QUEENSLAND COMPETITION AUTHORITY

Draft Report

SunWater
Irrigation Price Review: 2012-17

Volume 2

Burdekin-Haughton
Water Supply Scheme

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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 Burdekin-Haughton WSS for the 2012-17 regulatory period are outlined in Table 1 together with actual prices since 1 July 2006.

The Giru Groundwater Area and Glady's Lagoon tariff groups are reviewed in the Burdekin-Haughton Distribution System report.

Table 1: Prices for the Burdekin-Haughton WSS ($/ML)

	Actual Prices						***Recommended Prices***				
	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
River											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	9.92	10.17	10.42	10.68	10.95
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.47	0.49	0.50	0.51	0.52

Source: Actual Prices (SunWater, 2011al) 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 expenditure 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 the Burdekin-Haughton 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 Report due by 30 April 2012.

1. BURDEKIN-HAUGHTON WATER SUPPLY SCHEME

1.1 Scheme Description

The Burdekin-Haughton water supply scheme (WSS) is located near the town of Clare. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the Burdekin-Haughton WSS

	Burdekin-Haughton WSS
Business Centre	Ayr
Irrigation Uses of Water	Sugarcane, mangoes, vegetables and fruit such as capsicums, eggplant, rockmelons, squash, pumpkins, watermelons and sweet corn.
Urban water supplies	Supplies to small local townships, as well as to Townsville City Council.
Industrial Water Supplies	Quarries and sugar mills.
Water Boards	A significant quantity of the water from the Burdekin Falls Dam is released from Clare Weir and is directed to the North and South Burdekin water boards to supplement groundwater supplies.

Source: Synergies Economic Consulting (2010).

The WSS has 369 customers. The medium and high priority water access entitlements (WAEs) are detailed in Table 1.2. Total WAEs for the scheme includes 185,000 ML of free WAEs held by the North and South Burdekin Water Boards.

Table 1.2: Water Access Entitlements

Customer Group	***Irrigation WAE (ML)***	***Total WAE (ML)***
Medium Priority	608,944	979,594
High Priority	0	99,998
Total	**608,944**	**1,079,592**

Source: SunWater (2011ao).

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 is detailed in Table 1.3.

Table 1.3: Bulk Water Infrastructure in the Burdekin-Haughton WSS

Storage Information	*Total Storage Capacity (ML)*	*Age(years) 2011*
Burdekin Falls Dam	1,860,000	24
Gorge Weir	9,095	58
Blue Valley Weir	3,820	49
Clare Weir	15,900	33
Val Bird Weir	615	28
Giru Weir	1,025	34

Source: Synergies Economic Consultancies (2010).

The characteristics of the bulk water assets are:

(a) Burdekin Falls Dam holds 1,860,000 ML when full. SunWater provides recreational assets at the Burdekin Falls Dam, including picnic facilities, boat ramps, amenities blocks and public safety infrastructure;

(b) Gorge weir accommodates the Gorge Weir Pump Station which supplies the Burdekin-Moranbah Pipeline. The Gorge Weir pump station and the Burdekin-Moranbah Pipeline do not supply irrigation customers, but supply SunWater's commercial customers;

(c) Blue Valley Weir is located on the Burdekin River, 11.6 km downstream of Gorge Weir;

(d) Clare Weir was extensively damaged by floods in 1979 and subsequently repaired. Drop gates were added in 1988 increasing the storage capacity by 7,300 ML to 15,900 ML. The drop gates have hydraulic actuators, but a self-propelled gantry is kept on standby in case an actuator fails. The weir incorporates a fish lock;

(e) Val Bird Weir is located on the Haughton River at, 6.5 km upstream from the town of Giru; and

(f) Giru Weir, also on the Haughton River, consists of earth and cemented rockfill between two parallel rows of sheet piling (SunWater, 2011).

Figure 1.1 shows the location of the Burdekin-Haughton WSS and key infrastructure.

Figure 1.1: Burdekin-Haughton WSS Locality Map

Source: http://derm.qld.gov.au/wrp/pdf/burdekin/burdekin_map.pdf.

1.3 Network Service Plan

The Burdekin-Haughton 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.

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.

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 Burdekin-Haughton 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 Burdekin-Haughton WSS:

(a) the possible removal of regulated electricity tariffs which could have a significant impact on the cost of electricity;

(b) the introduction of schemes relating to the reduction of greenhouse gases that may have implications for electricity prices;

(c) metering costs related to changes in regulatory standards;

(d) damage to SunWater's assets, to the extent that such damage is not recoverable under insurances;

(e) levies or charges made in relation to the regulation of irrigation prices by the Authority; and

(f) outbreak of noxious weeds.

Other Stakeholders

Stakeholders made a range of comments on volume risk:

(a) Burdekin River Irrigation Area Irrigators Committee (BRIAIC, 2010) submitted that the Burdekin-Haughton WSS has a high degree of water supply reliability. BRIAIC submitted that SunWater identify mechanisms to reduce costs at time of low water sales.

BRIAIC submitted that the form of regulation should be determined at a scheme level to allow explicit consideration of potential water use efficiency impacts and environmental issues associated with groundwater accessions in the region; and

(b) T Weir (2010) submitted that the State Government does not want SunWater to bear the risk of insufficient water usage (volume risk) so that risk is transferred to farmers by charging a fixed charge. T Weir acknowledged that he is able to temporarily trade excess water but the amount received has been less than the fixed charge. T Weir concludes therefore that SunWater is already over-charging and water prices should be decreasing.

Stakeholders generally submitted that SunWater should bear cost risk to provide an incentive to reduce costs:

(a) BRIAIC (2011a) submitted that SunWater's proposed method for sharing electricity shifts all electricity price risk to the customer.

BRIAIC submitted that SunWater's proposed method is a new practice and that SunWater's former price paths estimated electricity prices and accepted electricity price risk. The previous approach provided an efficiency driver for SunWater by forcing the detailed review of pumping systems, operational strategies and usage projections to minimise electricity price impacts;

BRIAIC submitted that by excluding this risk from SunWater, it removes the emphasis of the organisation to ensure its systems and processes are being maintained to the upmost operational efficiency;

BRIAIC submitted that if SunWater is not prepared to accept any electricity cost risk, then SunWater prices should reflect pure electricity cost recovery with no overhead/indirect methodologies being applied to electricity. This would eliminate costing risk to SunWater and provide true pricing transparency to customers; and

(b) CANEGROWERS (2011b) submitted that SunWater needs an incentive to reduce electricity costs by reducing losses, changing balancing storages, new pumps, and utilising off peak tariffs.

2.3 Authority's Analysis

General Risks

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 means for addressing them are outlined in Table 2.1 below.

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

Risk	*Nature of the Risk*	*Allocation of Risk*	*Authority's Recommended Response*
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), (d), and (f) above be dealt with via 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 this investigation. No levies or charges (e) are to be applied by the Authority as a result of this irrigation price review.

In response to submissions received on volume risk:

(a) the Authority agrees that SunWater should have incentive to reduce costs, and has identified which costs vary with water sales. The recommended price cap provides incentive for SunWater to reduce costs, as SunWater is permitted to retain the cost savings over the 2012-17 regulatory period. If these savings are ongoing, they are subsequently shared with customers over the next regulatory period;

The Authority has responded to each of the scheme specific risks raised by SunWater and has concluded that a price cap is appropriate for the Burdekin-Haughton WSS; and

(b) the Authority has concluded that SunWater is not able to manage volume risk and recommends that short term volume risk is most appropriately borne by customers. SunWater's customers have some, albeit limited, scope to manage supply risks. Users of irrigated water can manage their water supply risks by holding surplus entitlements with SunWater, sourcing alternative supplies (e.g. groundwater) and using temporary trade markets. NERA (2010a) has, however, noted that there may be limitations to a customer taking up these options and that the availability of options may vary between schemes.

Further, the standard supply contract between SunWater and its customers requires SunWater to 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 attributes supply risk to WAE holders.

In response to submissions received on incentives:

(a) the Authority concluded in Volume 1 that changes in electricity costs may be passed through to customers. The Authority has reviewed SunWater's electricity costs for prudency and efficiency. Any further adjustments would only occur if SunWater could demonstrate the prudency and efficiency of these increased costs. No overhead/indirect component is included in electricity costs. The Authority's forecast charges and any scheme specific efficiencies are addressed further below;

(b) a price cap will ensure that SunWater has incentives to reduce costs (including electricity costs), as any cost reduction may be retained by SunWater, at least until the next price review;

(c) in responding to cost savings targets recommended by the Authority (see further below), SunWater will have further incentive to identify areas of potential savings.

The nature of any particular changes to electricity usage will be dependent scheme circumstances and may include those identified by CANEGROWERS (such as reducing losses, changing balancing storages, new pumps, and utilising off peak tariffs).

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 17% and Part B variable charges at 83% of total revenues in this scheme.

Stakeholder Submissions

SunWater

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

Other Stakeholders

On the method of determining the tariff structure, Lower Burdekin Water (LBW) (2011) submitted that SunWater's proposed tariff structure [to align fixed and variable costs which the fixed and volumetric charges] would have a profound negative impact on the charges imposed on LBW in a typical year. Both Boards rarely utilise their full WAE. Due to the current size of the volumetric charge, in an average year, LBW's total SunWater charges are approximately 50% ($0.5 million) less than if WAEs were fully utilised.

LBW (2010) submitted that SunWater's preferred tariff structure would create a situation where LBW's arrangements would almost equate to a single part take-or-pay tariff across LBW's full water demand profile. This would eliminate demand risk for SunWater, but would provide no price signals to implement water use efficiency for LBW or its customer base.

LBW further submitted that SunWater's proposed tariff structure would essentially lock in charges for LBW that could be as much as 4.5 times efficient lower bound costs. In effect, prices paid by LBW would be neither cost-reflective nor efficient.

On water use and SunWater efficiency:

(a) BRIAIC (2010) submitted the high reliability of water supply means that the mix of Part A and Part B prices has a relatively small incentive on the operations of SunWater.

BRIAIC (2011b) submitted that there needs to be an incentive for SunWater and irrigators to be efficient and the current tariff structure should remain unchanged;

(b) BRIAIC (2010) submitted that the tariff structure should consider environmental issues, such a rising groundwater levels, rather than just SunWater's operations; and

(c) T Weir (2010) submitted that water use efficiency would be increased if all scheme revenues were recovered through the volumetric charge (Part B). This would increase water use efficiency.

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.

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

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).

Moreover, 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 Burdekin-Haughton WSS are identified in Table 3.1.

Table 3.1: Volume of Water Traded in Burdekin-Haughton WSS (ML)

	2002-03	***2003-04***	***2004-05***	***2005-06***	***2006-07***	***2007-08***	***2008-09***	***2009-10***
Temporary	103,858	65,940	81,194	22,687	27,665	17,926	8,680	24,960

Source: SunWater Annual Report (2003-2010) and Queensland Valuation Services.

Annual volumes of temporary trades may not always be material when viewed against the total WAEs in the scheme. However, the option to trade, even if not materially utilised, contributes towards efficient allocation of water for this scheme.

In response to LBW's submission regarding the financial impact of a change in the tariff structure, the Authority recognises its proposed tariff structure will affect parties that rarely use their full WAEs. This is an outcome consistent with current legislative and contractual arrangements (and the Ministerial Direction).

In response to LBW's and other stakeholders concerns regarding efficiency, it is noted that efficiency is promoted 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.

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 WAEs, 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.

For the Burdekin-Haughton 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, 2006a).

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.

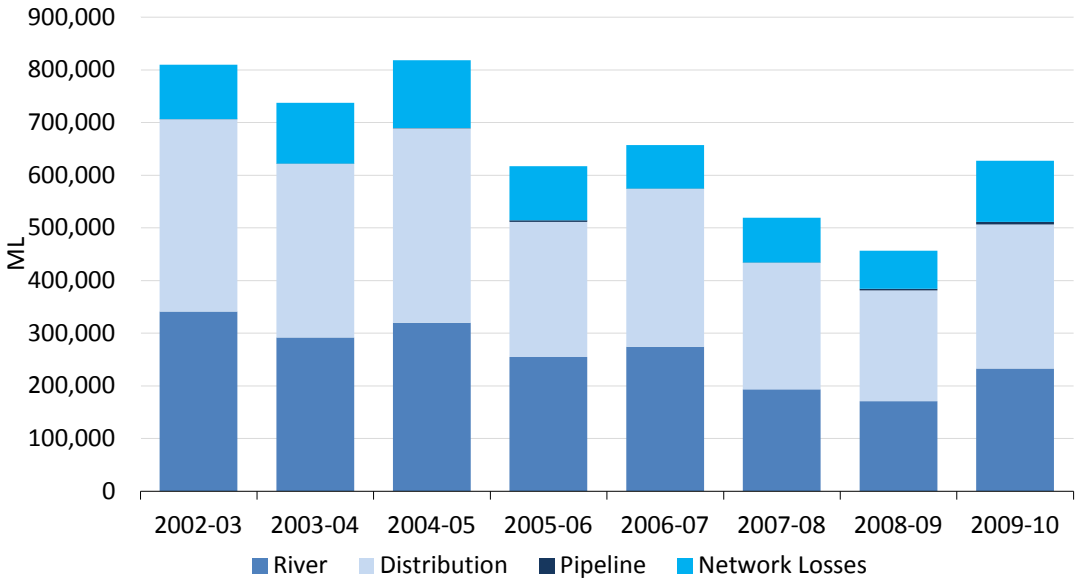
Based on the last eight years observations, SunWater has forecast use as follows:

(a) at a whole scheme level (all sectors) – an average of 59% of total WAEs (including SunWater's distribution loss WAEs and its other WAEs); and

(b) for the irrigation sector only – an average of 85% of irrigation WAEs, (including forecast usage of 85% within the distribution system. 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 Burdekin-Haughton WSS submitted by SunWater (2011). The river category includes all irrigation and other usage sourced from the river. Pipeline volumes refer to sales to industrial customers.

Figure 3.1: Water Usage for the Burdekin-Haughton WSS



Source: SunWater (2011).

Other Stakeholders

No other stakeholders have submitted on this matter.

Authority's Analysis

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

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 as proposed in SunWater's NSPs.

The previous SunWater Irrigation Price Paths Final Report nominated three tariff groups for the Burdekin-Haughton WSS:

(a) Burdekin River;

(b) Giru Groundwater Area; and

(c) Glady's Lagoon – other than from natural yield.

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

However, the Giru Groundwater Area and Glady's Lagoon tariff groups, rely on distribution system assets for supply, and are reviewed in the Burdekin-Haughton Distribution System report (as has historically been the case).

3.4 Free Water Allocations

Introduction

Prior to the construction of the Burdekin Falls Dam, the North Burdekin Water Board (NBWB) and the South Burdekin Water Board (SBWB) (the Boards) were granted an authority to divert water from the Burdekin River under two Orders in Council (OIC), dated 13 May 1965 and 31 March 1966 respectively. The OICs allowed SBWB to extract up to 61,000 acre feet per annum (approximately 75,000 ML) and NBWB to extract 40,200 acre feet per annum [approximately 50,000 ML].

Following the construction of the Burdekin Falls Dam, an agreement was made between the then Water Resources Commission and the Boards in 1991 regarding supply and charging arrangements for water supplied to the Boards from Burdekin Falls Dam. This agreement was documented in correspondence from the Commission of Water Resources (WRC) to the Boards.

In correspondence dated 5 November 1991 the total WAE for the boards was established to be 210,000 ML. Of this amount, 15,000 ML must be paid for irrespective of whether it is used, 185,000 ML was a free allowance, and the last 10,000 ML was to be charged at the applicable river rate.

The OICs were subsequently amended in 1992 to give legal effect to this agreement.

Previous Review

During the previous review, Government policy stated in the Tier 1 Report (SunWater, 2006a) that free water allocations represented pre-existing entitlements, and were a condition precedent to the establishment of the schemes. Therefore, costs were not be allocated to these WAEs for the period of the price path. Some 185,000 MLs of free water was identified in the Burdekin-Haughton WSS.

Stakeholder Submissions

SunWater

SunWater (2011d) submitted that free water WAEs should be considered on the basis of their original intent. SunWater concluded that the boards received free water allocations as a result of a compensation arrangement, as distinct from a commercially-negotiated water supply arrangement. Accordingly, these free water allocations should be considered as a cost to the

respective schemes, and no costs should be allocated to these free water allocations when setting prices to other users.

Other Stakeholders

LBW (2010, 2011) supported the continuation of free water, submitting that:

(a) the 185,000 ML is not chargeable because it recognises that the boards were established prior to the construction of the Burdekin Falls Dam. This volume of water was already available to the boards and the entitlements are partly required to achieve the natural resource management objectives outlined in the OIC;

(b) free allocations have been consistently recognised by several deliberate, considered, consistent and successive policy and regulatory decisions through Section 1089 of the *Water Act 2000*, SunWater's Interim Resource Operations Licence (IROL), Section 52 of the 2007 Water Resource Plan (WRP) and the Burdekin Basin ROP. In establishing the previous price path, Government determined that no costs would be assigned to free allocations held by LBW. This clearly reflected legacy obligations to provide this water free of charge. However, it was noted that this policy condition should be reviewed ahead of the next irrigation price review. The Authority should recognise the historical context for 185,000 ML of free allocations; and

(c) the loss of the free water allocation would create significant financial risks to LBW and its customers. Moreover, the entitlements are required to achieve the boards' natural resource management objectives in relation to the groundwater aquifer. The loss of free water allocations would be entirely inconsistent with State objectives for the management of the aquifer.

