QUEENSLAND COMPETITION AUTHORITY

Draft Report

SunWater
Irrigation Price Review: 2012-17
Volume 2
Bundaberg Water Supply Scheme

November 2011

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SUBMISSIONS

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

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

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

Confidentiality

In the interests of transparency and to promote informed discussion, the Authority would prefer submissions to be made publicly available wherever this is reasonable. However, if a person making a submission does not want that submission to be public, that person should claim confidentiality in respect of the document (or any part of the document). Claims for confidentiality should be clearly noted on the front page of the submission and the relevant sections of the submission should be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two copies of each version of these submissions (i.e. the complete version and another existing 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 (WSSs)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 Bundaberg bulk WSS for the 2012-17 regulatory period are outlined in Table 1 together with actual prices since 1 July 2006.

Table 1: Prices for the Bundaberg 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*
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	11.14	11.42	11.70	12.00	12.30
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1 13	1.16	1.18	1.21

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 Bundaberg 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. BUNDABERG WATER SUPPLY SCHEME

1.1 Scheme Description

The Bundaberg water supply scheme (WSS) is located near the towns Bundaberg, Childers and Gin Gin. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the Bundaberg WSS

	Bundaberg WSS
Business Centre	Bundaberg
Irrigation Uses of Water	Sugarcane, tomatoes, rockmelons, watermelons, capsicum, zucchini, beans, macadamia nuts and avocado.
Urban water supplies	Supplies water to Bundaberg as well as communities in the Burnett, Kolan and Isis shires.
Industrial Water Supplies	Sugar mills

Source: Synergies Economic Consulting (2010).

The Bundaberg WSS has a total of 1,109 bulk customers. Medium and high priority water access entitlements (WAEs) are shown in Table 1.2.

Table 1.2: Water Access Entitlements

Customer Group	*Irrigation WAE (ML)*	*Total WAE (ML)*
Medium Priority	*185,689*	*211,957*
High Priority	*0*	*24,372*
Total	*185,689*	*236,329*

Source: SunWater (2011am).

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.

Stakeholder Submissions

SunWater

SunWater submitted that the Bundaberg WSS consists of two sub-schemes: the Kolan River sub-scheme and the Lower Burnett River sub-scheme. The full supply storage capacity and age of key infrastructure is detailed in Table 1.3.

Table 1.3: Bulk Water Infrastructure in the Bundaberg WSS

Storage Infrastructure	*Capacity (ML)*	*Age (years)*
Kolan River sub-scheme:		
Fred Haigh Dam	562,000	35
Bucca Weir	11,600	23
Kolan Barrage	4,020	37
Lower Burnett River sub-scheme:		
Ned Churchward Weir	29,500	12
Ben Anderson Barrage	30,300	34

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

The Kolan River sub-scheme includes:

(a) Fred Haigh Dam, which is the principal bulk water storage in the Bundaberg WSS and lies approximately 75 kilometres from the mouth of the Kolan River;

(b) Bucca Weir, which is a roller-compacted concrete weir that is used to recharge the Kolan Barrage and to supply customers between the weir and the pond of the Kolan Barrage; and

(c) Kolan Barrage, which has a vertical-slot fishway, but no other outlet.

The Lower Burnett River sub-scheme includes:

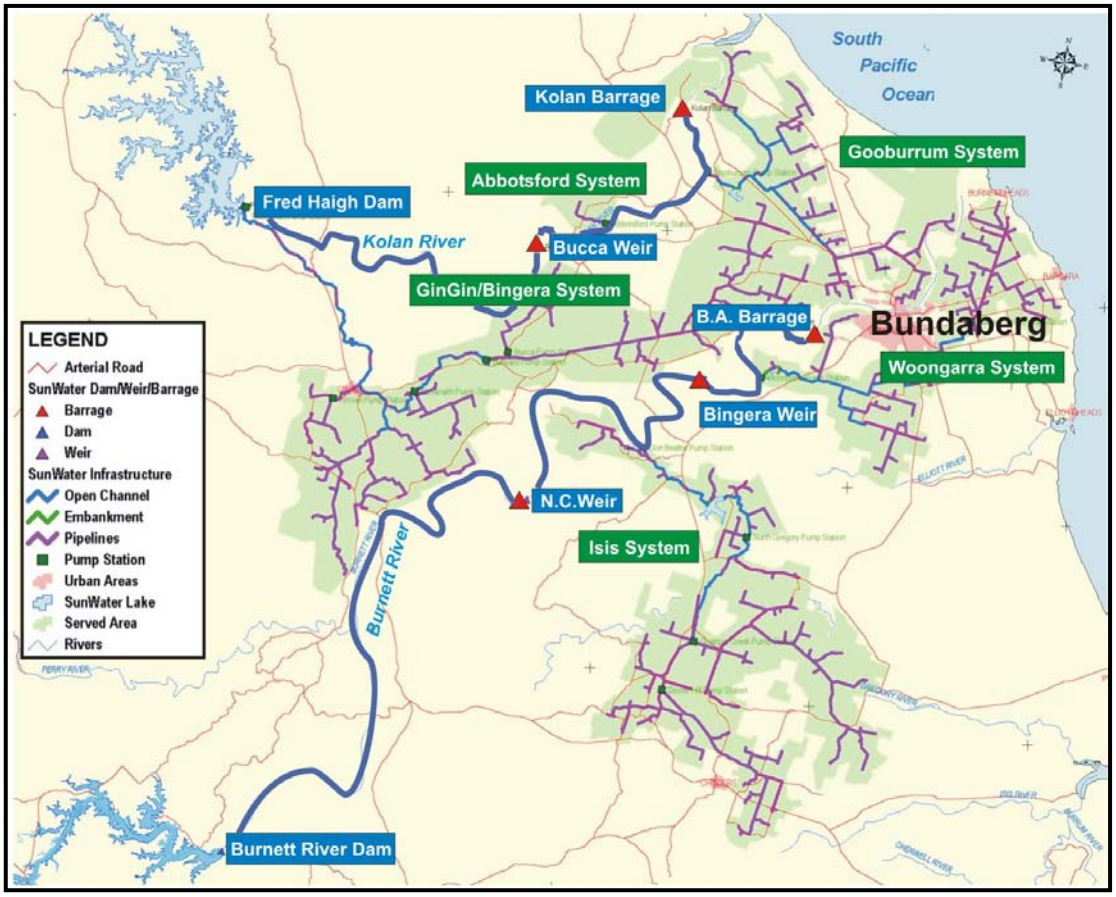
(a) Ned Churchward Weir, which has a fully automated fishlock and includes a small anabranch weir built to prevent the river from deepening at the anabranch;

(b) Ben Anderson Barrage which has a four-gated vertical slot fishway. Each gate is positioned at a different level so that the fishway will meet Resource Operations Plan (ROP) requirements; and

(c) Bingera Weir.

The location of the Bundaberg WSS and key infrastructure is shown in Figure 1.1.

Figure 1.1: Bundaberg WSS Locality Map



Source: SunWater (2011).

Other Stakeholders

In considering scheme assets, stakeholders queried whether:

(a) Bucca Weir is a bulk or distribution asset (Bundaberg Regional Irrigators Group (BRIG, 2011c) and irrigators during the second round of consultations (April 2011);

(b) Bingera Weir is a SunWater asset (BRIG 2011c); and

(c) river customers' meters are a bulk or distribution asset (BRIG, 2010). [It is understood that this query derives from distribution customers who propose they should not pay for river meters in a bundled bulk charge, as only river users benefit from these assets.]

Authority's Analysis

In relation to Bucca Weir, the Resource Operations Plan (ROP) for Bundaberg WSS and the letter from Minister Robertson, dated 28 September 2010, confirms that Bucca Weir is a bulk asset.

Further, SunWater has confirmed that Bingera Weir was mistakenly included in the Bundaberg Network Service Plan (NSP) and that Bingera Weir is not a SunWater asset (email 3 June 2011).

The issue of whether to recover the costs of river meters in a separate component of the bulk charge is addressed in Chapter 5.

1.3 Network Service Plans

The Bundaberg WSS NSP presents SunWater's:

(a) existing service standards;

(b) forecast operating and renewals costs and 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 liaised extensively with SunWater and other stakeholders throughout this review. 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 Draft Reports 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 and national metering standards. Submissions also referred to the merits of recovering recreation management costs from SunWater's customers.

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

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

2. REGULATORY FRAMEWORK

2.1 Introduction

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

During the negotiations that preceded the 2006-11 price path, the Bundaberg 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 Bundaberg WSS:

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

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

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

(d) unplanned frequency of installing and operating pumps to access low storage levels;

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

(f) the availability of chemicals to control submerged weeds and algae in channels; and

(g) outbreak of noxious weeds.

Other Stakeholders

Allocation of Risk

Bundaberg Fruit and Vegetable Growers (BFVG, 2010a) acknowledged that it is difficult to forecast future demand [volume risk] due to varying weather and rainfall events.

ISIS Sugar Partnership (2010) submitted that volume risk should be considered across all schemes as well as within each scheme. ISIS Sugar Partnership indicated that SunWater's volume risk should be measured over the past 20 years, not the past five years.

During the first round of consultations (May 2010), irrigators stated that SunWater has a small revenue risk. They submitted that irrigators bear most of the risk as they are obliged to pay Part A charges regardless of water use.

Support for a Price Cap

Stakeholders supported the continuation of a price cap for the Bundaberg WSS. In particular:

(a) BFVG (2010b) submitted that the price cap arrangement with a fixed Part A of 70% and Part B of 30% has worked well in Bundaberg WSS. They submitted that a price cap is preferred to ensure price stability throughout the regulatory period, whereas under a revenue cap arrangement, prices could be adjusted frequently leading to greater price volatility which may be disruptive and distort the planning of cropping cycles for irrigators;

(b) BRIG (2010e) noted that it preferred a price cap and that if fixed costs are matched to Part A and variable costs matched to Part B, much of the debate relating to the different levels of water use (availability and sales) is removed. BRIG (2010a) also noted that there would not be sufficient interest within the Bundaberg Scheme to adopt a revenue cap; and

(c) CANEGROWERS Isis (2011) noted that while they supported the price cap option, they had concerns with the projected water use figure nominated by SunWater in the NSP.

Other

ISIS Sugar Partnership (2010) stated that the form of regulation should provide sufficient incentive to SunWater to pursue efficiencies in its variable costs.

BRIG (2010) submitted that the pricing system should not prevent later adoption of capacity share or continuous accounting.

2.3 Authority's Analysis

General Risks

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

Consistent with the Authority's allocation of risks (Table 2.1), it is proposed that risks identified by SunWater in items (a), (b), (d), (f) and (g) (in stakeholder submissions above) will 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 the investigation. No levies or charges (e) are to be applied by the Authority as a result of this irrigation price review.

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).

Allocation of Risk

The Authority notes comments by BFVG (2010b) regarding volume risk. The Authority has concluded in Volume 1 that SunWater does not have the ability to manage volume risks and under the current legislation and contractual arrangements (including the Ministerial Direction) customers must bear all efficient costs of supply.

In response to ISIS Sugar Partnership (2010), the Authority concluded in Volume 1 that the nature of risks is essentially the same in each scheme, and as a result the same regulatory arrangements are recommended to apply to each scheme. The scheme specific risks for the Bundaberg WSS and the Authority responses are outlined above.

In response to comments that SunWater has small revenue risk as irrigators are obliged to pay Part A charges regardless of water use, the Authority notes that SunWater incurs fixed costs to maintain full service capability irrespective of demand. As noted above, the Authority therefore considers it appropriate for volume risk to be borne by customers and the appropriate mechanism to do so is through cost-reflective tariffs and for Part A to reflect fixed costs.

Support for Price Cap

The Authority has recommended an adjusted price cap as the preferred form of price control. The ratio of the Part A and Part B tariffs depends on the ratio of fixed and variable costs as the

Authority agrees with BRIG's proposal to match the Part A charge to fixed costs and variable costs with Part B, as noted further in Chapter 3.

Other

In response to ISIS Sugar Partnership (2010), the Authority notes that both forms of regulation (revenue caps and price caps) provide a service provider with an incentive to reduce costs, at least until prices are reset in the future. Under the price cap, the service provider also has the incentive to increase sales. To further promote efficiency the Authority has recommended specific cost savings targets.

The Authority is not aware of any impediment that would be caused by the proposed tariff structure to the adoption of capacity sharing or continuous accounting.

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 Bundaberg WSS Part A fixed charge was set at 52% and Part B variable charges at 48% of the total revenues.

Stakeholder Submissions

SunWater

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

Other Stakeholders

Stakeholders generally supported a two part tariff structure, although there were differences in stakeholders' preferences on the ratio of fixed to variable costs that should be recovered from each component. Specifically:

(a) CANEGROWERS ISIS (2011) supported the continuation of a two-part tariff structure within the Bundaberg WSS;

(b) CANEGOWERS ISIS (2011) considered that the 70/30 split is the right mix as it gives SunWater a level of security, while irrigators are not taking all the risk in years of limited water. Further, CANEGROWERS submitted that the Part B tariff should comprise a mix of fixed and variable costs including operating costs, repairs and maintenance costs; and

(c) BRIG (2011) stated that fixed costs should be matched to Part A and variable costs matched to Part B. BRIG (2010e) noted that under this arrangement, much of the debate relating to the different levels of water use (availability and sales) was removed. BRIG (2011c) submitted that currently Part A is too small and Part B is too big and that most costs for the river irrigators are fixed;

(d) BRIG (2010a) further stated that a tariff which matched more closely farm outgoings with income would interest some customers. There is potential for customers to be offered a choice of tariff structures.

On the efficiency implications of tariff structures:

(a) CANEGOWERS ISIS (2010a) noted that a high Part A charge does nothing to improve water use efficiency whereas maintaining a high Part B charge will continue to foster water efficiency gains at the farm gate;

(b) BRIG (2011c) submitted the current charges mean that water users are paying the costs of non-users and that irrigators are subsidising WAE holders that do not use any water;

(c) BRIG (2011) noted that any variance from its proposed fixed costs in Part A and variable cost in Part B approach will increase the risk associated with SunWater's income. BRIG considered that the Authority develop a risk matrix which showed the impact this additional risk will have on the weighted average cost of capital (WACC) and water prices; and

(d) BRIG (2011) submitted that charges per ML of use should be identical for medium priority and high priority users. The charge should be based on expected average announced allocation.

(e) during the second round of consultations (2011), irrigators stated that there was no incentive for SunWater to reduce fixed costs when the fixed charge [Part A] is high.

On the timing of the charge, M and K Hetherington (2010) stated that paying the Part A fixed charge in advance – before receiving any water – means that many farmers are left with insufficient funds to draw the water to which they are entitled. M and K Hetherington noted that a pricing system with a minimum number of ML and a per ML charge (a take-or-pay arrangement) was more realistic as these ML are then applied to the crop and consequently improved productivity and reduces the risk to both parties.

Authority's Analysis

Tariff Structure

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.

On this basis, the Authority recommends a Part A fixed bulk charge which reflects fixed costs and a Part B volumetric charge which reflects variable costs. The Authority does not accept CANEGROWERS' submission that the some fixed costs should be collected through the volumetric charge. This would expose SunWater to risk that it cannot manage (see chapter 2).

The Authority's analysis of which scheme costs constitute fixed, and which are variable costs, is addressed further below.

The Authority concurs with BRIG's (2011) view that, in aligning tariffs and costs, much of the debate relating to the different levels of water use (availability and sales) is removed.

In response to BRIG's (2010a) suggestion for tariffs to match farm outgoings, the Authority considers that a cost based approach, where the volumetric component reflects the marginal cost of the supply of water, sends the appropriate cost signals to both SunWater and irrigators.

Efficiency of Tariff Structures

In response to 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.

The Authority has in, Volume 1, analysed the efficiency implications of the proposed tariff structure and the role of water trading in moving water to its highest value use. 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 Bundaberg WSS (across bulk and distribution system customers) are identified in Table 3.1.

Table 3.1: Volume of Permanent and Temporary Water Traded in Bundaberg WSS (ML)

	2002-03	***2003-04***	***2004-05***	***2005-06***	***2006-07***	***2007-08***	***2008-09***	***2009-10***
Permanent water traded	213	1,631	1,515	4,682	5,403	1,615	654	1,574
Temporary water traded	16,101	5,523	5,649	6,410	18,285	10,836	12,200	37,262

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

Timing of the Charge

In response to M and K Hetherington (2010), the Authority further notes that if SunWater collects Part A charges in arrears, rather than in advance, the additional financing costs arising from an increased need for working capital will need to be included in prices. Therefore, the Authority proposes to retain the existing arrangements of charging Part A in advance.

3.2 Water Use Forecasts

Introduction

During the 2006-11 price path, 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 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 (SunWater, 2006a).

For the Bundaberg WSS, SunWater assumed a water usage forecast of 60% for the calculation of the Part B charges over the 2006-11 price path. Water usage for high and medium priority irrigation WAEs were not separately identified (SunWater, 2006b).

Stakeholder Submissions

SunWater

The available supply of water is determined by the announced allocations which are set according to rules contained in the 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 having 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.

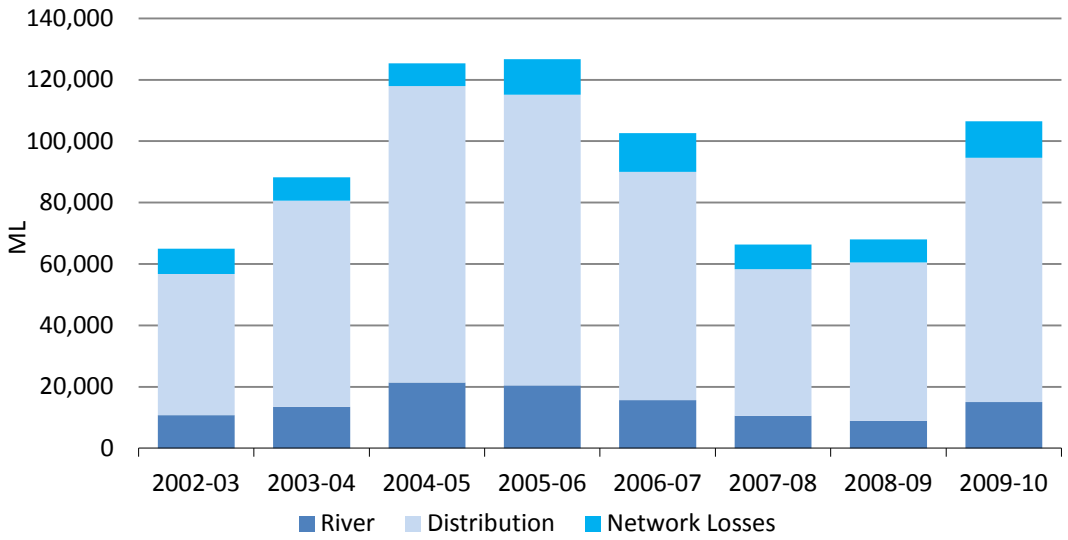
Based on the last eight years observations, SunWater has forecast use as follows:

(a) at a whole scheme level (all sectors) – an average of 40% of WAEs (including SunWater's distribution loss WAEs and its other WAEs); and

(b) for the irrigation sector only – 50% of WAEs, incorporating forecast usage of 80% within the distribution system. This compares with the eight-year average of 44%. Projected usage is higher than the eight-year average due to the impact of the past drought.

Figure 3.1 shows the historic usage information for the Bundaberg WSS submitted by SunWater (SunWater, 2011). The river category includes all irrigation and other usage sourced from the river. Distribution volumes refer to irrigation use only.

Figure 3.1: Water Usage for the Bundaberg WSS



Source: SunWater (2011f)

Other Stakeholders

BRIG (2010) and (2011) noted that much of the debate relating to the different levels of water use (availability and sales) is removed if fixed costs are matched to Part A and variable costs matched to Part B.

CANEGOWERS Isis (2011) stated that while storages are full, and given appropriate amendments to the Water Resource Plan and ROP, Bundaberg irrigators can be assured of a reasonable water supply for much of the 2011-2016 [now 2012-17] price path. However, they noted that they would not be as confident if the storage levels were not full.

M and K Hetherington (2010) submitted that water prices are having a detrimental effect upon water use.

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. The Authority agrees with BRIG that a water use forecast is not necessary to calculate prices if fixed costs are matched to Part A and variable costs matched to Part B.

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 (2011t) nominated one tariff group, River, for the river segment of the Bundaberg WSS.

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

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

3.4 Paradise Dam

Introduction

The Paradise Dam is located on the Burnett River and was completed in 2006. It provides an additional 124,000ML of medium priority water and 20,000ML of high priority water to customers lying within the geographic boundary of the existing Bundaberg WSS. (These additional volumes are not part of the Bundaberg WSS subject to review by the Authority).

The Paradise Dam is owned and operated by Burnett Water, a wholly owned SunWater subsidiary.

The operations of Paradise Dam integrate with the existing storage infrastructure within the Burnett and Kolan river systems. The new water allocations resulting from the construction of the dam have been made available throughout the Bundaberg WSS. To date, a total of 11,229ML of WAEs from Burnett Water has been sold, and a further 3,279ML has been leased.

A letter from Minister Robertson, dated 28 September 2010, stated that the Authority has not been requested to recommend prices for water services provided by Burnett Water Pty Ltd and, therefore, for the purposes of this referral, the assets of Burnett Water Pty Ltd (that is, Paradise Dam and Kirar Weir) are not to be included in this review.

Stakeholder Submissions

SunWater

SunWater has advised that water charges for Paradise Dam are not relevant to the Authority's current review.

Other Stakeholders

Stakeholders raised a number of issues relating to the impacts of Paradise Dam on existing users, both in terms of bulk and distribution activities.

During the second round of consultations (April 2011), irrigators also stated that Paradise Dam has caused credit water to be removed so there is a lower standard of service and water reliability.

During the second round of consultations (April 2011), irrigators submitted that with the introduction of Burnett Water, SunWater distribution customers have experienced a reduced share of channel capacity. The irrigators questioned whether SunWater charges should be reduced to reflect a drop in service.

CANEGROWERS (2011) submitted that SunWater irrigators have experienced a 15% decrease of peak flow rate in the channel due to Burnett Water. Consequently, 15% of distribution costs, including distribution losses should be removed.

BRIG (2010) submitted that existing customers should not be paying for assets constructed to service new customers. BRIG stated that this was clearly outside the current agreement in relation to delivery of Paradise Dam water where channel capacity is limited. The sale of new allocation from Paradise Dam has constrained the flow rate available to south side irrigators when their supply is being pumped from Monduran (see Figure 3.2).

CANEGROWERS (2011) submitted that the new water out of Paradise Dam does not contribute towards the costs of running the bulk or distribution assets, except for electricity. They stated that this was despite the fact that the charges for Burnett Water reflect similar water charges to the old water plus a rate of return plus a capital charge when purchasing the water. Burnett Water customers have some access to SunWater channels in peak times and significant access in off-peak times. Burnett Water should pay for its share of channels and bulk water or it should not be permitted to use these assets.

