed by a condition assessment undertaken prior to implementation, the proposed expenditure was considered prudent. Halcrow also considered the nominal expenditure to be efficient for the scope of works that can be reasonably expected to be required.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient provided confirmed by condition assessment.

Item 6: Fairbairn Dam – Refurbish 2 Hoists

SunWater

Refurbishment of hoists for gates at both Outlet Works 1 (Selma Channel Gatehouse) and Outlet Works 2 (Right Bank Outlet) is programmed as two separate line items. Expenditure forecasts are summarised as follows:

- (a) Outlet Works 2 Guard Gates – \$25,000 (\$20,000 direct costs) in 2013-14, 2021-22, 2029-30 and 2037-38;
- (b) Outlet Works 2 Regulating Gates – \$25,000 (\$16,000 direct costs) in 2013-14, 2021-22 and 2029-30; and
- (c) Outlet Works 1 Guard and Regulating Gates – \$50,000 (\$32,000 direct costs) in 2014-15, 2022-23 and 2030-31.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that the Fairbairn Dam Operations & Maintenance Manual indicates that refurbishment should be undertaken every 10 years (compared to the forecast interval of eight years); the 10-year frequency appears to be supported by reference to the Asset Management Standard for Cranes, Hoists and Winches.

Halcrow considered the expenditure to be prudent and efficient but recommended that refurbishment should be undertaken every 10 years rather than every eight years.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient but with refurbishment every 10 years rather than every eight years. That is, expenditure of \$36,000 (direct costs) would occur in 2013-14, 2023-24 and 2033-34. Expenditure of \$32,000 (direct costs) would occur in 2014-15, 2024-25 and 2034-35.

Item 7: Fairbairn Dam – Replace Level Transmitter and Remote Terminal Unit

SunWater

This activity involves the replacement of the level transmitter and associated remote terminal unit (RTU) at the Right Bank Inlet Works. Expenditure of \$83,000 (\$52,000 direct cost) and \$81,000 (\$53,000 direct) is proposed in 2013-14 and 2026-27 respectively.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that the proposed replacement frequency of 13 years is inconsistent with the nominated asset life of 15 years. An allowance of \$35,000 (direct) is considered more appropriate (and consistent with the Budget allowance nominated in the Fairbairn Dam Operations and Maintenance Manual). Halcrow also considered it appropriate that the subsequent replacement be deferred to 2028-29 to reflect the nominated asset life.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent but not efficient, and that the item be deferred to 2028-29.

Item 8: Fairbairn Dam – Replace 3 Inlet Lift Gates

SunWater

This activity involves the replacement of the three lift gates on the Selma Channel Intake regulating structure. Total expenditure of \$129,000 (\$81,000 direct cost) is forecast for 2014-15.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that SunWater indicates that an asset life of 50 years is nominated, on which basis replacement would not be expected until 2023-24. A condition assessment undertaken in June 2001 indicated moderate deterioration with minor refurbishment required. Given that the estimated replacement cost for each gate is in the order of \$27,000 (direct), refurbishment at a cost in the order of \$7,000-\$10,000 (direct) would be a more prudent approach.

Halcrow therefore proposed that an allowance of \$25,000 (direct) be provided for gate refurbishment in 2014-15 and \$81,000 (direct) for gate replacement in 2024-25.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent but not efficient.

Item 9: Fairbairn Dam – Refurbish 2 Outlet Gates

SunWater

This activity involves the refurbishment of all four gates, i.e. two guard gates and two regulating gates, at each of Outlet Works 1 (Selma Channel Gatehouse) and Outlet Works 2 (Right Bank Outlet). Total expenditure for all eight gates is programmed as separate line items, as follows:

- (a) \$256,000 (\$160,000 direct cost) in 2014-15;
- (b) \$244,000 (\$162,000 direct cost) in 2024-25; and
- (c) \$246,000 (\$162,000 direct cost) in 2034-35.

Refurbishment of the gates, comprising blast preparation and recoating and the replacement of anodes (corrosion protection), seals and stainless steel bolts, at 10-year intervals is considered prudent, and is consistent with other installations.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that the previous refurbishment was undertaken in 1999, and that gate and seal condition assessment undertaken in September 2005 supports refurbishment no later than 2014-15. At a cost of \$20,000 (direct) for each gate, the cost is deemed efficient considering the scope of work to be undertaken.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 10: Fairbairn Dam – Refurbish Metalwork

SunWater

This activity involves the refurbishment and/or replacement of ladders, covers and rails at the Selma (incorporating structures 1, 2 and 3) and right bank outlet works (structure 4). Expenditure is forecast as follows:

- (a) \$82,000 (\$52,000 direct cost) in 2014-15 – structures (1), (2), (3) and (4);
- (b) \$49,000 (\$32,000) direct cost in 2027-28 – structures (1) and (4); and
- (c) \$31,000 (\$20,000) direct cost in 2029-30 – structures (2) and (3).

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow considered the expenditure to be prudent on the basis that they are required to maintain safe work environments.

Halcrow considered that expenditure forecasting on the basis of a consistent replacement timeline of 15 years is considered more appropriate. In view of the scope of work required, the forecast expenditure was considered efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient but with a consistent life of 15 years rather than 13 years for some items.

Item 11: Fairbairn Dam – Replace Cables and Cableways

SunWater

SunWater noted that its forecast renewals included an item to replace cables and cableways at an estimated cost of \$116,000 (\$75,000) in 2015-16. Cables at Fairbairn Dam will be replaced based on their age and condition.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that although the SAP extracts provided by SunWater showed that the work involves replacement of power supply cabling and cableways to outlet works gate and pump motors, the extent of the work is not apparent from the information available.

Halcrow found that the forecast expenditure is deemed prudent based on a review of the SAP extracts indicating that the replacement is scheduled on a nominal 35-year frequency which is consistent with SunWater's adopted asset lives.

In the absence of more detailed information, Halcrow was unable to assess whether the expenditure is efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent but there is insufficient information to assess efficiency.

Item 12: Fairbairn Dam – Replace Switchboards – Gate House and Inlet Tower

SunWater

These activities involve replacement of switchboards at both the Selma Gatehouse and the Right Bank Inlet Tower. Expenditure of \$41,000 (\$27,000 direct cost) and \$63,000 (\$41,000 direct cost) is forecast for the Gatehouse and Inlet Tower respectively in 2015-16.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that, with adopted asset lives of 35 years, these switchboards were originally scheduled for replacement in 2006-07. In the absence of relevant information, Halcrow assumed that replacement has been deferred on the basis of condition assessment.

Halcrow noted that while the scope of work is not definitive, replacement costs are of an appropriate order and are deemed to be efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 13: Fairbairn Dam – 20-Year Dam Safety Review

SunWater

This activity involves undertaking a full dam safety review of Fairbairn Dam in accordance with the requirements of the Queensland Dam Safety Management Guidelines. In simple terms, it comprises a fresh engineering assessment of the integrity of all elements of a dam, which must be undertaken at intervals not exceeding 20 years.

Expenditure of \$124,000 (\$81,000 direct cost) is proposed in 2017-18.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Given the statutory driver, Halcrow considered the expenditure to be prudent. Whilst the timing of the previous review has not been confirmed, the need for a review may also be triggered by a change in design parameters (such as rainfall and runoff assumptions, or legislative changes).

On the basis of the scope of the required review, the proposed expenditure is not excessive and is therefore considered efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 14: Fairbairn Dam – Replace Selma Gatehouse Control Equipment

SunWater

This activity involves the replacement of control equipment at the Selma Gatehouse. Expenditure of \$115,000 (\$75,000 direct cost) is proposed in 2019-20 and again in 2032-33.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow considered that replacement of control equipment at appropriate intervals is prudent in view of both asset life and technology changes. Given that the control equipment relates to four gates as well as other equipment located at the gatehouse, the forecast expenditure is deemed to be efficient.

Halcrow noted that the proposed replacement frequency of 13 years is inconsistent with the nominated asset life of 15 years. Halcrow, therefore, recommended deferral of the subsequent replacement to 2034-35 to reflect the nominated asset life.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient but that expenditure be deferred to 2029-30.

Item 15: Fairbairn Dam – Replace Control Equipment

SunWater

This activity involves the replacement of pumping station control equipment at three sewage pumping stations that service toilet blocks within the recreation area at Fairbairn, i.e. at the boat ramp, lookout and point. Expenditure of \$53,000 (\$35,000 direct cost) is proposed in 2011-12 and \$55,000 (\$36,000 direct cost) is proposed in 2026-27.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Planning for replacement of control equipment at appropriate intervals is considered prudent in view of both asset life and technology changes. Halcrow noted a 15-year asset life has been assumed by SunWater.

Given that there are three pumping stations involved, the proposed expenditure amounts to approximately \$12,000 (direct) per unit. Although the unit cost is 50% higher than replacement of control equipment for the raw water pumps at the water treatment plant (see below), it is likely that the control systems for the sewage pumping stations will be more complex. Halcrow therefore considered the forecast expenditure to be efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 16: Fairbairn Dam – Sandblast and Recoat Clarifiers

SunWater

This activity involves the sandblasting (preparation) and recoating of the two clarifier tanks at Fairbairn Water Treatment Plant. Expenditure of \$24,000 (\$21,000 direct costs) is forecast for 2009-10; a consistent direct cost allowance of \$21,000 is forecast every 10 years, i.e. in 2010-11 and 2031-32.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow noted that a condition assessment undertaken in February 2010 rated the tanks as Condition 4 overall, i.e. significant deterioration with substantial refurbishment required. Details of the assessment reveal that the walls of both tanks were rated Condition 5, i.e. major

deterioration such that the asset is virtually inoperable, on the basis of severe corrosion pitting (2-3mm in places) on the internal surfaces.

Halcrow considered that recoating of the clarifier tanks every 10 years is prudent, and the estimated cost is considered efficient (on the basis of the approximate size of the tanks).

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient.

Item 17: Fairbairn Dam – Replace Control Equipment

SunWater

This activity involves the replacement of control equipment related to the water treatment plant, as follows:

- (a) treatment plant control equipment expenditure of \$211,000 (\$137,000 direct cost) in 2016-17; and expenditure of \$208,000 (\$137,000 direct cost) in 2029-30; and
- (b) raw water pump control equipment expenditure of \$12,000 (\$8,000 direct cost) in 2017-18; and expenditure of \$12,000 (\$8,000 direct cost) in 2032-33.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow considered that planning for replacement of control equipment at appropriate intervals is prudent in view of both asset life and technology changes and the forecast costs were considered efficient.

Halcrow noted that replacement of control equipment for some equipment is scheduled on the basis of 15 years asset life, whilst control equipment for other facilities is based on 13 year asset life, and suggested that reprogramming of forecast expenditure may be appropriate.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent and efficient but with consistent asset lives of 15 years rather than 13 years.

Item 18: Bedford Weir – Refurbish Bedford Outlets Works Gate (OWK) Gate

SunWater

Expenditure of \$39,000 is forecast in 2011-12, \$41,000 in 2021-22 and \$40,000 in 2031-32; and in each case this equates to approximately \$29,000 in direct costs.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Gate refurbishment at 10-year intervals is considered prudent for this type of installation.

However, based on the scope of work involved, and when compared to other installations (e.g. gates at Fairbairn Dam outlet structures), the forecast expenditure is considered excessive. Halcrow considered a direct cost allowance of \$20,000 to be more appropriate.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent but not efficient.

Item 19: Bedford Weir – Replace Hydraulic System

SunWater

Expenditure of \$276,000 (\$180,000 direct cost) is proposed in 2016-17. The existing equipment was assessed as having only minor defects in 2005, and SunWater noted that the condition will be re-assessed in 2014.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Consultant's Review

Halcrow considered that the timing of replacement after approximately 20 years (18 years proposed) is appropriate and considered the expenditure prudent.

In the absence of specific details, the estimated cost of the proposed works (\$180,000 direct) appeared excessive. Halcrow recommended that the nominated asset replacement value in SAP (\$115,000) with escalation adjustment to 2010-11, i.e. \$130,000 (direct cost), be adopted as the efficient cost.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is prudent but not efficient.

Conclusion

In summary, 19 items for the Nogoia-Mackenzie WSS were sampled, of which the Authority considers that:

- (a) 13 items are prudent and efficient and have been retained as forecast expenditure (although there are some adjustments to timing of expenditures);
- (b) five items are prudent but not efficient, requiring adjustment to forecast expenditure; and
- (c) one item is prudent but insufficient information was available to assess efficiency.

Further, as noted in Volume 1, after a consideration of all its consultants' reviews, the Authority has recommended that a 10% saving be applied to all non-sampled and sampled items for which there was insufficient information.

In total, the Authority recommends the direct renewals expenditure be adjusted as shown in Table 4.8.