CANEGROWERS (2011b) submitted that other customers should not pay for free, reserve and SunWater WAE.

BRIAIC (2010) submitted that providing free WAEs is a Government decision. The Government and SunWater should investigate whether a Community Service Obligation (CSO) should cover the costs of providing free water, rather than recovering these costs from other customers. To assist this decision, an outline of the costs to provide free water should be disclosed.

Authority's Analysis

In Volume 1, the Authority recommends that pre-existing rights to free water should be maintained where they continue as part of an existing agreement or as a part of current legislation or Government policy. Neither SunWater nor customers with pre-existing right to free water should bear these costs.

The Authority has reviewed the current basis of the OICs and is of the view that:

(a) Section 52 of the Burdekin Basin WRP required that the chief executive replace the 1992 OIC within 30 business days of the commencement of the WRP. The replacement took place and accordingly, the OICs in their entirety ceased to operate from the time of their replacement;

(b) the instruments that replaced the OICs did not address free WAEs or the charging regime for water supplied to the LBW. Where the new instruments are silent on a matter, it cannot be concluded that the OICs continue to apply to this matter; but

(c) there are transitional arrangements in the former *Water Resources Act 1989* and *Water Act 2000* (as passed) that may have preserved any agreement regarding the supply of free water agreed in 1991. Consequently, notwithstanding the replacement of the OICs, the free water arrangements detailed in the 1991 agreement may still be preserved.

The Authority has concluded that the terms of the 1991 agreement relating to the free allocation are preserved by the transitional arrangements of the *Water Act 2000*. This conclusion is based on key assumptions that the Boards accepted the terms proposed by the WRC. This appears likely as the terms of the OICs appear to reflect those detailed in the letter.

Further, the letter and the OICs contemplate a review of the agreement by no later than 1998. It is unknown whether this occurred. It is assumed that no amendments to the 1991 agreement were made.

To remove any doubts, it is recommended that a new agreement be formalised as parts of the 1991 agreement are arguably now uncertain. For example, the minimum charge rate specified in the 1991 agreement refers to the 'river rate', which no longer exists.

On this basis, the Authority recommends that the Boards not be charged for 185,000 ML of their WAEs, consistent with the terms of the 1991 agreement.

In response to LBW, the Authority does not agree that the OICs are the instruments that provide for free WAEs. However, the Authority reaches the same conclusion as LBW. That is, free WAEs should continue on the basis of the 1991 agreement.

In response to CANEGROWERS, the Authority has recommended prices that recover the cost of free allocations from the remaining (other) SunWater customers within the Burdekin-Haughton WSS. This is necessary to ensure SunWater's revenue adequacy, as required by the Ministerial Direction.

In response to BRIAIC, the Authority notes that the introduction of a CSO is outside the scope of the review. This is a matter for Government.

3.5 Allocation of Distribution System Costs to Bulk Water Services

Submissions

SunWater

SunWater (2011) submitted that the Tom Fenwick Pump Station and Haughton Main Channel perform a bulk water function and some costs associated with these assets should be assigned to the bulk water customers.

Based on hydrological modelling used for the ROP, SunWater submitted that 4% of water diverted through the Tom Fenwick Pump Station and Haughton Main Channel is required to service bulk water customers, namely delivery into the Haughton River when required. The remaining 96% of the water is supplied to the distribution system. On this basis, SunWater submitted that 4% of the forecast operating costs for the Tom Fenwick Pump Station and Haughton Main Channel should be assigned to bulk water customers. In the NSP, SunWater estimated this cost transfer to be $167,000 for 2011-12, including operating costs, electricity and renewals annuity. However, SunWater did not actually adjust the forecast operating costs for this transfer in its NSP.

Other Stakeholders

BRIAIC (2011b) submitted that bulk water users that use the distribution system for taking water should be treated as distribution customers and pay the full distribution fixed charge. It is unfair and inequitable that part of the distribution system (4% of the Tom Fenwick pump station and the Haughton main channel) can be segregated out and allocated as bulk assets. Irrigators do not have the same option of only contributing to the section of channel that they use, but all irrigators are in the entire system.

CANEGROWERS (2011a) submitted that Giru groundwater users [are distribution customers] and pay a distribution charge based on the proportion of water received through the channel system. For the water they received from the channel system, the price used was the same channel charge as for other users. This appeared fair and reasonable, and it would be inconsistent for them to only pay for the proportion of the distribution infrastructure they use.

Authority's Analysis

For the 2006-11 review, the Tier 1 Working Paper No 14 indicated that, in relevant schemes, a proportion of relevant pump stations and main channels costs would be allocated to irrigators in supplemented streams. However, the Tier 1 Report for the 2006-11 price path did not provide any details of the actual proportion of any distribution costs attributed to bulk users in the Burdekin-Haughton WSS.

In the Burdekin-Haughton WSS, the Tom Fenwick pump station and Haughton Main Channel are used to supplement flows in the Haughton River in the northern end of the scheme. Under the Burdekin ROP, the Val Bird Weir and Giru Weir on the Haughton River must be maintained at minimum operating levels, and this can be achieved when necessary by supplementary flows from the Haughton Main Channel.

In responding to further requests for information, SunWater advised that the Integrated Quantity and Quality Model (IQQM) was used to model the total channel flow volumes at the channel intake and total channel outflows to supplemented watercourses in the simulation period of more than 100 years.

SunWater's proposed 4% cost transfer effectively means around a 1% reduction in costs attributable to distribution system users and about 6% more costs to the Burdekin-Haughton WSS bulk customers (based on SunWater's forecast costs).

Given the requirements of the ROP, the Haughton Main Channel partially serves a bulk water function, and SunWater has designated the Giru Groundwater Area customers as bulk water customers.

However, the Authority notes that Giru Groundwater Area customers currently pay a bulk plus a distribution system charge, adjusted for natural flows and recharge. A more cost-reflective approach would involve separating the Val Bird and Giru Weirs from the current bulk costs, and the Giru Groundwater Area water charge should incorporate a bulk charge plus a share of the Haughton Main Channel (as suggested by SunWater) as well as the specific costs associated with Val Bird Weir and Giru Weir.

In the absence of separate cost information for the two Haughton River weirs, the preferred cost allocation option is not possible. In recognising that the Giru Groundwater Area is supplied through distribution system infrastructure, the Authority therefore recommends that the Giru Groundwater Area continue to be treated as a distribution system customer group. It is therefore inappropriate to allocate a further 4% of costs for the Haughton Main Channel to bulk customers, as the Giru Groundwater customers already meet a share of distribution costs.

This approach is in line with SunWater's approach in the Mareeba-Dimbulah WSS where a similar scenario exists with supply to Walsh River and supplemented streams. In that scheme, SunWater has designated the Walsh River and supplemented streams tariff groups as distribution system customers.

3.6 Allocation of Costs to Townsville Thuringowa Water Supply Joint Board

Townsville Thuringowa Water Supply Joint Board (TTWSJB) (formerly NQ Water) holds 10,000 ML of high priority WAE, which is accessed when required through the Burdekin-Haughton distribution system.

SunWater holds 110,000 ML of medium priority WAE on behalf of the TTWSJB.

Submissions

During Round 2 consultation, it was suggested the TTWSJB has access to the distribution system but currently pay a bulk charge only. Customers submitted that costs should be apportioned to TTWSJB in setting distribution prices.

BRIAIC (2011b) submitted that 110,000 ML WAE held in reserve by SunWater for TTWSJB should be allocated costs.

CANEGROWERS (2011b) submitted that NQ Water [TTWSJB] is paying a bulk charge, not a distribution system charge. CANEGROWERS (2011c) further submitted that NQ Water [TTWSJB] is a distribution system customers and must pay a distribution system charge.

SunWater's Response

In responding to stakeholder comments, SunWater confirmed that:

(a) TTWSJB are apportioned bulk and distribution costs associated with the 10,000 ML WAE they hold;

(b) SunWater holds an additional 110,000 ML bulk WAE on behalf of TTWSJB. The NSP allocates costs to this WAE. TTWSJB have not ever sought to access this 110,000 ML WAE; and

(c) TTWSJB are not allocated distribution system capacity above 10,000 ML. If TTWSJB ever needs to access the 110,000 ML WAE they would either need to provide their own distribution capacity (e.g. pipeline), or reach some other agreement with SunWater.

Authority's Analysis

In response to CANEGROWERS, the Authority considers that the current arrangements should continue for the 10,000 ML WAE held by TTWSJB. Bulk and distribution costs should be apportioned to this high priority WAE.

In response to BRIAIC, the Authority considers that the 110,000 ML reserve WAE should be allocated bulk costs only. The Authority considers that no distribution system capacity is installed for the purpose of delivering all or part of the 110,000 ML WAE. Therefore, no distribution costs should be apportioned to it. However, bulk costs should be apportioned to this WAE, currently effectively held by SunWater on behalf of the TTWSJB.

In the event that a portion of this reserve volume is taken up by TTWSJB, a share of channel costs should be allocated to reflect this.

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) 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 prudency 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 available for the review, nor desirable given the potential costs, to assess the prudency 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 renewal 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 prudency 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 Burdekin-Haughton WSS (including the Burdekin-Haughton Distribution System) was negative $1,185,000.

The Authority has accepted SunWater's unbundled opening ARR balance for the Burdekin-Haughton WSS (excluding the distribution system) of negative $302,000.

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 prudency 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 (2011) submitted actual renewals expenditure for the Burdekin-Haughton 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 (Actual) Renewals Expenditure 2006-11 (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*
Past (Actual) Renewals Expenditure	271	367	390	512	194

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

Other Stakeholders

CANEGROWERS (2011b) submitted that there are inconsistencies in SunWater's reporting of the renewals expenditure and revenue between the 2008-09 and 2009-10 in annual reports. The spend for 2006-07 increased from $0.7 to $1.2 million, the amount collected for 2007-08 decreased from $2.3 to $1.8 million and the amount spent in 2008-09 increased from $1.3 to $2.8 million.

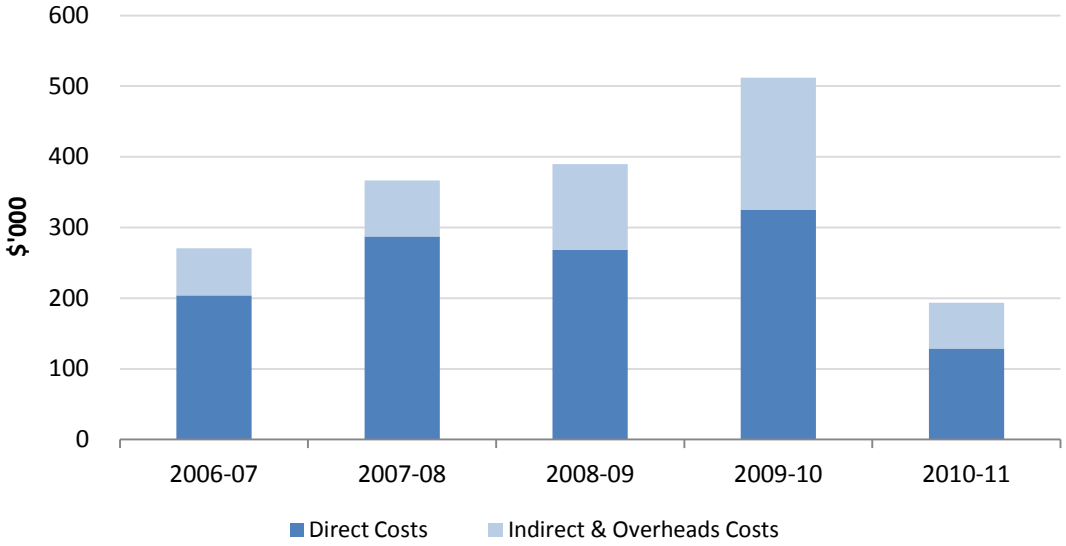
BRIAIC (2011a) also identified inconsistencies in annuity balances. It noted that the opening balance in the NSP of $3.12 million did not align with the 2008-09 or 2009-10 SunWater Annual Reports. BRIAIC suggested that if the NSP opening value is to be believed, SunWater has spent more on renewals than it had planned.

Authority's Analysis

Total Renewals Expenditure

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

Figure 4.1: Past (Actual) Renewals Expenditure 2006-11 (Real $'000)



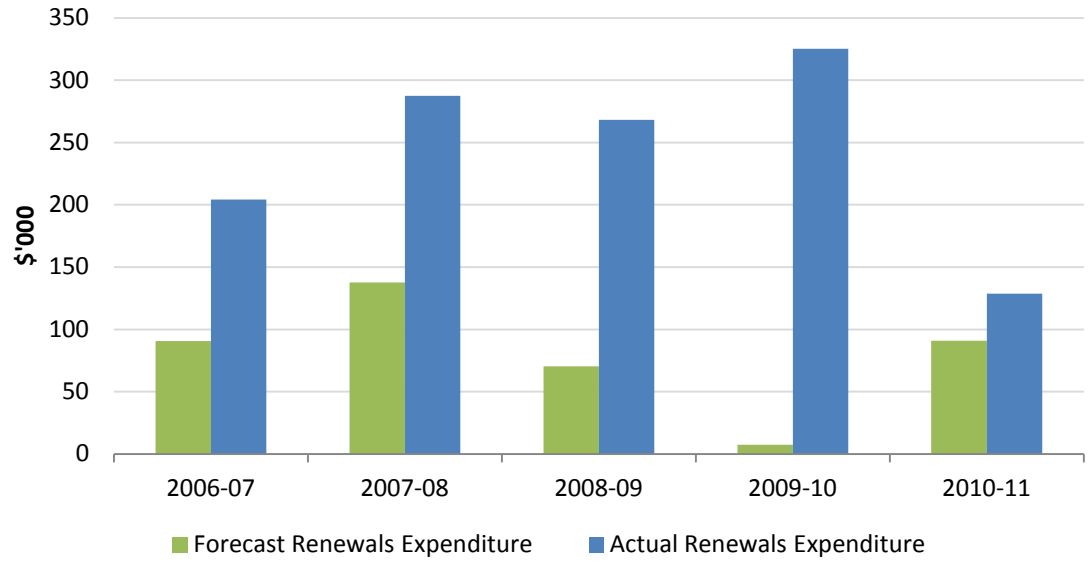
Source: Indec (2011d).

Comparison of Forecast and Actual Costs

The Authority was able to source details of 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 Burdekin-Haughton WSS for 2006-11 is shown in Figure 4.2.

Figure 4.2: Direct Renewals Expenditure 2006-11 (Real $'000)



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

Actual renewals expenditure was $817,000 (direct costs) above that forecast over the period.

Arup was also appointed to review the prudency and efficiency of past renewals projects.

In the absence of forecast renewals expenditure for 2006-11 from SunWater (as noted above), Arup sought to identify variances between annually budgeted and actual expenditure for certain items. One item was reviewed in detail.

Item 1: Clare Weir Fishlock – Design and Implement Hydraulic Upgrades and Completion of refurbishment of Clare Weir Fishlock

Arup reviewed one project relating to past renewal expenditure. This renewals expenditure appears in SunWater's NSP as future renewals expenditure, but due to the extension of the 2006-11 price path, this expenditure occurs prior to the commencement of 2012-17 prices.

SunWater

The Clare Weir fishway was constructed in 2004-05. The design and implementation of the hydraulic upgrades renewals expenditure cost $162,000 and was completed in 2010-11. The refurbishment of the fishlock is expected to cost $274,000 and be completed in 2011-12.

Other Stakeholders

BRIAIC (2011b) submitted that the costs to redesign and reengineer the fish ladder on the Clare Weir, as identified in the forecast renewal expenditure should not be attributed to irrigators of the scheme. This facility is an environmental requirement and as such should be funded across all of the community. Irrigators are unclear regarding the requirement for fish ladders as fish would have had to rely on seasonal conditions to travel up the river in the absence of a fish ladder.

Consultant's Review

Arup noted that since the fishlock was commissioned, $300,000 has been spent on maintenance. To address ongoing issues, SunWater's environmental engineer reported a detailed list of faults requiring significant works as follows:

(a) jamming of gates and valve actuators from debris;

(b) repeated failure of the valve actuator cylinders;

(c) failure of the gate hydraulic cylinders;

(d) contamination of the hydraulic fluid;

(e) breakage of the gate seals;

(f) the downstream gate not fully closing;

(g) accelerated corrosion of the gates after damage to the protective coating;

(h) lack of crane access to the lock and holding chambers;

(i) filling of the various lock chambers with debris;

(j) poor performance of the hydraulic system pumps;

(k) high hydraulic operating pressures;

(l) corrosion of one level sensor;

(m) blocking of level sensor stilling tubes; and

(n) loss of handrails and access ladders.

Arup reviewed the environmental engineers report and found that it appropriately reviewed all issues associated with the fishlock. Arup found that the original design underestimated the level of debris during normal operations which led to many of the issues noted above. Further, SunWater operation and maintenance staff advised Arup of significant levels of coarse sand and stones being introduced under normal operation.

