



**Final Report**

**SunWater**

**Irrigation Price Review: 2012-17**

**Volume 2**

**Burdekin-Haughton**  
**Distribution System**

**April 2012**

Level 19, 12 Creek Street Brisbane Queensland 4000  
GPO Box 2257 Brisbane Qld 4001  
Telephone (07) 3222 0555  
Facsimile (07) 3222 0599

[general.enquiries@qca.org.au](mailto:general.enquiries@qca.org.au)  
[www.qca.org.au](http://www.qca.org.au)

© Queensland Competition Authority 2012

The Queensland Competition Authority supports and encourages the dissemination and exchange of information. However, copyright protects this document. The Queensland Competition Authority has no objection to this material being reproduced, made available online or electronically but only if it is recognised as the owner of the copyright and this material remains unaltered.

## TABLE OF CONTENTS

<b>GLOSSARY</b>	<b>III</b>
<b>EXECUTIVE SUMMARY</b>	<b>IV</b>
<b>1. BURDEKIN-HAUGHTON DISTRIBUTION SYSTEM</b>	<b>1</b>
1.1 System Description	1
1.2 Distribution System Infrastructure	1
1.3 Network Service Plans	4
1.4 Consultation	4
<b>2. REGULATORY FRAMEWORK</b>	<b>5</b>
2.1 Introduction	5
2.2 Draft Report	5
2.3 Submissions Received from Stakeholders on the Draft Report	7
2.4 Authority's Response to Submissions Received on the Draft Report	7
<b>3. PRICING FRAMEWORK</b>	<b>8</b>
3.1 Tariff Structure	8
3.2 Termination (Exit) Fees	10
3.3 Water Use Forecasts	12
3.4 Tariff Groups	14
3.5 Distribution Losses	15
3.6 Drainage Charges and Drainage Diversion Charges	18
3.7 Channel Water Harvesting Charges	20
3.8 Giru Groundwater Area	21
3.9 Gladys's Lagoon	22
3.10 Allocation of Distribution Costs to Townsville Thuringowa Water Supply Joint Board	23
3.11 Storage Rental Fees	24
<b>4. RENEWALS ANNUITY</b>	<b>25</b>
4.1 Introduction	25
4.2 SunWater's Opening ARR Balance (1 July 2006)	26
4.3 Past Renewals Expenditure	27
4.4 Opening ARR Balance (at 1 July 2012)	35
4.5 Forecast Renewals Expenditure	36
4.6 SunWater's Consultation with Customers	46
4.7 Allocation of Headworks Renewals Costs According to WAE Priority	47
4.8 Calculating the Renewals Annuity	48
<b>5. OPERATING COSTS</b>	<b>50</b>
5.1 Background	50
5.2 Total Operating Costs	50
5.3 Non-Direct Costs	54
5.4 Direct Costs	59
5.5 Cost Allocation According to WAE Priority	70
5.6 Summary of Operating Costs	71

<b>6.</b>	<b>RECOMMENDED PRICES</b>	<b>75</b>
6.1	Background	75
6.2	Approach to Calculating Prices	76
6.3	Total Costs	76
6.4	Fixed and Variable Costs	79
6.5	Allocation of Costs According to WAE Priority	80
6.6	Cost-Reflective Prices	81
6.7	Queensland Government Pricing Policies	84
6.8	The Authority's Recommended Prices	86
6.9	Impact of Recommended Prices	89
	<b>REFERENCES</b>	<b>91</b>
	<b>APPENDIX A: FUTURE RENEWALS LIST</b>	<b>109</b>

## **GLOSSARY**

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

## **EXECUTIVE SUMMARY**

### **Direction Notice**

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

### **Summary of Price Recommendations**

The Authority's recommended irrigation prices to apply to the Burdekin-Haughton Distribution System for the 2012-17 regulatory period are outlined in Table 1 below, together with actual prices since 1 July 2006.

Although prices for bulk costs of the Burdekin-Haughton WSS are presented in Table 1, the review of the underlying bulk costs is set out in detail as part of a separate report on the Burdekin-Haughton WSS.

The Authority's recommended termination fees to apply to the Burdekin-Haughton Distribution System in 2012-17 are outlined in Table 2, together with actual termination fees since 1 July 2006.

The Authority's recommended drainage and drainage diversion charges to apply to the Burdekin-Haughton Distribution System in 2012-17 are outlined in Table 3 and Table 4, together with actual drainage and drainage diversion charges since 1 July 2006.

The Authority's recommended distribution system water harvesting charges are outlined in Table 5, together with actual distribution system water harvesting charges since 1 July 2006.

### **Final Report**

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

Volume 2, which comprises scheme specific reports, should be read in conjunction with Volume 1. Also relevant is the Final Report on the Burdekin-Haughton WSS.

### **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 and issues papers on key issues; and, publication of all relevant documents.

All submissions received on the Draft Report have been taken into account by the Authority in preparing its Final Report.

**Table 1: Prices for the Burdekin-Haughton Distribution System (\$/ML)**

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<i>Burdekin River (Unbundled)</i>											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	11.35	11.63	11.92	12.22	12.53
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.49	0.50	0.51	0.52	0.54
<i>Burdekin Distribution System (Unbundled)</i>											
Fixed (Part C)	23.04	23.72	24.84	25.60	26.40	29.36	13.26	15.64	18.13	20.74	23.46
Volumetric (Part D)	4.13	4.26	4.47	4.60	4.74	4.91	24.91	25.53	26.17	26.82	27.49
<i>Giru Groundwater Area (Unbundled)</i>											
Fixed (Part C)	9.88	10.20	10.68	11.00	11.36	11.76	1.51	3.60	5.79	7.82	8.01
Volumetric (Part D)	-3.29	-3.37	-3.54	-3.65	-3.76	-3.90	12.46	12.78	13.09	13.42	13.76
<i>Glady's Lagoon - Up to natural yield (Unbundled)</i>											
Fixed (Part C)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Volumetric (Part D)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
<i>Glady's Lagoon - Other than from natural yield (Unbundled)</i>											
Fixed (Part C)	21.80	22.48	23.52	24.24	25.04	25.92	12.07	14.43	16.89	19.46	22.16
Volumetric (Part D)	4.45	4.59	4.81	4.95	5.11	5.29	24.91	25.53	26.17	26.82	27.49
<i>Burdekin Distribution System (Bundled)</i>											
Fixed (Part A)	25.08	25.80	27.04	27.88	28.72	31.76	24.61	27.27	30.05	32.96	35.99
Volumetric (Part B)	16.06	16.53	17.33	17.87	18.41	19.07	25.39	26.03	26.68	27.34	28.03
<i>Giru Groundwater Area (Bundled)</i>											
Fixed (Part A)	11.92	12.28	12.88	13.28	13.68	14.16	12.86	15.23	17.71	20.04	20.54
Volumetric (Part B)	8.64	8.90	9.32	9.62	9.91	10.26	12.95	13.27	13.61	13.95	14.29
<i>Glady's Lagoon - Other than from natural yield (Bundled)</i>											
Fixed (Part A)	23.84	24.56	25.72	26.52	27.36	28.32	23.42	26.06	28.81	31.68	34.68
Volumetric (Part B)	16.38	16.86	17.67	18.22	18.78	19.45	25.39	26.03	26.68	27.34	28.03

*Note: Bundled prices are for information only. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012)*

**Table 2: Termination Fees (Nominal \$/ML)**

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Channel to:</b>											
River	n.d.	n.d.	222.39	219.63	249.12	302.84	361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area	n.d.	n.d.	126.78	125.26	141.92	181.54	196.66	201.58	206.62	211.78	217.08
Glady's Lagoon	n.d.	n.d.	11.82	11.67	12.83	35.48	0.00	0.00	0.00	0.00	0.00
<b>Giru Benefitted Area to:</b>											
River	n.d.	n.d.	95.62	94.37	107.20	121.30	165.23	169.37	173.60	177.94	182.39
<b>Glady's Lagoon to:</b>											
River	n.d.	n.d.	210.58	207.96	236.28	267.35	361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area	n.d.	n.d.	114.96	113.59	129.09	146.05	196.66	201.58	206.62	211.78	217.08

Note: n.d. - no data. SunWater started publishing termination fees in their Annual Fees & Charges Schedule from 2008-09. Prior to 2008-09, these fees were calculated as needed. Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012).

**Table 3: Drainage Charges (\$/ha of land)**

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Burdekin Distribution	18.70	19.30	20.20	20.80	21.40	22.15	22.70	23.27	23.85	24.45	25.06

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012).

**Table 4: Drainage Diversion Charges (\$/installation)**

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Burdekin Distribution	119.00	122.00	128.00	132.00	136.00	141.00	144.53	148.14	151.84	155.64	159.53

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012).

**Table 5: Distribution System Water Harvesting Charges (\$/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
Water Harvesting Charge	16.06	16.53	17.33	17.87	18.41	19.07	24.91	25.53	26.17	26.82	27.49

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012).



## 1. BURDEKIN-HAUGHTON DISTRIBUTION SYSTEM

### 1.1 System Description

The Burdekin-Haughton Distribution System has 258 customers. Medium and high priority water access entitlements (WAE) are detailed in Table 1.1. To deliver water to these customers, SunWater owns WAEs for distribution losses.

**Table 1.1: Water Access Entitlements**

<i>Customer Group</i>	<i>Irrigation WAE (ML)</i>	<i>Total WAE (ML)</i>
Medium Priority	280,801	280,801
Medium Priority Distribution Losses	183,927	190,477
High Priority	0	10,000
High Priority Distribution Losses	15,701	16,260
<b>Total</b>	<b>487,538</b>	<b>497,538</b>

*Note: Burdekin-Haughton Distribution System WAE is included in the total Burdekin-Haughton WAE of 1,079,592. Source: SunWater (2011).*

### 1.2 Distribution System Infrastructure

#### *Dalbeg system*

The Dalbeg system was built in the 1950s. Together with the Clare system it is one of the oldest systems in the Burdekin-Haughton distribution system. It has three pump stations Dalbeg A, Dalbeg B and Dalbeg relief.

The Dalbeg A pump station dates to the 1950s. It has three pumps with a combined capacity of 74 ML/day. The Dalbeg B pump station was added in 1970 to meet an increase in the demand for water. The station has two pumps with a combined capacity of 74 ML/day. The Dalbeg relief pump station draws from the outfall of the Dalbeg A pump station. It has two pumps with a combined capacity of 18 ML/day.

The Dalbeg Main Channel is concrete lined, but its lateral channels are unlined. The system has no balancing storages and water is controlled manually utilising overshot and undershot regulating gates. Drains are used to intercept runoff from irrigated and non-irrigated land.

#### *Millaroo system*

The Millaroo system has three pump stations: Millaroo A, Millaroo B and Millaroo relief. The Millaroo A pump station has four pumps and Millaroo B has three with combined capacities of 180 ML/day and 111 ML/day respectively. The Relift pump station which is used to supply water to about 200 ha of land that could not be supplied by gravity has a capacity of 34 ML/day.

Most Millaroo channels are concrete lined. The system has part manual and part automatic controls. Only one channel is fully automatic.

Drains are used to intercept runoff from irrigated and non-irrigated land.

### *Haughton system*

The Haughton system covers several areas that are still referred to by the names they were given during their construction – for example, Mulgrave, Northcote, Barratta, Jardine, Haughton and Selkirk.

The Haughton main channel, the Tom Fenwick pump stations and the Haughton balancing storage are the system's main structures.

The Tom Fenwick pump stations are a conglomerate of five pump stations housed in three adjacent structures on the bank of the Burdekin River. They are controlled from a single control room and pump into a shared sediment basin that syphons into the Haughton main channel. The pump capacities of the Tom Fenwick pump stations 1, 2/3 and 4/5 are 605, 1209 and 1209 ML/day respectively.

The Haughton main channel flows into the Haughton balancing storage at 34 km and reemerges at 35 km.

The channel traverses several erosion-prone flood plains requiring numerous protective structures, siphons, levees, retention ponds and cross drains. It also incorporates structures to protect the channels against flooding from the Haughton River. Only the gates in the first 6.8 km of the main channel have automated control. Beyond that, controls are manual or downstream-controlled regulators.

The Haughton main channel is unlined except for a 1.7km section, which is concrete lined. It can carry 2,600 ML/day.

### *Barratta system*

The Barratta system is a full gravity system supplied from the Haughton main channel. It supplies the Mulgrave, Jardine and Northcote areas as well as an area around Mona Park and Pelican Road.

The Barratta main channel has many closely-spaced regulating structures. Most are downstream-controlled utilising a mix of float and programmable logic controller (PLC) controls.

In the Barratta main channel, the laterals channels and its sub-lateral channels are unlined and open except for the channels in Mona Park, which are piped.

### *Clare system*

The Clare system is one of the Burdekin's oldest systems. Its construction commenced in 1949 and by 1953, it supplied 71 farms.

The Clare system relies on two pump stations: Clare A and Clare B. The stations have four pumps each. Clare A has a capacity of 166 ML/day and Clare B 122 ML/day. All pump stations and channel structures are manually operated.

Drains are used to intercept runoff from irrigated and non-irrigated land.

### *Elliot system*

The Elliot system comprises a 12.7km section of main channel, sized to cater for future extensions and a subsidiary channel system with associated drainage works to serve 14 farms.

The Elliot system draws from the Clare Weir through the Elliot pump station. The station has three pumps and can produce up to 180 ML/day. The Elliot MC has a design capacity of 3,800 ML/day.

The Elliot system drains flow into Cassidy Creek, which flows into the Burdekin River.

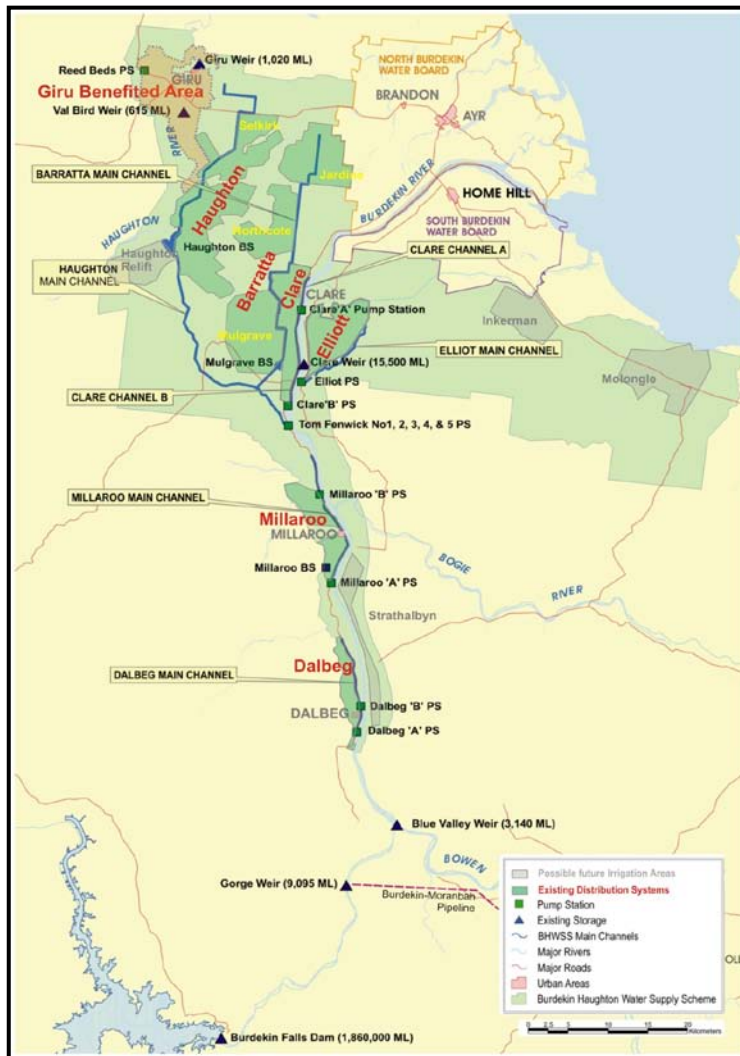
*Channel and Drainage Infrastructure*

Surface drains are designed to carry the runoff from a one in two year event and allow pondage of up to 0.5m for 48 hrs. Customers are required to discharge water from their farm blocks through the drain inlet provided.

Drainage discharge rates cannot be increased without major expenditure to augment capacity and any augmentation that does occur would do so on a commercial basis and after negotiation with customers.

The location of the Burdekin-Haughton Distribution System and key infrastructure is shown in Figure 1.1.

**Figure 1.1: Burdekin-Haughton Distribution System Locality Map**



Source: Department of Environment and Resource Management (DERM).

### 1.3 Network Service Plans

The Burdekin-Haughton Distribution System network service plan (NSP) presents SunWater's:

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

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

### 1.4 Consultation

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

- (a) invited submissions from interested parties;
- (b) met with stakeholders to identify and discuss relevant issues (two rounds of consultation prior to the Draft Report);
- (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;
- (f) considered all submissions and reports in preparing a Draft Report for comment; and
- (g) in particular, after releasing the Draft Report:
  - (i) considered issues arising from a third round of consultation in November and December 2011 and submissions on the Draft Report;
  - (ii) obtained and reviewed additional information, particularly relating to past and future renewals expenditures, and non-direct and direct costs; and
  - (iii) subjected SunWater's financial, renewals annuity and electricity models and the Authority's pricing module to independent external review.

In preparing its Draft Report, 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, nodal pricing, national metering standards and whether or not to recover recreation management costs from SunWater customers.

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

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

## **2. REGULATORY FRAMEWORK**

### **2.1 Introduction**

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

During the negotiations that preceded the 2006-11 price paths, the Burdekin-Haughton water supply scheme (WSS) Tier 2 group (including representatives from the distribution system) 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 Draft Report**

#### *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 specific risks identified by SunWater in the NSP associated with the Burdekin-Haughton Distribution System:

- (a) the possible removal of regulated electricity tariffs which could have a significant impact on the cost of electricity;
- (b) the introduction of schemes relating to the reduction of greenhouse gases that may have implications for electricity prices, or energy efficiency regulation that results in a net increase in costs;
- (c) the introduction of water planning and management charges in respect of SunWater's distribution loss entitlements for channel distribution systems;
- (d) damage to SunWater's assets, to the extent that such damage is not recoverable under insurances;
- (e) levies or charges made in relation to the regulation of irrigation prices by the Authority;
- (f) metering costs related to changes in regulatory standards;
- (g) the availability of chemicals to control submerged weeds and algae in channels;
- (h) outbreak of noxious weeds; and
- (i) possible requirement to line channels in response to rising groundwater levels.

##### Other Stakeholders

No stakeholders made a submission on this matter prior to the Draft Report.

## Authority's Analysis

### General Risks

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

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

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

Source: QCA (2011).

Consistent with the Authority's allocation of risks (Table 2.1), it is proposed that risks identified by SunWater in items (a), (b), (d), (g), (h) and (i) above will be dealt with as an end-of-period adjustment, or price trigger or cost pass through upon application by SunWater or customers. Any costs of the nature of (c) would be passed through, subject to a consideration of their materiality.

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.

No levies or charges (e) are to be applied by the Authority as a result of this irrigation price review. Metering upgrades (f) are outside the scope of this investigation.

### **2.3 Submissions Received from Stakeholders on the Draft Report**

As outlined in Volume 1, the Authority notes that several submissions regarding the Draft Report's recommendations were received. These submissions primarily referred to how more accurate forecasts of electricity costs could be undertaken and how best to accommodate any variance between actual expenditure and forecast expenditure that occur during the 2012-17 regulatory period through mechanisms such as a cost pass through.

### **2.4 Authority's Response to Submissions Received on the Draft Report**

As noted above, the Authority considers that only if costs are materially different to those forecast would there be a case to consider price triggers or cost pass throughs.

The Authority concluded that no compelling evidence had been put forward to change the approach recommended in the Authority's Draft Report.

### 3. PRICING FRAMEWORK

#### 3.1 Tariff Structure

##### *Introduction*

In the 2006-11 price path, tariffs incorporated bulk and distribution costs into a bundled two-part tariff. 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, fixed charges were set at 61% and variable charges at 39% of total revenues in this scheme for the distribution system and Giru Groundwater Area.

##### *Draft Report*

###### Stakeholder Submissions

For the 2012-17 regulatory period SunWater proposed to unbundle charges so that the recovery of distribution costs is separated from bulk water costs.

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

The Burdekin River Irrigation Area Irrigators Committee (BRIAIC, 2011b) submitted that there needs to be incentive to SunWater and irrigators to be efficient and that the current tariff ratio of 61:39 should be retained.

In regard to unbundling bulk and distribution tariffs, the Lower Burdekin Water (LBW, 2011) submitted that:

- (a) the Authority should consider whether to review the existing tariff applied to LBW or establish a new tariff altogether. SunWater has explicitly separated out the bulk water and distribution services in the Burdekin-Haughton Water Supply Scheme (BHWSS) and unbundled tariffs reflect this unbundling of services. LBW submitted that the current tariff of \$15.99/ML paid by LBW incorporates a significant cross-subsidy to other users in the BHWSS, potentially worth almost \$800,000 (the difference between SunWater costs attributable to LBW and SunWater charges for full use of LBW's entitlement). Maintaining the current tariff level of \$15.99/ML in order to be consistent with Section 1.1 a) iii) of the Amended Ministers Referral Notice (maintain prices at current real levels if they are already above lower bound) would not reflect the fact the services have been unbundled in the BHWSS (i.e. the current tariff is effectively invalid for future service provision) and would not reflect best practice pricing or regulatory economic principles; and
- (b) LBW submitted that maintaining the current tariff level of \$15.99/ML in order to be consistent with Section 1.1 a) iii) of the Amended Ministers Referral Notice (maintain prices at current real levels if they are already above lower bound), would not reflect the fact the services have been unbundled in the BHWSS (i.e. the current tariff is effectively invalid for future service provision) and would not reflect best practice pricing or regulatory economic principles.

###### Authority's Analysis

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



In response to BRIAIC, the Authority considered 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 recommended that all, and only, variable costs be recovered through a volumetric charge.

The Authority's analysis of whether service delivery costs are fixed or variable was further addressed in a subsequent chapter of the Draft Report.

In response to LBW, the Authority considered that unbundling of tariffs further promotes cost reflectivity of charges. Through unbundling, the tariffs for each tariff group are separately calculated and there is no cross subsidy between tariff groups. The impact of the Ministerial Direction on prices is discussed in Chapter 6.

The Authority's analysis of which service delivery costs are fixed and which are variable, is addressed in Chapter 5 – Operating Expenditure.

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

The volumes of permanent and temporary water traded for the Burdekin-Haughton WSS are identified in Table 3.1.

The Authority notes that the permanent trades in the Draft Report were sourced from the Water Allocations Register which centrally records ownership and other information on water allocations. Water allocations are established on completion of a ROP.

However, permanent trades of interim water allocations were allowed in the Burdekin-Haughton WSS through provisions of the Water Regulation 2002 prior to the completion of the ROP. Permanent trades of interim water allocations were recorded separately to the Water Allocations Register by DERM. Revised data on the permanent trades of interim water allocations are provided in Table 3.1.

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

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Temporary	103,858	65,940	81,194	22,687	27,665	17,926	8,680	24,960
Permanent	0	0	0	0	0	0	175	8

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

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

The Authority recognised that a change in tariff structure may impact the value of entitlements, and therefore incentives to trade. This matter was addressed further in the Draft Report in the context of pricing recommendations.

*Submissions Received from Stakeholders on the Draft Report*

Irrigators submitted (IA, December) that a high fixed charge provides very little incentive for efficiency improvements to be made, either by SunWater or customers.

BRIAC (2012) questioned whether a pricing approach is justifiable that penalises those who use the service more, and keeps the costs down for those who use the service less. BRIAC submitted that in this scheme only 75% of the service is utilised. Should the Authority be recommending prices which allow SunWater to recoup costs from the remaining users without promoting the availability of service or restructuring the current service to reflect use and reduce costs?

*Authority's Response to Submissions Received on the Draft Report*

In response to irrigators, the Authority notes that SunWater must deliver water in accordance with customers' WAE and announced allocations. The tariff structure does not alter this requirement.

As noted in the Draft Report, where fixed charges are relatively high, there is an incentive for customers to use all available water from existing infrastructure for productive purposes (where the marginal benefit exceeds the marginal cost), which is desirable from a commercial, economic and community perspective.

However, the total (and marginal) cost of on-farm water use also includes on-farm costs (such as pumping and storage). This will also impact on water use (along with commodity prices) and is likely to prevent frivolous or non-economic water use or water wastage.

Tariff structures (for the use of infrastructure services) are only part of the mix of instruments designed to promote on-farm water use efficiency. The water planning framework provide for environmental flows, usable water and incentives to use water efficiently.

### **3.2 Termination (Exit) Fees**

*Introduction*

SunWater charges termination fees when a distribution system WAE is permanently transferred to the river. Without a termination fee, SunWater would have insufficient revenue to cover that customer's share of fixed costs.

*Draft Report**Stakeholder Submissions*

In 2011-12, SunWater charged the exiting user the present value of 10 years of annual fixed distribution charges or 9.4 times the distribution system fixed charge, which SunWater submitted is consistent with the Australian Competition and Consumer Commission (ACCC) guidelines. SunWater treated such fees as revenue offsets for ten years with any subsequent revenue shortfall recovered from remaining distribution system customers.

No other stakeholders have commented on this matter.

*Authority's Analysis*

In Volume 1, the Authority noted that the purpose of a termination fee is to ensure that a customer's departure does not result in a financial cost to SunWater or, as currently occurs, to

remaining customers. Further, it should provide an incentive to SunWater to reduce costs following a customer's departure.

As proposed by SunWater, the Authority recommended a planning period of 20 years for the calculation of the renewals annuity and an annual rolling (recalculation of the) annuity (discounted by the Authority's recommended weighted average cost of capital (WACC)). Consistent with this approach, the Authority recommended that the termination fee for each year will reflect 20 years of fixed costs (which include forecast renewals and fixed operating expenditure), although due to the rolling annuity approach over the five-year regulatory period, 24 years of data will be incorporated.

The Authority recommended that costs not recovered via the termination fee are not to be passed on to customers in the form of higher (future) annual water charges. By not recovering all fixed costs, SunWater has an incentive to reduce costs or seek out new customers.

The Authority's approach resulted in a multiple of about 13.8 times the fixed distribution system costs for the distribution system. This compared to the ACCC's guidance of up to 11 times the fixed charge. SunWater's 2011-12 termination fees which are 9.4 times the 2011-12 distribution system fixed charge. These multiples all include GST.

SunWater's past termination fees and the Authority's Draft Report recommended termination fees are detailed in Chapter 6 – Recommended Prices.

The Authority's recommended termination fees were higher than those charged by SunWater, as the Authority's approach:

- (a) recovered 20 years of fixed costs with SunWater bearing the remaining fixed costs. SunWater's approach recovers 10 years of fixed costs with remaining fixed costs paid for by other users;
- (b) reflected the Authority's estimate of fixed costs in the cost-reflective fixed charge. The Authority's cost-reflective fixed charge recovered all fixed costs. SunWater's fixed charges recovered only a portion of fixed costs. Therefore, some fixed costs are excluded from SunWater's termination fees;
- (c) reflected the Authority's cost-reflective fixed charge and not the Authority's recommended fixed charge; and
- (d) resulted in a multiple of up to 13.8 times the Authority's cost-reflective fixed charge. SunWater's multiple is up to 9.4 of its fixed charge (Chapter 3).

#### *Submissions Received from Stakeholders on the Draft Report*

BRIAC (2012) submitted that the recommended fees of up to \$450/ML means that even if a customer wishes to stop receiving a service they will have to pay a cost that is over 100% of the current value of the WAE. This means if all distribution customers were to exit, the total termination fees would exceed \$222,000,000 and at 6% interest SunWater would recover more than the yearly total cost without providing any service.

BRIAC submitted there is no incentive for SunWater to look after customers, and the Authority's recommendation allows SunWater to impose a charge per ML to shift water from the channel which is only at cost recovery, to the river which is above cost by \$6.17/ML/year.

BRIAC suggested that all termination fees should be reduced to  $\$6.17 \times 20 \text{ years} = \$123.00$ . This greatly reduced termination fee would ensure that SunWater reduces cost in line with demand, maintains its systems so that they can deliver a high standard of service to customers,

and promotes its schemes to build demand and stop any risk of profiting by water being transferred to the river.

#### *Authority's Response to Submissions Received on the Draft Report*

The Authority's response to general comments in regard to termination fees is provided in Volume 1.

The Draft Report recommended that SunWater's termination fee should recover 20 years of fixed distribution system costs, resulting in a termination fee multiple of 13.8 times fixed costs (including GST). Since then, additional matters have been considered including the incorporation of estimates of cost saving (not previously incorporated in estimates of the multiple) and changes in the assumed fixed operating costs over time. As a result a multiple of just under 12 is considered more cost reflective.

When considered together with the arguments for administrative simplicity and consistency with the ACCC approach, the Authority proposes that a multiple of 11 (including GST) be applied by SunWater to cost reflective fixed charges when establishing termination fees for particular schemes.

The Authority considers that it is appropriate for exiting customers to contribute towards future fixed costs. Therefore, the Authority has set the multiple in reference to the future fixed costs, rather than the market value of WAE.

The Authority's calculations do not support BRIAIC's conclusion that the interest on the Draft Report termination fees would be greater than the annual cost of the distribution system.

For the Burdekin-Haughton Distribution System, if all irrigators paid a termination fee then SunWater would collect \$101 million based on 280,801 ML of medium priority WAE held by distribution system customers. The recommended termination fee is \$361.90/ML in 2012-13, to exit from the channel to the river.

If 6% interest was obtained on this amount, the revenue would be \$6.1 million. However, SunWater's total costs are estimated at \$14.8 million in 2012-13. This calculation does not support BRIAIC's submission that SunWater would recover more than the total annual cost of the distribution system through interest on termination fees alone.

As explained in Volume 1, it is appropriate to recognise above lower bound contributions in the bulk scheme. This has been taken into account in recommending the multiple of 11 (including GST) down from 13.8 for the Draft Report (including GST).

### **3.3 Water Use Forecasts**

#### *Introduction*

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

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

For the Burdekin-Haughton Distribution System, SunWater (2006b) assumed a water usage forecast of 91% of the WAEs in the distribution system and for the Giru Groundwater Area. Water usage for high and medium priority irrigation WAEs was not separately identified. **Invalid source specified.**

### *Draft Report*

#### Stakeholder Submissions

#### SunWater

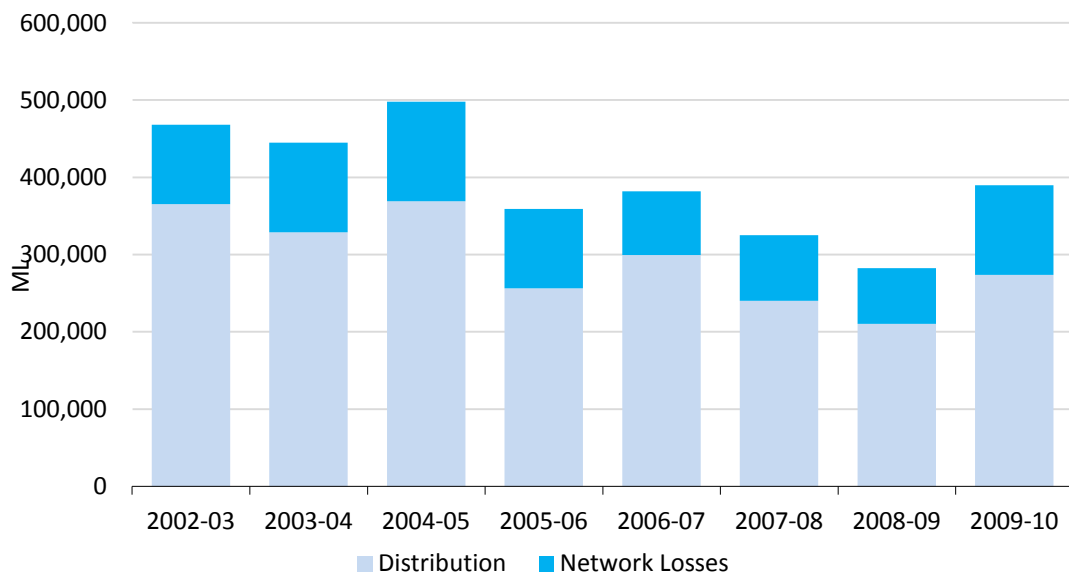
The available supply of water is determined by the announced allocations which are set according to rules contained in the Resource Operations Plan (ROP).

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

SunWater's usage forecast 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. The forecast use for the distribution system is 85% of current WAEs and medium priority distribution losses, plus 100% of high priority losses.

Figure 3.1 shows the historic usage information for the Burdekin-Haughton Distribution System submitted by SunWater. **Invalid source specified.** SunWater stated that over the past eight years, total water use in the distribution system has been 69% of current WAEs.

**Figure 3.1: Water Usage for the Burdekin-Haughton Distribution System**



Source: SunWater (2011).

#### Other Stakeholders

No other stakeholders made a submission on this matter.

#### Authority's Analysis

As noted in Volume 1, the Authority did consider that water use forecasts are relevant to establishing cost-reflective prices for SunWater.

Nonetheless, the Authority 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).

#### *Submissions Received from Stakeholders on the Draft Report*

Burdekin River Irrigation Area Committee (BRIAC 2012) submitted that [actual] water use numbers are well below those quoted in the NSP. In the irrigation sector, water use has averaged 87% of irrigation WAE over the same 8 year period.