Table 4.8: Review of Forecast (Direct) Renewals Expenditure 2011-36 (Real \$)

<i>Item</i>	<i>Year</i>	<i>SunWater (\$'000)</i>	<i>Authority's Findings</i>	<i>Recommended (\$'000)</i>
Sampled Items				
<i>Fairbairn Dam:</i>				
1. Repair spillway damage	2011-12	231	Prudent and efficient	231
2. Refurbish right bank outlet works	2011-12	486	Prudent and efficient	486
3. Refurbish baulks	2011-12, 2031-32	24,26	Prudent and efficient	24,26
4. 5-year dam inspection	2012-13 5-yearly	63, 63, 63, 63, 63	Prudent and efficient	63,63,63,63,63
5. Refurbish lower downstream slope of embankment	2013-14	40	Prudent and efficient, provided confirmed by condition assessment	40
6. Refurbish hoists (2 items)	2013-14, 2021-22, 2038-39	36, 36, 36	Prudent and efficient, but with refurbishment every 10 years rather than every 8 years	36 in 2013-14, 2023-24 and 2033-34
	2014-15, 2022-23, 2030-31	32, 32, 32	As above	32 in 2014-15, 2024-25 and 2034-35
7. Replace level transmitter and RTU	2013-14, 2026-27	52,53	Prudent but not efficient, deferred to 2028-29	35 in 2013-14 ,35 in 2028-29
8. Replace Inlet Lift Gates (3 items)	2014-15	81	Prudent but not efficient, deferred	25 in 2014-15, ,81 in 2024-25
9. Refurbish outlet gates (2 items)	2014-15, 2024-25, 2034-35	160, 160, 160	Prudent and efficient	160, 160, 160
10. Refurbish metalwork	2014-15, 2027-28	52, 52	Prudent and efficient, but with consistent life of 15 years rather than 13 years for some items (replacement in 2029-30)	52 in 2014-15, 52 in 2029-30
11. Replace cables and cableways	2015-16	75	Insufficient information	68
12. Replace switchboards – gatehouse and inlet tower (2 items)	2015-16	68	Prudent and efficient	68
13. 20-year dam safety review	2017-18	81	Prudent and efficient	81

<i>Item</i>	<i>Year</i>	<i>SunWater (\$'000)</i>	<i>Authority's Findings</i>	<i>Recommended (\$'000)</i>
14. Replace Selma gatehouse Control equipment	2019-20, 2032-33	75,75	Prudent and efficient, but with consistent asset lives	75 in 2019-20, 75 in 2034-35
15. Replace control equipment	2011-12, 2026-27	35, 35	Prudent and efficient	35, 35
16. Sandblast and recoat clarifiers	2011-12, 2021-22, 2031-32	21,21,21	Prudent and efficient	21, 21, 21
17. Replace control equipment	2016-17, 2029-30	145, 145	Prudent and efficient but with consistent asset lives of 15 years rather than 13 years	145 in 2016-17, 145 in 2031-32
<i>Bedford Weir:</i>				
18. Bedford Weir outlet works gate refurbishment	2011-12, 2026-27	28, 28	Prudent but not efficient	20, 20
19. Bedford Weir - Replace hydraulic system	2011-12, 2021-22, 2031-32	180, 180, 180	Prudent but not efficient	130, 130, 130
Non-Sampled Items				10% saving applied

Source: SunWater (2011), Halcrow (2011), SKM (2011) and QCA (2011).

4.6 SunWater's Consultation with Customers

Submissions

SunWater

SunWater (2011b) submitted that through Irrigator Advisory Committees (IACs), customers are:

- (a) able to offer suggestions on planned asset maintenance which are considered by SunWater in the context of asset management planning;
- (b) consulted on various operational and other aspects of service provision, including the timing of shutdowns and managing supply interruptions; and
- (c) provided with information about renewals expenditure, particularly where supply interruptions may result.

Nonetheless, SunWater noted opportunities for greater consultation with irrigators do exist.

Other Stakeholders

No comments were received from stakeholders regarding SunWater's consultation with customers.

Authority's Analysis

In Volume 1, the Authority noted customers' concerns about the lack of involvement in the planning of future renewals expenditure has been raised by irrigators and their representatives.

The Authority recommends that there be a legislative requirement for SunWater to consult with its customers about any changes to its service standards and proposed renewals expenditure program.

SunWater should also be required to submit the service standards and renewals expenditure program to irrigators for comment whenever they are amended and that irrigators' comments be documented and published on SunWater's website and provided to the Authority. The Authority's recommendations are detailed in Volume 1.

4.7 Allocation of Headworks Renewals Costs According to WAE Priority

Previous Review

For the 2006-11 price path, the renewals costs for the Nogo-Mackenzie bulk water infrastructure were apportioned between priority groups using converted nominal water allocations.

The conversion to medium priority WAE was determined by the Fitzroy River ROP conversion factor (3:1); that is, one ML of high priority WAE was considered equivalent to 3 ML of medium priority WAE.

Stakeholder Submissions

SunWater

For the 2012-17 regulatory period, SunWater proposed that renewals costs for bulk water infrastructure be apportioned in accordance with the share of utilisable storage headworks volumetric capacity dedicated to that priority group – as measured by the headworks utilisation factor (HUF).

SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAE. Specifically, the HUF methodology takes into account water sharing rules, critical water sharing arrangements (CWSAs) and other operational requirements that typically give high priority entitlement holders exclusive access to water stored in the lower levels of storage infrastructure.

SunWater (2010d) submitted a detailed outline of the HUFs methodology, outlining its derivation and application for each scheme. This methodology, discussed in detail Volume 1, can be summarised as follows.

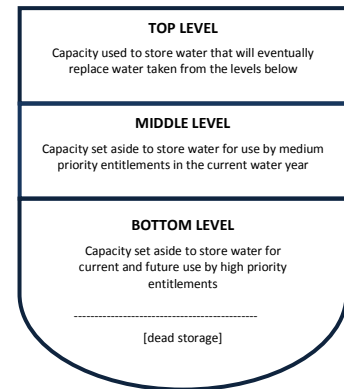
Step 1: Identify the water entitlement groupings for each scheme, as listed in DERM's Water Entitlement Register, and establish which groups are to be considered as high priority (HP) and medium priority (MP) for the purposes of the HUFs calculation⁵.

Step 2: Determine the volumes associated with the high and medium priority groupings identified in Step 1, taking into account any allowable conversion from medium to high priority under the scheme's ROP.

⁵ If more than two priority groups exist, water sharing rules and other differentiating characteristics are taken into account to determine whether they are included in the high or medium priority grouping, or neither.

Step 3: Determine the extent to which water sharing rules, CWSAs and other operational requirements give the different water entitlement priority groups exclusive or shared access to capacity components of the storage infrastructure.

This step divides the storage infrastructure into three levels: the bottom layer, which is exclusively reserved for high priority; the middle layer, which is effectively reserved for medium priority; and the top layer, which is shared between the medium and high priority groups.



Step 4: Assess the hydrological performance in 15-year sequences of each layer identified in Step 3 to determine the probability of each component of headworks storage being accessible to the relevant priority group.

Step 5: Calculate the percentage of storage headworks capacity to which medium priority users have access for each of the 15-year sequences analysed in Step 4:

$$\frac{MP \text{ Utilised Capacity}}{Total \text{ Utilised Capacity}} = \frac{MP_{1(utilised)} + MP_{2(utilised)}}{MP_{1(utilised)} + HP_{1(utilised)} + MP_{2(utilised)} + HP_{2(utilised)}} (\%)$$

Set the HUF_{mp} equal to the minimum of these values to reflect the worst 15-year period ($HUF_{hp} = 1 - HUF_{mp}$).

If more than two types of water entitlements were aggregated in Step 1 these are then disaggregated.

The parameters used for determining the HUFs for the Nogoia-Mackenzie WSS are summarised in Table 4.9. The HUFs for this scheme (SunWater, 2010d) are 40% for medium priority and 60% for high priority.

Table 4.9: Application of HUFs Methodology

STEP 1: Water Entitlement Groups (DERM's Water Allocation Register)			
Nominal Group	(ML)	HUF Group	(ML)
Medium Priority	190,620	MP _A	190,620
High Priority	44,703	HP _A	44,703
STEP 2: ROP Conversion Factor Adjustment			
Conversion Factor: ROP _{CF}			3.0
Maximum volume that can be converted to HP: HP _A max			56,000
Corresponding volume of MP: MP _A min = MP _A - (HP _A max - HP _A) * ROP _{CF}			156,729
STEP 3: Water Sharing Rules & Operational Requirements			
Water Sharing Rules			233,238
Volume below which MP not available: MP ₀ AA			445,930
Volume above which max.MP available: MP ₁₀₀ AA			
CWSAs and other operational requirements			
Likely increase in volume effectively reserved for HP: MP ₀			233,238
Likely increase in min. storage before maximum MP available: MP ₁₀₀			445,930
Key Dam Level Measures			
Full Supply Level: FSV _{hwks}			1,343,960
Dead Storage Level: DSL _{hwks}			19,520
STEP 4: Hydrologic performance of headworks storage			
Storage Layer	Storage Capacity (ML)	Prob of Utilisation	Utilised Capacity (ML)
Top: $\max\{(FSV_{hwks} - MP_{100}), 0\}^*$	MP ₂ = 447,934; HP ₂ = 450,096	6%	MP _{2u} = 26,921; HP _{2u} = 27,051
Middle: $\min\{(MP_{100} - MP_0), (FSV_{hwks} - MP_0)\}$	MP ₁ = 212,691	57%	MP _{1u} = 120,090
Bottom: MP ₀ - DSV _{hwks}	HP ₁ = 213,718	91%	HP _{1u} = 193,313
STEP 5: Calculation of HUFs for each Water Entitlement Group			
Formula	HUF Group	Nominal Group	
MP _A : $(MP_{1u} + MP_{2u}) / (MP_{1u} + HP_{1u} + MP_{2u} + HP_{2u})$ = $(120,090 + 26,291) / (120,090 + 193,313 + 26,921 + 27,051)$	HUF _{mp} = 40%	Medium Priority = 40%	
HP _A : $(HP_{1u} + HP_{2u}) / (MP_{1u} + HP_{1u} + MP_{2u} + HP_{2u})$ = $(193,313 + 27,051) / (120,090 + 193,313 + 26,921 + 27,051)$	HUF _{hp} = 60%	High Priority = 60%	

*Apportioned between MP₂ and HP₂ using the ratio MP₁:HP₁. Source: SunWater (2010d).

Other Stakeholders

CHCGIA (2010a) submitted support for the principle of user-pays for the correct apportionment of costs. CHCGIA queried whether the Authority was going to identify all beneficiaries of relevant infrastructure (e.g. dam and weirs).

CHCGIA also submitted that in previous pricing rounds, a conversion factor for pricing was set at 2.5:1 for medium to high priority allocations. Since that time, following extensive consultation and modelling, a conversion factor has been set by DERM at 3:1. This conversion factor is used to convert medium priority to high priority allocation for trading purposes. Given the amount of research conducted by DERM in determining this conversion factor, it is appropriate that this factor be used instead of headworks pricing. [Further specific comments relating to high priority charges in the Weemah Channel are included in the Emerald Distribution System report.]

In particular, CHCGIA noted that the biggest users of recreational facilities are urban and industrial customers as they would represent 90% of the relevant population. CHCGIA proposed that the renewals costs for recreational infrastructure could easily be apportioned by reference to population.

During the Round 1 consultation in April 2010, stakeholders suggested that, with respect to capital cost allocation, modelling 100% conversion from medium to high priority should be carried out as the true conversion factor is 3:1 not 2.5:1, as flood mitigation should be removed. Stakeholders also queried how the capital (to service environmental flows) would be charged.

Cotton Australia/QFF (2010b) submitted that if medium priority water is converted to high priority water some schemes will lose 50% of the income generated by medium priority users, and questioned how is this to be recovered as the proposed price difference between medium and high priority is as low as 5% when the storage requirement is as large as 300%.

Authority's Analysis

The Authority commissioned Gilbert & Sutherland (G&S) to conduct an independent review of SunWater's proposed HUFs methodology. G&S (2011) concluded that the input data and model sources were appropriate, calculations were accurate to the method and input data utilised, the methodology exhibits rigour and is generally robust in providing consistent outcomes. G&S also recommended some amendments to SunWater's approach.

As discussed in Volume 1, the Authority endorsed SunWater's proposed approach for the allocation of capital costs, subject to the following amendment proposed by G&S that the method for apportioning the top layer of storage between medium and high priority be modified to reflect the ratio of nominal volumes rather than ratio of $MP_1:HP_1$

SunWater (2011x) accepted these recommendations and submitted recalculated HUFs for each scheme. For the Nogoia-Mackenzie WSS, the changes resulted in the HUF_{mp} value rising from 40% to 45%, and the HUF_{hp} value falling from 60% to 55% (Table 4.10).