The 2009-10 ROP for the Burdekin Basin requires SunWater to, where practicable, use the fishway to release water from Clare Weir in preference to the outlet valve or allowing water over the crest of the weir. This requires that the fishlock be kept functional. Therefore, Arup concluded that this renewals expenditure is prudent.

In response to the environmental engineering report, in May 2010, SunWater's senior mechanical engineer detailed the problems associated with the fishlock and associated cost estimates. This report included the following measures:

(a) the use of a more robust actuator and replacing the cover over the valve but with a more solid cover to prevent major debris from jamming the actuator mechanism;

(b) modification of gate design to reduce the size of debris entering the lock; and

(c) applying some of the design principles used at the Bowen Weir Fishlock (built in 2009) to eliminate some of the operational issues at the Clare Weir Fishlock.

Arup noted the proposed works seek to reduce long term operational costs. SunWater based the forecast renewals expenditure on the actual costs incurred during the construction of the Bowen Weir fishlock. Arup concluded that this method to forecast costs results in efficient cost estimation.

Therefore, Arup concluded that this renewals expenditure is prudent and efficient.

Authority's Analysis

The Authority notes that this expenditure is required primarily due to poor original design that did not take into account the actual level of debris. Accordingly, there has been significant unplanned maintenance on the fishlock, which will not be recovered through future prices.

The Authority accepts Arup's advice that this renewals expenditure is prudent and efficient. The additional expenditure is required to reduce ongoing maintenance costs and therefore provides a benefit to irrigators.

In relation to BRIAIC's comment, the Authority considers that fish ladders are required to meet SunWater's ROP obligations, and as such, the costs should be met by customers.

Conclusion

In summary, one past renewals item for the Burdekin-Haughton WSS was sampled. On the basis of the consultant's review, the Authority found that this item was prudent and efficient and has been retained as past expenditure.

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, as summarised in Table 4.2.

Table 4.2: Review of Selected Past Renewals Expenditure 2006-11

Item	*Date*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Projects				
1. Fishlock	2011-12	274	Prudent and efficient	274
Non-Sampled Projects				**10% saving applied**

Note: SunWater (2011), Arup (2011).

Discrepancies in SunWater's Annual Reports

The Authority notes submissions from CANEGROWERS and BRIAIC regarding inconsistencies of renewals data in SunWater's Annual Reports. Specifically, the Authority notes discrepancies in annuity data presented in SunWater's Annual Reports for 2008-09 and 2009-10. An example is presented below in Table 4.3.

Table 4.3: Discrepancies in SunWater Annual Reports

Item	*Annual Report 2008-09: Data for 2008-09 for All Sectors ($)*	*Annual Report 2009-10: Data for 2008-09 for Irrigation Sector Only ($)*
Annuity Collected	2,000,000	1,900,000
Renewals Spend	1,250,000	2,750,000
Renewals Annuity Balance	1,600,000	(500,000)

Source: SunWater Annual Report 2008-2009, SunWater Annual Report 2009-10.

SunWater advises that the anomalies are explainable in that the 2008-09 Annual Report renewals data is for all sectors, whereas the 2009-10 Annual Report renewals data is for the irrigation sector only. As irrigators are the target audience for renewals data, SunWater changed its approach to reflect irrigation only data.

Accordingly, the following observations apply for each respective row of Table 4.3:

(a) annuity collected. The $2 million annuity collected as reported in 2008-09 was for all sectors, whereas the $1.9 million reported in 2009-10 was for the irrigation sector only. The latter figure is (intuitively) lower, but not substantially lower, because the Burdekin-Haughton WSS is predominantly an irrigation scheme;

(b) renewals spend. The $1.25 million spend as reported in 2008-09 was for all sectors, whereas the $2.75 million reported in 2009-10 was for the irrigation sector. Somewhat counter-intuitively, this shows a significant increase in renewals spend despite accounting for the irrigation sector only.

SunWater has submitted that the increase is due to the inclusion of $2.2 million of previously unquantified flood damage costs (all sectors) which, when added to the $1.25 million renewals reported in 2008-09 for all sectors, generates a total renewals of $3.45 million for the WSS. Of this, the irrigation share is $2.75 million, as reported in SunWater's Annual Report 2009-10; and

(c) renewals annuity balances. The changes to the renewals annuity balance reflect the above adjustments.

4.4 Opening ARR Balance (at 1 July 2012)

Stakeholder Submissions

SunWater

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was $1,610,000 for the Burdekin-Haughton WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and may differ from the NSP.

Other Stakeholders

No other stakeholders have commented on this matter.

Authority's Analysis

Based on the Authority's assessment of the prudency and efficiency of past renewals expenditure, and the proposed methodology for unbundling ARR balances, the recommended opening ARR balance for 1 July 2011 for Burdekin-Haughton $1,936,000.

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 $2,047,000, 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 their 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.

Prudency and Efficiency of Forecast Renewals Expenditure

Submissions

SunWater

SunWater's forecast renewals expenditure for 2011-16 for the Burdekin-Haughton WSS, as provided in its NSP, is presented in Table 4.4. This was submitted prior to the Government's announced interim prices for 2011-12.

Table 4.4: Forecast Renewals Expenditure 2011-12 to 2015-16 (Real $'000)

Facility	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Blue Valley Weir	16	10			
Burdekin Falls Dam	127	38	95	108	49
Clare Weir	356	163	139	154	229
Giru Weir	132	93			3
Gorge Weir	18				3
Reed Beds Pump Station			19		
Val Bird Weir	176	160			
Total	**824**	**464**	**253**	**262**	**283**

Source: SunWater (2011).

The major items incorporated in the above estimates are:

(a) Clare Weir[1] – complete refurbishment of fishlock at an estimated cost of $273,000 in 2011-12. This involves design and modification of the fishlock to improve reliability following flood events;

(b) Clare Weir – replace valve control equipment at an estimated cost of $103,000 in 2015-16; and

(c) Val Bird Weir and Giru Weir – upgrade outlet works, Stage 1 and 2 at an estimated cost of $461,000 from 2011-12 to 2012-13. The upgrades are to increase the capacity of the outlet works at Val Bird Weir and Giru Weir to meet requirements for release capability as set out the in the ROP for the scheme.

The major expenditure items from 2016-17 are:

(a) replace main high voltage cable system at Burdekin Falls Dam at an estimated cost of $2,687,000 in 2022-23;

[1] The Authority has reviewed this renewals item in Section 4.3 as the extension of timelines means that this item is now in the past.

(b) replace electrical cable at Burdekin Falls Dam at an estimated cost of $2,547,000 in 2023-24;

(c) replace hydraulic system at Clare Weir at an estimated cost of $2,644,000 in 2024-25;

(d) replace control equipment at Burdekin Falls Dam at an estimated cost of $541,000 in 2027-28;

(e) replace water supply at Burdekin Falls Dam at an estimated cost of $824,000 in 2027-28; and

(f) replace motor/gearbox coupling at Burdekin Falls Dam at an estimated cost of $295,000 in 2027-28.

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

CANEGROWERS (2011a) submitted that renewal expenditure is forecast to be very small over the next five years and to be much larger between 2022-23 and 2027-28. There is forecast to be large renewals expenditure in the last four years of the 25-year period.

CANEGROWERS (2011b) submitted that SunWater's renewal expenditure forecast for large infrequent expenditures does not match SunWater's current renewal program. For example, SunWater's forecast that all concrete channels will be replaced in a single year in 20 years time does not match SunWater's historical practice of fixing small amounts of concrete channels each year. The renewals program needs to match current best practice not theoretical asset lives which are clearly not correct.

CANEGROWERS (2011b) submitted that all renewals items need a major review now rather than just leaving in and reviewing when within a five-year time horizon as SunWater currently does. An alternative is to use a five-year time horizon only and assume future costs are the same as the current period.

CANEGROWERS (2011a) submitted that it is unclear why dam safety costs of $12 million are included in the NSP as no dam safety upgrades are forecast over the next five years.

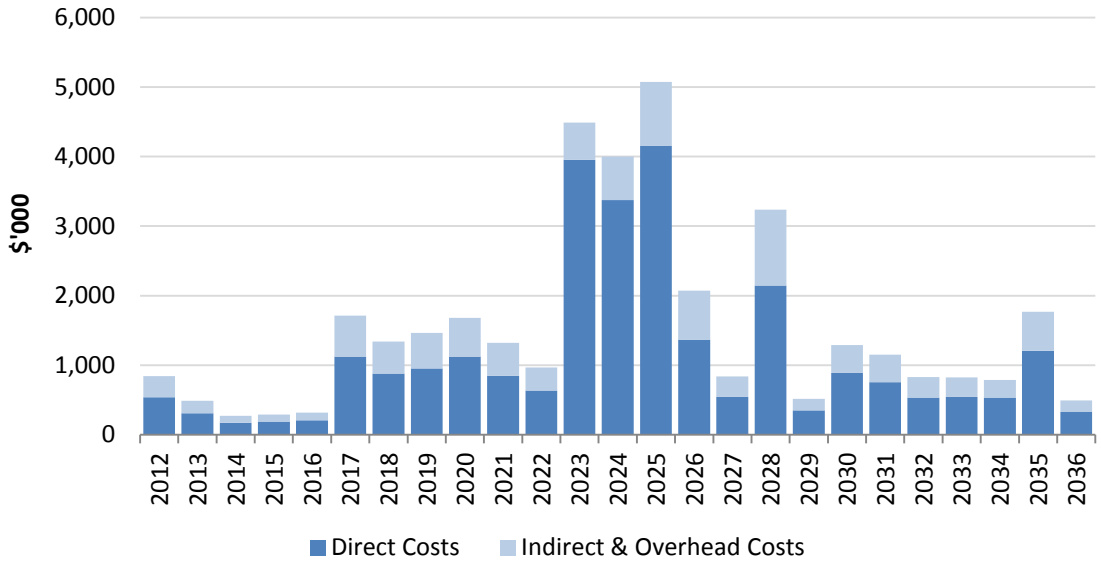
CANEGROWERS (2011b) note that there is a $824,000 cost in renewals for 2027-28 for replacing water supply at Burdekin Falls Dam.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the Burdekin-Haughton 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 reviewed below. The indirect and overheads component of expenditure relating to these projects are reviewed in Chapter 5 – Operating Expenditure.

Figure 4.4 Forecast Renewals Expenditure 2011-36 (Real $'000)



Source: SunWater (2011).

Item Reviews

Arup and SKM have reviewed the prudency and efficiency for a sample of projects. Each of the assessed items is discussed below.

The Clare Weir fishlock is ongoing expenditure and has been reviewed in the context of past renewals items in Section 4.3 above.

Item 1: Clare Weir – Replace Valve Control Equipment

SunWater

Electronic systems are generally replaced every 10 years. SunWater has forecast the replacement to take place at a cost of $104,000. SunWater intends to undertake an options study in 2015 to determine if the control unit can continue operating.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Arup indicated that SunWater proposes an options study in 2015 at a cost of $5000 to determine if the most appropriate strategy has been adopted and whether investment can be deferred. Arup considered that the options study proposed by SunWater to be prudent.

The cost of the replacement is based on revaluation of the construction cost in 2005. Arup was not able to determine the source of the revaluation for this specific piece of equipment. Arup also noted that SunWater's Systems, Applications and Products (SAP) system shows the replacement cost as being $82,736 and not $104,000 as shown in the annuity spreadsheet and the NSP [SunWater submitted $103,000 in the NSP]. Arup sought clarification of the difference, but SunWater did not provide a response. Arup considered the basis of the replacement cost is appropriate, but that SunWater should clarify the difference between the SAP system and the NSP.

Authority's Analysis

The Authority accepts Arup's conclusion that the renewals expenditure is prudent and will include the cost of the valve control equipment in the forecast renewals expenditure. Should the options analysis indicate that the replacement can be deferred, then the Authority will adjust the ARR balance during the subsequent price review.

Given that the SAP Works Management System (WMS) cost data are based on notional indirect and overhead costs only, the Authority proposes to apply the full value as nominated in the NSP.

Item 2: Val Bird Weir Outlet Works

SunWater

This renewals expenditure item relates to the Val Bird Weir Outlet works and is expected to cost $279,000 in 2012-13.

Other Stakeholders

No other stakeholders commented on this item.

Consultant's Review

Arup was provided with output from the SAP system and considered that this information was inadequate to assess the prudency and efficiency of the renewals expenditure. Arup noted that this equipment has been in operation from 1982 and that it is necessary as part of the ROP. However, it is unclear how the proposed outlet works are necessary to meet the requirements of the ROP. Without this information Arup was not able to assess the prudency and efficiency of this renewals expenditure.

Authority's Analysis

The Authority accepts Arup's advice that an assessment of prudency and efficiency cannot be made on the basis of information made available by SunWater.

Item 3 – Burdekin Falls Dam – Replace High Voltage System

SunWater

This expenditure relates to the replacement of an existing high voltage (HV) electrical system (11 kV distribution transformers, overhead line and switchgear) based on the assets reaching the end of their nominal operating life of 35 years.

According to SunWater's SAP-WMS, the asset has been in operation since 1987. SunWater has submitted a renewals item value of $2.687 million for replacement of the existing HV system in 2022-23.

Other Stakeholders

CANEGROWERS (2011b) questioned the timing and size of the forecast cost to replace the cable system at the dam in 2022-23 and 2023-24.

BRIAIC (2011b) questioned the need for the major electricity transmission replacements, as there is very little detail as what is involved in this project. Given the likelihood of hydro generation being established at the dam, it is uncertain whether provision for replacement is even warranted.

Consultant's Analysis

This item was selected by SKM for more detailed review.

(a) Available Information

SKM accessed SunWater's WMS, and asset condition and risk assessment policy and procedures. In particular, SKM have drawn on the following renewals item specific replacement/refurbishment report produced by SunWater for this review (Table 4.5).

Table 4.5: Documentation Reviewed Specific to Replacement of the Burdekin Falls Dam Replacement of HV System

Document No.	*Document Name*	*Document Title*	*Date*
1109905	1109905 1. QCA Justification Paper H1 – Burdekin Falls Dam – Replace High Voltage System	Burdekin Water Supply – Burdekin Falls Dam – Replace High Voltage System (BRI-BURD-BFD-ELEC-HVS)	21st August 2011

Source: SKM (2011).

SKM identified a cost of $2.62 million. The difference between this value and the NSP proposed amount is due to the SAP estimate including only a notional value for SunWater's indirect costs and overheads.

(b) Prudency Review

SKM considered that SunWater has largely followed the policies and procedures that it has in place to determine renewals item replacement/refurbishment dates and costs for such.

The standard object type (asset type) for this infrastructure has a standard life of 35 years and a condition inspection frequency of five years. SKM considered the standard run to failure asset life for this asset to be at the lower end of what is typically allocated by distribution network service providers in Australia to this type of asset and hence is conservative. Standard asset lives applied by power distribution network services providers in Queensland are shown in Table 4.6 below:

Table 4.6: Typical Asset Lives Applied by Power Distribution Companies

Asset Type	*Asset Life in Wet Conditions (Years)*	*Asset Life in Dry Conditions (Years)*
Distribution Transformers – Pole Mounted 11kV	35	45
Overhead Lines (11kV)	45	55
Pole Mounted Circuit Breakers	35	45

Source: SKM (2011).

SKM considered that the condition assessment frequency applied to this asset type is reasonable. SKM noted that the asset has been allocated an incorrect asset type in SAP-WMS, – Auxiliary Power Supply – AC which has a standard life of 15 years. This error was identified by SunWater and a replacement year commensurate with the correct asset type was submitted to the Authority in the NSPs.

SunWater has applied its risk evaluation method to this asset and determined, during the most recent risk assessment in 2005 which was a desk top as opposed to in-field evaluation. This risk assessment yields a highest risk score of Low. As such, under SunWater's systems, there should be no risk related adjustment to the standard run to failure asset life. SKM reviewed SunWater's submission and confirmed that this is the case.

The next stage of SunWater's method for determining asset replacement/refurbishment timing is by means of adjusting the risk adjusted run to failure asset life according to the variance of the condition score of the asset, at the time the last condition assessment was undertaken, with the condition that the standard asset condition decay curve predicts at that time.

The last condition assessment was undertaken in 2001, which is outside SunWater's stated maximum condition inspection periods for this asset type and hence, as SunWater has acknowledged, is out of date. This 2001 condition assessment indicates that the highest condition score allocated was a 2 (Minor Defects Only) for the protective enclosure criterion. As this condition assessment is captured in WMS as a 'Conversion' from earlier databases, no additional information was available.

SunWater advised that as there is no current condition assessment report available for this asset the replacement has been scheduled at the end of the risk based asset life of 35 years.

Hence, in absence of data to the contrary, SunWater has assumed a standard run to failure asset life for this asset and scheduled replacement at the end of that life; that is, a 1987 installed date plus 35 years standard life gives a 2022-23 replacement date.

SKM evaluated the projected run to failure asset life using SunWater's modelling tool. Inputting a Low business risk and worst case condition score in 2001 of 2 for this asset with a standard run to failure life of 35 years into SunWater's planning tool results in a projected run to failure life of 80 years and a projected required replacement year of 2066-67.

SunWater advised that when extrapolating from a low condition score, it finds the planning tool to be unreliable and prone to large errors. SKM accepted that judgement should be used when applying the tool.