The water use data for the Distribution System has included loss allocations which has distorted water use data. The losses have already been costed at 100% usage, even though less than 57% has been used over the last 8 years.

BRIAC recommended a review of the water use data for both Bulk and Distribution, noting that there are large differences in water use data for distribution which requires clarity from SunWater and the Authority. The water use model should not include losses allocation as this is already costed at 100% usage as bulk.

#### *Authority's Response to Submissions Received on the Draft Report*

As noted in Volume 1, in the Draft Report 10-year irrigation average water usage was based in part on water use data from a Tier 1 Working Paper. Specifically, for the Draft Report for the years 2001-02 to 2004-05 the Authority adopted Tier 1 data for some years rather than data provided by SunWater as the Authority was unable to discern the basis for differences with NSPs, and the Tier 1 data had previously been accepted for pricing purposes.

Since, the Authority has been able to establish that the Tier 1 data was inappropriate for 2012-17 price modelling as a number of formerly bulk assets should for 2012-17 be classified as distribution assets. SunWater's NSP water use (and cost) forecasts reflected this, whereas the Tier 1 data for 2001-02 to 2004-05 did not.

To estimate 10 years of water use the Authority has therefore:

- (a) adjusted 2001-02 water use data to correct for definitional changes;
- (b) adopted the NSP water use data for 2002-03 to 2009-10; and
- (c) maintained the Draft Report 2010-11 irrigation only water use data.

As explained below in section 3.5: Distribution Losses, some distribution loss costs are allocated to SunWater.

### **3.4 Tariff Groups**

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

The previous SunWater Irrigation Price Paths Final Report (SunWater, 2006b) nominated a single tariff group for the channel system of the Burdekin-Haughton Distribution System.

In accordance with the Ministerial Direction, the Authority will adopt the proposed designated tariff group but differential pricing for medium and high priority customers is to be maintained. The allocation of costs for this purpose is discussed further below.

Although the Giru Groundwater Area and Gladys Lagoon have tariffs that incorporate both a bulk and distribution charge, they have been designated in SunWater's NSP as bulk segments. As discussed in the Burdekin-Haughton WSS report, the Authority considers that these tariff groupings should be classified as distribution segments.

Accordingly, two additional distribution tariff groupings are:

- (a) Giru Groundwater Area; and
- (b) Gladys's Lagoon.

### **3.5 Distribution Losses**

#### *Introduction*

Distribution losses are incurred in the delivery of water to the Burdekin-Haughton Distribution System customers. SunWater holds WAEs to account for losses involved in delivering water to customers in the distribution system.

In the previous price path, the costs of distribution losses were allocated to distribution users.

#### *Draft Report*

##### Stakeholder Submissions

##### SunWater

SunWater (2011w) submitted that distribution loss WAEs should be assigned bulk water costs (and water charges) due to the need to store these WAEs using headworks like any other types of WAEs. It also submitted that these costs should be recovered from customers of the distribution system (by including them in that system's revenue requirement) on the basis that they are needed to provide the distribution service.

SunWater did not include the costs of distribution losses in its NSP costs, stating that these cannot be determined until the Authority establishes the level of the bulk water charges.

The projected usage for distribution losses in the NSP are based on the assumption that 100% of high priority loss WAEs are used each year and that medium priority loss WAEs reflect the same usage percentage as other medium priority WAEs in the distribution system. Therefore, in the case of the Burdekin-Haughton Distribution System, high priority loss WAE is assumed to be 16,260 ML per annum and medium priority loss WAE is estimated at 80% of 190,477 ML or 161,905 ML per annum.

##### Other Stakeholders

BRIAIC (2011a) submitted that SunWater's NSP illustrates a distribution loss figure of 69% of total water delivery entitlements (WDEs) that result in physical water loss averaging 90,148 ML. Given the NSP excludes cost impacts for channel lining to respond to rising ground water issues, it is imperative SunWater provide further data on loss by type so that customers can gain an appreciation of risk. This should be separated into pump losses, metering inaccuracy factors, channel overflow losses, evaporation losses and remaining projected seepage losses.

CANEGROWERS (2011a) submitted that there is a distribution loss WAE of 207,000 ML compared with average actual loss of approximately 100,000 ML. This very high loss WAE has a large impact on distribution customers' costs.

BRIAIC (2011b) submitted that distribution losses estimated by SunWater appear to be excessive and should be quantified on a realistic basis. SunWater have estimated approximately 50% of losses from the Clare Weir to an irrigators outlet compared to BRIAIC's understanding that losses are in the order of 10% across the schemes operated by SunWater in Queensland. BRIAIC suggested that it would be a very simple calculation to calculate the real losses by subtracting sales volume from pumped volume. The apportionment of this high level of losses to the renewals affects the irrigator's share of expenditure at head works level.

#### Authority's Analysis

As noted in the Draft Report, the Authority's general view was that distribution customers should pay for all distribution losses as identified in the distribution loss WAEs. Furthermore, that all distribution customers benefit from high priority losses, as these are released to fill the channel for all users and are not (solely) used to deliver high priority water.

In response to BRIAIC, SunWater has not provided disaggregated loss data.

In response to CANEGROWERS and BRIAIC, the Authority notes that, historically, SunWater has not used all distribution loss WAEs in delivering water to customers. Table 3.2 shows the actual amount of water loss compared with loss WAEs.

**Table 3.2: Total Medium and High Priority Distribution Loss WAE**

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Loss WAE (ML)	206,737	206,737	206,737	206,737	206,737	206,737	206,737	206,737
Actual Loss (ML)	103,044	115,909	128,901	102,659	82,339	85,037	72,235	100,743
Actual loss as % of loss WAE	50%	56%	62%	50%	40%	41%	35%	56%
Water use as % of WAE	106%	95%	104%	77%	85%	66%	55%	79%

Source: SunWater Data.

This variation between actual loss water released and loss WAEs is due to two factors.

Firstly, it is due to the management of water releases under a system of announced allocations. In this regard, SunWater each year announces the portion of WAEs available to customers (the announced allocation) based on the level of water in the WSS storages. Where there is an announced allocation of 70% for medium priority WAEs, it also applies to medium priority loss WAEs. So in that year, up to 70% of the loss WAEs can only be released. This system explains, in part, why actual losses released cannot always equate to the full loss WAEs.

Secondly, the variation between actual losses, water released and loss WAEs may be due to an excessive holding of loss WAEs. The Authority considers that, in principle, distribution system customers should not pay for distribution loss WAEs held by SunWater in excess of that needed to meet actual loss releases required as SunWater could benefit from their sale.

It is noted that DERM, as resource regulator, has progressively confirmed the distribution loss volumes through the water resource planning processes. Nevertheless, where it becomes



evident that there is a sustained difference between the loss WAEs and actual losses, the loss WAEs should immediately be reviewed by DERM. Prior to a DERM review, the Authority recommends that distribution prices be calculated on the basis of total loss WAEs.

#### *Submissions Received from Stakeholders on the Draft Report*

Burdekin River Irrigation Area Committee (BRIAC 2012) highlighted that the water use data for the Distribution System has included loss allocations which has distorted water use data. The losses have already been costed at 100% usage, even though less than 57% has been used over the last eight years.

In their submission, BRIAC queried whether losses WAE should be Distribution WAE. Presently distribution customers are paying the cost of having this WAE delivered through the channel as total cost of distribution. Its use is clearly determined for distribution and yet it is classed as a bulk WAE. If this WAE is removed from the channel there is more channel capacity available with a smaller spread of the costs. If it was determined as a distribution WAE an exit fee would have to be paid to ensure no impact on other users.

BRIAC recommended that all losses WAE to be treated as distribution WAE with a spread of distribution costs across the total of distribution allocation including losses allocation.

Further, BRIAC 2012 noted that the Authority recommended that prices reflect the cost of 100% of loss WAE when less than 55% are being used. The allocation of losses WAE bulk costs to distribution has added to the fixed costs for losses above actual use by \$347 420 per year or \$1.20/ML/year. This is in direct contrast to losses in the river/bulk system which is called TOL (transmission and operating losses) which do not incur any bulk costs. If distribution WAE holders are going to be charged for the total of the loss WAE then they demand the right to use the total losses WAE.

BRIAC also questioned the use of high priority losses to fill channels. The channels should only be filled with medium priority WAE to supply medium priority WAE. The only time the channels would be filled with high priority loss WAE is if the announced allocation for medium priority WAE was 0. All high priority loss WAE should only be paid by high priority WAE holders for the sections of channels that are supplied with HP allocation.

BRIAC recommended that the original intent of the losses WAE should be upheld, that being that they are treated the same as the TOL for the river. If this is not to be upheld then the person paying the cost must be the only beneficiary. The unused proportion of loss WAE must be made available for usage to those who have paid the cost.

The average loss WAE used over the last 8 years has been only 107,743 ML. SunWater should only be allowed to charge the bulk cost of losses WAE for the average yearly recorded amount of WAE used in the past eight years. This would be an interim measure until accurate bulk metering is carried out. If carryover of allocation is allowed within the scheme, carry-over of loss WAE should also be allowed, limited by the total amount required within one water year, that being the largest recorded amount over the last eight years or limited by the scheme rules for carryover.

#### *Authority's Response to Submissions Received on the Draft Report*

As detailed in Volume 1, the Authority recommends a change to its Draft Report recommendation.

The Authority has now confirmed that there are three means for reviewing distribution losses under the *Water Act 2000*. As a consequence, the Authority recommends that prudent and

efficient bulk costs associated with distribution loss WAEs should be paid for by distribution system customers, excluding the costs associated with distribution loss WAEs held by SunWater in excess of that needed to meet required actual loss releases. SunWater should bear the costs of holding distribution loss WAE greater than is needed to supply distribution customers.

The Authority's preliminary estimate of the excess distribution loss WAE is based on maximum actual distribution loss deliveries, adjusted for the level of water use in that year, based on available water use data from the past nine years up to and including 2010-11.

For the Burdekin-Haughton Distribution System, the Authority recommends that customers are allocated 100% of the costs of high priority distribution losses, and 59% of the costs of medium priority distribution losses. As a result, the remaining 41% of medium priority distribution loss costs are allocated to SunWater.

The Draft Report noted that high priority loss WAEs are routinely used to benefit medium priority customers. Where there are no high priority customers in a distribution system, the high priority loss WAEs are used exclusively for medium priority distribution customers. The use of high priority water also will be needed to supply medium priority customers when the medium priority announced allocation is low, not just zero. That is, when medium priority announced allocations are low for customers, the announced allocation for medium priority distribution loss WAE is equally low.

In such circumstances, there is not enough medium priority distribution loss water available to fill the channels. Thus, high priority distribution losses water must also be released to help meet medium priority customer requirements.

Therefore, medium priority customers derive a benefit from high priority distribution loss WAE and should be allocated costs accordingly. The Authority maintains its recommendation that the costs associated with high and medium priority distribution loss WAE are to be shared across all distribution customers.

The Draft Report noted that SunWater is not issued WAE for bulk (storage and transmission) losses but is instead required to comply with operating and environmental management rules established by DERM. By contrast, SunWater is issued with distribution system loss WAEs.

While the Authority considers that excess loss entitlements remaining in storages may, occasionally, be generating a benefit for river and distribution customers, the benefit is variable and cannot readily be determined. Further, the water planning framework does not prescribe a right for distribution customers to access unused distribution loss WAE.

### **3.6 Drainage Charges and Drainage Diversion Charges**

#### *Introduction*

Drainage charges apply in the Burdekin-Haughton Distribution System. SunWater provides the Burdekin-Haughton drainage system to remove water (farm run-off and storm water) from irrigation properties. Customers are required to discharge water from their farms through the drain inlet provided and they are charged for this facility.

#### *Previous Review*

In the previous review, drainage charges were calculated on a scheme basis. The Burdekin-Haughton Tier 2 group decided that the drainage rate would continue but in

combination with increases to the Part A water charge. The 2011-12 drainage charge for the Burdekin-Haughton Distribution System is \$22.15 per hectare of irrigable land.

In relation to drainage diversion charges, in the Burdekin-Haughton Distribution System, the drainage diversion charge in 2011-12 is \$141 per installation.

### *Draft Report*

#### Stakeholder Submissions

##### SunWater

SunWater (2011d) proposed that the existing drainage tariff groups be retained, with Burdekin-Haughton Distribution System being one of the four distribution systems continuing to receive a separate drainage charge.

SunWater proposed to maintain the already established arrangements and charges, whereby revenues from drainage and drainage diversion charges are treated as a revenue offset against total costs for this service contract. Further, SunWater submitted that this arrangement should be reviewed at the end of the 2012-17 regulatory period, with a view to incorporating drainage costs into a combined fixed charge for the distribution system.

##### Other Stakeholders

BRIAIC (2010) is satisfied that the current arrangements regards drainage charges are appropriate. It is apparent that SunWater has lifted its performance in managing the drainage network and BRIAIC trust that this will continue.

BRIAIC (2011b) submitted that the current per hectare rate should be maintained and SunWater should increase accountability, transparency and efficiency in relation to drainage services.

CANEGROWERS (2011a, 2011b) submitted that a thorough review of drainage costs and charges is required to decide whether to abolish or retain these charges.

#### Authority's Analysis

In Volume 1, the Authority recommended cost-reflective tariffs. Further, the Authority recognised that changes in farm practices have occurred such that some irrigators may not require drainage services to the same degree as previously.

SunWater advised the Authority that it does not separately identify drainage or drainage diversion costs within its accounts, and it would not be possible to generate renewals cost information for the planning period.

Without such cost information, the Authority was unable to recommend specific cost-reflective tariffs in this review.

In the circumstances, the Authority recommended that the current drainage and drainage diversion charges be maintained in real terms and that all revenue collected be treated as a revenue offset for distribution costs.

The Authority further recommended that SunWater collect detailed information on drainage (and drainage diversion) costs over the course of the 2012-17 regulatory period to inform cost-reflective charges prior to the next pricing review.

### *Submissions Received from Stakeholders on the Draft Report*

During the third round of consultation, stakeholders asserted that SunWater does very little maintenance in the drainage system so it is not fair for them to charge irrigators for it.

### *Authority's Response to Submissions Received on the Draft Report*

The Authority has recommended prices based on its assessment of prudent and efficient costs (including drainage costs). Further, drainage charge revenue is used to offset water tariffs.

## **3.7 Channel Water Harvesting Charges**

### *Introduction*

The Ministerial Direction requires the Authority to review channel [distribution system] water harvesting charges. Distribution system water harvesting entitlements are over and above the water available to a customer under their WAEs.

Water harvesting is the practice of water extraction from a river during authorised or announced high flow periods (e.g. flooding) that are specified in the applicable ROP. Water harvesting occurs in the Burdekin-Haughton Distribution System, with SunWater delivering water harvesting water through the distribution System.

### *Previous Review*

In the previous review, SunWater set the tariff for distribution system water harvesting as the Part B channel charge, which included the bulk variable charge.

### *Draft Report*

#### Submissions

#### SunWater

SunWater (2011d) submitted that the same pricing arrangements for water delivered in the distribution system should apply regardless of how a customer has sourced water. Prices relating to access to the entitlement itself should continue to be set within a market setting and are therefore outside the scope of regulatory oversight.

#### Other Stakeholders

CANEGROWERS (2011a) submitted that distribution system water harvesting charges should be reviewed.

CANEGROWERS (2011b) questioned whether water harvesting revenue should be included as a revenue offset, or collected separately.

#### Authority's Analysis

The price for distribution system water harvesting should reflect the marginal costs associated with its delivery which may consist of the following components:

- (a) a DERM water harvesting fee. The Water Regulation 2002 does not stipulate that this charge is currently payable in the Burdekin River groundwater Management Area. However, if SunWater is required to pay this charge in the future then the Authority

considers that it is appropriate for SunWater to collect this DERM charge from customers on a volumetric basis (as it is imposed on the basis of water usage);

- (b) the Part D volumetric water charge, which during 2006-11 recovered a portion of fixed costs, thus exceeding the (marginal) cost of supply. As for other distribution delivery services, the Authority considers that the charge for distribution system water harvesting should recover the marginal cost of delivery – the distribution system volumetric charge; and
- (c) a lease fee on water harvesting customers. SunWater has advised that the lease fee relates to access to the entitlement itself should continue to be set within a market setting and are therefore outside the scope of regulatory oversight. SunWater has not introduced this charge in the Burdekin-Haughton Distribution System. However, the Authority has previously indicated its support for SunWater to have an incentive to sell its other WAE and retain the revenues received in the market place. The price for these WAE is determined in the (trading) market. Accordingly, the lease fee for water harvesting WAE should also be set in the market place and therefore the Authority accepts SunWater's submission that the level of the lease fee should not be prescribed by the Authority.

In response to CANEGROWERS, the Authority considered that the proposed water harvesting charge result in any additional costs SunWater incurs in water harvesting are offset by the revenue collected.

As no submissions on this matter were received in response to the Draft Report and as the Authority has not identified any other grounds for altering its approach, the recommendation outlined in Draft Report is maintained.

### 3.8 Giru Groundwater Area

The Giru Benefited Groundwater Area is supplied through the Haughton Main Channel and Balancing Storage and consists of natural channels, relift pump stations and lagoons. The Haughton River is regulated by the Val Bird and Giru Weirs, both of which are managed to maximise recharge to the groundwater area. In the 2006-11 review, the charge for irrigators in the Giru Groundwater Area was assessed as half the total channel charge (bulk plus distribution excluding the drainage charge).

The discounted charge applied for any water usage up to twice the assessed natural yield. Water purchased above this limit was to be charged at the full channel rate, excluding the drainage charge.

#### *Draft Report*

##### Stakeholder Submissions

##### SunWater

SunWater advised that the discounted charges for the Giru Groundwater area was a legacy arrangement to reflect that 49% of volumes in the groundwater area were deemed to be natural groundwater yields not eligible to attract lower bound costs. SunWater did not estimate separate costs for the Giru Groundwater area in the NSP.

##### Other Stakeholders

CANEGROWERS (2011a) submitted that Giru groundwater users only paid a distribution charge based on the proportion of water they received via the channel system.

### *Authority's Analysis*

According to the Interim Resource Operations Licence (IROL) (DERM, 2000), the total surface and groundwater allocation in the Giru Benefited Area was 40,249 ML. Of this, 19,700ML was supplied by the natural yield of the Haughton system, while 20,549 ML was supplied from the Burdekin River, via the Haughton Main Channel. This appears to be the basis for the provision that 49% of volumes are attributable to natural yield. Currently, the total WAE is 40,184 ML.

In the absence of any more recent details relating to hydrological assessments of natural groundwater yields, the Authority proposed to continue the current long-standing arrangements. That is, the charge for the Giru Benefited Groundwater Area would be set to recover revenue equivalent to 51% of the bulk charge and 51% of the distribution system charge. The Authority considered that this level of cost recovery reflects the cost incurred by SunWater, as the remaining 49% was supplied by natural yield.

For the future, the Authority recommended that SunWater investigate the hydrological circumstances of the Giru Benefited Groundwater area to confirm the current cost allocation, or negotiate alternative arrangements with the irrigators.

As no submissions on this matter were received in response to the Draft Report and as the Authority has not identified any other grounds for altering its approach, the recommendation outlined in Draft Report is maintained.

### **3.9 Gladys's Lagoon**

In the 2006-11 price path, the Gladys's Lagoon irrigation section, a natural watercourse and lagoon located between the Haughton Main Channel and Ravenswood Road, attracted a slightly lower channel charge. Compared to the base channel Part A charge of \$31.76/ML, the Gladys's Lagoon Part A charge was \$28.32/ML. The Part B charge was \$19.07/ML in the main channels and \$19.45/ML in Gladys's Lagoon (2011/12 charges).

#### *Draft Report*

##### Stakeholder Submissions

SunWater indicated that the charge for Gladys's Lagoon included a legacy allowance for natural yield. SunWater submitted that the base tariff applies, albeit only for a portion of its WAEs.

##### Authority's Analysis

In reviewing historic pricing arrangements for Gladys's Lagoon, the Authority found that, prior to 2006, the charge was structured to provide approximately 15% of revenue through the Part A charge and 85% through the Part B charge. In contrast, the base distribution system charge was in line with the broadly adopted 70/30 ratio of revenues.

For the 2006-11 period, the charge structure for Gladys's Lagoon was transitioned to a structure broadly in line with the channel charge structure. In total, the Gladys's Lagoon charge was about 7% lower than the channel charge in terms of revenue recovery in 2006-07. In 2011-12, the Gladys's Lagoon total charge is about 6% lower than the distribution system charge.

According to Department of Natural Resources (DNR, 2001), supplemental releases are made from the Haughton channel network for supply to Gladys's Lagoon. SunWater advised that the total WAE in Gladys's Lagoon is 1,752 ML, of which 360 ML is natural flows.

In the absence of more recent details relating to hydrological assessments of natural yields at Gladys's Lagoon, the Authority proposed to recognise the natural flows to Gladys's Lagoon for

cost recovery purposes. The first 360 ML does not attract a charge, as SunWater incurs no costs to supply this water. However, the Authority recommended that the normal bulk and channel charges should apply to volumes delivered after the first 360 ML is supplied. There does not appear to be a basis to differentiate the charge for Glady's Lagoon from the standard distribution system charge.

For the future, the Authority recommended that SunWater investigate the hydrological circumstances of the Glady's Lagoon area to confirm the current cost allocation, or negotiate alternative arrangements with the irrigators.

As no submissions on this matter were received in response to the Draft Report and as the Authority has not identified any other grounds for altering its approach, the recommendation outlined in Draft Report is maintained.

### **3.10 Allocation of Distribution Costs to Townsville Thuringowa Water Supply Joint Board**

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

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

#### *Draft Report*

##### Stakeholder Submissions

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

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

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

##### SunWater's Response

In responding to stakeholder comments, SunWater confirmed that:

- (a) TTWSJB are apportioned bulk and distribution costs associated with the 10,000 ML WAE they hold;
- (b) SunWater holds an additional 110,000 ML bulk WAE on behalf of TTWSJB. The NSP allocates costs to this WAE. TTWSJB have not ever sought to access this 110,000 ML WAE; and
- (c) TTWSJB are not allocated distribution system capacity above 10,000 ML. If TTWSJB ever needs to access the 110,000 ML WAE they would either need to provide their own distribution capacity (e.g. pipeline), or reach some other agreement with SunWater.

#### Authority's Analysis

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

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

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

As no submissions on this matter were received in response to the Draft Report and as the Authority has not identified any other grounds for altering its approach, the recommendation outlined in Draft Report is maintained.

### **3.11 Storage Rental Fees**

Storage rental (carry-over) fees are not charged in the Burdekin-Haughton Distribution System.

#### *Submissions Received from Stakeholders on the Draft Report*

Lower Burdekin Water (LBW 2011) submitted that under current sales agreements, LBW has an ability to carry-over unused water between water years for a period up to six months.

However, while the Authority's Draft report has covered this issue for other schemes, it has not been explicitly addressed in the Burdekin report. LBW seek clarification from the Authority that carry-over arrangements will continue and will not incur any form of storage rental charges.

#### *Authority's Response to Submissions Received on the Draft Report*

Storage rental (carry-over) arrangements are outside the scope of the Authority's review. However, SunWater has proposed and the Authority has recommended in Volume 1 that storage rental fees are not charged.



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

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

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

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

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

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

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

An additional six past renewals items across the schemes were reviewed for the Final Report, bringing the share of past renewals expenditures reviewed from 29% in the Draft Report to 34% by value. A further 14 forecast renewals items were reviewed, increasing the share reviewed from 13% in the Draft Report to 29% by value. The size of the sample is sufficiently large to determine and apply separate cost savings to past (and forecast) non-sampled items.

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

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

### *Draft Report*

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

SunWater submitted that the opening balance for the Burdekin-Haughton WSS (including the distribution system) was negative \$1,185,000.

For the Draft Report, the Authority accepted SunWater's unbundled opening ARR balance for Burdekin-Haughton Distribution System (excluding Burdekin-Haughton bulk) of negative \$883,000.

The Authority's Draft Report unbundled ARR balance reflected 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, the Authority indicated that in October 2011 Indec had uncovered actual renewals expenditure for 2000-06. The Authority was not been able to review this information or quality assure it for the purposes of the Draft Report, but stated its intention to do so for the Final Report.

#### *Final Report*

For the Final Report, the Authority used the actual renewals expenditure for bulk and distribution assets over the period to revise the opening 1 July 2006 balances accordingly (see Volume 1).

As a result, the 1 July 2006 opening ARR balance is revised from negative \$883,000 to negative \$1,476,000.

### **4.3 Past Renewals Expenditure**

#### *Draft Report*

As noted in Volume 1, the Authority has reviewed the prudence and efficiency of selected renewals expenditures over the 2006-11 price path. The Authority has also sought to compare the original expenditure forecasts underlying the 2006-11 price path with actual expenditure, to establish the accuracy of SunWater's forecasts.

#### Stakeholder Submissions

##### SunWater

SunWater (2011) submitted actual renewals expenditure for the Burdekin-Haughton Distribution System 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 (Actual) Renewals Expenditure 2006-11 (Real \$'000)**

	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>
Past (Actual ) Renewals Expenditure	1,239	1,031	3,393	3,067	3,243

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

##### Other Stakeholders

CANEGROWERS (2011b) submitted that the automated gates may not have been necessary and that putting in new gates and replacing manual drop boards has not reduced costs, but increased them due to a greater capital cost.

CANEGROWERS (2011b) queried the nature of the renewal expenditure in 2010-11 as all gates were purchased prior to June 2010, but were installed in 2010-11.

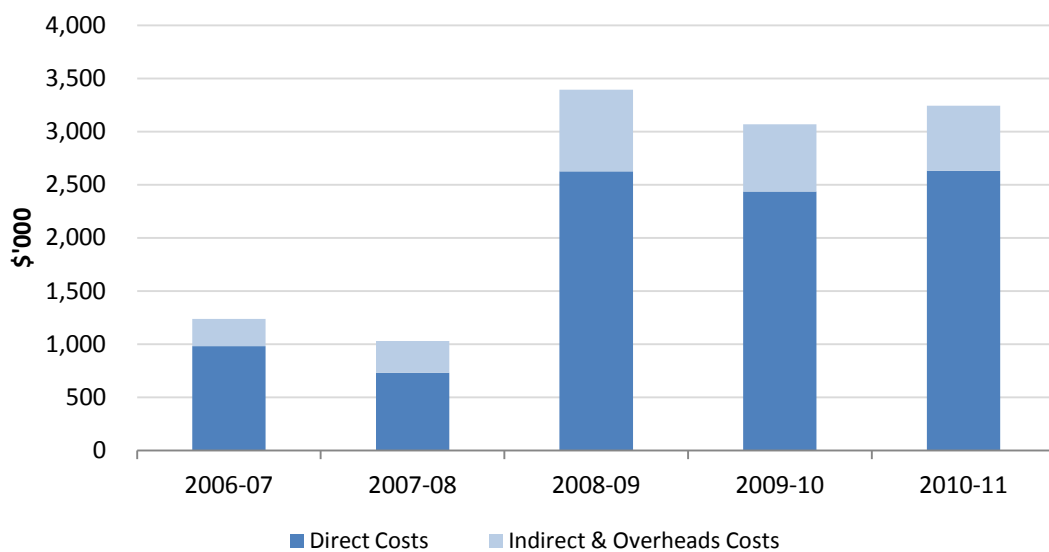
BRIAIC (2011a) questioned the size of SunWater's past renewal expenditure and submits that the opening negative ARR balance of \$3.2 million must be the result of \$5 million of unplanned expenditure, which seems unlikely.

Authority's Analysis

### Total Renewals Expenditure

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

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

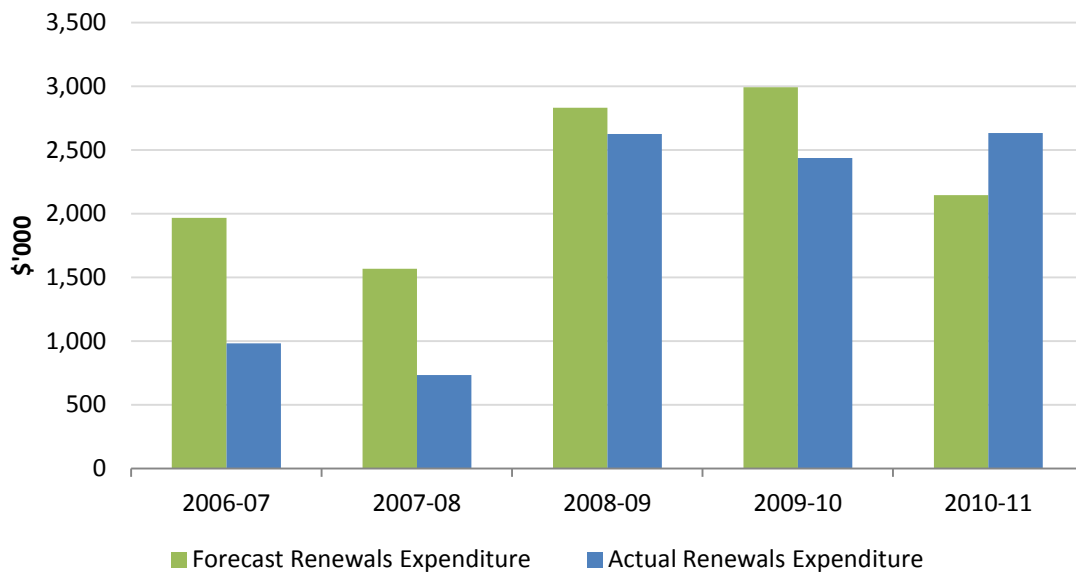


Source: Indec (2011d).

### Comparison of Forecast and Actual Costs

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

A comparison of forecast and actual direct renewals expenditure in the Burdekin-Haughton Distribution System for 2006-11 is shown in Figure 4.2.

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

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

Actual renewals expenditure was \$2,091,782 (direct costs) below that forecast over the period. As noted above, the Authority has not been able to compare the forecasted renewal items with the actual renewal items. However, the Authority notes the following unplanned expenditure (in nominal terms) on renewals items:

- (a) Intersafe expenditure of \$501,000;
- (b) flood damage repair expenditure of \$2,265,000; and
- (c) fencing installation expenditure of \$49,000.

#### *Review of Past Renewal Items*

Arup was also appointed to review the prudence and efficiency of past renewals expenditure items.

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

Arup identified a number of significant items of expenditure over the 2007-10 period, including:

- (a) Dalbeg Channel A – replacement of pipeline lateral with High-Density polyethylene (HDPE) liner, \$282,192 in 2006-07;
- (b) Millaroo Channel 3 – refurbishment of earth channel with HDPE liner, \$322,493 in 2006-07;
- (c) Flood damage repairs in 2007-08, including Haughton Drainage (\$155,818), Barratta system (\$168,508), Haughton Main Channel and pump stations (\$636,025), and Haughton system (\$189,637);

- (d) Flood damage repairs in 2008-09, including Millaroo system (\$110,062) and Clare system (\$138,255);
- (e) Clare pump station – refurbishment, including design in 2007-08 and construction in 2008-09 (\$206,534);
- (f) Haughton Diversion Channel – reinstatement of flow metering in 2009-10 (\$148,585); and
- (g) Intersafe gated at Clare in 2009-10 (\$464,483).

Arup observed that a large proportion of expenditure was related to flood damage repair.

A sample of material renewals expenditure items was then identified by the Authority and Indec (2011), with further more detailed analysis undertaken by SKM (2011).

#### *Item 1: Intersafe Gated Project*

##### Draft Report

The Intersafe gated project was put in place by SunWater to maintain appropriate workplace health and safety (WHS) standards for its employees. In 2005, SunWater engaged consultants, Intersafe, to undertake a pilot study in Mareeba to review distribution infrastructure to identify WHS risks. Intersafe identified 43 potentially damaging tasks with 27 considered high risk. In 2007, Intersafe was asked to extend the review to other regions.

The works included modifications and installation of handrails, walkways, steps, ladders, safety screens pit covers, control gates and associated metal work.

Expenditure totalling \$501,000 was identified by Arup.

##### Other Stakeholders

No other stakeholders have commented on this matter.

##### Halcrow's Review

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

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

##### Arup's Review

Arup found that SunWater has undertaken a risk assessment of all relevant Millaroo assets and identified high or extreme risk assets for modification. The State-wide application has meant that efficiencies could be adopted in terms of assessment and procurement. Arup was satisfied that the procedures around implementation of this project represent prudent and efficient practices and therefore are likely to result in prudent and efficient costs.

### SKM's Review

SKM reviewed the procedures used by SunWater to assess and develop, where possible, standard solutions to different risks types. SKM noted that SunWater's Asset Management group developed an internal procedure for identifying, ranking and developing solutions to infrastructure related WHS risks. The major tasks in the program were:

- (a) develop a standardized risk assessment template;
- (b) train regional staff in risk assessments;
- (c) engage regional staff to undertake risk assessments;
- (d) engage regional staff to select solutions to reduce high and extreme risk hazards;
- (e) upload risk assessments and maintenance items into works management system (WMS) planning; and
- (f) establish procurement contracts for standardised solutions.

SKM considered that that these systems were robust and hence will have led to the development and implementation of efficient solutions, in that, by developing standard infrastructure, implementation costs will have been reduced through economies of scale.

SunWater's Board initiated a program of work to take place over three years to address WHS risks associated with SunWater's distribution infrastructure.

Given that the risks have been identified through a two-part process: appointment of specialist consultants and through a formal internal mechanism as described above, SKM considered the timing of the works to be prudent and should be implemented as swiftly as possible.

