

Warrill Valley Water Supply Scheme

Network Service Plan

Updated: 2 November 2012

1. Introduction

Review Context

The QCA has been directed by the Queensland Government to recommend irrigation prices for the Warrill Valley Water Supply Scheme (the Scheme) for the four-year regulatory period 1 July 2013 to 30 June 2017. Prices are to recover the efficient operating, maintenance and administration costs, and an annuity to recover renewals and rehabilitation expenditure. This level of cost recovery is typically referred to as the lower bound (lower bound costs).

The QCA is required to provide a draft report including draft irrigation prices by 30 November 2012 and a final report with recommended price paths by April 2013.

The current irrigation prices were set when the Scheme was owned by SunWater, and commenced from 1 July 2006. The Scheme was transferred to Seqwater in 2008-09, along with the SunWater pricing arrangements. This is the first review of irrigation prices since the Scheme has been in Seqwater ownership.

This document is the Network Service Plan (NSP) for the Scheme. It sets out information relevant to the QCA's review, including Seqwater's expenditure proposals over the regulatory period and specific pricing proposals for the Scheme.

This is an update to the NSPs first made in April, 2012 and incorporates changes foreshadowed in that original NSP, as well as other amendments. The most significant change results from updates to renewals balances and additional renewals expenditure to capture a meter replacement program (distinct from upgrades to improve accuracy to meet forthcoming national standards, which is outside the scope of this review).

Forecast operating expenditure includes both direct and non-direct expenditure and is based on operating expenditure in a representative base year (2012-13) escalated forward over each year of the regulatory period on the basis of predetermined escalation factors. The base year adopts the costs presented to the QCA for its review of Grid Service Charges for the 2012-13 year. The QCA has since published a draft report recommending Grid Service Charges for the 2012-13 year however a final report is yet to be released. While Seqwater would prefer to wait until the 2012-13 base year is finalised, the QCA has requested that updated Network Service Plans are provided before the 2012-13 GSCs are released.

Accordingly, Seqwater has not updated the operating costs for the 2012-13 year as final information is not yet available. However, Seqwater submits that the operating costs that form the 2012-13 base year should be updated to reflect the QCA's final recommendations. This may affect both or either the direct costs, as well as the non-direct cost pool and the allocation of those costs.

Hence the operating costs in this NSP, along with the lower bound reference costs and reference tariffs should be considered interim and do not represent Seqwater's final cost base. Notwithstanding this situation, lower bound costs for each WSS have been provided, with those costs allocated to different priority groups (medium and high) within the Scheme.

Updated Review Context

Following the release of the QCA's final report on the 2012-13 Grid Service Charges, the Minister for Energy and Water Supply advised efficiency cost savings targets for Seqwater. Those targets have impacted the 2012-13 base year and consequently impacted the lower bound costs for this Scheme. This updated NSP presents amended lower bound costs and amended irrigation prices that take account of the finalised 2012-13 base year.

About Seqwater

Seqwater owns different types of water supply assets and service types, namely:

- Storage assets - Seqwater owns 26 dams and 48 weirs which provide bulk water storage services to a range of water entitlement holders in South East Queensland, including irrigators, local governments, industrial users and the SEQ Water Grid Manager (WGM);
- Bulk distribution assets - Seqwater also provides distribution system services to irrigators from pipelines and channel systems;
- Water treatment assets - Seqwater provides drinking water to the WGM from 46 water treatment plants;
- A desalination plant - provides bulk drinking water to the WGM;
- An advanced recycled water scheme, which provides treated recycled water to the WGM;
- Groundwater - Seqwater provides drinking water to the WGM from 14 groundwater bore fields.

Seqwater owns, manages and operates physical assets with a book value of \$6.3 billion. Seqwater provides irrigation services to around 1,455 rural customers in seven water supply schemes.

Seqwater also owns unregulated assets such as its head office building at 240 Margaret Street, water entitlements held for trading in the Upper Mary Water Supply Scheme, and two hydro-electricity plants. No costs of these assets are attributed to regulated assets.

Seqwater's total regulated revenue allowance for 2011-12 was \$705M to \$709M, of which some \$3.3M relates to irrigation supplies. Of this \$3.3M, some \$1.9M is sourced directly from irrigation charges, with the balance sourced from a Community Service Obligation (CSO) payment.

Scheme background and context

The Scheme supplies water access entitlements owned by irrigators, industrial users, Seqwater and the South East Queensland Water Grid Manager (WGM). The Scheme was transferred to Seqwater from SunWater Limited on 1 July, 2008. The map in section 2 below presents an overview of the Scheme, including the locations of storages and monitoring/gauging stations.

The Scheme is regulated under the Interim Resource Operations Licence for Warrill Valley Water Supply Scheme, as amended August 2008.

The scheme consists of bulk water supply assets only. There are no distribution systems associated with this scheme. All irrigators take their water supply directly from the river systems.

Customers served

Warrill Valley supplies water to:

- Irrigation users; and
- SEQ Water Grid Manager.

Seqwater also holds water access entitlements (WAE).

Further details are set out in section 2 below.

Asset base

The asset base of the scheme consists of bulk water storage assets. These assets are listed in section 2 below and details of individual assets can be found in Appendix A.

Organisational resourcing arrangements

Seqwater is well advanced in transitioning its resourcing arrangements from those inherited in July 2008. Key achievements include:

- replacing service level agreements with previous asset owners (e.g. Councils) with internal staff appointments;

- negotiating a single enterprise bargaining agreement (refer below) to standardise work conditions; and
- developing and refining the structure of the organisation and recruiting the necessary resources.

Seqwater has also substantially completed its procurement arrangements for external resources, including consultants and contractors. Seqwater continues to outsource many maintenance activities for its assets, usually with local suppliers. Seqwater has recently gone to market for a panel for maintenance services providers and is currently finalising the awarding of contracts.

Seqwater inherited 14 different enterprise agreements which required 47 separate payroll runs. Seqwater has since consolidated these into a single enterprise agreement, with a single payroll.

The enterprise agreement process also provided for more standardised work hours and overtime arrangements, and included the establishment of a 38 hour week.

The standardisation achieved through a single enterprise agreement has allowed more streamlined systems to be implemented, reducing the implementation costs for the payroll system and enabling a reduction in the number of staff required to administer the payroll from seven to two.

Seqwater's current enterprise agreement expired on 30 June 2012. Due to the Water Industry Restructure and amalgamation of three water entities into one new entity, it has been decided that a new certified agreement will not be negotiated until early next year.

Key systems and processes

Seqwater also inherited a diverse range of systems and business processes from previous asset owners. Since 2008-09, Seqwater has given priority to developing its systems so that they can support the business and enable more streamlined business processes.

Seqwater has completed a post implementation review across all modules of its Corporate Information System (CIS). As a result, Seqwater is committed to a series of continuous improvements for better business performance.

Seqwater is continuing with its program of end-to-end process reviews to identify improvements and generate cost savings in performing its business support and related activities.

Asset management

Asset management practice within Seqwater does not distinguish between irrigation and non-irrigation assets. Assets are managed as a portfolio and not on an industry sector basis.

Seqwater acquired the Warrill Valley Water Supply Scheme from SunWater Limited. While the physical assets were transferred, much of the asset history was not. The staff members who also transferred to Seqwater were mostly operations rather than maintenance staff. This meant that corporate asset management knowledge was not transferred along with the assets.

Seqwater's maintenance and renewals program is evolving and moving towards industry best practice. However, this process is resource-intensive and relies on a long history of quality, consistent asset information before reaching full maturity.

Seqwater's maintenance tasks and associated expenditure follows two broad categories:

- Planned maintenance – which relates to regular maintenance items that arise from an annual maintenance schedule, as well as work that is added to the maintenance program as a result of new information or inspections carried out during the year; and
- Unplanned maintenance – relating to maintenance that is made in reaction to events and where corrective work needs to be carried out quickly (e.g. for compliance or service reasons).

Seqwater uses the Asset Management module within CIS to plan and schedule asset maintenance work. Work orders are produced on the system for each parcel of work required to be performed to capture the costs of performing the work.

Renewals and refurbishments are determined through a strategic asset management process. This process and its outcomes are documented in Facility Asset Management Plans (FAMPs), which are being rolled out across all assets. Irrigation assets are currently not as advanced in this process as the high-priority water treatment plants.

Procurement

Seqwater complies with the State Procurement Policy (SPP). Policies, procedures and processes consistent with, and supporting, the requirements of the SPP have been developed and are in operation. Where possible, procurement processes are system based using the Supply Chain Module in Seqwater's Corporate Information System (CIS).

Procurement activities are undertaken at all business sites.

Seqwater's Procurement Team monitors and analyses a range of performance indicators to identify opportunities to improve performance and minimise costs.

Seqwater is currently reviewing its "procure to pay" process to streamline the procurement of services and goods, management of delivery and payment for services.

Customer and Financial Management

Customer information management including invoicing and accounts receivable operations for the Scheme are carried out from Seqwater's Karalee office. Financial management including financial reporting and accounts payable processing is centralised in Seqwater's Finance group in the Margaret Street office. Accounts payable is carried out using the AP module in CIS.

Insurance

Seqwater's portfolio of assets is insured with differing premium and deductible arrangements in place for bulk water and channel distribution systems. This requires specialist management of the insurances held, including management of claims and renewals and providing information to insurers and brokers.

Insurance premiums are obtained for a portfolio of Seqwater assets.

Although insurance premiums have not been allocated directly to schemes previously, these costs will be properly allocated to each WSS in future.

2. Scheme details

The Scheme was established following the construction of Moogerah Dam in 1961. The Scheme provides water for the irrigation of about 8,000ha of farms as well as for urban and industrial users.

Seqwater owns and operates the infrastructure in the Scheme under the authority of the Interim Resource Operations Licence for the Warrill Valley Water Supply Scheme (as amended August 2008 and originally issued 10 November 2000).

The water year runs from 1 July to 30 June each year.

Infrastructure details

The table below sets out the bulk water assets that comprise the scheme.

Table 2-1. Bulk water assets

Dams	Moogerah Dam
Weirs	Upper Warrill Diversion Weir Kents Lagoon Diversion Weir Aratula Weir Warrill Creek Diversion Weir Warroolaba Creek Diversion Weir West Branch Warrill Diversion Weir Churchbank Weir Railway Weir
Off-stream storages	Nil
Other assets	Gauging stations, gravity diversions, Upper Warrill Diversion pipeline and channel

For details of the assets, see Appendix A

Customers and water entitlements serviced

The Warrill Valley Water Supply Scheme supplies water to:

- Irrigation users, comprising 387 customers who hold 20,484.5ML of medium priority WAE (50.5ML unallocated);
- Two users who hold 254ML of high priority WAE;
- WGM, which holds 9,140ML of high priority WAE; and
- Seqwater, which holds 3,715ML of medium priority WAE and 56ML of high priority WAE.

The following charts illustrate the distribution of WAE amongst classes of customers.