SKM considered that taking a pragmatic engineering approach, there is no reason why a well-maintained asset of this type, operating within its design parameters, would not be capable of operating significantly beyond its standard run to failure asset life. From SKM's experience, overhead 11kV lines, pole-mounted transformers etc have been known to operate for in excess of 45 years without loss of performance. However, SKM recognised that these assets are operating in tropical conditions and hence tropical condition asset lives should apply.

SKM therefore concluded that it is appropriate to plan for replacement of this asset within this planning period as, if a 45 year life is adopted for all assets, based on the in service date, replacement should be planned for 2031-32. Therefore, SKM considered that inclusion of this asset replacement in this current price determination is prudent.

SKM considered that given the nature of this asset, the limited alternative technical options available and the date at which replacement is planned, there is no need to conduct an option assessment at this stage.

SKM concluded that it in absence of a recent and current condition assessment, it is appropriate to plan for replacement of this asset at or around the date of the end of the run to failure asset life. As such, the inclusion of this renewals item in the annuity value is considered to be prudent.

(c) Efficiency Evaluation

For assets that are planned to be replaced five years or more hence of the planning date, SunWater uses a valuation method based on a bill of materials (BOM) for the asset. The BOM has been developed from as built drawings and a 1997 value (determined from a 1997 valuation) attached to each item making up the BOM based on a 1997 valuation.

The 1997 value for each line is then escalated by a multiplier determined by Cardno in a 2008 valuation. This multiplier varies according to the component type being escalated. For example, all electrical equipment should be escalated by a 2.13 multiplier. The sum of costs is then adjusted by an indirect multiplier (in this case (1+44.62%) to take account of renewals item replacement specific factors such location, project management costs etc.

This approach (including the indirect uplift multipliers) has been audited by Arthur Anderson in 2000 and found to be robust and appropriate. Given the large portfolio of assets that SunWater is required to determine a replacement value for over a 25-year asset replacement/refurbishment cycle, SKM agreed with Arthur Anderson's conclusions and considered the approach to be appropriate.

Where SKM have concerns over the quantum of the 1997:2008 escalators, or the Indirect Cost multipliers, SKM have highlighted them in the analysis of individual proposed replacement costs.

SKM reviewed SunWater's calculation for determining a replacement cost and confirmed that it has applied the Indirect Cost multiplier contained in the BOM for this asset item in its SAP-WMS of 44.62%. Whilst this is at the upper end of the range of multipliers used by SunWater to capture asset item specific costs such as location, project management and engineering, SKM had insufficient information to determine its reasonableness.

SKM calculated a 2008 replacement value for this asset based on the standard 1997 to 2008 multiplier of 2.13 for electrical assets as determined by Cardno, which yields a replacement value of approximately $1.78 million. SKM is uncertain as to why an escalator above that determined by Cardno has been used by SunWater to calculate a replacement cost and a further multiplier applied to calculate the renewals value submitted to the Authority, as this is not in line with the method for determining renewals replacements advised by SunWater.

SKM benchmarked the renewals item replacement costs proposed by SunWater as submitted to the Authority against SKM's database costs for a modern equivalent electrical asset.

SKM compared its cost estimate against SunWater's cost estimate in Table 4.7 below.

Table 4.7: Burdekin Dam HV System Replacement Comparison of SunWater and SKM Cost Estimates

SunWater Estimate $2009-10	*SKM Estimate $2009-10*	*Variance*
2,629,204	1,228,694	+114%

Source: SKM (2011).

SunWater's estimate is some 114% higher than SKM's estimate for this asset. The primary contributing factor to this difference in estimated values is the building block rate used by SunWater for Aluminium Conductor Steel Reinforced "Banana" overhead conductor. The SKM rate of approximately $2,140 per km (ex works) is in sharp contrast to the 2007-08 escalated value of $29,000 per km ($87,000 per km installed) used by SunWater, and for this reason SKM

recommended that the scope of this building block is reviewed to ensure it is suitable for use in the capital estimate as it has been applied.

SKM relied on a number of sources to determine the $2,140/km rate for the overhead conductor:

(a) SKM conducted a procurement survey for ENERGEX in June 2006, where SKM asked for material only costs for various assets, including overhead conductor. This yielded a cost, for bulk purchases, of $1,000/km;

(b) SKM revisited this price directly with ENERGEX as part of this project which yielded cost of $2,120/km for 210mm^2 aluminium overhead conductor (compared to Banana which is 77mm^2 with steel reinforcement);

(c) SKM obtained prices from Alcan (via a US website) which yielded $2,140/km; and

(d) finally, SKM have obtained a budget price from Olex which yielded $1,650/km.

SunWater has developed a planning order for this item which details the following breakdown of costs between contractors, overheads and materials based on a standard costing apportionment of: 45% material, 35% contractors with the rest on plant, internal labour and overheads. SKM noted that the SAP-WMS planning order breakdown does not adhere to this standard costing apportionment as is shown in Table 4.8.

Table 4.8: SunWater Breakdown of Costs – Burdekin Falls Dam Replace Cable

Cost Item	***Planned Costs***
Contractors	$890,000
Internal Labour Transfer	$61,550
Internal Overhead Transfer	$190,654
Materials	$1,357,000
Plant Equipment and Vehicles	$130,000
Total	$2,295,906

Source: SKM (2011).

SunWater has advised that Internal Overhead Transfer relates to corporate overhead costs that are allocated to this renewals item replacement activity.

Based on SKM's estimated cost of a modern equivalent asset, SKM considered the proposed value of $2.629 million not to be efficient.

Summary and Conclusions

This annuity item consists of a number of components that have varying industry standard asset lives. SunWater has adopted an asset life consisted with the life of the lowest asset life items (35 years). Unless the annuity item is disaggregated and the 11kV line separated out (which has an industry norm asset life of 45 years), we consider this approach to be reasonable.

SKM concluded that the condition assessment is out of date and given that this asset has been allocated a risk category of Low, SKM considered that a detailed condition assessment should be undertaken prior to establishing a replacement date for this asset. However, if an aggregate

life of 45 years were to be adopted, this would still place replacement of this asset item within this price setting period. SKM therefore considered that the item is prudent.

From SKM's benchmarking of the replacement costs, SKM considered that SunWater's renewals value submitted for this renewals item to be 114% higher than SKM's cost estimate and therefore not efficient. The difference between SKM's estimated cost and SunWater's estimated cost arises from a difference in the unit rate adopted for the 11kV overhead line. SKM indicated that if the rate used by SunWater was used, then the difference between the two estimates falls within the normal estimating range of +30%/-20% for this level of estimate. SKM therefore concluded that the renewals item replacement value submitted by SunWater to the Authority is not efficient.

Authority's Analysis

The Authority notes that the total cost (including direct and indirect) submitted by SunWater for this renewals item ($2,687,000) does not equate to the amount reviewed by SKM ($2,629,204). As discussed in Volume 1, this is because SKM's review was based on SunWater's SAP system, which uses a simplified method for calculating indirect and overhead costs than SunWater's financial system, which formed the basis of SunWater's NSPs and submissions to the Authority. However, where direct costs were reviewed by SKM this aligns with the direct costs submitted to the Authority.

The Authority has therefore accepted SKM's efficiency recommendation of a $1,400,510 reduction in costs, and applied this to the value submitted by SunWater ($2,687,000). The Authority has confirmed this approach with SKM. The resultant cost of $1,286,490 in 2023 has been included in the Authority's recommended tariffs.

Item 4 – Burdekin Falls Dam – Replace Cable

This renewals item is for the replacement of an existing LV cable.

According to SunWater's SAP-WMS, the asset has been in operation since 1987. SunWater has submitted a value of $2.547 million in its NSP for replacement of the existing low voltage (LV) above ground cable system in 2024.

Other Stakeholders

CANEGROWERS (2011b) questioned the timing and size of the forecast cost to replace the cable system at the dam in 2023 and 2024.

Consultant's Analysis

This item was selected by SKM for more detailed review.

(a) Available Information

SKM have drawn on the following renewals item specific replacement/refurbishment report produced by SunWater for this review:

Table 4.9: Documentation Reviewed Specific to Replacement of the Low Voltage (LV) Above Ground Cable at Burdekin Falls Dam

Document No.	*Document Name*	*Document Title*	*Date*
1105989	1105989 2. QCA Justification Paper H2 – Burdekin Falls Dam – Replace Cable	Burdekin Water Supply – Burdekin Falls Dam – Replace Cable (BRI-BURD-BFD-WALL-CBLE)	21st August 2011

Source: SKM (2011).

From the SAP-WMS, SKM identified a cost of $2.296 million. The difference between this value and the NSP proposed amount is due to the SAP estimate including only a notional value for SunWater's indirect costs and overheads.

(b) Prudency Review

Asset Replacement/Refurbishment Date Determination

SKM considered that SunWater has largely followed the policies and procedures that it has in place to determine renewals item replacement/refurbishment dates and costs for such.

The standard object type (asset type) for this infrastructure is allocated a standard run to failure asset life of 35 years and a condition inspection frequency of five years. SKM considered the standard run to failure asset life to be towards the low end of what may be expected for above ground LV cable. For example, most electrical distribution utilities in Australia would apply an asset life of 45 to 60 years for above ground LV cables, depending on whether it is operated in dry or wet (tropical) conditions. SKM considered the condition assessment frequency applied to this asset type to be reasonable.

SKM indicated that SunWater has applied its risk evaluation method to this asset and determined, during the most recent risk assessment in 2005 which was a desk top as opposed to in-field evaluation. This risk assessment yields a highest risk score of Low. As such, under SunWater's systems, there should be no risk-related adjustment to the standard run to failure asset life. SKM reviewed SunWater's submission and confirmed that this is the case.

The next stage of SunWater's method for determining asset replacement/refurbishment timing is by means of adjusting the risk adjusted run to failure asset life according to the variance of the condition score of the asset, at the time the last condition assessment was undertaken, with the condition that the standard asset condition decay curve predicts at that time.

The last condition assessment was undertaken in 2001, which is outside SunWater's stated maximum condition inspection periods for this asset type and hence, as SunWater has acknowledged, is out of date. This 2001 condition assessment indicated that the highest condition score allocated was a 3 (Moderate deterioration with minor refurbishment required to ensure on-going operation). This was a high level assessment with no condition scores being applied to the different condition assessment criteria for this asset.

SunWater has advised that, as there is no current condition assessment report available for this asset, the replacement has been scheduled at the end of the risk based asset life of 35 years. In absence of data to the contrary, SunWater has assumed a standard run to failure asset life for this asset and scheduled replacement at the end of that life, that is, a scheduled replacement for 2024.

SKM evaluated the projected run to failure asset life using SunWater's modelling tool. Inputting a Low business risk and worst case condition score in 2001 of 3 for this asset with a

standard run to failure life of 35 years into SunWater's planning tool results in a projected run to failure life of 37 years and a projected required replacement year of 2023-24. If a 45-year run to failure asset life is applied to the planning tool, a replacement year of 2023-24 is similarly projected as the condition score of 3 indicates a higher rate of deterioration than the standard condition decay curve predicts at that time for a 45-year life.

SKM considered that given the nature of this asset, the limited alternative technical options available and the date at which replacement is planned, there is no need to conduct an option assessment at this stage. SKM noted that SunWater has planned to undertake a project in 2021-22 to review the options for replacement of the cable, which SKM believed is appropriate and in keeping with good industry practice.

Timing of Renewal/Refurbishment

SunWater has planned replacement based on its standard run to failure asset life for this asset given that the current condition assessment is out of date, i.e. more than five years old.

SKM considered that it would be preferable for SunWater to undertake a further condition assessment (as SunWater's procedures require for this asset) to obtain a more current and definitive assessment of the condition of the asset than the high level assessment undertaken in 2001 prior to determining the projected replacement date for this asset. SKM recommended that condition assessment should extend beyond a visual assessment and include electrical testing, such as insulation breakdown testing, earth impedance testing and similar to determine the condition of the cable installation.

In absence of this information, if a 45-year run to failure asset life is applied to the planning tool, a replacement year of 2023-24 is projected as the condition score of 3 indicates a higher rate of deterioration than predicted.

SKM therefore considered that the SunWater proposed timing for this asset replacement of 2023-24 is prudent.

(c) Efficiency Evaluation

For assets that are planned to be replaced five years or more hence of the planning date, SunWater uses a valuation method based on a BOM for the asset. The BOM has been developed from as built drawings and a 1997 value (determined from a 1997 valuation) attached to each item making up the BOM based on a 1997 valuation.

The 1997 value for each line is then escalated by a multiplier determined by Cardno in a 2008 valuation. This multiplier varies according to the component type being escalated. For example, all electrical equipment was escalated by a 2.13 multiplier. The sum of costs is then adjusted by an indirect multiplier (in this case (1+44.62%) to take account of renewals item replacement specific factors such location, project management costs etc.

This approach (including the indirect uplift multipliers) has been audited by Arthur Anderson in 2000 and found to be robust and appropriate. Given the large portfolio of assets that SunWater is required to determine a replacement value for over a 25-year asset replacement/refurbishment cycle, SKM agreed with Arthur Anderson's conclusions and considered the approach to be appropriate.

SKM considered that while the indirect cost multiplier contained in the BOM for this asset item of 44.62% was at the upper end of the range of multipliers used by SunWater to capture asset item specific costs such as location, project management, and engineering, SKM had insufficient information to determine its reasonableness.

SKM calculated a 2008 replacement value for this asset based on the standard 1997 to 2008 multiplier of 2.13 for electrical assets as determined by Cardno which yields a replacement value of approximately $1.85 million. SKM was uncertain as to why an escalator above that determined by Cardno has been used by SunWater as this is not in line with the method for determining renewals replacements advised by SunWater.

SKM benchmarked the renewals item replacement costs proposed by SunWater as submitted to the Authority against their database costs for a modern equivalent electrical asset. SKM compared their cost estimate against SunWater's cost estimate in Table 4.10:

Table 4.10: Burdekin Falls Dam Replace Cable Comparison of SunWater and SKM Cost Estimates

SunWater Estimate $2009-10	*SKM Estimate $2009-10*	*Variance*
2,295,907	2,076,000	+9.6%

Source: SKM (2011).

SunWater has developed a planning order for this renewals item replacement which details the following breakdown of costs between contractors, overheads and materials based on a standard costing apportionment of: 45% material, 35% contractors with the rest on plant, internal labour and overheads.

Table 4.11: SunWater Breakdown of Costs – Burdekin Falls Dam Replace Cable

Cost Item	*Planned Costs*
Contractors	$802,908
Internal Labour Transfer	$114,692
Internal Overhead Transfer	$231,296
Materials	$802,908
Plant Equipment and Vehicles	$344,103
Total	$2,295,906

Source: SKM (2011).

SunWater advised that Internal Overhead Transfer relates to corporate overhead costs that are allocated to this renewals item replacement activity. Total direct costs are $1.95 million.

The renewals value submitted by SunWater for replacement of this renewals item is within the estimating range of SKM's estimated cost for a modern equivalent replacement asset. As such SKM considered the SunWater proposed renewals item value of $2,295,906 to be efficient.

(d) Summary and Conclusions

SKM considered that the timing and inclusion of this renewals item in 2023-24 was prudent. From SKM's benchmarking of the replacement costs, SKM was satisfied that the renewals item replacement value submitted by SunWater is efficient.

Authority Analysis

The Authority accepts SKM's recommendation that the replacement of cables at Burdekin Falls Dam is prudent and efficient.

The Authority notes that the total cost (including direct and indirect) submitted by SunWater for this renewals item ($2,644,000) does not equate to the amount reviewed by SKM ($2,295,907). As discussed in Volume 1, this is because SKM's review was based on SunWater's SAP system, which uses a simplified method for calculating indirect and overhead costs than SunWater's financial system, which formed the basis of SunWater's NSPs and submissions to the Authority. However, where direct costs were reviewed by SKM this aligns with the direct costs submitted to the Authority.

Item 5: Clare Weir – Refurbishment of Hydraulic Rams

SunWater

The forecast renewals expenditure includes an annual cost of approximately $75,000 for the refurbishment of hydraulic rams from 2012-13 to 2035-36. SunWater has costed an options analysis in 2016-17 to review hydraulic system requirements and refurbishment strategy.

Other Stakeholders

No other stakeholders commented on this item.

Consultant's Review

Arup questioned why the refurbishment is being undertaken annually prior to the development of the options study in 2017. Arup indicated that it had not received information sufficient to justify the basis of the annual $75,000 renewals expenditure, which Arup's noted is a large proportion of the total renewals expenditure.

Authority's Analysis

The Authority accepts that insufficient information was available for Arup to reach a conclusion.

Item 6: Replacement of cylinders at Clare Weir

SunWater

Between 2016-17 and 2020-21, SunWater is proposing to undertake a full replacement of cylinders at various gates at Clare Weir. The total for this replacement is approximately $3.75 million.

Other Stakeholders

No other stakeholders commented on this item.

Consultant's Review

Arup noted that the forecast renewals expenditure itemised costs on a per asset basis. This generates a large number of items many of which should be packaged up into single large items. The total project cost assumes a unit cost of $25,000 per cylinder and a total cost of $3.75 million.

Arup considered that a 10-20% saving could be achieved if materials are purchased in a bulk single order, but was unable to exactly quantify the saving as the information provided by SunWater was inadequate for this purpose.

Authority's Analysis

The Authority accepts Arup's recommendation that costs should be estimated on the basis of purchasing many items in bulk. The Authority recommends that the cost be adjusted by 20% to approximately $3 million.