In absence of benchmarking information, SKM reviewed the procurement process undertaken by SunWater in implementing the program of works. The procurement process adopted for most of the works was via an open tender process, which in the Ayr region was via an invitation released on the Queensland Government e-Tender website. SunWater evaluated tender returns received against a number of criteria including cost.

SunWater prepared a Tender Evaluation Plan to assess tender returns and select the preferred tendering party. This included the formation of an evaluation committee consisting of senior technical and procurement staff. Tenders were subjected to a detailed analysis via an assessment matrix which contained assessment criteria and weightings to enable structured comparison and evaluation. The selection criteria being:

- (a) commercial conformity of tender;
- (b) demonstrated capacity to provide the works;
- (c) financial;
- (d) management;
- (e) technical;
- (f) suitability of gates and associated equipment; and
- (g) any other factors.

This assessment yielded a weighted score for each tendering party. SunWater deemed that two tenderers scored sufficiently high to allow progress to the next stage of the selection process. These tenderers were invited to interview.

SKM considered that there may have been merit in SunWater adopting a standard tender return assessment process for all regions and all work packages. However, SKM concluded that the costs incurred by SunWater in implementing the works have been subjected to competitive forces and hence can be considered to be efficient.

#### Authority's Analysis

The Authority agreed with the consultants' conclusions and considered that the Intersafe renewals expenditure is prudent and efficient.

As no submissions were received on this item following the Draft Report, the Authority proposes no change to its Draft Report conclusion.

#### *Item 2: Millaroo Irrigation System – Public Safety Strategy (Fencing Policy)*

##### Draft Report

The Millaroo fencing project is part of SunWater's response to a State-wide fencing policy. The renewals expenditure is to ensure SunWater meets its duty of care with respect to public safety. Total cost was \$49,000.

#### Other Stakeholders

CANEGROWERS (2011b) submitted that SunWater is being overly risk averse in regards to fencing. CANEGROWERS assert that typically costs are shared 50/50 between adjoining properties and query why this has not occurred. CANEGROWERS claim that if the fencing requirements had been negotiated with growers then a cheaper solution would have been found and half the costs would have been met by landholders.

#### Arup's Review

Arup acknowledged that SunWater's state-wide policy is likely to result in a prudent and efficient implementation. Activities include a risk assessment approach to identify high risk areas which warrant fencing and regional procurement strategies in implementation of the policy. Arup, however, noted that while cost-recovery from adjacent land owners has been identified significant additional negotiation needs to be undertaken in conjunction with local councils to ensure that this actually takes place. Arup noted that inaction on this may result in far greater costs to SunWater and therefore irrigators.

#### Authority's Analysis

In response to CANEGROWERS, the Authority noted that SunWater's fencing policy document specifies that the *Dividing Fences Act 1953* requires both parties to contribute an equal share towards fencing costs. It is unclear from the information that SunWater has provided whether the renewals expenditure forecast includes a 50% land holder contribution.

The Authority recommended that 50% of fencing costs be removed from the calculation of the renewals annuity, pending SunWater confirming the basis of its forecast fencing estimates.



#### Submissions in Response to the Authority's Draft Report

SunWater submitted that the Authority's approach to excluding 50% of past fencing costs was unjustified as SunWater are only entitled to seek 50% of the costs of a standard fence, as opposed to safety fence. SunWater provided evidence that, on average, a safety fence costs approximately three times that of a standards fence. Accordingly, SunWater proposed that the originally submitted \$49,000 be included.

#### Authority's Response to Submissions Received on the Draft Report

Following SunWater's submission on the Draft Report, the Authority concluded that:

- (a) it is reasonable for neighbours to pay 50% of standard fencing costs (and not 50% of safety fence costs); and
- (b) SunWater cannot recover from customers all prudent and efficient fencing costs where SunWater owns the land on both sides of the fence, because SunWater did not provide an estimate of such costs.

Accordingly, the Authority's cost savings have been adjusted to reflect neighbours paying 50% of standard fencing costs. Therefore, the Authority recommends cost savings of 16.7% of fencing costs rather than 50% as previously recommended.

#### *Item 3: Flood Damage Repairs*

##### Submissions Received from Stakeholders on the Draft Report

In its submission in response to the Draft Report, SunWater (2011as) advised that additional information is now available on required flood damage repairs which need to be taken into account for the renewals annuity calculation. For the Burdekin Haughton Distribution System, the flood repair costs are \$232,632 (actual) for 2010-11 and \$600 (estimated) for 2011-12.

SunWater has advised that the 2010-11 flood damage repair costs are included in its proposed renewals expenditure and the 2011-12 flood damage repair costs are additional to its proposed renewals expenditure.

However, SunWater subsequently submitted that insurance revenue was also expected to be received, which would offset some of the flood repair costs. SunWater sought that this submission remains confidential as the negotiations with the insurer are still ongoing.

##### Authority's Response to Submissions Received on the Draft Report

As outlined in Volume 1, the Authority reviewed a sample of flood damage repairs across SunWater's schemes. The sampled items accounted for 30% of total flood repairs. SKM found that all sampled items were prudent and efficient.

However, the Authority notes that if flood damage repair costs are to be included then so should any offsetting insurance revenues. As insurance revenues are yet to be determined, the Authority has not included flood damage repair costs in prices.

Therefore, once the insurance matter is settled, SunWater may apply for an adjustment to prices to account for the flood damage expenditure and revenue, or the ARR balances will be adjusted during the next regulatory review.

### Conclusion

#### Draft Report

In the Draft Report, two items were reviewed for the Burdekin-Haughton Distribution System. On the basis of the consultants review, the Authority considers that:

- (a) one item was prudent and efficient and has been retained as past expenditure; and
- (b) one item was prudent but not efficient, requiring adjustment to past expenditure.

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

In total, the Authority recommended the expenditure be adjusted as summarised in Table 4.2.

#### Final Report

After review of submissions in response to the Draft Report, the Authority's conclusions regarding the public safety fencing was adjusted for the cost of standard (not safety) fencing. Flood damage repair costs were excluded pending settlement of an insurance assessment.

As outlined above and in Volume 1, the Authority undertook further sampling of past renewals expenditures across SunWater's schemes. The larger sample of items reviewed indicated that a lower level of average savings for past renewals expenditures could have been achieved. (A separate level of savings was calculated for forecast renewals expenditures – see further below).

After consideration of this further work, the Authority recommended that a 4% saving be applied to all non-sampled and sampled items for which there was insufficient information.

**Table 4.2: Review of Selected Past Renewals Expenditure 2006-11 (\$'000)**

<i>Item</i>	<i>Date</i>	<i>SunWater (\$,000)</i>	<i>Authority's Draft Report Findings</i>	<i>Draft Recommended (\$,000)</i>	<i>Authority's Final Report Findings</i>	<i>Final Recommended (\$,000)</i>
<b>Sampled Items</b>						
1. Intersafe	2009-10, 2010-11	501	Prudent and efficient	501	Prudent and efficient	501
2. Fencing	2006-07	49	Prudent but not efficient	25	Prudent but not efficient	41
3. Flood damage repairs	2010-11 2011-12	232, 1	Not sampled	10% saving applied to 2010-11 cost	Excluded pending insurance claim	0
<b>Non-Sampled Items</b>				<b>10% saving applied</b>		<b>4% saving applied</b>

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

#### 4.4 Opening ARR Balance (at 1 July 2012)

##### *Draft Report*

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was negative \$3,195,000 for the Burdekin-Haughton Distribution System. This estimate reflected the most recent information provided by SunWater to the Authority in September 2011 and may differ from the NSP.

Based on the Authority's assessment of the prudence and efficiency of past renewals expenditure in the Draft Report, and the proposed methodology for unbundling ARR balances, the draft recommended opening ARR balance for 1 July 2011 for Burdekin-Haughton Distribution System was negative \$2,332,000.

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

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

For the Draft Report, to establish the closing ARR balance as at 30 June 2012 of negative \$2,483,000, 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.

##### *Submissions Received from Stakeholders on the Draft Report*

BRIAC (2012) submitted that any above lower bound margin recovered during this price path must be offset against the renewals overspend. It needs to be established how a pricing process can allow a scheme paying above lower bound during this price path to have a greatly reduced ARR balance in the next. A more optimised approach to future renewals spends is required to ensure the renewal doesn't exceed the requirement and therefore exceed the customers' ability to pay for the service.

##### *Final Report*

The Authority has revised its Draft Report estimate of the 30 June 2012 ARR to take account of the key changes since the Draft Report as outlined above including:

- (a) a change in the 1 July 2006 opening ARR balance from the use of actual renewals data. The 2006 opening balance is lower than in the Draft Report (negative \$883,000 compared to \$1,274,000);
- (b) the application of a 4% saving to non-sampled items and sampled items for which there was insufficient information; and

- (c) removal of 2010-11 flood damage repair costs.

The combined effect of these changes is that the opening ARR balance for 1 July 2011 is revised from negative \$2,332,000 to negative \$4,198,000.

The resulting revised ARR balance as at 30 June 2012 is negative \$4,604,000.

In response to BRIAC, the Authority considers that:

- (a) as noted above, when the Government set the 2006-11 price paths, the basis for renewal revenues was effectively approved. The preceding regulatory framework did not provide for an under and over adjustment of operating costs – SunWater bore the risk of under or over-recovery in most schemes.

Indeed, in aggregate SunWater under-recovered previous estimates of costs. It is not appropriate to change those regulatory arrangements or to adjust for an individual revenue (offset) item; and

- (b) in regards to optimisation, the Authority was directed to have regard to the level of service provided by SunWater and has sought to establish the most prudent and efficient cost of future renewals needed to meet those current standards of service.

Assessing changes in service levels or the capacity (ability) to pay of customers were explicitly removed from the Ministerial Direction.

The Authority has recommended (Volume 1 - Chapter 4: Pricing Framework) that service standards should be reviewed for schemes where water is not always available. A similar proposition applies where service quality standards or other technical requirements may create excessive costs (where, for example, exit from a scheme renders the maintenance of previous service quality standards inappropriate).

## 4.5 Forecast Renewals Expenditure

### *Planning Methodology*

#### Draft Report

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

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

#### Submissions Received from Stakeholders on the Draft Report

SunWater submitted that:

- (a) the costs of undertaking options analysis (and associated activities including consultation) are excessive (\$445,000 annually for all schemes);
- (b) these costs are to be allocated exclusively to the irrigation sector; and
- (c) although some of the Authority's consultants' suggested improvements have merit, they all involve additional cost. SunWater sought to implement only those that demonstrate a net-benefit.

Authority's Response to Submissions Received on the Draft Report

In response to SunWater, and as outlined in Volume 1, the Authority considers that:

- (a) the cost of the options analyses is acceptable when compared to SunWater's total renewals expenditure (\$14.5 million in 2011-12). In addition, SunWater's estimated \$445,000 does not include the savings associated with options analyses;
- (b) the cost of carrying out options analyses should be met by all water users (including irrigators and non-irrigators where they exist) in the relevant service contract; and
- (c) SunWater should review its renewals planning process (taking into account the Authority's consultants' suggested improvements) and provide a copy of the review to Government and the Authority by 30 June 2014.

As noted in Volume 1, the Authority has not, therefore, amended its draft recommendations regarding SunWater undertaking high-level and detailed options analyses. The Authority has, however, modified its draft recommendation as noted in (c) above.

#### *Prudence and Efficiency of Forecast Renewals Expenditure*

Stakeholder Submissions

#### SunWater

SunWater's forecast renewals expenditure for 2011-16 for the Burdekin-Haughton Distribution System, as provided in its NSP is presented in Table 4.3. This was submitted prior to the Government's announced interim prices for 2011-12.

**Table 4.3: Forecast Renewals Expenditure 2012-16 (Real \$'000)**

<i>Facility</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>
Barratta Irrigation Distribution	337	196	86	69	132
Clare A Pump Station	75	187	118	69	
Clare B Pump Station	503	53	7	17	374
Clare Drainage	11	2			
Clare Irrigation Distribution	20				
Clare Relift Pump Station	11	2	29		
Dalbeg A Pump Station	84	28	120	9	53
Dalbeg B Pump Station	57	143		28	37
Dalbeg Irrigation Distribution			6		
Dalbeg Relift Pump Station				3	2
Elliot Irrigation Distribution	3	85		33	22
Elliot Pump Station	458	102		21	145
Haughton Drainage	5				
Haughton Irrigation Distribution	200	31	133	15	90
Haughton Mc Irrigation Distribution			47		
Millaroo A Pump Station	35	236		16	15
Millaroo B Pump Station	434	2		72	40
Millaroo Irrigation Distribution	60	26	14		
Millaroo Relift Pump Station		34	47		32
Tom Fenwick Pump Station 1	134	163	33	105	
Tom Fenwick Pump Station 2/3	217	40	23		20
Tom Fenwick Pump Station 4/5	126	34	177	98	265
Tom Fenwick Temp Pump Station	5				
<b>Total</b>	<b>2,778</b>	<b>1,365</b>	<b>839</b>	<b>555</b>	<b>1,228</b>

Source: SunWater (2011).

The major items incorporated in the above estimates are:

- (a) Barratta Channel System – replacement of weed screen at an estimated cost of \$191,000 in 2011-12. The rotating weed screen at Mulgrave Balancing Storage has failed and requires replacement;

- (b) Barratta Channel System – refurbishment of regulating gates at an estimated cost of \$612,000 from 2011-12 to 2015-16;
- (c) Haughton Channel System – refurbishment of safety screen guides at an estimated cost of \$122,000 in 2011-12;
- (d) Haughton Channel System – replacement of gate control equipment at an estimated cost of \$145,000 from 2011-12 to 2014-15;
- (e) Clare A Pump Station – replacement of control system at an estimated cost of \$114,000 in 2012-13;
- (f) Clare B Pump Station – refurbishment and replacement of three submersible pumps, a switchboard and control equipment at an estimated cost of \$878,000 from 2011-12 to 2015-16;
- (g) Elliot Pump Station – replacement of two switchboards at an estimated cost of \$406,000 in 2011-12;
- (h) Millaroo B Pump Station – refurbishment of equipment and replacement of discharge valve at an estimated cost of \$222,000 in 2011-12;
- (i) Millaroo A Pump Station – refurbishment of works to motors and control equipment at an estimated cost of \$236,000 in 2012-13;
- (j) Tom Fenwick Pump Stations 1, 2/3 and 4/5 – replacement of control systems at an estimated cost of \$419,000 in 2011-12; and
- (k) Tom Fenwick Pump Station 4/5 – replacement of Pump 4 at an estimated cost of \$230,000 in 2015-16.

The major expenditure items from 2016-17 are:

- (a) refurbishment of channels in Dalbeg distribution system at an estimated cost of \$1,142,000 in 2026-27;
- (b) refurbishment of the Tom Fenwick Pump stations at an estimated cost of \$1,068,000 in 2026-27;
- (c) refurbishment of channels in Clare distribution system at an estimated cost of \$3,616,000 in 2032-33;
- (d) refurbishment of Clare drainage system at an estimated cost of \$1,213,000;
- (e) refurbishment/replacement of control gates in Barratta distribution system at an estimated cost of \$767,000;
- (f) refurbishment/replacement of control gates in Haughton distribution system at an estimated cost of \$661,000;
- (g) replacement of guard gate in Tom Fenwick Pump Station 2/3 at an estimated cost of \$414,000; and
- (h) refurbishment of Millaroo pumps at an estimated cost of \$1,212,000 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

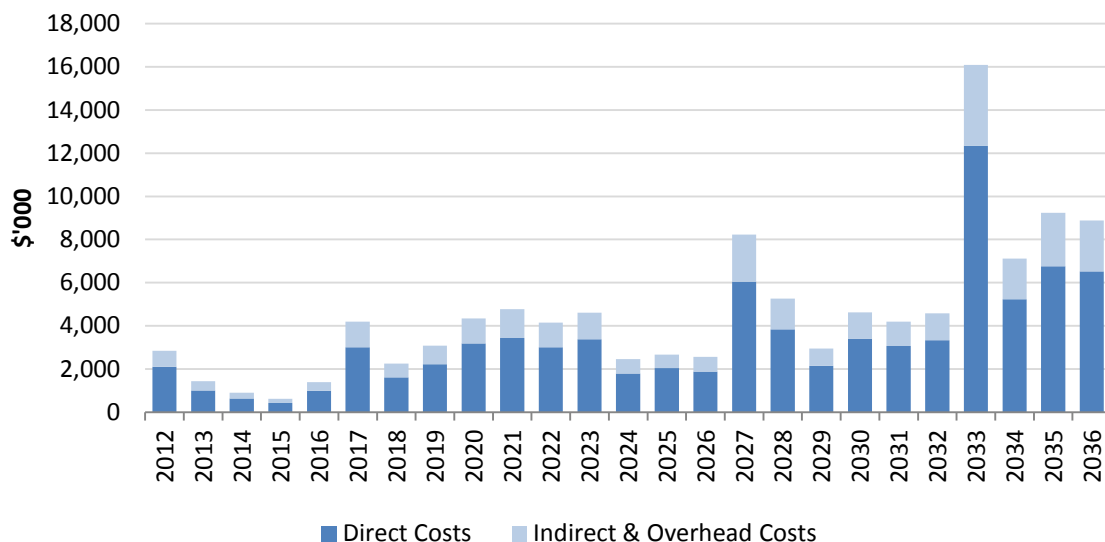
No other stakeholders submitted on these items.

Authority's Analysis

### Total Costs

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

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



Source: SunWater (2011).

### *Review of Forecast Renewals Items*

As for past renewals expenditure, Arup and SKM have reviewed the prudence and efficiency of a sample of items.

#### *Item 1: Barratta Irrigation Distribution – Replace Rotating Weed Screen*

Draft Report

SunWater proposed to replace weed screens at an estimated cost of \$191,000 in 2011-12. The rotating weed screen at Mulgrave Balancing Storage has failed and requires replacement.

### Arup's Analysis

Based on information from SunWater, the rotating weed screen failed in service due to corrosion and mechanical wear and on this basis for assigned a condition score of 6 (failed) with a replacement item raised for 2011-12. Arup found that the budget for this item was obtained



from a quote obtained from Batescrew Pumps and Valves (Quote LC102123) in December 2009 of \$174,000 for two screens to be fitted side by side. Given that this value was in excess of \$50,000 it has triggered further investigation in 2010-11 which revealed a cheaper alternative of \$43,000.

Without a detailed review of the actual works, Arup were not able to comment if this is the most efficient cost but note that the procedures adopted are considered to generate a prudent outcome. Arup also noted that SunWater has endeavoured to obtain a more efficient costing which was identified through the investigation undertaken. This demonstrates that initial costings may not always represent the best solution, which is likely to only be identified upon more detailed investigation. SunWater have indicated that this 2011-12 replacement planning item will be retained until the boom arrangement is proven in the short term and if no evidence of failure will be modified within the program.

#### Authority's Analysis

The Authority accepted Arup's conclusion and proposes to include the item as prudent, but with an adjusted value of \$43,000.

#### *Item 2: Replacement of Discharge Valves – Millaroo B Pump Station Pump Units 1,2 & 3*

Draft Report

Total cost as submitted in the NSP was \$222,000 in 2011-12.

#### Other Stakeholders

No other stakeholders have commented on this item.

#### Arup's Review

Arup found that the cost of this renewals expenditure is estimated to be \$67,739 for each valve, based on the Bill of Materials (BOM) produced in 1997 which indicated a replacement cost of \$29,710 for one such valve.

Arup reviewed the SAP output relating to the replacement of the discharge valves and were not able to ascertain from this output whether this is a prudent and efficient expenditure. The basis by which the 1997 cost has been escalated was not demonstrated.

Arup noted that original replacement date was 2009-10. The replacement date was revised to 2011-12 with an options analysis being proposed for 2010-11. This implied that some degree of prioritisation has taken place.

Arup considered that the replacement of the three valves is unlikely to be a direct multiplier of 3 from the value of one. While this forecast may be sufficient for the purposes of estimating into the future, Arup expected that the real cost of the replacement of the three will be less than estimated. An options study is proposed which will provide a more realistic estimate of the replacement cost.

#### Authority's Analysis

While Arup considered that the cost of this item is likely to be less than proposed by SunWater, it did not provide an alternative estimate. Given that SAP-WMS cost data are based on notional indirect and overhead costs only, the Authority proposed to apply the full value (\$222,000) as nominated in the NSP.

### *Item 3: Elliot Pump Station Replacement of Switch Gear*

#### Draft Report

This item refers to the replacement of the Elliot Pump Station Switchboard No. 1 (Pumps 1 & 2) in 2011-12 for a cost of \$406,000. The asset has been in operation at its current location since 1987.

#### SKM's Analysis

SKM reviewed SunWater's SAP-WMS and found the value to be \$262,000. While this is significantly less than indicated in the NSP, SunWater indicated that the SAP value includes only a notional uplift factor for indirect costs and overheads.

SKM drew on the following documentation in its review.

**Table 4.4: Documentation Reviewed Specific to Replacement of the LV Switchboard at Eliot Pump Station**

<i>Document No.</i>	<i>Document Name</i>	<i>Document Title</i>	<i>Date</i>
1108993	1105969-QCA Justification – Elliot Pump Station Switchboard 1	Elliot Pump Station – QCA Justification: Replace Switchboard No. 1 (Pumps 1 &2)	8 <sup>th</sup> August 2011
837517	837517 Final Report: SunWater audit of Electrical Sites.	SunWater: Audit of Electrical Sites	24 <sup>th</sup> July 2009

Source: SKM (2011).

SunWater has identified that the asset should be replaced on two counts:

- (a) the asset is scored 'High' on a WHS criterion. This score is driven by a condition assessment undertaken by Parsons Brinckerhoff (PB) in which PB commented that there were safety issues associated with access to live parts of the installation; and
- (b) asset age. The asset has been allocated an age related condition criterion of 5. This score, coupled with the current site in operation date of 1987 advances the standard asset condition deterioration curve, bringing forward the recommended replacement date to 2011-12.

#### (a) Prudency Review

SKM noted that in SunWater's Whole of Life Maintenance Planning Tool (Master), SunWater has allocated a standard run to failure asset life of 35 years and a maximum condition assessment frequency of every two years. SKM considered the standard run to failure asset life and condition assessment frequency applied to this asset type to be reasonable.

SKM viewed the WMS record for this asset and noted that the switchboard was relocated to this site from a previous installation and hence it is older than the in-service date in SAP-WMS would indicate. SunWater has advised that the switchboard initially may have entered service in 1978 in the Mirani temporary pump station. This would place the switchboard age as being 32 years old at the time of development of the NSPs.

SunWater commissioned PB to undertake a condition assessment and audit of all its electrical sites in 2009. The condition report and risk report in SunWater's SAP-WMS is therefore derived from a high level recommendation provided in the PB report. The risk assessment template in SAP-WMS records a Low risk for the business risk items used for asset replacement planning purposes (in fact no score at all has been given for these criteria). However, a High risk score has been allocated to the WHS criteria. Overall, the scores combine to place the overall risk in the High category.

Under SunWater's systems, any asset that has been allocated a High risk category on a WHS assessment criterion is scheduled as a priority 'A' (that is, highest priority) asset for remedial/rectification works to address the hazard causing the High WHS risk criterion rating irrespective of the condition of the asset. SKM considered this approach, which places a high value on employee safety to be not only prudent but in keeping with good electricity industry practice.

The reason provided by PB which drives this High WHS risk rating is that there are live parts (that is, electrically energised parts) which can be accessed (touched) without any interlocks ensuring isolation before access, and without the use of a tool or key to open.

SKM also noted that, in the standard SunWater Risk and Condition Assessment Collection Form prepared by PB following site inspection and from the relevant section of the PB report (Audit of Electrical Sites) that PB states that oversized fuses have been used and that labelling of the switch gear component live parts etc. is not in keeping with AS/NZS 3439.1:2002.

On this basis PB has provided a high level recommendation that due to the age of the switchboard, potential for access to live parts and the availability of components, it should be replaced.

SKM questioned the use of age as the criterion in assessing condition as age should be inherently captured in the asset condition decay curve used by SunWater. If age is used as a condition assessment criterion then it precludes SunWater, under its systems, from extending the run to failure life of an asset above an assets standard run to failure asset life for those assets that are otherwise in good condition. SKM noted that the SunWater method becomes unreliable when a condition assessment is significantly better than the standard run to failure condition deterioration curve projects.

SKM noted that, in its report, PB has stated that the board was observed to be in relatively good condition, but that there are major issues with access to live parts and with the age and availability of components utilised in the switchboard. SKM considered that the statement that the switchboard is in relatively good condition goes some way to justifying a view that age, in its self, should not be used as a condition assessment criterion.

PB also commented that there were major issues with availability of components utilised within the switchboard. However, SKM considered that given the significant market in replacement switchgear, most modern replacement switchgear and components are backwards compatible, allowing older boards with obsolete parts to be upgraded or defective parts replaced without significant re-work. This availability of backwards compatible parts should allow the life of the switchboard to be extended beyond standard run to failure life before a complete replacement is required.

SKM also considered that all of the safety issues (access to live parts, non compliance with standards for labelling of live electrical equipment, fuse ratings) can be addressed without resorting to a full replacement of the switchboard.

Elliot Pump Station No. 1 switchboard can be refurbished by the addition of the following items:

- (a) replacement of existing 450A fuse cartridges with suitably sized motor starting class fuse cartridges to match the motor starting duty;
- (b) insulated panel escutcheon(s) (safety barrier) with suitable cutouts for moulded case circuit breaker (MCCB) and miniature circuit breaker (MCB) toggles to be operated when fitted;
- (c) additional safety barriers and shrouds as required for segregation of live parts to IP2x level of ingress protection, in accordance with AS/NZS 3000; and
- (d) safety warning labels and circuit identification labels.

In addition, SKM recommended that testing of the switchboard to AS/NZS 3497.3 Section 8 - Tables 7 and 7b should be conducted following modifications, and arc flash hazard assessment should be conducted.

It is expected that such refurbishment will be less costly to the end of life than full switchboard replacement. SKM noted that PB makes almost identical recommendations.

Based on the above, in particular that the workplace, health and safety risk can be addressed relatively cheaply and that the condition of the switchboard is generally good, SKM found that the proposed timing for replacement of the switchboard of 2011-12 (that is, one year prior to the standard run to failure asset life projected replacement of 2012-13 based on an assumed initial in use date of 1978 and a standard run to failure asset life of 35 years) not to be prudent.

However, it is highly likely that the asset will require to be replaced within the next decade (assuming the above mentioned modifications are implemented to overcome the WHS risk issue). SKM recommended that the replacement be included at 2021-22.

#### (b) Efficiency Evaluation

For assets that are planned to be replaced within five years of the planning date, SunWater uses a bottom up approach to determine the asset replacement renewals value, or draws on recent experience of pricing/outturn costs of replacing similar renewals items. SKM noted that on a BOM based replacement cost assessment as used by SunWater for assets being replaced more than five years hence of the planning date, the standard replacement cost for this renewals item captured in SunWater's SAP-WMS is \$362,712.

The BOM based valuation method is described in the main part of this report. In short, SunWater uses BOM renewals asset item component quantities, 1997 (as installed) unit rates, an renewals item specific 'Indirect' multiplier to capture locational cost factors project management etc and a standard multiplier to escalate the 1997 unit rates to 2007-08 unit rates of 2.13 as developed by Cardno in order to develop a BOM based asset replacement value.

SKM benchmarked the renewals item replacement costs proposed by SunWater as submitted to the Authority against its own database costs for modern equivalent electrical assets.

**Table 4.5: Elliot Pump Station Switchboard No 1 Comparison of SunWater and SKM Cost Estimates**

<i>SunWater Estimate \$2009-10</i>	<i>SKM Estimate \$2009-10</i>	<i>Variance</i>
262,000	333,370	-21.4%

Source: SKM (2011).

SKM's estimate was \$333,370, or 27% higher than the amount of \$262,000 noted in the SAP-WMS, but 18% lower than the amount advised in the NSP.

SKM therefore considered that the renewals value as submitted to the Authority is efficient.

#### (c) Summary and Conclusions

SKM was not satisfied that the timing of replacement of this renewals item is prudent as submitted to the Authority as the main workplace, health and safety risk based driver for replacement can be addressed by a lower cost alternative than complete replacement.

However, the renewals asset will need to be replaced within the next 10 years and hence the replacement renewals asset item value should be captured in the renewals value used to determine this current price reset. On the basis of benchmarking of the replacement costs, SKM was satisfied that the renewals item replacement value submitted by SunWater is efficient.

#### Authority's Analysis

The Authority accepts SKM's conclusion that SunWater's proposed replacement of Elliott Pump Station switchboard is prudent and efficient, but with deferral to 2021-22.

#### Conclusion

##### Draft Report

In the Draft Report, three items for the Burdekin-Haughton Distribution System were sampled. Of these:

- (a) one item was prudent and efficient;
- (b) one item was prudent and efficient and has been retained as forecast expenditure, albeit deferred by 10 years; and
- (c) one item was prudent but not efficient, requiring adjustment to forecast expenditure.

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

##### Final Report

After reviewing submissions received in response to the Draft Report, the Authority proposes no change to Draft Report recommendations regarding the reviewed items.

As outlined in Volume 1, the Authority undertook further sampling of forecast renewals expenditures across SunWater's schemes. For the Final Report, the Authority recommended

that a 20% saving be applied to the direct costs of 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 (\$'000)**

<i>Item</i>	<i>Year</i>	<i>SunWater (\$,000)</i>	<i>Authority's Draft Report Findings</i>	<i>Draft Recommended (\$,000)</i>	<i>Authority's Final Report Findings</i>	<i>Final Recommended (\$,000)</i>
<b>Sampled Items</b>						
1. Barratta Channel – replace weed screen	2011-12	191	Prudent but not efficient	43	Prudent but not efficient	43
2. Millaroo B pump station discharge valves	2011-12	222	Prudent and efficient	222	Prudent and efficient	222
3. Elliott Pump Station, switchboard replacement	2011-12	406	Prudent and efficient, but defer to 2022	406	Prudent and efficient, but defer to 2022	406
<b>Nom-Sampled Items</b>				<b>10% saving applied</b>	<b>20% saving applied</b>	

*Note: SunWater (2011), Halcrow (2011), SKM (2011), Arup (2011).*

#### 4.6 SunWater's Consultation with Customers

##### *Draft Report*

##### Submissions

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.

No other stakeholders have commented on this item.

#### Authority's Analysis

In the Draft Report, 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 recommended that there be a legislative requirement for SunWater to consult with its customers about any changes to its service standards and proposed renewals expenditure program. SunWater should also be required to submit the service standards and renewals expenditure program to irrigators for comment whenever they are amended and that irrigators' comments be documented and published on SunWater's website and provided to the Authority. The Authority's recommendations were detailed in Volume 1.

#### *Submissions Received from Stakeholders on the Draft Report*

During round three consultation, stakeholders submitted that the price of water should be linked to service standards.

#### *Authority's Response to Submissions Received on the Draft Report*

The Authority has made recommendations that require Sunwater to consult with customers about any changes to its service standards and proposed renewals expenditure program.

The Authority proposes no change to its Draft Report conclusion.

### **4.7 Allocation of Headworks Renewals Costs According to WAE Priority**

#### *Previous Review*

For 2006-11 price path, the renewals costs for the Burdekin-Haughton Distribution System were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAE was determined by a pricing conversion factor (1.7:1), that is, one ML of high priority WAE was considered equivalent to 1.7 ML of medium priority WAE.

#### *Draft Report*

##### Stakeholder Submissions

SunWater (2011i) submitted that the allocation of the renewals is a matter for tariff setting by the Authority, but that the headworks utilisation factor (HUF) methodology should not be used because the HUF is not relevant to the allocation of fixed renewals costs in distribution systems which do not provide storage.

In determining a basis for allocating fixed distribution system costs to customers in general (rather than specifically between customer priority groups), SunWater submitted that current WAEs should be adopted. SunWater stated that current WAEs represent the best available means of determining customers' current share of distribution system capacity.

No other stakeholders commented on this matter prior to the Draft Report.

### Authority's Analysis

As noted in Volume 1, the Authority considered that distribution system costs should be allocated according to the relevant cost drivers. The Authority did not consider the HUF methodology to be an appropriate cost driver for distribution system costs.

In principle, the Authority considered that distribution system capacity is the relevant cost driver for fixed renewals expenditure. In general, the best measure of capacity share is the instantaneous or peak flow rate. However, neither DERM's regulatory framework nor SunWater's contracts currently specify a peak flow rate or share of system capacity.

As discussed in Volume 1, the Authority recommended that nominal WAEs be used for the allocation of fixed distribution system costs between priority groups. That is, on the basis of current WAE held, irrespective of priority type, with no conversion. Under this approach, high and medium priority WAE are allocated the same costs per ML. This reflects the view that medium and high priority users have the same share of distribution system capacity per ML of nominal WAE, as recognised by some customers (including the Central Highland Cotton Growers and Irrigators Association) and as submitted by SunWater.

The Authority also recommended that, at the conclusion of this review, SunWater commence a review of a more appropriate means for allocating fixed renewals costs in distribution systems.

As no submissions were received on this issue following the Draft Report, the Authority proposes no change to its Draft Report conclusion.

## 4.8 Calculating the Renewals Annuity

### *Draft Report*

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

For the Burdekin-Haughton Distribution System the draft recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.7. 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 2006-12 and SunWater's proposed total annuity for 2012-16. SunWater did not submit a disaggregation between high and medium priority customers.