Figure 2-1. WAE Distribution

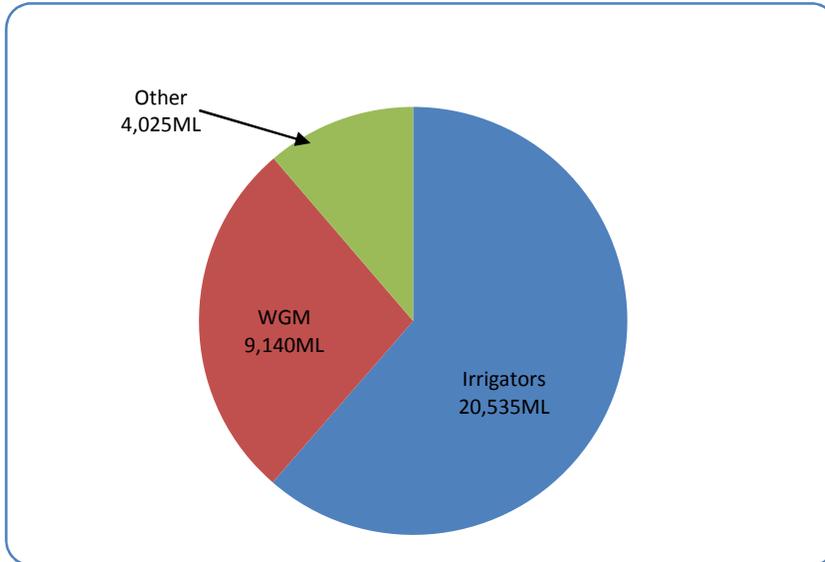


Figure 2-2. Composition of “Other”

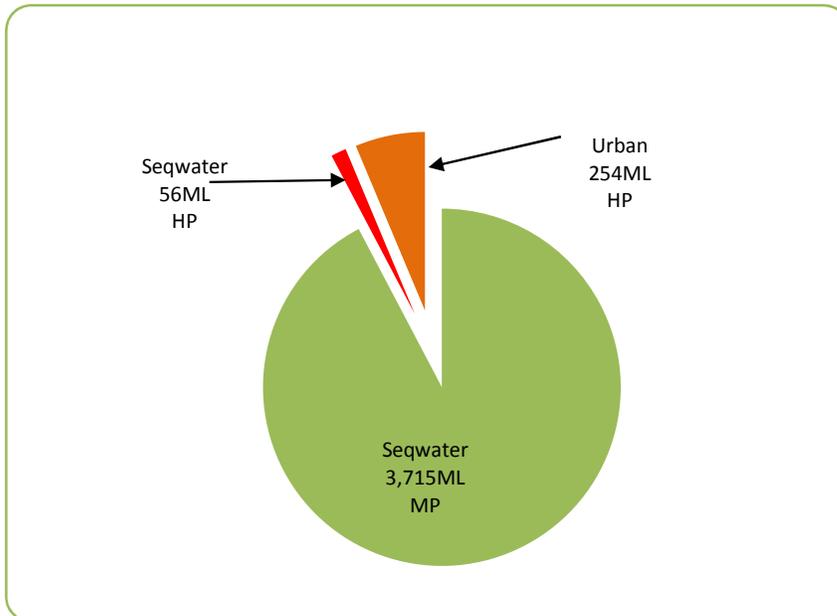


Table 2-2 sets out the ownership (as at 30 June 2011) of water access entitlements in the Scheme.

Table 2-2. Ownership of Entitlements

Customer Type	No. of customers	MP Vol (ML)	HP Vol (ML)	Notes
Irrigation	387	20,535	-	<ul style="list-style-type: none"> • 20,484.5ML – Price path • 10ML – surrendered • 40.5ML – unallocated (assumed surrendered)
Urban	2	-	254	<ul style="list-style-type: none"> • High-B
Seqwater	7	3,715	56	<ul style="list-style-type: none"> • 3,714ML – medium (loss) • 1ML – medium (river irrigation) • 56ML – amenities water (includes 3.6ML town water for 6 customers)
WGM	-	-	9,140	<ul style="list-style-type: none"> • 890ML – High-A • 8,250ML – High-B
Totals	396	24,250	9,450	

Source: Interim Resource Operations Licence for the Warrill Valley Water Supply Scheme (as amended August 2008 and originally issued 10 November 2000) and Seqwater's customer information data.

For pricing purposes, Seqwater proposes that the 3,714ML of loss is excluded, on the basis this loss services all WAE across the scheme. The lower bound costs are therefore distributed across the remaining WAE. After this adjustment, medium priority WAE (excluding losses) comprises 68.5% of the WAE issued in the Scheme.

Water availability and use

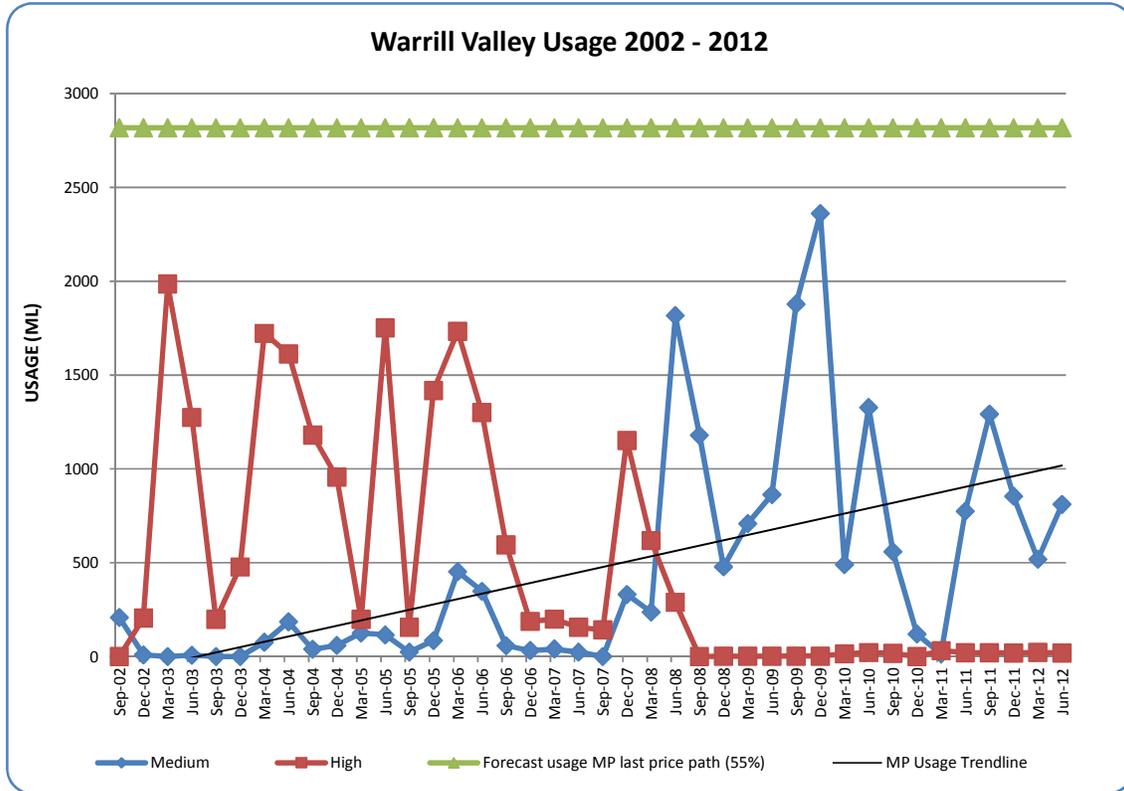
The announced allocation determines the percentage of nominal WAE volume that is available in a water year (1 July to 30 June). The following table sets out the announced allocation over the past six years.

Table 2-3. Announced allocations (%)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
High A Priority	100	100	51-100	100	100	100	100
High B Priority	20-70	15	0-100	100	100	100	100
Medium Priority	0	0	5-71	30-72	56-100	100	100

The current irrigation price paths adopted a use forecast at 55% of the nominal amount of WAE, equivalent to 11,272ML/annum or 2,818ML/quarter. This compares to actual use to date, as illustrated below.

Figure 2-3. Actual Usage 2002-11



As can be seen from the graph above, drought conditions impacted the availability of water throughout the period from 2002 to or 2,818ML/quarter 2007. The reduction in high priority usage from July, 2008 resulted from the transfer of Boonah Shire Council IWA to the SEQ Water Grid Manager under the SEQ water reforms.

Average annual usage comparison of Medium Priority water

The average annual usage comparison to MP forecast usage is set out in the table below:

Table 2-4. Forecast vs actual usage

Forecast annual usage for 2006-11 price path	11,272 ML/annum
Average actual annual usage for 2006-11 price path	2,806 ML/annum
Average actual annual usage for 9 years to December 2011	1,807 ML/annum

Temporary transfers

Temporary transfers or seasonal water assignments are useful for meeting additional short-term water needs. Under these transfers or assignments, some or all of the water that may be taken under a water entitlement in any water year can be assigned to another person or place.

The transfer of a volume of water from the amount available under the entitlement may only be assigned after the announced allocation. The volume assigned is not affected by any increase in the announced allocation during the water year, the benefits of which go to the holder of the entitlement and not the person to whom the temporary transfer of water has been assigned.

The following table sets out the volumes of temporary transfers by year from 1 July 2008 to 30 June 2012.

Table 2-5. Temporary transfers

Year	2008-09	2009-10	2010-11	2011-12
Volume in ML	469.6	627.4	275	172

Customer service standards

The current service standards were established in consultation with customer representatives in 2001 and were carried across to Seqwater from SunWater Limited. Although it is not intended that service standards should undergo major change during the price path period, they are to be periodically reviewed on an as-needs basis such as in response to requests by customer representatives or by Seqwater. This NSP is based on the existing service standards continuing throughout the regulatory 4 year period.

The document “*Water Supply Arrangements and Service Targets*” for the Scheme is attached to this NSP in Appendix B. This document sets out the customer service standards for the Scheme.

2006 lower bound costs

The 2006 price review process conducted by SunWater with customer representatives established the lower bound cost for the scheme. These lower bound costs are:

- Operations and maintenance costs;
- Administration costs, including a share of overhead; and
- The cost of asset renewals, via a renewals annuity.

The five year average lower bound cost recovery target established for this Scheme was \$495,187. The following table sets out the yearly targets and the five year average efficient lower bound costs:

Table 2-6. 2006 Lower Bound Costs (\$2005-06)

2005/06 IRRIGATION PRICE REVIEW WARRILL VALLEY WATER SUPPLY SCHEME SCHEME IRRIGATION LOWER BOUND COSTS & REFERENCE IRRIGATION TARIFFS						
SCHEME IRRIGATION LOWER BOUND COSTS						
	Year 1 2006/07	Year 2 2007/08	Year 3 2008/09	Year 4 2009/10	Year 5 2010/11	5 Year Average
Lower Bound Costs						
Operations, maintenance & administration	544,229	540,914	546,909	489,693	488,728	522,095
Electricity	-	-	-	-	-	-
Asset refurbishment annuity	48,075	47,764	48,016	47,908	47,824	47,917
Total Lower Bound Costs	592,304	588,678	594,925	537,601	536,552	570,012
less Tier 1 Productivity Adjustment	(69,901)	(71,394)	(82,779)	(74,846)	(75,204)	(74,825)
Total Efficient Lower Bound Costs	522,402	517,284	512,147	462,755	461,348	495,187
Community Service Obligations (CSO) & Revenue Offsets						
CSO Offsets						
CSO - Resource operating plan development costs	45,626	34,985	18,827	7,658	7,722	22,964
CSO - Rural water subsidy	-	-	-	-	-	-
Total CSO Offsets	45,626	34,985	18,827	7,658	7,722	22,964
Scheme related revenue offsets (a)	4,937	4,937	4,937	4,937	4,937	4,937
Total CSO & Revenue Offsets	50,563	39,922	23,764	12,596	12,660	27,901
TOTAL SCHEME IRRIGATION NET LOWER BOUND COSTS	471,839	477,362	488,382	450,159	448,688	467,286
<i>Irrigation share of scheme total net lower bound costs (%)</i>	47.3%	47.3%	47.3%	47.3%	47.3%	

Current pricing arrangements

The current prices were set with reference to the lower bound cost target above. For this Scheme the current prices were found to be sufficient to recover the 2006 lower bound target.