Item 7: Refurbish Hydraulics

SunWater

SunWater has proposed spending $1.2 million in 2025-26 on a three-year program to refurbish hydraulics.

Other Stakeholders

No other stakeholders commented on this item.

Consultant's Review

Arup noted that this renewals expenditure does not refer to a specific asset but rather a program of works. It is unclear how the system would have identified this piece of work and there is concern that these works may double up on the annual hydraulic modifications proposed for prior years. Arup concluded that SunWater should provide clear justification for this item before it is considered either prudent or efficient.

Authority's Analysis

The Authority notes that there was insufficient information for Arup to reach a conclusion in regard to this item.

Conclusion

In summary, seven projects for the Burdekin-Haughton WSS were sampled. Of these:

(a) two projects are prudent and efficient and have been retained as forecast expenditure;

(b) two projects are prudent but not efficient, requiring adjustment to forecast expenditure; and

(c) three projects could not be assessed due to insufficient information.

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 4.12

Table 4.12: Review of Forecast Renewals Expenditure 2011-36 ($'000)

Item	*Year*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Items				
1. Clare Weir – Replace Valve Control Equipment	2015-16	103	Prudent and efficient	103
2. Val Bird Weir Outlet Works	2012-13	279	Insufficient information to assess prudency and efficiency	10% saving applied
3. Burdekin Falls Dam – Replace High Voltage System	2022-23	2,687	Prudent but not efficient	1,286
4. Burdekin Falls Dam – Replace Cable	2023-24	2,547	Prudent and efficient	2,547
5. Clare Weir – Refurbishment of Hydraulic Rams	2012-13 to 2035-36	1,778	Insufficient information to assess prudency and efficiency	10% saving applied
6. Replacement of cylinders at Clare Weir	2016-17 to 2020-21	3,745	Prudent but not efficient	2,996
7. Refurbish Hydraulics	2025-26	1,200	Insufficient information to assess prudency and efficiency	10%saving applied
Not Sampled items				**10% saving applied**

Source: SunWater (2011), Arup (2011), SKM (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

BRIAIC (2010) submits that at a local level the current approach to communicating and gaining feedback on a local asset maintenance schedules has not been regular, updated or made transparent. The Authority should play a constructive role in setting expectations around these consultation processes.

BRIAIC (2011b) submitted a review of customer service standards should be conducted as part of the review and that transparency and regular reporting regarding the progress of bulk and distribution annual renewals expenditures should take place.

Authority's Analysis

In Volume 1, the Authority noted that customers' concerns about the lack of involvement in the planning of future renewals expenditure have been raised by irrigators and their representatives. The Authority further notes BRIAIC's submission on this topic.

In responding to customer concerns, 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 Burdekin-Haughton bulk water infrastructure were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAE was determined by the Burdekin ROP conversion factor (1.7:1); that is, 1 ML of high priority WAE was considered equivalent to 1.7 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).

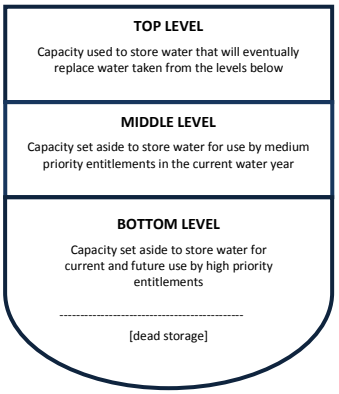
SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAE. Specifically, the HUF methodology takes into account water sharing rules, Critical Water Sharing Arrangements (CWSA) and other operational requirements that typically give high priority 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 in 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 calculation[2].

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.

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**:**

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

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 Burdekin-Haughton WSS are summarised in Table 4.13. The HUFs for this scheme (SunWater, 2010d) are 79% for medium priority and 21% for high priority.

[2] 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.

Table 4.13: Application of HUFs Methodology

STEP 1: Water Entitlement Groups (DERM's Water Allocation Register)

Nominal Group	(ML)	HUF Group	(ML)
Medium Priority	979,594	MP_A	979,594
High Priority	99,998	HP_A	99,998

STEP 2: ROP Conversion Factor Adjustment

Conversion Factor: ROP_{CF}	1/0.565
Maximum volume of HP: $HP_A max$	99,998
Corresponding volume of MP: $MP_A min = MP_A-(HP_A max-HP_A)*ROP_{CF}$	979,594

STEP 3: Water Sharing Rules & Operational Requirements

Water Sharing Rules	
Volume below which MP not available: $MP_0 AA$	271,913
Volume above which max. MP available: $MP_{100} AA$	1,767,325
CWSAs and other operational requirements	
Likely increase in volume effectively reserved for HP: MP_0	271,913
Likely increase in min. storage before maximum MP available: MP_{100}	1,767,325
Key Dam Level Measures	
Full Supply Level: FSV_{hwks}	1,875,900
Dead Storage Level: DSL_{hwks}	7,870

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 = 92,281; HP_2 = 16,294	19%	MP_{2u}= 17,688; HP_{2u}= 3,123
Middle: $\min\{(MP_{100}-MP_0),(FSV_{hwks}-MP_0)\}$	MP_1 = 1,495,411	65%	MP_{1u} = 976,166
Bottom: $MP_0 - DSV_{hwks}$	HP_1 = 264,043	99%	HP_{1u} = 261,223

STEP 5: Calculation of HUFs for each Water Entitlement Group

Formula	HUF Group	Nominal Group
MP_A: $(MP_{1u}+MP_{2u}) / (MP_{1u}+HP_{1u}+MP_{2u}+HP_{2u})$ = (976,166+17,688) / (976,166+261,223+17,688+3,123)	HUF_{mp} = 79%	Medium Priority = 79%
HP_A: $(HP_{1u}+HP_{2u}) / (MP_{1u}+HP_{1u}+MP_{2u}+HP_{2u})$ = (261,223+3,123) / (976,166+261,223+17,688+3,123)	HUF_{hp} = 21%	High Priority = 21%

**Apportioned between MP_2 and HP_2 using the ratio MP_1 HP_1. Source: SunWater (2010d).*

Other Stakeholders

BRIAIC (2010) agrees in principle that customers should contribute towards charges associated with scheme headworks on the basis of reliability of their water supply. The HUF approach is

an attempt to provide a logical and formulaic approach to this issue, but that it is difficult to assess whether the method represents an appropriate share of service capacity, until more detail is released. Further, the HUF should also take into account the impact of free allocations if their reliability has been altered by the dam's construction.

BRIAIC (2011b) submitted that irrigators should only pay their fair share of headworks costs associated with the allocation of 300,000ML of the 1.1 million ML available at Clare Weir. LBW (2010, 2011) submitted that recent demand growth in the scheme attributable to irrigation in recent years has been negligible and that analysis undertaken for the North Queensland Regional Water Supply Strategy concluded that irrigation demand would not trigger any augmentation of supply infrastructure in the scheme. Therefore, any costs attributable to augmentations of the Burdekin Falls Dam during the next regulatory period (including costs of feasibility studies, engineering studies, or actual infrastructure works) should be borne by future customers, not existing customers. LBW submitted it should not bear the costs of augmentation of the Burdekin Falls Dam given that demand by LBW or it customers would not trigger any augmentation of the Burdekin Falls Dam.

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 (2011y) accepted these recommendations and submitted recalculated HUFs for each scheme. For the Burdekin-Haughton WSS, the changes were immaterial and did not impact on the HUF values (Table 4.14).

In response to BRIAIC, the Authority considers that the HUF method apportions an appropriate share of service capacity between priority users. The reliability of all WAE, including the free WAE held by the boards, has been included in the calculations.

In respect of the Clare Weir, the HUF method allocates costs to WAE in accordance with their priority and capacity utilisation.

In response to LBW, SunWater has not submitted any costs for augmentation of the Burdekin Falls Dam and therefore, no costs have been allocated to any WAE holder.

Table 4.14: Revised HUF Calculations

STEP 4: Hydrologic performance of headworks storage

Storage Layer	Storage Capacity (ML)	Prob. of Utilisation	Utilised Capacity (ML)
Top layer			
Initial	MP_2 = 92,281; HP_2 = 16,294	19%	MP_{2u}= 17,688; HP_{2u}= 3,123
*Revised**	MP_2 = 98,518; HP_2 = 10,057	no change	MP_{2u}= 20,870; HP_{2u}= 2,130
Middle Layer	MP_1 = 1,495,411	65%	MP_{1u} = 976,166
Bottom Layer	HP_1 = 264,043	99%	HP_{1u} = 261,223

STEP 5: Calculation of HUFs for each Water Entitlement Group

	Initial	Revised	Nominal Group
HUF_{mp}	79%	79%	Medium Priority = 79%
HUF_{hp}	21%	21%	High Priority = 21%

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

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 2.6:1. This compares with the conversion factor of 1.7:1 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators will now pay 79% of the cost of renewals, whereas previously medium priority irrigators paid 85%.

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 Burdekin-Haughton WSS, the recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.15. 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 2006-12 and SunWater's proposed total annuity for 2013-16. SunWater did not submit a disaggregation between high and medium priority customers.

Table 4.15: Burdekin-Haughton WSS Renewals Annuity (Real $000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Total SunWater	984	1,383	1,381	1,407	1,564	978	969	960	950	951	951
Total Authority	-	-	-	-	-	-	769	759	748	753	737
High Priority	-	-	-	-	-	-	120	118	117	117	115
Medium Priority	-	-	-	-	-	-	467	461	455	457	448
Distribution Losses	-	-	-	-	-	-	182	179	177	178	174

Note: The costs of Distribution Losses are allocated to the distribution system (see the Burdekin-Haughton Distribution System Draft Report). Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5. Source: SunWater (2011) and 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 this scheme;

(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 prudency and efficiency of SunWater's proposed operating expenditures including direct and non-direct costs and escalation factors;

(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 contract (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 for this scheme 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 34 staff are located at the Clare 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;

(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 Resource Operations Licence (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*			
	Storage Level	*Head Water*	*Tail Water*	*BGA*
Burdekin Falls Dam	No	Yes	Yes	Yes
Clare Weir	No	Yes	Yes	Yes**
Giru Weir	No	No	No	Yes

*Includes sampling for the following variables: dissolved oxygen, electrical conductivity, pH, temperature; total nitrogen, phosphorus and BGA. ** Upgrade of outlet works required during this price path to meet environmental flow requirements for ROP compliance. Source: SunWater (2011).*

(ii) dam safety – as Burdekin Falls Dam is a referable dam under the *Water Act 2000*, SunWater is required to have a program in place 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 Burdekin Falls Dam and quarterly on the weirs. Specific dam safety inspections are required at Burdekin Falls 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) recreation facilities at Burdekin Falls 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.

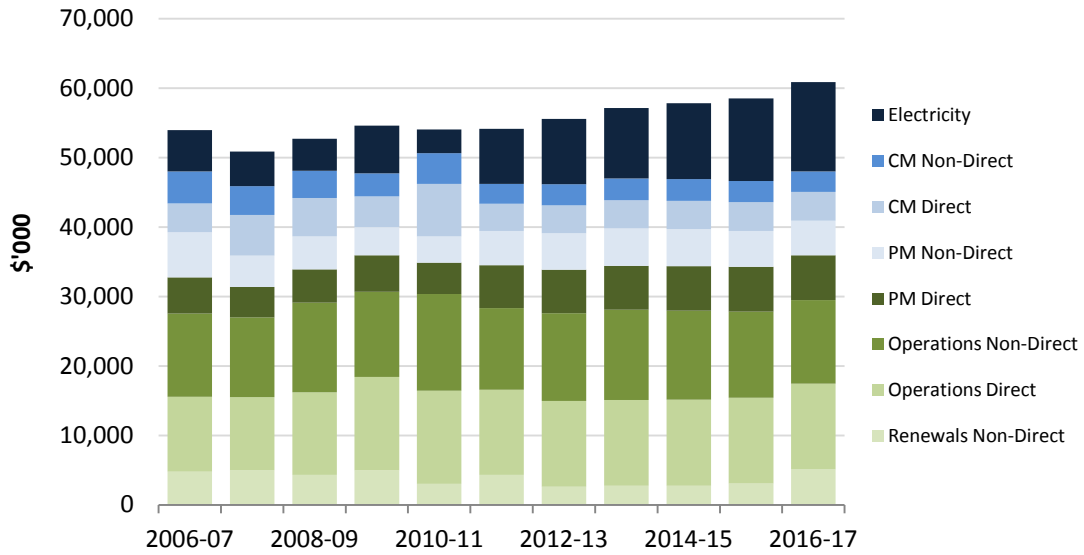
Stakeholder Submissions

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 NSP as noted in Volume 1.

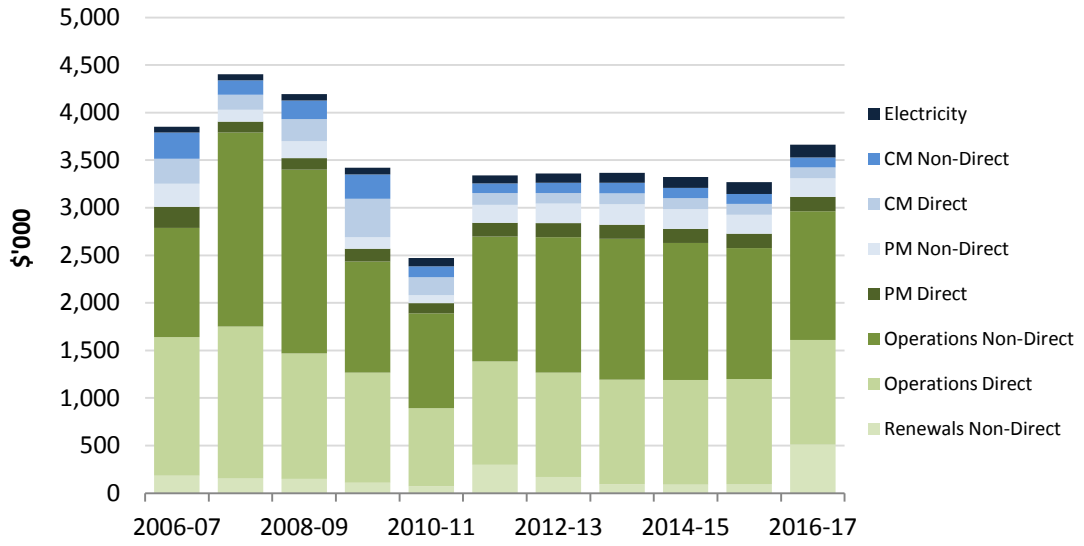
Expenditure by activity in the Burdekin-Haughton WSS (all sectors) is shown in Figure 5.2 and and Table 5.3.

Figure 5.1: SunWater's Total Operating Costs (Real $'000) – 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).

Figure 5.2: Total Operating Costs – Burdekin-Haughton WSS (Real $'000)



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: Expenditure 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	2,605	3,635	3,248	2,322	1,814	2,398	2,520	2,581	2,540	2,478	2,455
Electricity	59	62	67	69	84	83	98	106	114	124	134
Preventive Maintenance	464	241	299	256	194	335	353	362	357	349	345
Corrective Maintenance	538	309	430	661	303	226	221	226	224	220	218
Renewals Non-Direct	184	154	151	112	74	298	170	93	89	98	509
Total	**3,851**	**4,402**	**4,196**	**3,419**	**2,470**	**3,339**	**3,361**	**3,368**	**3,324**	**3,269**	**3,662**

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).

Table 5.3: 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*	*2016-17*
Labour	672	981	981	749	513	820	832	832	832	832	832
Electricity	59	62	67	69	84	83	98	106	114	124	134
Contractors	110	105	79	174	146	76	62	63	64	65	65
Materials	210	178	167	246	84	111	113	114	116	118	118
Other	945	608	448	527	373	353	353	353	353	353	353
Non-Direct	1,854	2,468	2,453	1,655	1,270	1,896	1,903	1,899	1,844	1,777	2,160
Total	**3,851**	**4,402**	**4,196**	**3,419**	**2,470**	**3,339**	**3,361**	**3,368**	**3,324**	**3,269**	**3,662**

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 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).

In its NSP, SunWater submitted that the operating costs for this scheme averaged $3.6 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 2012-16 are $3.0 million per annum.

Other Stakeholders

No other stakeholders have commented on this matter.