Table 4.10: Revised HUF Calculations

STEP 4: Hydrologic performance of headworks storage			
Storage Layer	Storage Capacity (ML)	Prob. of Utilisation	Utilised Capacity (ML)
Top layer			
<i>Initial</i>	MP ₂ = 447,934; HP ₂ = 450,096	6%	MP _{2u} = 26,921; HP _{2u} = 27,051
<i>Revised*</i>	MP ₂ = 727,436; HP ₂ = 170,594	no change	MP _{2u} = 43,720; HP _{2u} = 10,253
Middle Layer	MP ₁ = 212,691	57%	MP _{1u} = 120,090
Bottom Layer	HP ₁ = 213,718	91%	HP _{1u} = 193,313
STEP 5: Calculation of HUFs for each Water Entitlement Group			
	Initial	Revised	Nominal Group
HUF _{mp}	40%	45%	Medium Priority = 45%
HUF _{hp}	60%	55%	High Priority = 55%

*Apportioned between MP₂ and HP₂ using the ratio of nominal volumes (MP_A:HP_A). Source: SunWater (2011x).

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 5.2:1. This compares with the water pricing conversion factor of 2.5:1 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators will now pay 45% of the cost of renewals whereas previously medium priority irrigators paid 63%.

4.8 Calculating the Renewals Annuity

In Volume 1, the Authority recommends an indexed rolling annuity, calculated for each year of the 2012-17 regulatory period.

For the Nogoia-Mackenzie WSS the recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.11. The table shows the total renewals annuity recommended by the Authority and the component amounts for high and medium priority customers. Also presented for comparison are SunWater's total renewals annuity for 2006-11 and SunWater's proposed total annuity for 2012-17. SunWater did not submit a disaggregation between high and medium priority customers.

Table 4.11: Nogo-Mackenzie WSS Renewals Annuity (Real \$000)

	<i>Actual</i>						<i>Recommended</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total SunWater	241	488	559	597	556	547	544	543	535	530	530
Total Authority	-	-	-	-	-	-	424	425	416	417	409
High Priority	-	-	-	-	-	-	193	193	189	190	186
Medium Priority	-	-	-	-	-	-	178	178	174	175	172
Distribution Losses	-	-	-	-	-	-	53	53	52	53	52

Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5
Source: Actuals (SunWater, 2011) and Recommended (QCA, 2011).

5. OPERATING COSTS

5.1 Background

Ministerial Direction

The Ministerial Direction requires the Authority to recommend a revenue stream that allows SunWater to recover efficient operational, maintenance and administrative (that is, indirect and overhead) costs to ensure the continuing delivery of water services.

Issues

To determine SunWater's allowable operating costs for 2012-17, the Authority considered the following:

- (a) the scope of operating activities for the Nogoia-Mackenzie WSS;
- (b) the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices;
- (c) the prudence and efficiency of SunWater's proposed operating expenditures including direct and non-direct costs and escalation factors; and
- (d) the most appropriate methodologies for assigning operating costs to service contracts and to different priority customer groups (within each service contract).

5.2 Total Operating Costs

Operating costs are generally classified by SunWater as either non-direct or direct.

Non-direct costs are classified as either:

- (a) overhead costs – allocated to all of SunWater's 62 service contracts for services that support the whole business (for example, Board, CEO and human resource management costs); and
- (b) indirect costs – allocated to more than one service contract⁶ (but not all service contracts) for specialised services pertaining to a particular type of asset or group of service contracts (for example, asset management strategy and systems).

Direct costs are those readily attributable to a service contract (for example, labour and materials employed directly to service a scheme asset) and have been classified as operations, preventive maintenance (PM), corrective maintenance (CM), electricity and other costs.

In its NSP, SunWater described the scope of its operating activities to include service provision, compliance, insurance, recreation and other supporting activities (these were not classified by direct and indirect costs). SunWater noted that:

- (a) a Service Manager and 11 staff are located at the Emerald depot and are responsible for the day-to-day water supply management and for delivery of the programmed works for all users in the region. Operation and maintenance activities are undertaken by staff at Fairbairn Dam;

⁶ SunWater refers to each bulk scheme and each distribution system as a service contract. Consequently, SunWater has 22 irrigation bulk service contracts and eight irrigation distribution system service contracts.

- (b) service provision relates to:
- (i) water delivery – scheduling and releasing bulk water from storages, surveillance of water levels and flows in the river, and quarterly meter reading; and
 - (ii) customer service and account management – managing enquiries about accounts and major transactions; providing up to date online data on WAE, water balances and water usage; and managing transactions such as temporary trades, transfers and other scheme specific transactions;
- (c) compliance requirements to provide the bulk service include those relating to:
- (i) the ROP and ROL – a major part of which is gathering and reporting data at quarterly and annual intervals on water sharing rules, ROP amendments and modifications; water accounting and reporting on stream flow, water quality and other data (Table 5.1);

Table 5.1: DERM’s Water Quality Monitoring Requirements of SunWater

Storage	Monthly Monitoring Requirements			
	Inflow	Head Water	Tail Water	BGA
Fairbairn Dam	No	Yes	Yes	Yes
Bedford Weir	Yes	Yes	Yes	Yes
Bingegang Weir	No	Yes	Yes	Yes
Tartus Weir	Yes	Yes	Yes	Yes

Includes sampling for the following variables: Dissolved oxygen, electrical conductivity, pH, temperature; total nitrogen, phosphorus and blue green algae. Source: SunWater (2011).

- (ii) dam safety – as Fairbairn Dam is a referable dam under the *Water Act 2000*, SunWater is required to have a program in place to minimise the risk of dam failure, which involves documenting, recording and reporting on dam safety. Audits and thorough inspections are carried out annually.

Routine dam safety inspections are carried out monthly on Fairbairn Dam and monthly on the weirs. Specific dam safety inspections are required at Fairbairn Dam, which include monitoring of embankments, piezometers, seepage and the general condition of the storages as defined in the dam surveillance specification. They also include condition inspections to identify and plan maintenance requirements and to provide information for management planning of water delivery assets;
 - (iii) environmental management to comply with the ROP and *Environmental Protection Act 1994* which require SunWater to deal with risks such as fish deaths, chemical usage, pollution, contaminants and approvals for instream works; and
 - (iv) land management (weed and pest control, rates and land tax, security and trespass and access to land owned by SunWater) as well as other obligations in relation to workplace health and safety, financial reporting and taxation and irrigation pricing;
- (d) insurance is obtained on a portfolio basis and allocated to the scheme;

- (e) SunWater has sought to transfer the management and cost of recreation activities to private operators or Government. However, recreation facilities at Fairbairn Dam continue to be operated and maintained by SunWater (the cost of which is outlined further below); and
- (f) other supporting activities include central procurement, human resources and legal services.

Previous Review

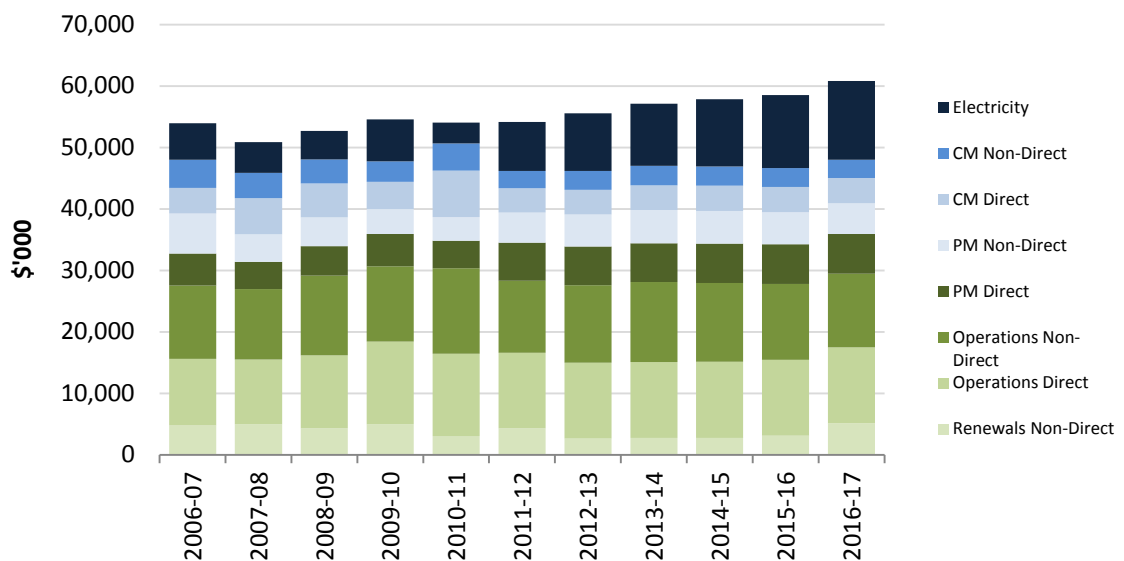
For the 2006-11 price paths, Indec identified annual cost savings of between \$3.8 million and \$5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

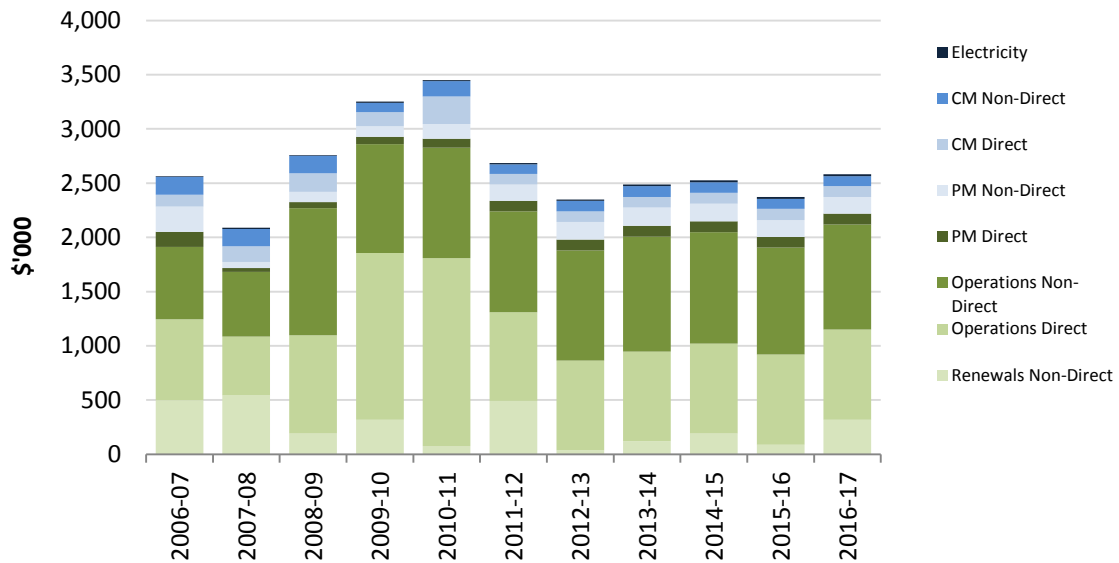
SunWater’s past and forecast total operating costs for its irrigation service contracts (all sectors) are summarised in Figure 5.1. SunWater’s allocation of non-direct costs to activities (including renewals) is also identified. These estimates reflect SunWater’s most recent information (including that received by the Authority in October 2011) and differ from SunWater’s NSPs.

Figure 5.1: SunWater’s Total Operating Costs (Real \$) – All Service Contracts



Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater’s revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Expenditure by activity in Nogoia-Mackenzie WSS (all sectors) is shown in Figure 5.2 and Table 5.2 and Table 5.3.

Figure 5.2: Total Operating Costs – Nogo-Mackenzie WSS (Real \$)

Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs. SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.2: Operating Costs by Activity – Nogo-Mackenzie WSS (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Operations	1,415	1,139	2,078	2,539	2,750	1,747	1,842	1,887	1,857	1,815	1,799
Electricity	7	12	8	11	10	12	13	15	15	17	18
Preventive Maintenance	371	92	148	167	218	247	261	268	263	256	254
Corrective Maintenance	274	305	333	215	396	186	195	200	198	194	193
Renewals Non-Direct	498	543	192	319	76	493	38	120	191	90	319
Total	2,565	2,090	2,760	3,251	3,450	2,685	2,349	2,489	2,525	2,372	2,582

Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011), SunWater (2011ap) and SunWater (2011ao).

Table 5.3: Operating Costs by Type – Nogo-Mackenzie WSS (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Labour	433	332	552	571	535	599	611	611	611	611	611
Electricity	7	12	8	11	10	12	13	15	15	17	18
Contractors	138	63	-130	157	255	95	97	98	100	101	101
Materials	114	63	158	56	88	76	77	78	79	80	80
Other	310	263	553	952	1,195	241	241	241	240	241	241
Non-Direct	1,562	1,357	1,620	1,505	1,368	1,662	1,311	1,447	1,480	1,323	1,532
Total	2,565	2,090	2,760	3,251	3,450	2,685	2,349	2,489	2,525	2,372	2,582

Note: Negative values will be investigated further for the Final Report. Renewals direct costs are discussed in the previous chapter. Non-direct costs include the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011), SunWater (2011ap) and SunWater (2011ao).

In its NSP, SunWater submitted that the operating costs for this scheme averaged \$2.15 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the indirect and overhead costs allocated to renewals expenditure]. The projected efficient average operating costs in the NSP for 2011-16 are \$2.22 million per annum.