In the 2006-11 irrigation price review, the Warrill Valley Tier 2 group opted to retain the price cap arrangement in preference to a revenue cap. The Tier 2 group opted to take up a two-tiered drought tariff option. This is shown in the table below.

Prices were increased based on the Brisbane – All Groups Consumer Price Index (CPI) each year.

The Scheme has only one nominated tariff group for 2013-14 to 2016-17 being Combined Supplemented Regulated Section.

A two part tariff applied:

- Part A, a fixed charged payable per ML of nominal water entitlement (regardless of use); and
- Part B, which was a consumption charge.

The table below shows the prices for the scheme since 2006-07 to 2011-12 in real terms.

Table 2-7. 2006 – 11 Price Paths (real, \$2005-06)

2005/06 IRRIGATION PRICE REVIEW WARRILL VALLEY WATER SUPPLY SCHEME SCHEME IRRIGATION LOWER BOUND COSTS & REFERENCE IRRIGATION TARIFFS							
FINAL IRRIGATION TARIFFS (based in 2005/06 dollars and subject to cumulative annual indexation on 1 July each year)							
	Last Yr 2005/06	Lower Bound Cost Tariff	Year 1 2006/07	Year 2 2007/08	Year 3 2008/09	Year 4 2009/10	Year 5 2010/11
COMBINED SUPPLEMENTED REGULATED SECTION (a) (b) (c)							
'Drought Tariff' Level of Announced Allocation at beginning of each quarter							
0% to 20%							
Part A (Adjustment 33%)			\$5.06	\$5.06	\$5.06	\$5.06	\$5.06
Part B			\$18.07	\$18.07	\$18.07	\$18.07	\$18.07
Total			\$23.13	\$23.13	\$23.13	\$23.13	\$23.13
'Drought Tariff' Level of Announced Allocation at beginning of each quarter							
Greater than 20%							
Part A (Adjustment 120%)			\$18.38	\$18.38	\$18.38	\$18.38	\$18.38
Part B			\$18.07	\$18.07	\$18.07	\$18.07	\$18.07
Total			\$36.45	\$36.45	\$36.45	\$36.45	\$36.45
'Drought Tariff' Cumulative Threshold Limit		\$525,902					
Irrigation customer nominal water allocations (ML)		20,503	20,503	20,503	20,503	20,503	20,503
Water usage forecast		55%	55%	55%	55%	55%	55%
Part A revenue share		70%	61%	61%	61%	61%	61%
Part B revenue share		30%	39%	39%	39%	39%	39%

Footnotes:

- (a) The Tier 2 group elected to end its existing price path on 30 June 2006, which was originally due to expire on 30 June 2007, to enable the new irrigation price path to commence on 1 July 2006.
- (b) The 'drought tariff' provides for a temporary reduction in the Part A charge during periods of lower water availability and in turn includes a higher Part A charge during periods of high water availability. The 'drought tariff' also includes a mechanism to carry forward any under or over payments of Part A charges compared to the Part A target revenue to the next price path, including any accumulated finance charges. A cumulative threshold limit has been set on the 'drought tariff' arrangement so that the scheme avoids establishing a large carryover balance. The cumulative threshold limit has been set to the dollar equivalent of 2 1/2 years of low supply or 10 quarters of announced allocation less than 20%.
- (c) The final Warrill Valley-Combined Supplemented Regulated Section tariff without a 'drought tariff' adjustment is as detailed below.

	Last Yr 2005/06	Lower Bound Cost Tariff	Year 1 2006/07	Year 2 2007/08	Year 3 2008/09	Year 4 2009/10	Year 5 2010/11
Warrill Valley-Combined Supplemented Regulated Section	\$20.08	\$15.32	\$15.32	\$15.32	\$15.32	\$15.32	\$15.32
	\$13.31	\$11.94	\$18.07	\$18.07	\$18.07	\$18.07	\$18.07
	\$33.39	\$27.26	\$33.39	\$33.39	\$33.39	\$33.39	\$33.39

The current tariffs for 2012-13 are:

- Part A - \$18.95/ML; and
- Part B – \$22.37/ML.

Renewals accounting and forecast ARR balance

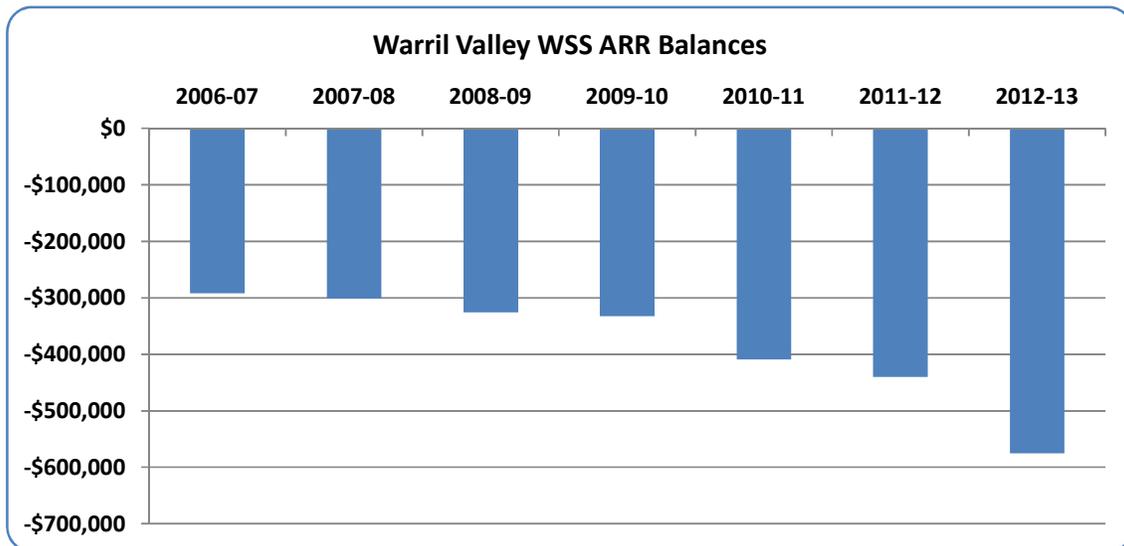
A renewals annuity approach applies to the current price paths, and is to continue to apply in accordance with the Ministerial Referral Notice.

The renewals annuity approach requires an accounting system to monitor renewals income and expenditure, to monitor the status of the renewals account or Asset Renewals Reserve (ARR). This balance can be either positive or negative, and is incorporated into the calculation of the renewals annuity itself. Interest is applied to the balance, at the same rate used to determine the original renewals annuity.

In order to calculate lower bound costs from 2013-14, a projected closing ARR balance at 30 June, 2013 must be made. This balance is forecast to be a deficit balance of \$575,422.

The following table shows the ARR balances from 2006-07 to 2012-13.

Table 2-8. Warrill Valley WSS ARR Balances



Seqwater engaged Indec to calculate the respective annuity balances. Indec undertook the following steps:

- Obtained relevant data for the water supply schemes from SunWater dating back to 2001 when the existing annuity balances were established;
- Calculated a closing ARR balance on a total scheme basis as at 30 June 2006 for each scheme from the SunWater data set which calculated the irrigation only ARR Balances. Seqwater sought advice and guidance from SunWater to establish these balances;
- Established a closing balance at 30 June 2011 based on actual renewals expenditure and income data from SunWater and from Seqwater; and
- Forecast a closing total scheme balance at 30 June 2013 based on the budgeted renewals expenditure and irrigation income for the 2011-12 year and the estimated renewals income and expenditure for 2012-13.

In calculating the closing ARR balance, Indec:

- Obtained actual renewals expenditure from SunWater from 2000-01 to 2007-08 for the Scheme, and included actual expenditure following the transfer of the assets to Seqwater in the 2008-09 year for the period ending 2010-11. Renewals expenditure for 2011-12 is based on actual and forecast data and 2012-13 is a forecast only;

- Identified renewals expenditure from both capital and operating expenditure. This step was completed with the assistance of the Seqwater asset management engineers and respective scheme operators to identify renewals and rehabilitation expenditure on existing asset with a frequency of greater than 12 months. Seqwater has withdrawn the 2008-09 operating expenditure from the renewals balance following QCA advice that the costs will be disallowed due to inadequate substantiation. This was a result of serious system constraints in the previous financial system which was replaced on 1 July 2009;
- the 2012-13 renewals expenditure forecasts were adjusted to account for the QCA determined efficiency factors for Grid Service Charges of 28% for capital expenditure related renewals and 3% for renewals expenditure which is classified as an operating cost in the accounting system.
- Renewals expenditure for the period 2008-09 to 2012-13 undertaken by Seqwater includes an allocation of overheads and indirect costs based on the SunWater average allocation rate for the period 2006-07 to 2007-08 of 28.6%;
- Obtained actual tariff revenue including CSOs for all customer sectors from SunWater for the period 2000-01 to 2007-08 inclusive;
- Obtained actual tariff revenue including CSOs from 2008-09 until 2010-11 sourced from Seqwater’s accounting system. A budget forecast and estimate was used for 2011-12 and 2012-13 respectively;
- Calculated the percentages of tariff revenues, including CSO, allocated to the ARR balance for the 2001 to 2006 period and the percentages for the 2006-07 to 2012-13 period. This allocation rate reflects the percentage of all customer sector renewals annuity to the total customer sector revenue target set for the 2007-11 irrigation price path. The percentages for the 2005-06 year are based on the 2004-05 year due to a one year extension to the price path and the 2011-12 and 2012-13 years have been based on the percentages applicable for the 2010-11 year due to a two year price path extension. These are shown in tables 2-9 and 2-10 below;

Table 2-9. Share of Irrigation Revenues Applicable to the ARR (%)

Water Supply Scheme	Tariff Group	2001	2002	2003	2004	2005	2006
Warrill Valley	River	11.6	11.8	11.4	11.0	10.8	10.8

Table 2-10. Share of Irrigation Revenues Applicable to the ARR (%)

Water Supply Scheme	Tariff Group	2007	2008	2009	2010	2011	2012	2013
Warrill Valley	River	10.2	10.0	9.8	10.6	10.7	10.7	10.7

- Applied interest to closing balances for the period 2006-07 to 2013-14 at the equivalent rate used to calculate the 2007-2011 price path annuities (9.69% nominal). No interest has been applied to balances between 2000-01 and 2005-06 based on advice from SunWater that the 2001-2006 price path made offsetting adjustments on the account that no interest would apply to ARR balances in that price path.