BRIG (2011) commented that the Authority should further clarify the matter of Paradise Dam water pricing. BRIG noted that its concerns are related to the fact that SunWater delivers the old water (subject to the Authority's review) and the new Burnett water (not subject to the Authority's review) through the same distribution infrastructure. BRIG stated that the NSPs do not adequately address this issue and it is unclear how costs and income associated with the delivery of the new water are included in the information relating to old water pricing.

B Strathdee (2010) submitted that SunWater made water available from Paradise Dam on two occasions to growers only by application. A further charge of $30/ML was made and the water had to be used within a certain number of days. Mr Strathdee suggests that this extra charge is unfair and that this extra charge and time limit is unfair.

N Baldwin (2010) submitted that an element of the yield of the Paradise Dam could be designated to service the currently held nominal allocations as opposed to capital sales of all the water which simply expands under supplied water allocations.

Authority's Analysis

The Authority accepts SunWater's view that pricing matters relating to Paradise Dam are outside the Authority's purview. However, the issues raised by stakeholders relate to cost allocation between existing and new allocation holders are relevant, as there could be implications for pricing for existing users. In addition, customers have raised concerns as to whether there is a reduction in service standards for existing distribution system customers as a result of Burnett Water customers sourcing water through channels and, whether Burnett Water customers should contribute to existing distribution assets.

Service Standards

The Authority notes that the Paradise Dam and Bundaberg WSS operate as a single integrated system, but with separate charging arrangements for 'new' and old' customers. These charging arrangements were originally negotiated by SunWater and the irrigators' Customer Council.

Burnett Water customers can have SunWater deliver 'new' water to off-river irrigation activities through the existing channel system. This requires an additional supply contract and attracts additional charges.

In the Burnett Water Information Package (2005), SunWater sought to implement an arrangement to avoid a costly $100 million channel system upgrade by offering delivery options involving:

(a) peak period distribution services, without a capacity upgrade, for up to 15% of allocation served at each point (5% in Woongarra system); or

(b) off-peak distribution services.

SunWater has advised that the 15% spare capacity was estimated taking into account an assessment of current capacity and recent utilisation. The take-up of capacity by Burnett Water customers results in a potential slight reduction in service standard, in that customers that previously could take up to 1% of their allocation each day can now take 0.95% of their allocation each day.

The Authority accepts that this is a slight reduction in service standards from that prevailing. However, it is noted that the approach taken is likely to be much cheaper for all customers as it avoids channel system upgrades, at least in the short term.

In response to comments made in round two consultation regarding credit water, the Authority sought further advice. Credit water was a temporary drought-related product arrangement to enable Burnett River irrigators to source water from weir releases from the Burnett River when announced allocations were below 100%. This credit water was in addition to announced allocation volumes. SunWater advised that the ability to provide this product was removed when the Burnett ROP was implemented, and was not a direct result of Paradise Dam.

Share of Distribution Costs

The pricing arrangements for Burnett Water customers are set out in the Burnett Water Information Package (2005).

Based on this, the Authority notes that Burnett Water users pay a higher price than Bundaberg WSS customers. The 2011-12 Burnett Water prices compared to Bundaberg WSS prices for are shown in Table 3.2.

Table 3.2: Comparison of Burnett Water and SunWater charges

	Burnett Water		*SunWater*
	Medium Priority	*High priority*	*Medium priority*
Initial purchase price for WAE	852	2562	-
Bulk charge – Part A	33.19	94.26	7.36
Bulk charge – Part B	11.47	11.47	11.47
Channel charge – Part C	23.52 to 57.36 (peak)[1] 8.24 to 42.12 (off-peak)	23.52 to 57.36 (peak)[1] 8.24 to 42.12 (off-peak)	39.04
Channel charge - Part D	20.25	20.25	20.25
Fixed channel charge	$244 up front or 36.64 annually (peak) $121 up front or 18.32 annually (off-peak)	$244 up front or 36.64 annually (peak) $121 up front or 18.32 annually (off-peak)	-

Note: 1 – Part C channel charges are set according to 5 segments in the Bundaberg Distribution system. Source: SunWater (2011).

The same variable (Part B) charges apply to Burnett Water and Bundaberg WSS customers, as there are no separate customer meters for 'old' and 'new' water.

For Burnett Water, the additional 'Part C' charges vary on a segment basis. There are five segments according to the scheme sub-systems – Abbotsford, Gin Gin/Bingera, Gooburrum, Isis and Woongarra. The lowest charge of $8.24/ML is for off-peak water in the Gooburrum system. The highest charge is $57.36/ML for peak supplies in the Abbotsford system.

As an example, a medium priority Burnett Water user in the Gin Gin/Bingera system will pay a Part A Burnett Water river charge ($33.19/ML), a Part B Bundaberg WSS river charge ($11.47/ML), a Part D Bundaberg distribution system channel charge ($20.25/ML). The segment Part C charge is $32.68/ML for peak supplies or $17.44/ML for off-peak. This total of $97.59/ML for peak supplies compares to a charge of $78.12/ML for existing users (all 2011-12 charges). In addition, Burnett water users pay an initial purchase price of $852/ML and a fixed distribution service charge of $244/ML for peak use or $121/ML for off-peak use.

As indicated in the Burnett Water Information Package (2005), the Part C charge will be indexed at the consumer price index (CPI) for 10 years and a record kept of costs and revenues to assess performance against lower bound cost recovery. The Part C charge was intended to cover additional electricity costs attributable to Burnett Water. Any surplus revenues accrued over the 10-year period from these charging arrangements will be used to offset any additional operating and maintenance costs and contribute to capital works required to deliver future 'new' water. The Burnett Water Information Package (2005) indicates that the charges are not set to make a profit for SunWater. The charges for 'old' and 'new' water may be merged if considered reasonable after 10 years (that is 2015-16) or when more than 65,000ML are sold into the channel system, whichever occurs first. However, water from Paradise Dam would still attract an upfront capital charge. The Authority considers that the merger of the charges may be best implemented at the start of the next price period (2017-18) to avoid confusion regarding prices in 2015-16 and 2016-17.

In effect, in return for existing users accepting unchanged Part B charges, all additional costs including electricity and future marginal costs including capacity costs are passed through to 'new' customers. In the long term, existing customers should benefit to the extent that lower bound costs for the overall scheme should be more easily met with the addition of new WAEs.

Of further note, the existing arrangements as described above were negotiated between Burnett Water and irrigator groups on behalf of irrigators at the time that 'new' allocations were made available. It is clear that Burnett Water customers are, by paying the same Part B charges as Bundaberg WSS irrigators, covering their share of marginal (variable) costs for the Bundaberg WSS. However, they are also making a significant contribution to distribution system costs, by means of the long term arrangement that is in place to manage any surplus revenues for the benefit of all irrigators.

The Authority considers that, as Burnett Water is taken up, and the two schemes ultimately merge, the bulk fixed costs should decline on a per ML basis. Until they are merged, there is no scope for unit savings to be achieved in the bulk component of the scheme.

However, the Authority notes that, in the distribution system, the additional volumes should result in slightly lower costs per ML, in the absence of any channel system capacity upgrades.

The Authority therefore does not propose to make any adjustments to lower bound bulk costs in the Bundaberg WSS in response to the availability of 'new' water. However, distribution system fixed costs are proposed to be apportioned across all volume supplied through the distribution system, including water sourced from Burnett Water, for the purposes of determining lower bound costs.

In response to comments made at round two consultation and CANEGROWERS, allocating costs to Burnett Water customers will decrease the portion of costs allocated to SunWater distribution system customers.

SunWater's NSP details the electricity costs in the Bundaberg WSS attributable to the Burnett Water users assuming a volume of 3,410ML at a cost of $28.45/ML. As noted above, there is no proposed contribution to distribution system costs that would otherwise result in a revenue offset for existing users.

SunWater has advised that distribution services are provided for a total of 5,832ML of Burnett Water contracts (including 2,483ML peak) and a further 2,515ML of leased Burnett Water (all off-peak). SunWater's estimate of 3410ML in the NSP reflects the expected level of usage of these WAEs (about 41%).

In response to CANEGROWERS, BRIG, Strathdee and Baldwin, Paradise Dam [Burnett Water] charges are beyond the scope of this review.

3.5 Gin Gin Main Channel – Allocation of costs to Bulk water Services

Submissions

SunWater

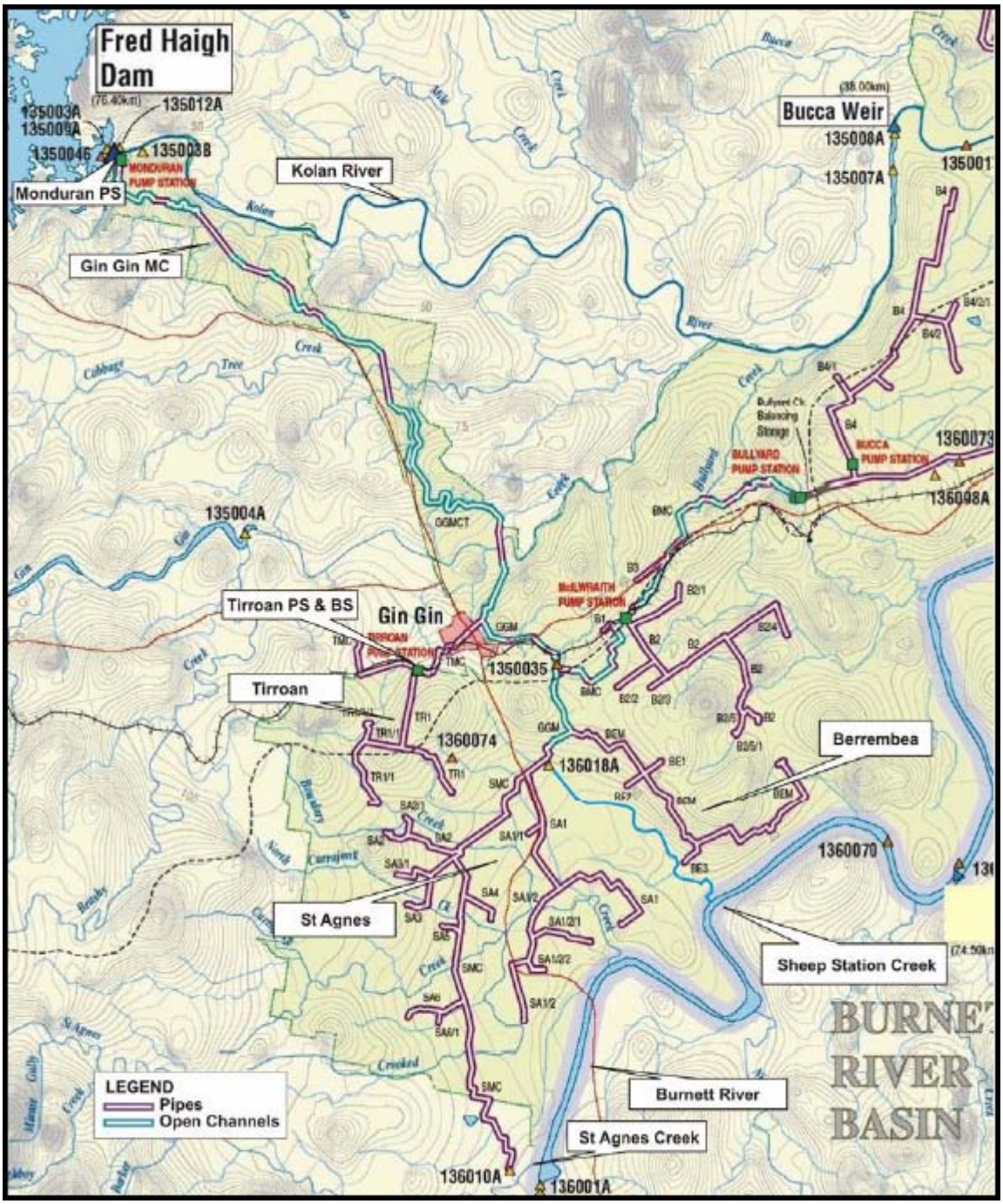
In the Bundaberg WSS NSP, a provision of 8% of the lower bound costs of Gin Gin main channel and the Monduran pump station are included in bulk costs. This reflects the occasional need to pump water from the Kolan system to supplement supplies in the Burnett.

SunWater proposed that the costs of the Gin Gin Main Channel that should be attributed to bulk are equivalent to $118,000 in the 2010-11 year. This covers an 8% share of operating costs including electricity, indirect costs and overheads and the renewals annuity associated with the pump station and the channel. However, SunWater has not included the adjustment in its proposed operating costs for Bundaberg WSS and Bundaberg Distribution systems in its NSPs.

Subsequent to the receipt of the NSPs, SunWater proposed to the Authority that the total cost transfer from the distribution system to the bulk scheme was $61,000 in 2012-13. This amount includes $12,000 of renewals annuity and $49,000 of operational expenditure.

The Gin Gin distribution system is shown in Figure 3.2.

Figure 3.2: Gin Gin Distribution System



Source: SunWater (2011)

Other Stakeholders

BRIG (2011) commented that the bulk water NSP for Bundaberg is not a simple storage model with a portion of distribution costs for Gin Gin channel being included to cover the transfer of water from the Kolan River to the Burnett River. BRIG questioned the magnitude of this transfer as it expects SunWater will use the unsold water in Paradise Dam instead of pumping water from the Kolan River.

BRIG (2011) stated that it does not expect there to be much water transferred from the Fred Haigh Dam to the south side due to unsold water in Paradise Dam.

CANEGROWERS (2011) submitted that the use of channel infrastructure for the bulk system needs to be reviewed. In this case, 8% of the costs of the Gin Gin main channel and associated pump station are attributed to the bulk system. CANEGROWERS submitted that if any deemed bulk customers are using any part of the channel infrastructure, they should be paying the same channel charge as growers within the channel system for the proportion of their allocation which is typically delivered through the distribution system.

Authority's Analysis

For the 2006-11 review, the Tier 1 Working Paper No. 14 indicated that, in relevant schemes, a proportion of the costs of relevant pump stations and main channels 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 Bundaberg WSS.

The Authority notes that the Burnett ROP makes provisions for transfer of water under certain conditions:

(a) when Fred Haigh Dam is above 59.13m Australian Height Datum (AHD) and Paradise Dam is between 52.8m AHD and 46.3m AHD, the first 760ML/day demand on the Burnett River downstream of the confluence of Sheepstation Creek less the volume required for the Gin Gin-Bingera system, is to be supplied from Fred Haigh Dam; and

(b) when Fred Haigh Dam is above 59.13m AHD and Paradise Dam is below 46.3m AHD, water may be released from Fred Haigh Dam to meet the demand on the Burnett River downstream of the confluence of Sheepstation Creek.

In 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.

With the addition of Paradise Dam, the need for any additional pumping and use of the Gin Gin Main Channel to supplement the Burnett River will be much reduced. SunWater has advised that the 8% factor represents a proportion that is likely to be pumped from the Kolan to the Burnett over the longer term, assuming full take-up of Paradise Dam WAE, but also taking into account ROP constraints.

The Authority notes that, with the large volume of unused WAE in Paradise Dam, and given current capacity levels (100% in both Fred Haigh and Paradise Dams) the likelihood that Gin Gin Channel will be used as a bulk asset is very low for the foreseeable future.

However, given the requirements of the ROP, it is clear that Gin Gin Channel serves a bulk water function and it is appropriate that a proportion be allocated to bulk. As long as the ROP

makes such provision, a relevant portion of the Gin Gin Main Channel should be included in bulk water costs.

The Authority has no reason to reject the outputs of the IQQM and proposes to accept SunWater's revised cost transfer of $61,000 in 2012-13.

In relation to submissions:

(a) as noted by BRIG, there is scope for additional flows from Paradise Dam to reduce the need for transfers from Fred Haigh Dam. However, this is limited under the ROP rules; and

(b) in relation to CANEGROWERS' comment, the Authority considers that, where possible, prices should reflect costs incurred in service provision. Bulk customers use only a proportion of total distribution assets, and in circumstances where an asset has joint usage, it is appropriate that bulk customers be allocated a share of the costs commensurate with their relative usage of the asset.

The Authority notes that such a principle, if applied more widely, would be consistent with cost reflective segment-based or nodal pricing. However, the Ministers' Direction requires the Authority to adopt only the tariff groups as identified in SunWater's NSPs and not to adopt any additional nodal pricing structures. The proposed cost allocation approach for part of the distribution system cost to be met by bulk customers remains consistent with the Ministers' Direction as it does not change the existing tariff groups nor introduce new nodal charges.

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);

  (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 for the review, nor desirable given the potential costs involved, to assess the prudency and efficiency of the renewal of every individual asset.

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

Subsequently, the Authority liaised directly with SunWater to obtain further information, and commissioned Sinclair Knight Merz (SKM) to address material expenditure items (that is, those renewals items which represented more than 10% 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 Bundaberg WSS (including the Bundaberg Distribution System) was $547,000.

The Authority has accepted SunWater's unbundled opening ARR balance for Bundaberg (excluding the Bundaberg Distribution System) of $120,000.

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 Bundaberg WSS for 2006-11 (Table 4.1) in real terms as at 2010-11. 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 Renewals Expenditure 2006-11 (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*
Renewals Expenditure	160	289	527	709	1,067

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

Other Stakeholders

CANEGROWERS (2011) submitted that past renewal expenditure, in particular that over the past two years needs to be investigated further and validated. CANEGOWERS (2011) submitted that there was a large renewals spend in the last six years.

CANEGROWERS (2011) questioned whether a cost benefit analysis was done on the asset replacement options, or were assets simply replaced at set times.

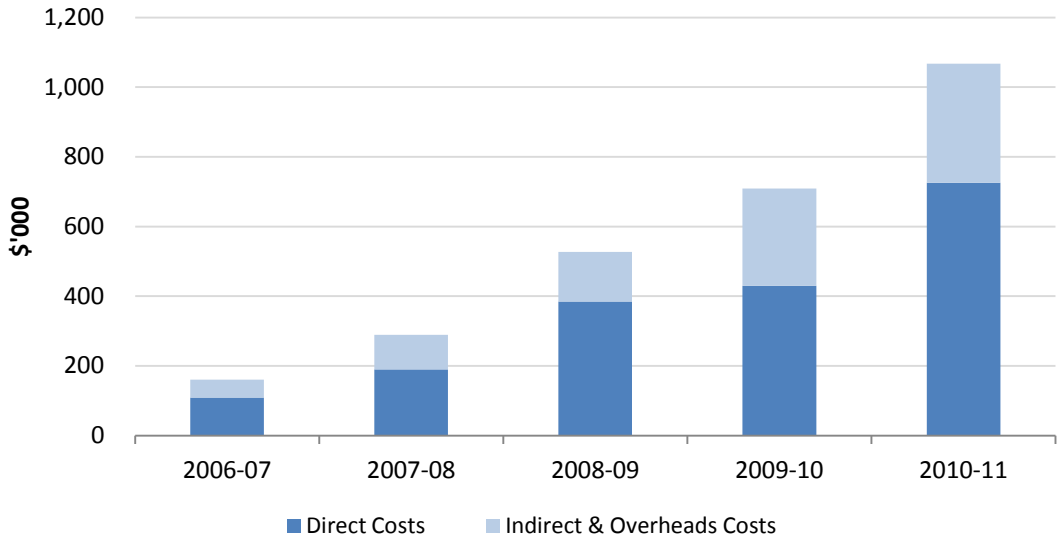
During the second round of consultations in April 2011, customers stated that they would like to see a full list of past renewal expenditure and that renewals expenditure over the past two years for the bulk scheme needs to be investigated further. Customers also queried whether SunWater reviewed past expenditure to monitor if the new equipment worked according to plan.

Authority's Analysis

Total Renewals Expenditure

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

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



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

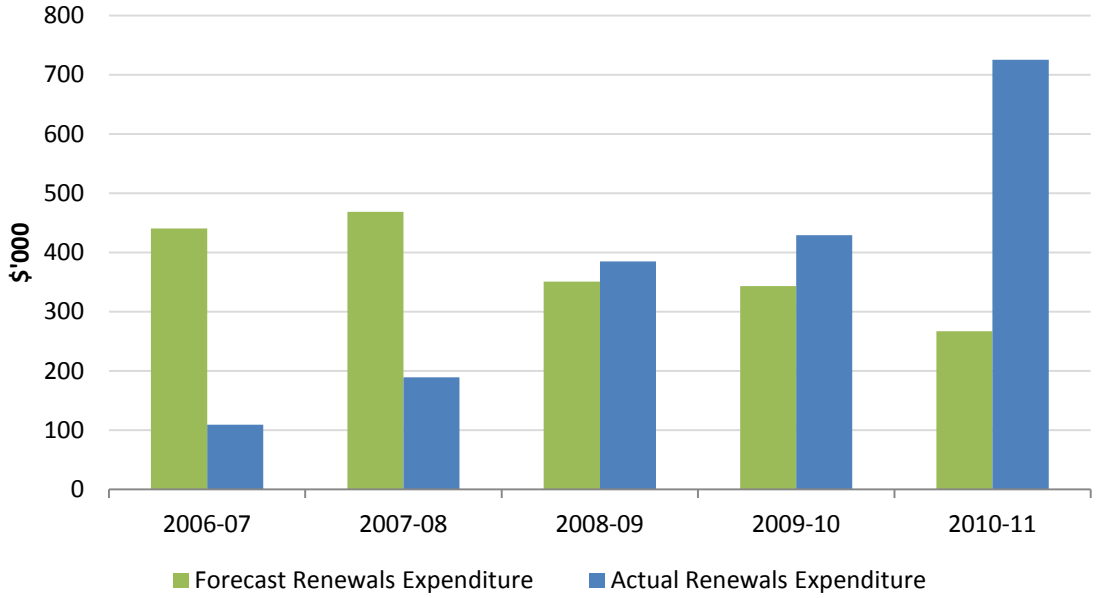
In response to stakeholder requests for a full list of past renewal expenditure, the Authority advises that a list of renewals expenditure by scheme was compiled by Indec and is available on the Authority's website.

Comparison of Forecast and Actual Costs

The Authority was able to source details of forecast direct renewals expenditure from Indec, who undertook the analysis for the 2005-06 review.

A comparison of forecast and actual direct renewals expenditure in the Bundaberg 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, 2011d) and Actuals (SunWater, 2011k).

Actual renewals expenditure was $32,000 (direct costs) below that forecast over the period.

In response to stakeholder concerns about past renewals expenditure, particularly over the past two years, Aurecon was appointed to review the efficiency (and prudency where not previously approved) of past renewals items.

In the absence of forecast renewals expenditure for 2006-11 from SunWater (as noted above), Aurecon sought to identify variances between annually budgeted (Board approved) and actual expenditure for certain items.

Aurecon noted a number of limitations in the general past renewals information provided by SunWater including:

(a) no indication of the Board approved budget for all items in 2006-07;

(b) totals include indirect and overhead costs, and any proposed changes in allocation methods by the Authority will impact renewal activity costs;

(c) many items run over several financial years, in which the Board approved budget only appeared in the first year, and not subsequently. Further there was difficultly linking activities across years, due to the nature of the database provided; and

(d) the summation of annual totals within the database did not equate with stated renewals expenditure in the NSP.