### *Final Report*

For the Final Report, changes to the Authority's recommended forecast renewals annuity arise due to revised assessment of specific renewals items for which new information was provided. The changes included:

- (a) a change in the 1 July 2006 opening ARR balance from the use of actual renewals data. The 2006 opening balance is lower than in the Draft Report;
- (b) the application of a 4% saving to non-sampled items and sampled items for which there was insufficient information, rather than 10% in the Draft Report;
- (c) removal of the previously included flood damage repair costs for 2010-11; and
- (d) application of a 20% saving to non-sampled items and sampled forecast renewals items for which there was insufficient information (instead of 10% in the Draft Report).



The revised renewals annuities recommended by the Authority are provided in Table 4.7 for comparison with the Draft Report estimates.

The Authority's recommended renewals annuity is lower than SunWater's proposed renewals annuity for the same reasons.

**Table 4.7: Burdekin-Haughton Distribution System 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	1,923	1,553	1,561	1,763	1,719	2,637	2,638	2,764	2,788	2,831	2,831
<b>Draft Report</b>											
Total Authority	-	-	-	-	-	-	2,381	2,568	2,602	2,665	2,718
High Priority	-	-	-	-	-	-	43	47	47	48	49
Medium Priority	-	-	-	-	-	-	2,338	2,522	2,555	2,617	2,668
<b>Final Report</b>											
Total Authority	-	-	-	-	-	-	2,369	2,536	2,563	2,616	2,659
High Priority	-	-	-	-	-	-	76	81	82	84	85
Medium Priority	-	-	-	-	-	-	2,295	2,456	2,482	2,533	2,575

*Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5.  
Source: SunWater (2011) and QCA (2011, 2012).*

## 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 prudence and efficiency of SunWater's proposed operating expenditures including direct and non-direct costs and escalation factors; and
- (d) the most appropriate methodologies for assigning operating costs to service contracts<sup>1</sup> 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 system to include service provision, compliance, insurance, and other supporting activities (these were not classified by direct and indirect costs). SunWater noted that:

- (a) a Service Manager and 34 staff are located at the Clare depot and are responsible for the day-to-day water supply management and for delivery of the programmed works for all users in the region;

---

<sup>1</sup> 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 – receiving and collating water orders, scheduling the diversion of bulk water into the distribution system, monitoring channel flows and operating regulating structures and quarterly meter reading;
  - (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 distribution service include those relating to
  - (i) the ROP – water accounting and managing and reporting to DERM on the distribution loss WAE;
  - (ii) 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, contamination and the discharge of water from channels and drains into the environment;
  - (iii) 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; and
- (e) 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.

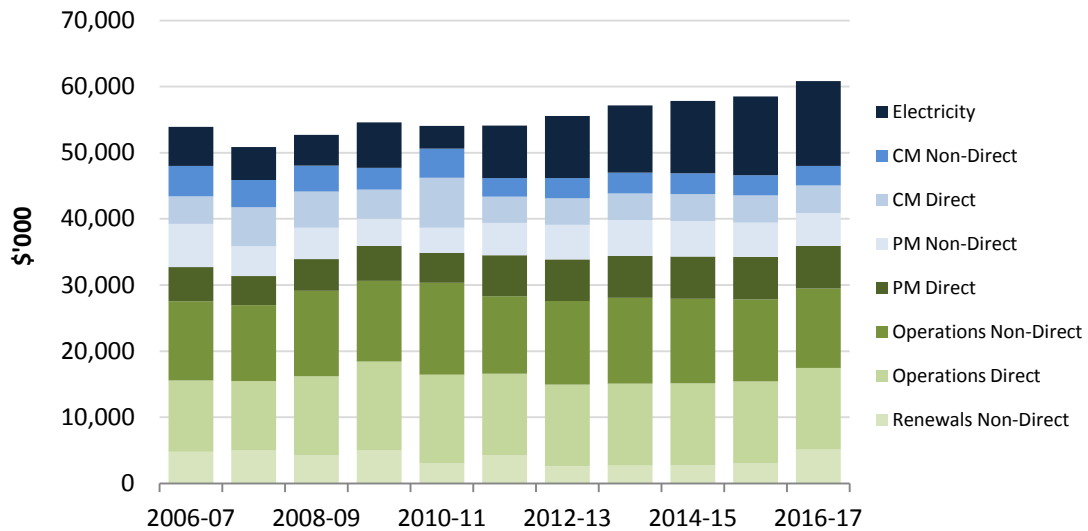
#### *Draft Report*

Stakeholder Submissions

#### SunWater

SunWater's past and forecast total operating costs for its irrigation service contracts (all sectors) are summarised in Figure 5.1. SunWater's allocation of non-direct costs to activities (including renewals) is also identified. These estimates reflect SunWater's most recent information (including that received by the Authority in October 2011) and differ from SunWater's NSP as noted in Volume 1.

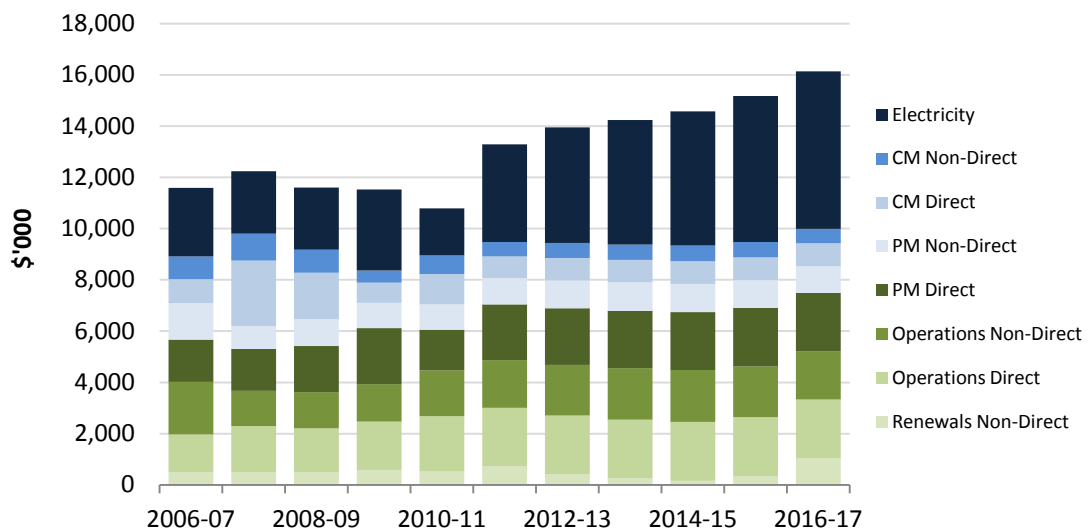
**Figure 5.1: SunWater’s Total Operating Costs (Real \$’000) – All Service Contracts**



*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 the Burdekin-Haughton Distribution System (all sectors) is shown in Figure 5.2, Table 5.1 and Table 5.2.

**Figure 5.2: Total Operating Costs –Burdekin-Haughton Distribution System (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 5.1: 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	3,532	3,175	3,126	3,347	3,947	4,133	4,271	4,305	4,316	4,272	4,181
Electricity	2,680	2,433	2,421	3,167	1,827	3,805	4,511	4,862	5,240	5,704	6,148
Preventive Maintenance	3,060	2,525	2,850	3,172	2,579	3,200	3,295	3,336	3,366	3,366	3,318
Corrective Maintenance	1,825	3,615	2,710	1,257	1,909	1,415	1,463	1,480	1,490	1,485	1,458
Renewals Non-Direct	493	493	494	588	521	730	412	255	165	349	1,032
<b>Total</b>	<b>11,590</b>	<b>12,241</b>	<b>11,601</b>	<b>11,531</b>	<b>10,783</b>	<b>13,283</b>	<b>13,952</b>	<b>14,239</b>	<b>14,577</b>	<b>15,175</b>	<b>16,137</b>

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

**Table 5.2: 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	2,106	1,698	1,787	1,669	1,852	2,284	2,317	2,317	2,317	2,317	2,317
Electricity	2,680	2,433	2,421	3,167	1,827	3,805	4,511	4,862	5,240	5,704	6,148
Contractors	547	861	818	894	884	1,029	1,044	1,059	1,075	1,091	1,091
Materials	977	2,397	1,822	1,358	1,227	1,050	1,066	1,081	1,097	1,113	1,113
Other	426	1,056	886	930	965	948	948	948	948	948	948
Non-Direct	4,853	3,796	3,867	3,514	4,027	4,167	4,067	3,971	3,900	4,003	4,521
<b>Total</b>	<b>11,590</b>	<b>12,241</b>	<b>11,601</b>	<b>11,531</b>	<b>10,783</b>	<b>13,283</b>	<b>13,952</b>	<b>14,239</b>	<b>14,577</b>	<b>15,175</b>	<b>16,137</b>

*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 \$10.7 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the indirect and overhead costs allocated to renewals expenditure.] The projected efficient average operating costs in the NSP for 2012-16 are \$11.6 million per annum.

#### Other Stakeholders

No other stakeholders have submitted on this matter.

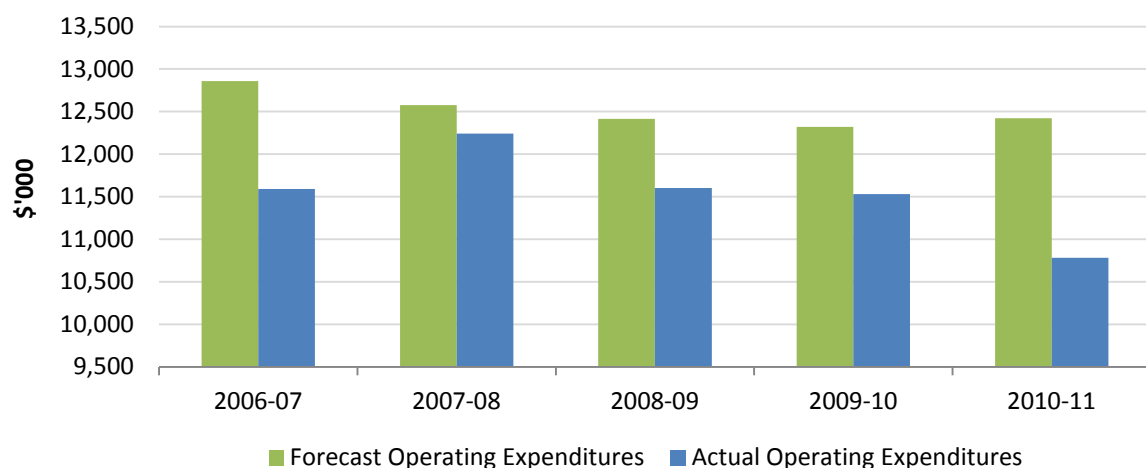
### Authority's Analysis

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

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

In 2011, the Authority engaged Indec to assess whether SunWater achieved the cost savings forecast in 2005-06. A comparison of forecast and actual operating costs for the Burdekin-Haughton Distribution System is shown in Figure 5.3. For this scheme, SunWater's actual operating costs were \$4.84 million above Indec's forecast efficient operating costs. Indec noted that anomalies could arise for the service contracts from linked bulk and distribution systems and the solution was to combine them into bundled schemes. See Volume 1.

**Figure 5.3: Forecast and Actual SunWater Operating Expenditure 2006-11**



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 2011. It observed that further analysis would be required to justify and support such an inference (see Volume 1). The Authority engaged other consultants to address potential scheme specific cost savings.

Following the Draft Report, further information was received from SunWater about how savings from SLFI are taken into account in its operating cost estimates. This information is set out in Volume 1.

## 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, such as communication systems (SCADA), 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.

#### *Draft Report*

Stakeholder Submissions

#### SunWater

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

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

SunWater proposed that total direct labour costs (DLCs) be used to allocate non-direct costs between service contracts.

Total non-direct costs and those allocated to the Burdekin-Haughton Distribution System are in Table 5.3 below including non-direct costs attributed to renewals.

**Table 5.3: SunWater's Actual and Proposed Non-Direct Costs (Real \$'000)**

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater	27,831	25,097	25,872	24,579	25,152	23,770	23,512	24,244	24,055	23,708	25,089
Burdekin-Haughton Distribution System	4,853	3,796	3,867	3,514	4,027	4,167	4,067	3,971	3,900	4,003	4,521

Source: SunWater (2001ap).

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 (2011a) submitted that 31% of operating costs are overhead [non-direct] costs. CANEGROWERS also submitted that insurance of the distribution system is forecast to be \$344,000.

### Authority's Analysis

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

In seeking to establish prudence and efficiency, the Authority commissioned Deloitte Touche Tohmatsu (Deloitte) to review SunWater's non-direct costs. Deloitte carried out benchmarking to assess where potential efficiencies within SunWater may be achieved. Deloitte identified savings of \$495,314 (in 2010-11 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 the PVWB and other Australian rural water service providers. Deloitte noted that PVWB's non-direct costs were higher than those of SunWater as a percentage of total operating costs – but that there are differences between PVWB and SunWater which made the comparison unreliable.<sup>2</sup>

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 recommended 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).

<sup>2</sup> For example, PVWB has only four FTE staff. For the benchmarking exercise, PVWB needed to estimate the proportions of staff time spend on administration versus operations and maintenance activities, which varies considerably depending on weather conditions and workloads. Deloitte found it difficult to compare PVWB's estimated apportionments with SunWater, who have around 500 staff assigned to specific projects or centralised functions.



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

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

Deloitte reviewed SunWater's proposal and identified alternative cost allocation bases (CABs). On the basis of this analysis, the Authority concluded 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 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 ensured that schemes are paying for the overhead costs from those resource centres that are most directly related to their schemes and not, for example, for Infrastructure Management overhead costs from the other three regions.

The Authority's Draft Report recommended level of non-direct costs to be recovered from the Burdekin-Haughton Distribution System (from all customers) is set out in . The allocation of these costs between high and medium priority customers is discussed below.

In response to CANEGROWERS, in Volume 1, the Authority recommended that SunWater's revised insurance estimate be accepted as SunWater have undergone a competitive and rigorous process in selecting its insurers. SunWater's revised insurance premium for the Burdekin-Haughton Distribution System is \$389,000, 13% greater than SunWater's initial forecast of \$344,000 in its NSP.

#### *Submissions Received from Stakeholders on the Draft Report*

Burdekin River Irrigation Area Committee (BRIAC 2012) submitted that there are large differences in the indirect and overhead data presented in the documents. The Burdekin-Haughton WSS has an indirect and overhead cost of over 54%. This is well above any of the data presented in the Deloitte report.

By using all the data from the Deloitte and the Authority reports BRIAC stated that:

- (a) SunWater's total indirect and overheads percentage of total costs is 34%.
- (b) irrigation service contracts indirect and overheads percentage of total costs are 49%.
- (c) other service contracts excluding irrigation service contracts indirect and overheads percentage of total costs are 24%.

The data presented in the Deloitte's benchmarking of administration costs to compare SunWater's costs with PV water is vastly different to the data in Volume 1 of the Authority's draft prices Table 7.3.

BRIAC recommended the Authority accept Deloitte's report and comment when benchmarking SunWater as a whole for indirect and overheads of 34%.

#### *Authority's Response to Submissions Received on the Draft Report*

##### Proportion of Non-direct to Total Costs

The Authority also notes that in many schemes (including Burdekin-Haughton Distribution System), irrigators considered that the non-direct costs allocated to their schemes appeared to be high, and in some cases much higher than the SunWater-wide average ratio of non-direct to total costs. The reason for the wide variation of non-direct to total cost ratios across service contracts is because non-direct costs are allocated on the basis of DLC. It follows that if a service contract has a relatively high proportion of labour costs it will attract a relatively high proportion of non-direct costs.

In addition, the greater the indirect resources absorbed by a particular scheme, the higher will be the ratio of non-direct costs to direct labour costs. Together, these factors result in a relatively high non-direct to total cost ratio for irrigation service contracts.

##### Allocation of Non-directs to Service Contracts

In regard to the allocation of non-direct costs to irrigation service contracts, the Draft Report recommended a change to SunWater's approach to allocating non-direct costs for Infrastructure Management (IM) and Infrastructure Development (ID). The Authority recommended (regionally) targeted DLC. SunWater recommended state-wide DLC, consistent with SunWater's general approach to the allocation of other non-direct costs.

However, as set out in Volume 1, in the light of new information submitted by SunWater, the Authority now considers that the benefit of using targeted DLC is unlikely to outweigh the additional complexity and cost of implementing and maintaining this alternative approach. It is proposed to adopt the approach initially proposed by SunWater.

Accordingly, the Authority has amended its recommendation (removing the recommendation to adopt targeted DLC for these cost centres).

For the Final Report, the cost of options analyses and consultation with customers on renewals items (\$445,000 for SunWater as a whole) has also been allocated to schemes on the basis of direct labour.

The Authority's draft and final recommended level of non-direct costs to be recovered from the Burdekin-Haughton Distribution System (from all customers) is set out below. The allocation of these costs between high and medium priority customers is discussed below.

**Table 5.4: Recommended Non-Direct Costs Including Indirect Renewals (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	4,853	3,796	3,867	3,514	4,027	4,167	4,067	3,971	3,900	4,003	4,521
Authority Draft Report	-	-	-	-	-	-	3,944	3,804	3,684	3,724	4,153
Authority Final Report							3,991	3,861	3,747	3,765	4,105

Source: SunWater (2011ap).

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

## 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.

### *Draft Report*

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 5.5. 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 5.5: 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	1,479	1,807	1,711	1,889	2,156	2,275	2,295	2,296	2,297	2,298	2,298
Electricity	2,680	2,433	2,421	3,167	1,827	3,805	4,511	4,862	5,240	5,704	6,148
Preventive Maintenance	1,641	1,642	1,796	2,178	1,588	2,178	2,210	2,233	2,256	2,279	2,279
Corrective Maintenance	937	2,563	1,806	783	1,185	858	870	877	885	892	892
<b>Total</b>	<b>6,737</b>	<b>8,445</b>	<b>7,734</b>	<b>8,017</b>	<b>6,756</b>	<b>9,116</b>	<b>9,886</b>	<b>10,267</b>	<b>10,677</b>	<b>11,173</b>	<b>11,617</b>

*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 5.6 presents the same operating costs developed by SunWater on a functional basis.

**Table 5.6: 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	2,106	1,698	1,787	1,669	1,852	2,284	2,317	2,317	2,317	2,317	2,317
Electricity	2,680	2,433	2,421	3,167	1,827	3,805	4,511	4,862	5,240	5,704	6,148
Contractors	547	861	818	894	884	1,029	1,044	1,059	1,075	1,091	1,091
Materials	977	2,397	1,822	1,358	1,227	1,050	1,066	1,081	1,097	1,113	1,113
Other	426	1,056	886	930	965	948	948	948	948	948	948
<b>Total</b>	<b>6,737</b>	<b>8,445</b>	<b>7,734</b>	<b>8,017</b>	<b>6,756</b>	<b>9,116</b>	<b>9,886</b>	<b>10,267</b>	<b>10,677</b>	<b>11,173</b>	<b>11,617</b>

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

### Other Stakeholders

BRIAIC (2011a) submitted that the overall average costs of operations, preventive and corrective maintenance is forecast to increase from 2.85 million during the 2006-11 price path to \$2.99 million over the next price path. BRIAIC is concerned that SunWater has underestimated corrective maintenance expenditure and does not intend to repair assets.

### Authority's Analysis

### Consultant's Review

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

Arup reported that SunWater's systems were not specifically designed for the provision of information to assess prudence and efficiency.

Arup noted that the information provided by SunWater did not sufficiently enable costs to be aligned with specific service obligations. Further, there have been numerous operational and procedural changes to SunWater make the extraction and reconciliation of such information difficult.

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

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

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

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

### Conclusion

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

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

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

*Review of Direct Operating Expenditure*

*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, 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 5.5.

Other Stakeholders

CANEGROWERS (2011a) submitted that operations costs are forecast to increase by 8% in real terms over five years. This equates to approximately 30% in nominal terms.

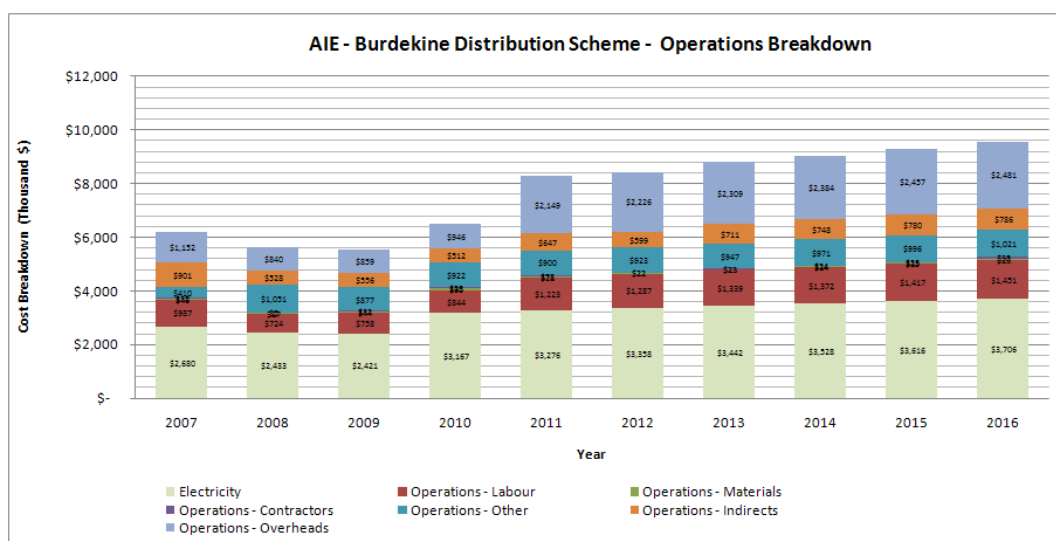
Authority’s Analysis

Consultant’s Review

Arup’s review of historic operations data indicates that scheduling and delivery of water is by far the largest component, with labour and overheads being the largest components within this. Arup noted that labour costs are forecast to generally increase but Arup received no justification. Some reappportioning between the bulk and distribution system may be forecast but this would not explain the overall rise in operational labour costs for the distribution system.

Figure 5.4 shows SunWater’s operations costs in the Burdekin-Haughton Distribution System.

**Figure 5.4: Operations Cost Breakdown**



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

Implementation of the SLIFI review has reduced local administrative staff, optimised vehicle strategy, disposed of depot and land and adoption of IT Thin client technology.

Arup did not recommend an adjustment to SunWater's operations costs for this scheme.

### Conclusion

In the Draft Report, the Authority noted that Arup did not recommend any adjustment to operations costs for this scheme.

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

Further, SunWater's forecast average annual operations costs are approximately 27% higher than the 2006-11 average. The Authority noted that this increase is largely due to a change in the allocation of non-direct costs, previously discussed.

On the basis of the consultants' review and SunWater's internal cost reductions over time, the Authority did not specifically adjust SunWater's operations cost forecast.

### Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

### *Item 2: Preventive Maintenance*

#### Stakeholder Submissions

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

Preventive maintenance includes:

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

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

SunWater's proposed preventive maintenance costs are set out in Table 5.5.

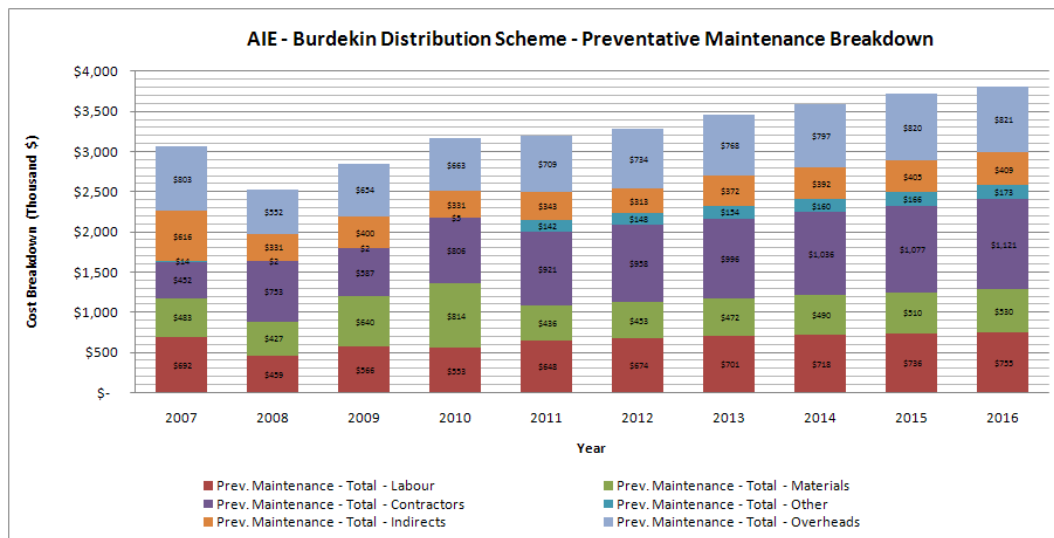
No other stakeholders have commented on this item.

#### Authority's Analysis

Arup's review of maintenance costs indicates that service delivery strategies have achieved labour utilisation efficiencies. As a result there is a change in the distribution of costs and duties between preventive maintenance and corrective maintenance.

Figure 5.5 shows the preventive maintenance breakdown in the Burdekin-Haughton Distribution System.

**Figure 5.5: Breakdown of Preventive Maintenance**



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

Arup’s analysis indicates that materials and chemicals are a large cost component.

Additionally, Arup’s discussions with irrigators and SunWater’s operational personnel indicated that weed control is a significant issue. Arup reviewed SunWater’s internal paper which indicates that weed control is the largest preventive maintenance activity. Arup questioned the rationale for both labour and contractor forecast expenditure increasing.

Arup concluded that SunWater’s five-year operational cost forecast include a cost saving of \$58,187. Savings include the new policy to slash grass and vegetation only 1-2 meters alongside the channels and not the entire nature strip, and the reduction in maintenance costs due to the disposal of houses in Clare and Ayr.

**Conclusion**

In the Draft Report, 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 Parsons Brinkerhoff’s earlier recommendations that:

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



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

SunWater's forecast annual preventive maintenance costs are approximately 27% higher than over 2006-11. The Authority noted SunWater's contention that the increase in preventive maintenance forecast costs are offset by a decrease in corrective maintenance costs. Further, the Authority noted that corrective maintenance costs are forecast to decrease by 39%, with overall maintenance costs forecast to decrease by 3%.

Given that Arup did not recommend any preventive maintenance cost adjustment, the re-balancing of preventive and corrective maintenance costs and SunWater's overall forecast decline in maintenance costs, the Authority did not recommend a specific adjustment to SunWater's proposed preventive maintenance costs.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

### *Item 3: Corrective Maintenance*

Draft Report

#### Stakeholder Submissions

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

SunWater identifies two types of corrective maintenance activities:

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

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

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

SunWater's proposed corrective maintenance costs are set out in Table 5.5.

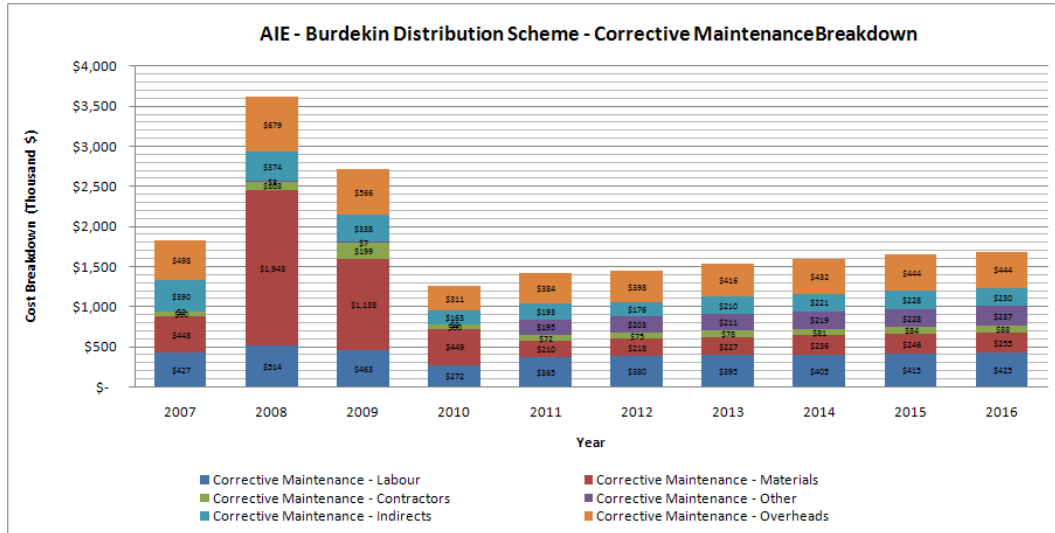
No other stakeholders have commented on this item.

Authority's Analysis

Arup's review of maintenance costs indicates that service delivery strategies have achieved labour utilisation efficiencies. As a result there is a change in the distribution of costs and duties between preventive maintenance and corrective maintenance.

Additionally, there has been a reduction in maintenance costs due to the disposal of houses in Clare and Ayr. Figure 5.6 shows the corrective maintenance costs in the Burdekin-Haughton Distribution System.

**Figure 5.6: Corrective Maintenance Breakdown**



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

**Conclusion**

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

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

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

As discussed in relation to preventive maintenance, the Authority noted that total maintenance costs are forecast to decrease by 3%, with a 39% decrease in forecast corrective maintenance costs.

The Authority did not recommend any specific adjustment to SunWater’s proposed corrective maintenance costs.

**Final Report**

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

#### *Item 4: Electricity*

Draft Report

##### Stakeholder Submissions

The pump stations along the Burdekin River used to supply the distribution system are a major contributor to the cost of 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 Benchmark Retail Cost Index (BRCI) between 2008 and 2012, together with further adjustments in 2013 and 2016 to reflect expected increases from the introduction of the carbon tax and carbon trading scheme.

SunWater's (revised) forecast electricity cost is based on an estimated cost per ML of \$18.45 (in 2012-13). SunWater's proposed electricity costs are set out in Table 5.5.

CANEGROWERS (2011a) was concerned that electricity is forecast to be \$15/ML (in SunWater's NSP).

##### Authority's Analysis

Arup found that electricity costs are a large component of SunWater operational costs. The issue of utilising contestable tariffs was raised by irrigators to reduce electricity costs. SunWater indicated that due to the remote nature of the scheme that the adoption of contestable tariffs was not practicable.

##### Conclusion

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

The Authority noted that Arup did not recommend any adjustments to SunWater's electricity costs.

As noted in the Draft Report, the Authority proposed 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.

The Authority did not accept an escalation rate that makes an explicit allowance for carbon price impacts prior to them becoming enacted legislation.

The Authority made a specific adjustment to the proposed electricity costs as noted in Table 5.7.

##### Submissions Received from Stakeholders on the Draft Report

BRIAC (2012) submitted that electricity costs must be based on actual costs paid in arrears and not forecasts. During round 3 consultation, stakeholders also questioned whether the Authority has reviewed SunWater's electricity bills.

### Authority's Response to Submissions Received on the Draft Report

The Authority considers that it is accepted regulatory practice for a five year price path to be based on forecast costs, including for electricity. Following the Draft Report, the Authority engaged NERA to review the appropriateness of SunWater's electricity cost forecasting model. NERA found that, in general, SunWater's electricity model was appropriate, with a minor issue in relation to indexation (see Volume 1).

The Authority accepts that SunWater's electricity model is appropriate and has accepted NERA's minor adjustments to 2010-11 electricity cost estimates, to which the Authority's cost escalation factors are applied (see Volume 1).

Further information relevant to electricity cost escalation was available following the Draft Report. This included the release of the Authority's Draft Determination regarding the review of regulated (franchise) tariffs, the passing of relevant legislation relating to a carbon tax and the Australian Government's forecast of the impact of carbon trading.

As a result, and as set out in Volume 1, the Authority revised its recommended escalation of electricity costs.

The Authority recommends that electricity should be escalated by 6.6% in 2011-12, 12.5% in 2012-13 and 7% per annum for subsequent years, with the exception of 2015-16 where 8% will apply (reflecting a further 1% increase from the introduction of carbon trading). Proposed electricity costs are set out further below.

#### *Item 5: Cost Escalation*

##### Draft Report

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

##### Direct Labour

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

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

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

### Other Direct Costs

The Authority accepted 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.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

### *Conclusion*

A comparison of SunWater's and the Authority's direct operating costs for the Burdekin-Haughton Distribution System is set out in Table 5.7.

The Authority's proposed costs included all specific adjustments and the Authority's proposed cost escalations as noted above.

In the Draft Report the Authority 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.

Final Report

For the Final Report, the Authority's proposed costs include a change to the escalation of electricity costs to reflect new information.

Further, as noted in Volume 1, in the Draft Report the Authority inadvertently understated cost saving percentage estimates. These have been corrected and as a result, the Authority has now applied a minimum 4.5% saving to direct operating costs (excluding electricity) in 2012-13. A further 0.75% saving arising from labour productivity is also applied annually.

The Authority's final recommended direct costs are shown in Table 5.7 compared to the Draft Report recommendations.

**Table 5.7: Direct Operating Costs (Real \$'000)**

	<i>SunWater</i>					<i>Authority</i>				
	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<b>Draft Report</b>										
Operations	2,295	2,296	2,297	2,298	2,298	2,222	2,224	2,226	2,228	2,228
Electricity	4,511	4,862	5,240	5,704	6,148	3,867	4,011	4,159	4,358	4,567
Preventive Maintenance	2,210	2,233	2,256	2,279	2,279	2,140	2,155	2,170	2,184	2,176
Corrective Maintenance	870	877	885	892	892	843	848	854	860	858
<b>Total</b>	<b>9,886</b>	<b>10,267</b>	<b>10,677</b>	<b>11,173</b>	<b>11,617</b>	<b>9,072</b>	<b>9,238</b>	<b>9,409</b>	<b>9,630</b>	<b>9,830</b>
<b>Final Report</b>										
Operations						2,175	2,177	2,179	2,181	2,182
Electricity						4,358	4,550	4,750	5,004	5,224
Preventive Maintenance						2,095	2,110	2,124	2,139	2,132
Corrective Maintenance						825	830	836	842	841
<b>Total</b>						<b>9,453</b>	<b>9,667</b>	<b>9,889</b>	<b>10,166</b>	<b>10,378</b>

*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.