Table 2-11 below sets out irrigation renewals expenditure and revenue and the annual change applicable to the ARR for the financial years 2000-01 to 2005-06 and Table 2-12 sets out irrigation renewals expenditure and revenue and the annual change applicable to the ARR for the financial years 2006-07 to 2012-13:

Table 2-11. Annual Change in Irrigation ARR Balances (\$, Nominal) 2001 - 2006

Tariff Group	Item	2001	2002	2003	2004	2005	2006
River	Expenditure	(77,044)	(242,433)	(163,512)	(109,387)	(208,719)	(35,002)
	Revenue	114,117	108,938	103,833	97,847	59,105	54,124
	Change	37,073	(133,495)	(59,679)	11,540	(149,613)	19,122

Table 2-12. Annual Change in Irrigation ARR Balances (\$, Nominal) 2007 - 2013

Tariff Group	Item	2007	2008	2009	2010	2011	2012	2013
River	Expenditure	(57,081)	(77,402)	(39,124)	(27,137)	(90,747)	(44,298)	(150,315)
	Revenue	91,632	96,724	44,171	51,957	45,978	52,625	58,280
	Change	34,551	19,322	5,047	24,820	(44,769)	8,327	(92,035)

The full Indec report is provided as Attachment 4 to Seqwater’s main submission.

3. Lower bound costs and reference tariffs

Lower bound costs

The following provides a summary of Seqwater’s proposed lower bound costs for the scheme over the 1 July 2013 to 30 June 2017 forecast period. Lower bound costs include operating and renewals costs. None of the costs vary proportional to water demand. That is, the short run marginal cost in this scheme is \$0, and all costs are fixed.

In order to determine lower bound estimates for irrigation customers within the scheme, aggregate scheme costs are attributed to medium priority consistent with the QCA's approach adopted for SunWater.

Operating costs

Operating activities for this scheme include service provision, compliance, recreation, and other supporting activities:

- Service provision relates to:
 - scheduling and releasing bulk water from storages, surveillance of water levels and flows in the river, and quarterly meter reading; and
 - customer service and account management.
- Compliance requirements relates to:
 - Requirements set out in the Resource Operations Plan (ROP) and Resource Operations Licence;
 - Dam safety obligations under the *Water Act 2000*;
 - Environmental management obligations to comply with the ROP and *Environmental Protection Act 1994*; and
 - Land management, workplace health and safety obligations and other reporting obligations.
- Recreation relates to the operation and maintenance of recreation facilities in the Warrill Valley scheme; and
- Other supporting activities cover a range of services including central procurement, human resources and legal services.

Operating cost forecasting approach

Seqwater has adopted an approach to forecasting whereby operating expenditure for schemes is derived for a representative base year (2012-13) and escalated forward over each year of the regulatory period on the basis of predetermined escalation factors.

The 2012-13 year was adopted as the base year as it provides the best and most current representation of the costs required to deliver Seqwater's service standards and obligations during the regulatory period. Aggregate operating costs for 2012-13 (including costs associated with both grid and irrigation services but excluding costs associated with unregulated activities) were derived as part of Seqwater's 2012-13 grid service charges

submission to the QCA.¹ Seqwater has developed its 2012-13 budget on the basis of a zero base build-up, taking into account costs which could be reasonably anticipated at the time of budget development. In addition, the 2012-13 operating expenditure forecasts provided in the grid service charges submission have been reviewed by the QCA for prudence and efficiency.

Further details on the forecasting methodology are provided in the Irrigation Pricing submission provided to the QCA.

The following escalators have been applied to 2012-13 operating costs to derive forecasts for the regulatory period:

- direct labour, materials and contractors' costs and repairs and maintenance were escalated at 4% per annum over the regulatory period; and
- 'other' direct costs and all non-direct costs were escalated at forecast CPI (2.5% per annum).

Details of the direct and non-direct operating expenditure forecasts for the Warrill Valley scheme are provided below.

Direct operating and maintenance costs

Direct costs are those costs that have been budgeted at the individual asset level.

Operations

Operations relates to the day-to-day costs of delivering water and meeting compliance obligations. The primary activities relate to dam operations and group support.

Dam operations are the largest contributor to direct operating costs. Dam Operations aims to deliver best practice management of dams and water sources while being fully compliant and effective in operating, maintaining and monitoring its water source infrastructure.

Dam operations must meet the regulatory requirements under various Acts including those relating to Dam Safety, Flood Management, Resource Operating Plans, and providing sufficient water to meet standards of service.

Dam operations are relatively labour intensive and expenditure is driven by:

- providing efficient service to irrigation customers in terms of information and management and delivery of service;

¹ Refer Chapter 1.

- developing robust and acceptable systems to monitor water flows to manage water sources, floods and regulations;
- developing an effective and technically capable and resilient flood operations centre utilising systems of quality standards;
- improving data management to ensure compliance on a wide variety of water management areas;
- ensuring security and safety at our water sources is meeting regulatory and community standards; and
- developing system operating plans to ensure the efficiency and operation of dams, weirs, bores and other water sources.

Group support has responsibility for the development and delivery of recreation and catchment maintenance services for all operational assets. The team ensures that asset management plans, processes, systems and practices are implemented in accordance with relevant regulatory requirements. The costs associated with catchment management activities (for water quality outcomes) are excluded from the lower bound cost base for irrigation.

Seqwater has responsibility for the ongoing management and maintenance of recreation sites transferred from SunWater. The use of Seqwater assets for recreational purposes is secondary to Seqwater's main function of water supply and treatment. However, recreation facilities must be managed in a sustainable and environmentally responsible manner to ensure that Seqwater's core responsibilities and accountabilities are not adversely impacted.

Direct operations costs are presented in terms of the type of cost being labour, contractors and materials, and "other":

- labour costs are derived on the basis of budgeted work in the scheme for 2012-13 and the related salary costs for routine activities. The costs represent all costs budgeted as employee costs for the scheme. In practice, a small proportion of this labour will be used for maintenance activities.² Consistent with the current Enterprise Bargaining Agreement for Seqwater and the recommendation of the QCA in its draft SunWater report, Seqwater has escalated internal labour costs at 4% per annum for the regulatory period 2013-14 to 2016-17;

² Repairs and maintenance are budgeted as a separate line item, and exclude labour, Most maintenance work is delivered via contractors. Seqwater has sought to minimise the manipulation of data from its financial system when presenting information in this NSP and forecasting lower bound costs. While there are minor shortcomings in this approach, Seqwater does not believe there is a material impact on the pricing outcomes given the overall proportion of labour costs that might relate to future repairs and maintenance is small (on average, 3% across all schemes).

- contractor and materials costs for 2012-13 are based on the quantities required in the work instructions for the scheme. As per the QCA’s draft SunWater report, contractor and material costs have been escalated at 4% per annum for the regulatory period; and
- “other” direct operating costs incorporate a range of expenses including plant and fleet hire, water quality monitoring expenses and fixed energy costs. These costs have been escalated at forecast CPI for the regulatory period.

Forecast operations costs are provided below.

Table 3-1. Forecast direct operations costs (\$000, Nominal)

Cost	2013-14	2014-15	2015-16	2016-17
Labour	368.7	383.5	398.8	414.8
Contractors and materials	58.8	61.2	63.6	66.2
Other	192.5	197.3	202.2	207.3
TOTAL	620.0	642.0	664.7	688.2

Repairs and maintenance

Repairs and maintenance is performed at the scheme in accordance with Seqwater’s maintenance system. This system identifies the maintenance requirements for each asset, and then sets out a schedule for maintenance over the year(s) for that asset. In addition, maintenance requirements are developed through Facilities Asset Management Plans and as a result of scheduled inspections.

There is also unplanned maintenance which is required in response to asset breakdown or failure, or where new information emerges about asset condition (e.g. via regular inspections). Expenditure on unplanned maintenance for 2012-13 is derived based on past experience.

Seqwater have set a target ratio of 71:29 planned maintenance to unplanned maintenance in 2012-13. This ratio has been applied for the forecast period.

Repairs and maintenance for 2012-13 has been escalated at 4% per annum over the regulatory period.

The table below presents a summary of forecast repairs and maintenance costs.

Table 3-2. Forecast repairs and maintenance by expenditure type (\$000, Nominal)

Type	2013-14	2014-15	2015-16	2016-17
Planned	224.8	233.8	243.1	252.8
Unplanned	91.8	95.5	99.3	103.3
TOTAL	316.6	329.2	342.4	356.1

Dam safety inspections

Routine dam safety inspections are carried out to identify and plan maintenance requirements and to provide information for management planning of water delivery assets. These costs are included in forecast operations expenditure.

In addition, more thorough periodic dam safety inspections are carried out on a 5 yearly basis. Costs associated with these inspections have been added to forecast direct operating expenditure in the year in which the expenditure is expected to be incurred. Forecast dam safety inspections expenditure is provided below.

Table 3-3. Forecast dam safety inspections (\$000, Nominal)

Dam	2013-14	2014-15	2015-16	2016-17
Moogerah	-	-	-	27.6
Total	-	-	-	27.6

These inspections are based on the dam safety compliance requirements for the dams and the cost estimates are based on actual historic cost of inspection.

The table below presents consolidated forecast repairs and maintenance costs for the Warrill Valley scheme.

Table 3-4. Total repairs and maintenance forecast (\$000, Nominal)

Type	2013-14	2014-15	2015-16	2016-17
Planned	224.8	233.8	243.1	252.8
Unplanned	91.8	95.5	99.3	103.3
Dam safety inspections	-	-	-	27.6
TOTAL	316.6	329.2	342.4	383.7

Rates

Seqwater incurs rates in relation to its land portfolio, including storages. Seqwater has forecast rates expenses for the Warrill Valley scheme based on 2011-12 actual rates, and has forecast these to increase annually by CPI for the regulatory period.

Table 3-5. Forecast rates cost (\$000, Nominal)

Year	2013-14	2014-15	2015-16	2016-17
Cost	44.9	46.1	47.2	48.4

Metering

Consistent with the Referral Notice to the QCA, capital expenditure (renewals) costs for meter upgrades to meet national metering standards have been excluded. Similarly, operating costs associated with complying with the new standards have not been included in the cost estimates. However, costs for normal meter refurbishments (like-for-like) and costs to address identified safety risks associated with meter locations have been included.

Non-direct costs

Non-direct costs are common costs which are not directly attributable to the operations and management of a specific scheme and include both indirect and overhead costs associated with the provision of corporate and other business services. In the absence of suitably disaggregated data at the project level, allocations of non-direct costs to renewals / capital expenditure were not examined. All non-direct costs were therefore allocated to operating expenditure only.

Non-direct costs for 2012-13 were derived at the aggregate level for all schemes and allocated to individual schemes based on the proportion of direct costs attributable to the individual scheme. These costs were then escalated forward to derive forecast non-direct costs for the regulatory period.

Non-direct costs are categorised by the type of expenditure:

- Water delivery includes non-direct costs associated with dam operations, infrastructure maintenance, environmental management and recreation and catchment maintenance services;
- Asset delivery costs are associated with project planning and managing the delivery of projects;

- Corporate costs include business services, organisational development and the office of the CEO. These include costs associated with the provision of IT services, finance, procurement, legal and risk, governance and compliance activities; and
- Other costs primarily reflect costs associated with the North Quay facilities and flood control centres.

As discussed, the Warrill Valley scheme was allocated a portion of 2012-13 total business non-direct costs on the basis of direct costs attributable to the scheme. This estimate was escalated by CPI to derive forecasts for each year of the regulatory period.

Forecast non-direct operating costs are provided below.