In addition to general comments on past renewals information, Aurecon assessed the prudency and efficiency of past renewals at one bulk water asset.

Item 1: Ben Andersen Barrage – refurbish shutters 2007-08 to 2009-10

SunWater

The shutters have been in operation since 1984. An asset life of 50 years is assigned, indicating replacement in 2033-34 (replacement cost estimated at $2.15 million).

At the Ben Andersen Barrage, there has been significant ongoing expenditure as follows:

(a) 2007-08 – A renewals item to refurbish and remove 10 shutters, 20 tie arms & anchors. However, out of an allocated budget of $90,903, SunWater spent $61,941;

(b) 2009-10 – A renewals item to remove and refurbish 10 shutters with an allocated budget of $134,120. However, SunWater only replaced five shutters at a cost of $57,315; and

(c) 2010-11 – A renewals item to refurbish 10 shutters with an allocated budget of $180,189. As at February 2011, SunWater had spent $75,084.

Other Stakeholders

CANEGROWERS (2011) submitted that it may be possible to replace shutters at Ben Andersen Barrage more efficiently.

Consultant's Review

Aurecon noted that there was a structured process employed in regards to this on-going expenditure at the Barrage including:

(a) internal documentation supporting the requirements for works. Aurecon sighted a number of condition assessments undertaken between 2006 and 2009, which allocated scores of 4 for a number of shutters due to coating failure and deep rust;

(b) Aurecon also reviewed an expert engineering report by JLR Engineering Services Pty Ltd (2008) Ben Anderson Barrage Shutter Maintenance, which examined the merits of alternative options. Aurecon suggested that this analysis re-examine the NPV analysis undertaken evaluating the merits of replacing the shutters with stainless steel. Aurecon recommended that the modelling analysis timeframe should have been extended reflecting the extended life expectancy of stainless steel. The report also highlighted that the NPV analysis was highly price sensitive to stainless steel prices, and recommended that better quotations be sought;

(c) research was on-going with alternative coating systems trailed in recent years to identify the optimal protective coating;

(d) substantial internal documentation highlighting the management approval process; and

(e) detailed financial accounts highlighting historical expenditure and works completed.

Aurecon noted that:

(a) the replacement of shutters was a major on-going refurbishment program with significant investment requirements;

(b) SunWater had employed transparent and logical asset management process to date;

(c) the removal and subsequent re-installation of refurbished shutters is undertaken by SunWater staff. The actual refurbishment work of shutters undertaken by external contractors; and

(d) the proposed annual refurbishment program has not been fully implemented to date due to a number of drivers including reassessment of shutter conditions, and environmental conditions restricting access to the shutters.

Based on the information reviewed, site inspection, and discussions with SunWater staff, Aurecon viewed the historical expenses in 2007-08 and 2009-10 as prudent and efficient. Aurecon did not provide a recommendation on the expenditure incurred during 2010-11.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the refurbishment of shutters at Ben Andersen Barrage in 2007-08 and 2009-10 was prudent and efficient. On this basis, the Authority also proposes to incorporate the 2011 expenditure for inclusion within the renewals annuity for 2012-17.

In response to stakeholder queries about whether SunWater undertakes cost-benefit analysis for asset replacement, the Authority notes that Aurecon found that SunWater had undertaken a NPV options analysis. Given SunWater's obligation to maintain service standards of its assets, the Authority considers a NPV options analysis, as observed in this instance, to be similar to a formal cost-benefit analysis.

Conclusion

In summary, renewals expenditure at Ben Andersen Barrage over two separate years was sampled and was found to be prudent and efficient.

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

Item	*Date*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Items				
1. Ben Andersen Barrage refurbish shutters	2007-08	$61,941	Prudent and efficient	$61,941
2. Ben Andersen Barrage – refurbish shutters	2009-10	$57,315	Prudent and efficient	$57,315
Non-Sampled Items				**10% saving applied**

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

4.4 Opening ARR Balance (at 1 July 2012)

SunWater

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was negative $1,388,000 for the Bundaberg WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and differs from that included in the NSP of negative $1,305,000.

Other Stakeholders

CANEGROWERS (2011) submitted that the opening renewal balance is negative $1.305 million and suggested that the large negative starting balance means that the annuity is much greater than future spending and renewals annuity is 33% of total costs.

BRIG (2010) noted that the renewal income was greater than renewal expenditure and questioned whether the renewal annuity was funding operational cash requirements. BRIG also queried whether a return on capital will be sought on future renewals.

BRIG (2010) stated that the most recent SunWater annual report suggested that SunWater holds $1.5 million paid by existing customers for scheme refurbishment. BRIG contended that these funds (should) be retained for the scheme under any new pricing system.

BRIG (2011) sought clarification as to why there was a negative renewals annuity balance.

BRIG (2011) noted that SunWater appeared to be proposing that the current positive whole of scheme renewals annuity balance be divided so that the bulk scheme has a negative $1.3 million balance in 2011-12 and the distribution scheme has a positive $2.29 million balance. BRIG stated that river irrigators for many years have been paying well above lower bound prices and the Part A/Part B tariff split was amended in the previous review to partly address this issue. BRIG considered that this cross-subsidy was then deployed to reduce the channel irrigator's charges and that it can be argued that SunWater's current proposal perpetuates this cross-subsidy. BRIG considered this to be unfair and suggested that at the very least the bulk water balance should be set at zero.

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 Bundaberg is negative $1,141,000.

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

(a) adopting the opening balance as at 1 July 2006;

(b) adding 2006-2011 renewals annuity revenue;

(c) subtracting 2006-2011 renewals expenditure; and

(d) adjusting interest over the period consistent with the Authority's recommendations detailed in Volume 1.

To establish the closing ARR balance as at 30 June 2012 of negative $1,505,000, 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.

In response to BRIG's (2010) submission, the Authority notes that forecast renewals annuity exceeds forecast renewals expenditure in order to recoup the negative ARR balance.

In response to BRIG's (2010) submission that SunWater holds $1.5 million for scheme refurbishment, the Authority notes that it has calculated ARR balances from a 1 July 2006 starting point, and confirms that the ARR balance at the starting point of the regulatory period for Bundaberg WSS is not $1.5 million.

The Authority notes that the reason for the negative 1 July 2012 ARR balance is largely due to actual renewals expenditure exceeding forecast renewals expenditure over the 2006-12 period.

In response to BRIG's (2011) concerns about the apportionment of ARR between bulk and distribution, the Authority notes that both SunWater's and the Authority's methodologies apportion the ARR at 1 July 2006. As noted above, the main driver of a negative 1 July 2012 ARR balance in the bulk scheme is greater than forecast expenditure over the 2006-12 period.

By contrast, renewals expenditure in the distribution system was largely in line with forecast over 2006-12. The build-up of ARR in the distribution system is in anticipation of a relatively large future renewals program over the planning period, particularly in 2019-24 and 2032-35. The divergence in ARRs is therefore not caused by the split of ARR undertaken in 1 July 2006. As a consequence, there is no evidence that the bulk ARR should be set at zero.

4.5 Forecast Renewals Expenditure

Planning Methodology

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

(a) high-level options analysis for all material renewals expenditures expected to occur over the Authority's recommended planning period (20 years), with a material renewals expenditures 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 proposed renewals expenditure for the Bundaberg WSS is presented in Table 4.3 as provided in its NSP (submitted prior to the Government's announced interim prices for 2011-12).[1]

Table 4.3: Forecast Renewals Expenditure 2011-16 ($'000)

Facility	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Ben Anderson Barrage	450	294	176	184	427
Bucca Weir	-	-	-	8	-
Fred Haigh Dam	242	61	310	317	58
Kolan Barrage	-	-	-	-	10
Ned Churchward Weir	131	32	-	62	35
Total	**823**	**387**	**486**	**571**	**530**

Source: SunWater (2011).

The major items incorporated in the above estimates are:

(a) Ben Anderson Barrage – undertake rolling shutter refurbishment program at an estimated cost of $861,000 from 2011-12 to 2015-16. Due to their condition, 10 shutters will be refurbished each year over the regulatory period to maintain them in working condition;

(b) Ben Anderson Barrage – replace hydraulic control at an estimated cost of $193,000 in 2015-16. The control system at Ben Anderson Barrage requires replacement based on asset life and condition;

(c) Ben Anderson Barrage – replace anodes at an estimated cost of $217,000 in 2011-12. The corrosion protection anodes at Ben Anderson Barrage will be replaced as they have reached the end of their service life;

(d) Ned Churchward Weir – refurbish upstream sheet piling at an estimated cost of $119,000 in 2011-12. The sheet piling on the upstream side of the weir requires refurbishment to maintain long term corrosion protection. The need for this work was identified during a safety inspection; and

(e) Fred Haigh Dam – replace electrical cables main wall at an estimated the cost of $619,000 from 2013-14 to 2014-15. These cables are approaching the end of their deign life and require replacement. The work will occur over two years.

The major expenditure items from 2016-17 are:

[1] SunWater's forecast renewals expenditure reviewed in this chapter do not include the adjustment for Gin Gin Channel (Chapter 3). This adjustment is included in the Authority's proposed renewals annuity.

(a) refurbish 10 shutters at Ben Anderson Barrage; at Fred Haigh Dam, 20-year safety review and at Ned Churchward Weir, replace fish trap elements at an estimated total cost of $435,000 in 2019-20;

(b) reinstate rockfill at the Ben Anderson Barrage at an estimated cost of $200,000 in 2035-36; and

(c) replace upstream guardrail and handrails Fred Haigh Dam at an estimated cost of $176,000 in 2035-36.

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

CANEGOWERS (2011) submitted that the impact of the floods on renewals needs to be considered. A number of assets have been affected by floods and some will be covered under insurance. This may mean that a number of forecast renewals activities may not be required as previously planned.

CANEGOWERS (2011) noted that there appeared to be a greater focus on the next five years compared to the latter 20 years. CANEGOWERS considered that all major expenditures have a similar impact on the renewals annuity especially with a low WACC and so equal focus should be placed on all high cost items across the renewals time period chosen.

CANEGOWERS (2011) commented that the cost savings associated with the modernisation in renewals expenditure, especially for items beyond year 5, need to be considered. For example, renewals expenditure in year 6 of $5 million will have a very significant effect on renewals annuity. However, any cost savings that may occur from this item would not be picked up in the five-year operational expenditure forecast. CANEGOWERS questioned that if in NPV terms half of the $5 million in renewals expenditure is covered by cost savings, should $5 million or $2.5 million be used as renewals expenditure in year 6.

CANEGROWERS ISIS (2011) submitted that SunWater should model asset replacement options and replace assets if more efficient technology is now available that would deliver net savings to irrigators.

BRIG (2010) sought a dedicated sinking fund to cover future asset maintenance and renewals.

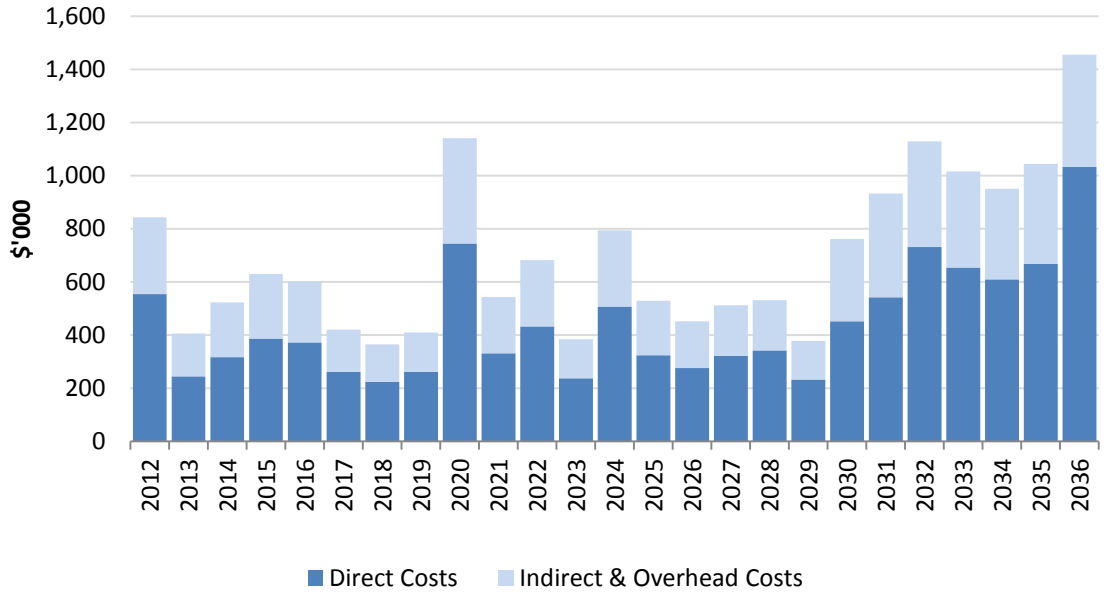
During the second round of consultations (April 2011), irrigators noted that service standards imposed by SunWater are all the same throughout State when this may not be appropriate. Irrigators considered this to be a significant issue for renewals.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the Bundaberg WSS is shown in Figure 4.3. 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 items are reviewed in Chapter 5 – Operating Costs.

Figure 4.3: Forecast Renewals Expenditure 2011-36 (Real $'000)



Source: SunWater (2011am).

In response to CANEGROWER'S (2011) concerns regarding the impact of flood damage and associated insurance revenue on renewals balances, the Authority noted in Volume 1 that it has yet to receive and consider submissions from SunWater regarding the impacts of the 2010-11 floods (including any related insurance revenues). SunWater has advised that it will submit renewals expenditure data relating to flood damage repairs, after the deadline for the Authority's Draft Report.

In response to CANEGROWERS' (2011) and CANEGROWERS ISIS's (2011) concerns about modernisation of renewals expenditure, the Authority notes SKM's (2011) findings (see Volume 1) that renewals expenditure projects expected to commence more than five years from the planning date are estimated by SunWater from unit rates listed in a Bill of Materials (BoM) based on like-for-like replacement. For renewals forecast to occur within five years, SunWater applies an estimation based on the cost for recent similar works undertaken.

The Authority notes that there is a trade off between forecasting accuracy and planning costs incurred by SunWater, and accepts the recommendation of its consultants that SunWater's renewals forecasting approach is prudent in this regard.

In response to BRIG's (2010) request for a dedicated sinking fund for renewals expenditure, the Authority notes that the Ministerial Direction requires the Authority to adopt a renewals annuity.

The Authority notes irrigators' concerns that service standards are the same across the state, but notes that the Standard Supply Contracts allow SunWater, following consultation with customers, to alter service standards on a scheme by scheme basis.

Item Review

As for past renewals expenditure, Aurecon and SKM have reviewed the prudency and efficiency for a sample of items. To respond to CANEGROWERS (2011) concerns about focussing on the next five years of renewals, the Authority notes that the sample of renewals projects was identified based on the impact on renewals annuities. While projects forecast to

occur in the next five years will have a relatively greater impact on annuities to distant projects, the comparative size of the expected expenditure is also a key determining factor.

Item 2: Fred Haigh Dam Replacement of Cables and Cableways

SunWater

This renewals item is for the replacement of cables and cableways at Fred Haigh Dam in the Bundaberg WSS at a total cost of $619,000 (including direct and indirect costs) in 2013-14 and 2014-15.

The replacement renewals item submission encompasses the replacement of both high voltage (HV) (11kV) and low voltage (LV) cables through a main dam wall and includes for the replacement of conduits and a light pole.

According to SunWater's Systems, Applications, and Products (SAP) Works Management System (WMS), the asset has been in operation since 1975 and was installed as part of the original construction works of the dam. The estimated value for the entire replacement renewals item as shown in SunWater's SAP-WMS is approximately $474,000. SunWater has suggested that the work will be undertaken in two parts over the period 2014-2015.

SunWater has not provided information to indicate how the works are to be split, or which assets are to be replaced at each stage. SunWater has submitted a renewals item value of $250,000 for phase 1 of replacement of the existing cable through the main wall in 2013-14. A further $250,000 is planned to be spent in 2014-15 to complete the works.

Other Stakeholders

No other stakeholders have commented on this item.

Aurecon's Review

Aurecon's review of the SAP extracts indicates that an asset life of 35 years is assigned to this asset, and that the cables have been in existence since 1975 indicating a need for replacement in 2009-10, although condition assessments indicate that they are still functioning well. The 35-year frequency is consistent with SunWater's adopted asset lives for these assets, and in this case the assets have exceeded the asset life assigned. SunWater plans to undertake a study in 2012-13 to scope works that will be required in 2013-14 and 2014-15.

SunWater also provided an extensive BoM for the proposed replacement works, along with forecast unit rates for inputs, predominately cable and cable conduit. The BoM provided was based upon a pre-2000 valuation (mainly 1996-97). Based on the Cardno valuation work, a recommendation was made to index all BoM for Electrical assets by 2.13 to inflate them to a 2007-08 valuation. Aurecon reviewed the stated unit rates (2007-08 valuation) for a number of listed items against quoted commercial rates and found that the unit rates proposed (2007-08) were generally comparable.

The BoM (indexed 2007-08) indicates a total direct cost of $324,000 for material components. Aurecon noted that an expenditure of $310,000 (2013-14) and $309,000 (2014-15) has been assigned for this task. Aurecon was not provided with a cost breakdown, but assumed it is based on the indexed BoM, project management fees, possibly a percentage for contingency costs (to cover over-runs for material cost inputs and contractor expenses), and possibly other Overheads.

Based upon a desktop review of the information provided, Aurecon considered that the proposed renewal activity is prudent in terms of timing. Aurecon also noted that SunWater has

planned a study in advance to better scope the project requirements (and costs). Aurecon considered the proposed direct expenditure, as highlighted within the BoM, as efficient, based on the comparative analysis undertaken of the unit charge rates used for key material inputs.

SKM's Review

SKM reviewed information relating to this item by accessing and viewing information recorded in SunWater's SAP-WMS to the value of $250,000 in 2013-14 and a further $250,000 in 2014-15.

Available Information

In particular, SKM has drawn on the following renewals item specific replacement/refurbishment report produced by SunWater for this review:

Table 4.4: SKM's Reviewed Documents – Fred Haigh Dam Replacement of Cables and Cableways

Document No.	*Document Name*	*Document Title*	*Date*
1106063	5 -QCA Justification paper H4 – Fred Haigh Dam –Cable and Cableways	BIA-KOLA-FHD-ELEC-CBL2: Replace Cable Main Wall	21 Aug 2011

Source: SKM (2011).

Prudency Review

(a) Asset Replacement/Refurbishment Date Determination

The standard object type (asset type) allocated for this infrastructure in SAP-WMS is CALVAG – Low Voltage above ground cable.

SKM noted that SunWater has allocated a standard run to failure asset life of 35 years and a maximum condition assessment frequency of every five years. SKM considered the standard run to failure asset life to be conservative for both above and below ground LV and HV cable. For example, most electrical distribution utilities in Australia would apply an asset life of 45 to 60 years for above ground LV cable depending on whether it is operated in wet (tropical) or dry conditions respectively. SKM considered the condition assessment frequency of every five years applied to this asset type to be reasonable.

SKM viewed the WMS record for this asset and confirmed that the asset has been in service since 1975.

SKM noted that SunWater has applied its risk evaluation method to this asset and determined, during the most recent risk assessment in 2005, that it has a financial risk criterion consequence rating of minor (score 8). This, together with a probability (likelihood of occurrence) score of 3, results in an overall risk score of 24 which, under SunWater's risk assessment method, places this asset in a Low risk category. SKM viewed the WMS record for this asset and confirm that it has been allocated a Low risk rating. An overall risk category of Low should not trigger any reduction in the standard run to failure asset life of this type of asset and SKM confirmed this to be the case for this asset.

Under SunWater's systems, a business risk classification of Low does not result in a reduction in the standard run to failure asset life for that asset. Hence the risk adjusted run to failure asset life for this asset is 35 (as per the standard asset life).

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.

SunWater has advised that, as the cable is buried, SunWater has not carried out a visual condition assessment nor has SunWater carried out any electrical test to determine if there has been degradation in the insulation. As such, there is no condition assessment contained in SAP-WMS. Whilst SKM accepted that a visual inspection cannot be easily undertaken, this should not preclude electrical testing of the cable or, in absence of that, a 'desk top' condition assessment being undertaken based on typical degradation profiles for this cable. SKM noted that SunWater uses a mix of 'Field' and 'Desktop' assessments to populate SAP-WMS.

SunWater has advised that it was decided to push this item out by a few years as the electrical system was not giving any apparent trouble and the system had not been tested.

Based on a 35-year life with no risk or condition related reduction, under SunWater's systems, the cable should have been replaced in 2009-10. SKM found the justification provided by SunWater for delaying the item beyond 2009-10 not to be convincing. All other issues aside, the lack of recent condition assessment data does not support the extension of the service life due to the absence of operational issues. Generally, SKM would not consider evidence of this nature to be sufficient to satisfy a regulatory test.

(b) Options Evaluation

SunWater advised SKM that it has scheduled for a $20,000 item to be undertaken in 2012-13 to carry out a full condition assessment and options analysis before undertaking any of the planned works. This options analysis is intended to determine the optimum time for replacement of the asset and each of its components.

SunWater considers that at this stage of planning, there is no obvious alternative to like-for-like replacement that would reduce costs by more than 30%.

SKM concurred with this statement and hence considered a like-for-like replacement to be prudent at this stage of the planning process. SKM assumed that, in assessing condition under this item, SunWater will conduct electrical condition tests on the cable at this time such as earth impedance testing, insulation breakdown testing rather than operational performance.

(c) Timing of Renewal/Refurbishment

SunWater has planned for replacement of this asset based on a standard run to failure asset life for this asset type given that no condition assessment has been undertaken to date. However, given that SunWater intends to undertake a condition assessment in 2013, a major intention of which is to determine the optimum replacement date, SKM considered that it is not appropriate to plan a replacement date until that condition assessment has been completed.

Further, and as previously mentioned, SKM did not agree with the standard run to failure asset life applied by SunWater to this asset class and considered that 45 years would be a more appropriate run to failure asset life. An asset life of 45 years is in line with the asset type life adopted by power network utilities in Queensland for this asset type.

Conclusion on Prudency Evaluation

SKM did not consider that it is prudent to plan for replacement of this asset until a full condition assessment has been undertaken. Further, SKM considered that the standard run to failure asset

life applied to this asset class by SunWater is less than industry norms would suggest (35 years as opposed to a minimum of 45 years).

However, even if a 45-year life is adopted, it is appropriate to plan for replacement of this renewals item within this current price setting annuity period. As such, it is prudent to include a replacement value for this price setting period.

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 1996-97 value (determined from a 1996-97 valuation) attached to each item making up the BoM based on a 1997 valuation. The 1996-97 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+46.359%), 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 consider the approach to be appropriate.