### *Draft Report*

#### Stakeholder Submissions

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 WAE.

No other stakeholders have commented on this matter.

### *Authority's Analysis*

In Volume 1, the Authority summarised the views of its consultants and recommended that, in relation to distribution systems fixed operating costs be allocated to medium and high priority customers using current WAEs.

The Authority recommends that for distribution systems insurance premiums are also allocated on the basis of nominal WAEs.

The effect for the Burdekin-Haughton Distribution System 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 5.8. The Authority's draft recommended operating costs are set out in Table 5.9, and final recommended operating costs are provided in Table 5.10.

Compared to the Draft Report, the Final Report estimated operating costs take account of:

- (a) an increase in non-direct costs to include the cost of options analyses and consultation with customers on renewals items (\$445,000 for SunWater as a whole) which has been allocated to schemes on the basis of direct labour;
- (b) lower direct operating costs reflecting higher efficiency gains; and
- (c) increased electricity costs.

Taken together, total operating costs are higher since the Draft Report.

**Table 5.8: SunWater's Proposed Operating Costs (Real \$'000)**

	2012-13	2013-14	2014-15	2015-16	2016-17
Operations					
Labour	1,274	1,274	1,274	1,274	1,274
Materials	54	54	55	56	56
Contractors	22	22	22	23	23
Other	945	945	945	945	945
Non-direct	1,977	2,010	2,020	1,974	1,883
Preventive Maintenance					
Labour	667	667	667	667	667
Materials	595	604	613	622	622
Contractors	948	962	976	990	990
Other	0	0	0	0	0
Non-direct	1,085	1,104	1,110	1,087	1,039
Corrective Maintenance					
Labour	376	376	376	376	376
Materials	417	423	429	436	436
Contractors	74	75	77	78	78
Other	3	3	3	3	3
Non-direct	592	603	606	593	566
Electricity	4,511	4,862	5,240	5,704	6,148
<b>Total</b>	<b>13,540</b>	<b>13,983</b>	<b>14,412</b>	<b>14,826</b>	<b>15,105</b>

*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 5.9: The Authority's Draft Recommended Operating Costs (Real \$'000)**

	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<b>Operations</b>					
Labour	1,234	1,243	1,251	1,259	1,268
Materials	52	52	53	53	52
Contractors	21	21	21	21	21
Other	915	908	901	894	887
Non-direct	1,925	1,928	1,907	1,834	1,721
<b>Preventive Maintenance</b>					
Labour	646	650	655	659	664
Materials	576	580	584	588	583
Contractors	918	925	931	937	930
Other	0	0	0	0	0
Non-direct	1,058	1,061	1,051	1,014	955
<b>Corrective Maintenance</b>					
Labour	364	366	369	371	374
Materials	404	407	409	412	409
Contractors	72	72	73	73	73
Other	3	3	3	3	3
Non-direct	577	578	573	552	518
Electricity	3,867	4,011	4,159	4,358	4,567
<b>Total</b>	<b>12,633</b>	<b>12,805</b>	<b>12,940</b>	<b>13,030</b>	<b>13,024</b>

Source: QCA (2011).

**Table 5.10: The Authority's Final Recommended Operating Costs (Real \$'000)**

	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Operations					
Labour	1,208	1,216	1,225	1,233	1,242
Materials	51	51	51	52	51
Contractors	20	21	21	21	21
Other	896	889	882	875	869
Non-direct	2,011	2,011	1,989	1,920	1,817
Preventive Maintenance					
Labour	632	637	641	646	650
Materials	564	568	572	576	571
Contractors	899	905	911	917	910
Other	0	0	0	0	0
Non-direct	1,058	1,061	1,051	1,015	957
Corrective Maintenance					
Labour	356	359	361	364	366
Materials	395	398	401	403	400
Contractors	70	71	71	72	71
Other	3	3	3	3	3
Non-direct	577	578	573	552	519
Electricity	4,358	4,550	4,750	5,004	5,224
<b>Total (Final)</b>	<b>13,098</b>	<b>13,317</b>	<b>13,502</b>	<b>13,652</b>	<b>13,672</b>

Source: QCA (2012).

## 6. RECOMMENDED 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 system, prices over 2006-11 were increased by CPI. In 2011-12, prices in this distribution system were increased by \$2/ML plus 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.

For the Draft Report, the Authority adopted a 20 year price model mainly to promote long term price stability. Under this approach, prices are above costs for the first ten years of the 20 year model and below costs for the last ten years. Over the 20 year period, costs are fully recovered.

Some stakeholders raised concerns about estimated cost reflective prices exceeding lower bound costs over the 2012-17 price period.

In the Final Report, the Authority has adopted a five year pricing model for the purpose of developing prices. The Authority has retained the rolling 20 year renewals annuity planning period and used the relevant five years of the smoothed renewals annuity. For non-renewals costs the five year model now incorporates only five years of such costs, rather than 20 years. Such an approach also has the advantage of removing from prices the inaccuracies associated with longer term forecasts in non-capital costs.

## 6.3 Total Costs

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

**Table 6.1: Total Costs for the Burdekin-Haughton Distribution System (Real \$'000)**

	<i>Actual Costs</i>						<i>Future Costs</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
SunWater's Submitted Costs	12,399	12,685	12,023	12,075	11,364	14,559	15,548	16,117	16,570	17,027	17,306
Renewals Annuity	1,923	1,553	1,561	1,763	1,719	2,637	2,638	2,764	2,788	2,831	2,831
Operating Costs	11,097	11,748	11,108	10,943	10,262	12,552	13,540	13,983	14,412	14,826	15,105
Revenue Offsets	-621	-616	-646	-631	-617	-630	-630	-630	-630	-630	-630
<b>Draft Report</b>											
Authority's Total Costs	-	-	-	-	-	-	14,394	14,754	14,923	15,076	15,122
Renewals	-	-	-	-	-	-	2,381	2,568	2,602	2,665	2,718
Operating Costs	-	-	-	-	-	-	12,633	12,805	12,940	13,030	13,024
Revenue Offsets	-	-	-	-	-	-	-630	-630	-630	-630	-630
Return on Working Capital	-	-	-	-	-	-	10	10	10	10	10
<b>Final Report</b>											
Authority's Total Costs	-	-	-	-	-	-	14,848	15,234	15,445	15,649	15,711
Renewals	-	-	-	-	-	-	2,369	2,536	2,563	2,616	2,659
Operating Costs	-	-	-	-	-	-	13,098	13,317	13,502	13,652	13,672
Revenue Offsets	-	-	-	-	-	-	-630	-630	-630	-630	-630
Return on Working Capital	-	-	-	-	-	-	10	10	10	11	11

*Note: Costs are presented for the total service contract (all sectors). Costs reflect SunWater's latest data provided to the Authority in October 2011 and may differ from the NSP. Source: Actual Costs (SunWater, 2011ap) and Total Costs (QCA, 2012).*

#### *Submissions Received from Stakeholders on the Draft Report*

Burdekin River Irrigation Area Committee (BRIAC 2012) submitted that a detailed review is required to establish whether all revenue offsets have flowed through to recommended prices, in particular:

- (a) minimum charges;
- (b) revenue from the seasonal trading of WAE brought about by channel lining;
- (c) sale of WAE from channel lining paid for by the scheme;
- (d) revenue gained from the selling water seasonally out of the channel and river to spot purchasers including irrigators, Main Roads and Land Developers;

- (e) revenue from drainage charges and flood harvesting charges;
- (f) any revenue from leasing land for grazing or other purposes; and
- (g) leasing income from buildings (Giddy Road offices).

BRIAC recommended that all revenues need to be allocated correctly and be increased by CPI each year and that detailed reviews of the model are required to ensure all revenues are offset against costs.

All revenue offsets recovered above budget during the current price path must be offset against over budgeted costs that are carried forward into the next.

#### *Authority's Response to Submissions Received on the Draft Report*

The Authority's analysis focused on comparison of SunWater's forecast revenue offsets with historical actual offsets.

The Authority found that in the case of Burdekin-Haughton Distribution System, SunWater's forecast of \$630,000 in revenue offsets is consistent with recent averages.

Table 6.2 provides a comparison of actual and SunWater's forecast revenue offsets.

**Table 6.2: Revenue Offsets (\$,000 Real)**

	<i>Actual 2009-10</i>	<i>Actual Average 2006-10</i>	<i>SunWater NSP 2010-11</i>
Land Lease	19	14	18
Drainage Levies	600	601	601
Drainage Diversion Charges	2	2	2
Other Fees and Charges	10	12	9
Termination Fees	0	0	0
<b>Total</b>	<b>631</b>	<b>629</b>	<b>630</b>

*Source: QCA (2012) and SunWater (2012j).*

In relation to issues raised by BRIAC:

- (a) SunWater has indicated that minimum charges will be discontinued in the next price path. Revenue from minimum charges was about \$1000 in 2009-10;
- (b) the Authority does not consider that revenue from sales of new allocations or trading of allocations as a result of channel lining should be treated as a revenue offset. Existing irrigators benefit to the extent that costs are shared across additional WAE. However, if channel re-lining is funded from the renewals reserve, any sales revenue should be offset against the renewals ARR. The Authority is not aware that new allocations are proposed to be sold as a result of channel re-lining in the Burdekin over the 2012-17 period;
- (c) SunWater has advised that no channel linings that have resulted in sale of WAE have been paid for by irrigators. Therefore, no offset is required.

- (d) the specific items identified by BRIAC such as spot sales to external customers from the channels are small revenues taken into account in the long term averages for other fees and charges;
- (e) revenues from drainage levies and drainage diversion fees are relatively stable in real terms and are included; and
- (f) lease fees are included.

The Authority proposes no change to Draft Report recommendations.

#### 6.4 Fixed and Variable Costs

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

SunWater submitted that all of its operating costs are fixed in the Burdekin-Haughton Distribution System and that only electricity pumping costs vary with water use.

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

- (a) costs that would be *expected* to vary with water use. Indec expected that electricity pumping costs would generally be variable and non-direct costs would be fixed;
- (b) all other activities and expenditure types (costs) would be expected to be semi-variable, including: labour, material, contractor and other direct costs, maintenance, operations and renewals expenditures;
- (c) costs that *actually* varied with water use in 2006-11, by activity and by type:
  - (i) by activity, Indec found that operations, preventive and corrective maintenance and renewals were semi-variable. Electricity was generally highly variable with water use in five distribution systems and two bulk schemes. In three distribution systems electricity pumping costs were semi-variable due to gravity feed;
  - (ii) by type, Indec found that labour, materials, contractors and other direct costs were semi-variable. Non-direct costs were fixed; and
- (d) 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 distribution systems, Indec considered 67% of costs would be fixed and 33% variable. However Indec proposed that scheme-specific tariff structures should be applied to reflect the relevant scheme costs.

For the Burdekin-Haughton Distribution System, Indec recommended 60% of costs should be fixed and 40% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 61% of costs in the fixed charge and 39% of costs in the volumetric charge.

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

### *Submissions Received from Stakeholders on the Draft Report*

BRIAC (2012) queried the calculation of cost reflective tariffs and has derived alternative figures, based on the data presented in the Draft Report.

### *Authority's Response to Submissions Received on the Draft Report*

The Authority has used a five year model to calculate prices, which smooths prices across the five year period. Subsequently, although costs and revenues are equated across the five year period, the cost reflective price will not equal the annually calculated cost per ML in any given year.

## **6.5 Allocation of Costs According to WAE Priority**

### *Fixed Costs*

The method of allocating fixed costs to priority groups is outlined in Chapter 4 – Renewals Annuity and Chapter 5 – Operating Costs. The outcome is summarised in Table 6.3.

**Table 6.3: Allocation of Fixed Costs According to WAE Priority (Real \$'000)**

	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<b>Draft Report</b>					
Net Fixed Costs	8,388	8,604	8,706	8,797	8,826
High Priority	269	275	279	282	283
Medium Priority	8,120	8,329	8,427	8,516	8,543
<b>Final Report</b>					
Net Fixed Costs	9,205	9,393	9,399	9,341	9,186
High Priority	295	301	301	299	294
Medium Priority	8,910	9,092	9,098	9,042	8,891

*Note: Net fixed costs are net of revenue offsets and return on working capital. Source: Actual Costs (SunWater, 2011ap) and Total Costs (QCA, 2011 and QCA, 2012).*

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

### *Variable Costs*

#### **Draft Report**

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.

#### **Final Report**

As previously noted, following the Draft Report, the Authority reviewed SunWater's electricity model, including SunWater's forecasts of water use.



To estimate the variable costs for final prices, therefore, the Authority has now adopted SunWater's water use estimate in the context of forecasting the per ML cost of electricity for this scheme. In addition, the Authority has divided the balance of variable costs for all sectors (excluding electricity) by the Authority's historical total water use for all sectors. This now provides a more accurate estimate of variable costs per ML for this scheme.

## 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. As noted in Chapter 3 – Pricing Framework, drainage and drainage diversion charges have been rolled forward in real terms.

**Table 6.4: Draft MP Cost-Reflective Prices for Burdekin-Haughton Distribution System (\$/ML)**

	<i>Actual Prices</i>						<i>Draft Cost-Reflective Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<i>Burdekin River (Unbundled)</i>											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	3.75	3.85	3.94	4.04	4.14
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.47	0.49	0.50	0.51	0.52
<i>Burdekin Distribution System (Unbundled)</i>											
Fixed (Part C)	23.04	23.72	24.84	25.60	26.40	29.36	31.94	32.73	33.55	34.39	35.25
Volumetric (Part D)	4.13	4.26	4.47	4.60	4.74	4.91	25.57	26.21	26.87	27.54	28.23
<i>Giru Groundwater Area (Unbundled)</i>											
Fixed (Part C)	9.88	10.20	10.68	11.00	11.36	11.76	14.45	14.81	15.18	15.56	15.95
Volumetric (Part D)	-3.29	-3.37	-3.54	-3.65	-3.76	-3.90	12.81	13.13	13.46	13.80	14.14
<i>Glady's Lagoon - Up to natural yield (Unbundled)</i>											
Fixed (Part C)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Volumetric (Part D)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
<i>Glady's Lagoon - Other than from natural yield (Unbundled)</i>											
Fixed (Part C)	21.80	22.48	23.52	24.24	25.04	25.92	31.94	32.73	33.55	34.39	35.25
Volumetric (Part D)	4.45	4.59	4.81	4.95	5.11	5.29	25.57	26.21	26.87	27.54	28.23
<i>Burdekin Distribution System (Bundled)</i>											
Fixed (Part A)	25.08	25.80	27.04	27.88	28.72	31.76	nr	nr	nr	nr	nr
Volumetric (Part B)	16.06	16.53	17.33	17.87	18.41	19.07	nr	nr	nr	nr	nr
<i>Giru Groundwater Area (Bundled)</i>											
Fixed (Part A)	11.92	12.28	12.88	13.28	13.68	14.16	nr	nr	nr	nr	nr
Volumetric (Part B)	8.64	8.90	9.32	9.62	9.91	10.26	nr	nr	nr	nr	nr
<i>Glady's Lagoon - Other than from natural yield (Bundled)</i>											
Fixed (Part A)	23.84	24.56	25.72	26.52	27.36	28.32	nr	nr	nr	nr	nr
Volumetric (Part B)	16.38	16.86	17.67	18.22	18.78	19.45	nr	nr	nr	nr	nr

Note: nr – not relevant. Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2011).

**Table 6.5: Final Cost-Reflective MP Prices for Burdekin-Haughton Distribution System (\$/ML)**

	<i>Actual Prices</i>						<i>Cost-Reflective Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<i>Burdekin River (Unbundled)</i>											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	3.59	3.68	3.77	3.86	3.96
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.49	0.50	0.51	0.52	0.54
<i>Burdekin Distribution System (Unbundled)</i>											
Fixed (Part C)	23.04	23.72	24.84	25.60	26.40	29.36	32.90	33.72	34.57	35.43	36.31
Volumetric (Part D)	4.13	4.26	4.47	4.60	4.74	4.91	24.91	25.53	26.17	26.82	27.49
<i>Giru Groundwater Area (Unbundled)</i>											
Fixed (Part C)	9.88	10.20	10.68	11.00	11.36	11.76	15.02	15.40	15.78	16.18	16.58
Volumetric (Part D)	-3.29	-3.37	-3.54	-3.65	-3.76	-3.90	12.46	12.78	13.09	13.42	13.76
<i>Glady's Lagoon - Up to natural yield (Unbundled)</i>											
Fixed (Part C)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Volumetric (Part D)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
<i>Glady's Lagoon - Other than from natural yield (Unbundled)</i>											
Fixed (Part C)	21.80	22.48	23.52	24.24	25.04	25.92	32.90	33.72	34.57	35.43	36.31
Volumetric (Part D)	4.45	4.59	4.81	4.95	5.11	5.29	24.91	25.53	26.17	26.82	27.49
<i>Burdekin Distribution System (Bundled)</i>											
Fixed (Part A)	25.08	25.80	27.04	27.88	28.72	31.76	36.49	37.40	38.33	39.29	40.27
Volumetric (Part B)	16.06	16.53	17.33	17.87	18.41	19.07	25.39	26.03	26.68	27.34	28.03
<i>Giru Groundwater Area (Bundled)</i>											
Fixed (Part A)	11.92	12.28	12.88	13.28	13.68	14.16	18.61	19.07	19.55	20.04	20.54
Volumetric (Part B)	8.64	8.90	9.32	9.62	9.91	10.26	12.95	13.27	13.61	13.95	14.29
<i>Glady's Lagoon - Other than from natural yield (Bundled)</i>											
Fixed (Part A)	23.84	24.56	25.72	26.52	27.36	28.32	36.49	37.40	38.33	39.29	40.27
Volumetric (Part B)	16.38	16.86	17.67	18.22	18.78	19.45	25.39	26.03	26.68	27.34	28.03

*Note: Bundled prices are for information only. Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2012).*

**Table 6.6: Termination Fees (\$/ML)**

<i>Actual Prices</i>							<i>Cost-Reflective Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<b>Draft Report</b>											
<b>Channel to:</b>											
River	n.d.	n.d.	222.39	219.63	249.12	302.84	439.13	450.11	461.36	472.89	484.71
Giru Benefitted Area	n.d.	n.d.	126.78	125.26	141.92	181.54	188.84	193.56	198.40	203.36	208.45
Glady's Lagoon	n.d.	n.d.	11.82	11.67	12.83	35.48	0.00	0.00	0.00	0.00	0.00
<b>Giru Benefitted Area to:</b>											
River	n.d.	n.d.	95.62	94.37	107.20	121.30	198.66	203.62	208.71	213.93	219.28
<b>Glady's Lagoon to:</b>											
River	n.d.	n.d.	210.58	207.96	236.28	267.35	439.13	450.11	461.36	472.89	484.71
Giru Benefitted Area	n.d.	n.d.	114.96	113.59	129.09	146.05	240.47	246.48	252.64	258.96	265.44
<b>Final Report</b>											
<b>Channel to:</b>											
River							361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area							196.66	201.58	206.62	211.78	217.08
Glady's Lagoon							0.00	0.00	0.00	0.00	0.00
<b>Giru Benefitted Area to:</b>											
River							165.23	169.37	173.60	177.94	182.39
<b>Glady's Lagoon to:</b>											
River							361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area							196.66	201.58	206.62	211.78	217.08

Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2011 and QCA, 2012).

**Table 6.7: Drainage Charges (\$/ha of land)**

	<i>Actual Prices</i>						<i>Calculated Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Burdekin Distribution (Draft)	18.70	19.30	20.20	20.80	21.40	22.15	22.70	23.27	23.85	24.45	25.06
Burdekin Distribution (Final)							22.70	23.27	23.85	24.45	25.06

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011 and QCA, 2012).

**Table 6.8: Drainage Diversion Charges (\$/installation)**

	<i>Actual Prices</i>						<i>Calculated Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Burdekin Distribution (Draft)	119.00	122.00	128.00	132.00	136.00	141.00	144.53	148.14	151.84	155.64	159.53
Burdekin Distribution (Final)							144.53	148.14	151.84	155.64	159.53

Source: Actual Prices (SunWater, 2011a) and Calculated Prices (QCA, 2011 and QCA, 2012).

**Table 6.9: Distribution System Water Harvesting Charges (\$/ML)**

	<i>Actual Prices</i>						<i>Cost Reflective Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Burdekin Distribution (Draft)	16.06	16.53	17.33	17.87	18.41	19.07	25.57	26.21	26.87	27.54	28.23
Burdekin Distribution (Final)							24.91	25.53	26.17	26.82	27.49

Source: Actual Prices (SunWater, 2011a) and Cost Reflective Prices (QCA, 2011 and QCA, 2012).

## 6.7 Queensland Government Pricing Policies

As noted above, the Queensland Government has directed that:

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

### *Submissions Received from Stakeholders on the Draft Report*

In round three consultation (November 2011), questions were raised as to whether river customers and subsidising channel customers.

### 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 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.

To ensure that distribution customers are not disadvantaged by unbundling, the comparison included both bulk and distribution system revenues. In response to submissions made in round three consultation, the Authority notes that river customers are not subsidising channel customers. Channel customers also pay the recommended river price.

On this basis, current prices are below the level required to recover prudent and efficient costs for each tariff group (Table 6.10).

**Table 6.10: Comparison of Current Revenues and Cost-Reflective Revenues (\$2012-13)**

Tariff Group	2010-11 Prices (indexed to 2012-13)		Irrigation WAE (ML)	Irrigation Water Use (ML)	Current Revenue	Revenue from Cost-Reflective Tariffs	Difference
	Fixed	Variable					
<b>Draft Report</b>							
Channel Bundled	\$30.17	\$19.34	280,801	154,234	\$11,456,071	\$14,039,829	-\$2,583,758
Giru Bundled	\$14.37	\$10.41	40,184	22,072	\$807,350	\$1,024,676	-\$217,326
Glady's Lagoon - Other than from natural yield - Bundled	\$28.75	\$19.73	1,392	765	\$55,099	\$69,599	-\$14,500
<b>Final Report</b>							
Channel Bundled	\$30.17	\$19.34	280,801	176,260	\$11,882,095	\$14,720,898	-\$2,838,804
Giru Bundled	\$14.37	\$10.41	40,184	25,224	\$840,167	\$1,074,383	-\$234,215
Glady's Lagoon - Other than from natural yield - Bundled	\$28.75	\$19.73	1,392	874	\$57,253	\$72,975	-\$15,722

Source: QCA (2011, 2012).

In Volume 1, the Authority recommended that, after tariff rebalancing, fixed charges should increase by \$2/ML per annum in real terms until cost recovery is achieved. This is consistent with the rate of increase in 2006-11 prices. Volumetric charges are to reflect variable costs from 2012-13.

The increase of \$2/ML per annum in real terms is applied to the (rebalanced) bundled fixed charge for the 2012-17 regulatory period. At this rate of increase, cost-reflective bundled charges are not achieved by the end of the 2012-17 regulatory period in the Channel and Glady's Lagoon tariff groups. Cost-reflective bundled charges are achieved in 2015-16 for

Giru, and maintained in real terms thereafter. The recommended (unbundled) charge is then calculated by deducting the recommended river charge from the bundled charge.

## 6.8 The Authority's Recommended Prices

The Authority's draft and final recommended prices to apply to the Burdekin-Haughton Distribution System for 2012-17 are outlined in Table 6.11 and 6.12, 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 6.11: Draft Prices for Burdekin-Haughton Distribution System (\$/ML)**

	Actual Prices						Draft Prices				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<i>Burdekin River (Unbundled)</i>											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	9.92	10.17	10.42	10.68	10.95
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.47	0.49	0.50	0.51	0.52
<i>Burdekin Distribution System (Unbundled)</i>											
Fixed (Part C)	23.04	23.72	24.84	25.60	26.40	29.36	14.65	17.07	19.59	22.24	25.00
Volumetric (Part D)	4.13	4.26	4.47	4.60	4.74	4.91	25.57	26.21	26.87	27.54	28.23
<i>Giru Groundwater Area (Unbundled)</i>											
Fixed (Part C)	9.88	10.20	10.68	11.00	11.36	11.76	2.87	5.00	7.22	8.92	9.14
Volumetric (Part D)	-3.29	-3.37	-3.54	-3.65	-3.76	-3.90	12.81	13.13	13.46	13.80	14.14
<i>Glady's Lagoon - Up to natural yield (Unbundled)</i>											
Fixed (Part C)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Volumetric (Part D)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
<i>Glady's Lagoon - Other than from natural yield (Unbundled)</i>											
Fixed (Part C)	21.80	22.48	23.52	24.24	25.04	25.92	13.44	15.82	18.32	20.93	23.66
Volumetric (Part D)	4.45	4.59	4.81	4.95	5.11	5.29	25.57	26.21	26.87	27.54	28.23
<i>Burdekin Distribution System (Bundled)</i>											
Fixed (Part A)	25.08	25.80	27.04	27.88	28.72	31.76	nr	nr	nr	nr	nr
Volumetric (Part B)	16.06	16.53	17.33	17.87	18.41	19.07	nr	nr	nr	nr	nr
<i>Giru Groundwater Area (Bundled)</i>											
Fixed (Part A)	11.92	12.28	12.88	13.28	13.68	14.16	nr	nr	nr	nr	nr
Volumetric (Part B)	8.64	8.90	9.32	9.62	9.91	10.26	nr	nr	nr	nr	nr
<i>Glady's Lagoon - Other than from natural yield (Bundled)</i>											
Fixed (Part A)	23.84	24.56	25.72	26.52	27.36	28.32	nr	nr	nr	nr	nr
Volumetric (Part B)	16.38	16.86	17.67	18.22	18.78	19.45	nr	nr	nr	nr	nr

Note: Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. nr – not relevant. Source: Actual Prices (SunWater, 2011am) and Recommended Prices (QCA, 2011).

**Table 6.12: Recommended Prices for Burdekin-Haughton Distribution System (\$/ML)**

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
<i>Burdekin River (Unbundled)</i>											
Fixed (Part A)	2.04	2.08	2.20	2.28	2.32	2.40	11.35	11.63	11.92	12.22	12.53
Volumetric (Part B)	11.93	12.27	12.86	13.27	13.67	14.16	0.49	0.50	0.51	0.52	0.54
<i>Burdekin Distribution System (Unbundled)</i>											
Fixed (Part C)	23.04	23.72	24.84	25.60	26.40	29.36	13.26	15.64	18.13	20.74	23.46
Volumetric (Part D)	4.13	4.26	4.47	4.60	4.74	4.91	24.91	25.53	26.17	26.82	27.49
<i>Giru Groundwater Area (Unbundled)</i>											
Fixed (Part C)	9.88	10.20	10.68	11.00	11.36	11.76	1.51	3.60	5.79	7.82	8.01
Volumetric (Part D)	-3.29	-3.37	-3.54	-3.65	-3.76	-3.90	12.46	12.78	13.09	13.42	13.76
<i>Glady's Lagoon - Up to natural yield (Unbundled)</i>											
Fixed (Part C)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Volumetric (Part D)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
<i>Glady's Lagoon - Other than from natural yield (Unbundled)</i>											
Fixed (Part C)	21.80	22.48	23.52	24.24	25.04	25.92	12.07	14.43	16.89	19.46	22.16
Volumetric (Part D)	4.45	4.59	4.81	4.95	5.11	5.29	24.91	25.53	26.17	26.82	27.49
<i>Burdekin Distribution System (Bundled)</i>											
Fixed (Part A)	25.08	25.80	27.04	27.88	28.72	31.76	24.61	27.27	30.05	32.96	35.99
Volumetric (Part B)	16.06	16.53	17.33	17.87	18.41	19.07	25.39	26.03	26.68	27.34	28.03
<i>Giru Groundwater Area (Bundled)</i>											
Fixed (Part A)	11.92	12.28	12.88	13.28	13.68	14.16	12.86	15.23	17.71	20.04	20.54
Volumetric (Part B)	8.64	8.90	9.32	9.62	9.91	10.26	12.95	13.27	13.61	13.95	14.29
<i>Glady's Lagoon - Other than from natural yield (Bundled)</i>											
Fixed (Part A)	23.84	24.56	25.72	26.52	27.36	28.32	23.42	26.06	28.81	31.68	34.68
Volumetric (Part B)	16.38	16.86	17.67	18.22	18.78	19.45	25.39	26.03	26.68	27.34	28.03

*Note: Bundled prices are for information only. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011am) and Recommended Prices (QCA, 2011).*

The Authority's recommended draft and final termination fees to apply to the Burdekin-Haughton Distribution System during 2012-17 are outlined in Table 6.13, together with actual termination fees since 2008-09.

The Authority's draft recommended termination fees were generally higher than those charged by SunWater, as the Authority's approach:

- (a) recovered 20 years of fixed costs with SunWater bearing the remaining fixed costs. SunWater's approach recovers 10 years of fixed costs with remaining fixed costs paid for by other users;
- (b) reflected the Authority's estimate of fixed costs in the cost-reflective fixed charge. The Authority's cost-reflective fixed charge recovers all fixed costs. SunWater's fixed

charges recover only a portion of fixed costs. Therefore, some fixed costs are excluded from SunWater's termination fees;

- (c) reflected the Authority's cost-reflective fixed charge and not the Authority's recommended fixed charge; and
- (d) resulted in a multiple of up to 13.8 times the Authority's cost-reflective fixed charge. SunWater's multiple is up to 9.4 of its fixed charge (Chapter 3).

In the Final Report, the Authority reviewed the approach to estimating termination fees (see Chapter 4, Volume 1). The net effect is that the Authority adopted a multiple of 11 including GST, rather than 13.8 as in the Draft Report. Termination fees are therefore lower than those estimated for the Draft Report.

Under the Authority's approach, the recommended termination fee for transfers from Channel to Gladly's Lagoon is now zero.

**Table 6.13: Termination Fees (\$/ML)**

<i>Actual Prices</i>							<i>Recommended Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<i>Draft Report</i>											
<i>Channel to:</i>											
River	n.d.	n.d.	222.39	219.63	249.12	302.84	439.13	450.11	461.36	472.89	484.71
Giru Benefitted Area	n.d.	n.d.	126.78	125.26	141.92	181.54	188.84	193.56	198.40	203.36	208.45
Gladly's Lagoon	n.d.	n.d.	11.82	11.67	12.83	35.48	0.00	0.00	0.00	0.00	0.00
<i>Giru Benefitted Area to:</i>											
River	n.d.	n.d.	95.62	94.37	107.20	121.30	198.66	203.62	208.71	213.93	219.28
<i>Gladly's Lagoon to:</i>											
River	n.d.	n.d.	210.58	207.96	236.28	267.35	439.13	450.11	461.36	472.89	484.71
Giru Benefitted Area	n.d.	n.d.	114.96	113.59	129.09	146.05	240.47	246.48	252.64	258.96	265.44
<i>Final Report</i>											
<i>Channel to:</i>											
River							361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area							196.66	201.58	206.62	211.78	217.08
Gladly's Lagoon							0.00	0.00	0.00	0.00	0.00
<i>Giru Benefitted Area to:</i>											
River							165.23	169.37	173.60	177.94	182.39
<i>Gladly's Lagoon to:</i>											
River							361.90	370.94	380.22	389.72	399.46
Giru Benefitted Area							196.66	201.58	206.62	211.78	217.08

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011 and 2012).

The Authority's recommended draft and final drainage and drainage diversion charges to apply to the Burdekin-Haughton Distribution System in 2012-17 are outlined in Table 6.14 and Table 6.15 together with actual drainage and drainage diversion charges since 2006-07.



**Table 6.14: Drainage Charges (\$/ha of land)**

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Burdekin Distribution (Draft)	18.70	19.30	20.20	20.80	21.40	22.15	22.70	23.27	23.85	24.45	25.06
Burdekin Distribution (Final)							22.70	23.27	23.85	24.45	25.06

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011 and 2012).

**Table 6.15: Drainage Diversion Charges (\$/installation)**

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Burdekin Distribution (Draft)	119.00	122.00	128.00	132.00	136.00	141.00	144.53	148.14	151.84	155.64	159.53
Burdekin Distribution (Final)							144.53	148.14	151.84	155.64	159.53

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011 and 2012).

The Authority's recommended draft and final distribution system water harvesting charges to apply to the Burdekin-Haughton Distribution System in 2012-17 are outlined in Table 6.16.

**Table 6.16: Distribution System Water Harvesting Charges (\$/ML)**

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Water Harvesting Charge (Draft)	16.06	16.53	17.33	17.87	18.41	19.07	25.57	26.21	26.87	27.54	28.23
Water Harvesting Charge (Final)							24.91	25.53	26.17	26.82	27.49

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011 and 2012).

## 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).

*Authority's Response to Submissions Received on the Draft Report*

During consultation meetings for the Draft Report, stakeholders highlighted that investment decisions by irrigators were made on the basis of water prices when farms were purchased, but these prices have since doubled.

*Submissions Received from Stakeholders on the Draft Report*

The Ministerial Direction did not allow consideration of customer's capacity to pay. However, where price paths are necessary to reach cost-reflective prices, the Authority applied the same increase (\$2/ML/year in real terms) as has historically applied.