Table 3-6. Forecast non-direct operating cost (\$000, Nominal)

Type	2013-14	2014-15	2015-16	2016-17
Water Delivery	95.3	97.7	100.1	102.6
Asset Delivery	44.0	45.1	46.2	47.4
Corporate	276.7	283.7	290.8	298.0
Other	28.5	29.2	30.0	30.7
TOTAL	444.5	455.6	467.0	478.7

In addition to non-direct operating costs, Seqwater has allocated costs to the Warrill Valley scheme associated with the use of non-infrastructure assets, insurance and working capital.

Non-infrastructure assets

The Warrill Valley scheme utilises a range of non-infrastructure assets (buildings and plant and equipment). These assets are not included in the renewals expenditure forecasts. However, it is necessary for costs associated with the use of these assets to be attributed to the Scheme. Seqwater has used depreciation costs as a proxy for the cost associated with use of these assets. However, these depreciation costs are not captured for the WSS. Accordingly, aggregate non-infrastructure depreciation for 2012-13 has been allocated to facilities on the basis of direct costs and escalated forward over the forecast period.

The table below provides a breakdown of forecast non-infrastructure asset costs allocated to the Warrill Valley scheme over the forecast period.

Table 3-7. Forecast non-infrastructure operating cost (\$000, Nominal)

Year	2013-14	2014-15	2015-16	2016-17
Cost	45.6	46.8	47.9	49.1

Insurance

Seqwater’s annual insurance premium cost for 2012-13 is forecast at \$6.2 million. The major components to the premium include industrial special risks, machinery breakdown, public liability, professional indemnity, contract works and directors and officers insurance.³

Seqwater is in the process of placing insurances, and proposes to update this forecast once new premiums are set.

Seqwater has allocated its 2012-13 premium to the Warrill Valley scheme using the replacement value of scheme assets. This value has been escalated by CPI to determine a premium for each year of the forecast period. The table below shows the forecast premiums for the Warrill Valley scheme.

Table 3-8. Forecast insurance cost (\$000, Nominal)

Year	2013-14	2014-15	2015-16	2016-17
Cost	38.3	39.3	40.3	41.3

Working capital

The QCA has already adopted a methodology for calculating Seqwater’s working capital in Grid Service Charges. Seqwater has calculated the working capital allowance using this methodology and the values submitted to the QCA for 2012-13⁴, at \$5.538M.

Seqwater has allocated a portion of this working capital allowance to the Warrill Valley scheme on the basis of revenue attributable to the scheme. The 2012-13 working capital allowance has then been escalated by CPI to provide a forecast for each year of the regulatory period.

Table 3-9. Forecast working capital (\$000, Nominal)

Year	2013-14	2014-15	2015-16	2016-17
Cost	14.2	14.5	14.9	15.3

Total operating costs for the forecast period are provided below.

³ Seqwater also notes the QCA canvassed concerns raised by irrigators about the insurance costs attributable to irrigation services, and accepted SunWater’s proposed scope of insurances as reasonable (including professional indemnity). Refer to QCA (2011),pp 106-107

⁴ Seqwater (2012). p146

Table 3-10. Total operating cost forecast (\$000, Nominal)

Cost	2013-14	2014-15	2015-16	2016-17
Direct				
Operations	620.0	642.0	664.7	688.2
Repairs and maintenance	316.6	329.2	342.4	356.1
Dam safety	-	-	-	27.6
Rates	44.9	46.1	47.2	48.4
Non-direct				
Operations	444.5	455.6	467.0	478.7
Non- infrastructure	45.6	46.8	47.9	49.1
Insurance	38.3	39.3	40.3	41.3
Working capital	14.2	14.5	14.9	15.3
Total	1,524.2	1,573.5	1,624.5	1,704.7

Revenue offsets

Seqwater receives revenue from other sources, including property leases, recreation fees and the provision of town water supplies. The estimated revenue from these sources for the Warrill Valley scheme for the regulatory period is provided below. These forecasts are based on expected revenue received in 2012-13 escalated by CPI for the regulatory period.

Table 3-11. Forecast revenue offset (\$000, Nominal)

Year	2013-14	2014-15	2015-16	2016-17
Revenue	20.0	20.5	21.0	21.5

To ensure that Seqwater is not overcompensated for the provision of services, this revenue has been removed from the estimate of scheme costs for the regulatory period.

Renewals

The renewals outlays for the irrigation schemes consist of the same cost elements as their operating costs, namely direct labour, materials and contractors' services, other direct costs (such as rates and land taxes) and miscellaneous administrative costs and non-direct (indirect and overhead) costs.

Seqwater has adopted the same rates for escalation of renewals expenditure as for operating expenditure.

Accordingly, renewal expenditure has been escalated for direct labour, materials and contractors costs at 4% per annum for the years 2013-14 to 2016-17 and forecast inflation thereafter for the remainder of the planning period. All other direct costs and non-direct costs are escalated at forecast inflation for both the regulatory period and the remainder of the planning period.

Inflation is forecast to increase at 2.5% per annum over the forecast period and beyond.

Renewals forecast

Seqwater has proposed a rolling 20 year renewals annuity, consistent with the approach adopted for SunWater's irrigation pricing in the QCA's draft report.

Seqwater has defined renewals as non-maintenance expenditure that is required to maintain the service capacity of the assets.

Seqwater has based its renewals forecast on the more significant and predictable renewals expenditure items. Seqwater has not attempted to include minor renewals projects (less than \$10,000), or renewals on water treatment plants at recreation areas, or make any allowance or contingency for renewals expenditure arising from damage or changes in law. This approach has been adopted to focus the renewals forecasting effort on more material items of expenditure.

Seqwater identified renewals needs and the schedule of projects through a range of processes, including:

- the existing Facility Asset Management Plans (FAMPs);
- the existing asset maintenance program;
- reports from site safety inspections and dam safety management program; and
- advice from operators.

Seqwater then evaluated potential projects against criticality and other criteria, and conducted workshops with local staff as well as site inspections to validate and adjust the scope and timing of projects. In many cases, Seqwater has revised the timing of major renewals jobs to a later time where there was not sufficient evidence that the asset required renewal, or renewal of the asset could be deferred at an acceptable risk of failing to meet service standards or compliance obligations.

Forecast renewals expenditure for the regulatory period is provided below.

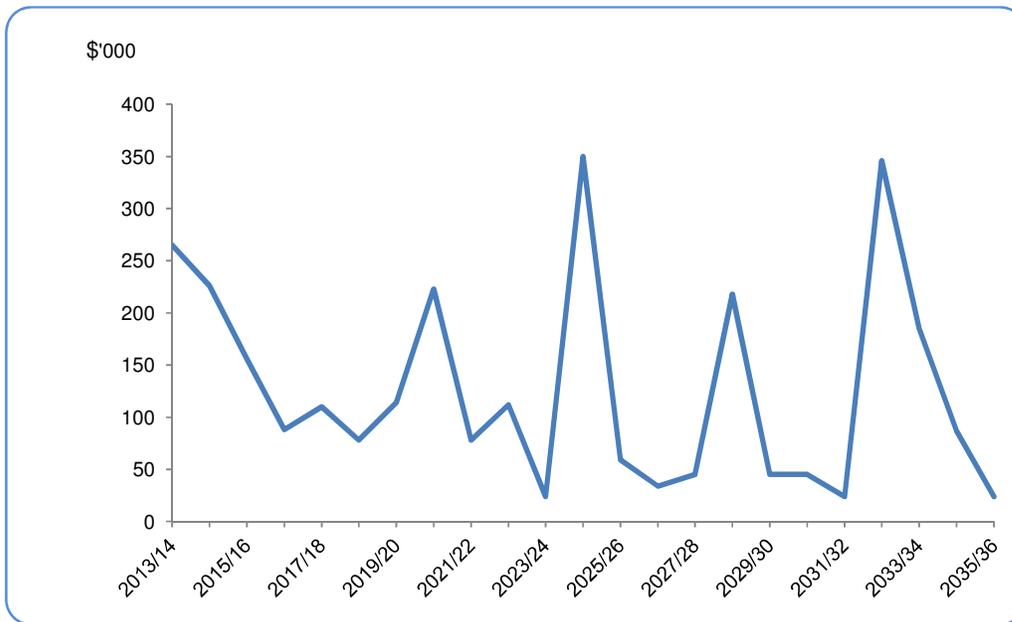
Table 3-12. Forecast renewals expenditure to 2016-17 (\$2012-13, \$000)

	2013-14	2014-15	2015-16	2016-17
Renewals expenditure	265.0	226.0	156.0	88.0

This excludes any dam safety or meter upgrade expenditure, in accordance with the Referral Notice. However, costs for normal meter refurbishments (like-for-like) and costs to address identified safety risks associated with meter locations have been included.

The figure below shows the long term renewals profile over a 24 year period.

Figure 3-1: Warrill Valley renewals profile (\$2012-13)



The major projects that have a material 10% impact on the annuity are described below:

Table 3-13. Major renewals projects

Asset	Description of Work	Timing of Work	Project Value \$'000	Significance*
Moogerah Dam - ladders	Replacement of wire rope on wall	2013-14	100	HAV
Moogerah Dam – concrete structure	Repair of concrete wall	2013-14	20	HAV
Water meters	Water meter refurbishment	2013-14	145	HAV
Upper Warrill Diversion Channel	De-silting	2014-15	21	HAV
Upper Warrill Diversion Channel	Refurbishment of valves	2014-15	36	HAV
Upper Warrill Diversion Channel	Refurbish scour valve	2014-15	12	HAV
Water meters	Water meter refurbishment	2014-15	145	HAV
Upper Warrill Diversion Channel	Refurbish Trash Inlet Screens	2015-16	18	HAV
Upper Warrill Diversion Channel	Refurbish scour valve	2015-16	12	HAV
Upper Warrill Diversion Channel	Refurbish scour valve	2015-16	24	HAV
Upper Warrill Diversion Channel	Refurbish scour valve	2015-16	12	HAV
Upper Warrill Diversion Channel	Refurbish scour valve	2015-16	12	HAV
Water meters	Water meter refurbishment	2015-16	78	HAV
Water meters	Water meter refurbishment	2016-17	78	HAV

* HAV – Higher than Average Value (for period from 2013-14 to 2016-17)
 IA – Project has an impact on the annuity of greater than 10%

Total Lower Bound Costs

The total lower bound costs for the Warrill Valley scheme are set out in the table below.

Table 3-14. Total Lower Bound costs (\$000, Nominal)

Cost	2013-14	2014-15	2015-16	2016-17
Direct operations*	645.0	667.6	690.9	742.7
Repairs and maintenance	316.6	329.2	342.4	356.1
Non-direct opex**	542.7	556.2	570.1	584.4
Renewals annuity	207.7	212.7	215.2	216.0
TOTAL	1,712.0	1,765.8	1,818.7	1,899.3

* Incorporates revenue offset ** Incorporates operations, non-infrastructure costs, insurance and working capital.

Cost allocation to medium priority

Seqwater proposes that renewals and maintenance costs are allocated to medium priority using the Headworks Utilisation Factor (HUF). Seqwater commissioned Parsons Brinckerhoff (PB) to calculate the HUF percentage for the scheme, using the methodology endorsed by the QCA for irrigation pricing in SunWater schemes.

PB calculated a HUF for medium priority customers of 11%.