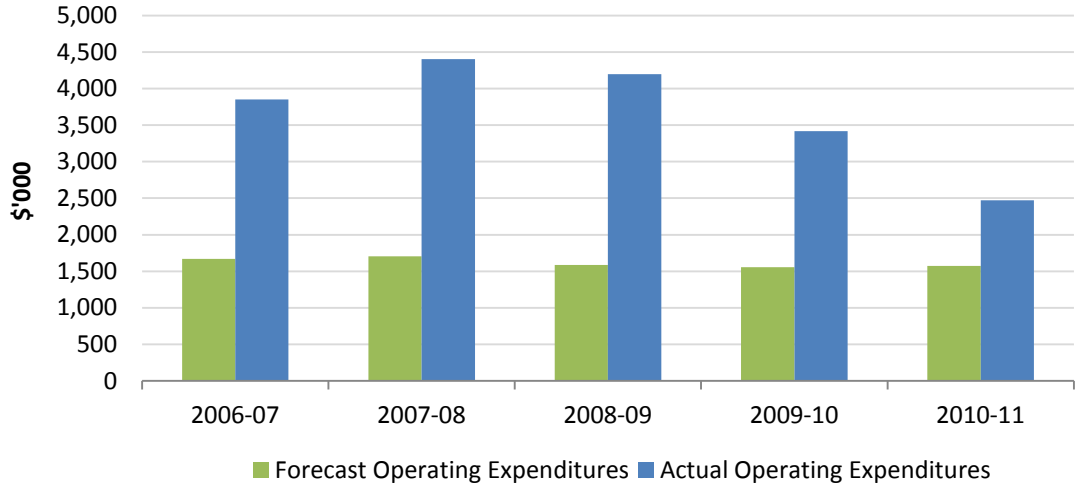
Authority's Analysis

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 forecast. 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 in 2005-06. A comparison of forecast and actual operating costs for the Burdekin-Haughton WSS is shown in Figure 5.3. For this scheme, SunWater's actual operating costs were $10.2 million above Indec's forecast efficient operating costs. 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 $'000)



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 has 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, and 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 5.4). 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 total direct labour costs (DLCs) be used to allocate non-direct costs between service contracts.

Total non-direct costs and those allocated to the Burdekin-Haughton WSS are in Table 5.4 below.

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
Burdekin-Haughton WSS	1,854	2,468	2,453	1,655	1,270	1,896	1,903	1,899	1,844	1,777	2,160

Source: SunWater (2011ap).

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

BRIAIC (2011a) noted that the percentage of non-direct costs increases throughout the price path when compared to direct costs of labour, electricity, materials, contractors and other, excluding static electricity costs,

CANEGROWERS (2011b) questioned whether SunWater is incurring higher non-direct costs due to complying with higher standards (for example, fencing and removal of drop boards) than is necessary for irrigation supply due to its service of the mining industry. If so, CANEGROWERS considers that any non-direct costs necessary to meet this higher standard be met by mining customers only.

BRIAIC (2011a) submitted that SunWater should define the cost efficiency gains due to centralising procurement activities. Specifically, SunWater should specify the labour/overhead costs applied to the scheme prior to centralisation and after centralisation. Considerably more information on how optimised procurement occurs within the region is required.

BRIAIC (2011a) submitted that the key issue is to compare and justify the annual $5.3 million dollars of non-direct costs that SunWater propose to allocate to the scheme. BRIAIC questioned whether this level of expenditure is efficient. The data presented in SunWater's NSP's shows that non-direct represents 57% of total costs for the coming price path which, by any business standard, is exceedingly high.

BRIAIC (2011b) submitted that SunWater's proposed cost allocation methodology is not appropriate and support an investigation of an alternative approach, as undertaken by Deloitte Touche Tohmatsu (Deloitte).

LBW (2010, 2011) submitted that allocating non-direct costs on the basis of WAE would result in a large allocation of costs to LBW, as LBW currently accounts for almost half of the irrigation use in the scheme.

LBW considers that a key regulatory pricing principle is that prices should be cost-reflective and reflect the costs of providing the service. LBW submitted that the previous allocation of lower bound on the basis of converted nominal allocations would not reflect actual costs as LBW accounts for only two out of 369 customers in the scheme.

Therefore, LBW submitted that allocating non-direct costs on the basis of WAE is unlikely to represent efficient costs where there are large customers such as LBW.

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 response to BRIAIC submission that the percentage of non-direct costs is too high, from the perspective of least cost service delivery, it is the total cost that is most relevant - rather than any particular non-direct to direct cost ratio.

In seeking to establish prudency and efficiency, the Authority commissioned 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 real terms) 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.[3]

In response to CANEGROWERS and BRIAIC's submissions that non-direct costs need investigation, the Authority accepts the recommendations made by Deloitte.

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

[3] 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.

$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 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).

In response to BRIAIC and LBW's submissions regarding allocation of non-direct costs, the Authority, on the basis of Deloitte's recommendations, concludes that no alternative CAB is superior to DLC and that the introduction of any alternative would likely be costly and complex.

On this basis, 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).

This adjustment ensures that schemes are paying for the overhead costs from those resource centres that 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 Burdekin-Haughton WSS (from all customers) is set out in Table 5.5 below. 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	1,854	2,468	2,453	1,655	1,270	1,896	1,903	1,899	1,844	1,777	2,160
Authority	-	-	-	-	-	-	1,846	1,819	1,740	1,653	1,945

Source: SunWater (2011ap).

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. 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: 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	1,455	1,599	1,318	1,155	819	1,089	1,099	1,100	1,101	1,102	1,102
Electricity	59	62	67	69	84	83	98	106	114	124	134
Preventive Maintenance	220	116	122	137	110	146	148	148	149	150	150
Corrective Maintenance	262	156	235	404	187	126	113	114	115	116	116
Total	**1,997**	**1,933**	**1,743**	**1,764**	**1,200**	**1,443**	**1,458**	**1,469**	**1,479**	**1,492**	**1,502**

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)

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	672	981	981	749	513	820	832	832	832	832	832
Electricity	59	62	67	69	84	83	98	106	114	124	134
Contractors	110	105	79	174	146	76	62	63	64	65	65
Materials	210	178	167	246	84	111	113	114	116	118	118
Other	945	608	448	527	373	353	353	353	353	353	353
Total	**1,997**	**1,933**	**1,743**	**1,764**	**1,200**	**1,443**	**1,458**	**1,469**	**1,479**	**1,492**	**1,502**

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).

Other Stakeholders

BRIAIC (2011a) submitted that the NSP does not adequately define the operation cost impact associated with compliance and how efficiencies will be gained given lower forecast operational direct costs.

BRIAIC (2011a) submitted that SunWater's Third Party Certification for ISO 9001, 4801 and 14001 (Quality, Safety and Environment respectively) is not required by any Act or Regulation. BRIAIC submit that if third party certification is not legislatively required to operate the scheme, but is held to qualify for commercial contracts such as mining operations or large scale service contracts, then the associated should not be included in price path calculations.

BRIAIC (2011a) submitted that SunWater infer in its NSP that the Work Instructions have been reviewed for optimal efficiency and contain work unit quantities. BRIAIC request that SunWater provides copies of or access to Work Instructions for review. These instructions should include the "quantities of work" required and the referenced unit costs as stated in the NSP.

BRIAIC (2011a) submitted that the NSP does not define the actual results for current price path operations, nor does it review the cost associated with meeting these standards. SunWater should include service standard result data for review and contrast these to operating costs.

Authority's Analysis

The Authority engaged Arup to review the prudency and efficiency of SunWater's proposed direct operating expenditure for this scheme. Arup noted that there were substantial information deficiencies that prevented Arup from determining whether SunWater's forecast operational expenditure is prudent and efficient.

Arup reported that SunWater's systems were not specifically designed for the provision of information to assess prudency and efficiency and that the information provided by SunWater did not sufficiently enable costs to be aligned with specific service obligations. Further, there have been numerous operational and procedural changes to SunWater make the extraction and reconciliation of such information difficult.

In Arup's view, the information provided by SunWater did not afford the ability to 'drill down' into costs to adequately review prudency and efficiency; hence the assessment of direct operating expenditure was limited to processes, procedures and trends.

Arup concluded that SunWater's policy and procedural documents are broadly consistent with industry practice, and SunWater has demonstrated the adoption and integration of these into its management system.

Arup acknowledged that SunWater is continually reviewing policies and procedures to take account of changed market conditions, with the aim of streamlining operations across the organisation. While in some instances observing such changes from a regional perspective may give the impression that the changes are inefficient, Arup considered that when observed from a state wide perspective, significant efficiencies are being made.

The information Arup analysed shows the general trends in operational costs but does not associate costs directly with work orders. However, Arup found that operational cost can be justified given historic trends. SunWater has demonstrated prudency and efficiency in its policies and procedures in maintaining its desired level of service. On this basis, Arup concluded that forecasts are in line with historic actual costs but could not state whether the costs are prudent and efficient.

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.

Arup'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 relate to the day to day operational activity (other than maintenance) enabling water delivery, customer management, asset management planning, financial and ROP reporting, workplace health and safety (WHS) 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 5.6. SunWater noted that recreation facilities at Burdekin Falls Dam continue to be operated and maintained by SunWater.

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

	2011-12	*2012-13*	*2013-14*	*2014-15*	*2015-16*
	$'000	$'000	$'000	$'000	$'000
Recreational Facility Cost	366	381	433	388	432

Source: SunWater (2011).

Other Stakeholders

LBW (2011) note that total operating costs account for 87% of relevant lower bound costs, of which operations dominate (71% of total costs).

BRIAIC (2011a) submitted that meter reading costs are not defined. SunWater should define meter reading costs and the projected savings from customer entered meter reads, or other processes such as technology improvements that will reduce these costs.

The following submissions were made regarding recreational costs:

(a) CANEGROWERS (2011b) submitted that prices should recover only the bare minimum of recreational costs and not decisions that SunWater has made to be a good corporate citizen. These costs should be paid by SunWater not by growers;

(b) CANEGROWERS (2011b) submitted that the $400,000 per year recreation costs submitted by SunWater is very high given the remote facility and small recreation facilities. CANEGROWERS question whether water treatment costs for Clare, Millaroo and Dalbeg are included in the NSP. CANEGROWERS claim that it is cheaper to truck clean water into dam than having water treatment plants;

(c) BRIAIC (2010) submitted that recreational costs should not be recovered from SunWater customers, but from the communities that benefit from the use of recreational facilities and services. SunWater should develop a strategy for its recreational areas that would enable a discussion with paying customers on the appropriate direction policy to employ these assets, whether it be, user pays charging, handing over the responsibility or maintaining current arrangements;

(d) BRIAIC (2011a) sought for SunWater to define its position on recreational activities. They submitted the costs shown in the NSP do not define the function or objective of this cost pool, nor do they separate operational from capital costs; and

(e) BRIAIC (2011b) submitted that recreational costs indicated in the NSP should not be allocated to the scheme. If SunWater are unable to shift these facilities to local Council operations then they should either scale down the level of the facility or initiate a user pays system to recover the costs required to maintain these facilities.

Authority's Analysis

Arup's Review

Arup noted that SunWater did not provide documentation detailing the processes undertaken in developing operations cost forecasts. Arup considered that the key drivers are:

(a) WHS;

(b) environmental obligations (ROL and ROP); and

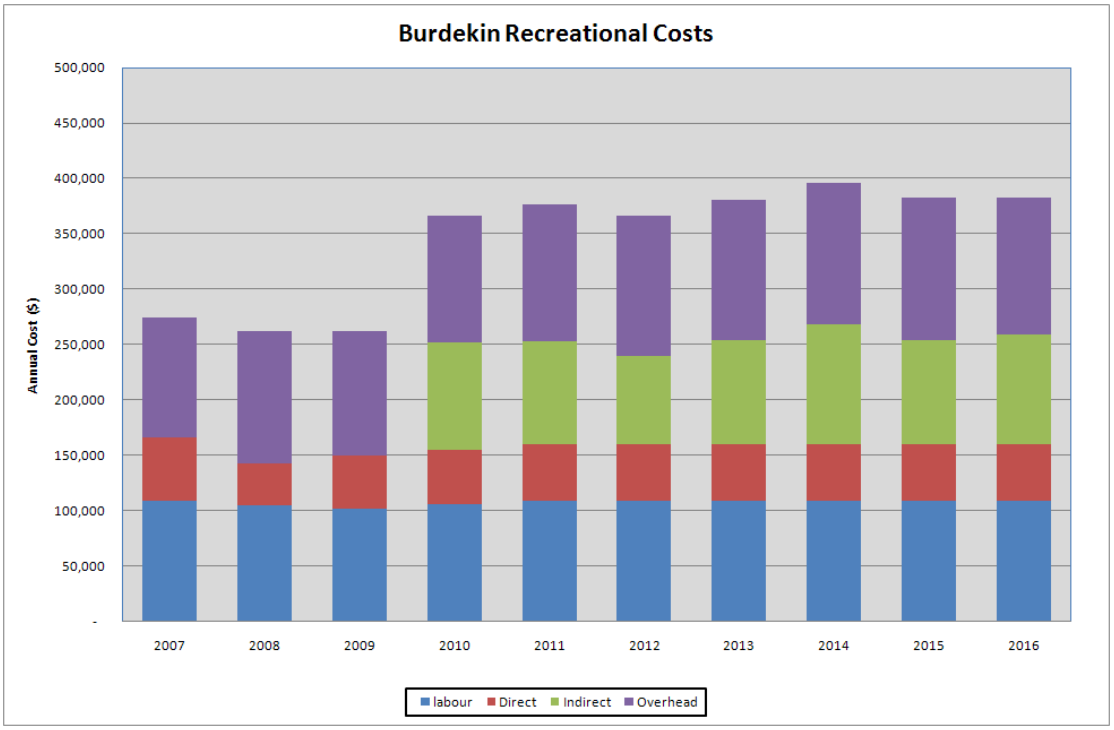
(c) dam safety obligations.

Arup noted that SunWater, given the size and nature of the organisation is required to be vigilant in meeting the above obligations. More broadly, Arup found that the implementation of the SLFI review has reduced costs at the regional level.

In relation to recreation costs, Arup found that SunWater's recreation provision activities include clearing grass, signage, maintaining facilities and managing health and safety. Arup found that direct and labour recreation costs are not projected to increase significantly above 2009-10 expenditures. However, since 2009-10, SunWater has included a non-direct component in total recreation costs.

Figure 5.4 shows total recreation costs for the Burdekin-Haughton WSS.

Figure 5.4: Recreation Costs



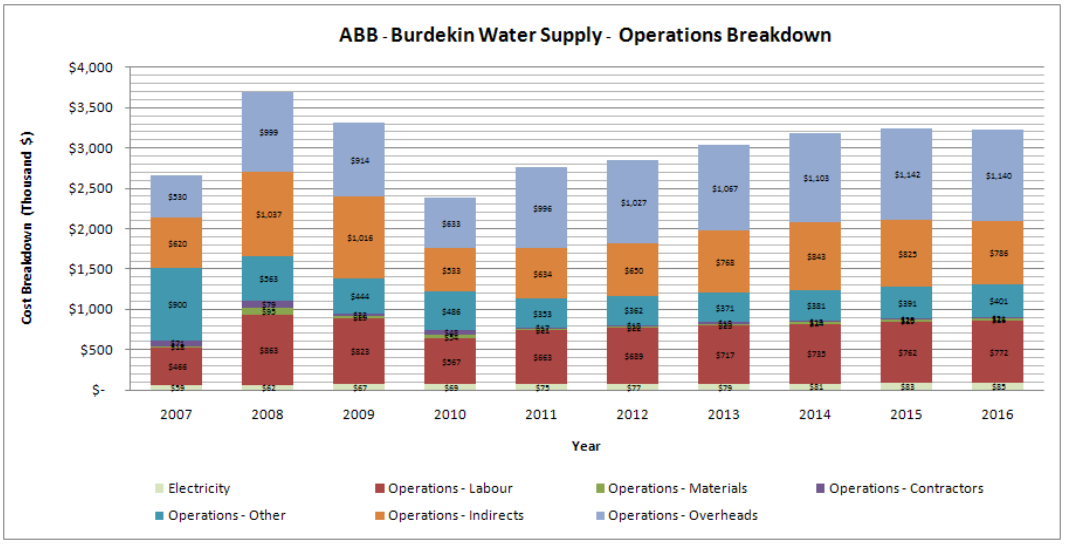
Note: Arup's review was based on NSP data not the October 2011 SunWater cost estimates. Source: Arup (2011).

SunWater did not provide a further breakdown of recreation costs to allow an understanding of the relationship between the recreation activities and the recreation costs. Therefore, Arup were unable to determine whether the recreation costs are either prudent or efficient.

Arup acknowledge the contention regarding whether these costs should be borne by SunWater customers and noted SunWater's efforts to hand over responsibility [and costs] of recreational areas to relevant councils to reduce costs.

Figure 5.5 shows SunWater's operations costs in the Burdekin-Haughton WSS.

Figure 5.5: Operations Cost Breakdown



Note: Arup's review was based on NSP data not the October 2011 SunWater cost estimates. Source: Arup (2011).

Arup noted that biggest component of general operations costs relate to water management and scheme management.

Implementation of the SLFI review has reduced labour costs in 2009-10 and 2010-11 compared with 2008-09 and 2007-08. Arup noted that the introduction of the ROP has increased compliance and health and safety obligations.

Arup did not recommend any adjustments to the SunWater's operations costs.

Conclusion

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 Arup did not recommend any adjustments to SunWater's operations costs, including recreation costs. On this basis, the Authority has not specifically adjusted SunWater's recreation cost forecast. The Authority notes that the consultants engaged to review operations costs in other SunWater schemes (Halcrow (2011), GHD (2011) and Aurecon (2011)) also did not recommend any adjustment to operations costs.

Further, SunWater's forecast operations costs are approximately 13% lower than 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 5.6.

Other Stakeholders

No other stakeholders have commented on this item.

Authority's Analysis

Arup's Review

Arup noted that SunWater engaged PB to consider SunWater's preventive maintenance program. PB found that the baseline preventive maintenance cost for future periods will need to be higher than historic levels to enable the entire program to be completed, but PB did not consider whether the baseline costs are prudent and efficient.