Other Stakeholders

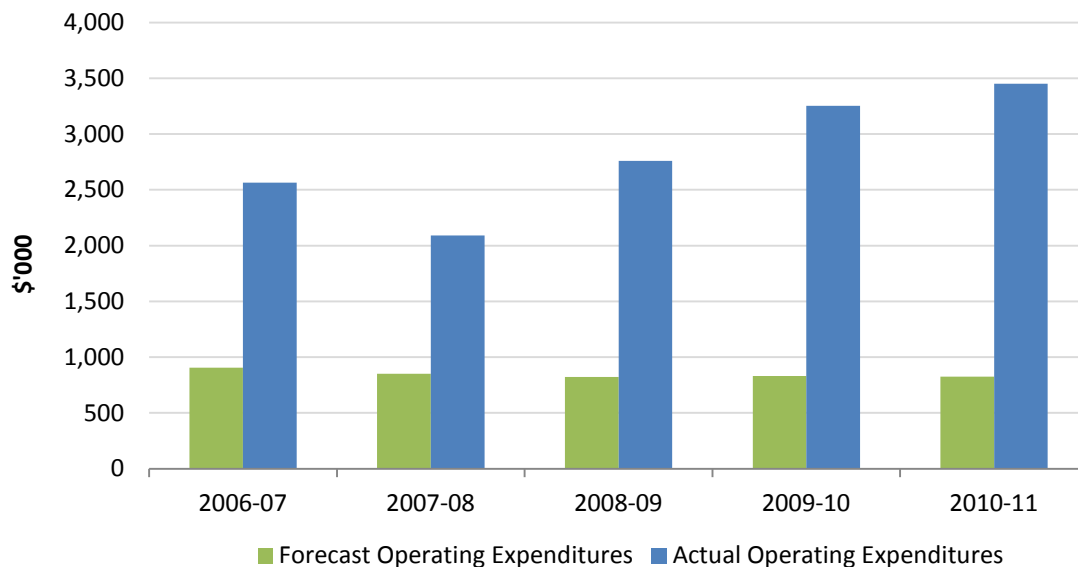
No submissions were received from other stakeholders on this matter.

Authority's Analysis

The Authority has sought to review the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices.

In Volume 1, the Authority noted that during the beginning of the 2006-11 price paths, SunWater's total operating costs increased above those previously agreed. In response, in July 2009 SunWater instigated a program to reduce costs by \$10 million (the Smarter Lighter Faster Initiative (SLFI)). SunWater submitted that these savings should be fully realised by 30 June 2012.

In 2011, the Authority engaged Indec to assess whether SunWater achieved the cost savings forecast for 2005-06. A comparison of forecast and actual operating costs for the Nogo-Mackenzie WSS is shown in Figure 5.3 below. For this scheme, actual operating costs exceeded forecast operating costs in 2010-11 by \$1.5 million. Indec noted that anomalies could arise for the service contracts from linked bulk and distribution systems and the solution was to combine them into bundled schemes. See Volume 1.

Figure 5.3: Forecast and Actual SunWater Operating Expenditure 2006-11 (Real \$)

Source: SunWater (2011ap) and Indec (2011f).

Indec has not, however, inferred from its analysis that SunWater should alter its costs over the 2012-17 regulatory period to the level of efficient costs determined for 2010-11. It observed that further analysis would be required to justify and support such an inference (see Volume 1). The Authority engaged other consultants to address potential scheme specific cost savings.

5.3 Non-Direct Costs

Introduction

Since structural reforms were implemented, SunWater has become a more centrally organised business. SunWater's strategic operational management (for example, Finance, Strategy and Stakeholder Relationships) is provided centrally. This arrangement seeks to ensure that appropriate systems and processes are in place, are being applied in a consistent manner, are addressing key regulatory compliance and business requirements; and to ensure a high degree of flexibility across SunWater's workforce.

Some specialist operations staff with expertise in key operational areas may be located either in Brisbane or regional locations. Their specialist expertise is applied to technical problems and issues in support of local operators.

Operational works planning and maintenance scheduling is provided by regional management, although all staff positions and budgets are managed centrally. For example, spare capacity in one region will be diverted (and billed) to regions with higher demand. Similarly, staff may be assigned to either irrigation or non-irrigation service contracts.

The nature of these non-direct activities is detailed in Volume 1.

As noted above, SunWater categorises non-direct costs as either overheads or indirect costs.

Previous Review

As noted above, in the previous review, Indec reviewed SunWater's non-direct costs for 2006-11. Non-direct costs were allocated to schemes on the basis of total direct costs.

Stakeholders

SunWater

As noted in Volume 1, SunWater submitted that it will incur \$23.5 million in total non-direct costs in 2012-13 (Table 5.3). SunWater's approach to the forecasting of non-direct operating expenditures is detailed in Volume 1.

In brief, SunWater forecast non-direct costs for 2010-11 and then escalated these forward using indices applied to the components of these costs. The costs in 2010-11 were based on actual costs over the past four years (excluding spurious costs) and adjustments for known or expected changes in costs. In particular, SunWater proposed that salaries and wage costs generally will rise by 4% per annum. However, SunWater has forecast that its total salaries and wages will rise by only 2.5% per annum, with the difference (1.5% per annum) being accounted for by (unspecified) productivity improvements.

SunWater proposed that the total direct labour costs (DLCs) of each service contract be used to allocate non-direct costs.

Total non-direct costs and those allocated to the Nogoia-Mackenzie WSS are set out in Table 5.4.

Table 5.4: SunWater's Actual and Proposed Non-Direct Costs (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater	27,831	25,097	25,872	24,579	25,152	23,770	23,512	24,244	24,055	23,708	25,089
Nogoia-Mackenzie	1,562	1,357	1,620	1,505	1,368	1,662	1,311	1,447	1,480	1,323	1,532

Source: SunWater (2011).

The non-direct costs for this scheme include a portion of SunWater's total overhead costs (for example, HR, ICT and finance), as well as a share of Infrastructure Management costs for each region (South, Central, North and Far North) and a share of the overhead costs of SunWater's Infrastructure Development Unit.

Other Stakeholders

During Round 1 Consultation, stakeholders expressed concern about the overall level of administrative costs, including head office cost, and how these are allocated.

During Round 2 Consultation, stakeholders noted that indirect and overhead costs are over 55% of the total operating costs. They noted that the scheme is very large and efficient with very high water use per customers, but it is still attracting a very high percentage of indirect and overhead costs. The methodology for apportioning these costs needs to be looked at closely to ensure this scheme is not subsidising other schemes that lack the size and efficiencies.

Stakeholders further questioned whether overhead costs were required and whether the scheme could operate with lower overheads. Stakeholders submitted that SunWater changes its structure and accounting methods between every review which makes it difficult to compare current forecast with past expenditures.

During Round 1 Consultation, stakeholders submitted that efficient operating costs are desirable but not at the expense of local administration support. Concern was expressed at the level of administration costs, including head office costs.

Authority's Analysis

As noted in Volume 1, the ratio of non-direct to total costs reflects the structure of the organisation. A more centralised organisation can be expected to have a higher ratio of non-direct to direct costs.

In seeking to establish prudence and efficiency, the Authority commissioned Deloitte Touche Tohmatsu (Deloitte) to review SunWater's non-direct costs. Deloitte carried out benchmarking to assess where potential efficiencies within SunWater may be achieved. Deloitte identified savings of \$495,314 (in 2010-11 dollars) per annum in finance, human resources, information technology, and health, safety, environmental and quality areas (for the whole of SunWater).

Deloitte was unable to draw any definitive conclusions from an attempt to benchmark against Pioneer Valley Water Board (PVWater) and other Australian rural water service providers. Deloitte noted that PVWater's non-direct costs were higher than those of SunWater as a percentage of total operating costs – but that there are differences between PVWater and SunWater which can make comparisons unreliable.⁷

The Authority accepts that \$495,314 of full time equivalent (FTE) staff costs were not efficient and should be excluded from SunWater's total non-direct costs (of which an amount of \$297,189 relates to irrigation service contracts under SunWater's proposed cost allocation methodology). See Volume 1.

In addition, the Authority recommends that SunWater's forecast total non-direct operating costs should be reduced by a compounding 1.5% per annum (based on the Authority's view that non-labour productivity gains are achievable and in line with labour productivity gains).

The Authority has also reviewed the allocation of non-direct costs to irrigation service contracts.

SunWater's proposed use of DLCs is on the basis that it: best reflects activity and effort; is a proxy for other drivers; and provides consistency across service contracts.

Deloitte reviewed SunWater's proposal and identified alternative cost allocation bases (CABs). On the basis of this analysis, the Authority concludes that no alternative CAB is superior to DLC and that the introduction of any alternative would likely be costly and complex.

The Authority has therefore accepted SunWater's proposed DLC methodology with two exceptions recommended by Deloitte:

- (a) the overhead component of Infrastructure Management (Regions) should be allocated directly to the service contracts serviced by each relevant resource centre (South, Central, North and Far North), on the basis of DLC from each respective resource centre (that is, targeted DLC); and
- (b) the overhead component of the Infrastructure Development unit should be allocated (on the basis of DLC) to service contracts receiving services from that unit (that is, targeted DLC).

⁷ For example, PVWater has only four FTE staff. For the benchmarking exercise, PVWater needed to estimate the proportions of staff time spend on administration versus operations and maintenance activities, which varies considerably depending on weather conditions and workloads. Deloitte found it difficult to compare PVWater's estimated apportionments with SunWater, who have around 500 staff assigned to specific projects or centralised functions.

This adjustment ensures that schemes are only paying for the overhead costs from those resource centres that are most directly related to their schemes and not, for example, for Infrastructure Management overhead costs from the other three regions.

The Authority's recommended level of non-direct costs to be recovered from the Nogo-Mackenzie WSS (from all customers) is set out in Table 5.5. The allocation of these costs between high and medium priority customers is discussed below.

Table 5.5: Recommended Non-Direct Costs (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater	1,562	1,357	1,620	1,505	1,368	1,662	1,311	1,447	1,480	1,323	1,532
Authority							1,278	1,379	1,379	1,232	1,388

Source: SunWater (2011ap) and SunWater (2011ao).

Insurance and labour utilisation rates (which affect non-direct and direct costs) are addressed in Volume 1.

5.4 Direct Costs

Introduction

SunWater classified its operational activities into operations, preventive maintenance, corrective maintenance and electricity. SunWater's operating costs were forecast using this classification. The nature of these activities and costs are identified further below.

With the exception of electricity, SunWater has disaggregated each of the above activities into the following cost types:

- (a) labour – direct labour costs attributed directly to jobs , not including support labour costs such as asset management, scheduling and procurement, which are included in administration costs;
- (b) materials – direct materials costs attributed directly to jobs , including pipes, fittings, concrete, chemicals, plant and equipment hire;
- (c) contractors – direct contractor costs attributed directly to jobs , including weed control contractors, commercial contractors and consultants; and
- (d) other – direct costs attributed directly to service contracts, including insurance, local government rates, land tax and miscellaneous costs.

Stakeholder Submissions

SunWater

SunWater estimated the costs of each activity in 2010-11, based on actual costs over the past four years (excluding spurious costs) with adjustments for known or expected changes in costs. Adjustments were also made to preventive maintenance in line with the Parsons Brinckerhoff (PB, 2010) review. These estimates were then escalated forward for the 2012-17 pricing period. Further details are outlined in Volume 1.

SunWater's forecast direct operating expenditure by activity is set out in Table 5.6 below. These estimates reflect SunWater's most recent positions and differ from the NSP. The

estimates also reflect the most recent information provided by SunWater to the Authority in October 2011.

Table 5.6: SunWater Direct Operating Expenditures by Activity (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Operations	746	543	905	1,537	1,734	816	827	828	829	832	832
Electricity	7	12	8	11	10	12	13	15	15	17	18
Preventive Maintenance	139	35	56	69	85	98	99	99	100	100	100
Corrective Maintenance	111	144	172	130	253	97	99	99	100	101	101
Total	1,003	733	1,141	1,747	2,082	1,023	1,038	1,042	1,044	1,049	1,050

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.7 presents the same operating costs developed by SunWater on a functional basis.

Table 5.7: SunWater Direct Operating Expenditures by Type (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Labour	433	332	552	571	535	599	611	611	611	611	611
Electricity	7	12	8	11	10	12	13	15	15	17	18
Contractors	138	63	-130	157	255	95	97	98	100	101	101
Materials	114	63	158	56	88	76	77	78	79	80	80
Other	310	263	553	952	1,195	241	241	241	240	241	241
Total	1,003	733	1,141	1,747	2,082	1,023	1,038	1,042	1,044	1,049	1,050

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Authority's Analysis

The Authority engaged Halcrow to review the prudence and efficiency of SunWater's proposed direct operating expenditure.

Halcrow (2011) noted that it sought to obtain detailed information to facilitate its assessment of prudence and efficiency. In particular, Halcrow sought to understand the basis for SunWater's expenditure forecasts, together with the key assumptions used in their development.