(a) Renewal/Replacement Item Cost Evaluation

A Planning Order has not yet been developed for this asset and SunWater has not developed a breakdown of direct and overhead costs.

SKM reviewed SunWater's calculation for determining a replacement cost and confirmed that it has instead applied the Indirect Cost multiplier contained in the BOM for this asset item in its SAP-WMS of 46.359%. 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 benchmarked the renewals item replacement costs proposed by SunWater as submitted to the Authority against database costs for a modern equivalent electrical asset. SKM categorised its estimates based on a modern equivalent asset unit rate database as a class 4 estimate, having an accuracy of +30%/-20%.

SKM noted that SunWater's estimate based on the process described above is $474,308, and not $500,000 captured in WMS SAP for the renewals item replacement total.

SKM compared its cost estimate against SunWater's cost estimate in Table 4.5 below:

Table 4.5: Fred Haigh Dam Replacement of Cables and Cableways - SunWater and SKM Cost Estimates

SunWater Estimate $2009-10	*SKM Estimate $2009-10*	*Variance*
$500,000	512,778	-2.5%

Source: SKM 2011. Note: SunWater plans to replace this item in two stages, each stage costing $250k (according to SAP WMS). SKM noted that SunWater's estimate based on the process described above is $474,308, not $500,000.

Given the total replacement valuation for the installation is shown in SAP as $474,308, the SunWater estimate of two stages of $250,000 is not supported by any recommended staging of asset replacement. Therefore, and whilst SKM used the combined value for the comparison and found the aggregate estimate to be reasonable, this should not be inferred as SKM finding the nominal 2-stage $250,000 split in expenditure reasonable in itself. Such a conclusion could only be drawn based on more detailed project information.

From the SunWater analysis, it was not apparent to SKM why it is necessary to smooth the cable replacement over a two-year period, nor the justification for the total $474,308 forecast becoming two $250,000 stages.

However, the renewals expenditure provided to SKM by SunWater for replacement of this renewals item was 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 $500,000 in total to be efficient.

Summary and Conclusions

SKM did not agree with the timing of the replacement of this asset principally because SKM considers that standard asset life adopted by SunWater to be less than industry norms. However, SKM considered it prudent to include this asset's replacement value in the 30-year annuity planning period since if an industry standard 45 years asset life is applied, this asset would reach the end of its run to failure asset life by 2019-20.

From SKM's benchmarking of the replacement costs, it was satisfied that the renewals item replacement value submitted by SunWater is efficient.

Authority's Analysis

The Authority accepts Aurecon's and SKM's recommendations that the costs they reviewed are prudent and efficient.

However, the Authority notes that SKM considered that replacing the cables and cableways at Fred Haigh Dam over a two-year period has not been justified by SunWater. Further, the Authority notes that SKM considered that replacement of the asset in 2013-14 and 2014-15 had not been substantiated by SunWater in place of the end of its run to failure asset life of 2019-20.

The Authority notes that the total cost (including direct and indirect) submitted by SunWater for this renewals item ($619,000) does not equate to the amount reviewed by SKM ($474,308). Neither of these numbers reconcile to the total two-year amount proposed by SunWater to SKM ($250,000 in 2013-14 and $250,000 in 2014-15 for a total of $500,000). 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.

Despite the cost discrepancy, the Authority accepts SKM's recommendation that the expenditure is prudent and efficient. The Authority has therefore included SunWater's proposed costs of $619,000 in its recommended tariffs. However, the Authority also accepts SKM's view that the expenditure be deferred to 2019-20.

Item 3: Ben Andersen Barrage – Refurbish shutters 2011-12 to 2015-16

Aurecon's review of the shutter refurbishment at Ben Andersen Barrage addressed both past renewal expenditure (see above) and future renewals expenditure.

SunWater

The shutters have been in operation since 1984. An asset life of 50 years has been assigned to this asset, indicating replacement in 2033-34 (replacement cost estimated at $2.15 million).

At the Ben Andersen Barrage, SunWater forecasts the refurbishment of 10 shutters per year from 2011-12 to 2015-16 at a proposed budget of $165,000 to $173,000 per year. The total cost over the five-year period is $861,000.

Other Stakeholders

CANEGROWERS (2011) submitted that it may be possible to replace shutters at Ben Anderson Barrage more efficiently.

Consultant's Review

Aurecon noted that there was a structured process employed in regards to this on-going expenditure at the Barrage including:

(a) internal documentation supporting the requirements for works. Aurecon sighted a number of condition assessments undertaken between 2005-06 and 2008-09, which allocated scores of 4 for a number of shutters due to coating failure and deep rust;

(b) Aurecon also reviewed an expert engineering report by JLR Engineering Services Pty Ltd (2008) Ben Anderson Barrage Shutter Maintenance, which examined the merits of alternative options. Aurecon suggested that this analysis re-examine the NPV analysis undertaken evaluating the merits of replacing the shutters with stainless steel. Aurecon recommended that the modelling analysis timeframe should have been extended reflecting the extended life expectancy of stainless steel. The report also highlighted that the NPV analysis was highly price-sensitive to stainless steel prices, and recommended that better quotations be sought;

(c) research was on-going with alternative coating systems trailed in recent years to identify the optimal protective coating;

(d) substantial internal documentation highlighting the management approval process; and

(e) detailed financial accounts highlighting historical expenditure, and works completed.

Aurecon noted that:

(a) the replacement of shutters was a major on-going refurbishment program with significant investment requirements;

(b) SunWater had employed transparent and logical asset management process to date;

(c) the removal and subsequent re-installation of refurbished shutters is undertaken by SunWater staff. The actual refurbishment work of shutters undertaken by external contractors; and

(d) the proposed annual refurbishment program has not been fully implemented to date due to a number of drivers including reassessment of shutter conditions, and environmental conditions restricting access to the shutters.

Aurecon considered that the proposed expenditures in 2011-12 to 2015-16 are prudent and efficient, however recommends that SunWater re-examine the options study undertaken by JLR

Engineering Services (2008) to expand the financial analysis undertaken, and re-examine costing (quotes) for stainless steel.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the refurbishment of shutters at Ben Andersen Barrage from 2011-12 to 2015-16 is prudent and efficient.

Item 4: Ben Andersen Barrage – Replace Hydraulic Control System

This renewals item relates to the replacement of the hydraulic control system at Ben Andersen Barrage in 2023-24 at a cost of $238,000.

SunWater

The Ben Andersen Barrage was constructed in 1984 and has a series of gates which are operated by a hydraulic system. The standard asset life assigned to hydraulic systems is 60 years, which would suggest a replacement date in 2043-44.

SunWater stated that although the current condition of the hydraulic system was assessed as a 2, there is a substantial ongoing problem with hydraulic oil leakage. SunWater provided Aurecon with a summary of the work maintenance orders associated with the leakage which has totalled $85,000 since 2002-03.

In consideration of the emerging hydraulic oil leakage problems, SunWater has reassessed the asset life of these hydraulics to 40 years, bringing the replacement date forward to 2023-24.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Aurecon noted the on-going difficulties encountered at the Ben Andersen Barrage (including deterioration of the shutters), is mainly attributed to the saline water that the structure is exposed to.

Prior to replacement scheduled for 2023-24, SunWater proposes a mechanical engineering assessment (including a cost benefit analysis) to examine the feasibility of extending the life of the hydraulic system (in face of increasing maintenance costs) versus the cost of replacement.

An examination of the BoM provided by SunWater suggests that the replacement costs (direct expenses) are currently projected at $150,000.

Based upon a desktop review of the information provided, Aurecon considered that the proposed renewal activity is prudent in terms of timing even though it suggests an earlier replacement date than that assigned by its prescribed asset life. Aurecon also noted that SunWater has planned an engineering study prior to 2023-24 that seeks to examine the feasibility of deferring replacement.

The BoM provided did not provide sufficient detail for Aurecon to evaluate the appropriateness of the assigned direct costs for this asset.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the replacement of the hydraulic control system at Ben Andersen Barrage is prudent, but that insufficient information had been provided

by SunWater to establish efficiency. The Authority has therefore not made any specific adjustments to this renewals item.

Item 5: Ben Andersen Barrage – Anode Replacement

At the Ben Andersen Barrage, SunWater has proposed to replace the anodes at an expense of $217,000 in 2011-12.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Aurecon noted that:

(a) these anodes are part of the protection system for the barrage to reduce corrosion and extend the life of the asset. They are deployed underground on the right hand side bank;

(b) the current anodes were installed in the mid-1980s. The operational life prescribed by the manufacturer of the anodes is 10 years;

(c) an external expert report by JLR Engineering Services (2008) recommended the replacement of the anodes; and

(d) the asset management register has incorporated the replacement of the anodes every 10 years from 2011-12.

Aurecon made the following key points:

(a) the replacement of the anodes comes at a significant cost every 10 years. The manufacturers suggest that the operational life is only 10 years; and

(b) testing the operation of the galvanic protections system is relatively simple, and should be carried out on a routine basis. Further, the anodes have well exceeded their expected life. This can mean that either SunWater has not routinely tested the operation of the protections system or has not been responsive to any issues identified, or simply that the life of the anodes is much greater than the expected 10 years. Either way, Aurecon suggests that it indicates that the management or operational strategy for these needs further consideration.

Based on the information reviewed and site inspection, Aurecon considered that the proposed expenditure in 2011-12 is prudent and efficient. Aurecon noted that this expense is now projected at 10-year intervals based on the manufacturer's recommendation. Aurecon recommended that condition assessments at the Barrage incorporate testing of the galvanic protections systems to allow an extended operational life beyond the projected 10 years.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the replacement of anodes at Ben Andersen Barrage is prudent and efficient.

Item 6: Bucca Weir – Refurbishment of Trash Racks and Guides

SunWater

SunWater's renewals database includes $72,000 for the refurbishment of Trash Racks and Guides in 2012-13, allocated to the Bundaberg Distribution WSS.

Other Stakeholders

BRIG (2011c) and irrigators during the second round of consultations queried whether Bucca Weir is a bulk or distribution asset.

Consultant's Review

Aurecon noted that a renewal expenditure has been assigned to Bucca Weir within the NSP. Bucca Weir is a listed asset of the Bundaberg Bulk WSS. Aurecon noted that the proposed renewal expenditure relates to $72,000 in 2012-13, for the refurbishment of Trash Racks and Guides. Aurecon questioned if the actual expense relates to the Weir itself, or supporting channel/infrastructure directly related to the Distribution network.

Aurecon did not provide a recommendation on the prudency and efficiency of this expenditure.

Authority's Analysis

The Authority notes that the ROP for Bundaberg WSS and the letter from Minister Robertson, dated 28 September 2010, confirms that Bucca Weir is a bulk asset. In the absence of a recommendation from Aurecon regarding the prudency and efficiency of this item, the Authority has not made any specific adjustments to this item. However, the Authority has transferred it from the distribution system to the bulk scheme.

Conclusion

In summary, five items for the Bundaberg WSS were sampled. Of these:

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

(b) one item is prudent but insufficient information has been provided by SunWater to establish efficiency; and

(c) one item is prudent but not efficient, required adjustment to forecast expenditure; and

(d) one item was transferred to the Bundaberg WSS from the Bundaberg Distribution WSS.

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 4.6.

Table 4.6: Review of Forecast (Direct) Renewals Expenditure 2011-36 (Real $'000)

Item	*Year*	*SunWater ($000)*	*Authority's Findings*	*Recommended ($000)*
Sampled Items				
1. Fred Haigh Dam - Replacement of Cables and Cableways	2013-14 to 2014-15	619	Prudent and efficient, but deferred to 2020	619
2. Ben Andersen Barrage – Refurbish shutters	2011-12 to 2015-16	861	Prudent and efficient	861
3. Ben Andersen Barrage – Replace Hydraulic Control System	2023-24	238	Insufficient information.	10% saving applied
4. Ben Andersen Barrage – Anode Replacement	2011-12	217	Prudent and efficient	217
5. Bucca Weir – Refurbishment of Trash Racks and Guides	2012-13	0	Transferred from the Bundaberg Distribution WSS.	10% saving applied
Non-Sampled Items				**10% saving applied**

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

4.6 SunWater's Consultation with Customers

Submissions

SunWater

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

(a) able to offer suggestions on planned asset maintenance which are considered by SunWater in the context of asset management planning;

(b) consulted on various operational and other aspects of service provision, including the timing of shutdowns and managing supply interruptions; and

(c) provided with information about renewals expenditure, particularly where supply interruptions may result.

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

Other Stakeholders

BRIG (2010) submitted that customers are not consulted on asset management plans and the renewal annuity expenditure or revenue. BRIG submitted that the transparency and irrigator input into the renewal annuity should be increased.

ISIS Sugar Partnership (2010) submitted that a formal customer engagement process to plan future assets should be established.

CANEGOWERS ISIS (2011) stated that SunWater's consultation with irrigators is terrible. The current Bundaberg WSS IAC cannot discuss and is not engaged in matters outside local operations and maintenance issues.

CANEGOWERS ISIS (2011) stated that the Authority should recommend that SunWater engage with customers on a more regular basis on broader issues.

BRIG (2010) stated that there was insufficient time for customers to examine the service standard/price relationship during the previous water pricing negotiations and there was an undertaking and an expectation that this would be considered in the next available process.

CANEGROWERS (2011) submitted that there has been a reduction in service standards in recent years, without customer approval. CANEGROWERS question the purpose of setting service standards if there is no penalty for non-compliance.

Authority's Analysis

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

The Authority recommends that there be a legislative requirement for SunWater to consult with its customers about any changes to its service standards and proposed renewals expenditure program. SunWater should also be required to submit the service standards and renewals expenditure program to irrigators for comment whenever they are amended and that irrigators' comments be documented and published on SunWater's website and provided to the Authority.

4.7 Allocation of Headworks Renewals Costs According to WAE Priority

Previous Review

For the 2006-11 price path, the renewals costs for the Bundaberg bulk water infrastructure were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAEs was determined by WPCF of 1.7:1, that is, one 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).

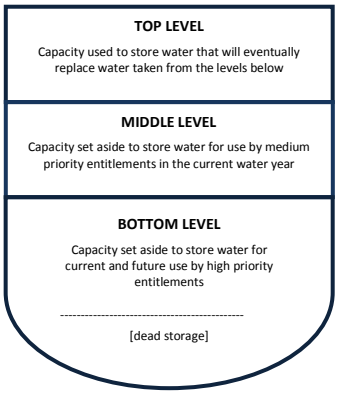
SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAEs. Specifically, the HUF methodology takes into account water sharing rules, Continuous Water Sharing Arrangements (CWSAs) and other operational requirements that typically give high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

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

Step 1: Identify the water entitlement groupings for each scheme, as listed in DERM's Water Entitlement Register, and establish which groups are to be considered as high priority and medium priority 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 Bundaberg WSS are summarised in Table 4.7. They reflect revisions to nominal WAE volumes, as submitted by SunWater in Addendum Part 1 – Erratum: Errors found in HUF Input Data (SunWater, 2011x). The HUFs for this scheme are 82% for medium priority and 18% 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 4.7: Application of HUFs Methodology

STEP 1: Water Entitlement Groups (DERM's Water Allocation Register)			
Nominal Group	*(ML)*	*HUF Group*	*(ML)*
Medium Priority (SunWater)	211,957	MP_A	335,957
Medium Priority (Burnett Water)	124,000		
High Priority (SunWater)	24,372	HP_A	44,372
High Priority (Burnett Water)	20,000		
STEP 2: ROP Conversion Factor Adjustment			
Conversion Factor: ROP_{CF}			N/A
Maximum volume that can be converted to HP: $HP_A max$			44,372
Corresponding volume of MP: $MP_A min = MP_A-(HP_A max-HP_A)*ROP_{CF}$			335,957
STEP 3: Water Sharing Rules & Operational Requirements			
Water Sharing Rules			
Volume below which MP not available: MP_0AA			65,138[3]; 69,165[4]
Volume above which max. MP available: $MP_{100}AA$			637,363
CWSAs and other operational requirements			
Likely increase in volume effectively reserved for HP: MP_0			134,303
Likely increase in min. storage before maximum MP available: MP_{100}			688,221
Key Dam Level Measures			
Full Supply Level: FSV_{hwks}			937,420
Dead Storage Level: DSL_{hwks}			29,590

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 = 220,126; HP_2 = 29,073	18%	MP_{2u}= 40,294; HP_{2u}= 5322
Middle: $min\{(MP_{100}-MP_0),(FSV_{hwks}-MP_0)\}$	MP_1 = 553,918	74%	MP_{1u}= 408,557
Bottom: $MP_0 - DSV_{hwks}$	HP_1 = 104,713	100%	HP_{1u}= 104,737

STEP 5: Calculation of HUFs for each Water Entitlement Group		
Formula	*HUF Group*	*Nominal Group*
MP_A: $(MP_{1u}+MP_{2u}) / (MP_{1u}+HP_{1u}+MP_{2u}+HP_{2u})$ = (408,557+40,294)/(408,557+104,737+40,294+5322)	HUF_{mp} = 80%	Medium Priority (SunWater) = 82% Medium Priority (Burnett Water) = 77%
HPA: (HP1u+HP2u) / (MP1u+HP1u+MP2u+HP2u) = (104,737+5322)/(408,557+104,737+40,294+5322)	HUFhp = 20%	High Priority (SunWater) = 18% High Priority (Burnett Water) = 23%

[3] Refers to MP_0AA for Kolan sub-scheme;
[4] Refers to MP_0AA for Burnett sub-scheme

**Apportioned between MP_2 and HP_2 using the ratio MP_1:HP_1. Source: SunWater (2010d, 2011x).*

Other Stakeholders

BRIG (2011) submitted that:

(a) medium priority and high priority users should not pay the same cost per ML as more of the dam is required to supply high priority;

(b) HUF is not appropriate when there is no longer a return on assets and that renewals costs are heavily back-loaded without an explanation;

(c) while the conversion factor for medium priority to high priority calculated by DERM maintains the reliability of medium priority water, the impact of medium priority users of such conversions at very low storage levels is very severe – from a small announced allocation to zero;

(d) the pricing structure should not encourage the conversion of medium priority to high priority. In other words, the cost of holding extra medium priority to ensure a reasonably reliable supply should be less than the cost of a lesser quantity of high priority water; and

(e) the HUF approach proposed by SunWater for allocation of asset renewal costs to medium priority and high priority underestimates the proportion of the asset devoted to supplying high priority bulk water. BRIG proposes that the conversion factors in the Water Resource Plan be adopted.

CANEGOWERS (2011) questioned the conversion factor and HUF for this scheme and questioned that if 90% of WAEs are medium priority, then why is the converted nominal allocation for medium priority 84%? CANEGOWERS (2011) stated that this indicates a conversion factor of around 1.7, which is very low for this scheme; especially as the current ROP rules give extremely high reliability for high priority especially towards the end of a water year.

CANEGROWERS (2011) submitted that the 82% HUF indicated that the driest 15 years for Bundaberg were very close to the average. They noted that this did not match the very dry conditions experienced in the past few decades.

CANEGROWERS (2011) submitted that the cost allocation methodology needs to reflect that some irrigators are likely to convert from medium priority to high priority. Conversion factors should be calculated by converting all medium priority to high priority and use this so there is no incentive or cost impacts on remaining irrigators if some irrigators do decide to convert.

ISIS Sugar Partnership (2010) submitted costs should be allocated depending on reliability of supply.

During the second round of consultations (April 2011), irrigators expressed concern regarding conversion factors since some growers are likely to convert from medium to high priority over the next five years. Irrigators considered that this will cause remaining medium priority users to be imposed with extra costs. Conversion factors should be calculated by converting all medium priority to high priority and use this for both bulk and channel so there is no incentive or cost impacts on remaining growers if some growers decide to convert.

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 (2011) that the method for apportioning the top layer of storage between medium and high priority be modified to reflect the ratio of nominal volumes rather than ratio of MP_1:HP_1.

SunWater (2011x) accepted these recommendations and submitted recalculated HUFs for each scheme. For the Bundaberg WSS, these recommendations did not result in any changes to the HUF (Table 4.8).

Table 4.8: 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 = 220,126; HP_2 = 29,073	18%	MP_{2u}= 40,294; HP_{2u}= 5322
*Revised**	MP_2 = 220,126; HP_2 = 29,073	no change	MP_{2u}= 40,294; HP_{2u}= 5322
Middle Layer	MP_1 = 553,918	74%	MP_{1u}= 408,557
Bottom Layer	HP_1 = 104,713	100%	HP_{1u}= 104,737

STEP 5: Calculation of HUFs for each Water Entitlement Group			
	Initial	*Revised*	*Nominal Group*
HUF_{mp}	80%	80%	Medium Priority (SunWater) = 82% Medium Priority (Burnett Water) = 77%
HUF_{hp}	20%	20%	High Priority (SunWater) = 18% High Priority (Burnett Water) = 23%

**Apportioned between MP_2 and HP_2 using the ratio of nominal volumes (MP_A:HP_A). Source: SunWater (2011x).*

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 1.91:1. This compares with the WPCF of 1.7:1 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators (served by SunWater) will now pay 82% of the cost of renewals whereas previously medium priority irrigators (served by SunWater) paid 84%.

In response to issues raised:

(a) in regard to BRIG's comments, the HUF provides a cost reflective approach to allocating storage costs that provides greater recognition of the requirements of High Priority users. It would mean that high priority users are allocated a greater share of these costs, as compared to that applying in the Water Resource Plan (WRP);

(b) in regard to CANEGROWERS comments, the Authority notes that the HUF is equivalent to a 1.91:1 conversion factor, different to the 1.7:1 that previously applied. The HUF methodology takes into account drought expectations over time. The conversion factors remain appropriate where trading occurs between high and medium priority, as shown in the WRP. The HUF is used to allocated storage related renewals costs;

(c) in regard to Isis Sugar Partnerships (2011), the Authority notes that the HUF methodology does take into account the reliability of supply; and

(d) in regard to Round 2 comments, converted allocations to high priority would attract a greater proportion of storage related costs.

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 Bundaberg WSS the recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.9. 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 is SunWater's total renewals annuity for 2006-11 and SunWater's proposed total annuity for 2012-16. SunWater did not submit a disaggregation between high and medium priority customers.

Table 4.9: Bundaberg 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	99	397	421	456	668	640	641	640	638	637	637
Total Authority	-	-	-	-	-	-	544	544	543	545	553
Medium Priority	-	-	-	-	-	-	76	76	76	77	78
High Priority	-	-	-	-	-	-	372	372	371	373	378
Distribution Losses	-	-	-	-	-	-	96	96	95	96	97

Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5. SunWater's renewals annuity does not include the allocation of Gin Gin channel costs to the bulk system (see Chapter 3). The Authority's renewals annuity does include the adjustment. Source: Actuals (SunWater, 2011) and Recommended (QCA, 2011).