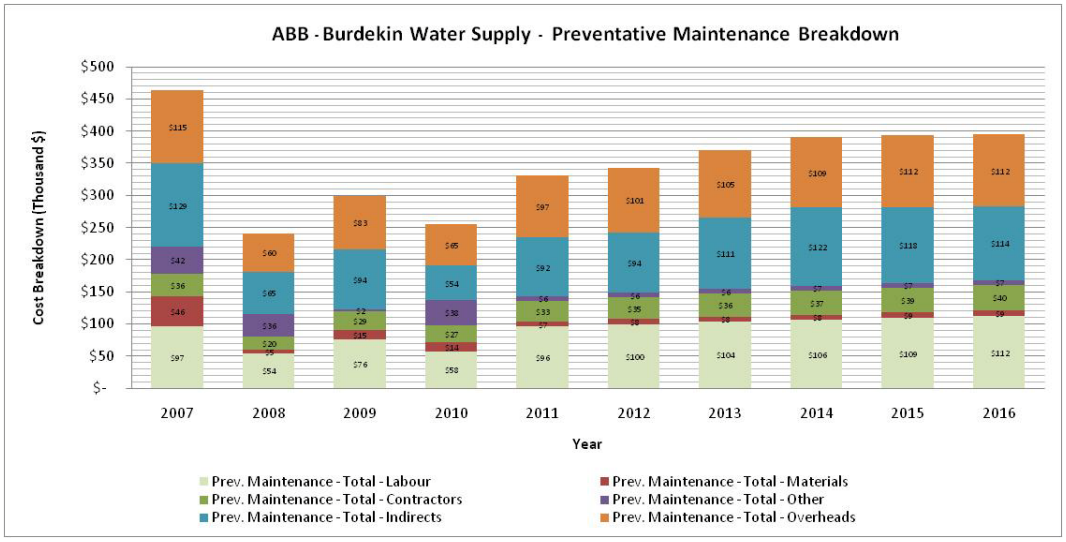
Arup requested SunWater to explain how the PB report outcomes were incorporated into the preventive maintenance forecasts, as Arup noted that SunWater's preventive maintenance forecasts exceed PB proposed costs. Arup were unable to source sufficient information to allow them to verify how PB's revised forecasts were integrated into SunWater's forecasts.

PB recommended that SunWater adopt a reliability centred maintenance (RCM) approach to optimise the ratio of preventive and maintenance activities. SunWater did not provide Arup with the status of any RCM approach, but Arup noted that the ratio of forecast preventive maintenance costs to corrective maintenance costs has altered from past years.

Arup concluded that without SunWater adopting a RCM approach, classifying the preventive maintenance and corrective maintenance forecast expenditures as efficient is not possible.

Figure 5.6 shows the preventive maintenance breakdown in the Burdekin-Haughton WSS.

Figure 5.6: Preventive Maintenance Breakdown



Note: Arup's review was based on NSP data not the October 2011 SunWater cost estimates. Source: Arup (2011).

Arup noted SunWater's contention that future preventive maintenance is likely to increase to compensate for reduction in corrective maintenance.

Arup did not recommend any adjustments to the SunWater's preventive maintenance costs.

Conclusion

The Authority notes that Arup did not recommend any adjustments to SunWater's preventive maintenance costs.

In Volume 1, the Authority noted that most of its consultants considered that 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 RCM approach to formulating maintenance activity requirements should be adopted.

SunWater's forecast annual preventive maintenance costs are approximately 6% higher than over 2006-11. The Authority notes SunWater's contention that the increase in preventive maintenance forecast costs are offset by a decrease in corrective maintenance costs. Further, the Authority notes that corrective maintenance costs are forecast to decrease by 54%, with overall maintenance costs forecast to decrease by 32%.

Given the large overall maintenance forecast cost reductions, the Authority has not adjusted SunWater's proposed 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 which refers to maintenance that 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 which refers to maintenance that 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 5.6.

Other Stakeholders

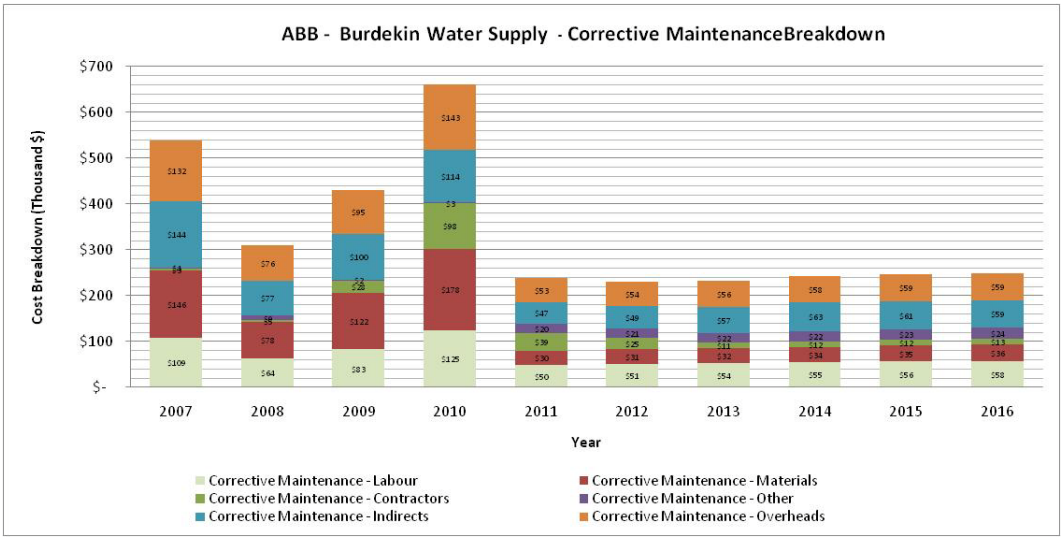
No other stakeholders have commented on this item.

Authority's Analysis

Arup's Review

Arup noted that corrective maintenance expenditure overall is forecast to reduce by 50 %. Figure 5.7 shows the corrective maintenance costs in the Burdekin-Haughton WSS.

Figure 5.7: Corrective Maintenance Breakdown



Note: Arup's review was based on NSP data not the October 2011 SunWater cost estimates. Source: Arup (2011).

Arup did not recommend any adjustments to the SunWater's corrective maintenance costs.

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.

The Authority notes that Arup did not recommend any adjustments to SunWater's preventive maintenance costs.

SunWater's forecast corrective maintenance costs are approximately 54% lower than over 2006-11. Given the SunWater forecast that total maintenance costs will decrease by 32%, the Authority has not adjusted SunWater's proposed preventive maintenance expenditure.

Item 4: Electricity

Stakeholder Submissions

SunWater

Electricity is used to pump water and operate major items of infrastructure.

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

Authority Analysis

Arup's Review

Arup did not specifically review electricity costs, but did note that SunWater has undertaken extensive analysis of whether to use contestable or franchise tariffs. SunWater's conclusion for this scheme is to retain a franchise tariff.

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 5.9.

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.

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 Burdekin-Haughton WSS is set out in Table 5.9.

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 5.9: Direct Operating Costs (Real $'000)

	SunWater					***Authority***				
	2012-13	***2013-14***	***2014-15***	***2015-16***	***2016-17***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Operations	1,099	1,100	1,101	1,102	1,102	1,065	1,067	1,069	1,072	1,073
Electricity	98	106	114	124	134	87	91	95	100	105
Preventive Maintenance	148	148	149	150	150	143	144	145	146	146
Corrective Maintenance	113	114	115	116	116	109	110	111	112	112
Total	**1,458**	**1,469**	**1,479**	**1,492**	**1,502**	**1,404**	**1,412**	**1,421**	**1,429**	**1,435**

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 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).

5.5 Cost Allocation According to WAE Priority

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

No other stakeholders have submitted on this matter.

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 Burdekin-Haughton 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 5.10. The Authority's recommended operating costs are set out in Table 5.11.

Table 5.10: SunWater's Proposed Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	682	682	682	682	682
Materials	18	18	18	18	18
Contractors	47	48	49	49	49
Other	352	352	352	352	352
Non-direct	1,420	1,481	1,438	1,376	1,353
Preventive Maintenance					
Labour	99	99	99	99	99
Materials	34	35	35	36	36
Contractors	14	14	14	14	14
Other	1	1	1	1	1
Non-direct	205	214	208	199	195
Corrective Maintenance					
Labour	51	51	51	51	51
Materials	11	11	11	11	11
Contractors	51	52	53	54	54
Other	0	0	0	0	0
Non-direct	108	112	109	104	103
Electricity	98	106	114	124	134
Total	**3,192**	**3,275**	**3,234**	**3,171**	**3,153**

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 5.11: The Authority's Recommended Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	661	665	670	674	679
Materials	46	46	46	47	46
Contractors	17	17	17	17	17
Other	341	338	336	333	330
Non-direct	1,383	1,419	1,357	1,278	1,235
Preventive Maintenance					
Labour	96	96	97	98	98
Materials	13	13	13	14	13
Contractors	33	33	34	34	34
Other	1	1	1	1	1
Non-direct	200	205	196	185	178
Corrective Maintenance					
Labour	49	50	50	50	51
Materials	50	50	51	51	50
Contractors	10	10	10	10	10
Other	0	0	0	0	0
Non-direct	105	108	103	97	94
Electricity	84	87	91	95	99
Total	**3,089**	**3,140**	**3,072**	**2,983**	**2,937**

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 CPI. Interim prices in 2011-12 were increased by CPI with additional increases in some schemes.

For this scheme, prices over 2006-11 were increased by CPI. In 2011-12, prices in this scheme were also 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 Burdekin-Haughton 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 Burdekin-Haughton WSS ($/ML)

	Actual Costs						***Future Costs***				
	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
SunWater's Submitted Costs	4,570	5,547	5,327	4,616	3,878	3,924	4,066	4,140	4,089	4,027	4,009
Renewals Annuity	984	1,383	1,381	1,407	1,564	978	969	960	950	951	951
Operating Costs	3,667	4,248	4,045	3,307	2,396	3,041	3,192	3,275	3,234	3,171	3,153
Revenue Offsets	-81	-84	-99	-98	-82	-95	-95	-95	-95	-95	-95
Authority's Total Costs	-	-	-	-	-	-	3,765	3,807	3,728	3,643	3,582
Renewals Annuity	-	-	-	-	-	-	769	759	748	753	737
Operating Costs	-	-	-	-	-	-	3,089	3,140	3,072	2,983	2,937
Revenue Offsets	-	-	-	-	-	-	-95	-95	-95	-95	-95
Return on Working Capital	-	-	-	-	-	-	3	3	3	3	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 Burdekin-Haughton WSS.

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; and

(d) 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 WSS, 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 Burdekin-Haughton WSS, Indec recommended 93% of costs should be fixed and 7% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 17% of costs in the fixed charge and 83% 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

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Net Fixed Costs	3,495	3,534	3,460	3,382	3,325
High Priority	490	495	485	475	467
Medium Priority	2,179	2,203	2,157	2,108	2,072
Distribution Losses	826	835	818	799	786

Note: Net fixed costs are net of revenue offsets and return on working capital. Source: Actual Costs (SunWater, 2011ap) and Total Costs (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 76.3% 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 Burdekin-Haughton WSS ($/ML)

	Actual Prices						*Cost Reflective Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	3.75	3.85	3.94	4.04	4.14
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.47	0.49	0.50	0 51	0.52

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

6.7 Queensland Government Pricing Policies

As noted above, the Queensland Government has directed 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.

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 this scheme, current revenues are above the level required to recover prudent and efficient costs (Table 6.4). Therefore, the Authority is required to recommend prices that maintain revenues in real terms for the 2012-17 regulatory period.

Table 6.4: Comparison of Current Prices and Cost-Reflective Prices (Real $2012-13)

Tariff Group	*2010-11 Prices (indexed to $2012-13)*		*Irrigation WAE (ML)*	*Water Use (ML)*	*Current Revenue*	*Revenue from Cost-Reflective Tariffs*	*Difference*
	Fixed	*Variable*					
River	$2.44	$14.36	423,944	230,628	$4,345,631	$1,701,273	$2,644,358

Note: Irrigation WAE does not include free water (see Chapter 3). Source: SunWater (2011al), SunWater (2011ao) and QCA (2011).

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the Burdekin-Haughton WSS for 2012-17 are outlined in Table 6.5, 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 6.5: Draft Medium Priority Prices for the Burdekin-Haughton WSS ($/ML)

	Actual Prices						*Recommended Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	9.92	10.17	10.42	10.68	10.95
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.47	0.49	0.50	0 51	0.52

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).

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.

Asset	*Year*	*Description*	*Value ($'000)*
Blue Valley Weir	2011-12	Investigate future management options fo	16
Burdekin Falls Dam	2011-12	Study: 5yr Dam Comprehensive inspection (by 1 Jun 2012)	89
		Refurbish:Recondition or Replace Sump Pump and Fittings	19
		Survey of Downstream Anchor Zone - Burdekin Falls Dam	12
	2012-13	Study: 5yr Dam Comprehensive inspection (Review of EAPs, O&M, SOPs)	25
		Refurbish Trash Racks - paint and refurbish - rolling program	14
	2013-14	Replace Batteries, Saft	31
		Refurbish lower gallery and external raw water pipework	25
		Replace Reduction Gearbox	19
		10BRI09-BFD REFURB POOL -PAINT LINING	12
	2014-15	10BRI01-BFD POLE & AERIAL TREATMENT 5YR	51
		INVESTIGATION CONTAMINATED LAND SITES	26
		Refurbish Alternator System - change out batteries (NiCd - consider Pb), charger, electrics, alternator overhaul	19
	2015-16	10BRI08-BFD CARAVAN PARK ELEC SERVICES	49
	2016-17	Refurbish Liner - paint steel lining of outlet penstocks (Blog) (contract)	93
		Study: 5yr Dam Comprehensive inspection (by 1 Jun 2012)	93
		Replace Reflux Valve	50
		11BRIXX - Burdekin Falls Dam - Caravan P	44
		Replace Cabling & Busduct (Lighting Ups)	31
		Replace No.1 Ws Pump Unit - Pump	20
	2017-18	Replace Uninterruptable Power Supply	36
		Change out UPS - replace UPS & batteries	30
		Study: 5yr Dam Comprehensive inspection (Review of EAPs, O&M, SOPs)	25
		Study:Options analysis for Control and HV Replacment or Refurbishment strategy	25
		Replace Air Conditioner, 8.1Kw Mitsubishi	20
		Refurbish HV Supply - replace poles, crossarms & hardware as required, township supply, decommission as possible	20
		Refurbish:Recondition or Replace Sump Pump and Fittings	20
		Replace Surge Protection	17
		10BRI09-BFD REFURB POOL -PAINT LINING	13
	2018-19	Replace Ventilation Fan-Lower	62
		Replace Ventilation Fan-Upper	62
		Refurbish Metalwork - refurbish metalwork and paint fixed wheel gate & bulkhead gate	48
		Replace Batteries, Saft	31
		Replace All Manual Call Points	25
		Refurbish Trash Racks - paint and refurbish - rolling program	14
		Replace All Fire Detectors	12
		Replace All Smoke Detectors	12
		Replace Fire Indicator Panel	12
	2019-20	Replace Fire Alarm System	151
		10BRI01-BFD POLE & AERIAL TREATMENT 5YR	52
		10BRI05-BFD FW GATE HOIST 10YR INSP	16
		Replace Security Fencing & Gates	14
		Replace Pump, 75Mm Submersible Flygt	11

Asset	*Year*	*Description*	*Value ($'000)*
	2020-21	Study: 20yr Dam Safety Review (by 1 Jun 2021)	131
	2021-22	Refurbish Gate - paint, seals & bearing replacement, remove from structure - one gate at a time (Blog)	137
		Study: 5yr Dam Comprehensive inspection (by 1 Jun 2012)	93
		10BRI08-BFD CARAVAN PARK ELEC SERVICES	49
		Refurbish: Lighting & power distribution system repairs and corrective actions as per O&M report on the Dam Wall lower gallery lighting.	43
		Replace Lighting & Cabling	31
		Refurbish lower gallery and external raw water pipework	25
		10BRI09-BFD REFURB POOL -PAINT LINING	13
		Study:Options Analysis RE Replacement of Cable	12
		Survey of Downstream Anchor Zone - Burdekin Falls Dam	12
	2022-23	Replace Main Cabling (HV System)	2,867
		11BRIXX - Burdekin Falls Dam - Caravan P	44
		Study: 5yr Dam Comprehensive inspection (Review of EAPs, O&M, SOPs)	25
	2023-24	Replace cable (2024)	2,547
		Refurbish Crane - Electrical overhall long travel drives, major mech maintenance, paint including cable replacement.	49
		Replace Batteries, Saft	31
		09BRI16-BFD RADIAL GATES HYD SYSTEM	25
		Refurbish:Recondition or Replace Sump Pump and Fittings	20
		Replace Fire Suppression System	16
	2024-25	Balance of Replacement Costs two year split	612
		Replace INTRUDER SURVEILLANCE SYSTEM	56
		10BRI01-BFD POLE & AERIAL TREATMENT 5YR	52
		Refurbish Metalwork - refurbish metalwork and paint fixed wheel gate & bulkhead gate	48
		Refurbish Alternator System - change out batteries (NiCd - consider Pb), charger, electrics, alternator overhaul	18
		10BRI02-BFD REFURB No 2 RAW WATER PUMP	17
		Refurbish Trash Racks - paint and refurbish - rolling program	13
	2025-26	Refurbish:Replace Radial Gate Seals - Major periodic Maintenance	27
		Refurbish BGTE - paint and replace seals	18
		10BRI09-BFD REFURB POOL -PAINT LINING	12
	2026-27	Study: 5yr Dam Comprehensive inspection (by 1 Jun 2012)	92
		Replace Suction Valve	61
		Replace Earthing System	50
		Replace Discharge Valve	49
		Replace Fall Arrest Safety Device	14
	2027-28	Replace Water Supply	824
		Replace Control Equipment	541
		Replace Main Switchboard	295
		Refurbish Hoist - major mech/elec overhaul - access difficulties for removal	61
		10BRI08-BFD CARAVAN PARK ELEC SERVICES	49
		Replace Alternator	40
		Study: 5yr Dam Comprehensive inspection (Review of EAPs, O&M, SOPs)	25
		Replace Air Conditioner, 8.1Kw Mitsubishi	20
	2028-29	11BRIXX - Burdekin Falls Dam - Caravan P	44
		Replace Batteries, Saft	31
		Replace Valves, Pipes & Fittings	25
	2029-30	10BRI01-BFD POLE & AERIAL TREATMENT 5YR	52
		Refurbish lower gallery and external raw water pipework	24