---

**REFERENCES**

- Alexander, I. and Irwin, T. (1996). *Price Caps, Rate-of-Return Regulation, and the Cost of Capital* (Note No. 87 in Public Policy for the Private Sector). Washington D.C.: World Bank Group.
- Alexander, I., Mayer, C., and Weeds, H. (1996). *Regulatory Structure and Risk And Infrastructure Firm: An International Comparison* (World Bank Policy Research Working Paper No. 1698). Washington D.C.: World Bank Group.
- Anderson, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, September.
- Anderson H. and Anderson, P. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- ARUP. (2011). Review of SunWater's Network Service Plans - Cluster 4 Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, July.
- Aurecon. (2011a). Review of SunWater's Network Service Plans Bundaberg Cluster Draft Report. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- Aurecon. (2011b). Review of SunWater's Network Service Plans Bundaberg Cluster Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- Austin, G. and Austin C. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Australian Bureau of Statistics (ABS). (2011a). *Engineering Construction Activity, Australia., cat. no. 8762*. Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics (ABS). (2011b). *Labour Price Index, cat. no. 6345*. Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics (ABS). (2011c). *Producer Price Index, cat. no. 6427*. Canberra: Australian Bureau of Statistics.
- Australian Competition and Consumer Commission (ACCC). (2008a). *Water Charge (Termination Fees) Rules Final Advice*. Canberra: Commonwealth of Australia.
- Australian Competition and Consumer Commission (ACCC). (2008b). *Water Market Rules*. Canberra: Commonwealth of Australia.
- Australian Competition and Consumers Commission (ACCC). (2011). *Pricing Principles for Price Approvals and Determinations Under the Water Charge (Infrastructure) Rules 2010*. Canberra: Commonwealth of Australia.
- Australian Competition Tribunal. (2010). Application under S 71B of the National Electricity Law for a Review of a Distribution Determination Made by the Australian Energy Regulator in Relation to Ergon Energy Corporation Limited Pursuant to Clause 6.11.1 of the National Electricity Rules. Commonwealth of Australia, National Electricity Law.
- Australian Energy Regulator (AER). (2007). Decision: Powerlink Queensland Transmission Network Revenue Cap 2007-08 to 2011-12, Canberra: Commonwealth of Australia.
- Australian Sugar Milling Council (ASMC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

- 
- Avondale Water Board (AWB). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Baldwin, N. S. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.
- Biggs, J. (2011). Submission re: Irrigation Prices for SunWater Cunnumulla Weir Scheme, April.
- Bowen Broken Water Supply Scheme Irrigators (BBWSSI). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Boyne River Irrigator Advisory Committee (BRIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Boyne River Irrigator Advisory Committee (BRIAC). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Bundaberg Fruit and Vegetable Growers Cooperative Limited. (BFVG). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Bundaberg Fruit and Vegetable Growers Cooperative Limited (BFVG). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Bundaberg Regional Irrigators Group (BRIG). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Bundaberg Regional Irrigators Group (BRIG). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, September.
- Bundaberg Regional Irrigators Group (BRIG). (2010c). Submission re: Nodal Pricing, September.
- Bundaberg Regional Irrigators Group (BRIG). (2010d). Submission re: Extended Water Pricing Consultation Period, November.
- Bundaberg Regional Irrigators Group (BRIG). (2010e). Submission re: Irrigation Prices for Bundaberg Schemes 2011 to June 2016 on Issues Papers Released as at November 2010, November.
- Bundaberg Regional Irrigators Group (BRIG). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.
- Bundaberg Regional Irrigators Group (BRIG). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.
- Bundaberg Regional Irrigators Group (BRIG). (2011c). Submission re: Irrigation Prices for the Bundaberg Scheme 2011 to June 2016 Following the Bundaberg Visit by Aurecon Representatives March 2011, March.
- Bundaberg Regional Irrigators Group (BRIG). (2011d). Submission re: Irrigation Prices for SunWater Schemes 2011-16 Bundaberg Scheme, April.
- Bundaberg Regional Irrigators Group (BRIG). (2011e). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Bundaberg Regional Irrigators Group (BRIG). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
-

- 
- Bundaberg Sugar (BS). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.
- Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- CANEGROWERS. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.
- CANEGROWERS. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.
- CANEGROWERS. (2011c). Submission re: Irrigation Prices for Sunwater Schemes 2011-16, April.
- CANEGROWERS. (2012a). Submission re: Irrigation Prices for Sunwater Schemes 2012-17, January.
- CANEGROWERS. (2012b). Submission re: Irrigation Prices for Sunwater Schemes 2012-17, January.
- CANEGROWERS. (2012c). Submission re: Irrigation Prices for Sunwater Schemes 2012-17, January.
- CANEGROWERS. (2012d). Submission re: Irrigation Prices for Sunwater Schemes 2012-17, February.
- CANEGROWERS Isis Limited. (2010a). Submission re: Bundaberg Isis Irrigation Scheme, August.
- CANEGROWERS Isis Limited. (2010b). Submission re: The Progress of the Bundaberg - Isis Irrigation Scheme, August.
- CANEGROWERS Isis Limited. (2010c). Submission re: Water Pricing Options for the Bundaberg WSS, August.
- CANEGROWERS Isis Limited. (2011a). Submission re: Bundaberg Water Supply Scheme and Distribution System Network Service Plans, April.
- CANEGROWERS Isis Limited. (2011b). Submission re: Bundaberg Water Supply Scheme and Distribution System Network Service Plans, December.
- CANEGROWERS Proserpine Limited. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Cardno. (2008). Asset Valuation: Final Report. A Consultancy Report Prepared for SunWater, June.
- Cardno-Atkins. (2008). 2008 Review of Water Prices - Assessment of Expenditure Forecasts for Southern Rural Water: Final Report. A Consultancy Report Prepared for Essential Services Commission (ESC), March.

- 
- Cardno-Atkins. (2009). Strategic Management Overview and Review of Operating and Capital Expenditure of State Water Corporation 2009: Final. A Consultancy Report Prepared for the Independent Pricing and Regulatory Tribunal of New South Wales (IPART), November.
- Central Downs Irrigators Ltd. (CDIL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Central Downs Irrigators Ltd. (CDIL). (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Central Highlands Cotton Growers and Irrigators Association (CHCGIA). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Central Highlands Cotton Growers and Irrigators Association (CHCGIA). (2010b). Submission re: Issues Paper, August.
- Childers and District Fruit and Vegetables Growers Association (CDFVGA). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Cicero, C. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Condamine Plains Water (CPW) (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Cooinda Cotton Co.(CCC) (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.
- Cooinda Cotton Co. (CCC) (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Cooinda Cotton Co. (CCC) (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Corbett, L. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Cotton Australia. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Cotton Australia. (2012a). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- Cotton Australia. (2012b). Submission re: Irrigation Prices for SunWater Schemes 2012-17 Dawson Valley Bulk and Distribution Scheme Submission, January.
- Cotton Australia. (2012c). Submission re: Irrigation Prices for SunWater Schemes 2012-17 Nogoia and Mackenzie Bulk and Distribution Scheme Submission, January.
- Cotton Australia. (2012d). Submission re: Irrigation Prices for SunWater Schemes 2012-17 St George Bulk and Distribution Scheme Submission, January.
- Cotton Australia. (2012e). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- Cotton Australia/QFF. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.
- Cotton Australia/QFF. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
-

- 
- Council of Australian Governments (COAG). (1994). *Report of the Working Group on Water Resource Policy: Communique*. Canberra: Council of Australian Governments.
- Council of Australian Governments (COAG). (2004). *Intergovernmental Agreement on a National Water Initiative*. Canberra: Council of Australian Governments.
- Council of Australian Governments (COAG). (2010). *National Water Initiative Principles*. Canberra: Council of Australian Governments.
- Cronin, S. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Cunnamulla Golf Club (CGC). (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Dawson Valley Irrigators Group (DVIG). (2010). Submission re: Irrigation Prices for SunWater Scheme 2011-16, July.
- Department of Environment and Resource Management (DERM). (2000). Interim Resource Operations License: Burdekin Irrigation Area. Brisbane: Department of Environment and Resource Management.
- Department of Natural Resources and Water (DNRW). (2008). *Submission to Water Charge Rules Issues Paper for Charges Payable to Irrigation Infrastructure Operators*. Brisbane: Department of Natural Resources and Water.
- Deloitte. (2011a). SunWater Administration Cost Review Phase 2. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- Deloitte. (2011b). SunWater Working Capital Allowance. A Consultancy Report Prepared for the Queensland Competition Authority, August..
- Deloitte. (2011c). Operations Benchmarking Phase 1: SunWater and PV Water. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- Deloitte. (2011d). Forecast Growth in Labour Costs: Update of December 2010 Report. A Report Prepared for Australian Energy Regulator.
- Dunsdon, G. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16 for the Cunnamulla Weir Scheme, May.
- Economic Regulation Authority (ERA). (2007). Inquiry on Harvey Water Bulk Water Pricing, April.
- Economic Regulation Authority (ERA). (2009). Inquiry into Tariffs of the Water Corporation, Aqwest and Busselton Water, August.
- Enkelmann, P. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Enkelmann, P. (2011a). Submission from the Murgon Meeting of the 14 April 2011, April.
- Enkelmann, P. (2011b). Submission re: Irrigation Water Prices 2011-16, April.
- Enkelmann, P. (2011c). Submission re: Water Pricing for Barker Barambah Water Supply Scheme, April.
- Ernst and Young. (1997). SCARM Water Industry Asset Valuation Study - Draft Guidelines on Determining Full Cost Recovery, August.
-

- 
- Essential Services Commission (ESC). (2008). *2008 Water Price Review: Regional and Rural Businesses' Water Plans 2008-13 and Melbourne Water's Drainage and Waterways Water Plan 2008-13*, June.
- Essential Services Commission (ESC). (2009). *Metropolitan Melbourne Water Price Review 2008-09: Final Decision*, June.
- Essential Services Commission of South Australia (ESCOSA). (2010). *Inquiry into the 2010-11 Metropolitan and Regional Potable Water and Sewerage Pricing Process: Final Report*, October.
- Eslake, S. (2011). *Productivity*. A paper presented to the Reserve Bank of Australia Annual Conference, The Grattan Institute, Victoria, August.
- Eton Irrigators Advisory Committee (EIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Eton Irrigators Advisory Committee (EIAC). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.
- Eton Irrigators Advisory Committee (EIAC). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Eton Irrigators Advisory Committee (EIAC). (2011c). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Francis, P., & Francis, M. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16 - Three Moon Creek Water Supply Scheme, April.
- Frontier Economics. (2005). Review of Pricing Policies: A Report Prepared for Goulburn Murray Water, March.
- Frontier Economics. (2008). Termination Fees and Landholder Considerations. A Consultancy Report Prepared for the Australian Competition and Consumers Association, October.
- GHD. (2001). State Water Projects Distribution System Efficiency Review: Burdekin Irrigation Area. A Consultancy Report Prepared for the Department of Natural Resources.
- GHD. (2009). Review of WHS Hazard Reduction Project Schedule Close-off Report, November.
- GHD. (2011). Review of SunWater's Network Service Plans: Toowoomba Cluster - Operational and Capital Expenditure - Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- Gilbert and Sutherland. (2011). Quality Assurance Assessment of a Review of SunWater's Headworks Utilisation Factors Methodology. A Consultancy Report Prepared for the Queensland Competition Authority, March.
- Goulburn-Murray Water (GMW). (2009). Goulburn-Murray Water: Water Services Committee Charter, September.
- Grout, P.A. and Zalewska, A. (2006). The impact of regulation on market risk. *Journal of Financial Economics*, 80(1), 149-184.
- Growcom. (2010). Submission re: Segmented Water Pricing in Bundaberg, September.



- 
- Halcrow. (2005). 2005 Review of Rural Water Prices Assessment of Expenditure Forecasts: Goulburn-Murray Water. A Consultancy Report Prepared for the Essential Services Commission, December.
- Halcrow. (2011). SunWater - Biloela Water Supply Schemes ("Cluster 3"): Review of Price Paths 2011-2016. A Consultancy Report Prepared for the Queensland Competition Authority, June.
- Hetherington, M. and Hetherington, K. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Heywood, R. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Hinchliffe, G., Hinchliffe, P., & Farmer, G. (2011). Submission re: Network Service Plan - Lower Fitzroy Water Supply Scheme, April.
- Holt, K. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December..
- Hubert, J. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Independent Competition and Regulatory Commission (ICRC). (2008). Water and Wastewater Price Review: Final Report and Price Determination, April.
- INDEC. (2005). Productivity and Cost Efficiency Review of Irrigation Services Provided by SunWater. A Consultancy Report Prepared for the Statewide Irrigation Pricing Working Group (Tier 1), December.
- INDEC. (2011a). SunWater Water Supply Schemes 2011-16 Price Paths: Audit and Review of SunWater's Business Operating Model (BOM). A Consultancy Report Prepared for the Queensland Competition Authority, March.
- INDEC. (2011b). SunWater Water Supply Schemes 2011-16 Price Paths: Review of SunWater Pricing Model - Step 1. A Consultancy Report Prepared for the Queensland Competition Authority, March.
- INDEC. (2011c). SunWater Water Supply Schemes 2011-16 Price Paths: Qualitative Framework and Assessment of Fixed and Variable Cost Drivers. A Consultancy Report Prepared for the Queensland Competition Authority, October.
- INDEC. (2011d). SunWater Water Supply Schemes 2012-2017 Price Paths: Analysis of SunWater's 2006-07 to 2010-11 Renewals Expenditure Forecasts. A Consultancy Report Prepared for the Queensland Competition Authority, October.
- INDEC. (2011e). SunWater Irrigation Pricing Data Forecasts 2003-11. Excel Spreadsheets Prepared for the Queensland Competition Authority, October.
- INDEC. (2011f). SunWater Refurbishment and Augmentation Cash Spend Details. Excel Spreadsheets Prepared for the Queensland Competition Authority, October.
- INDEC. (2011g). SunWater Water Supply Schemes 2011-16 Price Paths: Analysis of SunWater's Forecast Total Cost. A Consultancy Report Prepared for the Queensland Competition Authority, October.
- Independent Pricing and Regulatory Tribunal (IPART). (2004). Bulk Water Prices 2005-06 - Issues Paper, September.
- Independent Pricing and Regulatory Tribunal (IPART). (2006). Bulk Water Prices for State Water Corporation and Water Administration Corporation, September.
-

- 
- Independent Pricing and Regulatory Tribunal (IPART). (2009a). Review of Prices for the Sydney Catchment Authority From 1 July 2009 to 20 June 2012; Water - Determination and Final Report, June.
- Independent Pricing and Regulatory Tribunal (IPART). (2009b). Review of Prices for Water, Sewerage and Other Services for Hunter Water Corporation: Determination and Final Report, July.
- Independent Pricing and Regulatory Tribunal (IPART). (2010a). Review of Bulk Water Charges for State Water Corporation: Water-Final, June.
- Independent Pricing and Regulatory Tribunal (IPART). (2010b). Review of Prices for the Water Administration Ministerial Corporation, July.
- Independent Pricing and Regulatory Tribunal (IPART). (2011). Review of Prices for the Water Administration Ministerial Corporation: Water - Determination, February.
- InterSafe Group Pty Ltd. (2005). Report on High Risk Management Plan: SunWater Operations & Maintenance - Mareeba Works - Far North Queensland, July.
- InterSafe Group Pty Ltd. (2007). Report on SunWater Ayr Region Sampled Focussed Recall, October.
- Isis Central Sugar Mill (ICSM). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Isis Central Sugar Mill (ICSM). (2010a). Submission re: Water Pricing Options, August.
- Isis Central Sugar Mill (ICSM). (2010b). Submission re: Water Pricing Options, September.
- Isis Central Sugar Mill (ICSM). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17 Bundaberg Distribution System, January.
- Isis Sugar Partnership (ISP). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Jackson, I. (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- Jenyns, M. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Kavanagh, G. (2011). Submission re: Irrigation Prices for SunWater 2011-16, June.
- Kelsey Creek Water Board (KCWB). (2011). Submission re: Irrigation Prices for SunWater Schemes, April.
- Lally, M. (2011). The Estimated WACC for the SEQ Interim Price Monitoring. A Paper Prepared for the Queensland Competition Authority.
- Lower Boyne River Irrigators (LBRI). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Lower Burdekin Water (LBW). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Lower Burdekin Water (LBW). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

- 
- Lower Burdekin Water (LBW). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- MacDonald, K. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Macintyre Brook Irrigators Association (MBIA). (2011). Submission re: SunWater Price Path Issues Regarding the Macintyre Brook Scheme, April.
- Mackay Canegrowers Limited and Mackay Sugar Limited (MCL and MSL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Mackay Irrigation Stakeholders (MIS). (2010). Submission re: Irrigations Prices for SunWater Schemes 2011-16, November.
- Mackenzie, R. A. (2010a). Submission re: Rate of Return, June.
- Mackenzie, R. A. (2010b). Submission re: Postage Stamp Prices, June.
- Mackenzie, R. A. (2010c). Submission re: Standard Supply Contracts, September.
- MacroMonitor (2010) Australian Construction Cost Trends 2010. Viewed on 19 October 2010. [http://www.macromonitor.com.au/index\\_files/Pages570.htm](http://www.macromonitor.com.au/index_files/Pages570.htm).
- Mareeba-Dimbulah Irrigation Area Council (MDIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Mareeba-Dimbulah Irrigation Area Council (MDIAC). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Mareeba-Dimbulah Irrigation Area Council (MDIAC). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Mareeba-Dimbulah Irrigation Area Council (MDIAC). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- Maryborough Sugar Factory (MSF). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Maryborough Sugar Factory (MSF). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Maryborough Sugar Factory (MSF). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- McCull, D. (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- McCull, D. (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- McGuigan, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- McLellan, P., & McLellan, B. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-2016, April.
- Millar, C. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

- 
- Mobbs, N. and Mobbs, J. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- National Water Commission (NWC). (2008). *National Performance Report 2006-07: Rural Water Service Providers*. Canberra: Australian Government.
- National Water Commission (NWC). (2009a). *Australian Water Reform: Second Biennial Assessment of Progress in Implementation of the National Water Initiative*. Canberra: Australian Government.
- National Water Commission (NWC). (2009b). *National Performance Report: Rural Water Performance Reporting Indicators and Definitions 2008-09*. Canberra: Australian Government.
- National Water Commission (NWC). (2010). *National Performance Report 2008-09: Rural Water Service Providers*. Canberra: Australian Government.
- National Water Commission (NWC). (2011). *National Performance Report 2009-10: Rural Water Service Providers*. Canberra: Australian Government.
- NERA Economic Consulting. (2010a). Form of Price Control: SunWater Water Supply Schemes. Issues Paper Prepared for the Queensland Competition Authority, August.
- NERA Economic Consulting (NERA). (2010b). Single or Multiple Rate of Return: SunWater. A Consultancy Report Prepared for the Queensland Competition Authority, August.
- NERA Economic Consulting (NERA). (2011). Cost of Capital for Water Infrastructure Company. A Consultancy Report Prepared for the Queensland Competition Authority, March.
- NERA Economic Consulting (NERA). (2012a). SunWater's Electricity Cost Model. A Consultancy Report Prepared for the Queensland Competition Authority, April.
- O'Brien MP, J. (2010). Submission re: Irrigation Prices fo SunWater Schemes 2011-16, June.
- Office for Water Security. (2010). *Water for Good*. Adelaide: Government of South Australia.
- Osborne, S. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Otto, N., & Otto, M. (2011). Submission re: Irrigation Prices for SunWater Schemes, April.
- Parsons Brinckerhoff. (PB) (2010). Provisions of Services for Costing SunWater's Work Instructions. A Consultancy Report Prepared for SunWater, October.
- Pioneer Valley Water Co-operative Limited (PVWaterL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Pioneer Valley Water Co-operative Limited (PVWaterL). (2011a). Submission re: SunWater Network Service Plan - Pioneer River Water Supply Schemes, February.
- Pioneer Valley Water Co-operative Limited (PVWaterL). (2011b). Submission on Consultants Draft Report on Pioneer WSS Network Service Plan, April.
- Pioneer Valley Water Co-Operative Limited (PVWaterL). (2011c). Submission on Consultants Draft Report on SunWater Administration Cost Review, April.
- Pioneer Valley Water Co-Operative Limited (PVWaterL). (2011d). Review of Irrigation Water Pricing in SunWater Schemes: Comments on SunWater Response to PVWater Submission, June.
-

- 
- Pioneer Valley Water Co-Operative Limited (PVWaterL). (2011e). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Pioneer Valley Water Co-Operative Limited (PVWaterL). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, February.
- PricewaterhouseCoopers (PwC). (2010a). Pricing Principles and Tariff Structures for SunWater's Water Supply Schemes. Issues Paper Prepared for the Queensland Competition Authority, September.
- PricewaterhouseCoopers (PwC). (2010b). Allocating Capital Costs of Bulk Water Supply Assets. Issues Paper Prepared for the Queensland Competition Authority, September.
- Productivity Commission (PC). (2011). *Australia's Urban Water Sector (Draft Report)*. Canberra: Commonwealth of Australia.
- Proserpine District Canegrowers Cooperative Limited and Proserpine Co-operative Sugar Milling Association Limited (PDCCL and PCSMAL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Queensland Competition Authority (QCA). (2000). Statement of Regulatory Pricing Principles for the Water Sector, December.
- Queensland Competition Authority (QCA). (2002). Gladstone Area Water Board: Investigation of Pricing Practices, September.
- Queensland Competition Authority (QCA). (2004). Draft Report on General Pricing Principles for Infrastructure Investments Made in Response to Extraordinary Circumstances.
- Queensland Competition Authority (QCA). (2005). Gladstone Area Water Board: Investigation of Pricing Practices - Final Report, March.
- Queensland Competition Authority (QCA). (2007). Final Decision: Advice to the Minister for Mines and Energy - Benchmark Retail Cost Index for Electricity: 2005-07 and 2007-08, June.
- Queensland Competition Authority (QCA). (2009a). Remade Final Decision: 2008-09 Benchmark Retail Retail Cost Index, June.
- Queensland Competition Authority (QCA). (2009b). Review of Electricity Pricing and Tariff Structures - Stage 1, September.
- Queensland Competition Authority (QCA). (2010a). Gladstone Area Water Board: Investigation of Pricing Practices, July.
- Queensland Competition Authority (QCA) (2010b). QR Network's 2010 DAU: Final Decision, September.
- Queensland Competition Authority (QCA) (2010c). Final Decision: Benchmark Retail Retail Cost Index for Electricity: 2010-11, May.
- Queensland Competition Authority (QCA). (2011a). South East Queensland (SEQ) Interim Price Monitoring for 2010-11, March.
- Queensland Competition Authority (QCA). (2011b). South East Queensland (SEQ) Grid Service Charges 2011-12, July.
-

- 
- Queensland Competition Authority (QCA) (2011c). Final Decision: Benchmark Retail Retail Cost Index for Electricity: 2011-12, May.
- Queensland Competition Authority (QCA) (2011d). Approval of QR Network's Revenue Cap Adjustment Amounts 2009-10, April.
- Queensland Farmers' Federation (QFF). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.
- Queensland Farmers' Federation (QFF). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.
- Queensland Farmers' Federation (QFF). (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Queensland Farmers' Federation (QFF). (2012). Submission re: Irrigation Prices for SunWater Schemes 2012-17, January.
- Queensland Valuation Services (QVAS). (2010). Permanent Water Trade.
- Robertson MP, Hon Stephen. (2010a). Submission re: Nodal Pricing Arrangements, September.
- Robertson MP, Hon Stephen. (2010b). Submission re: Assets Associated with Bulk Water Supply Service, September.
- Robertson MP, Hon Stephen. (2012). Submission re: Authority's Draft Report on the SunWater Irrigation Price Review: 2012-17, February.
- Roth, R. (2011). Submission re: Irrigation Prices for Sunwater Schemes 2011-16 - Three Moon Creek, March.
- SAHA. (2010). Renewals Annuity or a Regulatory Depreciation Allowance: SunWater's Water Supply Schemes 2011-16 Price Paths. Issues Paper Prepared for the Queensland Competition Authority, September.
- SAHA. (2011). Assessment of SunWater's Administration Costs. A Consultancy Report Prepared for the Queensland Competition Authority, January.
- Simpson Farms. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- Sinclair Knight Merz (SKM). (2011). Review of Selected Annuity Values for Refurbishment and Replacement Items. A Consultancy Report Prepared for the Queensland Competition Authority, October.
- Sinclair Knight Merz (SKM). (2012a). SunWater Price Regulation: A Review of Selected Annuity Values for Refurbishment and Replacement Items - Addendum. A Consultancy Report Prepared for the Queensland Competition Authority, April.
- Sinclair Knight Merz (SKM). (2012b). Clarification on Two Renewals Project Items for St George Distribution System, April.
- Smith, T. and Smith, C. (2011). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Southern Rural Water (SRW). (2007a). Customer-Charter: Water Supply, Version 5, August.

- 
- Southern Rural Water (SRW). (2007b). Southern Rural Water: Water Plan 2008-13.
- SP Exports. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.
- St George Irrigators (SGI). (2010). Perspectives on Pricing of Irrigation Water in Queensland 2011-2016, July.
- St George Irrigators (SGI). (2011). St George Water Supply Scheme, Network Service Plan, 2012-2016, April.
- State Water. (2008). 2008-12 Customer Service Charter Terms of Reference.
- Stewart, D. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.
- Stewart, D. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Stewart, D. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Strathdee, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.
- SunWater. (2003). *SunWater Annual Report 2002-03*. Brisbane: SunWater Limited.
- SunWater. (2004). *SunWater Annual Report 2003-04*. Brisbane: SunWater Limited.
- SunWater. (2005). *SunWater Annual Report 2004-05*. Brisbane: SunWater Limited.
- SunWater. (2006a). *Statewide Irrigation Pricing Working Group: Tier 1 Report*. Brisbane: SunWater Limited.
- SunWater. (2006b). *SunWater Irrigation Price Paths 2006-07 to 2010-11: Final Report*. Brisbane: SunWater Limited, September.
- SunWater. (2006c). *SunWater Annual Report 2005-06*. Brisbane: SunWater Limited.
- SunWater. (2007). *SunWater Annual Report 2006-07*. Brisbane: SunWater Limited.
- SunWater. (2008). *SunWater Annual Report 2007-08*. Brisbane: SunWater Limited.
- SunWater. (2009a). *SunWater Annual Report 2008-09*. Brisbane: SunWater Limited.
- SunWater. (2009b). *SunWater: Statement of Corporate Intent*. Brisbane: SunWater Limited.
- SunWater. (2010a). QCA Review of Irrigation Prices: Public Submission Letter, May.
- SunWater. (2010b). QCA Review of Irrigation Prices: Service Framework Background Paper. Brisbane, May.
- SunWater. (2010c). QCA Review of Irrigation Prices: Contributed Assets Background Paper, May.
- SunWater. (2010d). QCA Review of Irrigation Prices: Headworks Utilisation Factors Technical Report, September.
- SunWater. (2010e). QCA Review of Irrigation Prices: Bulk Water Asset Valuation, October.
- SunWater. (2010f). QCA Review of Irrigation Prices: Asset Management Planning Methodology Paper, October.
-

- 
- SunWater. (2010g). *SunWater Annual Report 2009-10*. Brisbane: SunWater Limited.
- SunWater. (2010h). QCA Review of Irrigation Prices: Return of Capital Renewals or Depreciation, October.
- SunWater. (2011a). QCA Review of Irrigation Prices: Centralised Costs Background Paper, January.
- SunWater. (2011b). QCA Review of Irrigation Prices: Cost Forecasting Assumptions Background Paper, January.
- SunWater. (2011c). QCA Review of Irrigation Prices: Renewals Annuity Background Paper, January.
- SunWater. (2011d). QCA Review of Irrigation Prices: Pricing Principles and Tariff Structures January.
- SunWater. (2011e). QCA Review of Irrigation Prices: Form of Regulation, January.
- SunWater. (2011f). QCA Review of Irrigation Prices: Review and Adjustment Triggers Supplementary Information, February.
- SunWater. (2011g). QCA Review of Irrigation Prices: Allocation of Centralised Costs Supplementary Information, February.
- SunWater. (2011h). QCA Review of Irrigation Prices: Electricity Costs Background Paper, February.
- SunWater. (2011i). QCA Review of Irrigation Prices: Water Distribution Entitlements Supplementary Information, February.
- SunWater. (2011j). QCA Review of Irrigation Prices: Bulk Water Price Differentiation Supplementary Submission, February.
- SunWater. (2011k). QCA Review of Irrigation Prices: Customer Involvement in Renewals Expenditure Supplementary Background Paper, February.
- SunWater. (2011l). QCA Review of Irrigation Prices: Weighted Average Cost of Capital - Renewals Annuity Background Paper, February.
- SunWater. (2011m). QCA Review of Irrigation Prices: Pumping Cost Reconciliation, February.
- SunWater. (2011n). QCA Review of Irrigation Prices: WAE Reconciliation, February.
- SunWater. (2011o). QCA Review of Irrigation Prices: Storage Rental Fees, March.
- SunWater. (2011p). QCA Review of Irrigation Prices: Pricing of Distribution Losses, March.
- SunWater. (2011q). QCA Review of Irrigation Prices: Estimated Flood Damage Letter, March.
- SunWater. (2011r). QCA Review of Irrigation Prices: Metering and Price Model Letter, March.
- SunWater. (2011s). QCA Review of Irrigation Prices: Tariff Groupings, March.
- SunWater. (2011t). QCA Review of Irrigation Prices: Revenue Analysis, March.
- SunWater. (2011u). QCA Review of Irrigation Prices: Electricity - Actual vs 2006 IPR Forecast, March.
-



- 
- SunWater. (2011v). QCA Review of Irrigation Prices: Water Harvesting Usage Summary, April.
- SunWater. (2011w). QCA Review of Irrigation Prices: Headworks Utilisation Factors, Critical Periods and Bulk Water Supply Capital Cost Allocatooon, April.
- SunWater. (2011x). QCA Review of Irrigation Prices: Headworks Utilisation Factors, Combined Technical Paper and Addendum, May.
- SunWater. (2011y). QCA Review of Irrigation Prices: Service Delivery Strategies, May.
- SunWater. (2011z). QCA Review of Irrigation Prices: Service Delivery Paper, May.
- SunWater. (2011aa). QCA Review of Irrigation Prices: Drainage Data, April.
- SunWater. (2011ab). QCA Review of Irrigation Prices: Response to Pioneer Valley Water Board Submission on the Pioneer River Water Supply Scheme - Network Services Plan, May.
- SunWater. (2011ac). QCA Review of Irrigation Prices: Administration Costs for Bundaberg Groundwater, June.
- SunWater. (2011ad). QCA Review of Irrigation Prices: Supplementary Information on Electricity Cost Management, Background Paper, August.
- SunWater. (2011ae). QCA Review of Irrigation Prices: Intersafe, August.
- SunWater. (2011af). QCA Review of Irrigation Prices: SunWater Analysis of Working Capital, August.
- SunWater. (2011ag). QCA Review of Irrigation Prices: SunWater Submission on Deloitte Administration Cost Review Stage 2 Report, August.
- SunWater. (2011ah). QCA Review of Irrigation Prices: SunWater Submission on Drainage Charges, February.
- SunWater. (2011ai). QCA Review of Irrigation Prices: Background Paper on the Treatment of Costs Related to Inflatable Rubber Dams, September.
- SunWater. (2011aj). QCA Review of Irrigation Prices: Supplementary Information on Response to Issues - Operating Costs Forecasts, September.
- SunWater. (2011ak). QCA Review of Irrigation Prices: Background Paper on Electricity Cost Re-Forecast, September.
- SunWater. (2011al). SunWater Published Water Prices 2005-06 to 2011-12, PDF files submitted by SunWater to the Queensland Competition Authority.
- SunWater. (2011am). SunWater Irrigation Pricing Model.
- SunWater. (2011an). SunWater Annuity Expenditures 2007-11 for all 30 Irrigation Service Contracts. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority, September.
- SunWater. (2011ao). SunWater Financial Model. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority, October.
- SunWater. (2011ap). SunWater Operating Expenditures and Renewals 2007-11. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority, September.
-

---

SunWater. (2011aq). QCA Review of Irrigation Prices: Background Paper on Expenditure Update Changed Regulatory Period, September.

SunWater. (2011ar). QCA Review of Irrigation Prices: Response to QCA Consultants' Review of Opex, October.

SunWater. (2011as). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Response to Draft Report, December.

SunWater. (2011at). *SunWater Annual Report 2010-11*. Brisbane: SunWater Limited

SunWater. (2012a). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Background Paper on Main Channel Factors, January.

SunWater. (2012b). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Excel Spreadsheet of Distribution System Losses, January.

SunWater. (2012c). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Water Use Data, February.

SunWater. (2012e). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Response to Renewals Expenditure Request 4 (a) - Insurance Proceeds, March.

SunWater. (2012f). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Service Contract Annuity Expenditure 2001-2011, March.

SunWater. (2012g). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Recommended Changes to CAM, March.

SunWater. (2012h). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Application of Interest on Annuity Before the 2006-11 Price Path, March.

SunWater. (2012i). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Expenditure Information Request, February.

SunWater. (2012j). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Draft Prices (And Opex Continued) Information Request, March.

SunWater. (2012k). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Minimum Charge, March.

SunWater. (2012l). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Land Leases, March.

SunWater. (2012m). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Drainage Revenue, March.

SunWater. (2012n). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Mareeba Access Charge, March.

SunWater. (2012o). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Response on the Authority's Draft Recommendation to Change SunWater's CAM, March.