5. OPERATING COSTS

5.1 Background

Ministerial Direction

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

Issues

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

(a) the scope of operating activities for 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; and

(d) the most appropriate methodologies for assigning operating costs to service contracts[5] 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 41 staff are located at the Bundaberg 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;

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

(b) service provision relates to:

(i) water delivery – scheduling and releasing bulk water from storages, surveillance of water levels and flows in the river, and quarterly meter reading; and

(ii) customer service and account management – managing enquiries about accounts and major transactions; providing up to date online data on WAE, water balances and water usage; and managing transactions such as temporary trades, transfers and other scheme specific transactions;

(c) compliance requirements to provide the bulk service include those relating to:

(i) the ROP and ROL – a major part of which is gathering and reporting data at quarterly and annual intervals on water sharing rules, ROP amendments and modifications; water accounting and reporting on stream flow, water quality and other data (Table 5.1 refers).

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

Storage	*Monthly monitoring requirements*			
	Inflow	*Head Water*	*Tail Water*	*BGA*
Fred Haigh Dam	Yes	Yes	Yes	Yes
Bucca Weir	Yes	No	Yes	Yes
Kolan Barrage	No	Yes	No	No
Ned Churchward Weir	No	Yes	Yes	Yes
Ben Anderson Barrage	No	Yes	Yes	Yes
Sheep Station and St Agnes Creeks	Yes	Yes	No	No

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

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

Routine dam safety inspections are carried out monthly on Fred Haigh Dam and quarterly on the weirs and barrages. Specific dam safety inspections are at the 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;

(iv) land management (weed and pest control, rates and land tax, security and trespass and access to land owned by SunWater) as well as other obligations in relation to workplace health and safety, financial reporting and taxation and irrigation pricing;

(d) insurance is obtained on a portfolio basis and allocated to the scheme;

(e) SunWater has sought to transfer the management and cost of recreation activities to private operators or Government. The recreation facilities at Fred Haigh Dam are managed by the Bundaberg Regional Council; and

(f) other supporting activities include central procurement, human resources and legal services.

Previous Review

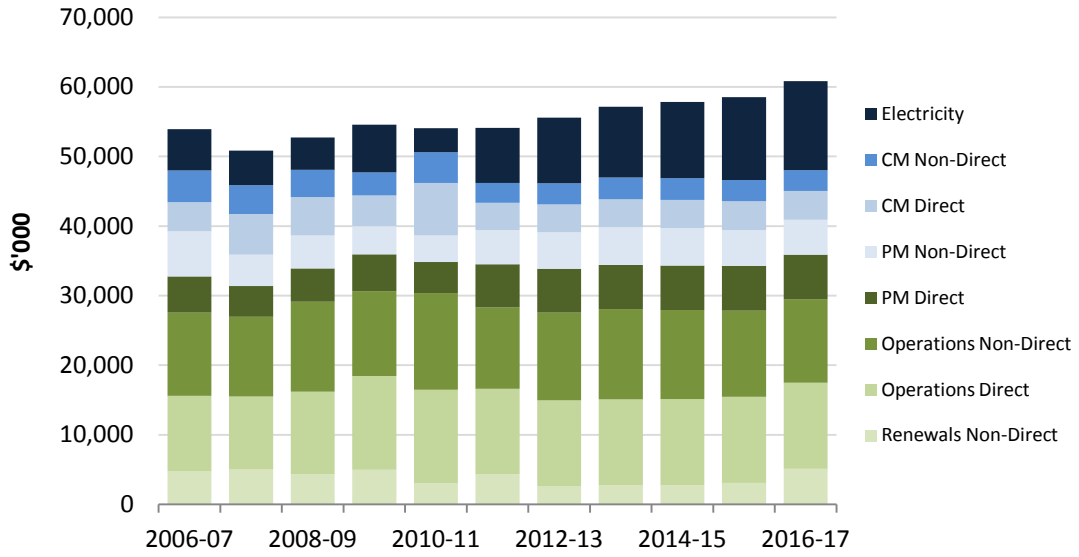
For the 2006-11 price paths, Indec identified annual cost savings of between $3.8 million and $5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

SunWater's past and forecast total operating costs for its irrigation service contracts (all sectors) are summarised in Figure 5.1 below. 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.

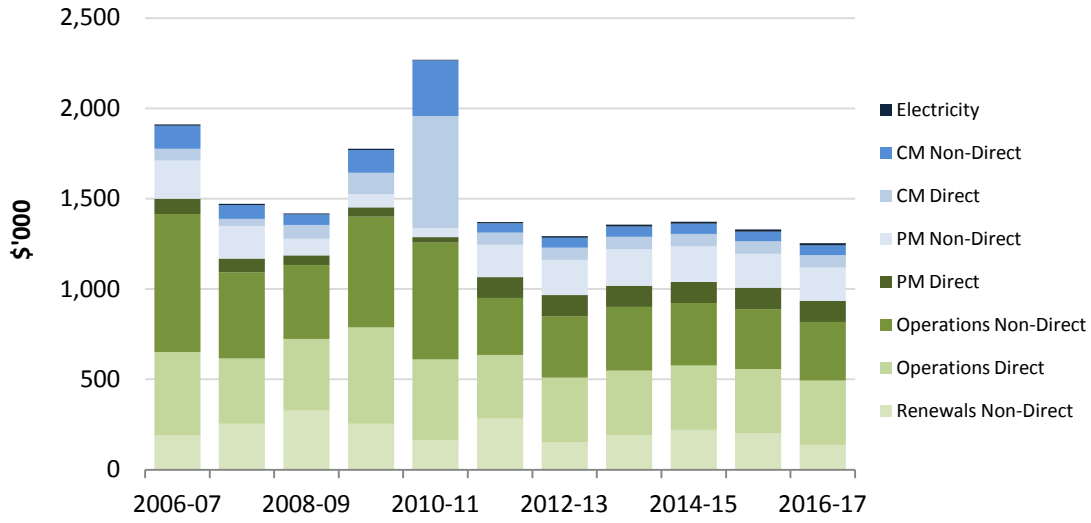
Figure 5.1: SunWater's Total Operating Costs (Real $'000) – All Service Contracts



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).

Expenditure by activity in Bundaberg WSS (all sectors) is shown in Figure 5.2 and Tables 5.2 and 5.3.[6]

Figure 5.2: SunWater's Total Operating Costs – Bundaberg 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	1,227	838	807	1,147	1,092	668	697	710	702	688	680
Electricity	7	7	7	7	5	8	10	10	11	12	13
Preventive Maintenance	296	256	144	124	80	295	312	319	314	306	302
Corrective Maintenance	192	116	134	243	928	117	122	125	124	122	121
Renewals Non-Direct	188	255	327	255	165	282	154	192	221	202	137
Total	**1,910**	**1,472**	**1,419**	**1,776**	**2,270**	**1,371**	**1,294**	**1,356**	**1,372**	**1,330**	**1,254**

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).

[6] SunWater's operating costs for the Bundaberg WSS in this chapter do not include the adjustment for Gin Gin Channel (see Chapter 3). This adjustment is included in Chapter 6 – Draft Prices.

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	352	249	213	410	426	292	296	296	296	296	296
Electricity	7	7	7	7	5	8	10	10	11	12	13
Contractors	43	40	93	59	430	49	50	51	52	52	52
Materials	51	24	33	41	87	39	40	40	41	42	42
Other	167	162	185	192	154	154	154	154	154	153	153
Non-Direct	1,290	990	888	1,067	1,168	829	745	805	819	776	698
Total	**1,910**	**1,472**	**1,419**	**1,776**	**2,270**	**1,371**	**1,294**	**1,356**	**1,372**	**1,330**	**1,254**

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 $1.3 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the indirect and overhead costs allocated to renewals expenditure.] The projected efficient average operating costs in the NSP for 2011-16 are $1.1 million per annum.

Other Stakeholders

BRIG (2011) questioned how operating costs are going to decrease substantially in 2010-11 when they are supposedly efficient now.

CANEGROWERS (2011) also noted that 53% of operating costs are overheads.

During the first round of consultations (May 2010) irrigators wanted to ensure that SunWater's costs are based on efficient costs.

Authority's Analysis

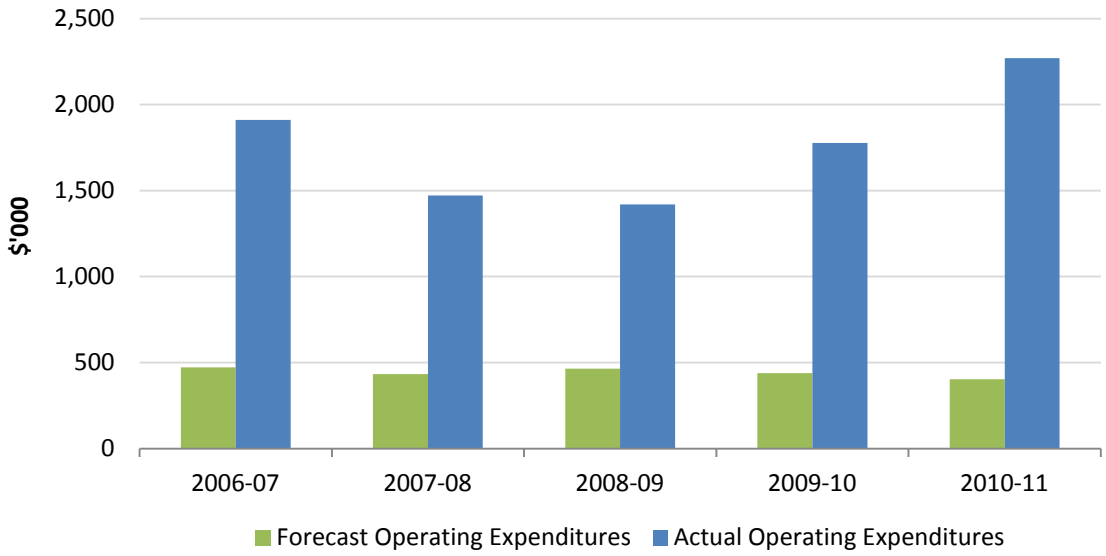
The Authority has sought to review the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices.

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 Bundaberg WSS is shown in Figure 5.3 below. For this scheme, SunWater's actual operating costs were greater than Indec's forecast efficient operating costs by $6,636,000 over the period.

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 engaged Aurecon to address potential Bundaberg WSS specific cost savings (see below).

5.3 Non-Direct Costs

Introduction

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

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

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

The nature of these non-direct activities, as either indirect or overhead costs, is detailed in Volume 1.

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

Total non-direct costs and those allocated to the Bundaberg 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
Bundaberg WSS	1,290	990	888	1,067	1,168	829	745	805	819	776	698

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

CANEGROWERS ISIS (2011) submitted that water ordering and scheduling are not required within the scheme so these costs should not be included in the scheme's overhead costs.

CANEGROWERS (2011a) and irrigators during the second round of consultations (April 2011) raised concerns that field staff was decreasing but total staff numbers were unchanged. Irrigators prefer that the majority of staff in field doing work not overhead staff in Brisbane which does not increase service. Irrigators submitted that centralisation has moved staff from Bundaberg to Brisbane and that higher labour costs in Brisbane means costs have increased.

CANEGROWERS (2011b) questioned whether items such as water meter reading for groundwater are attracting overhead costs. Are they included as revenue offset?

CANEGROWERS (2011b) and irrigators at the second round of consultations (April 2011) questioned whether the labour mix of full time, casual and contract was appropriate? If there is spare labour then should there be more casuals and contractors? Further, the irrigators queried whether costs were attributed accurately to projects or are costs of people sitting around doing nothing attributed directly to schemes?

During the second round of consultations (April 2011) irrigators raised concern that overheads are too high. For example 61.3% of costs for preventive maintenance bulk are indirect and overheads. Indirect, overheads and other for operations bulk is 70% which is not operations costs but overheads.

During the second round of consultations (April 2011) irrigators also questioned whether items such as water meter reading for groundwater are attracting overhead costs. If so, are they included as revenue offset?

Authority's Analysis

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

In seeking to establish prudency and efficiency, the Authority commissioned Deloitte Touché Tohmatsu (Deloitte) to review SunWater's non-direct costs. Deloitte carried out benchmarking to assess where potential efficiencies within SunWater may be achieved. Deloitte identified savings of $495,314 (in 2010-11 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 made the comparison unreliable.[7]

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

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

[7] For example, PVWater have only four FTE staff. For the benchmarking exercise, PVWater needed to estimate the proportion of staff time spend on administration versus operations and maintenance activities, which varied 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.

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

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 Bundaberg 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	1,290	990	888	1,067	1,168	829	745	805	819	776	698
Authority	-	-	-	-	-	-	717	662	656	727	641

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 below. These estimates reflect SunWater's most recent positions and differ from the NSP. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011.

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations	463	360	396	534	446	353	356	356	356	356	356
Electricity	7	7	7	7	5	8	10	10	11	12	13
Preventive Maintenance	86	76	52	50	30	115	117	117	117	117	117
Corrective Maintenance	65	39	76	118	621	66	67	68	68	69	69
Total	**620**	**482**	**532**	**709**	**1,101**	**542**	**549**	**551**	**553**	**555**	**556**

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

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

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Labour	352	249	213	410	426	292	296	296	296	296	296
Electricity	7	7	7	7	5	8	10	10	11	12	13
Contractors	43	40	93	59	430	49	50	51	52	52	52
Materials	51	24	33	41	87	39	40	40	41	42	42
Other	167	162	185	192	154	154	154	154	154	153	153
Total	**620**	**482**	**532**	**709**	**1,101**	**542**	**549**	**551**	**553**	**555**	**556**

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

Authority's Analysis

The Authority engaged Aurecon to review the prudency and efficiency of SunWater's proposed direct operating expenditure for this scheme.

Aurecon (2011) reported that the major limitation to its review was the lack of precise information from SunWater, particularly given the tight time frames for its study. Although Aurecon found that SunWater staff were willing to provide information as requested, a number of difficulties were still encountered, including that:

(a) reports due for completion in 2010, were still incomplete during the review period;

(b) obtaining operational trend expenditure information was difficult due to the implementation of the Business Operating Model (BOM) and management accounting system;

(c) historical cost data, which had been re-coded for entry into the BOM, could not be traced or verified;

(d) the capacity of the BOM to extract specific data for analysis was limited;

(e) the incorporation of indirect and overhead costs in all activities made it difficult to assess the activity related expenditure; and

(f) retrieving information regarding individual assets was difficult.

Aurecon also noted that SunWater has developed a new electronic Asset Management System, which has greatly improved information capture and asset management data, but access to all components of this system is limited to a handful of computers and personnel located within the Brisbane office. Extracting specific asset information was extremely time-consuming for all involved.

Aurecon concluded that SunWater underestimated the level of detail and information required for the review. This impacted SunWater's capacity in many cases to provide the requested information within the required timeframes. Aurecon therefore found that significant information gaps still exist, which hindered its capacity to adequately assess the prudency and efficiency of all proposed operational expenditure.

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

(a) attain greater operating efficiency;

(b) achieve greater transparency;

(c) facilitate future price reviews; and

(d) promote more meaningful stakeholder engagement.

Aurecon'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 compliance, administration, 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 above.

Other Stakeholders

CANEGOWERS (2011) noted that operations costs are estimated to fall by 15% over the next five years in real terms which is a 2% increase in nominal terms by 2015-16.

CANEGOWERS (2011) questioned whether insurance costs forecast at $90,000 are for the bulk scheme or bulk and distribution combined.

Consultant's Review

Aurecon reviewed SunWater's operations costs in more detail as shown in Table 5.8.

Table 5.8: Operations Expenditure by Type ($2010-11, $'000)

Type	***Actual***					***Forecast***				
	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***
Labour	242	161	156	309	165	167	167	168	169	169
Materials	17	3	2	2	2	2	2	2	2	2
Contractors	42	35	54	32	29	29	29	30	30	31
Other	161	162	185	191	146	146	145	145	146	146
Total Direct Costs	*463*	*360*	*396*	*534*	*342*	*344*	*343*	*345*	*347*	*348*
Indirects	500	287	230	274	143	143	164	175	167	157
Overheads	264	190	180	339	170	171	174	176	177	172
Total	**1,227**	**838**	**807**	**1,147**	**655**	**658**	**681**	**696**	**691**	**677**

Source: Aurecon (2011). Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data. Totals may not match SunWater's NSP due to rounding.

Particular observations by Aurecon were that:

(a) operations costs comprise between 62% and 78% of total operating costs;

(b) water usage in the 2006-07 was 80% (of 2006 levels) and operations costs were $1.22 million. Water use in 2010 increased slightly to 82% but operations costs decreased to $1.14 million; and

(c) cost items in the 'other' category included insurance ($90,000 in 2010-11), rates ($17,000) land tax ($23,000 in 2010-11) and other administrative costs.

Aurecon provided a summary of the operations costs by activity for the four years 2006-07 to 2009-10 (Table 5.9).

Table 5.9: Operations Expenditure by Activity ($2010-11, $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*
Customer Management	53	-	-	68
Workplace H&S	-	-	-	3
Environmental Management	167	-	-	73
Water Management	70	168	156	152
Scheme Management	613	405	413	646
Dam Safety	156	39	69	59
Schedule /Deliver	141	173	95	108
Metering	2	52	67	37
Facility Management	5	1	6	-

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

Significant items include:

(a) water management – activities related to announcement of water allocations, water quality monitoring and sampling, blue-green algae management, shoreline inspections, monitoring of groundwater levels. Contractors are used for water quality monitoring. SunWater noted that 2006-07 was a transition year in switching from the previous internal trade model to the new Business Operating Model, giving rise to comparability problems with line items;

(b) scheme management – energy management, land and property management, manual development, scheme strategies, facility contingency plans and emergency action plans, system leakage management plans (SLMPs), insurance, rates and land taxes;

(c) dam safety – routine monthly dam inspections, monitoring of embankments, piezometers, seepage surveillance, compliance documentation and reporting;

(d) schedule/deliver – scheduling, releasing, operations of pump stations and SCADA, monitoring of water entitlements, reporting of breaches, water harvesting, ROP compliance of water levels and flows; and

(e) metering – costs incurred in reading meters.

Aurecon noted that the provision of disaggregated historical activity data for operations by SunWater, provided substantial insights, but identified substantial activities and issues requiring additional information and explanation from SunWater.

Aurecon also noted that SunWater was not able to provide 2010-11 cost estimates for the sub-activities, which Aurecon views as critical in verifying the prudency and efficiency of these costs. Aurecon recommends that to fully verify the prudency and efficiency of 2010-11 expenditure, the following information and analysis is required:

(a) 2010-11 cost estimates for sub-activities be released and examined to ensure compliance with SunWater's averaging methodology for preceding four years;

(b) cost estimates for metering be based on 2009-10 costs (assuming that is the first time all installed meters were read, and major labour efficiency measures were gained in comparison to 2008-09); and

(c) the Dam Safety forecast 2010-11 cost is reduced by $5,500 to account for the transfer of activities to Preventive Maintenance.

Due to the above data limitations, Aurecon was unable to validate fully the prudency and efficiency of operations costs.

Authority's Analysis

In Volume 1, the Authority recommended that SunWater staff continue to conduct all quarterly meter reads.

The Authority notes that Aurecon did not recommend any adjustment to operations costs for this scheme.

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

Further, SunWater's forecast average annual operations costs are approximately 21% lower than the average 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.

In response to stakeholder submission, the Authority notes that the $90,000 insurance costs presented by SunWater relate to the Bundaberg (bulk) WSS only. A further $475,000 of insurance costs is attributed to the Bundaberg Distribution System.

The Authority notes that Aurecon did not conduct a detailed review of SunWater's insurance costs for Bundaberg WSS, but a detailed assessment of SunWater's total insurance costs in included in Volume 1. The Authority notes that Aurecon's queries to SunWater revealed that insurance costs were forecast to decrease from $138,000 in 2009-10 to $90,000 in 2010-11.

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 identified in Table 5.6 above.

Other Stakeholders

CANEGROWERS (2011) raised concerns that assets were not been properly maintained which may impact on levels of service.

During the second round of consultations (April 2011) irrigators raised concern regarding declining levels of service delivery as assets are not being maintained properly. Irrigators were also concerned that unused SunWater staff time had been booked against preventive maintenance activities.

Authority's Analysis

Consultant's Review

Aurecon observed that:

(a) In 2006-07, costs that should have been coded to refurbishment were included in preventive maintenance causing a spike in these costs. Corrective maintenance costs were likewise understated;

(b) The average annual preventive maintenance costs between 2006-07 and 2009-10 were $205,000 per annum. For 2010-11, projected preventive maintenance costs is $292,000 representing an increase of 42.4%;

(c) Although preventive maintenance should generally be correlated to usage, Aurecon did not find a consistent correlation;

(d) In 2010-11, 61% of preventive maintenance costs were indirect costs and overheads, 33% was labour and 3% was materials, 2% contractors and 1.5% other. The 2010-11 cost structure was used as a basis for 2012-17;

(e) The total cost of labour at $96,000 in 2010-11 was more than double the average of $45,000 for 2007-08 to 2009-10; and

(f) Weed control costs declined from $55,000 (2006-07) to $22,000 (2009-10), with labour component ranging from $4000 to $13,000.

Aurecon noted that SunWater's proposed labour costs for preventive maintenance of $96,000 in 2010-11 are informed by a study by PB in 2010. PB proposed that for 2010-11, a total of 1,569 hours would be required at a total cost of $90,957 for condition monitoring and servicing. This included 278 hours of new monitoring and inspection activities.

In assessing historical preventive maintenance costs, Aurecon noted the differences between 2007 observations and later years (possibly due to error due to the change in the business model used). However, SunWater advised that 2006-07 was a transition year in which the previous internal trade model was removed and the new BOM model developed and implemented in 2007-08. This causes difficulties in comparability over this time period.

Aurecon identified historical preventive maintenance between 2006-07 and 2009-10 at an average of 882 hours (noting that 2007 data was questionable) and labour at an average of $37/hour. Aurecon recommended that that an audit of historical activities (particularly 2009-10)

be undertaken to identify if all activities were previously undertaken and if coding errors resulted in these costs being allocated to other activities before accepting SunWater's proposal of 1,569 hours of labour input.

Aurecon also noted that the 2010-11 hourly labour rate adopted by PB ($58/hour) exceeded SunWater's actual costs in 2009-10 ($36/hour), possibly due to an assumption by PB of the utilisation of more senior SunWater staff.

Aurecon recommended that 1,160 hours of labour be budgeted at $50/hour at a total cost of $58,000 for these activities (882 being the average between 2006-07 and 2009-10 and 278 additional hours recommended by SunWater). Aurecon further recommended that an allowance of $7,800 should be provided for the labour input to weed control costs, based on a 10% mark-up on the four-year average of these costs.

In total for labour for monitoring and weed control, Aurecon recommended that the $96,000 estimate projected by SunWater be revised to $65,800.

Aurecon's analysis results in a reduction of $30,200 in total preventive maintenance, to be applied to each year for the next pricing period.

SunWater's Response

In relation to Aurecon's suggested reductions in labour costs related to preventive maintenance based on a four year historical average, SunWater submitted that past data is not a reliable indicator of actual costs or work. SunWater noted that some past preventive maintenance at storages was booked to operations, rather than preventive maintenance.