In its draft SunWater report, the QCA allocated insurance premium costs in water supply schemes based on the HUF, and in distribution systems according to nominal WAEs.⁵ Seqwater has adopted the same approach as the draft report. Seqwater acknowledges a different approach was adopted in the final report (50% HUF and 50% nominal WAE), which resulted in medium priority being allocated a greater share of these costs.

Seqwater has assigned working capital costs between medium and high priority customers proportional to lower bound revenue.

The balance of costs have been allocated to the irrigation sector based on a 50:50 split between the HUF (11%) and the nominal ML entitlements attributable to medium priority customers (68.5%).

The table below presents the outcomes of this sector cost allocation.

⁵ QCA (2011). SunWater Irrigation Price Review: 2012-2017. Draft Report. p244

Table 3-15. Total Lower Bound costs allocated to medium priority (\$000, Nominal)

Cost	2013-14	2014-15	2015-16	2016-17
Direct operations*	256.4	265.3	274.6	295.2
Repairs and maintenance	34.8	36.2	37.7	39.2
Non-direct opex**	206.1	211.2	216.5	221.9
Renewals annuity	22.8	23.4	23.7	23.8
TOTAL	520.1	536.2	552.4	580.0

* Incorporates revenue offset ** Incorporates operations, non-infrastructure costs, insurance and working capital.

A comparison against the lower bound costs allocated to irrigation in the SunWater 2006 Irrigation Pricing Review is provided below. To facilitate comparison with Seqwater’s forecast costs, SunWater’s 2010-11 lower bound cost estimates have been indexed forward to \$2013-14 by actual and forecast inflation.

Table 3-16. Total Lower Bound Costs allocated to medium priority (\$000, Nominal)

Lower bound cost	SunWater 2006 LBC (\$2013-14)	2013-14	2014-15	2015-16	2016-17
Total	588.3	520.1	536.2	552.4	580.0

Seqwater does not have detailed information about the 2006 lower bound costs, and hence has not been able to provide any meaningful comparisons or analysis.

Lower bound reference tariffs

Tariff groups

The Referral Notice requires the QCA to adopt the tariff groups as proposed in Seqwater’s NSPs.

Seqwater proposes the current tariff groupings continue for the Scheme. That is, a single tariff group will continue to apply.

Tariff structure

A two part tariff structure currently applies, with a Part A charge levied per ML of customer WAE, and a Part B charge levied against metered water use.

As discussed, Seqwater considers that all costs in the scheme are fixed. Accordingly, Seqwater proposes to apply a single Part A tariff.

Lower bound reference tariffs

Lower bound reference tariffs for Warrill Valley irrigation customers are provided below.

Table 3-17. Forecast Warrill Valley irrigation tariffs (\$/ML Nominal)

	Part	2013-14	2014-15	2015-16	2016-17
Fixed component based on WAE	A	25.63	26.27	26.93	27.60
Variable component based on usage	B	-	-	-	-

Price path

The Referral Notice requires that any prices rises for customers already above lower bound costs be restricted to increases in inflation. This appears likely to be the case for the Warrill Valley tariff group, although this will depend on how the QCA determines equivalent prices through tariff re-balancing for the scheme. In its main submission, Seqwater identified that the fixed-charge equivalent for the 2012-13 charge was \$31.25/ML, which indicates current prices are above the \$25.63/ML lower bound reference tariff for 2013-14.⁶

Supporting documentation

- Irrigation Infrastructure Renewal Projections - 2013-14 to 2046-47 – Warrill Valley Tariff Group

⁶ The 2012-13 charge would increase with inflation for 2013-14.

Appendix A – Asset details

SI.1 MOOGERAH DAM - REYNOLDS CREEK - AMTD 15.3 km

ITEM	DESCRIPTION
1. Description of water infrastructure:	Dam - Double curvature arch concrete.
2. Storage Capacities:	
a) Total storage capacity	83,700 ML.
b) Commandable storage capacity	82 500 ML.
c) Dead Storage capacity	1,200 ML. [A volume of 1,200 ML was adopted in hydrologic modelling. The volume below the level of the outlet works (EL 132.95 m AHD) is 563 ML.]
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 154.91 m AHD.
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	i) 2 x 760 mm diameter outlet pipes each with a 760 mm diameter guard valve and 660 mm diameter discharge regulator. ii) Spillway has an excavated rock sill approach channel with an ogee crest discharging to a flip approx 90 m downstream of toe of dam.
b) Levels	i) Invert of outlet pipes EL 132.95 m AHD. ii) Top of spillway EL 154.91 m AHD.
5. Inlet Works:	
a) Multi level offtakes	Single level offtake.
b) Levels	Invert of Inlet Works EL 132.95 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific environmental flow allowances in the Warrill Valley. Base flow maintained for regulated section from Moogerah Dam downstream to Berry's Lagoon Weir.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	Base flow maintained for regulated section from Moogerah Dam downstream to Berry's Lagoon Weir (Swanbank) for power 20 ML/d, urban 6 to 8 ML/d and irrigation 0 to 150 ML/d max. (780 to 5340 ML/month).
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate agreed for resource protection. No potential for rapid change in water level. 900 ML/d max. for outlet works at full supply level.

ITEM	DESCRIPTION
<p>7. Operational constraints:</p> <p>a) Minimum operating level/capacity</p> <p>b) Operation of fabridams</p> <p>c) Operation of gates</p> <p>d) Flood Mitigation</p>	<p>Invert of Outlet Works EL 132.95 m AHD. 1130 ML is cease to flow. 563 ML dead storage after syphoning takes place.</p> <p>No fabridam exists.</p> <p>No gates installed.</p> <p>Extent of flooding downstream of Reynolds/Warrill Creek junction reduced dramatically by dam.</p>
<p>8. Management of storage water levels and quality:</p> <p>a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies</p> <p>b) Minimum operating level for protection of fauna</p> <p>c) Storage fringe margin management</p>	<p>Single level offtake. Blue Green Algae Priority 1 storage, sampled weekly.</p> <p>EL 132.95 m AHD (563 ML), corresponding to a water depth of 8.4 metres.</p> <p>No specific protection measures in place.</p>
<p>9. Operation of Fish Transfer Systems:</p>	<p>There are no fish transfer systems.</p>

**S1.2 UPPER WARRILL DIVERSION WEIR - REYNOLDS CREEK
AMTD 12.9 km**

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir – Rockfill with Concrete Cap.
2. Storage Capacities:	
a) Total storage capacity	3 ML.
b) Commandable storage capacity	3ML.
c) Dead Storage capacity	0 ML (weir constructed of permeable material).
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 115.92 m AHD.
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	i) No downstream river outlet works. Releases made by discharge over spillway crest. ii) Diversion works to Upper Warrill Creek: Structure 4200 mm long x 1500 mm wide x 2100 mm high (internal dimensions) with 900 mm dia RC pipe and 900 mm dia Armco slide gate.
b) Levels	i) Level for river releases - EL 115.92 m AHD (crest). ii) Levels for diversions to Upper Warrill Creek: Sill EL 115.16 m AHD. Pipe Invert, EL 114.86 m AHD.
5. Inlet Works:	Inlet works only for Upper Warrill Creek diversion
a) Multi level offtakes	Diversion works to Upper Warrill Creek: Structure 4200 mm long x 1500 mm wide x 2100 mm high (internal dimensions) with 900 mm dia RC pipe and 900 mm dia Armco slide gate.
b) Levels	Sill of inlet: EL 115.16 m AHD
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	No useful storage volume or outlet works through weir to make releases to downstream users. Releases made from Moogerah Dam passed through storage over crest to meet industrial, urban and irrigation requirements downstream.
f) Maximum Release Rates, actual as agreed for Resource Protection	No downstream outlet works for releases.

ITEM	DESCRIPTION
7. Operational constraints: <ul style="list-style-type: none"> a) Minimum operating level/capacity b) Operation of fabridams c) Operation of gates d) Flood Mitigation 	EL 115.16 m AHD. 0 ML. No fabridam exists. No gates installed. No flood mitigation effects of weir.
8. Management of storage water levels and quality: <ul style="list-style-type: none"> a) Water Quality Management, eg. Algal Management, multi-level offtakes including release strategies b) Minimum operating level for protection of fauna c) Storage fringe margin management 	No water quality management control. No minimum level has been set. Small storage with minimal impact and no management plan.
9. Operation of Fish Transfer Systems:	There are no fish transfer systems.

**SI.3 KENTS LAGOON DIVERSION WEIR - REYNOLDS CREEK
AMTD 1.2 km**

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir - clay core with concrete cap.
2. Storage Capacities:	
a) Total storage capacity	5 ML.
b) Commandable storage capacity	5 ML.
c) Dead Storage capacity	Negligible.
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 74.74 m AHD – top of drop logs. [Warrill Creek Diversion Weir is located downstream and has a higher FSL = EL 74.77 m AHD. Level in Kents Lagoon Diversion Weir may be governed by level in Warrill Creek Diversion Weir.]
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	i) River outlet Works: 225 mm diameter pipe and valve. ii) Spillway: Incorporates 2 / 1000 wide x 600 deep inlet/outlet flume with drop log controls. iii) Diversion to Kents Lagoon: 900 mm offtake pipe
b) Levels	i) River outlet works invert EL 73.86 m AHD. ii) Spillway top of drop logs EL 74.74 m AHD. Inlet/Outlet flume invert EL 74.14 m AHD. iii) Outlet pipe invert EL 73.25 m AHD.
5. Inlet Works:	
a) Multi level offtakes	i) River outlet: Single level offtake to outlet pipe. ii) Kents Lagoon Diversion: 3000 mm long x 1200 mm wide x 2100 mm high inlet structure with 900 mm dia inlet pipe to 1500 mm dia valve operating well with 900 mm dia Armco slide gate and 900 mm dia offtake pipe.
b) Levels	i) River outlet: Invert Level of inlet works EL 73.86 m AHD. ii) Kents Lagoon Diversion: Pipe invert EL 73.25 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	No useful storage volume to make releases to downstream users. Releases made from Moogerah Dam passed through storage over crest to meet industrial, urban and irrigation requirements downstream.
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate data available for outlet works.

ITEM	DESCRIPTION
7. Operational constraints:	
a) Minimum operating level/capacity	<p>Normal operating level EL 74.74 m AHD for diversion to Kents Lagoon. This level can be attained by use of drop logs at Kents Lagoon Diversion Weir for releases made from Moogerah Dam. Alternatively diversions from Warrill Creek Diversion Weir (crest EL 74.77 m AHD) to Kents Lagoon can be made by removal of drop logs.</p> <p>Minimum operating level is Kents Lagoon diversion offtake level of EL 73.25 m AHD at which stored volume is negligible.</p>
b) Operation of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood Mitigation	No flood mitigation effects of weir.
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies	No specific water quality management.
b) Minimum operating level for protection of fauna	No minimum level has been set.
c) Storage fringe margin management	No storage fringe management for weir.
9. Operation of Fish Transfer Systems:	No fish transfer system exists.