Halcrow noted that while SunWater has provided information in response to the requests made, the data was insufficiently disaggregated to enable a detailed review of cost information. This limited Halcrow's ability to adequately assess the prudence and efficiency of the proposed expenditure.

In Volume 1, the Authority recommends that SunWater undertake a review of its planning policies, processes and procedures to better achieve its strategic objectives. The Authority also recommends that SunWater needs to improve the usefulness of its information systems. In particular, SunWater needs to document and access relevant information necessary to:

- (a) attain greater operating efficiency;
- (b) achieve greater transparency;
- (c) facilitate future price reviews; and
- (d) promote more meaningful stakeholder engagement.

Halcrow's review of specific cost categories for this scheme and the Authority's conclusions and views on cost escalation are outlined below.

Item 1: Operations

Stakeholder Submissions

SunWater

Operations costs relate to the day-to-day operational activity (other than maintenance) enabling waster delivery, customer management, asset management planning, financial and ROP reporting, workplace health and safety compliance, and environmental and land management.

SunWater's operating expenditure forecasts have been developed on the basis of detailed work instructions and operational manuals for each scheme.

SunWater's proposed operations costs are set out in Table 5.7 above. SunWater noted that recreation facilities at Fairbairn Dam continue to be operated and maintained by SunWater (Table 5.8).

Table 5.8: Recreational Facility Costs (Real \$'000)

	2011-12	2012-13	2013-14	2014-15	2015-16
Recreational Facility Cost	493	364	372	383	361

Source: SunWater (2011).

Other Stakeholders

Stakeholders further submitted that recreational area costs are passed to irrigation customers yet are a community resource, and the Authority should investigate who should pay for these costs.

CHCG (2010) submitted that recreational costs should be allocated on a user pays basis. Non-irrigators account for 90% of the use; however irrigators contribute the biggest proportion to offset costs.

During Round 1 Consultation, stakeholders noted that the biggest users of recreational facilities are the urban and industrial customers as they would represent 90% of the relevant population. Costs could easily be apportioned by reference to population demographics.

Authority's Analysis

Consultant's Review

Halcrow provided a breakdown of historical operations expenditure into key sub-activities in Table 5.9. A similar breakdown for forecast expenditure was not provided by SunWater.

Table 5.9: Breakdown of Historical Operations Expenditure (Real \$'000)

	2006-07	2007-08	2008-09	2009-10
Customer Management	42	-	-	87
Workplace H&S	-	11	1	23
Environmental Management	78	78	113	114
Water Management	248	5	130	63
Scheme Management	505	387	652	677
Dam Safety	62	131	891	1,026
Schedule/Deliver	244	122	142	143
Metering	-	44	33	34
Facility Management	256	360	391	374
Other	20*	-0*	-276*	0
Total	1,415	1,139	2,078	2,539

Note: * Negative values will be investigated for the Final Report. Source: Halcrow (2011).

Halcrow noted that the historical data contains some inaccurate coding to sub-activities, and that 2006-07 has the majority of anomalies because many expenses were retrospectively re-categorised to fit into the Business Operating Model structure (new organisational structure) and this was a not a completely precise process. Halcrow also noted that:

- (a) the significant increase in dam safety appears to correspond with the increase in water levels in the scheme's dams and weirs;
- (b) scheme management costs have also increased, these relate to management time (regional and scheme), supervisor time costs and insurance costs and rates;
- (c) facilities management expenditure includes that associated with recreation facilities at Fairbairn Dam, including the water and wastewater treatment plants;
- (d) customer management expenditure is now predominantly captured as indirect and overhead costs.

Halcrow also noted SunWater's historical and forecast expenditure on operations by type of cost, noting that SunWater's 2011 operations budget was \$1,717,000 and this was used as the basis of its forecast expenditure for the price path period.

Table 5.10: Operations Expenditure by Type – Nogoia-Mackenzie WSS (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Labour	293	242	453	481	470	477	487	487	487	487
Materials	62	18	78	37	39	39	40	40	41	41
Contractors	91	41	-165	71	65	66	67	68	69	70
Other	301	241	540	949	217	217	217	217	217	217
Total Direct Costs	746	543	905	1,537	791	799	810	812	814	815
Indirects	291	306	649	438	498	450	521	563	527	496
Overheads	377	290	524	564	428	481	493	494	500	487
Total Operating Costs	1,415	1,139	2,078	2,539	1,717	1,730	1,825	1,870	1,841	1,798
Annual change (%)		-20%	82%	22%	-32%	1%	5%	2%	-2%	-2%

Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data. Source: Halcrow (2011).

In its assessment of expenditure by type, Halcrow noted that labour and other costs are the most significant elements of direct expenditure. In respect of labour costs:

- (a) labour costs increased between 2007-08 and 2008-09 due to increased costs as a result of increased water management and scheme management costs arising from an increase in water storage following the drought. Minimum work was undertaken in 2006-07 and 2007-08 during the drought;
- (b) SunWater provided an extract of its resource planning tool used to develop labour forecasts for 2011-12. Halcrow confirmed that the forecast uses the general approach to forecasting labour costs as outlined in Volume 1. The extract indicated the direct labour charge for Nogoia-Mackenzie in 2011-12 is based on 8,620 hours per annum accounting for \$390,000 of labour costs, or 5.5 to 6 FTE staff working on operations. Halcrow stated this allowance is on the upper limit of what might be expected, although more information on work practices is required to enable prudence and efficiency assessment;
- (c) during site visits SunWater advised that the recent restructure had resulted in a reduction of six staff in Emerald (over the bulk and distribution systems), including three reception staff a mechanical fitter and two operational staff. Halcrow was unable to confirm whether this was included in SunWater's expenditure forecasts.

In relation to other costs, Halcrow noted that these include insurance (\$183,000 per annum), rates (\$8,000 per annum), land tax (\$15,000 per annum), and telephone and leasehold fees (\$10,000 per annum). Halcrow confirmed that SunWater's forecast expenditure for land tax and rates is in line with historical payments, and is considered appropriate.

Labour forecasts include real increases of 1.5% in 2011-12 and 2012-13, which is consistent with its Enterprise Agreement (4% nominal increase) with labour forecast to remain steady thereafter. Forecast expenditure for materials and contractors is assumed to outstrip inflation by 1.5% per annum. [The Authority's assessment of cost escalation is provided further below].

Within the Nogo-Mackenzie scheme there are two recreational facilities owned and operated by SunWater, at Fairbairn Dam and Bedford Weir. SunWater has sought to transfer responsibility for these to the Central Highland Regional Council, without success.

Given the facilities in place, Halcrow is satisfied that the operations and maintenance expenditure forecasts for recreational facilities are appropriate.

Halcrow noted, however, that the expenditure associated with the water treatment plant at Fairbairn Dam may be higher than normally required due to the plant being significantly oversized (the estimated capacity being 750 kL per day while demand is estimated at between 50 and 150 kL per day). Halcrow suggested that the water supply needs may be met with a small package plant or connection to the Emerald town potable water supply. A whole of life assessment may be appropriate.

Halcrow also commented that the recovery of recreation costs from the broader population (through charges for high security town and industrial water supply) may result in a fairer allocation of expenditure.

SunWater's Response

In relation to Halcrow's comment that the increase in operating costs was attributed to increased water levels in the scheme's dams and weirs, SunWater responded that the increase in operations cost in Table 4.3 of the NSP is due to the incident at Bedford Weir regarding the deflation of the fabric dam.

Conclusion

The Authority notes that, although Halcrow was unable to undertake a detailed review of operations expenditure, Halcrow was generally satisfied that the expenditure appears reasonable (although labour costs are on the upper limit of what might be expected). Halcrow did not recommend any specific adjustment to operations costs for this scheme.

In relation to recreation costs, the Authority notes that the Ministerial Direction requires that the Authority set prices to recover prudent and efficient recreation management costs. The Authority notes that Halcrow did not recommend any adjustments to SunWater's operations costs, including recreation costs.

The Authority notes that the consultants engaged to review operations costs in other SunWater schemes (Arup (2011), GHD (2011) and Aurecon (2011)) also did not recommend any adjustment to operations costs.

Further, SunWater's forecast average annual operations costs are materially lower than the actual average operations costs over 2006-11.

On the basis of the consultants' reviews and SunWater's internal cost reductions over time, the Authority has not specifically adjusted SunWater's operations cost forecast.

Item 2: Preventive Maintenance

Stakeholder Submissions

SunWater

SunWater defines preventive maintenance as maintaining the ongoing operational performance and service capacity of physical assets as close as possible to designed standards. Preventive maintenance is cyclical in nature with a typical interval of 12 months or less.

Preventive maintenance includes:

- (a) condition monitoring – the inspection, testing or measurement of physical assets to report and record its condition and performance for determination of preventive maintenance requirements; and
- (b) servicing – planned maintenance activities normally expected to be carried out routinely on physical assets.

Preventive maintenance costs are based on the updated work instructions developed for operating the scheme and an estimate of the resources required to implement that scope of work.

SunWater's proposed preventive maintenance costs are set out in Table 5.7 above.

Other Stakeholders

No stakeholder submissions were received regarding this item.

Authority's Analysis

Consultant's Review

Preventive maintenance is comprised of condition monitoring, servicing and weed control. Cost estimates for condition monitoring and servicing are based on PB estimates applied to SunWater's current preventive maintenance activities. Halcrow commented that:

- (a) the forecast expenditure for the Biloela region represents a significant increase over SunWater's historical expenditure, in part due to inaccuracies in recording of historical data as noted by PB. These errors have meant that it is not easily possible to compare historical to planned expenditure;
- (b) PB noted inconsistencies in maintenance frequencies across regions for the same type of assets, and a degree of catchup explains why planned preventive expenditure in some cases exceeds historical levels;
- (c) it reviewed a selection of work orders and cost estimates prepared by PB and is generally satisfied that the expenditure forecasts are developed appropriately;
- (d) SunWater has not optimised its mix of preventive and corrective maintenance and NSPs do not reflect savings that might be achieved from this;
- (e) SunWater's NSPs include greater expenditure than that forecast by PB, and Halcrow recommended that expenditure forecasts be adjusted accordingly;
- (f) in relation to weed control, SunWater provided information indicating that the cost of chemicals (Acrolein) was to reduce by 15%, however this is not reflected in its forecasts which adopt CPI indexation. The use of CPI indexation is supported by Halcrow.

A breakdown of historical and forecast expenditure on preventive maintenance is shown in Table 5.11.

Table 5.11: Preventive Maintenance Expenditure (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Labour	93	24	37	49	76	77	78	78	78	78
Materials	25	3	7	6	9	9	9	9	10	10
Contractors	12	6	6	11	7	7	7	7	7	7
Other	9	3	6	3	5	5	5	5	5	5
Total Direct Costs	139	35	56	69	97	98	99	99	100	100
Indirects	119	30	52	45	73	73	84	90	85	80
Overheads	113	27	40	53	75	76	78	79	79	77
Total Operating Costs	371	92	148	167	245	247	261	268	263	256
Annual change (%)		-75%	62%	13%	46%	1%	6%	3%	-2%	-3%

Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data. This was cited in Halcrow (2011) Source: Historical data extracted from SunWater spreadsheet 'Extract LBC Data Conversion extra activity detail and preventive maint split.xls', forecast expenditure data from SunWater spreadsheet 'IM Central -610.03.PSV'. Source: Halcrow (2011).

Halcrow noted that SunWater is forecasting an increase in preventive maintenance. Of the direct costs, the most significant increase is in labour costs with the spike in expenditure in 2006-07 attributed to the retrospective transfer of financial data into SunWater's revised Business Operating Model.

As noted previously, SunWater's condition monitoring and servicing forecast expenditure is primarily based on forecasts by PB. PB forecast around \$64,000 on condition monitoring and servicing, excluding indirect and overhead costs. Halcrow noted that:

- (a) the maintenance activities in Fairbairn Dam operating manuals were generally consistent with those costed by PB, although PB include additional activities such as site inspections and servicing of piezometers, which are considered appropriate given the nature of the assets;
- (b) while the expenditure forecasts developed by PB were based on appropriate drivers, the estimates were based on SunWater's existing work instructions and current approach to maintenance, which is yet to be optimised.

Of the remaining \$33,000, Halcrow attributed \$28,000 to weed control. This was based on the average of 2008-09 and 2009-10 expenditure, noting that these were based on non-drought years and 2006-07 and 2007-08 expenditure was significantly less reflecting drought years. While Halcrow noted the inherent uncertainty of forecasting weed control costs, recognising the high rainfall in the past couple of years, an allowance of \$28,000 does not appear unreasonable.

Halcrow noted that \$5,000 of forecast preventive maintenance expenditure in 2010-11 remains unaccounted for and that an adjustment should be made for this amount [and carried forward throughout the period].

SunWater's Response

SunWater noted Halcrow's comment that SunWater has not been able to justify \$5,000 of the forecast preventive maintenance.

In response, SunWater submitted that, in reviewing its preventive maintenance activity costs, Halcrow tried to evaluate the costs by sub-activity. This has occurred because there is information about two of the three preventive maintenance sub-activities cost, condition monitoring and servicing, which were recently reviewed and quantified by PB. SunWater noted that Halcrow took the PB costs and concluded that the residual relates to weed control.