SunWater considered that the PB review (which informed SunWater's submission) identified the labour effort and materials – contractor costs for each maintenance item from first principles. SunWater submitted that this was a thorough and detailed review undertaken by an independent party, is forward looking and is the best source of reliable information for Operations costs forecasts.

In response to Aurecon's comments regarding the difference in wages rates between SunWater's historic costs, and those recommended by PB, SunWater responded that the costs for 2010-11 were based on information received from field staff through consultation. Each preventive maintenance job was costed by identifying the different staff required to complete the work. Depending on the level of employee, different hourly labour rates were used.

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

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

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

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

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

(a) historic costs are heavily dependent on how employees have recorded their time, and there scope for error in these entries; and

(b) forecasts were developed at the activity, not sub-activity level. Attempts to recreate a labour or other cost at the sub-activity level will be fraught and misleading.

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

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

Conclusion

In Volume 1, the Authority 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 Reliability Centred Maintenance (RCM) approach to formulating maintenance activity requirements should be adopted.

For this scheme, the Authority notes Aurecon's suggested revisions to SunWater's preventive maintenance costs, and also SunWater's responses. As noted by SunWater, the Authority considers that Aurecon's analysis reflects the level of information provided to them. SunWater objects to Aurecon's use of historical costs to forecast labour costs to inform forecast labour costs, based on the fact that historical labour data is not reliable. However, the Authority notes that the historical cost data was provided by SunWater. The Authority does not consider that adopting SunWater's forecasts in place of those recommended by Aurecon because SunWater's historical data is unreliable provides the appropriate regulatory incentives.

In objecting to Aurecon's findings regarding weed control, SunWater submitted that costs be reviewed on a scheme-wide basis, rather than on a sub-activity basis. However, the Authority considers that it is necessary to understand the sub-activities performed by SunWater staff to be able to evaluate the efficiency of labour costs.

The Authority accepts Aurecon's recommendations, and has reduced SunWater's proposed preventive maintenance costs by $30,200 per annum in its recommended tariffs.

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.

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

SunWater's proposed corrective maintenance costs are set out in Table 5.6 above.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Aurecon noted that corrective maintenance costs mainly related to indirect costs and overheads (44%), labour (22.4%), materials and contractors (12.8%) and other (7.8%).

Aurecon noted the difficulty in forecasting corrective maintenance costs, and that SunWater's approach of using historical expenditure as a basis for forecasting is commonly used by other water utilities. On this basis, the annual average direct cost was $75,000 (excluding indirect costs and overheads). This compares to SunWater's forecast of $65,000 for the period starting at 2010-11. Aurecon considered SunWater's forecast to be prudent and efficient.

Authority's Analysis

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, the Authority recommends that SunWater formally document its processes for the development of correct maintenance expenditure forecasts.

For this scheme, the Authority accepts Aurecon's recommendations, and has included SunWater's proposed Corrective Maintenance costs in recommended tariffs.

Item 4: Electricity

Stakeholder Submissions

SunWater

The electricity costs for the scheme relate to the electricity required for the operation of Fred Haigh Dam and Ned Churchward Weir for lighting and for powering their mechanical installations.

SunWater submitted that additional electricity costs at the Monduran Pump Station should be attributed to bulk water service to account for water pumped to the Burnett River.

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

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

SunWater's proposed electricity costs are set out in Table 5.6 above.

Other Stakeholders

CANEGROWERS ISIS (2011) submitted that the Authority should investigate the options for delivering cheaper electricity charges for the Bundaberg Water Supply Scheme by moving to the contestable market. While SunWater may prefer to stay with Ergon Energy, it may be to irrigators' advantage in Bundaberg to swap to another electricity supplier.

Consultant's Review

Aurecon did not review SunWater's electricity costs.

Authority Analysis

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 5.10 below.

The Authority accepts SunWater proposal to attribute 8% or $118,000 of costs from the Gin Gin Main Channel to the Bundaberg (bulk) WSS. This issue is addressed in detail in Chapter 3 above.

Item 5: Cost Escalation

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

Direct Labour

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

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

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

Direct Materials and Contractors

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

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

Direct Electricity

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

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

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.

Other Direct 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.

Non-direct costs

The Authority accepts SunWater's proposal to escalate all non-direct costs by 2.5% per annum for the 2012-17 regulatory period, and for the interim year 2011-12.

Conclusion

A comparison of SunWater's and the Authority's direct operating costs for the Bundaberg WSS is set out in Table 5.10.

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 5.10: 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	356	356	356	356	356	343	343	343	343	343
Electricity	10	10	11	12	13	8	8	9	9	10
Preventive Maintenance	117	117	117	117	117	112	113	114	115	115
Corrective Maintenance	67	68	68	69	69	65	65	66	66	66
Total	549	551	553	555	556	528	530	532	533	534

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).

5.5 Cost Allocation According to WAE Priority

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

Previous Review

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

Stakeholder Submissions

SunWater

SunWater (2011j) has proposed to assign operating costs to users on the basis of their current WAE, except for non-direct costs allocated to renewals (on the basis of DLC) which are to be allocated to priority groups using HUFs. SunWater's proposed HUF for this scheme is set out in Chapter 4 Renewals Annuity.

Other Stakeholders

BRIG (2011) noted that intuitively the number of staff per ML involved in river operating must be much less than those involved in the channel operations.

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 Bundaberg 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 5.11. The Authority's recommended operating costs are set out in Table 5.12.

Table 5.11: SunWater's Proposed Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	170	170	170	170	170
Materials	3	3	3	3	3
Contractors	29	30	30	31	31
Other	153	153	153	153	153
Non-direct	341	354	345	331	324
Preventive Maintenance					
Labour	99	99	99	99	99
Materials	12	12	12	12	12
Contractors	5	5	5	5	5
Other	1	1	1	1	1
Non-direct	195	202	197	189	185
Corrective Maintenance					
Labour	27	27	27	27	27
Materials	25	25	25	26	26
Contractors	15	16	16	16	16
Other	0	0	0	0	0
Non-direct	55	57	56	53	52
Electricity	10	10	11	12	13
Total	**1,140**	**1,164**	**1,151**	**1,128**	**1,117**

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. These costs do not include the allocation of Gin Gin channel costs to the bulk system. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.12: The Authority's Recommended Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	164	165	166	167	168
Materials	3	3	3	3	3
Contractors	28	29	29	29	29
Other	148	146	145	144	143
Non-direct	332	339	326	308	296
Preventive Maintenance					
Labour	96	96	97	98	98
Materials	11	11	12	12	12
Contractors	5	5	5	5	5
Other	0	0	0	0	0
Non-direct	190	194	186	175	168
Corrective Maintenance					
Labour	26	26	26	27	27
Materials	24	24	24	24	24
Contractors	15	15	15	15	15
Other	0	0	0	0	0
Non-direct	54	55	53	50	48
Electricity	8	8	9	9	10
Total	**1,104**	**1,118**	**1,096**	**1,066**	**1,046**

Note: These costs do not include the allocation of Gin Gin channel costs to the bulk system. 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 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 Ministerial 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 Bundaberg 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 Bundaberg WSS (Real $'000)

	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	1,810	1,597	1,480	1,929	2,783	1,705	1,757	1,780	1,766	1,742	1,746
Renewals Annuity	99	397	421	456	668	640	641	640	638	637	637
Operating Costs	1,722	1,217	1,092	1,521	2,105	1,089	1,140	1,164	1,151	1,128	1,117
Revenue Offsets	-10	-17	-33	-49	10	-24	-24	-24	-24	-24	-24
Authority's Total Costs	-	-	-	-	-	-	1,672	1,686	1,664	1,635	1,622
Renewals	-	-	-	-	-	-	544	544	543	545	553
Operating Costs	-	-	-	-	-	-	1,150	1,165	1,143	1,113	1,092
Revenue Offsets	-	-	-	-	-	-	-24	-24	-24	-24	-24
Return on Working Capital	-	-	-	-	-	-	1	1	1	1	1

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. SunWater's costs do not include the allocation of Gin Gin channel costs to the bulk system (Chapter 3). The Authority's costs do include the adjustment. Source: SunWater (2011ap) and 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 Bundaberg 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;

(c) costs that *should* vary with water use under Indec's proposed optimal (prudent and efficient) management approach (as outlined in Volume 1). On average across all SunWater's bulk schemes, 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 Bundaberg 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 52% of costs in the fixed charge and 48% 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 – Renewals Annuity and Chapter 5 – Operating Costs. The outcome is summarised in Table 6.2.

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

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Net Fixed Costs	1,553	1,567	1,546	1,519	1,507
High Priority	195	197	194	191	190
Medium Priority	1,085	1,095	1,080	1,061	1,052
Distribution Losses	273	275	272	267	265

Note: Net fixed costs is net of revenue offsets and return on working capital. Source: SunWater (2011ap) and 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 46.7% 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 Bundaberg 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*
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	5.94	6.09	6.25	6.40	6.56
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.15	1.18	1.21

Note: Channel (Bundled) prices are provided for reference only. 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 (Table 6.4).

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 and Priority Group	*2010-11 Prices $/ML (indexed to 2012-13)*		*Irrigation WAE (ML)*	*Irrigation Water Use (ML)*	*Current Revenue*	*Revenue from Cost-Reflective Tariffs*	*Difference*
	Fixed	*Variable*					
River	7.44	11.64	185,689	66,425	$2,154,477	$1,176,756	$977,722

Source: Source: SunWater (2011al), SunWater (2011ao) and QCA (2011).

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the Bundaberg 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 Bundaberg WSS ($/ML)

	Actual Prices						*Calculated Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	11.14	11.42	11.70	12.00	12.30
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1 10	1.13	1.16	1.18	1.21

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

6.9 Impact of Recommended Prices

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

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APPENDIX A: FUTURE RENEWALS LIST

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

Asset	*Year*	*Description*	*Value ($'000)*
Ben Anderson Barrage	2011-12	Replace Anodes	217
		11BIAXX REFURBISH 10 SHUTTERS	165
		09BIA49 REPLACE SECTION OF CRANE RAIL (complete replacement to be done over 4 years)	39
		10BIA19 DESIGN/INSTALL WEED DEFLECTOR	29
	2012-13	11BIAXX REFURBISH 10 SHUTTERS	172
		09BIA49 REPLACE SECTION OF CRANE RAIL (final sections after 4 years)	76
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	15
	2013-14	11BIAXX REFURBISH 10 SHUTTERS	176
	2014-15	11BIAXX REFURBISH 10 SHUTTERS	175
	2015-16	Replace Control	193
		11BIAXX REFURBISH 10 SHUTTERS	173
		Replace Hydraulic Power System	61
	2016-17	11BIAXX REFURBISH 10 SHUTTERS	171
	2017-18	11BIAXX REFURBISH 10 SHUTTERS	170
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	15
	2018-19	11BIAXX REFURBISH 10 SHUTTERS	171
		10BIA13 COND ASSES AND REFURB OF CP SYST	52
		Refurbish Road - fill potholes, reconstruct table drainage, reseal surface	24
	2019-20	11BIAXX REFURBISH 10 SHUTTERS	170
		Replace Cables & Cableways	58
		10BIA20 - 10Y CRANE INSPECTION	26
	2020-21	11BIAXX REFURBISH 10 SHUTTERS	173
	2021-22	Replace Anodes	226
		11BIAXX REFURBISH 10 SHUTTERS	171
	2022-23	11BIAXX REFURBISH 10 SHUTTERS	169
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	14
		Refurbish Seals etc - Gates are Stainless Stell installed April 2005 (BUN731)	12
	2023-24	Replace Hydraulic Control System	238
		11BIAXX REFURBISH 10 SHUTTERS	170
	2024-25	11BIAXX REFURBISH 10 SHUTTERS	168
		Refurbish Crane - corrosion treatment, mech/elec/hydraulic refurbishment incl winch	54
		Replace Electric Winch	50
		09BIA49 REPLACE SECTION OF CRANE RAIL	32
	2025-26	11BIAXX REFURBISH 10 SHUTTERS	168
		Replace Hydraulic Power System	60
	2026-27	11BIAXX REFURBISH 10 SHUTTERS	169
	2027-28	11BIAXX REFURBISH 10 SHUTTERS	169
		10BIA13 COND ASSES AND REFURB OF CP SYST	51
		Study: 5yr Dam Comprehensive Inspection	30
		Refurbish Gate - corrosion, rope, seals & actuator - moved out from 2005	24
		Study: Failure Impact Assessment	14
	2028-29	11BIAXX REFURBISH 10 SHUTTERS	170
		09BIA46 REFURBISH GATE 2	31

Asset	*Year*	*Description*	*Value ($'000)*
		09BIA47 REFURBISH GATE 3	30
	2029-30	11BIAXX REFURBISH 10 SHUTTERS	168
		10BIA14 REFURBISH GATE	133
		10BIA20 - 10Y CRANE INSPECTION	26
	2030-31	Replace Control	189
		11BIAXX REFURBISH 10 SHUTTERS	169
		11BIA26 REFURBISH GATE	55
		11BIAXX REPAIR D/S CONCRETE SLAB	28
	2031-32	Replace Anodes	223
		11BIAXX REFURBISH 10 SHUTTERS	169
		Refurbish Control	36
	2032-33	Replace Transformer Rectifier Unit, Seaford	208
		11BIAXX REFURBISH 10 SHUTTERS	169
		Study: 5yr Dam Comprehensive Inspection	30
		Refurbish Road - fill potholes, reconstruct table drainage, reseal surface	24
		Study: Failure Impact Assessment	14
	2033-34	11BIAXX REFURBISH 10 SHUTTERS	169
	2034-35	11BIAXX REFURBISH 10 SHUTTERS	169
	2035-36	11BIAXX REINSTATE ROCKFILL	200
		11BIAXX REFURBISH 10 SHUTTERS	169
		Replace Hydraulic Power System	60
		09BIA49 REPLACE SECTION OF RAIL	33
Bucca Weir	2023-24	Replace BUOYS (5 OFF), SAFETY BUOYAGE SYSTEMS	24
	2025-26	Refurbish: Baulks which were installed in 2005.	36
	2033-34	Replace Splitters	32
Bullyard Pump Station	2034-35	Refurbish Valve - corrosion, seals, bearings etc	11
	2035-36	Replace Steel Gantry Structure	120
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	44
		Refurbish Pump - bearings, casing, wear rings etc	44
		Refurbish Building - paint, fixtures, fittings, electrical installation etc	33
		Refurbish Valve - corrosion, seals, bearings etc	11
Burnett River Distribution	2016-17	Replace Gauging Equipment	14
	2019-20	Replace Recorder	36
	2028-29	Replace Burnett River Meter Outlets	12
	2031-32	Replace Gauging Equipment	14
	2034-35	Replace Recorder	35
Childers Distribution	2012-13	Refurbish: Refurbish Slide Gates	17
	2019-20	Replace Valve, 900Mm Butf	49
		Replace Air Vent At 8931.89M	13
		Replace Air Vent At 5077.75M	11
		Replace Air Vent At 8397.56M	11
	2021-22	Refurbish: refurbish break pressure structure	22
	2022-23	Refurbish: Refurbish Slide Gates	17
	2024-25	Replace Valve, 200Mm Gate Tyco	32
		Replace Air Vent At 5.20M	11
	2030-31	Replace Valve, 1050Mm Disk Stewarts	26
		10BIA84 REPLACE ISOLATION VALVE	21
	2031-32	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	206
		Replace Isolating Valve	66
		Replace Air Valve At 3494.24M	18
		Replace Air Valve At 3950.37M	14
		Replace Air Valve At 3350.41M	14

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Air Valve At 1896.78M	14
		Replace Air Valve At 3820.79M	14
		Replace Air Valve At 2244.78M	14
		Replace Air Valve At 406.61M	14
		Replace Air Valve At 3230.64M	14
		Replace Air Valve At 1007.67M	14
	2032-33	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	56
		Refurbish: Refurbish Slide Gates	17
	2034-35	Replace Valve, 250Mm Prv Singer	12
Dinner Hill Distribution	2029-30	Replace Air Vent At 1848.04M	11
		Replace Air Vent At 1589.08M	11
	2031-32	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	128
Dinner Hill Pump Station	2011-12	Documents, Drawings, Specs and Cost Estimate for PLC and SCADA system	55
	2012-13	Supply, Implement, Install, Commission PLC and SCADA system	168
	2015-16	Refurbish Motor - bearings, bake etc	11
		Refurbish building electricals - lights, fittings ect	11
	2017-18	Refurbish Pump - bearings, casing, wear rings etc	14
	2018-19	Refurbish Pump - bearings, casing, wear rings etc- actual cost	14
	2019-20	Refurbish Pump - bearings, casing, wear rings etc	13
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	13
	2020-21	Replace Pump	100
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	11
	2021-22	Refurbish Building - Roof, paint, fixtures & fittings, electrical installation etc	17
	2022-23	Replace Suction Valve	15
	2025-26	Replace Structure Of Building	136
	2026-27	Replace Switchboard, Low Voltage	183
		Replace Cable	54
	2027-28	Refurbish Building - Roof, paint, fixtures & fittings, electrical installation etc	17
	2028-29	Refurbish Motor - bearings, bake etc	11
	2029-30	Replace Suction Valve	15
	2030-31	Replace Discharge Valve	323
		Replace Pump	104
		Replace Electric Motor	14
	2031-32	Replace Electric Motor	14
	2032-33	Replace Electric Motor	19
		Refurbish Pump - bearings, casing, wear rings etc	13
	2033-34	Refurbish Building - Roof, paint, fixtures & fittings, electrical installation etc	17
		Refurbish Pump - bearings, casing, wear rings etc- actual cost	13
		Refurbish building electricals - lights, fittings ect	11
	2034-35	Refurbish Pump - bearings, casing, wear rings etc	13
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	13
	2035-36	Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	11
Don Beattie Pump Station	2011-12	Refurbish Pwks - shotcrete slope protection - movement -bi-annual deformation survey to monitor ness	55
		11BIAXX INSTALL ACCESS LADDER TO OHC	35
	2012-13	Refurbish Building - roof, paint, cladding, fittings etc	56
	2014-15	Refurbish Lift - mech & elec overhaul - specialist contractor	34
		Refurbish Valve - corrosion, seals, bearings etc incl. air actuator as required	23
		Refurbish Protection Works - stabilise and replace as required	17
		Refurbish Circuit Breakers - new vacuum bottles etc (same as Quart Pot, failure could affect motor?)Taken out of budget so DT put to 04	17
		Refurbish Circuit Breakers - new vacc-uum bottles etc (same as Quart Pot, failure could affect motor?)	17
		Refurbish Valve - corrosion, seal, bearings	11

Asset	*Year*	*Description*	*Value ($'000)*
	2015-16	11BIA20 EEO Assessment and report	85
		Refurbish Screens - corrosion treatment and repair as required	11
	201617	Refurbish Motor - bearings, bake etc - Brought forward from 2007; - actual cost	51
		Refurbish Motor - bearings, bake etc - actual costs	51
	2017-18	Refurbish Pump - bearings, casing, wear rings etc - actual costs	68
		Refurbish Motor - bearings, bake etc - was ROC375 in 2002 (deferred)Taken out of budget so DT put to 04	51
	2018-19	Replace Common Controls	1220
		Refurbish Pump - bearings, casing, wear rings etc -brought forward from 2007 - actiual cost	68
	2019-20	Refurbish Pipework - external paint & refurbish within pstn	101
		Refurbish Pump - bearings, casing, wear rings etc - was roc379 2002-defrred;Taken out of budget so DT put to 04	67
		10BIA103 - 10Y CRANE INSPECTION - as per	60
		Refurbish Pipework - external blast & paint	56
		Refurbish Metalwork - structural steel, blast & paint, difficult access	45
		10BIA88 REFURBISH HV SWITCHBOARD	28
		Refurbish Pipework - above ground section external blast & paint	28
		Refurbish Guard Rails - regalvanise	28
		10BIA89 REFURBISH BULKHEAD GATE	26
		Replace Dewatering Pump No1	25
		Replace Dewatering Pump No2	25
		Refurbish Valve - corrosion, seals, bearings etc incl. air actuator as required. (increaced costs from $10K; brought forward from 2012)Then taken out so DT put to 04	22
		Refurbish Ladders - replace with SS	22
		Refurbish Pipework - paint & refurish pipework	22
		Refurbish Valve - corrosion, seal, bearings(brought forward from 2012)Taken out of budget so DT put to 04	11
	2020-21	Refurbish slope stability works - unstable slope - dropped from $1Mill in Oct 04 JK	283
		11BIA20 EEO Assessment and report	85
		Changeout Pipework - replace valves, refurbish pipework	11
	2021-22	Refurbish Screens - corrosion treatment and repair as required	11
	2022-23	Refurbish Building - roof, paint, cladding, fittings etc	56
		Refurbish Circuit Breakers - new vacuum bottles etc (same as Quart Pot, failure could affect motor?)-brought forward from 2004)	17
	2023-24	Replace Switchboard, High Voltage	893
		09BIA29 REFURBISH PUMP, MOTOR, DV	100
		Replace Suction Valve	91
		Replace Discharge Valve	83
	2024-25	Replace Switchboard, Low Voltage	73
		Refurbish Lift - mech & elec overhaul - specialist contractor	33
		Refurbish Circuit Breakers - new vacc-uum bottles etc (same as Quart Pot, failure could affect motor?)	17
		Refurbish Circuit Breakers - new vacuum bottles etc (same as Quart Pot, failure could affect motor?)Taken out of budget so DT put to 04	17
	2025-26	11BIA20 EEO Assessment and report	84
	2027-28	Refurbish Screens - corrosion treatment and repair as required	11
	2029-30	10BIA103 - 10Y CRANE INSPECTION - as per	60
		Refurbish Motor - bearings, bake etc - Brought forward from 2007; - actual cost	50
		Refurbish Motor - bearings, bake etc - actual costs	50
		Refurbish Metalwork - stairs, platforms, supports etc	45
		10BIA89 REFURBISH BULKHEAD GATE	26
		Refurbish Valve - corrosion, seals, bearings etc incl. air actuator as required	22
		Refurbish Valve - corrosion, seal, bearings	11
	2030-31	11BIA20 EEO Assessment and report	84
		Refurbish Motor - bearings, bake etc - was ROC375 in 2002 (deferred)Taken out	50