Asset	*Year*	*Description*	*Value ($'000)*
		Refurbish:Recondition or Replace Sump Pump and Fittings	20
		10BRI09-BFD REFURB POOL -PAINT LINING	19
		Replace Surge Protection	17
		10BRI05-BFD FW GATE HOIST 10YR INSP	16
	2030-31	Refurbish Metalwork - refurbish metalwork and paint fixed wheel gate & bulkhead gate	48
		0	43
		Repair Radial Gate No. 3 Frame Corrosion	38
		11BRIXX - Replace/reinstate missing and	15
		Refurbish Trash Racks - paint and refurbish - rolling program	14
	2031-32	Refurbish Liner - paint steel lining of outlet penstocks (Blog) (contract)	92
		Study: 5yr Dam Comprehensive inspection (by 1 Jun 2012)	92
		Replace Switchboard, 415V	61
		Survey of Downstream Anchor Zone - Burdekin Falls Dam	12
	2032-33	Replace Building Structure	177
		Change out UPS - replace UPS & batteries	29
		Study: 5yr Dam Comprehensive inspection (Review of EAPs, O&M, SOPs)	25
	2033-34	Replace Ventilation Fan-Lower	61
		Replace Ventilation Fan-Upper	61
		10BRI08-BFD CARAVAN PARK ELEC SERVICES	49
		Replace Batteries, Saft	31
		Replace All Manual Call Points	25
		10BRI09-BFD REFURB POOL -PAINT LINING	12
		Replace All Fire Detectors	12
		Replace All Smoke Detectors	12
		Replace Fire Indicator Panel	12
	2034-35	Refurbish Hoist - major mech/elec overhaul - access difficulties for removal	61
		10BRI01-BFD POLE & AERIAL TREATMENT 5YR	52
		11BRIXX - Burdekin Falls Dam - Caravan P	44
		Refurbish Alternator System - change out batteries (NiCd - consider Pb), charger, electrics, alternator overhaul	18
		Study: Options analysis to review radial gate hydraulics refurbishment/replacement	18
	2035-36	11BRI44 Replace Disk Brake Arrangement.	31
		Refurbish:Recondition or Replace Sump Pump and Fittings	20
Burdekin Falls Dam Sewerage Tp	2023-24	Refurbish operational unit, tender decomissioned by tender.	62
Burdekin Falls Dam Wtp		09BRI86-BFD WT PLANT TELEMETRY EQPT	12
	2026-27	Replace Motor	12
	2027-28	Replace Water Treatment Plant	172
	2029-30	Refurbish: Install liner into 1 corroded clear water storage tank to prevent further leaks and deterioration of tank	18
Burdekin River Distribution	2021-22	Replace Display Unit, Siemens	12
	2026-27	Replace Display Unit, Siemens	12
	2031-32	Replace Display Unit, Siemens	12
Clare Weir	2011-12	Refurbish: Completion of refurbishment of Clare Weir Fishlock	273
		Refurbish DC System - NiCad battery & charger replacement including hydraulic controls	30
		Remove trees from upstream and downstrea	20
		11BRIXX - Weir Inspection and Condition	17
	2012-13	Replace Control Equipment	89
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend	74

Asset	*Year*	*Description*	*Value ($'000)*
		$3M replacement from 2016 to 2036	
	2013-14	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	76
		Replace Plc	63
	2014-15	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	75
		Replace Pc	63
	2015-16	Replace Valve Control Equipment	103
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	75
		Replace Control Panel	37
		Study: Failure Impact Assessment: Regula	13
	2016-17	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Hoist	31
		Options analysis to review hydraulic system requirements and refurbishment strategy	25
		Replace Cylinder C001 At Gate 1	25
		Replace Cylinder C002 At Gate 2	25
		Replace Cylinder C003 At Gate 3	25
		Replace Cylinder C004 At Gate 4	25
		Replace Cylinder C005 At Gate 5	25
		Replace Cylinder C006 At Gate 6	25
		Replace Cylinder C007 At Gate 7	25
		Replace Cylinder C008 At Gate 8	25
		Replace Cylinder C009 At Gate 9	25
		Replace Cylinder C010 At Gate 10	25
		Replace Cylinder C011 At Gate 11	25
		Replace Cylinder C012 At Gate 12	25
		Replace Cylinder C013 At Gate 13	25
		Replace Cylinder C014 At Gate 14	25
		Replace Cylinder C015 At Gate 15	25
		Replace Cylinder C016 At Gate 16	25
		Replace Cylinder C017 At Gate 17	25
		Replace Cylinder C018 At Gate 18	25
		Replace Cylinder C019 At Gate 19	25
		Replace Cylinder C020 At Gate 20	25
		Replace Cylinder C021 At Gate 21	25
		Replace Cylinder C022 At Gate 22	25
		Replace Cylinder C023 At Gate 23	25
		Replace Cylinder C024 At Gate 24	25
		Replace Cylinder C025 At Gate 25	25
		Replace Cylinder C026 At Gate 26	25
		Replace Cylinder C027 At Gate 27	25
		Replace Cylinder C028 At Gate 28	25
		Replace Cylinder C029 At Gate 29	25
		Replace Cylinder C030 At Gate 30	25
		Replace Hydraulic Cylinders	25
		Replace Switchboard	21
		Replace Diesel Engine (Main)	19
		Replace Diesel Engine (Stand-By)	19
		11BRIXX - Weir Inspection and Condition	18
	2017-18	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Winch (Complete)	59

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Cylinder At Gate 51	25
		Replace Cylinder At Gate 52	25
		Replace Cylinder At Gate 53	25
		Replace Cylinder At Gate 54	25
		Replace Cylinder At Gate 55	25
		Replace Cylinder At Gate 56	25
		Replace Cylinder At Gate 57	25
		Replace Cylinder At Gate 58	25
		Replace Cylinder At Gate 59	25
		Replace Cylinder At Gate 60	25
		Replace Cylinder C031 At Gate 31	25
		Replace Cylinder C032 At Gate 32	25
		Replace Cylinder C033 At Gate 33	25
		Replace Cylinder C034 At Gate 34	25
		Replace Cylinder C035 At Gate 35	25
		Replace Cylinder C036 At Gate 36	25
		Replace Cylinder C037 At Gate 37	25
		Replace Cylinder C038 At Gate 38	25
		Replace Cylinder C039 At Gate 39	25
		Replace Cylinder C040 At Gate 40	25
		Replace Cylinder C041 At Gate 41	25
		Replace Cylinder C042 At Gate 42	25
		Replace Cylinder C043 At Gate 43	25
		Replace Cylinder C044 At Gate 44	25
		Replace Cylinder C045 At Gate 45	25
		Replace Cylinder C046 At Gate 46	25
		Replace Cylinder C047 At Gate 47	25
		Replace Cylinder C048 At Gate 48	25
		Replace Cylinder C049 At Gate 49	25
		Replace Cylinder C050 At Gate 50	25
		Clare Weir - Refurbish Winch Including Rope Replacement & Electricals	12
	2018-19	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Pc	62
		Refurbish DC System - NiCad battery & charger replacement including hydraulic controls	31
		Replace Cylinder At Gate 61	25
		Replace Cylinder At Gate 62	25
		Replace Cylinder At Gate 63	25
		Replace Cylinder At Gate 64	25
		Replace Cylinder At Gate 65	25
		Replace Cylinder At Gate 66	25
		Replace Cylinder At Gate 67	25
		Replace Cylinder At Gate 68	25
		Replace Cylinder At Gate 69	25
		Replace Cylinder At Gate 70	25
		Replace Cylinder At Gate 71	25
		Replace Cylinder At Gate 72	25
		Replace Cylinder At Gate 73	25
		Replace Cylinder At Gate 74	25
		Replace Cylinder At Gate 75	25
		Replace Cylinder At Gate 76	25
		Replace Cylinder At Gate 77	25
		Replace Cylinder At Gate 78	25

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Cylinder At Gate 79	25
		Replace Cylinder At Gate 80	25
		Replace Cylinder At Gate 81	25
		Replace Cylinder At Gate 82	25
		Replace Cylinder At Gate 83	25
		Replace Cylinder At Gate 85	25
		Replace Cylinder At Gate 86	25
		Replace Cylinder At Gate 87	25
		Replace Cylinder At Gate 88	25
		Replace Cylinder At Gate 89	25
		Replace Cylinder At Gate 90	25
	2019-20	Replace Plc	93
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Cylinder At Gate 100	25
		Replace Cylinder At Gate 101	25
		Replace Cylinder At Gate 102	25
		Replace Cylinder At Gate 103	25
		Replace Cylinder At Gate 104	25
		Replace Cylinder At Gate 105	25
		Replace Cylinder At Gate 106	25
		Replace Cylinder At Gate 107	25
		Replace Cylinder At Gate 108	25
		Replace Cylinder At Gate 109	25
		Replace Cylinder At Gate 110	25
		Replace Cylinder At Gate 111	25
		Replace Cylinder At Gate 112	25
		Replace Cylinder At Gate 113	25
		Replace Cylinder At Gate 114	25
		Replace Cylinder At Gate 115	25
		Replace Cylinder At Gate 116	25
		Replace Cylinder At Gate 117	25
		Replace Cylinder At Gate 118	25
		Replace Cylinder At Gate 119	25
		Replace Cylinder At Gate 120	25
		Replace Cylinder At Gate 91	25
		Replace Cylinder At Gate 92	25
		Replace Cylinder At Gate 93	25
		Replace Cylinder At Gate 94	25
		Replace Cylinder At Gate 95	25
		Replace Cylinder At Gate 96	25
		Replace Cylinder At Gate 97	25
		Replace Cylinder At Gate 98	25
		Replace Cylinder At Gate 99	25
		10BRI06-CLARE WEIR GANTRY CRANE 10YR INS	16
		Replace Flow Meter No 1	12
		Replace Flow Meter No 2	12
	2020-21	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	75
		Replace Cylinder At Gate 121	25
		Replace Cylinder At Gate 122	25
		Replace Cylinder At Gate 123	25
		Replace Cylinder At Gate 124	25
		Replace Cylinder At Gate 125	25

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Cylinder At Gate 126	25
		Replace Cylinder At Gate 127	25
		Replace Cylinder At Gate 128	25
		Replace Cylinder At Gate 129	25
		Replace Cylinder At Gate 130	25
		Replace Cylinder At Gate 131	25
		Replace Cylinder At Gate 132	25
		Replace Cylinder At Gate 133	25
		Replace Cylinder At Gate 134	25
		Replace Cylinder At Gate 135	25
		Replace Cylinder At Gate 136	25
		Replace Cylinder At Gate 137	25
		Replace Cylinder At Gate 138	25
		Replace Cylinder At Gate 139	25
		Replace Cylinder At Gate 140	25
		Replace Cylinder At Gate 141	25
		Replace Cylinder At Gate 142	25
		Replace Cylinder At Gate 143	25
		Replace Cylinder At Gate 144	25
		Replace Cylinder At Gate 145	25
		Replace Cylinder At Gate 146	25
		Replace Cylinder At Gate 147	25
		Replace Cylinder At Gate 148	25
		Replace Cylinder At Gate 149	25
		Replace Cylinder C150 As Spare	25
		Replace Cylinder C151 As Spare	25
		Replace Cylinder C153 As Spare	25
		Study: Failure Impact Assessment: Regula	13
	2021-22	Replace Scada Telemetry System	97
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		11BRIXX - Weir Inspection and Condition	18
	2022-23	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Pc	61
	2023-24	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Batteries (84 Off), Sab Nife	29
	2024-25	Replace hydraulic system (2025)	2,644
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	73
		Replace Light & Power Installation	25
		Replace Distribution Board	13
	2025-26	Refurbish Hydraulics - three year program balance of replacement budget	1,221
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	73
		Refurbish DC System - NiCad battery & charger replacement including hydraulic controls	31
		Refurbish Gantry - Review Lifting Mech, wheel bearings, paint, overhaul hydraulics, diesel engines etc as required	31
		Study: Failure Impact Assessment: Regula	13
	2026-27	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Pc	61
		Replace Plc	61

Asset	*Year*	*Description*	*Value ($'000)*
		11BRIXX - Weir Inspection and Condition	17
		Clare Weir - Gantry Crane Refurbish Winches (drums, ropes, drives etc)	12
		Refurbish Bld - internal ceiling, roof and access repl.	12
	2027-28	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Clare Weir - Refurbish Winch Including Rope Replacement & Electricals	12
	2028-29	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Batteries (84 Off), Sab Nife	29
	2029-30	Replace Actuator, Hydraulic Qld Hydrailics	264
		Replace Hydraulic Powerpack	108
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	73
		10BRI06-CLARE WEIR GANTRY CRANE 10YR INS	16
	2030-31	Replace Valve, 1050Mm Sluice Gordon Marr	170
		Replace Control Cubicle	123
		Replace Valve, 900Mm Sluice Gordon Marr	85
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Pc	61
		Study: Failure Impact Assessment: Regula	13
	2031-32	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Trash Screens	68
		11BRIXX - Weir Inspection and Condition	17
	2032-33	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Refurbish DC System - NiCad battery & charger replacement including hydraulic controls	31
		Refurbish Bld - internal ceiling, roof and access repl.	12
	2033-34	Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Batteries (84 Off), Sab Nife	29
		Replace Fire Suppression System	15
	2034-35	Replace Hydraulic Pipework	221
		Replace Hydraulic System	157
		Replace Plc	92
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Replace Pc	61
		Replace Actuator, Hydraulic Parker	27
		Replace Actuator, Hydraulic Parker	13
		Replace Security Fence	12
	2035-36	Replace Valve Control Equipment	102
		Refurbish: Refurbish 12/15 hydraulic Rams on an annual basis to extend $3M replacement from 2016 to 2036	74
		Study: Failure Impact Assessment: Regula	13
Giru Groundwater Distribution	2019-20	Replace U/Shot Regulating Gate	88
	2029-30	Replace Control Equipment	159
Giru Weir	2011-12	Install Functional Outlet Works for End of System Flow Stg 1 (ROP) - Giru Weir	89
		Install Continuous Time Series Storage Level Option Analysis - Giru Weir Headwater (ROP)	30
	2012-13	Install Functional Outlet Works for End of System Flow Stg 2 (ROP) - Giru Weir	93

Asset	*Year*	*Description*	*Value ($'000)*
Gorge Weir	2011-12	Infill missing dental concrete on D/S Left abutment	18
	2016-17	Investigate and decommission valve	74
	2022-23	Replace Protection Works	245
Healeys Pump Station	2016-17	Replace Actuator, Rotork	33
	2021-22	Replace Gate Control Equipment	66
		Replace Batescrew Gate, 900Mm	19
		Replace Flap Gate, 900Mm	18
	2023-24	11BRIXX- HLPSTN REFURB PUMP & MOTOR	13
	2028-29	Replace Switchboard	34
		Replace General Control Equipment	27
		Replace Cable	24
	2031-32	Replace Actuator, Rotork	33
		Refurbish Cntl - SCADA replacement	25
	2032-33	Replace Pump	104
Reed Beds Pipeline	2019-20	Replace 150 Dia M/O Type Pa (Bahr'S)	12
		Replace Flow Meter 35.0M	12
Reed Beds Pump Station	2013-14	Reed Beds PSTN - Refurbish Pump unit 1 (Seals, bearings, wearing parts, corrosion)	19
	2019-20	Replace Weed Deflector	24
	2028-29	Reed Beds PSTN - Refurbish Pump unit 1 (Seals, bearings, wearing parts, corrosion)	18
	2034-35	Replace Switchboard	54
		Replace Pump Stn Control Equipment	48
Val Bird Weir	2011-12	Upgrade Outlet Works Construct and Commission Stg 1 (ROP) - Val Bird Weir	119
		Install Continuous Time Series Storage Level Monitoring - Val Bird Weir Headwater (ROP)	30
		Refurbish:Reinstate damaged areas of protection works downstream of weir (2010 DS rec)	18
	2012-13	Upgrade Outlet Works Construct and Commission Stg 2 (ROP) - Val Bird Weir	160