S1.4 ARATULA WEIR - WARRILL CREEK - AMTD 60.0 km

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir - Mass Concrete.
2. Storage Capacities:	
a) Total storage capacity	54 ML. [As-constructed capacity is 54 ML. Existing storage is silted up and has negligible capacity.]
b) Commandable storage capacity	49 ML.
c) Dead Storage capacity	5 ML. [A volume of 5 ML was adopted in hydrologic modelling.]
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 97.52 m AHD (crest).
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	i) 230 mm diameter outlet pipe and valve. ii) Spillway has an ogee crest with apron sill.
b) Levels	i) Invert Level of outlet pipe EL 95.12 m AHD. ii) Top of spillway EL 97.52 m AHD.
5. Inlet Works:	
a) Multi level offtakes	Single level offtake to outlet pipe.
b) Levels	Invert Level of inlet works EL 95.20 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	No control over flow variation, weir is silted up. There is no useful storage volume to make releases to downstream users.
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate data available for outlet works.
7. Operational constraints:	
a) Minimum operating level/capacity	EL 97.52 m AHD (crest). Existing storage is silted up and has negligible capacity. Outlet works inadequate to meet downstream user requirements (no useful storage and outlet works inoperable, because of siltation).
b) Operation of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood Mitigation	No flood mitigation effects of weir.

ITEM	DESCRIPTION
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies	No specific water quality management.
b) Minimum operating level for protection of fauna	Storage is not to be drawn down below the dead storage volume of 5 ML.
c) Storage fringe margin management	No storage fringe management for weir.
9. Operation of Fish Transfer Systems:	There are no fish transfer systems.

S1.5 WARRILL CREEK DIVERSION WEIR - WARRILL CREEK - AMTD 51.4 km

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir - Stepped steel sheet piling structure (cascade type) with concrete slabs placed over free draining fill. Weir is just downstream of the confluence of Reynolds Creek and Warrill Creek.
2. Storage Capacities:	
a) Total storage capacity	110 ML.
b) Commandable storage capacity	96 ML.
c) Dead Storage capacity	14 ML. [A volume of 14 ML corresponds to a water depth of 2.5 metres. The volume below the level of the outlet works (EL 70.43 m AHD) is 0 ML.]
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 74.77 m AHD Weir Crest.
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	i) Outlet Works: 750 mm diameter pipe with butterfly control valve. ii) Spillway: Free fall over 3 rows of steel sheet piling stepped down from weir crest to bed level.
b) Levels	i) Invert of Outlet pipe EL 70.43 m AHD. ii) Spillway Crest EL 74.77 m AHD.
5. Inlet Works:	
a) Multi level offtakes	Inlet box with single level offtake to 750 mm diameter pipe.
b) Levels	Invert Level of inlet pipe EL 70.42 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	Base flow of 755ML/month - to maximum of 5130 ML/month (25 ML/day to 171 ML/day) for regulated section from Warrill Creek Diversion Weir downstream to Berry's Lagoon Weir (no allowance for transmission losses).
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate agreed for resource protection. Max release rate of 250 ML/d for outlet works at EL 74.6 m AHD.

ITEM	DESCRIPTION
7. Operational constraints: <ul style="list-style-type: none"> a) Minimum operating level/capacity b) Operation of fabridams c) Operation of gates d) Flood Mitigation 	EL 70.43 AHD, 0 ML. No fabridam exists. No gates installed. No flood mitigation effects of weir.
8. Management of storage water levels and quality: <ul style="list-style-type: none"> a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies b) Minimum operating level for protection of fauna c) Storage fringe margin management 	No specific water quality management. No minimum level has been set. Storage not to be drawn down below dead storage volume of 14 ML. The volume corresponding to 2.5 metres depth of water is 14 ML. Although not agreed, this depth of water has been discussed as an absolute minimum volume for the protection of fauna. No storage fringe management for weir.
9. Operation of Fish Transfer Systems:	No fish transfer system exists.

**S1.6 WARROOLABA CREEK DIVERSION WEIR - WARRILL CREEK
AMTD 35.0 km**

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir - Rockfill.
2. Storage Capacities:	
a) Total storage capacity	8 ML.
b) Commandable storage capacity	8 ML.
c) Dead Storage capacity	0 ML (weir constructed of permeable material).
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 52.71 m AHD.
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	<ul style="list-style-type: none"> i) Releases to river through 300 mm diameter outlet pipe with valve. ii) Releases made by discharge over spillway crest. iii) Offtake to Warroolaba Ck: 2510mm x 1070 mm R C collar cast around 900 mm dia inlet pipe to 1500 mm dia valve operating well with 600mm dia sluice valve and 675 mm dia outlet pipe.
b) Levels	<ul style="list-style-type: none"> i) River outlet pipe invert: EL 52.00 m AHD. ii) EL 52.71 m AHD (crest). iii) Outlet pipe to Warroolaba Creek: Pipe invert EL 52.01 m AHD.
5. Inlet Works:	
a) Multi level offtakes	<ul style="list-style-type: none"> i) River outlet: Single level offtake to outlet pipe through weir. ii) Offtake to Warroolaba Ck: 2510mm x 1070 mm R C collar cast around 900 mm dia inlet pipe to 1500 mm dia valve operating well with 600mm dia sluice valve and 675 mm dia outlet pipe.
b) Levels	<ul style="list-style-type: none"> i) River outlet pipe: EL 52.00 m AHD (estimated to be 750 mm below crest level). ii) Outlet pipe to Warroolaba Creek: Pipe invert EL 52.01 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	No useful storage volume to make releases to downstream users. Releases made from Moogerah Dam passed through storage over crest to meet industrial, urban and irrigation requirements downstream.
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate data available for outlet works.

ITEM	DESCRIPTION
7. Operational constraints:	
a) Minimum operating level/capacity	EL 52.00 m. Negligible storage volume.
b) Operation of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood Mitigation	No flood mitigation effects of weir.
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies	No specific water quality management.
b) Minimum operating level for protection of fauna	No minimum level has been set.
c) Storage fringe margin management	No storage fringe management for weirs.
9. Operation of Fish Transfer Systems:	No fish transfer system exists.

**S1.7 WEST BRANCH WARRILL DIVERSION WEIR - WARRILL CREEKAMTD
28.5 km**

ITEM	DESCRIPTION
1. Description of water infrastructure:	<p>The weir consists of left bank and right bank components with diversion off-take from left bank part of structure to the West Branch of Warrill Creek.</p> <p>Weir has reinforced concrete base with two rows of blockwork on weir crest.</p>
2. Storage Capacities:	
a) Total storage capacity	2 ML.
b) Commandable storage capacity	2 ML.
c) Dead Storage capacity	Negligible.
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 43.72 m AHD.
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	<p>i) Spillway: Downstream releases made by discharge over crest. No outlet through weir to East Branch Warrill Creek. These releases pass to the East Branch of Warrill Creek.</p> <p>ii) Downstream diversion along West Branch Warrill Creek made through 600 mm diameter pipe to outlet in West Branch Warrill Creek.</p>
b) Levels	<p>i) EL 43.72 m AHD (crest).</p> <p>ii) Invert at outlet to West Branch Warrill Creek diversion EL 42.52 m AHD.</p>
5. Inlet Works:	
a) Multi level offtakes	Single level offtake to 600 mm diameter pipe (for downstream diversion to West Branch Warrill Creek) in L/B component of weir structure.
b) Levels	West Branch Diversion Pipe inlet Invert – EL 42.47 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	<p>No useful storage volume to make releases to downstream users. Releases made from Moogerah Dam are passed through storage over crest to Warrill Creek and through 600 mm diversion pipe to West Branch Warrill Creek to meet industrial, urban and irrigation requirements downstream.</p>

ITEM	DESCRIPTION
f) Maximum Release Rates, actual as agreed for Resource Protection	No control works for downstream releases to West Branch Warrill Creek or Warrill Creek. Operational releases are passed through storage over crest to Warrill Creek then to East Branch Warrill Creek, and through 600 mm diversion pipe to West Branch Warrill Creek.
7. Operational constraints:	
a) Minimum operating level/capacity	EL 42.47 m AHD. Capacity - negligible.
b) Operation of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood Mitigation	No flood mitigation effects of weir.
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies	No specific Water Quality Management.
b) Minimum operating level for protection of fauna	No minimum level has been set. Negligible dead storage.
c) Storage fringe margin management	No storage fringe management for weir.
9. Operation of Fish Transfer Systems:	No fish transfer system exists.

S1.8 CHURCHBANK WEIR - WARRILL CREEK - AMTD 3.2 km

ITEM	DESCRIPTION
1. Description of water infrastructure:	Weir - mass concrete.
2. Storage Capacities:	
a) Total storage capacity	170 ML.
b) Commandable storage capacity	160 ML.
c) Dead Storage capacity	20 ML. [The volume below the level of the non-operational outlet works (EL 35.78 m AHD) is 12 ML. The volume below the level of the operational outlet works (EL 36.63 m AHD) is 38 ML. A volume of 53 ML was adopted in hydrologic modelling.]
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 38.68 m AHD (Level 1).
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	<p>Outlet Works:</p> <ul style="list-style-type: none"> i) 225 mm diameter pipe and valve. (Non-operational) ii) 750 mm x 750 mm outlet. <p>Spillway:</p> <ul style="list-style-type: none"> iii) Ogee crest (Level 1) with a downstream sill baffle on stream bed. iv) A second spillway (Level 2) for higher flows discharges to a concrete/rock pitched apron on stream bed.
b) Levels	<p>Outlet works:</p> <ul style="list-style-type: none"> i) Invert Level of outlet pipe EL 35.78 m AHD. (Non-operational) ii) 750 mm x 750 mm outlet EL 35.78 m AHD. <p>Spillway:</p> <ul style="list-style-type: none"> iii) Top of spillway EL 38.68 m AHD (Level 1). iv) Top of spillway EL 39.14 m AHD (Level 2).
5. Inlet Works:	
a) Multi level offtakes	<ul style="list-style-type: none"> i) Single level offtake to outlet pipe. (Non-operational) ii) Single square outlet through weir controlled by gate on upstream face of weir. Removable drop boards are installed in a continuous vertical opening above the floor of the well.
b) Levels	<ul style="list-style-type: none"> i) Invert Level of outlet pipe EL 35.78 m AHD. ii) 750 mm sq. outlet EL 35.84 m AHD with removable drop boards and upstream sill level of EL 36.63 m AHD.
6. Pass flows:	
a) Environmental provisions	No specific releases made.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No specific releases made.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.

ITEM	DESCRIPTION
e) Flow variations	Base flow of 690 ML/month to maximum of 1170 ML/month (22.6 ML/day to 39 ML/day) for regulated section from Churchbank Weir downstream to Berry's Lagoon Weir (no allowance for transmission losses).
f) Maximum Release Rates, actual as agreed for Resource Protection	No release rate agreed for resource protection. No release rate data available for outlet works.
7. Operational constraints:	
a) Minimum operating level/capacity	Invert Level of outlet works EL 35.78 m AHD. 12 ML. Actual minimum operating level may be restricted by the level of the road crossing just downstream of the weir.
b) Operation of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood Mitigation	No flood mitigation effects of weir.
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including release strategies	No specific water quality management.
b) Minimum operating level for protection of fauna	20 ML. The volume corresponding to 2.5 metres depth of water is 68 ML. Although not agreed, this depth of water has been discussed as an absolute minimum volume for the protection of fauna.
c) Storage fringe margin management	No storage fringe management for weirs.
9. Operation of Fish Transfer Systems:	No fish transfer system exists.