Halcrow then looked to understand the basis of this residual and evaluate whether it was prudent and efficient. In some cases, Halcrow compared the residual to past labour costs for weed control, and used historic figures as proxy for weed control labour costs to recommend adjustments to the preventive maintenance activity costs.

SunWater stated that it is understandable that Halcrow would follow this logic given the information provided, and its frustration about the lack of data to support this residual is apparent.

SunWater submitted that its expenditure forecasts, particularly labour costs, are not intended to be viewed at the sub-activity level, and indeed examining labour costs even at the activity level should be done with some caution. This is because labour is shared between activities and schemes, and any examination of the costs will tend to be more about the assumptions about how the existing workforce will spend its time, rather than an overall assessment of efficiency.

SunWater accepted that discrepancies exist when comparing the 'residual' labour costs for weed control against historic costs for weed control. However, SunWater did not recommend examining costs at the sub-activity level, given:

- (a) historic costs are heavily dependent on how employees have recorded their time, and there scope for error in these entries; and
- (b) forecasts were developed at the activity, not sub-activity level. Attempts to recreate a labour or other cost at the sub-activity level will be fraught and misleading.

SunWater suggested that a better approach, which more closely aligns with its workforce arrangements, is to examine the labour costs for each WSS at the scheme level, and assess whether the total labour dedicated to that scheme is efficient for a given level of workload.

SunWater did not agree with recommendations made in relation to preventive maintenance costs which are made on the basis of examining labour costs at the sub-activity level.

Conclusion

In Volume 1, the Authority accepted the basis of Halcrow's adjustments to condition monitoring and services. Further, the Authority noted that most of its consultants considered that there is scope for SunWater to achieve further efficiencies once the balance of preventive and corrective maintenance is optimised. The Authority considered that this potential for efficiency could be addressed via the broad efficiency measures imposed on SunWater schemes (noted further below).

In Volume 1, the Authority also recommended that SunWater implement PB's earlier recommendations that:

- (a) SunWater's maintenance plans and work instructions; and associated labour inputs and unit costs should be audited, including a review of sub-contracted maintenance activities;
- (b) maintenance practices and costs need to be examined to identify the optimum mix of preventive and corrective maintenance activities for each scheme; and
- (c) a Reliability Centred Maintenance (RCM) approach to formulating maintenance activity requirements should be adopted.

For this scheme, the Authority has therefore adjusted SunWater's estimates in line with Halcrow's findings.

Notwithstanding SunWater's response, the Authority considers that the approach adopted by Halcrow is reasonable as efficiency at the activity level can only be determined by assessing efficiency at the sub-activity level. The Authority recognises that efficiencies can be gained by sharing labour between activities and schemes. However, an estimate of the costs of conducting an activity necessarily requires an assessment of the costs of the component sub-activities.

The Authority accepts Halcrow's recommendation to remove \$5,000 of unjustified preventive maintenance expenditure.

Item 3: Corrective Maintenance

Stakeholder Submissions

SunWater

SunWater submitted that even with sound preventive maintenance practices, unexpected failures can still occur or other incidents can arise that require reactive corrective maintenance.

SunWater identifies two types of corrective maintenance activities:

- (a) emergency breakdown maintenance – has to be carried out immediately to restore normal operation or supply to customers or to meet a regulatory obligation (e.g. rectify a safety hazard); and
- (b) non-emergency maintenance – does not have to be carried out immediately to restore normal operations, but needs to be scheduled in advance of the planned maintenance cycle.

SunWater has forecast corrective maintenance based on past experience. This provision includes a portion of labour costs in the scheme for such events, as well as additional materials and plant hire.

SunWater's corrective maintenance forecast does not include any costs of damage arising from events covered by insurance.

SunWater's proposed corrective maintenance costs are set out in Table 5.7 above.

Other Stakeholders

No other stakeholders have commented on this item.

Authority's Analysis

Consultant's Review

Halcrow noted that:

- (a) a lack of documentation made it difficult to review SunWater's approach, although the use of historical expenditure for forecasting purposes is commonly adopted by water utilities; and
- (b) an increase in preventive maintenance should reduce corrective maintenance, as asset reliability increases. An optimal mix would reflect the most economical combination of these. SunWater has signalled its intention to move to a reliability centred maintenance approach which can assist in providing the optimal mix, and its forecast expenditure do not reflect this approach. Consequently, there is scope for savings, although the extent of these savings is currently unclear,

A breakdown of historical and forecast corrective maintenance expenditure is provided in Table 5.12 below. Halcrow noted a small increase in expenditure over the price path, driven by increases in labour, materials and contractors.

Table 5.12: Corrective Maintenance Expenditure by Type (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Labour	47	66	62	41	44	45	46	46	46	46
Materials	27	42	73	13	27	27	28	28	29	29
Contractors	36	17	29	76	23	23	23	24	24	24
Other	0	19	8	0	2	2	2	2	2	2
Total Direct Costs	111	144	172	130	96	97	99	99	100	101
Indirects	103	84	89	37	42	42	49	52	49	46
Overheads	60	78	73	49	46	46	47	48	48	47
Total Operating Costs	274	305	333	215	184	186	195	200	198	194
Annual change (%)		11%	9%	-35%	-15%	1%	5%	2%	-1%	-2%

Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data. This was cited in Halcrow (2011). Source: Halcrow 2011.

As noted previously, SunWater's forecast expenditure is based on an average of the past four years (including 2011) excluding outliers. Halcrow noted that SunWater's approach of using historical expenditure is commonly adopted by water utilities.

However, Halcrow noted that:

- (a) increases in preventive maintenance should ultimately result in a reduction in corrective maintenance as asset reliability increases. While the effect will not be immediate, some

reduction in corrective maintenance activities should be evident towards the end of the price path. Halcrow noted this was not readily apparent in SunWater's forecasts; and

- (b) SunWater's total mix of expenditure on maintenance indicated a 50:50 share between preventive and corrective maintenance and SunWater has not yet reviewed the optimal mix although it intends to move to a reliability centred maintenance approach. Halcrow noted that SunWater's forecasts do not reflect this approach. Halcrow noted that, in its experience, for the type of assets in the Nogo-Mackenzie scheme the optimal mix is more likely to be around 80:20 (preventive:corrective). Consequently, although difficult to quantify, there is likely to be scope for SunWater to optimise its proposed maintenance program and an overall reduction in costs would be expected as a result.

Halcrow noted that corrective maintenance has not been optimised to take account of the changes to preventive maintenance.

SunWater's Response

SunWater noted that Halcrow stated corrective maintenance has not been optimised to take account of the changes to preventive maintenance.

In response, SunWater submitted that the PB review focussed on costing the preventive maintenance program as it exists. The PB review did not result in major changes to the historic preventive maintenance program.

Where the PB review resulted in changes to preventive maintenance costs from the past, this was due to more accurate and updated costing, rather than a change to the preventive maintenance program itself.

In some cases, additional condition monitoring is carried out (e.g. on storages after floods / pumping equipment if minor faults occur during the peak season). In some cases, an additional allowance was included as this condition monitoring was not in the scope of the work instructions reviewed by PB.

SunWater is progressively introducing condition-based maintenance rather than the previous time-based maintenance approach. The RCM process has started but will take some time to implement due to the number of assets involved. It would not be prudent to reduce the corrective maintenance costs at this time.

Any reductions to corrective maintenance as a result of this shift will also take some time to materialise, and any savings will be difficult to predict.

Conclusion

As noted above, in Volume 1, the Authority recommended an optimal mix of preventive and corrective maintenance should be pursued by SunWater. Further, for corrective maintenance, that SunWater formally document its processes for the development of correct maintenance expenditure forecasts.

In the absence of any measure of the impact of the optimisation process, the Authority does not propose to apply any specific adjustments to this measure but intends to take this into account when considering the application of a general efficiency target.

Item 4: Electricity

Stakeholder Submissions

SunWater

SunWater (2011) submitted that the electricity costs for the Nogoa-Mackenzie WSS mostly relate to the operation of Fairbairn Dam, the weirs and some control structures.

SunWater initially proposed that electricity costs increase in line with inflation with prices adjusted annually (cost pass through) to reflect the actual change in electricity costs (2011h).

SunWater subsequently proposed to escalate electricity prices by 10.5% per annum over the regulatory period reflecting the average in the Benchmark Retail Cost Index (BRCI) between 2007-08 and 2011-12, together with further adjustments in 2012-13 and 2015-16 to reflect expected increases from the introduction of the carbon tax and carbon trading scheme (2011ak).

SunWater's proposed electricity costs are set out in Table 5.7.

Other Stakeholders

During Round 2 Consultation, stakeholders stated that the bulk electricity cost in the NSP is likely related to running the water treatment plant.

Authority Analysis

Consultant's Review

In relation to SunWater's approach to forecasting electricity costs, Halcrow noted that:

- (a) for bulk water supply schemes without off-line storages (such as Nogoa-Mackenzie), SunWater has based its forecast on actual expenditure in 2009-10, inflated by 13.29% to account for the increase in franchise tariffs between 2009-10 to 2010-11. This method assumes that electricity usage will remain in line with that of 2009-10. Electricity use in these schemes is typically stable year on year, and not material when compared to other elements of operating expenditure;
- (b) SunWater claimed it periodically reviews whether to move from franchise tariffs to the contestable market, and has concluded it is not feasible to do so. While Halcrow accepted that this is likely to be the case, these periodic assessments do not appear to be documented;
- (c) SunWater has not historically sought to optimise pumping regimes, which indicates that there may be scope to reduce electricity costs in the future. This is likely to have an impact on distribution schemes (such as Emerald), which typically incur greater expenditure on electricity than the bulk supply schemes.

Halcrow noted that SunWater has recently sought advice on optimising its pumping regime. Further, an energy management program plan notes 107 opportunities for energy savings covering individual schemes and organisational wide initiatives. SunWater's Board has set a target to improve energy efficiency by one percent per annum for the next five years. These savings are not included in the NSPs.

Halcrow noted that proposed electricity expenditure in the Nogoa-Mackenzie scheme is not material, accounting for less than one per cent of operating expenditure. While the scheme is a gravity system, electricity is used for operation on inlet towers, headworks and fishways and

usage is generally stable from year to year. Electricity is also used in the operation of water and wastewater systems servicing the recreational area at Fairbairn Dam.

As noted above, SunWater's 2010-11 budget (\$11,658) is based on actual costs in 2009-10 inflated by 13.29% to account for the increase in franchise tariffs.

Halcrow noted that if usage is stable an alternative would have been to calculate the forecast using average expenditure over the period since 2006-07, although this may not take into account rising tariffs. Halcrow noted that the impact is not material and the method adopted for forecasting electricity costs is therefore considered to be appropriate.

Conclusion

In Volume 1, the Authority recommended that SunWater review the cost differential between franchise and contestable electricity contracts on an annual basis. Further, that SunWater report back to stakeholders on the success (or otherwise) of its energy savings measures, and quantify the savings that have been achieved.

As noted in Volume 1, the Authority proposes electricity be escalated at 7.41% per annum, based on expected growth in the four key components of electricity prices – network costs, energy costs, retail operating costs and retail margin.

At this stage, the Authority does not accept an escalation rate that makes an explicit allowance for carbon price impacts prior to them becoming enacted legislation.

The Authority has adjusted proposed electricity costs as set out in Table 5.14

Item 5: Cost Escalation

As noted in Volume 1, the Authority's consultants were required to examine the appropriateness of SunWater's proposed cost escalation methods (electricity is dealt with above).

Direct Labour

The consultants generally agreed that SunWater's labour escalation forecast using the general inflation rate (2.5%) underestimated the likely actual movement in the cost of labour.

Evidence cited included the growth in both the Labour Price Index for the Electricity, Gas, Water and Waste Services Industry and the Labour Price Index for Queensland, which have averaged around 4% per annum in recent years, and recent forecasts by Deloitte suggesting an average increase in the labour costs facing Queensland's utilities sector of 4.3% per annum between 2011-12 and 2017-18.

The Authority recommends that labour costs be escalated at 4% per annum.

Direct Materials and Contractors

Most consultants agreed that SunWater's proposed escalation factor of 4% per annum for this component of cost was appropriate. Evidence in support included the historical analysis of Australian Bureau of Statistics (ABS) construction cost data and forecasts of industry trends. However, both Halcrow and GHD considered that SunWater had not provided sufficient rationale for its proposed escalation factor of 4% per annum for direct materials and contractor services, and that these costs should be escalated at the general rate of inflation.

The Authority recommends that direct materials and contractor costs be escalated at 4% per annum.

Other Costs

The Authority accepts SunWater's proposal to escalate other direct costs and all non-direct costs by the general inflation rate as these costs are primarily administrative and management functions.

Conclusion

A comparison of SunWater's and the Authority's direct operating costs for the Nogo-Mackenzie WSS is set out in Table 5.13.