Asset	*Year*	*Description*	*Value ($'000)*
		of budget so DT put to 04	
	2031-32	Refurbish Road - repair potholes, reconstruct table drainage, spray seal	22
	2032-33	Refurbish Pump - bearings, casing, wear rings etc - actual costs	67
		Refurbish Building - roof, paint, cladding, fittings etc	56
		Refurbish Circuit Breakers - new vacuum bottles etc (same as Quart Pot, failure could affect motor?)-brought forward from 2004)	17
	2033-34	Replace Common Controls	1206
		Refurbish Pump - bearings, casing, wear rings etc -brought forward from 2007 - actiual cost	67
		Refurbish Screens - corrosion treatment and repair as required	11
	2034-35	Refurbish Pipework - external paint & refurbish within pstn	100
		Refurbish Pump - bearings, casing, wear rings etc - was roc379 2002-defrred;Taken out of budget so DT put to 04	67
		Refurbish Metalwork - structural steel, blast & paint, difficult access	44
		Refurbish Lift - mech & elec overhaul - specialist contractor	33
		10BIA88 REFURBISH HV SWITCHBOARD	28
		Refurbish Guard Rails - regalvanise	28
		Refurbish Pipework - above ground section external blast & paint	28
		Refurbish Valve - corrosion, seals, bearings etc incl. air actuator as required. (increaced costs from $10K; brought forward from 2012)Then taken out so DT put to 04	22
		Refurbish Circuit Breakers - new vacc-uum bottles etc (same as Quart Pot, failure could affect motor?)	17
		Refurbish Circuit Breakers - new vacuum bottles etc (same as Quart Pot, failure could affect motor?)Taken out of budget so DT put to 04	17
		Refurbish Valve - corrosion, seal, bearings(brought forward from 2012)Taken out of budget so DT put to 04	11
	2035-36	11BIA20 EEO Assessment and report	84
		Changeout Pipework - replace valves, refurbish pipework	11
Farnsfield Distribution	2011-12	Replace 120m length of pipeline as per option analysis hummingbird doc No. 756460	87
	2012-13	Replace 120m length of pipeline as per option analysis hummingbird doc No. 756460	90
	2017-18	Refurb air vents - see individual assessments	20
		Refurb 5 air vents	17
	2018-19	Replace Structure, 150Mm Meter Outlet	24
	2019-20	Replace a further 240m section as required (requires further analysis)	180
		Replace Security Fencing	38
		Replace Outlet Slide Gate - Fmc Pipeline	13
	2023-24	Replace Screen	21
	2025-26	Replace Valve, 375Mm Sluice	19
	2027-28	Refurb air vents - see individual assessments	20
		Refurb 5 air vents	17
		Change Out Guides - place stainless steel guides	11
	2029-30	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	89
		Replace Air Vent At 3495.00M	13
		Replace Air Vent At 5500.00M	13
		Replace Air Valve At 12310.00M	11
		Replace Air Valve At 11380.00M	11
		Replace Air Valve At 10246.69M	11
		Replace Air Vent At 1800.00M	11
		Replace Air Vent At 150.00M	11
		Replace Air Vent At 2104.00M	11
		Replace Air Vent At 950.00M	11
		Replace Air Vent At 3100.00M	11
	2030-31	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	33
	2031-32	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	156
	2034-35	Replace Air Vent At 1596.00M	19

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Air Vent At 140.00M	11
Fred Haigh Dam	2011-12	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	94
		Replace Instrumentation	59
		Refurbish Cne - rope, corrosion etc	23
		Refurbish Door - cannot remove, refurbish insitu, work in confined space difficult	23
		redesign and construct modified lifting	16
		Remove rocks from spillway floor and pli	12
	2012-13	Refurbish Trash Racks - patch paint & annodes	36
		Study: Options analysis and condition assessment on cable replacement and cable outlet works etc	24
	2013-14	Replace Cable Main Wall	310
	2014-15	Replace Cable Main Wall	309
	2015-16	Refurbish Valve	31
		Refurbish Valve - 751 cone patch painting - carried out Jan 03	27
	2016-17	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	98
		Refurbish Valve - manual actuation	37
		Remove rocks from spillway floor and pli	13
	2017-18	Refurbish Valve - manual actuation incl. Insertion piece	36
		Refurbish Trash Racks - patch paint & annodes	36
	2018-19	Replace Cable Inlet Tower	46
	2019-20	Study: 20yr Dam Safety Review (by 1 Sep 2019)	121
		Refurbish Metal Work - handrails & barriers (gal)	61
		10BIA03 - 10Y CRANE INSPECTION	34
	2020-21	Refurbish Actuator - replace Rotork	49
	2021-22	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	98
		Remove rocks from spillway floor and pli	13
	2022-23	Refurbish Trash Racks - patch paint & annodes	36
		Refurb valve - 2006 DS Report Rec 6.1a	24
	2026-27	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	97
		Replace Instrumentation	60
		Remove rocks from spillway floor and pli	13
	2027-28	Refurbish Trash Racks - patch paint & annodes	36
	2029-30	10BIA03 - 10Y CRANE INSPECTION	34
		Blast to remove existing coating and repaint gate with an approved APAS coating.	20
		10BIA02 RECOAT GATE WITH AN APP COATING	18
	2030-31	11BIAXX REFURBISH BULKHEAD GATES	49
		Refurbish Valve	30
		11BIAXX REFURBISH VALVE	22
	2031-32	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	97
		Refurbish Valve - manual actuation	36
		Refurbish Cne - rope, corrosion etc	24
		Refurbish Door - cannot remove, refurbish insitu, work in confined space difficult	24
		Remove rocks from spillway floor and pli	13
	2032-33	Refurbish Valve - manual actuation incl. Insertion piece	36
		Refurbish Trash Racks - patch paint & annodes	36
		Investigate and implement replacement of fishing gear for removal of bhk gates/trks DS Report Rec. ES/OM Pro	30
	2034-35	Refurbish Metal Work - handrails & barriers (gal)	30
	2035-36	Replace Guardrail (Upstream)	147
		Replace Guardrail	79
		Replace Guardrails & Handrails	29
		Refurbish Valve - 751 cone patch painting - carried out Jan 03	27
Gin Gin Main Channel Distrib	2014-15	Refurbish Gate, paint gate, anodes, lifting gear - GGM OTLT2	10

Asset	*Year*	*Description*	*Value ($'000)*
	2017-18	Refurb air valves - (See individual assessments)	34
	2019-20	10BIA117 REFURBISH FENCE 20305M - 25000M	109
		10BIA117 REFURBISH FENCE 8965M - 11174M	11
	2024-25	Refurbish Bench Flume - reseal contraction joints - pending condition assessment	67
		Refurbish Gate, paint gate, anodes, lifting gear - GGM OTLT2	10
	2025-26	Replace Weed Deflector	17
	2026-27	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	116
		Replace Air Valve At 19890.51M	19
		Replace Air Valve At 19591.30M	19
		Replace Air Valve At 19915.02M	19
	2027-28	Refurb air valves - (See individual assessments)	33
	2029-30	10BIA117 REFURBISH FENCE 20305M - 25000M	109
		10BIA116 REPLACE CONCRETE BAYS (7 OF)	27
		10BIA117 REFURBISH FENCE 8965M - 11174M	11
	2031-32	Replace Air Valve, 150Mm Double	14
	2034-35	Replace Slide Gate Actuators (3 Of)	146
		Refurbish Gate, paint gate, anodes, lifting gear - GGM OTLT2	10
	2035-36	Replace Slide Gates (3)	65
		Replace Weed Deflector	18
Givelda Distribution	2020-21	Replace Screen	12
	2022-23	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	112
		Change Out Guides - place stainless steel guides	11
	2032-33	Replace Press. Rel. Valve At 3300.00M	15
		Replace Press. Rel. Valve At 2370.00M	15
	2035-36	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	111
Gooburrum Distribution	2011-12	Replace Weed Screen	20
		11BIAXX REFURBISH FENCE 6360M - 7108M	16
	2012-13	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Replace Gate Valve At 0.50M	17
		Refurbish Gate - remove, repaint, anodes & bearings, install - BYM RG02	17
		Replace Scour Valve At 589.35M	12
	2013-14	Refurbish Gate - remove, repaint, anodes & bearings, re-install	57
		14BIAXX Refurbish Penstock Gates on Goob	42
		Replace Weed Screen	38
		Replace Safety Screen	15
		Refurbish Gate - paint gate, anodes, lifting gear	13
	2014-15	Refurbish Gate, remove, repaint, anodes & bearings, install - GMC RG03	23
	2015-16	Refurbish / Replace and upgrade security on gates - moved out from 03 master blaster - GOOB BSTR	34
		Replace Slide Gate	22
	2018-19	Replace Valve, 150Mm Prv Sw	36
		Change Out Seals - loss of steel lining, SS seals onto headwall, replace with regulator	34
		10BIA35 REFURBISH VALVE	32
		09BIA13 REFURBISH FENCING	15
		Replace Weed Deflector	15
	2020-21	Replace Fencing, Gates And Grids	170
	2021-22	11BIAXX REFURBISH FENCE 6360M - 7108M	17
	2022-23	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Refurbish Gate - remove, repaint, anodes & bearings, install - BYM RG02	17
	2023-24	Refurbish Gate - remove, repaint, anodes & bearings, re-install	56
		Replace Screen	29
		Refurbish Gate - paint gate, anodes, lifting gear	18
		Replace Screen, Vecellios Rd Xing	14

Asset	*Year*	*Description*	*Value ($'000)*
	2024-25	Replace Screen	22
		Refurbish Gate, remove, repaint, anodes & bearings, install - GMC RG03	22
		10BIA34 REFURBISH GATE	22
	2025-26	Refurbish / Replace and upgrade security on gates - moved out from 03 master blaster - GOOB BSTR	33
	2026-27	Replace Screen	18
	2027-28	Replace Slide Gates (2)	125
		Replace Concrete Lining	113
		Replace Screens (2)	39
		10BIA35 REFURBISH VALVE	32
		Replace Slide Gate (Gmc)	16
		Replace Pressure Relief Valve 632.50M	15
		Replace Pressure Relief Valve 508.00M	15
		Replace Pressure Relief Valve 1272.45M	15
		Replace Pressure Relief Valve 1885.00M	15
		Replace Pressure Relief Valve 4253.73M	15
		Replace Pressure Relief Valve 284.00M	15
		Replace Pressure Relief Valve 2037.57M	15
		Replace Screen, Vecellios Rd Xing	15
		Replace Screen	11
	2028-29	09BIA13 REFURBISH FENCING	15
		Replace Gate, 915Mm Slide Waterman	11
	2030-31	Replace Pressure Relief Valve 870.51M	28
		Replace Pressure Relief Valve 358.60M	15
		Replace Pressure Relief Valve 13115.23	15
		Replace Pressure Relief Valve 14486.52	15
	2031-32	11BIAXX REFURBISH FENCE 6360M - 7108M	17
	2032-33	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Refurbish Gate - remove, repaint, anodes & bearings, install - BYM RG02	17
	2033-34	Refurbish Gate - remove, repaint, anodes & bearings, re-install	56
		14BIAXX Refurbish Penstock Gates on Goob	41
		Refurbish Gate - paint gate, anodes, lifting gear	12
	2034-35	Refurbish Gate, remove, repaint, anodes & bearings, install - GMC RG03	22
	2035-36	Refurbish / Replace and upgrade security on gates - moved out from 03 master blaster - GOOB BSTR	33
Gooburrum Pump Station	2011-12	Electrical Component Upgrade (from 2010/11) - Supply, Implement, Install, Commission	262
	2012-13	REPLACE AIR CONDITIONER UNIT	15
		Refurbish Bulkhead Gate - paint and seals - deferred from 03 Master blaster	13
	2015-16	11BIA11 EEO Assessment and Report	85
	2016-17	Refurbish Motor - bearings, bake etc	51
		Replace Sump Pump No1	10
	2017-18	Refurbish Pipework - repaint exposed pipe	11
	2018-19	Refurbish Pump - bearings, casing, wear rings etc - actual cost	51
	2019-20	10BIA42 - 10Y CRANE INSPECTION	60
		Refurbish Screen - corrosion treatment	13
	2020-21	11BIA11 EEO Assessment and Report	85
	2022-23	Replace Switchboard H V	688
		Replace Cable	483
		Refurbish Valve - Replace body seal and pins - blast and paint	67
		10BIA37 REFURBISH MOTOR	50
		Refurbish: Refurbish HV switchboard	17
		REPLACE AIR CONDITIONER UNIT	15
		Refurbish Bulkhead Gate - paint and seals - deferred from 03 Master blaster	13
	2024-25	10BIA37 REFURBISH PUMP	50

Asset	*Year*	*Description*	*Value ($'000)*
	2025-26	11BIA11 EEO Assessment and Report	84
	2027-28	Replace Stairways, Ladders & Handrails	153
	2028-29	Replace Concrete Structure	94
	2029-30	10BIA42 - 10Y CRANE INSPECTION	60
		Refurbish Motor - bearings, bake etc	50
	2030-31	11BIA11 EEO Assessment and Report	84
	2032-33	REPLACE AIR CONDITIONER UNIT	15
		Refurbish Bulkhead Gate - paint and seals - deferred from 03 Master blaster	13
	2033-34	Refurbish Pump - bearings, casing, wear rings etc - actual cost	50
		Refurbish: Refurbish HV switchboard	17
	2034-35	Refurbish Ventilation System - screen, blower.	39
		Refurbish Screen - corrosion treatment	13
	2035-36	11BIA11 EEO Assessment and Report	84
		10BIA37 REFURBISH MOTOR	50
		Replace Fan, Fantech	39
Isis Balancing Storage	2011-12	Study: 5yr Dam Comprehensive Inspection (by 1 Oct 2011)	33
		Remove trees within 6M of embankment	29
	2016-17	Study: 5yr Dam Comprehensive Inspection (by 1 Oct 2011)	34
	2018-19	Replace Screen	21
		Change Out Guides - place stainless steel guides	11
	2021-22	Study: 5yr Dam Comprehensive Inspection (by 1 Oct 2011)	34
	2026-27	Study: 20yr Dam Safety Review (by 1 Oct 2026)	55
		Study: 5yr Dam Comprehensive Inspection (by 1 Oct 2011)	33
	2028-29	09BIA31 STUDY: DAM SAFETY REVIEW	29
	2031-32	Study: 5yr Dam Comprehensive Inspection (by 1 Oct 2011)	33
Isis Distribution	2012-13	Refurbish Gate - remove, repaint, anodes & bearings	28
	2013-14	Refurbish gate	28
		Replace Screen	19
	2014-15	Refurbish Fencing, party fencing issues, repairs only - IMC FN01	11
	2019-20	Replace Gates	11
	2020-21	11BIA18 REFURBISH REGULATOR GATE	30
	2022-23	Refurbish Gate - remove, repaint, anodes & bearings	61
	2023-24	Refurbish gate	28
		Refurbish Fencing, party fencing issues, repairs only - IMC FN01	11
	2024-25	Replace Air Vent At 20.00M	11
		Replace Air Vent At 619.05M	11
		Replace Air Vent At 580.00M	11
	2028-29	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	73
	2029-30	Change Out Guides - place stainless steel guides	223
		Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	89
		Replace Bulkhead Gate Guides	38
		Replace Air Vent At 50.00M	21
		Replace Air Vent At 1350.00M	21
		Replace Slide Gate	19
		Replace Air Vent At 18189.45M	13
		Refurbish Weir - rock protection, stabilisation as required	11
		Replace Air Vent At 2500.00M	11
		Replace Air Vent At 1340.00M	11
		Replace Air Vent At 354.70M	11
		Replace Air Vent At 441.19M	11
		Replace Air Vent At 4506.00M	11
		Replace Air Vent At 522.98M	11
		Replace Air Vent At 150.00M	11

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Air Vent At 340.00M	11
		Replace Air Vent At 16.00M	11
		Replace Air Vent At 3700.00M	11
		Replace Air Vent At 5250.74M	11
		Replace Air Vent At 445.76M	11
		Replace Air Vent At 1820.00M	11
		Replace Air Vent At 5300.00M	11
		Replace Air Vent At 1919.00M	11
		Replace Air Vent At 1147.00M	11
		Replace Air Vent At 2023.00M	11
		Replace Air Vent At 902.00M	11
	2030-31	11BIA18 REFURBISH REGULATOR GATE	30
	2032-33	Refurbish Gate - remove, repaint, anodes & bearings	61
		Refurbish Fencing, party fencing issues, repairs only - IMC FN01	11
	2033-34	Refurbish gate	28
	2034-35	Replace Air Vent At 1725.00M	11
		Replace Air Vent At 1100.00M	11
Kolan Barrage	2015-16	11BIA22 5Y COMPREHENSIVE INSPECTION	10
	2020-21	11BIA22 5Y COMPREHENSIVE INSPECTION	10
	2023-24	Replace BUOYS (7 OFF), SAFETY BUOYAGE SYSTEMS	34
		Replace Fishway Gate	27
		Replace Trash Racks	15
	2031-32	June 2005 5 Yearly Barrage Safety Inspection - Recomm 8) Fill holes in concreted rock fill.	24
Kolan River Distribution	2020-21	Replace Head Water Level Recorder	17
	2035-36	Replace Head Water Level Recorder	17
Mcilwraith Distribution	2012-13	Replace Scour Outlet At 1396.6 M	12
	2022-23	Replace Air Valve, 25Mm Ari	15
	2023-24	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	72
		Refurbish Valve - paint & refurbish	17
		Refurbish Gate - paint gate, anodes, lifting gear - Actual Cost	13
	2034-35	Replace Slide Gates On Inlet & Outlet	38
		Replace Screen	35
		Replace Screen On Inlet/Outlet	30
		Replace Pressure Relief Valve 2711.80M	28
		Replace Pressure Relief Valve 7460.72M	15
Mcilwraith Pump Station	2012-13	Study: Options analysis for Electrical Component Upgrade (PLC, SCADA)	28
		Refurbish Building - roof, fittings, fixtures, paint, electrical installation	22
	2013-14	Electrical Component Upgrade (from 2012/13) - Documents, Drawings, Specs and Cost Estimate	57
	2014-15	Electrical Component Upgrade (from 2013/14) - Supply, Implement, Install, Commission	172
		Replace Switchboard, Low Voltage	157
		Refurbish Pump - bearings, casing, wear rings etc - inspected July 04, good condition push maintena	23
		Refurbish Motor - bearings, bake etc - inspected July 04, good condition push maintenance out from 04	14
	2016-17	Refurbish Motor - bearings, bake etc	14
	2018-19	Refurbish Building - roof, fittings, fixtures, paint, electrical installation	23
		Refurbish Pump - bearings, casing, wear rings etc	23
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	17
	2019-20	Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	17
	2023-24	Replace Suction Valve	37

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Electric Motor	29
		Replace Discharge Valve	26
		Replace Reflux Valve	13
	2024-25	Replace Cable	81
		Replace Electric Motor	29
		Refurbish Building - roof, fittings, fixtures, paint, electrical installation	22
		Replace Valve, 450Mm Butf Dezurick	21
		Replace Reflux Valve	13
	2027-28	Refurbish Motor - bearings, bake etc - inspected July 04, good condition push maintenance out from 04	13
	2029-30	Refurbish Pump - bearings, casing, wear rings etc - inspected July 04, good condition push maintena	22
		Refurbish Motor - bearings, bake etc	13
	2030-31	Refurbish Building - roof, fittings, fixtures, paint, electrical installation	22
	2033-34	Replace Pump	98
		Refurbish Pump - bearings, casing, wear rings etc	22
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	17
	2034-35	Replace Pump	98
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	17
Monduran Pump Station	2011-12	Cement line suction main downstream of 84 inch guard valve	109
		Install Thermographic Windows	44
		Refurbish Motor - bearings, bake, slip rings etc	38
		Refurbish Valve - corrosion, seals, bearings etc	19
	2012-13	10BIAXX REFURBISH VALVE	40
		Review need to replace cables in 2014	22
	2013-14	Replace incomer section of cable	80
		Refurbish Building - ventilation syst, general repairs, roof, doors etc	57
		Refurbish Valve - corrosion, seals, bearings etc - actiual cost	17
	2015-16	Refurbish Common Control - replace obsolescent electrical components, spare parts	57
		Refurbish Valve - corrosion, seals, bearings etc	34
	2016-17	Refurbish Pump - casing, bearings etc	85
		Refurbish Motor - bearings, bake, slip rings etc	68
	2017-18	Replace Valve, 900Mm Butf John	121
		Replace Valve, 675Mm Butf John	39
		Refurbish Motor - bearings, bake, slip rings etc - actiual cost	28
		Replace Uninteruptable Power Supply - Misc Funct	19
		Refurbish switchboard	17
	2019-20	10BIA124 - 10Y CRANE INSPECTION - as per	72
		Replace Suction Valve (Supp)	64
		Refurbish Pump - casing, bearings etc	45
		Replace Reflux Valve (Supp)	30
		Refurbish discharge valve	17
	2020-21	Replace Suction Valve	96
		Replace Reflux Valve	65
	2021-22	Replace Suction Valve	95
		Replace Reflux Valve	64
	2022-23	Replace Suction Valve	95
		Replace Reflux Valve	64
		10BIAXX REFURBISH VALVE	13
	2023-24	Refurbish Building - ventilation syst, general repairs, roof, doors etc	56
		Refurbish Pump - casing, bearings etc(changed from $20K in 2010)	44
		Refurbish Valve - corrosion, seals, bearings etc - actiual cost	17
	2024-25	Replace Station Services, 415V	140
		Refurbish Motor - bearings, bake, slip rings etc	39

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Building	22
	2025-26	11BIA21 REFURBISH VALVE	25
		Refurbish Valve - corrosion, seals, bearings etc	17
		Replace Actuator, Electric Rotork	13
	2026-27	Refurbish Valve - corrosion, seals, bearings etc	11
	2027-28	10BIAXX REFURBISH VALVE	27
	2028-29	Replace 2.4T Hoist	38
		Replace Actuator, Electric Rotork	13
	2029-30	10BIA124 - 10Y CRANE INSPECTION - as per	72
		Refurbish Motor - bearings, bake, slip rings etc	67
	2030-31	Refurbish Motor - bearings, bake, slip rings etc - actiual cost	27
		Refurbish Valve - corrosion, seals, bearings etc	17
	2031-32	Refurbish Pump - casing, bearings etc	83
	2032-33	10BIAXX REFURBISH VALVE	13
		Study - Review requirement for replacement of common controls	11
	2033-34	Refurbish Building - ventilation syst, general repairs, roof, doors etc	56
		Refurbish Valve - corrosion, seals, bearings etc - actiual cost	26
	2034-35	Replace Common Control	469
		Replace Cable	321
		Refurbish Pump - casing, bearings etc	44
		Refurbish discharge valve	17
	2035-36	Replace Switchboard, High Voltage	873
		Refurbish switchboard	17
		Refurbish Valve - corrosion, seals, bearings etc	17
Ned Churchward Weir	2011-12	10BIA11 REFURBISH U/S L/B SHEET PILING	119
		10Y CRANE INSPECTION - as per AS2550	12
	2012-13	Replace 450 Dia Supply Line Valve	32
	2014-15	Change Out Cntl - electronics & SCADA software	62
	2015-16	Refurbish screens 1 and 2 - hydraulics, coating etc	25
		11BIAXX 5Y COMPREHENSIVE INSPECTION	11
	2016-17	Refurbish Hydraulics - constant use, pumps, motors brought forward from 2009	24
	2017-18	Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
	2018-19	Maintain access road - grade, gravel replacement, drainage, road furniture. Brought forward from 2009.	24
	2019-20	Replace Exit/Ent Upper & Lwr Fish Trap	74
		Refurbish Baulks - paint & annodes, seals	73
		Replace Holding Chamber Fish Trap	70
		10BIA16 REFURBISH VALVE - SEALS	59
		Change Out PLC - obsolescence	49
		Refurbish Gate - paint & annodes, seals	36
		Refurbish Valve - seals, corrosion - Remove?	18
		Refurbish Baulk - paint & annodes, seals	18
	2020-21	Refurbish Baulks - paint & annodes, seals	104
		Refurbish Gate - paint & annodes, seals	31
		Refurbish Baulk - paint & annodes, seals	25
		11BIAXX 5Y COMPREHENSIVE INSPECTION	11
	2021-22	10Y CRANE INSPECTION - as per AS2550	12
	2023-24	Replace Pump, Submersible	35
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2024-25	Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2025-26	Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
		11BIAXX 5Y COMPREHENSIVE INSPECTION	10
	2027-28	Refurbish screens 1 and 2 - hydraulics, coating etc	24