S1.8A RAILWAY WEIR - NORMANBY GULLY - AMTD 1.5 km

ITEM	DESCRIPTION
1. Description of water infrastructure:	Mass concrete structure.
2. Storage Capacities:	
a) Total storage capacity	20 ML.
b) Commandable storage capacity	20 ML.
c) Dead Storage capacity	0 ML.
3. Physical Dimensions (Main Structure):	
a) Full supply level	EL 46.18 m AHD. [Weir crest is 1.79 metres above bed level.]
4. Outlet Works/Spillway Arrangement/Diversion Works:	
a) Description of works	300 mm diameter gate valve.
b) Levels	Invert level of outlet pipe EL 44.39 m AHD.
5. Inlet Works:	
a) Multi level offtakes	Single level offtake.
b) Levels	Invert level of outlet pipe EL 44.39 m AHD.
6. Pass flow requirements:	
a) Environmental provisions	No releases made specifically for environmental purposes.
b) Volume of first flush currently required to be passed through structure	No specific releases made.
c) Riparian/stock and domestic flows	No releases are made specifically for riparian/stock and domestic purposes.
d) Other compensation flows (eg. for underground water resources)	No specific releases made.
e) Flow variations	The weir is used as a regulating structure. Downstream flows normally overtop the crest of the weir but at low levels of flow, releases will be made through the gate valve.
f) Maximum release rates, actual as agreed for by Resource Protection	No release rate data is available. No releases are specifically made for resource protection.
7. Operational constraints:	
a) Minimum operating level/capacity	There is no specific level. The weir is operated between the FSL and dead storage level.
b) Operations of fabridams	No fabridam exists.
c) Operation of gates	No gates installed.
d) Flood mitigation	Weir has no flood mitigation effects.

ITEM	DESCRIPTION
8. Management of storage water levels and quality:	
a) Water Quality Management, eg: Algal Management, multi-level offtakes including releases strategies	No specific water quality management.
b) Minimum operating level for protection of fauna	No provision is made for this purpose.
c) Storage fringe margin management	No storage fringe management for weir.
9. Fish Transfer System:	No fish transfer system exists.

Appendix B – Customer service standards



Water Supply Arrangements and Service Targets

WARRILL VALLEY WATER SUPPLY SCHEME

Water Supply Arrangements

This is referred to as Seqwater Rules in the River/Groundwater contract

To manage the water delivery to our customers, arrangements for the taking of water in the Scheme have been discussed with the Customer Council and are outlined below. These arrangements are aimed at achieving the efficient delivery of water to customers in the Scheme that best meets their needs.

River Supplies

Taking Water from the Scheme

In the Warrill Valley Water Supply Scheme, customers must place water orders using the telephone ordering system at least 48 hours before taking water. This allows Seqwater to make timely releases from Moogerah Dam and to minimise losses.

To place an order, phone 5463 0177

Note - Water orders for Monday must be recorded by 12 noon on the Friday preceding the weekend

The water ordering system assists Seqwater to deliver water to customers in an efficient and timely way and enables customers to plan and manage their water use. Customers who take without ordering may reduce Seqwater's ability to supply customers who have ordered according to the above requirements.

Orders may not be available:

- During interruptions to supply (both scheduled and unscheduled)
- During periods of low demand for water, when water losses or operational circumstances make it impractical to supply (eg during times when there is minimal irrigation demand)

Customers requiring water during these times should contact the water officer to obtain information regarding water delivery.

Rain Shutdown

Customers must notify the water officer as soon as possible of any rain event that substantially lessens their water requirements. To conserve water, the water officer may shutdown the system when there is widespread general rain.



Water Supply Arrangements and Service Targets

Access to Storage

Storages are currently operated in the following nominal operating range:

Moogerah Dam – 22 metres below Full Supply Level

All minor storages – operated to dead storage

This range may change in the future if required, for example under Seqwater's Interim Resource Operations Licence (IROL) or Resource Operations Licence (ROL) and for other licence changes. Customers will be informed if such a change occurs. Customers should note that they are responsible for locating and maintaining pumps to take water.

Waterharvesting

Waterharvesting is announced and charged for by the Department of Environment and Resource Management (DERM). Some customers waterharvest through a pump metered by Seqwater. To account for the water taken as waterharvesting, customers must advise DERM of their start and stop meter readings. DERM then informs Seqwater of these readings so that Seqwater can record this use as waterharvesting. The phone number for DERM is 3224 7373.

If no meter reads are received by Seqwater then all water taken will be treated as Allocation Water.

Changes to the volume or location for taking water

Customers wishing to:

- Have multiple delivery points; or
- Transfer water to another customer

must first obtain Seqwater's approval. For their own benefit, customers should obtain Seqwater's approval before finalising any dealing with another party (eg. a temporary transfer).

Seqwater may require operational and other issues to be resolved before granting its approval. These will be discussed with customers during the application and approval process.

Application forms are available from the Seqwater Business Centre in Karalee.

Changes to Customers' Pumping Arrangements

Customers must obtain approval from both Seqwater and The Department of Environment & Resource Management or any other approvals necessary, before proceeding with any changes to their pumps, including changing size/capacity of the pump. Customers are advised to contact Seqwater to clarify any requirements before lodging applications to the Department of Environment & Resource Management.

Stopping or restricting supply

Seqwater may suspend or restrict supply in a number of circumstances, including:

- during maintenance of Seqwater's assets;



Water Supply Arrangements and Service Targets

- if supply could cause Seqwater to break the law;
- during a peak demand period, when rosters or rations may apply;
- when the demand for water is so small it is impractical to supply it;
- infrastructure limitations which make delivery impractical;
- when there is a need to make special releases to maximise efficiency at times of limited supply;
- or
- during rain shutdown.

Customers who require water all year round should make arrangements for on-farm water storage to provide their requirements during interruptions.

General

Complaints and dispute Resolution

Seqwater's aim is to resolve problems and complaints quickly and effectively. Where a customer has a concern that is not able to be resolved, customers can choose to initiate a formal dispute resolution process by writing to the Business Manager.

If through discussions, resolution cannot be reached either party may request the commencement of negotiations in good faith on a dispute resolution procedure, other than litigation or arbitration. If agreement is reached to proceed to the next phase, independent mediation services of the disputes Resolution Centres of Queensland can be used.

Billing Arrangements

Invoices are sent quarterly with the exception of minimum charge invoices, which are sent annually and all invoices must be paid within 30 days. Payments are allocated to the customer's oldest debt first, unless an invoice is in dispute.

Notices

Correspondence should be sent to the Karalee Business Centre as detailed below.

Seqwater

P O Box 2437

NORTH IPSWICH QLD 4305

Facsimile: 07 3884 5312

Email: irrigatorquestions@seqwater.com.au



Water Supply Arrangements and Service Targets

Communication – Contact Arrangements

The Karalee Business Centre has staff available for enquiries and business transactions (billing, temporary transfers, etc.) between the hours of 8.30am and 4.30pm Monday to Friday Phone: 1800 077 005.

Water operations enquiries can be made between the hours of 7.30am and 4.30pm Monday to Friday at Maroon – Office: 07 5463 6161 or Mobile: 0409 044 793. The office may, at times, be unattended and during these hours a message service is available.

Emergency water supply problems can be directed to the duty officer. These numbers are:

- 5463 0164 (Mobile: 0409 044 793)
- 5463 6186

Further information about Seqwater can be obtained from our website:

www.seqwater.com.au

SERVICE TARGETS

As described under clause 3 of the standard contract:

- 3(d) Seqwater shall, at approximately annual intervals, during this Agreement publish a report comparing the performance of Seqwater with the Service Targets;
- 3(e) Seqwater shall publish Service Targets for the Regulated Area and revise these from time to time after considering changes in customer needs determined through customer consultation, and changes in industry practice and procedures.

We are committed to publishing service targets and to reporting to customers on our performance against the targets. Following discussion and consultation with the Customer Council, this document contains service targets that have been set for the Warrill Valley Water Supply Scheme.

Planned Shutdowns

Planned shutdowns have been included as a target and Seqwater recognises that the following are important service issues for you:

- *That you will be notified about a shutdown so that you can plan ahead;*
- *The timing of the shutdown should suit most customers;*
- *The duration of the shutdown should minimise the impact on customers, while enabling Seqwater to perform maintenance on the scheme.*

Definition: A Planned Shutdown occurs when a customer's supply is interrupted or restricted due to the performance of work that is planned in advance.



Water Supply Arrangements and Service Targets

Planned Shutdowns – Timing

Delivery Service Type	Scheme Target
River	The timing of all planned shutdowns will be set following consultation with the Customer Council (for a shutdown affecting a large part of the scheme) or customer groups or individuals (for shutdowns effecting small areas).

Planned Shutdowns – Duration

Delivery Service Type	Scheme Target
River	Seqwater will complete all planned shutdowns within the period notified to customers (unless later varied by agreement with the groups originally consulted with), unless something occurs that is beyond Seqwater’s control, such as adverse weather conditions.

Planned Shutdowns – Notice

Delivery Service Type	Scheme Target
River	<p>For shutdowns planned to exceed 2 weeks, at 8 weeks written notice by letter will be provided to each customer affected by the annual shutdown.</p> <p>For shutdowns planned to exceed 3 days, at least 2 weeks written notice by letter, fax, telephone, or verbal advice will be provided to each customer affected by the shutdown.</p> <p>For shutdowns planned to be less than 3 days, at least 5 days notice will be provided at least verbally to each customer affected.</p> <p>Each notice will state the start date, and anticipated shutdown duration.</p> <p>A courtesy reminder will be placed in the local newspaper one week before the planned shutdowns commence.</p>

Unplanned Shutdown

Unplanned shutdowns have been included as a target and Seqwater recognises that the information provided to you about an interruption and the period of time taken to resume supply are important to you.

Definition: An Unplanned Shutdown is an unforeseen or not planned mechanical or operational failure of Seqwater’s water delivery infrastructure that stops or restricts the supply of water to a customer for more than 2 hours (including emergency repairs). It does not include events that are beyond Seqwater’s control



Water Supply Arrangements and Service Targets

(eg. power failure or storm)¹ and does not include interruptions to supply caused by errors in estimating water demand and releases, or people taking water without authorisation.

Unplanned Shutdown – Duration

Delivery Service Type	Service Target
River	<p>Unplanned Shutdowns will be fixed so that at least partial supply can be resumed to those customers requiring water within:</p> <ul style="list-style-type: none"> • 48 hours of Seqwater being notified of the event. <p>Some events may interrupt supply greater than the above standard and are excluded from these targets. Seqwater will publish these events from time to time.</p>

Unplanned Shutdown – Notice

Delivery Service Type	Scheme Target
River	<p>Seqwater will notify all affected customers requiring water verbally or by telephone, radio announcement or fax of the likely duration of the interruption to supply within 24 hours of learning of the event, or by the end of the first business day following the event, whichever is the earlier.</p>

Unplanned Shutdown – Meter Repairs

Delivery Service Type	Scheme Target
River	<p>Faults causing restrictions to supply will be repaired within one working day of Seqwater being notified.</p>

¹ This includes other events described as Events of Force Majeure in your contract.



Water Supply Arrangements and Service Targets

Total frequency of interruption to supply

Frequency of interruptions to supply

Delivery Type	Service	Scheme Target
River		No customer will experience more than six planned or unplanned interruptions per water year (as defined above).

Complaints

Seqwater will provide an initial response to all complaints within five working days of receiving a complaint by the customer:

- in writing; or
- by telephone to a Business Centre

Seqwater will either resolve a customer's complain, or provide a written response providing reasons why the complaint has not or cannot be resolved within 21 days of receiving the complaint.