The Authority's proposed costs include all specific adjustments and the Authority's proposed cost escalations as noted above. As noted in Volume 1, the Authority has applied a minimum 2.43% saving to direct operating costs (excluding electricity) in 2012-13. A further 0.75% saving arising from labour productivity is also applied, compounding annually.

Table 5.13: Direct Operating Costs (Real \$'000)

	<i>SunWater</i>					<i>Authority</i>				
	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Operation	827	828	829	832	832	800	803	805	807	808
Electricity	13	15	15	17	18	12	12	13	13	14
Preventive Maintenance	99	99	100	100	100	96	97	97	98	98
Corrective Maintenance	99	99	100	101	101	95	96	97	97	97
Direct Operating Costs	1,038	1,042	1,044	1,049	1,050	1,004	1,008	1,011	1,015	1,017

Note: Renewals direct costs are discussed in the previous chapter. Non-direct costs include the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offsets (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011a) and QCA (2011).

5.5 Cost Allocation According to WAE Priority

It is necessary to establish a methodology to allocate operating costs to the differing priority groups of WAE.

Previous Review

For the 2006-11 price paths, all costs were apportioned between medium and high priority customers according to WPCFs in both bulk and distribution systems.

Stakeholder Submissions

SunWater

SunWater (2011j) has proposed to assign operating costs to users on the basis of their current WAE, except for non-direct costs allocated to renewals (on the basis of DLC) which are to be allocated to priority groups using HUFs.

Other Stakeholders

The Central Highlands Cotton Growers submitted support for the principle of user-pays for the correct apportionment of costs.

Authority's Analysis

In Volume 1, the Authority has summarised the views of its consultants and has recommended that, in relation to bulk schemes:

- (a) variable costs be allocated to medium and high priority WAE on the basis of water use;
- (b) fixed preventive and corrective maintenance costs be allocated to medium and high priority WAE using HUFs; and
- (c) for fixed operations costs 50% be allocated using HUFs and 50% using current nominal WAEs.

The Authority recommends that within bulk service contracts, insurance premiums are allocated between medium and high priority customers on the basis of HUFs.

The effect for the Nogo-Mackenzie WSS is detailed in the following chapter (as it takes into account other factors relevant to establishing total costs).

5.6 Summary of Operating Costs

SunWater's proposed operating costs by activity and type are set out in Table 5.14. The Authority's recommended operating costs are set out in Table 5.15.

Table 5.14: SunWater's Proposed Operating Costs (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Operations					
Labour	487	487	487	487	487
Materials	40	40	41	41	41
Contractors	67	68	69	70	70
Other	234	234	233	234	234
Non-Direct	1,015	1,058	1,028	984	967
Preventive Maintenance					
Labour	78	78	78	78	78
Materials	9	9	10	10	10
Contractors	7	7	7	7	7
Other	5	5	5	5	5
Non-Direct	162	168	164	156	154
Corrective Maintenance					
Labour	46	46	46	46	46
Materials	28	28	29	29	29
Contractors	23	24	24	24	24
Other	2	2	2	2	2
Non-Direct	96	100	97	93	92
Electricity	13	15	15	17	18
Total Operating Costs	2,311	2,369	2,334	2,283	2,263

Note: Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011a).

Table 5.15: The Authority's Recommended Operating Costs (Real \$'000)

	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Operations					
Labour	471	475	478	481	484
Materials	38	39	39	39	39
Contractors	65	65	66	66	66
Other	226	224	222	221	219
Non-direct	989	1,015	970	914	883
Preventive Maintenance					
Labour	76	76	77	77	78
Materials	9	9	9	9	9
Contractors	6	7	7	7	7
Other	5	5	5	5	5
Non-direct	157	161	154	145	140
Corrective Maintenance					
Labour	44	44	45	45	45
Materials	27	27	27	27	27
Contractors	22	23	23	23	23
Other	2	2	2	2	2
Non-direct	94	96	92	87	84
Electricity	12	12	13	13	14
Total Operating Costs	2,243	2,280	2,228	2,161	2,124

Source: QCA (2011).

6. DRAFT PRICES

6.1 Background

Ministerial Direction

The Ministerial Direction requires the Authority to recommend SunWater's irrigation prices for water supply delivered from 22 SunWater bulk water schemes and eight distribution systems and, for relevant schemes, for drainage, drainage diversion and water harvesting.

Prices are to apply from 1 July 2012 to 30 June 2017.

Recommended prices and tariff structures are to provide a revenue stream that allows SunWater to recover:

- (a) prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity; and
- (b) efficient operational, maintenance and administrative costs to ensure the continuing delivery of water services.

In considering the tariff structures, the Authority is to have regard to the fixed and variable nature of the underlying costs. The Authority is to adopt tariff groups as proposed in SunWater's network service plans and not to investigate additional nodal pricing arrangements.

The Ministerial Direction also requires that:

- (a) where current prices are above the level required to recover prudent and efficient costs, current prices are to be maintained in real terms;
- (b) where cost-reflective prices are above current prices, the Authority must consider recommending price paths to moderate price impacts on irrigators, whilst having regard to SunWater's commercial interests; and
- (c) for certain schemes or segments of schemes [hardship schemes], prices should increase in real terms at a pace consistent with 2006-11 price paths, until such time as the scheme reaches the level required to recover prudent and efficient costs.

Price paths may extend beyond 2012-17, provided the Authority gives its reasons. The Authority must also give its reasons if it does not recommend a price path, where real price increases are recommended by the Authority.

Previous Review

In the 2006-11 price paths, real price increases over the five years were capped at \$10/ML for relevant schemes. The cap applied to the sum of Part A and Part B real prices. In each year of the price path, the prices were indexed by the consumer price index (CPI).

In 2011-12, prices in this scheme were increased by CPI.

6.2 Approach to Calculating Prices

In order to calculate SunWater's irrigation prices in accordance with the Direction, the Authority has:

- (a) identified the total prudent and efficient costs of the scheme;

- (b) identified the fixed and variable components of total costs;
- (c) allocated the fixed and variable costs to each priority group;
- (d) calculated cost-reflective irrigation prices;
- (e) compared the cost-reflective irrigation prices with current irrigation prices; and
- (f) implemented the Government's pricing policies in recommended irrigation prices.

6.3 Total Costs

The Authority's estimate of prudent and efficient total costs for the Nogoa-Mackenzie WSS for the 2012-17 regulatory period is outlined in Table 6.1. Total costs since 2006-07 are also provided. Total costs reflect the costs for the service contract (all sectors) and do not include any adjustments for the Queensland Government's pricing policies.

Table 6.1: Total Costs for the Nogoa-Mackenzie WSS (Real \$'000/ML)

	<i>Actual Costs</i>						<i>Future Costs</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
SunWater's Submitted Costs	2,287	1,921	2,937	3,369	3,799	2,685	2,801	2,858	2,815	2,759	2,739
Renewals Annuity	241	488	559	597	556	547	544	543	535	530	530
Operating Costs	2,066	1,547	2,568	2,932	3,374	2,192	2,311	2,369	2,334	2,283	2,263
Revenue Offsets	-21	-114	-190	-161	-131	-54	-54	-54	-54	-54	-54
Authority's Total Costs	-	-	-	-	-	-	2,614	2,652	2,591	2,526	2,481
Renewals	-	-	-	-	-	-	424	425	416	417	409
Operating Costs	-	-	-	-	-	-	2,243	2,280	2,228	2,161	2,124
Revenue Offsets	-	-	-	-	-	-	-54	-54	-54	-54	-54
Return on Working Capital	-	-	-	-	-	-	2	2	2	2	2

Note: Costs are presented for the total service contract (all sectors). Costs reflect SunWater's latest data provided to the Authority in October 2011 and may differ from the NSP. Source: Actual Costs (SunWater, 2011ap) and Total Costs (QCA, 2011).

6.4 Fixed and Variable Costs

The Ministerial Direction requires the Authority to have regard to the fixed and variable nature of SunWater's costs in recommending tariff structures for each of the irrigation schemes.

SunWater submitted that all of its operating costs are fixed in the Nogoa-Mackenzie WSS and that only electricity pumping costs vary with water use.

As noted in Volume 1, the Authority engaged Indec to determine which of SunWater's costs are most likely to vary with water use. Indec identified:

- (a) costs that would be *expected* to vary with water use. Indec expected that electricity pumping costs would generally be variable and non-direct costs would be fixed;
- (b) all other activities and expenditure types (costs) would be expected to be semi-variable, including: labour, material, contractor and other direct costs, maintenance, operations and renewals expenditures;
- (c) costs that *actually* varied with water use in 2006-11, by activity and by type:
- (i) by activity, Indec found that operations, preventive and corrective maintenance and renewals were semi-variable. Electricity was generally highly variable with water use in five distribution systems and two bulk schemes. In three distribution systems electricity pumping costs were semi-variable due to gravity feed;
 - (ii) by type, Indec found that labour, materials, contractors and other direct costs were semi-variable. Non-direct costs were fixed;
- (c) costs that *should* vary with water use under Indec's proposed optimal (prudent and efficient) management approach (outlined in Volume 1). On average across all SunWater's distribution systems, Indec considered 93% of costs would be fixed and 7% variable. However Indec proposed that scheme-specific tariff structures should be applied, to reflect the relevant scheme costs.

For Nogoia-Mackenzie WSS, Indec recommended 92% of costs should be fixed and 8% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 63% of costs in the fixed charge and 37% of costs in the volumetric charge.

In general, the Authority accepts Indec's recommended tariff structure, for the reasons outlined in Volume 1.

6.5 Allocation of Costs According to WAE Priority

Fixed Costs

The method of allocating fixed costs to priority groups is outlined in Chapter 4 - Renewals Annuity and Chapter 5 - Operating Costs. The outcome is summarised in Table 6.2.

Table 6.2: Allocation of Fixed Costs According to WAE Priority (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Net Fixed Costs	2,401	2,436	2,380	2,319	2,278
High Priority	897	910	889	868	853
Medium Priority	1,201	1,219	1,191	1,159	1,139
Distribution Losses	302	307	300	292	287

Note: Net fixed costs are net of revenue offsets and return on working capital. Source: QCA (2011).

These costs are translated into the fixed charge using the relevant WAE for each priority group.

Variable Costs

Variable costs are allocated to all users on the basis of water use. Volumetric tariffs are calculated based on SunWater's eight-year historical water usage data for all sectors. However, consistent with SunWater's assumed typical year for operating cost forecasts, the Authority has removed from the eight years of data, the three lowest water-use years for each service contract. Accordingly, to determine the volumetric charge, the Authority has assumed historical total water use for all sectors to be 83.2% of WAE.

6.6 Cost Reflective Prices

Cost-reflective prices reflect the Authority's estimates of prudent and efficient costs, recommended tariff structures, and the allocation of costs to different priority groups.

Table 6.3: Medium Priority Prices for the Nogoa-Mackenzie WSS (\$/ML)

	<i>Actual Prices</i>						<i>Cost-Reflective Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
River – Medium Priority											
Fixed (Part A)	5.12	5.28	5.52	5.72	5.88	6.08	7.16	7.34	7.52	7.71	7.90
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21

Note: Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2011).

Table 6.4: High Priority Prices for the Nogoa-Mackenzie WSS (Real \$'000/ML)

	<i>Actual Prices</i>						<i>Cost-Reflective Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
River – Medium Priority											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	24.25	24.86	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21

Note: Channel (Bundled) prices are provided for reference only. Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2011).

6.7 Queensland Government Pricing Policies

As noted above, the Queensland Government has directed that:

- where current prices are above the level required to recover prudent and efficient costs, current prices are to be maintained in real terms;
- where cost-reflective prices are above current prices, the Authority must consider recommending price paths to moderate price impacts on irrigators, whilst having regard to SunWater's commercial interests; and

- (c) for certain schemes or segments of schemes [hardship schemes], prices should increase in real terms at a pace consistent with 2006-11 price paths, until such time as the scheme reaches the level required to recover prudent and efficient costs.

Price paths may extend beyond 2012-17, provided the Authority gives its reasons. The Authority must also give its reasons if it does not recommend a price path, where real price increases are recommended by the Authority.

Authority's Analysis

To identify the relevant price path (if any), the Authority must first identify whether current prices recover prudent and efficient costs. To do so, given changes to tariff structure, the Authority has compared current revenues with revenues that would arise under the cost-reflective tariffs, if implemented (see Volume 1).

The Authority has calculated these current revenues using the relevant 2010-11 prices, current irrigation WAE and the five-year average (irrigation only) water use during 2006-11.

For the medium priority tariff group, current revenues are above the level required to recover prudent and efficient costs (Table 6.5). Therefore, the Authority is required to recommended prices that maintain revenues in real terms for the 2012-17 regulatory period for this tariff group.

For the high priority tariff group, current revenues are below the level required to recover prudent and efficient costs. The Authority is required to consider a price path to cost recovery. In Volume 1, the Authority recommended that, after tariff restructuring, fixed charges should increase by \$2/ML per annum in real terms until cost recovery is achieved. This is consistent with the pace of increase in 2006-11 prices. Volumetric charges are to reflect variable costs from 2012-13.