SunWater. (2012p). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Replacement of Inflatable Rubber Dam, March.

- 
- SunWater. (2012q). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Renewals Expenditures and Annuities Information Request, February.
- SunWater. (2012r). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Escalation of Electricity Prices, April.
- SunWater. (2012s). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Further Support to the Inclusion of Non-Directs in Renewals, March.
- SunWater. (2012t). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Direct Opex Information request, March.
- SunWater. (2012u). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Adjustment to Overheads, March.
- SunWater. (2012v). Submission re: Irrigation Prices for SunWater Schemes: 2012-17 Application of QCA Efficiency Savings to Non-Direct Costs, April.
- Sydney Catchment Authority (SCA). (2010). Sydney Catchment Authority Annual Report 2009-10. Sydney: Sydney Catchment Authority.
- Synergies Economic Consulting. (2010). Rural Water Pricing Business and Scheme Overview. A Consultancy Report to the Queensland Competition Authority, January.
- Tableland Canegrowers Ltd and Mareeba District Fruit and Vegetable Growers Association Inc. (TCL and MDFVGA). (2010a). Submission re: Key Issues on Irrigation Prices for Mareeba-Dimbulah Water Supply Scheme, July.
- Tableland Canegrowers Ltd and Mareeba District Fruit and Vegetable Growers Association Inc (TCL and MDFVGA). (2010b). Submission re: Tiered Pricing, August.
- Tanner, J., & Tanner, S. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.
- Thomas, W. A. (2011). Submission re: Principles Relevant to Recovering Long-Run Average Costs of SunWater Schemes, April.
- Voss, A. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.
- Voss, A. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2012-17, December.
- Water Act 2000 (Qld).*
- Water Act 2007, No. 137 (Cwlth).*
- Water Charge (Infrastructure) Rules (Cwlth).*
- Water Industry Regulatory Order 2003 (Vic).*
- Water Regulation 2002 (Qld).*
- Water Supply (Safety and Reliability) Act 2008 (Qld).*
- Workplace Health and Safety Act 1995 (Qld).*
- Weir, T. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.
-

World Wildlife Fund (WWF). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

**APPENDIX A: FUTURE RENEWALS LIST**

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

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Barratta Drainage	2020-21	Barratta Irrigation System - Refurbish Roads (Berm pavement regrading, drainage)	17
	2021-22	Replace Drainage Inlet 5640.0 L	36
	2026-27	Replace Drainage Inlet 2479M R	19
		Replace Drainage Inlet 3269.6M R	19
	2032-33	Barratta Irrigation System - Operations and Maintenance Manual (HO Program)	28
	2034-35	Barratta Irrigation System - Refurbish Roads (Berm pavement regrading, drainage)	17
Barratta Irrigation Distrib	2011-12	Replace Rotating Weed Screen	191
		Refurbish Gate - paint, bearings, seals, sensor tube etc	55
		Refurbish Gate - paint, bearings, seals etc	27
	2012-13	Refurbish:M1 paint, bearings, seals, sensor tube etc	84
		Refurbish Gate - paint, bearings, seals, sensor tube etc	56
		Refurbish Gate - paint, bearings, seals etc - difficult to achieve operationally	28
		Barratta Ba1 Reg Gate 103 - Refurbish Gate Mech and Elec, (Rropes, pulleys, motors, gearboxes)	17
	2013-14	Replace 1050 Dia Batescrew Gate	11
		Refurbish Gate - paint, bearings, seals etc	28
		Refurbish Gate - paint, bearings, seals, sensor tube etc	28
		Refurbish: M1 paint, bearings, seals, sensor tube etc	28
	2014-15	Refurbish gate - blast and paint	46
		INVESTIGATION CONTAMINATED LAND SITES	12
	2015-16	Refurbish Gate - paint, bearings, seals, sensor tube etc	86
		Refurbish:Refurbish Gate - paint, bearings, seals etc	29
		Replace Security Fencing	17
	2016-17	Replace C2537-Bmc 0.0K-10.3K	264
		Replace Bank Overflow 1186.0L	42
		Barratta Main Channel - Refurbish Gate RO19 (Blast, Paint, Bearings, Seals)	23
		Replace Ladders, Handrails, Platforms & Safety	18
	2017-18	Mulgrave Balancing Storage - Refurbish Oultet Metalwork	11
		Mulgrave BS - Refurbish Rock Protection	11
		Replace Bank Overflow 1240.0L	11
		Replace C2589 Bmc 10.3K - 23.3K	100
		Refurbish: Enlarge fabricated steel control cabinet & improve weatherproofing. Sandblast & paint cabinet and winch frame. Sandblast & hot dip galvanise solar mast & components.	11
	2018-19	Barratta Main Channel - Refurbish Gate R023 (paint, bearings, seals etc)	22
Barratta Main Channel - Refurbish Gate (Paint, bearings, seals etc)		20	
Barratta Main Channel - Refurbish Butterfly Valve SI01 (Remove, inspect and repair internals)		13	
Barratta Irrigation System - Refurbish Gate RO81 (paint, bearings, seals, sensor tube etc)		13	
2020-21		Replace Fencing Ba5 C2674	90
	11BR1XX - BMC REFURBISH GATE RO29	21	
	Replace Scour Valve 150 Mm Dia	13	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		Barratta Irrigation System - Refurbish G	12
	2021-22	Replace Control Equipment	385
		Replace Safety Screens	69
		Replace Switchboard And Controls	62
		Refurbish Gate - paint, bearings, seals, sensor tube etc	56
		Refurbish Gate - paint, bearings, seals etc	28
	2022-23	Replace Control Equipment	380
		Replace C2789-Bmc 32.4K-36.7K	171
		Refurbish:M1 paint, bearings, seals, sensor tube etc	84
		Replace Safety Screens	64
		Refurbish Gate - paint, bearings, seals, sensor tube etc	56
		Refurbish Gate - paint, bearings, seals etc - difficult to achieve operationally	28
		Refurbish Metalwork - maintain screens, walkway, guides & handrails;	11
	2023-24	Refurbish Gate - paint, bearings, seals etc	28
		Refurbish Gate - paint, bearings, seals, sensor tube etc	28
		Refurbish: M1 paint, bearings, seals, sensor tube etc	28
	2024-25	Refurbish Gate - control gate replacement	17
		Replace Batescrew Gate, 600Mm	12
		Replace Batescrew Gate, 900Mm	11
	2025-26	Refurbish Gate - paint, bearings, seals, sensor tube etc	83
		Refurbish:Refurbish Gate - paint, bearings, seals etc	28
		Refurbish Gate - control gate replacement	17
	2026-27	Replace Regulating Gate	270
		Barratta Main Channel - Refurbish Gate RO19 (Blast, Paint, Bearings, Seals)	22
		Replace Meter, 450Mm Emag Siemens	22
		Replace Valve, 525Mm Sluice Batescrew	21
	2027-28	Refurbish Slide Gates - replace spindles and general metalwork refurbishment	57
		Barratta Ba1 Reg Gate 103 - Refurbish Gate Mech and Elec, (Rropes, pulleys, motors, gearboxes)	17
	2028-29	Replace Meter, 450Mm Emag Siemens	28
		Replace Meter, 400Mm Emag Siemens	17
	2029-30	Replace Regulating Gate	89
		Refurbish gate - blast and paint	45
		Barratta Main Channel - Refurbish Gate R023 (paint, bearings, seals etc)	22
		Barratta Main Channel - Refurbish Gate (Paint, bearings, seals etc)	20
		Barratta Irrigation System - Refurbish Gate RO81 (paint, bearings, seals, sensor tube etc)	13
	2030-31	11BRIXX - BMC REFURBISH GATE RO29	20
		Barratta Irrigation System - Refurbish G	12
	2031-32	Replace Regulating Gate	139
		Refurbish Gate - paint, bearings, seals, sensor tube etc	56
		Refurbish Gate - paint, bearings, seals etc	28
	2032-33	Replace Regulating Gate	543
		Refurbish:M1 paint, bearings, seals, sensor tube etc	83
		Refurbish Gate - paint, bearings, seals, sensor tube etc	56
		Refurbish Gate - paint, bearings, seals etc - difficult to achieve operationally	28
		Replace Hoist Actuator, Rotork	20
		Barratta Channel Ba1 - Replace Meter BM273W1 with EM or Ultrasonic type (WHS ISSUE)	19
		Replace 1050 Dia Batescrew Gate	11

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Burdekin Scada	2033-34	Replace Regulating Gate	89
		Refurbish Gate - paint, bearings, seals etc	28
		Refurbish Gate - paint, bearings, seals, sensor tube etc	28
		Refurbish: M1 paint, bearings, seals, sensor tube etc	28
		Refurbish: Enlarge fabricated steel control cabinet & improve weatherproofing. Sandblast & paint cabinet and winch frame. Sandblast & hot dip galvanise solar mast & components.	11
	2034-35	Barratta Main Channel - Refurbish Butterfly Valve SI01 (Remove, inspect and repair internals)	13
	2035-36	Replace Regulating Gate	188
		Refurbish Gate - paint, bearings, seals, sensor tube etc	83
		Refurbish: Refurbish Gate - paint, bearings, seals etc	28
	2019-20	09BRI01-MT DALRYMPLE INSTALL NEW T/X	78
	2024-25	09BRI02-MT KELLY REPEATER REPLACE T/X	78
	2034-35	09BRI01-MT DALRYMPLE INSTALL NEW T/X	78
	Clare A Pump Station	2011-12	10BRI24-REPLACE REFLUX V/Vs CLARE A 1&2
		Replace Trash Screen	15
2012-13		Replace Control Equipment	114
		Replace Discharge Valve	33
		Clare PSTNA - Refurbish Pump Unit No. 2 (Seals, bearings, wear rings)	22
		Refurbish Road - stabiliation, culvert replacement, fill as required	17
2013-14		Replace Control Building	41
		Replace Discharge Valve	33
		Clare PSTN A - Refurbish RM01 Surge Tank (blast & paint protective coating)	23
		Replace Trash Screen	20
2014-15		Clare PSTNA - Refurbish Pump Unit 3 (Seals, Bearings etc)	29
		Clare PSTNA - Refurbish Pump Unit 4 (Seals, bearings etc)	29
		INVESTIGATION CONTAMINATED LAND SITES	12
2018-19		Replace Submersible Pump No 3	117
2019-20		Refurbish Valve - seals, corrosion, seats etc	11
2020-21		Refurbish Pump - Seals, bearings, wear rings etc	34
2021-22		Replace Submersible Pump No 4	40
2022-23		Replace Cable	431
		Refurbish Sutk - full repaint, remove debris deflector?	33
2023-24		Replace Crib Brick Wall	16
2027-28	Clare PSTNA - Refurbish Pump Unit No. 2 (Seals, bearings, wear rings)	22	
Clare B Pump Station	2029-30	Clare PSTNA - Refurbish Pump Unit 3 (Seals, Bearings etc)	28
		Clare PSTNA - Refurbish Pump Unit 4 (Seals, bearings etc)	28
		Replace Flow Meter Pit	22
		Refurbish Valve - seals, corrosion, seats etc	11
	2030-31	Replace Concrete Pipe	94
		Replace Steel Pipe	92
		Replace Concrete Structure	90
		Replace Rm01 & Rm02 Shared Outlet Structure	24
	2033-34	Refurbish Pump - Seals, bearings, wear rings etc	33
		Clare PSTN A - Refurbish RM01 Surge Tank (blast & paint protective coating)	22
	2034-35	Replace Switchboard	113
	2011-12	Replace Switchboard	249
		Replace Submersible Pump No 1	65

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		Replace Submersible Pump No 2	65
		Replace Submersible Pump No 4	65
		Investigate River Bank Erosion at Clare Pump Station B - Clare Irrigation System	16
		Replace Electromagnetic Flow Meter	11
		Replace Flow Chart Recorder	11
	2012-13	11BR1XX- CPSTNB REPLACE VAC PRIMING SYS	50
	2015-16	Replace Cable	164
		Replace Incoming Supply Panel	115
		Replace Control Equipment	96
	2016-17	xxBR1xx-CLARE B PUMP 3 REFURBISHMENT	34
		Clare PSTNB - Refurbish Pump No. 2 (Seals, wear rings)	34
		Clare PSTNB Pump Unit 1 - Refurbish Pump/Motor Unit	34
		Clare PSTNB - Pump 4 Refurbish (seals, rings, corrosion)	32
		11BR1XX - CLARE PSTN B TRASH SCREENS	12
	2020-21	Replace Discharge Valve	299
		Replace Hydraulic System	26
	2021-22	Refurbish SWB - CB, starters etc poor condition	45
		Replace Electromagnetic Flow Meter	11
	2022-23	xxBR1xx-CLARE B PUMP 3 REFURBISHMENT	34
		Clare PSTNB - Refurbish Pump No. 2 (Seals, wear rings)	33
		Clare PSTNB Pump Unit 1 - Refurbish Pump/Motor Unit	33
		Clare PSTNB - Pump 4 Refurbish (seals, rings, corrosion)	31
		11BR1XX - CLARE PSTN B TRASH SCREENS	12
	2025-26	11BR1XX - CLARE PSTN B REFURB PUN 4 DV	12
	2026-27	Replace Flow Chart Recorder	11
	2028-29	xxBR1xx-CLARE B PUMP 3 REFURBISHMENT	34
		Clare PSTNB - Refurbish Pump No. 2 (Seals, wear rings)	34
		Clare PSTNB Pump Unit 1 - Refurbish Pump/Motor Unit	34
		Clare PSTNB - Pump 4 Refurbish (seals, rings, corrosion)	31
		11BR1XX - CLARE PSTN B TRASH SCREENS	12
	2029-30	Replace Concrete Structure	146
	2029-31	Replace Pump Unit No. 2 Rising Main	42
		Replace Pump Unit No. 5 Rising Main	42
		Replace Pump Unit No.1 Rising Main	42
		Replace Pump Units No. 3 Rising Main	42
		Replace Pump Unit No. 4 Rising Main	28
		Refurbish Cntl - change out electronics	28
	2031-32	Replace Electromagnetic Flow Meter	11
	2034-35	xxBR1xx-CLARE B PUMP 3 REFURBISHMENT	34
		Clare PSTNB - Refurbish Pump No. 2 (Seals, wear rings)	33
		Clare PSTNB Pump Unit 1 - Refurbish Pump/Motor Unit	33
		Clare PSTNB - Pump 4 Refurbish (seals, rings, corrosion)	31
		11BR1XX - CLARE PSTN B TRASH SCREENS	12
Clare Drainage	2011-12	Investigate and Report on Drainage Adequacy - Clare Drain 1/2	11
	2026-27	Replace Drainage Inlet 2742.10 R Lot 63	19
	2031-32	Replace Access Culvert 1097.28	90
		Replace Access Culvert 4600.0	78
		Replace Access Culvert 2900.0	67
		Replace Access Culvert 637.02	63
		Replace Road Culvert 381.0	47
		Replace Road Culv 1257.30 George Rd	41
		Replace Drop Structure 1837.94	18
	2032-33	Replace Road Culvt 2889.19 Strauss Rd	107



<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Clare Irrigation Distribution		Replace Road Culvert 2584.70	66
		Replace Road Culvert 2218.03	66
		Replace Road Culvert 3813.35	66
		Replace Road Culv 852.40 Dearness Rd	65
		Replace Road Culvt 117.65 George Rd	65
		Replace Road Culvert 1536.50 Dunn Rd	63
		Replace Road Culvert 1029.61	62
		Replace Road Culvert 1372.21	62
		Replace Road Culvert 3061.11	62
		Replace Road Culvert 4837.18	62
		Replace Road Culvert 712.84 George Rd	60
		Replace Road Culv 1035.95 Dearness Rd	58
		Replace Road Culvert 1364.59	55
		Replace Road Culvert 1222.25	52
		Replace Access Culvert 50.0	51
		Replace Drop Structure 3630.17	33
		Replace Drop Structure 2554.22	32
		Replace Drop Structure 296.44	31
		Replace Drop Structure 1228.0	27
		Replace Drop Structure 2249.42	23
		Replace Access Crossing 10.0	22
		Replace Parshall Flume 2249.42	17
	2034-35	Replace Road Culvt 316.38 George Rd	69
		Replace Road Culvert 3047.09	56
		Replace Road Culvert 291.39	50
		Replace Access Culvert 1351.18	33
		Replace Access Culvert 435.86	16
	2016-17	Replace Earthworks	311
	2017-18	Replace Concrete Lining	462
		Refurbish metal work, controller and solar panel/upgrade technology	204
		Replace Flow Meter, 1000Mm Ults Panametrics	68
		Replace Earthworks	44
	2018-19	Replace Concrete Lining	481
		Replace Earthworks	140
		Replace Access Culvert 3265.32	55
		Replace Access Culvert 2033.63	53
		Replace Check & Drop Stru 3163.82	13
		Replace Check & Drop Stru 3466.49	13
		Replace Check & Drop Stru 2060.45	12
		Replace Check & Drop Stru 2823.97	12
	2019-20	Replace Earthworks	253
	Replace Access Culvert 1497.18	38	
	Replace Access Culvert 719.94	38	
	Replace Check & Access Stru 887.58	36	
	Replace Concrete Lining	34	
2021-22	Replace Pipeline 519.99 - 1249	410	
	Replace Pipeline 00 - 519.99	375	
	Replace Pipeline 00 - 96.01	28	
	Replace Channel Offtake	10	
2022-23	Replace Meter, 300Mm Emag Siemens	56	
	Remove and Refurbish Valve	11	
2023-24	Replace Isolating Valve 2540.0M	36	
	Replace Isolating Valve 2180.0	24	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		Replace Meter, 485Mm Emag Tyco	17
		Replace Meter, 300Mm Emag Siemens	11
	2024-25	Refurbish Concrete Lining - major replacement of bays, repair cracks, stabilise structures, drainage	11
		Refurbish Concrete Lining - replace bays, repair cracks, stabilise structures, drainage	11
		Refurbish Concrete Lining - replace bays, repair cracks, stabilise structures, drainage as required	11
	2027-28	Replace Structure, 300Mm Meter Outlet	14
	2028-29	Replace Meter, 300Mm Emag Siemens	45
	2029-30	Replace Check,Drop&Access Stru 7190.82	28
		Replace Check,Drop&Access Stru 7485.28	28
		Replace Check,Drop&Access Stru 7827.28	28
		Replace Check,Drop&Access Str 9570.72	27
		Replace Check,Drop&Access 10967.92	26
		Replace Check,Drop&Access Str 10586.31	25
		Replace Check & Drop Stru 9869.42	13
		Replace Check & Drop Stru 5352.29	13
		Replace Check Structure 10047.12	13
		Replace Check & Drop Stru 6423.66	13
		Replace Check & Drop Stru 8808.72	13
		Replace Check Structure 8347.56	13
		Replace Check Structure 12682.73	12
	2031-32	Replace Regulating Gate	67
		Replace Check,Drop& Access Stru 487.68	50
		Replace Road Culvert 96.62	37
		Replace Access Culvert 554.74	35
		Replace Check,Drop&Access Stru 1219.20	29
		Replace Isolating Valve 1675.9	28
		Replace Access Culvert 853.44	27
		Replace Check,Drop&Access 11811.61	24
		Replace Concrete Works	22
		Replace Channel Offtake	21
		Replace Check & Drop Stru 1799.54	13
		Replace Bypass Structure	11
	2032-33	Replace Concrete Lining (2033)	2,166
		Replace Concrete Lining	526
		Replace Pipeline 00 - 648.61	306
		Replace 900 Dia Pipe	116
		Replace 750 Dia Pipe	81
		Replace Access Bridge 8656.32	50
		Replace Road Culvert 8981.97	32
		Replace Road Culvert 6822.73	32
		Replace Road Culvert 10024.90	29
		Replace Access Culvert 5330.86	29
		Replace Access Bridge 8823.96	28
		Clare Irrigation System - Operations and Maintenance Manual (HO Program)	28
		Replace Check, Drop & Access Stru 4238.85	28
		Replace Check,Drop&Access Stru 3806.04	28
		Replace Check,Drop&Access Stru 4744.82	28
		Replace Access Culvert 10479.02	26
		Replace Access Culvert 12819.89	24
		Replace Access Culvert 9367.11	22

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Clare Relift Pump Station	2035-36	Replace Access Bridge 243.84	19
		Refurbish metal work, controller and solar panel/upgrade technology	28
		Replace Structure, 300Mm Meter Outlet	13
	2011-12	Clare PSTNB8 - Refurbsh Pump (motor, corrosion, seals, bearings etc)	11
	2013-14	Replace Variable Speed Drive, 22Kw Toshiba	16
		Replace Switchboard Unit 1	10
	2018-19	Change Out VSD - replace VSD	17
	2022-23	Replace Pump	17
		Replace Switchboard Unit 2	13
	2024-25	Clare PSTNB8 - Refurbsh Pump (motor, corrosion, seals, bearings etc)	12
2033-34	Replace Pump	36	
	Change Out VSD - replace VSD	17	
Dalbeg A Pump Station	2011-12	Replace Valve, 534Mm Sluice John	32
		09BRI67-DALBEG A STN SUCTION MAIN WORKS	19
		Replace Rope Drum And Carriage	19
	2012-13	Replace Valve, 356Mm Sluice John	13
		Dalbeg PSTNA - Refurbish Pump No.1 (Wearing parts, bearings, seal etc)	28
		Refurbish pump inc seals, wear rings, bearings etc on PUN3 - Dalbeg Pump Station A	40
	2013-14	Refurbish pump inc. seals, wear rings, bearings etc on PUN 1 - Dalbeg Pump Station A	40
		Refurbish Pump - corrosion, wearing parts, bearings, seal etc - submersible in dry well	17
		Replace Control Equipment	53
	2015-16	Refurbish Pump - corrosion, wearing parts, bearings, seal etc - submersible in dry well	17
		Replace Ladder And Enclosure	14
	2017-18	10BR1XX-REPLACE DALBEG A HOIST	53
	2018-19	Replace Cable	19
	2019-20	10BRI56-DALBEG A HOIST 10YR INSPECTION	16
	2020-21	Replace Suction Valve	21
	2023-24	09BRI59-DALBEG A SUCTION MAIN REFURB	42
	2024-25	Replace Concrete Structures	285
		Replace Motor, 7.5Kw Flaktwood	26
		Replace Fan, 560Mm Flaktwoods	22
		Replace Pump, 70Mm Submersible Grindex 6.9Kw	19
		Replace Pump, Vacuum Busch	14
		Replace Motor, Cmg 15Kw	13
		Refurbish Sealing Water System - re-arrange and refurbish with pstn remodel	11
	2025-26	Dalbeg PSTNA - Refurbish Pump No.1 (Wearing parts, bearings, seal etc)	28
	2027-28	Refurbish pump inc seals, wear rings, bearings etc on PUN3 - Dalbeg Pump Station A	39
		Refurbish pump inc. seals, wear rings, bearings etc on PUN 1 - Dalbeg Pump Station A	39
		Refurbish Pump - corrosion, wearing parts, bearings, seal etc - submersible in dry well	17
	2029-30	10BRI56-DALBEG A HOIST 10YR INSPECTION	16
	2030-31	Replace Pump Unit No 1 Discharge Valve	68
		Replace Pump Unit No 2 Discharge Valve	68
Replace Pump Unit No 3 Discharge Valve		68	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Dalbeg B Pump Station	2032-33	Dalbeg PSTNA - Change Out Pump Controls (PLC's etc)	33
		Replace Cable Car Emergency Access	34
		Refurbish Pump - corrosion, wearing parts, bearings, seal etc - submersible in dry well	17
	2034-35	Replace Suction Pipe	167
	2035-36	Replace Pipe	609
		Replace Support Piers	100
	2011-12	Replace Trash Screen Concret Structure	56
		Replace Flow Meter Pit	22
	2011-12	Replace Outlet Structure	14
		Replace Discharge Valve	32
	2012-13	Replace Reflux Valve Pump No 1	17
		11BR1XX- DPSTNB Replace Obsolete Ctrl Eq	47
	2014-15	Dalbeg PSTNB - Refurbish Pump Unit 2 (corrosion, seals, wear rings)	34
		Dalbeg PSTNB - Refurbish Pump 1 (corrosion, seals, wearing parts)	34
		12BR1XX - DPSTNB REPLACE DISCHARGE VLV	29
	2014-15	Dalbeg PSTN B - Refurbish Vacuum Priming System (pump & motor, valves & pipework)	22
	2015-16	09BRI98-DALB PSTNB REFURB INLET WKS	23
		Refurbish SWB - change out starters & protection as required (obsolescence & risk)	14
	2018-19	Dalbeg PSTNB - Refurbish Pump Unit 2 (corrosion, seals, wear rings)	34
		Dalbeg PSTNB - Refurbish Pump 1 (corrosion, seals, wearing parts)	34
	2018-19	Change Out:Replace Corroded Fixings	11
		Dalbeg PSTN B - Refurbish Vacuum Priming System (pump & motor, valves & pipework)	22
	2021-22	Replace Suction Valves	132
	2022-23	09BRI98-DALB PSTNB REFURB INLET WKS	23
		Replace Pump No 1	127
	2022-23	Replace Pump No 2	127
		Replace Cable	177
	2023-24	Dalbeg PSTNB - Refurbish Pump Unit 2 (corrosion, seals, wear rings)	33
	2024-25	Dalbeg PSTNB - Refurbish Pump 1 (corrosion, seals, wearing parts)	33
		Dalbeg PSTN B - Refurbish Vacuum Priming System (pump & motor, valves & pipework)	21
	2025-26	Dalbeg PSTNB - Surge Tank Refrubish (Blast and Paint Internal and External Surfaces)	17
	2026-27	Replace Pump, Busch Dolphin	24
	2027-28	09BRI98-DALB PSTNB REFURB INLET WKS	22
2029-30	Dalbeg PSTN B - Refurbish Vacuum Priming System (pump & motor, valves & pipework)	21	
2030-31	Dalbeg PSTNB - Refurbish Pump Unit 2 (corrosion, seals, wear rings)	33	
	Dalbeg PSTNB - Refurbish Pump 1 (corrosion, seals, wearing parts)	33	
2031-32	Replace Switchboard	135	
	Change Out:Replace Corroded Fixings	11	
2033-34	09BRI98-DALB PSTNB REFURB INLET WKS	22	
	Refurbish SWB - change out starters & protection as required (obsolescence & risk)	13	
2034-35	Dalbeg PSTN B - Refurbish Vacuum Priming System (pump & motor, valves & pipework)	21	
Dalbeg Irrigation Distribution	2017-18	Replace Road Culvert 8754.92	17
		Replace Access Culvert 7924.80 Lot 38	14
		Replace Access Culvert 7336.54 Lot 36	13

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2018-19	Replace Flow Meter, 800Mm Ults Panametrics	68
		Replace Regulating Gate	59
		Replace Bypass Structure	23
		Replace Check & Culv. 5704.03	20
		Replace Access Culvert 6292.60 Lot 27	13
		Replace Access Culvert 5876.64 Lot 26	13
		Replace Access Culvert 5294.38 Lot 24	12
		Replace Access Culvert 6790.94 Lot 34	12
	2019-20	Replace Regulating Gate	89
		Replace Walsh Rd Siphon 4874.7M	34
		Replace Bypass Structure	23
		Replace Road Culvert 2688.12	22
	2020-21	Replace Pipeline 00 - 807.10	405
		Replace Pipeline 00 - 416.50	148
		Replace Pipeline 908.15 - 1236.45	92
		Replace Pipeline 1236.45 - 1487.0	55
		Replace Pipeline 808.62 - 906.62	42
		Replace Surge Tank 725.96	17
		Replace Surge Tank 807.10	15
		Replace Channel Offtake	15
		Replace Surge Tank 1236.45	12
		Replace Surge Tank 906.62	12
	2023-24	Refurbish/replace electronics	139
		Replace Valve, 450Mm Sluice Keystone Fl	13
	2024-25	Replace Regulating Gate	30
		Replace Check Drop&Culv 1877.57 Lot 6	29
		Replace Access Culvert 445.01 Lot 2&3	13
	2025-26	Refurbish Concrete Lining - repair earthworks and replace concrete panels as required	100
	2026-27	Dalbeg Channel 1 - Replace concrete lined channel with Gravity HDPE Pipeline (Stage 1)	454
		Replace Earth Channel 914.40 - 3910.58	207
		Replace Earth Channel 45.72 - 592.84	108
		Replace Earth Channel 00 - 595.88	91
		Replace Earth Channel 00 - 1320.39	85
		Replace Access Culvert 1666.55 Lot13	38
		Replace Gate Structure Start	31
		Replace Access Culvert 850.39 Lot12	26
		Replace Access Culvert 2820.92 Lot14	16
		Replace Channel Offtake	13
		Replace Check&Drop Struc 502.92	12
		Replace Overflow Structure 1318.26	12
		Replace Pipeline 0.0 - 45.72	11
		Replace Check&Drop Struc 509.02 Lot9	10
		Replace Channel Overflow 586.74	10
	2027-28	Dalbeg Channel 1 - Replace concrete lined channel with Gravity HDPE Pipeline	650
		Replace Pipe Work	332
		Replace Access Culvert 357.23 Lot10	28
		Replace Concrete Works	20
		Replace Scour Outlet	19
		Replace Check&Drop Struc 3691.13	11
		Replace Check&Drop Struc 2833.12 Lt20	11
	2028-29	Replace Meter, 300Mm Emag Siemens	22

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Dalbeg Relift Pump Station	2030-31	Refurbish/replace electronics	50
	2032-33	Replace Concrete Lining	243
		Dalbeg Irrigation System - Operations and Maintenance Manual (HO Program)	11
	2034-35	Refurbish Gate - refurbish corrosion control, anodes, bearings and other metalwork as required	17
	2016-17	Replace Pump No 1	118
		Replace Pump No 2	118
		Replace Discharge Valve	14
Elliot Irrigation Distribution	2019-20	Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	13
	2034-35	Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	13
	2012-13	Refurbish Gate - paint gate and refurbish metalwork as required	85
	2014-15	Replace Actuator	25
	2015-16	M1 operating range beaching repair	11
		Replace Level Control Sensor	10
	2016-17	Replace 4M Access Rd To Scour Cassidy Ck	15
	2017-18	Replace Gate Control Telemetry & Equipment	51
	2019-20	Replace Boundary Fence Of Emc, Gates	610
	2021-22	Replace 750Mm Butterfly Valve	35
	2022-23	Refurbish Gate - paint gate and refurbish metalwork as required	85
		Elliot Main Channel - Reg Gate RO35 Blast, Paint Overhaul Valves	11
	2023-24	Refurbish Gate - control gate replacement	11
	2026-27	Replace Regulating Gates	166
	2029-30	Study: Condition Assssments	28
		Replace Actuator	25
	2032-33	Refurbish Gate - paint gate and refurbish metalwork as required	84
		Replace Gate Control Telemetry & Equipment	50
		Replace 450 Dia Batescrew Gate	34
		Elliot Irrigation Area - Operations and Maintenance Manual (HO Program)	11
2034-35	Replace Concrete Work	1,755	
	Replace Concrete Works	250	
2035-36	Replace Concrete Work	209	
	Replace Concrete Works	182	
	Replace Level Control Sensor	10	
Elliot Pump Station	2011-12	Replace Switchboard No 1 (Pumps 1 & 2)	286
		10BRI93-ELLIOT STN REPLACE CTRL EQPT	120
		Elliot PSTN - Refurbish Pump Unit No1 (mech seals, wear rings, bearings)	33
		Elliot PSTN RM - Refurbish Batescrew gate (access & rock protection works)	11
	2012-13	Replace Radio Telemetry Equipment	58
		Elliot PSTN - Refurbish Pump Unit No. 3 (mech seals, wear rings, bearings)	28
		Refurbish Ventilation Air Con, Water Damaged Floors and UV Prot for Cables, paint steelwork	17
	2014-15	Replace Air Valve 303.1	10
		Replace Air Valve 63.11	10
	2015-16	10BRI92-REFURBISH ELLIOT No 2 PUMP	74
		Replace Flow Meter, 910Mm Ults Danfoss	69
	2016-17	Replace Incoming Supply Panel	113