Asset	*Year*	*Description*	*Value ($'000)*
	2029-30	10BIA16 REFURBISH VALVE - SEALS	59
		Refurbish Bld - paint, fixtures & fittings, house services as required	12
	2030-31	11BIAXX 5Y COMPREHENSIVE INSPECTION	10
	2031-32	10Y CRANE INSPECTION - as per AS2550	12
	2032-33	Maintain access road - grade, gravel replacement, drainage, road furniture. Brought forward from 2009.	24
		Refurbish Valve - seals, corrosion - Remove?	18
	2033-34	Replace Electrical Cabling	296
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
		Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
	2034-35	Replace Electro-Hydraulic Cubicle	141
		Replace Main Switchboard	61
		Replace Control Cubicle	57
		Replace Fencing And Gates	34
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2035-36	11BIAXX 5Y COMPREHENSIVE INSPECTION	10
North Gregory Distribution	2013-14	Replace Screen	15
		Refurbish vertical control gate inc corrosion control	11
	2023-24	Refurbish vertical control gate inc corrosion control	11
	2024-25	Replace Air Vent At 4097.19M	13
	2027-28	Replace Security Fence	43
	2028-29	Refurbish Pipework - refurbish fixings & valves, minor replacements as required	22
		Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	17
	2029-30	Replace Air Vent At 3600.00M	13
		Replace Air Vent At 750.00M	13
		Replace Air Vent At 3800.00M	13
		Replace Air Vent At 1400.00M	13
		Replace Air Vent At 3300.00M	13
		Replace Air Vent At 2400.00M	13
		Replace Air Vent At 233.00M	11
		Replace Air Vent At 835.29M	11
		Replace Air Vent At 490.77M	11
		Replace Air Vent At 1650.00M	11
		Replace Air Vent At 1177.17M	11
		Replace Air Vent At 2100.00M	11
		Replace Air Vent At 2900.00M	11
	2033-34	Refurbish vertical control gate inc corrosion control	11
	2034-35	Replace Screen	30
North Gregory Pump Station	2013-14	Refurbish Building - roof, fixtures, fittings, electrical installation etc	28
	2016-17	Study: Review requirement for PLC and SCADA system	11
	2017-18	Documents, Drawings, Specs and Cost Estimate for PLC and SCADA system	34
		Refurbish Motor - bearings, bake etc	14
	2018-19	Supply, Implement, Install, Commission PLC and SCADA system	169
		Refurbish Pump - bearings, casing, wear rings etc - actiual cost	23
	2019-20	Refurbish Pump - bearings, casing, wear rings etc	22
		Replace Reflux Valve	14
	2022-23	Replace Structure Of Building	127
	2023-24	Refurbish Building - roof, fixtures, fittings, electrical installation etc	28
	2024-25	Replace Cable	164
		Replace Switchboard, Low Voltage	131
	2028-29	Replace Discharge Valve	37
	2029-30	Replace Electric Motor	28

Asset	*Year*	*Description*	*Value ($'000)*
	2030-31	Refurbish Motor - bearings, bake etc	13
	2033-34	Refurbish Building - roof, fixtures, fittings, electrical installation etc	28
		Refurbish Pump - bearings, casing, wear rings etc - actiual cost	22
	2034-35	Refurbish Pump - bearings, casing, wear rings etc	22
Quart Pot Creek Pump Station	2011-12	CONSTRUCT ROOF	98
	2012-13	Refurbish Building - roof, paint, fittings, fixtures, electrical installation etc	28
	2015-16	Refurbish Motor - bearings, bake etc-actual cost	69
		Study: Review requirement for PLC and SCADA system	34
	2016-17	Documents, Drawings, Specs and Cost Estimate for PLC and SCADA system	57
		Refurbish Motor - bearings, bake etc - actual cost	45
	2017-18	Supply, Implement, Install, Commission PLC and SCADA system	283
		Refurbish Pump - bearings, casing, wear rings etc-actual cost	57
		Refurbish Motor - bearings, bake etc	45
		Refurbish: Discharge ValveValve - corrosion, seals, bearings etc	28
	2018-19	Refurbish Motor - bearings, bake etc	68
		Refurbish Pump - bearings, casing, wear rings etc - - actiual cost	56
		09BIA26 REFURBISH CIRCUIT BREAKERS	35
		09BIA27 REFURBISH CIRCUIT BREAKERS	35
		09BIA28 REFURBISH CIRCUIT BREAKERS	26
		09BIA25 REFURBISH CIRCUIT BREAKERS	26
	2019-20	Refurbish Pump - bearings, casing, wear rings etc- from quote for 03/04	56
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	28
		Replace Security Fencing	19
		Refurbish: Refurbish switchboard, Circuit Breakers etc	17
	2020-21	Refurbish Pump - bearings, casing, wear rings etc	57
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	28
	2022-23	Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	28
		Refurbish Building - roof, paint, fittings, fixtures, electrical installation etc	28
	2023-24	Replace Switchboard, High Voltage	766
		Replace Structure Of Building	163
		09BIA30 REFURBISH ZORCS	66
	2024-25	Replace Switchboard, Low Voltage	235
		Replace Cable	98
	2028-29	Refurbish Motor - bearings, bake etc-actual cost	67
		09BIA26 REFURBISH CIRCUIT BREAKERS	35
		09BIA27 REFURBISH CIRCUIT BREAKERS	35
		09BIA25 REFURBISH CIRCUIT BREAKERS	25
		09BIA28 REFURBISH CIRCUIT BREAKERS	25
	2029-30	Refurbish Motor - bearings, bake etc - actual cost	45
		Refurbish Metalwork - corrosion treatment, fixings, minor replacements as required	22
		Replace Actuator, Magnetic	16
	2030-31	Refurbish Motor - bearings, bake etc	44
	2031-32	Refurbish Motor - bearings, bake etc	67
	2032-33	Refurbish Pump - bearings, casing, wear rings etc-actual cost	56
		Refurbish: Discharge ValveValve - corrosion, seals, bearings etc	28
		Refurbish Building - roof, paint, fittings, fixtures, electrical installation etc	28
	2033-34	Refurbish Pump - bearings, casing, wear rings etc - - actiual cost	56
	2034-35	Refurbish Pump - bearings, casing, wear rings etc- from quote for 03/04	56
		Replace Actuator, Magnetic	46
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	28
		Refurbish: Refurbish switchboard, Circuit Breakers etc	17
	2035-36	Refurbish Pump - bearings, casing, wear rings etc	56

Asset	*Year*	*Description*	*Value ($'000)*
		Refurbish Valve - corrosion, seals, bearings etc incl. Actuator as required	28
St Agnes Distribution	2020-21	Refurbish Valve - paint & refurbish	28
	2024-25	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	72
	2029-30	Replace Structure, 200Mm Meter Outlet	76
		Replace Screen	16
	2032-33	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	172
		Replace Pressure Releif Valve 1842.4	28
		Replace Pressure Relief Vlv @ 2584.43M	15
	2034-35	10BIA28 REFURB SCOUR VALVE LIDS St Agnes	74
	2035-36	Replace 29 isolating valves	34
		11BIAXX REFURBISH SCOUR VALVES	27
System	2020-21	Refurbish: Isolation valves (2) in the bingera system.Rolling program no 1	11
	2021-22	09BIA06 WHS: REFURBISH SCOUR VALVES	41
	2034-35	09BIA06 WHS: REFURBISH SCOUR VALVES	41
	2035-36	Refurbish: Isolation valves (2) in the bingera system.Rolling program no 1	11
Tirroan Distribution	2029-30	Replace Slide Gate	22
		Replace Air Valve, 50Mm Twin	11
	2030-31	Replace Screen	48
		Replace Presure Relief Valve 1552.00 M	15
		Replace Pressure Releif Valve 2755 M	15
		Replace Pressure Relief Valve 3507.44	15
Tirroan Pump Station	2012-13	Study: Review requirement for PLC and SCADA system	28
		Refurbish Motor - bearings, bake etc-actual cost	22
		Refurbish Pump - bearings, casing, wear rings etc	22
	2013-14	Documents, Drawings, Specs and Cost Estimate for PLC and SCADA system	45
		Refurbish Building - paint, fittings, fixtures, roof, electrical installation etc	28
		Refurbish Pump - bearings, casing, wear rings etc-actual cost	23
		Refurbish Motor - bearings, bake etc	11
	2014-15	Replace Switchboard, Low Voltage	184
		Supply, Implement, Install, Commission PLC and SCADA system	92
	2021-22	Replace Electric Motor	46
		Replace Actuator, Elec Rotork	16
	2022-23	Replace Electric Motor	46
	2023-24	Refurbish Building - paint, fittings, fixtures, roof, electrical installation etc	28
		Refurbish Motor - bearings, bake etc-actual cost	22
	2024-25	Replace Cable	110
		Replace Discharge Valve	16
		Refurbish Motor - bearings, bake etc	11
	2025-26	Refurbish Pump - bearings, casing, wear rings etc	22
	2026-27	Refurbish Pump - bearings, casing, wear rings etc-actual cost	22
	2029-30	Replace Fence And Gates (Perimeter)	13
	2031-32	Replace Pump	144
	2032-33	Replace Pump	144
	2033-34	Refurbish Building - paint, fittings, fixtures, roof, electrical installation etc	28
	2034-35	Refurbish Motor - bearings, bake etc-actual cost	22
	2035-36	Refurbish Motor - bearings, bake etc	11
Walker Street Pump Station	2012-13	Refurbish Building - roof, fixtures & fittings	28
	2013-14	Refurbish motor	13
	2014-15	Refurbish Pump - bearings, casing, changeout impeller	34
		Refurbish motor	13
	2016-17	Refurbish Pump - bearings, casing, changeout impeller	34
	2018-19	Replace Pump Cartridge, 450Mm Indeng - 47082	80

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Pump, 450Mm Indeng - 47080	80
		Replace Motor, Electric 132Kw Pope - Kk2/928	38
		Refurbish Pipework - paint exposed pipework, joints & internal repairs as required	23
		Refurbish Motor - bearings, bake windings etc	17
	2020-21	Replace Discharge Valve	41
		Replace Suction Valve	31
		Replace Suction Valves	10
	2021-22	Replace Motor, 200Kw Electric Toshiba - 20411490	74
	2022-23	Replace Motor, 132Kw Electric Pope - Kk2/930	42
		Replace Motor, 132Kw Electric Pope - Kk2/929	42
		Refurbish Building - roof, fixtures & fittings	28
	2023-24	Refurbish Pump - bearings, casing, changeout impeller	33
		09BIA17 REFURBISH PUMP	31
	2025-26	Refurbish Pump - bearings, casing, changeout impeller	33
	2026-27	Refurbish motor	12
	2027-28	Replace Pump Cartridge, 450Mm Indeng - 47079	79
		Refurbish motor	12
	2029-30	Replace Bulkhead Gate Guides	10
	2030-31	Replace Cable	96
		Replace Screen	87
	2031-32	Refurbish Motor - bearings, bake windings etc	17
	2032-33	Replace Motor, 132Kw Electric Pope - Kk2/931	42
		Refurbish Pump - bearings, casing, changeout impeller	33
		Refurbish Building - roof, fixtures & fittings	28
	2033-34	Replace Pump Cartridge, 450Mm Indeng - 47081	79
		Refurbish Pipework - paint exposed pipework, joints & internal repairs as required	22
	2034-35	Refurbish Pump - bearings, casing, changeout impeller	33
Woongarra Balancing Storage	2011-12	Study: 5yr Dam Comprehensive Inspection (by 1 Nov 2011)	33
		Refurbish Gate - paint gate, anodes, lifting gear	11
	2012-13	Refurbish bulkhead gates. 2010 DS Rec 2.	15
	2016-17	Study: 5yr Dam Comprehensive Inspection (by 1 Nov 2011)	34
	2020-21	Refurbish Gate - paint gate, anodes, lifting gear	11
	2021-22	Study: 5yr Dam Comprehensive Inspection (by 1 Nov 2011)	34
		Refurbish: Replace flap valve seals on No 1& 2 gate- others completed last year	17
		Change Out Guides - place stainless steel guides	11
	2023-24	Change out: Replacement of 5 flap valves on rising main. Last changed 18 March 03	21
	2026-27	Study: 20yr Dam Safety Review (by 1 Nov 2026)	55
		Study: 5yr Dam Comprehensive Inspection (by 1 Nov 2011)	33
	2028-29	Replace INNER FACE EMBANKMENT EARTHWORKS	309
		Replace OUTER FACE EMBANKMENT EARTHWORKS	309
		09BIA20 STUDY: DAM SAFETY REVIEW	29
		07-002512 O&M Manual,SOP	17
	2029-30	Refurbish Road - fill potholes, reconstruct drainage, reseal road surface-deferred from 03 master blaster	17
		Refurbish Gate - paint gate, anodes, lifting gear	11
	2030-31	Replace Slide Gate	62
		Replace Screen	27
	2031-32	Study: 5yr Dam Comprehensive Inspection (by 1 Nov 2011)	33
	2032-33	Replace Gates, Flap (5 Of)	69
		Refurbish bulkhead gates. 2010 DS Rec 2.	16
	2033-34	Change Out Guides - place stainless steel guides	11
Woongarra Distribution	2011-12	Replace Screen	25

Asset	*Year*	*Description*	*Value ($'000)*
		Replace Weed Screen (1215M)	23
		Refurbish Reg. Gate - remove, repaint, anodes & bearings, install - WMC RG06	22
		Remove decommissioned access crossing - WMC AC04	22
		Refurbish Reg. Gate - remove, repaint, anodes & bearings, install WMC RG07	16
	2012-13	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Refurbish Gate, remove, repaint, anodes & bearings, install - AMC RG01	22
	2013-14	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG01	45
		Replace Screen	24
		Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG04	23
	2014-15	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG08	17
		Refer SG strategy - ARMCO - Cast 1800*1800	14
	2015-16	Refurbish Reg. Gate, remove, repaint, anodes & bearings, install - WMC RG02	46
		Refurbish Gate, remove, repaint, anodes & bearings, install, moved from 2004 - AMC RG02	23
		Replace Screen	19
		11BIAXX Replace Slide Gate on WMC Access	16
	2018-19	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	101
		09BIA16 REFURBISH GATE	56
		10BIA47 REPLACE SECTIONS OF FENCE	35
		10BIA47 REPLACE 160M FENCE - PALAIS CRT	16
	2019-20	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	22
		Replace Screen 14867.67M	16
		Replace Valve, 150Mm Scour	12
	2020-21	11BIAXX REFURBISH REGULATOR GATE	40
	2021-22	Refurbish Reg. Gate - remove, repaint, anodes & bearings, install - WMC RG06	22
		Replace Safety Screen	20
		Refurbish Reg. Gate - remove, repaint, anodes & bearings, install WMC RG07	17
	2022-23	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Refurbish Gate, remove, repaint, anodes & bearings, install - AMC RG01	22
		Refer SG strategy - ARMCO - Cast 1800*1800	14
	2023-24	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG01	44
		Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG04	22
	2024-25	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG08	17
	2025-26	Refurbish Reg. Gate, remove, repaint, anodes & bearings, install - WMC RG02	44
		Refurbish Gate, remove, repaint, anodes & bearings, install, moved from 2004 - AMC RG02	22
	2027-28	10BIA47 REPLACE SECTIONS OF FENCE	35
		10BIA47 REPLACE 160M FENCE - PALAIS CRT	16
	2028-29	09BIA16 REFURBISH GATE	56
		Replace Screen 21130M	20
		Replace Screen 15096.58M	17
		Replace Screen	16
		Replace Pres. Rel. Valve At 3405.4 M	15
		Replace Pres. Rel. Valve At 3562.9 M	15
	2029-30	10BIA55 REPLACE BULKHEAD GATE	32
		Replace Screen	31
		Replace Slide Gate - Al1 Pipeline	22
		Replace Slide Gate	16
		10BIA48 REFURB MINOR GATE, ARMCO	14
		Replace Gate, 380Mm Slide Awma	12
		Replace Structure, 150Mm Scour Outlet	11
		Replace Screen (Bench Flume)	11
	2030-31	Replace Screen	82
		Replace Metal Work	41
		Replace Safety Screen (Woodward Rd)	41

Asset	*Year*	*Description*	*Value ($'000)*
		11BIAXX REFURBISH REGULATOR GATE	39
		Replace Safety Screen (Isis Hwy)	17
		Replace Pres. Rel. Valve At 30947.74M	15
		Replace Pres. Rel.Valve At 5791.63M	15
		Replace Pres. Rel. Valve At 7086.00M	15
		Refer SG strategy - ARMCO - Cast 1800*1800	14
	2031-32	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	95
		Refurbish Reg. Gate - remove, repaint, anodes & bearings, install - WMC RG06	22
		Refurbish Reg. Gate - remove, repaint, anodes & bearings, install WMC RG07	17
	2032-33	Refurbish Gate - remove, repaint, anodes & bearings, install	28
		Refurbish Gate, remove, repaint, anodes & bearings, install - AMC RG01	22
		Replace Slide Gate	17
		Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	17
		Replace Structure, 150Mm Meter Outlet	13
	2033-34	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG01	44
		Replace Screen	37
		Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG04	22
	2034-35	Refurbish Gate, remove, repaint, anodes & bearings, install - WMC RG08	17
		Replace Screen	15
		Replace Structure, 200Mm Meter Outlet	11
	2035-36	Refurbish Reg. Gate, remove, repaint, anodes & bearings, install - WMC RG02	44
		Refurbish Gate, remove, repaint, anodes & bearings, install, moved from 2004 - AMC RG02	22
Woongarra Pump Station	2011-12	Electrical Component Upgrade - Supply, Install, Commission (PLC, Switchboards, Cables)	262
		Refurbish Pump - bearings, casing, wear rings etc	87
		Refurbish pump	87
		Reprogram SCADA based on pumps and motors upgrade study from 2010	55
	2012-13	Refurbish Pump - bearings, casing, wear rings etc	90
	2013-14	Refurbish Pump - bearings, casing, wear rings etc	91
		Refurbish:refurbish HV switchboard	28
	2014-15	Refurbish Pump - bearings, casing, wear rings etc - New Diffuser (Reduced from $80K) - Pump 3 failed christmas 03, this job deferred	92
		Refurbish Motor - bearings, bake etc	46
	2015-16	Refurbish motor	46
	2016-17	Refurbish Motor - bearings, bake etc	45
	2017-18	Refurbish motor	45
	2018-19	Refurbish Motor - bearings, bake etc - Pump 3 failed christmas 03, this job deferred to 05 as 04 budget already set	45
	2019-20	Replace Pump	161
		Replace Electric Motor	85
		Replace Cooling Water Unit 3	47
		Replace Cooling Water Unit 1	47
		Enhancement Security - constant vandalism problems. Fence has been ripped down. Need to upgrade to Weldmesh	22
		Replace Cooling Water Unit 2 (Spare)	21
	2020-21	Replace Pump	162
		Refurbish pump	91
		Replace Electric Motor	86
		Refurbish Cooling Water System - pump filter & pipework - New filter system was installed in 1998.(Brought forward by JK July 04)	11
		Refurbish Cooling Water System - pump filter & pipework - New filter system was installed in 1998. (Brought forward by JK July 04)	11
	2021-22	Refurbish Pump - bearings, casing, wear rings etc	179
		Replace Electric Motor	85
	2022-23	Replace Pump	160
		Refurbish Pump - bearings, casing, wear rings etc	89

Asset	*Year*	*Description*	*Value ($'000)*
	2023-24	Refurbish Pump - bearings, casing, wear rings etc - New Diffuser (Reduced from $80K) - Pump 3 failed christmas 03, this job deferred	89
	2024-25	Refurbish:refurbish HV switchboard	28
	2027-28	Refurbish Motor - bearings, bake etc	44
	2028-29	Refurbish motor	45
	2029-30	Refurbish pump	89
		Refurbish Motor - bearings, bake etc	45
	2030-31	Refurbish Pump - bearings, casing, wear rings etc	89
		Refurbish motor	44
	2031-32	Replace Common Control (2032)	2583
		Refurbish Pump - bearings, casing, wear rings etc	178
		Refurbish Motor - bearings, bake etc - Pump 3 failed christmas 03, this job deferred to 05 as 04 budget already set	44
	2032-33	Refurbish Pump - bearings, casing, wear rings etc - New Diffuser (Reduced from $80K) - Pump 3 failed christmas 03, this job deferred	89
	2034-35	Enhancement Security - constant vandalism problems. Fence has been ripped down. Need to upgrade to Weldmesh	22
	2035-36	Refurbish:refurbish HV switchboard	28
		Replace Pump, Subm Flygt	13
		Refurbish Cooling Water System - pump filter & pipework - New filter system was installed in 1998. (Brought forward by JK July 04)	11
		Refurbish Cooling Water System - pump filter & pipework - New filter system was installed in 1998.(Brought forward by JK July 04)	11
Woongarra Relift	2018-19	Replace Structure, 150Mm Meter Outlet	24
	2019-20	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	67
	2020-21	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	85
		Replace Air Valve At 1700.00M	11
		Replace Air Valve At 400.00M	11
		Replace Air Valve At 1798.00M	11
		Replace Air Valve At 600.00M	11
	2021-22	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	123
	2026-27	Replace Structure, 80Mm Meter Outlet	16
	2030-31	Refurbish Reservoir - replace lining	111
		Replace Slide Gate (Wmc)	43
		Replace Pres. Rel. Valve At 2542.10M	28
		Replace Pres. Rel. Valve At 1347.19M	28
		Replace Pres. Rel. Valve At 5118.00M	28
		Replace Pres. Rel. Valve At 6110.86M	28
		Replace Pres. Rel. Valve At 2126.63M	28
		Replace Pres. Rel. Valve At 2009.15M	28
		Replace Pres. Rel. Valve At 2356.34M	28
		Replace Pres. Rel. Valve At 586.51M	15
		Replace Pres. Rel. Valve At 5200.27M	15
	2031-32	Replace Altitude Valve	17
	2032-33	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	67
	2033-34	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	72
	2034-35	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	117
	2035-36	Refurbish Scour Outlet - refurbish metalwork/valves - consider retiring asset	11