Therefore, the Authority recommends that fixed charges for the high priority tariff group should increase by \$2/ML in real terms until cost reflective charges are achieved in 2014-15, and remain constant in real terms thereafter. After tariff restructuring, the revenue-neutral high priority tariff is a Part A charge of \$19.29 per WAE and a Part B charge of \$1.10 per ML of usage, and the \$2/ML increase in real terms is applied to the fixed Part A charge.

Table 6.5: Comparison of Current Prices and Cost-Reflective Prices (Real \$2012-13)

<i>Tariff and Priority Group</i>	<i>2010-11 Prices (indexed to 2012-13)</i>		<i>Irrigation WAE (ML)</i>	<i>Irrigation Water Use (ML)</i>	<i>Current Revenue</i>	<i>Revenue from Cost-Reflective Tariffs</i>	<i>Difference</i>
	<i>Fixed</i>	<i>Variable</i>					
Medium	\$6.18	\$8.10	163,375	94,761	\$1,776,875	\$1,273,576	\$503,299
High	\$15.42	\$8.10	2,801	1,625	\$56,360	\$69,706	-\$13,346

Source: SunWater (2011a), SunWater (2011a0) and QCA (2011).

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the Nogo-Mackenzie WSS for 2012-17 are outlined in Table 6.6 and Table 6.7 together with actual prices since 2006-07. In calculating the recommended prices, a 10-year average irrigation water use has been adopted (see Volume 1).

Table 6.6: Draft Medium Priority Prices for the Nogoia-Mackenzie WSS (\$/ML)

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<i>River (Unbundled)</i>											
Fixed (Part A)	5.12	5.28	5.52	5.72	5.88	6.08	10.05	10.30	10.55	10.82	11.09
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21

Source: Actual Prices (SunWater, 2011am) and Recommended Prices (QCA, 2011).

Table 6.7: Draft High Priority Prices for the Nogoia-Mackenzie WSS (\$/ML)

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<i>River (Unbundled)</i>											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	21.29	23.87	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21

Source: Actual Prices (SunWater, 2011am) and Recommended Prices (QCA, 2011).

6.9 Impact of Recommended Prices

The impact of any change in prices on the total cost of water to a particular irrigator, can only be accurately assessed by taking into account the individual irrigator's water usage and nominal WAE (see Volume 1).

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APPENDIX A: FUTURE RENEWALS LIST

Below are listed SunWater's forecast renewal expenditure items greater than \$10,000 in value, for the years 2011-12 to 2035-36 in 2010-11 dollar terms.

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>	
Bedford Weir	2011-12	12EIAXX Refurbish Bedford OWK2 Gate	39	
		Refurbish Baulks - paint & anodes	18	
		Refurbish trashracks - paint & anodes	12	
	2013-14	Study: 5yr Dam Comprehensive Inspection	10	
	2016-17	Replace Hydraulic System	276	
		Replace Ladders & Handrails	33	
		Refurbish Valve - overhaul valve, replace bolts, corrosion	12	
	2017-18	Replace Security Fence	16	
		Refurbish trashracks - paint & anodes	12	
	2018-19	Refurbish protection works (gabion wire corrosion) - rock replacement & concrete	25	
	2021-22	12EIAXX Refurbish Bedford OWK2 Gate	41	
	2023-24	Refurbish trashracks - paint & anodes	12	
	2026-27	Replace Building	258	
	2027-28	Replace Control Equipment	257	
	2028-29	Refurbish Protection Works - intervals full overhaul of protection works	123	
		Replace Air Bell, 140L Pinnacle Engineering	29	
		Replace Actuator, 4X49 Inch Hydroil	22	
	2029-30	Refurbish trashracks - paint & anodes	12	
	2031-32	12EIAXX Refurbish Bedford OWK2 Gate	40	
		Refurbish Baulks - paint & anodes	18	
		Refurbish Valve - overhaul valve, replace bolts, corrosion	12	
	2032-33	Replace Switchboard	75	
		Replace Electrical Cable	34	
	2035-36	Refurbish trashracks - paint & anodes	12	
	Bingegang Weir	2013-14	Refurbish trashracks - paint & anodes	19
			Refurbish: Rock Matress / Sausage Protection	19
Study: 5yr Dam Comprehensive Inspection			10	
2015-16		Refurbish Cntl - replace PLC etc Obsolescence	12	
2016-17		Refurbish Protection Works	12	
2019-20		Refurbish trashracks - paint & anodes	19	
2020-21		11EIAXX Refurbish Bingegang Reg Gate	36	
2022-23		Refurbish Cntl - replace PLC etc Obsolescence	12	
2025-26		Refurbish trashracks - paint & anodes	18	
		Replace Hydraulic System	56	
2029-30		Replace Trash Racks	39	
		Replace Air Bell, 140L Pinnacle Engineering	20	
		Replace Actuator, 4X49 Inch Hydroil	13	
		Refurbish Cntl - replace PLC etc Obsolescence	12	
		Replace Control Equipment	90	
2030-31		11EIAXX Refurbish Bingegang Reg Gate	35	
		Refurbish trashracks - paint & anodes	18	
2031-32	Refurbish trashracks - paint & anodes	18		
	11EIAXX - Refurbish Right bank Outlet Works	749		
Fairbairn Dam	2011-12	10EIA05 Replace damaged concrete at R3P and R4P as well as minor spalls and other damage	357	
		Refurbish Baulks - corrosion treatment, minor metalwork replacement as required	38	
		Replace valve (add gearbox) on end of RBO tunnel drain line	18	
	2012-13	Study: 5yr Dam Comprehensive Inspection (by 1 Dec 2012)	99	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2013-14	Replace Level Transmitter & Rtu	83
		Refurbish: Repair and armour lower downstream slope of emdankment	63
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	25
		14EIA-REFURBISH HOISTS	25
		INVESTIGATION CONTAMINATED LAND SITES	14
	2014-15	Refurbish gate - blast & paint, anodes, new seals, install SS bolts	126
		Refurbish Gate - blast, paint, anodes, new seals, install SS bolts	126
		Refurbish Metalwork - refurbish/replace ladders, covers & rails	82
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	50
		Replace Cen Lift Gate (Inlet)	43
		Replace Lh Lift Gate (Inlet)	43
		Replace Rh Lift Gate (Inlet)	43
		09EIA-REFURB PICNIC AREA TOILET BLOCKS	17
	2015-16	Replace Cables & Cableways	116
		Replace Switchboard-Inlet Tower	63
		Replace Switchboard-Gate House	41
		11EIAXX Inspect Spillway Bridge Bearings	17
	2016-17	11EIAXX Inspect RBT Bridge Bearings	13
		Repair fencing at Saddle Dam 1: gates, gate posts, stays etc	12
		Replace Building Civil Works	12
		Replace Instrumentation	12
		Replace Toilet Block - Boat Ramp	12
	2017-18	Refurbish: Reseal roads** - Item added for periodic maintenance after backlog	124
		Study: 20yr Dam Safety Review (by 1 Dec 2017)	124
		Study: 5yr Dam Comprehensive Inspection (by 1 Dec 2012)	100
		Refurbish Trash Racks - regalvanise/paint as required	12
	2018-19	Replace Barbeques (Electric) (4 Off)	58
	2019-20	Replace Selma Gatehouse Control Equip	115
	2020-21	09EIA-REFURB PICNIC AREA TOILET BLOCKS	17
		11EIAXX Inspect Spillway Bridge Bearings	17
	2021-22	14EIA-REFURBISH HOISTS	25
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	25
	2022-23	Replace Trashracks	151
		Replace Trash Racks	102
		Study: 5yr Dam Comprehensive Inspection (by 1 Dec 2012)	99
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	49
		10EIA-Refurbish Trashracks Gatehouse	33
		11EIAXX Inspect RBT Bridge Bearings	13
	2023-24	Replace Winch, Forrers P/L (No 1 Reg Gate)	113
		Replace Winch, Forrers P/L (No 2 Reg Gate)	113
		Replace Winch, Forrers P/L (No 1 Guard Gate)	112
		Replace Winch, Forrers P/L (No 2 Guard Gate)	112
		Replace Winch, Forrers P/L (Lh Reg Gate)	96
		Replace Winch, Forrers P/L (Rh Reg Gate)	96
		Replace BUOYS, PLASTICS FABRICATIONS	60
		Replace Winch, Forrers P/L (Lh Guard Gate)	50
		Replace Winch, Forrers P/L (Rh Guard Gate)	50
		Replace Monorail Crane 1T (Trashrack No1)	34
		Replace Monorail Crane 1T (Trashrack No2)	34
		Refurbish Trash Racks - regalvanise/paint as required	12
	2024-25	Refurbish gate - blast & paint, anodes, new seals, install SS bolts	122
		Refurbish Gate - blast, paint, anodes, new seals, install SS bolts	122

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2025-26	11EIAXX Inspect Spillway Bridge Bearings	16
	2026-27	Replace Level Transmitter & Rtu	81
		Refurbish: Emerald Depot Reseal Bitumen pavement*	25
		09EIA-REFURB PICNIC AREA TOILET BLOCKS	17
	2027-28	Study: 5yr Dam Comprehensive Inspection (by 1 Dec 2012)	99
		Refurbish Metalwork - refurbish/replace ladders, covers & rails	49
	2028-29	11EIAXX Inspect RBT Bridge Bearings	13
	2029-30	Refurbish Metalwork - refurbish/replace ladders, covers & rails	31
		14EIA-REFURBISH HOISTS	25
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	24
		Refurbish Trash Racks - regalvanise/paint as required	12
	2030-31	Refurbish Hoist - Overhaul motor & electrics & replace ropes	49
		11EIAXX Inspect Spillway Bridge Bearings	16
	2031-32	Refurbish Baulks - corrosion treatment, minor metalwork replacement as required	39
		Refurbish: 3 Gates, wheels, seals etc Last completed in 2001	26
		Replace Instrumentation	12
	2032-33	Replace Selma Gatehouse Control Equip	114
		Study: 5yr Dam Comprehensive Inspection (by 1 Dec 2012)	99
		Replace Lift Gate (River)	31
		Replace Cen Lift Gate (Weemah)	30
		Replace Lh Lift Gate (Weemah)	30
		Replace Rh Lift Gate (Weemah)	30
		09EIA-REFURB PICNIC AREA TOILET BLOCKS	17
		Replace Gate	15
	2034-35	Refurbish gate - blast & paint, anodes, new seals, install SS bolts	123
		Refurbish Gate - blast, paint, anodes, new seals, install SS bolts	123
		10EIA-Refurbish Trashracks Gatehouse	33
		11EIAXX Inspect RBT Bridge Bearings	13
	2035-36	Refurbish Contl - replace PLC due to obsolescence	49
		Refurbish: 3 Gates, wheels, seals etc Last completed in 2001	26
		11EIAXX Inspect Spillway Bridge Bearings	16
		11EIAXX Selma Gatehouse 25 yr Hoist Insp	15
		11EIAXX RBT Gate Hoist 25 yr Inspection	15
		Refurbish Trash Racks - regalvanise/paint as required	12
Fairbairn Dam Waste Water	2011-12	Replace Control Equipment	53
		Replace Control Switchboard	12
	2026-27	Replace Control Equipment	55
Fairbairn Dam Wtp	2011-12	11EIAXX Sandblast and Recoat Clarifiers	24
		11EIAXX Install Chlorine Recirc WTP	18
		11EIAXX Replace WTP Transfer Pump No.2	12
	2016-17	Replace Control Equipment	211
		Replace Actuator, Elec George Fischer	20
	2017-18	Replace Control Equipment	12
	2021-22	11EIAXX Sandblast and Recoat Clarifiers	25
	2022-23	Replace Pump, Submersible Flygt	85
		Replace Hoist, 1T Hitachi (Town Water-Inlt Twr)	25
	2024-25	Replace Pe Delivery Pipe	24
	2026-27	Replace Security Fence	12
	2029-30	Replace Control Equipment	208
		Replace Treatment Building	56
	2031-32	11EIAXX Sandblast and Recoat Clarifiers	25
		Replace Actuator, Elec George Fischer	19

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2032-33	Replace Control Equipment	12
Nogoa-Mackenzie River Distrib	2030-31	Replace Gauging Equipment	42
Selma Weir	2025-26	Major Refurbishment	49
	2028-29	Minor Refurbishment	74
	2031-32	Replace Structure	165
		Replace Security Fence	11
Tartrus Weir	2011-12	Investigate and install fall restraint system for inlet access	19
		Replace Gauging Boards	14
	2013-14	Study: 5yr Dam Comprehensive Inspection	10
	2016-17	Enhance: Following 2004 business case, remote actuation and calibrated gate at Tatus Weir	149
		Replace Pavement	65
		Refurbish Metalwork - covers, handrails etc Last completed 2001 (J.A)	12
	2026-27	Replace Gauging Boards	14
	2029-30	Refurbish Metalwork - covers, handrails etc Last completed 2001 (J.A)	12
	2030-31	Replace 1220 Sq Penstock	12