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2017-18	Elliot PSTN - Refurbish Pump Unit No1 (mech seals, wear rings, bearings)	34
	2019-20	Refurbish Ventilation Air Con, Water Damaged Floors and UV Prot for Cables, paint steelwork	17
	2021-22	10BRI92-REFURBISH ELLIOT No 2 PUMP	73
		Replace Hydraulic Cylinder No. 1 Valve	11
		Replace Hydraulic Cylinder No. 2 Valve	11
	2022-23	Replace Incoming Supply Panel	112
		Replace Hydraulic System	25
	2023-24	Elliot PSTN - Refurbish Pump Unit No1 (mech seals, wear rings, bearings)	33
	2026-27	10BRI93-ELLIOT STN REPLACE CTRL EQPT	126
		Refurbish Ventilation Air Con, Water Damaged Floors and UV Prot for Cables, paint steelwork	17
	2027-28	Replace Cable	440
		10BRI92-REFURBISH ELLIOT No 2 PUMP	72
		Replace Structure	58
		Replace Radio Telemetry Equipment	57
		Elliot PSTN - Refurbish Pump Unit No. 3 (mech seals, wear rings, bearings)	28
	2029-30	Elliot PSTN - Refurbish Pump Unit No1 (mech seals, wear rings, bearings)	33
	2030-31	Replace Structure Of Building	86
	2031-32	Replace Cabling-Pump No. 3	84
		Elliot PSTN RM - Refurbish Batescrew gate (access & rock protection works)	11
	2032-33	Replace Pump	339
	2033-34	10BRI92-REFURBISH ELLIOT No 2 PUMP	72
		Refurbish Ventilation Air Con, Water Damaged Floors and UV Prot for Cables, paint steelwork	17
	2035-36	Replace Pump, Submersible Flygt	146
		Replace Flow Meter, 910Mm Ults Danfoss	67
		Elliot PSTN - Refurbish Pump Unit No1 (mech seals, wear rings, bearings)	33
Haughton Drainage	2016-17	Replace Drainage Inlet (Start)Lot 17	24
	2021-22	Replace Lot 76 Drainage Inlet	44
		Replace Lot 61 Drainage Inlet 337.0 R	37
		Replace Drainage Inlet Lot 65	37
Haughton Irrigation Distrib	2011-12	Refurbish Safety Screen and Guides	122
		Replace Gate Control Equipment	29
	2012-13	Replace Gate Control Equipment	31
	2013-14	Replace Gate Control Equipment	70
		Replace Rtu, Moscad-L	21
		Replace Radio, Darcom 900Mhz	15
		Replace Antenna & Cabling, Yagi 900Mhz	11
	2014-15	Replace Gate Control Equipment	15
	2015-16	EEO Assessment and Report	85
	2016-17	Replace Fencing Hmc 33.7 - 42.8K	54
		Replace Scour Outlet 787.0	41
		Replace Scour Outlet 1178.7	40
		Replace Scour Outlet 811.1	40
		Replace Scour Outlet 1724.8	39
		Replace Valve, 1000Mm Slide Gate Rodney	16
		Replace Scour Outlet 60252.0	11

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2017-18	Replace Gate Control Equipment	14
	2018-19	Replace Electrical System	30
	2019-20	Replace Hh076R1 232.4 End Type K	11
	2020-21	EEO Assessment and Report	85
		11BR1XX Replace 900MHz Gate Radios HMC	30
	2021-22	Replace Pipe 12.5 - 49.1	46
		Replace Drainage Pipeline Inlet 3497L Lot 55	41
	2022-23	Replace Safety Screens	48
	2025-26	Replace Hmc 55100-61243.1	111
		Replace Walkway 8164	105
		Replace Walkway 6766	101
		EEO Assessment and Report	84
	2026-27	Refurbish Safety Screen and Guides	124
		Replace Gate Control Equipment	29
		Refurbish Gate - control gate replacement	11
	2027-28	Replace Gate Control Equipment	31
		Refurbish Gate - control gate replacement	17
	2028-29	Replace Steel Walkway 564M	154
		Replace Gate Control Equipment	69
		Replace Rtu, Moscad-L	21
		Replace Radio, Darcom 900Mhz	15
		Replace Antenna & Cabling, Yagi 900Mhz	11
	2029-30	Replace Gate Actuator, Emp/Sew-Euro Drive	22
		Replace Gate Control Equipment	15
	2030-31	EEO Assessment and Report	84
		11BR1XX Replace 900MHz Gate Radios HMC	29
	2032-33	Replace Regulating Gate	661
		Haughton Irrigation System - Operation and Maintenance Manual	28
		Haughton Channel H10 - Replace Meter HH054W1 with EM or Ultrasonic type	19
	2033-34	Replace Regulating Gate	454
		Replace Left Hand Regulating Gate	394
		Replace Right Hand Regulating Gate	394
	2034-35	Replace Power Supply	54
		Replace Control Equipment	39
		Replace Gate Actuator, Emp/Sew-Euro Drive	22
	2035-36	Replace Regulating Gate	628
		EEO Assessment and Report	84
		Replace Fencing, Gates & Signage	18
Haughton Mc Irrigation Distrib	2013-14	Haughton Main Channel - Reg Gate RO01 Blast, Paint, Replace Anodes, Bearings	28
		Haughton Balancing Storage - Refurbish Rotating Weed Screen (inc paint, chain replacement etc)	18
	2016-17	M1 pavement replacement	28
		Replace Switchboard And Controls	13
		Haughton Main Channel - Refurbish Berm Road (upgrade/stabilisation works)	11
	2018-19	M2 mechanical/elec control replacement;	28
	2019-20	10BRI78-HAUG SYS REPLACE MOSCAD RTUs	58
		Replace Structure, 50Mm Meter Outlet	22
		Haughton Balancing Storage - Refurbish Rotating Weed Screen (inc paint, chain replacement etc)	18
		10BRI79-REPLACE HAUG SYS 900MHZ RADIOS	14
	2023-24	Haughton Main Channel - Reg Gate RO01 Blast, Paint, Replace	28



<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Millaroo A Pump Station		Anodes, Bearings	
	2024-25	Refurbish Gate	11
	2025-26	Haughton Balancing Storage - Refurbish Rotating Weed Screen (inc paint, chain replacement etc)	18
	2026-27	Replace Fencing Hmc 19523 - 33692	956
		Replace Fencing Hmc 5150 - 19374	778
		Replace Fencing Hmc 00 - 5150	285
	2028-29	Refurbish: mechanical/elec control replacement;	28
	2029-30	10BRI78-HAUG SYS REPLACE MOSCAD RTUs	58
		Replace Regulating Gate	23
		10BRI79-REPLACE HAUG SYS 900MHZ RADIOS	14
	2030-31	Haughton Main Channel - Refurbish Berm Road (upgrade/stabilisation works)	11
	2031-32	M1 pavement replacement	28
		Haughton Balancing Storage - Refurbish Rotating Weed Screen (inc paint, chain replacement etc)	18
		Replace Control Equipment	11
	2033-34	Replace Gate Control Equipment	269
		Haughton Main Channel - Reg Gate RO01 Blast, Paint, Replace Anodes, Bearings	28
	2035-36	Refurbish: mechanical/elec control replacement;	28
		Replace Actuator (Hoist), Rotork	20
	2011-12	11BR1XX Refurbish/Replace Inlet Trash Sc	14
		Advance Pump Frame Flexing/Vibration Investigation - Millaroo PSTNA Pump Units 1 to 4	11
	2012-13	Replace Control Equipment	152
		Replace Discharge Valve	56
		Refurbish SWB - refit starter units	28
	2015-16	Replace Instrumentation	15
	2016-17	Replace Instrumentation	14
		Replace Pump, 80Mm Submersible Flygt	11
	2017-18	Replace Instrumentation	14
	2018-19	Refurbish: Remove and repair surge vessel fixings and inspect internal condition	34
		Replace Instrumentation	14
	2019-20	Millaroo PSTNA - Refurbish Control System Electronics	67
		10BRI43-MILLAROO A CRANES 10YR INSP	16
	2020-21	Refurbish: mech and elec pump and valves as required by 2003 strategy	45
	2021-22	09BRI49-MILLAROO A UNIT 4 MOTOR REFURB	10
		Replace Pump	10
	2023-24	sd-09BRI48-MILLAROO A PUMP 4 REFURB	36
		11BR1XX - MPSTNA REFURB PUMP & MOTOR	23
		11BRI41 - MPSTNA REFURB PUMP & MOTOR	20
	2025-26	10BRI35-REFURBISH MILLAROO A PUMP 3	41
		Replace Ventilation System	22
		11BR1XX - MPSTNA REFURB PUMP & MOTOR	12
		11BRI41 - MPSTNA REFURB PUMP & MOTOR	10
	2026-27	Millaroo PSTNA - Refurbish Control System Electronics	67
2029-30	10BRI43-MILLAROO A CRANES 10YR INSP	16	
2030-31	Replace Switchboard	380	
	Replace Incoming Supply Panel	111	
	Replace Cable	46	
	Refurbish SWB - refit starter units	28	
	Replace Instrumentation	14	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>	
Millaroo B Pump Station	2031-32	Replace Instrumentation	14	
	2032-33	Replace Instrumentation	14	
	2033-34	09BRI47-MILLAROO A STN REPLACE F/MTR 1&2	101	
		Millaroo PSTNA - Refurbish Control System Electronics	67	
		Refurbish: Remove and repair surge vessel fixings and inspect internal condition	33	
	2034-35	Replace Instrumentation	14	
		Replace Pump No 4	57	
		09BRI49-MILLAROO A UNIT 4 MOTOR REFURB	10	
	2035-36	Replace Fencing, Gates & Signage	10	
		Replace Pump No 1	445	
		Replace Steel Pipe	286	
		Replace Discharge Valve	149	
		Replace Pump Motor No 1	69	
		Replace Concrete Pipe	50	
		Refurbish: mech and elec pump and valves as required by 2003 strategy	44	
		Replace Suction Pipe	20	
		Replace Outlet Structure	17	
		Replace Suction Valve	11	
		2011-12	Replace Discharge Valve	222
	Replace Control Equipment		97	
	11BR1XX REFURBISH PUMP REFLUX VALVES ON		38	
	Millaroo PSTNB - Refurbish PUN 3 (corr., seals, wearing parts, bearings, motor, etc.)		33	
	Replace Compressed Air System-Complete		24	
	2014-15		09BRI54-MILLAROO B PUMP 1 REFURB	61
			Millaroo PSTNB - Refurbish Corroding Metalwork	11
	2015-16		Change Out Contactors - replace contactors - obsolescence/reliability	23
			Change Out: Element - replace electronics and element as required	17
	2016-17		10BRI34-REFURBISH PUMP 2 MILLAROO B STN	66
	2017-18		Millaroo PSTNB - Refurbish PUN 3 (corr., seals, wearing parts, bearings, motor, etc.)	34
	2018-19		Refurbish Metalwork - screens, bellmouths, walkways & support - paint & replace as required	23
	2019-20		Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	79
			10BRI36-REFURBISH MILL B PRIMING SYSTEM	43
	2020-21		09BRI54-MILLAROO B PUMP 1 REFURB	61
			Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	34
			Refurbish Valve - corrosion, seals etc rarely used	17
	2021-22		Replace Suction Valve	99
			Replace Reflux Valve	51
			11BR1XX REFURBISH PUMP REFLUX VALVES ON	39
	2022-23	10BRI34-REFURBISH PUMP 2 MILLAROO B STN	65	
	2023-24	Millaroo PSTNB - Refurbish PUN 3 (corr., seals, wearing parts, bearings, motor, etc.)	33	
2025-26	Replace Pump	83		
	Change Out: Element - replace electronics and element as required	17		
2026-27	09BRI54-MILLAROO B PUMP 1 REFURB	61		
	Millaroo PSTNB - Refurbish Suction Valve Pit Metalwork (covers, supports and pipe fxings)	11		
2028-29	10BRI34-REFURBISH PUMP 2 MILLAROO B STN	65		
	Refurbish Metalwork - screens, bellmouths, walkways & support - paint	22		

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		& replace as required	
	2029-30	Millaroo PSTNB - Refurbish PUN 3 (corr., seals, wearing parts, bearings, motor, etc.)	33
	2030-31	Replace Switchboard	250
		Replace Cable	193
	2031-32	11BR1XX REFURBISH PUMP REFLUX VALVES ON	38
	2032-33	09BR154-MILLAROO B PUMP 1 REFURB	61
	2033-34	Refurbish Valve - corrosion, seals etc rarely used	17
	2034-35	Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	78
		10BR134-REFURBISH PUMP 2 MILLAROO B STN	65
	2035-36	Millaroo PSTNB - Refurbish PUN 3 (corr., seals, wearing parts, bearings, motor, etc.)	33
		Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	33
		09BR171-MILL B INTAKE PIPES AND PROT WKS	28
		Change Out: Element - replace electronics and element as required	17
Millaroo Drainage	2034-35	Replace Outfall Structure 10951.46	382
		Replace Drop Structure 8473.44	232
		Replace Parshall Flume 6169.15	157
		Replace Drop Structure 5849.11	133
		Replace Access Culvert 6123.43	101
		Replace Drop Structure 10539.98	95
		Replace Drop Structure 3011.42	78
		Replace Access Culvert 2523.74	74
		Replace Road Culvert 1621.23	74
		Replace Drop Structure 3569.21	54
		Replace Road Culvert 405.38	38
		Replace Road Culvert 1751.08	37
		Replace Access Culvert 996.39	35
		Replace Drop Structure 2660.90	34
		Replace Drop Structure 495.30	18
	2035-36	Replace Outfall Structure 1188.72	104
		Replace Outfall Structure 2051.30	92
		Replace Outfall Structure 1225.30	77
		Replace Outfall Structure 1432.56	75
		Replace Drop Structure 1310.64	60
		Replace Drop Structure 1030.22	24
		Replace Drop Structure 841.25M	23
Millaroo Irrigation Distrib	2011-12	Repair/Replace 100m of HDPE Lining Near Reg Gate 108 - Millaroo Main Channel	55
	2012-13	11BR1XX - REG 104 Replace Control Equip	15
		Refurbish Electronics - replace electronics, batteries, solar pannel etc as required	11
	2013-14	Refurbish Gate - refurbish metalwork, paint, fixings, attach anodes etc as required	14
	2016-17	Replace Concrete Lining	412
		Replace Earthworks	411
		Replace Ma209W1 Mbs Bank Type Hk	61
		Replace Regulating Gate	43
		Refurbish Gate - replace electronics, solar panel, batteries & motor, refurbish hoist	34
		Replace Concrete Work	21
		Millaroo Balancing Storage - Refurish Road (Erosion, pavement, drainage)	17

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2017-18	Replace Concrete Lining	352
		Replace Earthworks	89
		Refurbish Valve - refurbish valve, pipework and pit as required	11
	2018-19	Replace Earthworks	502
		Replace Offtake Structure	48
		Replace Pipe Work	43
		Replace Access Culvert 1933.96	38
		Replace Concrete Works	32
		Replace Channel Overflow 966.23	32
		Replace Access Crossing Culvert 747.77	24
		Replace Access Culvert 234.76	24
		Replace Road Culvert 705.92	21
		Replace Check & Drop Structure 309.07	20
		Replace Check Structure 240.79	18
		Replace Check & Drop Structure 1051.56	16
		Replace Check & Drop Structure 1344.07	16
		Replace Check & Drop Structure 1548.38	16
		Replace Check & Drop Structure 2302.76	16
		Replace Check & Drop Structure 731.52	15
		Replace Channel Overflow 2386.58	14
		Replace Access Culvert 720.00	13
		Replace Access Culvert 246.89	12
		Replace Check Structure 484.63	12
	2019-20	Replace Concrete Lining	655
		Replace Earthworks	647
		Replace Regulating Gate	53
		Replace Offtake Structure	26
		Replace Access Road Culvert 1592.28	24
		Replace Access Road Culvert 2413.71	17
		Replace Road Culvert 3050.00	17
		Replace Concrete Works	14
	2020-21	Replace Concrete Lining	967
		Millaroo Channel 13 - Refurbishment Open Channel with HDPE Pipeline (Stage II)	634
		Replace Earthworks	320
		Replace Road Culvert 496.82	17
		Replace Access Culvert 18.23	12
		Replace Offtake Structure	11
	2021-22	Replace Synthetic Lining 1139.95-2529.95M	612
		Refurbish Structure - replace/upgrade metalwork, protection works & approaches	11
	2022-23	Replace Earthworks	203
		Replace Concrete Lining	173
		Replace Regulating Gate	42
	2023-24	Refurbish Gate - refurbish metalwork, paint, fixings, attach anodes etc as required	13
	2025-26	Replace Boundary Fencing	148
		Refurbish Concrete Lining - repair earthworks and replace concrete panels as required	89
		Replace Air Vent 1320.40M	12
		Replace Air Vent 1886.60M	12
		Refurbish Concrete Lining - repair earthworks and replace concrete panels as required	11
		Replace Gearbox	11

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2026-27	Replace Regulating Gate	198
		Replace Air Vent 545M	13
		Replace Air Vent 985M	12
	2027-28	11BRIXX - REG 104 Replace Control Equip	15
		Refurbish Electronics - replace electronics, batteries, solar pannel etc as required	11
	2030-31	Millaroo Balancing Storage - Refurish Road (Erosion, pavement, drainage)	17
	2031-32	Refurbish Gate - replace electronics, solar panel, batteries & motor, refurbish hoist	33
		Replace Structure, 250Mm Meter Outlet	12
	2032-33	Replace Concrete Lining	457
		Replace Check & Drop Structure 6154.67	44
		Replace Basket Rd Culvert 8333.84	35
		Replace Access Culvert 18982.94 L135	33
		Replace Access Culvert 11098.68 Lot 46	32
		Replace Access Culvert 13158.22 Lot 51	31
		Replace Access Culvert 18655.28 L134	30
		Replace Access Culvert 15386.30 Lot 63	28
		Replace Access Culvert 13587.68 Lot 51	26
		Replace Access Culvert 7099.40 Lot 40	26
		Replace Access Culvert 18312.38 Lot132	25
		Replace Access Culvert 15740.48 Lot 67	24
		Replace Road Culvert 10507.07 Lot175	23
		Refurbish Meter - upgrade technology, refurbish metal work & protection works	22
		Replace Access Culvert 14730.37 Lot 57	18
		Replace Access Culvert 17337.02 Lot 81	18
		Replace Access Culvert 18079.52 Lot131	18
		Replace Check Structure 1139.95 Por 20	17
		Replace Road Culvert - 1894.33	13
		Replace Check & Drop Structure 4686.30	12
		Replace Check & Drop Structure 4855.46	12
		Replace Check & Drop Structure 5145.02	11
		Replace Check & Drop Struc 17027.65	11
		Replace Check & Drop Struc 17716.50	11
		Millaroo Irrigation System - Operations and Maintenance Manual (HO Program)	11
		Refurbish Valve - refurbish valve, pipework and pit as required	11
		Replace Check & Drop 3371.09	11
		Replace Check & Drop Structure 4242.82	11
		Replace Check & Drop Struct 10041.03	11
		Replace Check & Drop Structure 7111.59	11
		Replace Check Structure 3703.32	10
		Replace Check & Drop Struc 17349.22	10
		Replace Check & Drop Struc 18116.09	10
	2033-34	09BRI55-MILLAROO FENCING IMPLIMENTATION	89
		Replace Earthworks	26
		Refurbish Gate - refurbish metalwork, paint, fixings, attach anodes etc as required	13
	2034-35	Replace Gate Control Equipment	95
		Refurbish Meter - upgrade technology, refurbish metal work & protection works	56
		Replace Pipe Work	11
		Replace Concrete Work	11

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>	
Millaroo Relift Pump Station	2035-36	Refurbish Meter - upgrade technology, refurbish metal work & protection works	33	
	2012-13	Replace Control Equipment	34	
	2013-14	Replace Pump Priming System	47	
	2015-16	Replace Switchboard	19	
	2016-17	Replace Discharge Valve	14	
	2019-20	Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	11	
	2032-33	Replace Control Equipment	33	
	2033-34	Replace Pump, Centrifugal Tkl Mvp03	29	
	2034-35	Refurbish: Refurb mech and elec pump and valves as required by 2003 strategy	11	
	System	2028-29	Study:Condition Assssments	134
		Condition Assessments	101	
Tom Fenwick Pump Station 1	2029-30	Study:O&M Systems Manual	56	
	2011-12	10BRI82-HAUG STN 1 REPLACE CTRL SYS PLC	107	
	2012-13	Haughton PSTN1 - Replace UPS Unit (pending condition assessment)	17	
		Haughton PSTN1 - Refurbish PUN 1/1 (bearing replacement, seals, rings, sleeves, impeller wear, etc)	90	
		Refurbish Motor - bearings, bake, etc as required (A class overhaul)	56	
		Tom Fenwick PSTN1 - Refurbish PUN1 SV (corrosion treatment, seals, seats, adjustment, refer Keystone)	16	
		2013-14	Replace Battery Charger	18
		2014-15	Replace Fire Alarm System	53
		Lift Refurbishment - drive components, safety equipment, metalwork as required	23	
		Haughton PSTN1 - Refurbish Header Tank inc paint tank and refurb assoc valves & pipwrk	11	
	2017-18	Haughton PSTN1 - Refurbish Valve (corrosion treatment, seals, seats, adjustment (refer Keystone)	16	
	2018-19	Change Out Charger - NiCd batteries & charger	11	
	2019-20	10BRI77-REPLACE ZORC T/F STN 1 MOTOR 2	36	
		10BRI91-HAUG STN1 BRIDGE CRANE 10YR INSP	21	
		Refurbish Sump Pump System - replace pumps and refurbish pipework & electricals	17	
	2020-21	10BRI85-HAUG1/2 MOTOR OVERHAUL	45	
	2021-22	Haughton PSTN1 - Replace UPS Unit (pending condition assessment)	18	
	2022-23	Replace Cable 11Kv Supply Feeder No.2	11	
	2024-25	Replace Main L.V.Switchboard-Unit 011	229	
		Replace Cable	174	
		10BRI82-HAUG STN 1 REPLACE CTRL SYS PLC	112	
		10BRI89-HAUG1/2 PUMP REFURBISHMENT	87	
		Replace Transformer 11Kv / 415V	84	
		10BRI94-HAUG1/2 DEL VALVE REFURBISHMENT	42	
		Lift Refurbishment - drive components, safety equipment, metalwork as required	22	
		Replace Cable 11Kv Supply Feeder No.1	11	
	2025-26	Refurbish Cntl - PLC obsolescence replacement, Square D	111	
	Refurbish Motor - bearings, bake, etc as required (A class overhaul)	56		
	Refurbish Discharge Valve - Pun1 Haugh 1	48		
2026-27	Replace H V Switchboards	527		
2027-28	Haughton PSTN1 - Refurbish PUN 1/1 (bearing replacement, seals, rings, sleeves, impeller wear, etc)	89		
	Tom Fenwick PSTN1 - Refurbish PUN1 SV (corrosion treatment, seals,	16		

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		seats, adjustment, refer Keystone)	
	2028-29	Flood repairs/erosion damage	112
		Refurbish Road - seal between service bld to prevent dust intakes	34
		Replace Battery Charger	18
		09BRI79-HAUG STN 1 CONTROL SYS TESTING E	12
	2029-30	Replace Suction Valve	364
		Replace Discharge Valve	299
		Replace Ventilation System	164
		Refurbish Metalwork - electrical, wall cladding, roof, guttering, guard rails, handrails, lightning arresters etc - refurbish or replace as required	89
		10BRI77-REPLACE ZORC T/F STN 1 MOTOR 2	35
		Refurbish Crane - overhaul all mechanical parts, corrosion treat metalwork	22
		10BRI91-HAUG STN1 BRIDGE CRANE 10YR INSP	21
	2031-32	10BRI85-HAUG1/2 MOTOR OVERHAUL	44
		Haughton PSTN1 - Replace UPS Unit (pending condition assessment)	18
	2032-33	Refurbish Cntl - PLC obsolescence replacement, Square D	111
		Haughton PSTN1 - Refurbish Valve (corrosion treatment, seals, seats, adjustment (refer Keystone)	16
	2033-34	Change Out Charger - NiCd batteries & charger	11
	2034-35	Replace Fire Alarm System	51
		Lift Refurbishment - drive components, safety equipment, metalwork as required	22
		Refurbish Sump Pump System - replace pumps and refurbish pipework & electricals	17
		Haughton PSTN1 - Refurbish Header Tank inc paint tank and refurb assoc valves & pipwrk	11
	2035-36	Replace Stairway & Handrail	23
		Replace Fencing, Gates & Signage	10
Tom Fenwick Pump Station 2/3	2011-12	10BRI83-HAUG STN2 RELACE CTRL SYS PLC	104
		Relocate Sump Pump Controls to Stn Bldg - Tom Fenwick PSTN 2/3	33
		Replace Ultrasonic Flow Transmitter	22
		Replace ASEA Mech Flow Switches with IFM	20
		Relocate Sump Pump Controls to Station S	20
		Haughton PSTN 2/3 - Replace seals, corrosion protection (13t) - including pressure testing	11
	2012-13	Haughton PSTN2 Pump Unit 2 - Refurbish Submarine Doors( hydraulic/seals)	17
		Refurbish Metalwork - corrosion treatment, fixings, minor replacements as required	11
	2013-14	Haughton PSTN2/3 - Refurbish Doors (hydraulics/seals)	17
	2015-16	09BRI80-HAUG STN 2 CONTROL SYS TESTING E	13
	2016-17	Haughton PSTN 2_3 - Refurbish Pump Unit 3 (Seals, Impeller, Bearings)	227
		Haughton PSTN 2_3 - Refurbish Pump Unit 3 Gear Box (Lube system, Bearings, Gears)	85
		Haughton PSTN 2 - Refurbish Pump Unit Motor 3 (class A overhaul - bearings, clean, bake)	23
	2017-18	Replace Trash Screen	173
		Refurbish Metalwork - corrosion treatment, fixings, minor replacement as required	23
		Refurbish Cooling Water System - refurbish and replace components as required	12
	2018-19	Replace Fire Alarm System	17
	2021-22	Replace Intake Access	15

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		Replace Access Platform Guard Gate Unit 2	14
		Replace Access Platform Guard Gate Unit 3	14
		Replace Uninterruptable Power Supply	14
	2022-23	10BRI74-HAUG PUMP 2 REFURBISHMENT	221
		Replace All Vent Operating Machinery	169
		10BRI73-HAUG 2 - GEAR BOX REFURBISHMENT	80
		Replace Structure	72
		Replace Security Alarm System	52
		Haughton PSTN2_3- Replace/Refurbish corroded volute drain valves & pipework	50
		10BRI90-HAUG 1/2 MOTOR REFURBISHMENT	29
		Replace Sump Pump No.1 E115.16; Pump 3	15
		Replace Sump Pump No.1 E115.16;Pump 2	15
		Replace Sump Pump No.2 E117.16; Pump 2	15
		Replace Sump Pump No.2 E117.16;Pump 3	15
		09BRI80-HAUG STN 2 CONTROL SYS TESTING E	12
		Replace Cable 11Kv Motor Station No.2	11
		Replace Cable 11Kv Motor Station No.3	11
	2023-24	Balance of Replacement Costs over two years	222
		Refurbish Motor - rewind if required (LSE)	155
		Refurbish Metalwork - corrosion treatment, fixings, minor replacement as required	22
	2024-25	10BRI83-HAUG STN2 RELACE CTRL SYS PLC	109
		Replace Erosion Protection	71
	2027-28	Replace Cable	494
		Replace H V Switchboards	322
		Replace L V Switchboards	280
		Haughton PSTN2 Pump Unit 2 - Refurbish Submarine Doors( hydraulic/seals)	17
		Refurbish Metalwork - corrosion treatment, fixings, minor replacements as required	11
	2028-29	Haughton PSTN2/3 - Refurbish Doors (hydraulics/seals)	17
	2029-30	Haughton PSTN 2_3 - Refurbish Pump Unit 3 (Seals, Impeller, Bearings)	223
		Haughton PSTN 2_3 - Refurbish Pump Unit 3 Gear Box (Lube system, Bearings, Gears)	84
		Haughton PSTN 2 - Refurbish Pump Unit Motor 3 (class A overhaul - bearings, clean, bake)	22
		Refurbish Metalwork - corrosion treatment, fixings, minor replacement as required	22
		09BRI80-HAUG STN 2 CONTROL SYS TESTING E	12
	2030-31	10BRI83 Tom Fenwick PSTN2 - Replace Cont	95
	2031-32	Replace Ultrasonic Flow Transmitter	22
		Haughton PSTN 2/3 - Replace seals, corrosion protection (13t) - including pressure testing	11
	2032-33	Replace Guard Gate No.2 Pump Unit	414
		Replace Valve	138
		Replace Valves	138
		Replace Intake Access	15
		Refurbish Cooling Water System - refurbish and replace components as required	12
	2033-34	Replace Guard Gate No.3 Pump Unit	414
	2035-36	10BRI74-HAUG PUMP 2 REFURBISHMENT	221
		10BRI73-HAUG 2 - GEAR BOX REFURBISHMENT	80
		10BRI90-HAUG 1/2 MOTOR REFURBISHMENT	29



<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Tom Fenwick Pump Station 4/5		Refurbish Metalwork - corrosion treatment, fixings, minor replacement as required	22
	2011-12	10BRI84-HAUG STN 3 REPLACE CTRL SYS PLC	104
		Replace ASEA Mech Flow Switches with IFM	20
	2012-13	Haughton PSTN3 Pump Unit 5 - Refurbish Submarine Doors (hydraulic/seals)	17
		Refurbish Road - re-stabilise road, drainage improvement, cross drains	17
	2013-14	Refurbish Gear Box - overhaul on condition, need stratetgy, major task - lube system, bearings, gears, corrosion treatment	85
		Refurbish Ventilation System - overhaul/replace fans & motors	34
		Refurbish Doors - maintenance - hydraulic/seals - critical component	17
		Replace Fire Alarm System	16
		Refurbish Hydraulics - refurbish system as required, ram, valves, pipework etc	11
	2014-15	Refurbish Gear Box - overhaul on condition, need stratetgy, major task - lube system, bearings, gears, corrosion treatment	86
	2015-16	Tom Fenwick PSTN3 - Refurbish PUN4 (refurbish seals, impeller, bearings etc)	230
		Tom Fenwick PSTN3 - Refurbish PUN 4 Motor (Class A overhaul - bearing replaced, clean, bake)	23
		09BRI81-HAUG STN 3 CONTROL SYS TESTING E	13
	2016-17	Tom Fenwick PSTN3 - Refurbish PUN5 (refurbish seals, impeller, bearings etc)	227
		Refurbish Ventilation System - overhaul/replace fans & motors	34
		Change Out CB - reliability & obsolescence	23
		Tom Fenwick PSTN 3 - Refurbish PUN5 Motor (Class A overhaul - bearing replaced, clean, bake)	23
	2018-19	Refurbish Metalwork - corrosion treatment, fixings, minor replacements as required	11
		Replace Aux Lub Pump Motor - Gearbox	11
	2019-20	Refurbish Ventilation System - overhaul/replace fans & motors	34
	2021-22	Replace Access Platform Guard Gate Unit 4	14
		Replace Access Platform Guard Gate Unit 5	14
	2022-23	Refurbish Ventilation System - overhaul/replace fans & motors	33
		09BRI81-HAUG STN 3 CONTROL SYS TESTING E	12
	2023-24	Replace Trash Screen	160
		Refurbish Metalwork - corrosion treatment, fixings, minor replacement as required	22
	2024-25	10BRI84-HAUG STN 3 REPLACE CTRL SYS PLC	109
	2025-26	Refurbish Ventilation System - overhaul/replace fans & motors	33
	2026-27	Replace Erosion Protection	298
		Refurbish Gear Box - overhaul on condition, need stratetgy, major task - lube system, bearings, gears, corrosion treatment	83
		Replace Access Door Pump Unit No.4	68
		Replace Access Door Pump Unit No.5	68
	Refurbish Road - re-stabilise road, drainage improvement, cross drains	17	
2027-28	Refurbish Gear Box - overhaul on condition, need stratetgy, major task - lube system, bearings, gears, corrosion treatment	83	
	Replace Intake Access	39	
	Haughton PSTN3 Pump Unit 5 - Refurbish Submarine Doors (hydraulic/seals)	17	
2028-29	Tom Fenwick PSTN3 - Refurbish PUN4 (refurbish seals, impeller, bearings etc)	224	
	Replace All Vent Operating Machinery	188	
	Replace Alternator	75	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Tom Fenwick Temp Pump Station		Refurbish Ventilation System - overhaul/replace fans & motors	34
		Tom Fenwick PSTN3 - Refurbish PUN 4 Motor (Class A overhaul - bearing replaced, clean, bake)	22
		Refurbish Doors - maintenance - hydraulic/seals - critical component	17
		Replace Fire Alarm System	16
		Replace Sump Pump No.1-Pump 4	14
		Replace Sump Pump No.1-Pump 5	14
		Replace Sump Pump No.2-Pump 4	14
		Replace Sump Pump No.2-Pump 5	14
		Refurbish Bld - replace roof & doors/frames, house electrics etc	11
	2029-30	Tom Fenwick PSTN3 - Refurbish PUN5 (refurbish seals, impeller, bearings etc)	223
		Replace Haughton Load Bank	79
		Refurbish Motor - rewind if required	78
		Tom Fenwick PSTN 3 - Refurbish PUN5 Motor (Class A overhaul - bearing replaced, clean, bake)	22
		09BRI81-HAUG STN 3 CONTROL SYS TESTING E	12
	2030-31	10BRI84 Tom Fenwick PSTN3 - Replace Cont	95
	2031-32	Refurbish Ventilation System - overhaul/replace fans & motors	33
	2033-34	Replace Cable	617
		Replace H V Switchboards	315
		Replace L V Switchboards	163
		Replace Hps4/5 Transformer	89
		Refurbish Metalwork - corrosion treatment, fixings, minor replacements as required	11
	2034-35	Refurbish Ventilation System - overhaul/replace fans & motors	33
	2035-36	Refurbish Bld - replace roof & doors/frames, house electrics etc	11
	2016-17	Replace Vacuum Priming System	79
	2017-18	Haughton PSTNT - Refurbish Pump Unit 2 (seals, bearings, corrosion)	23
	2020-21	Replace Hydraulic System	34
	2023-24	Replace Cable	265
		Haughton PSTNT - Refurbish Pump Unit 2 (seals, bearings, corrosion)	22
	2025-26	Replace Main Switchboard	189
		Replace Control Equipment	86
	2027-28	Replace Control Building	53
	2029-30	Haughton PSTNT - Refurbish Pump Unit 2 (seals, bearings, corrosion)	22
	2030-31	Replace Pump	182
	2031-32	Replace Discharge Valve & Pipework	443
		Replace Pump	364
		Replace Pump Suction Pipe	199
2035-36	Haughton PSTNT - Refurbish Pump Unit 2 (seals, bearings, corrosion)	22	