PROJECT

QUALITY ASSURANCE ASSESSMENT OF A REVIEW OF SUNWATER'S HEADWORKS UTILISATION FACTORS METHODOLOGY

PREPARED FOR

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SYNOPSIS This report provides a quality assurance assessment of SunWater's review of it's Headworks Utilisation Factors (HUF) Methodology.

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SUMMARY

The Queensland Competition Authority (QCA) commissioned Gilbert & Sutherland Pty Ltd (G&S) to undertake an independent assessment, for quality assurance purposes, of a peer review conducted by Dr Sharmil Markar of WRM Water and Environment.

Dr Markar peer reviewed a draft technical paper and final report prepared by SunWater in 2010 titled 'Headworks Utilisation Factors' (HUF). Dr Markar's 6 August 2010 review of the draft technical paper and his 3 September 2010 review of the final technical paper constitute his independent peer review of SunWater's HUF approach together with underlying data, assumptions and calculations.

Gilbert & Sutherland's independent quality assurance review was undertaken in accordance with the QCA's requirements to address its wider obligations as detailed in the Amended Ministers' Referral Notice gazetted 17 December 2010 (Appendix B). Specifically, G&S sought to assess the veracity of Dr Markar's work and his certification that SunWater's HUF approach is:

- rigourous and robust
- based on reasonable assumptions
- founded on appropriate models and data sources
- results in appropriate calculations for HUF factors.

On the basis of the required outcomes from the Referral, and the stated objectives of the SunWater HUF methodology, the methodology has been reviewed and assessed against the following set of measures (and key questions) . Review outcomes are provided against each of these assessment measures:

Appropriate quantitative input data and assumptions: Has approach been founded on appropriate models and data sources?

- The input data and model sources were found to be appropriate and applicable to the methodology as developed by SunWater.

Calculation accuracy: Have calculations been undertaken as defined in the SunWater technical report?

- The calculations of all 26 water supply systems were reviewed and found to be accurate to the method and input data utilised.

Rigour of methodology: Does the HUF calculation methodology incorporate all factors of significance to cost allocation?

- The methodology exhibits rigour in the inclusion of significant physical and WSS operational factors within the overall approach.
- Selection of the 15-year period giving the lowest HUFmp leads to estimates of benefit (or LOS) with a high probability of being exceeded (based on historical records) and does not in the reviewers opinion provide statistically objective outcomes.

Robustness of methodology: Does method provide consistent outcomes across all WSS's to which it is applied?

- The methodology is considered to be generally robust in providing consistent outcomes across the majority of WSS's to which it has been applied.
- Inconsistency between intent and effect on HUF values of adoption of the same ratio of MP2/HP2 as calculated for MP1/HP1.

Appropriateness of methodology: Does the HUF methodology provide an appropriate means of comparing benefit to each water entitlement group and so provide a means to apportion costs?

- The HUF values proposed are based on an assumed MP level of service equivalent to the worst 15-year performance that would have been expected under climatic conditions experienced over the past (approximately) 110 years.
- Volumes of entitlements based on an assumption of all possible future MP to HP conversions undertaken. Provide a further level of conservativeness to calculated HUFmp values.
- It is the reviewers opinion that the methodology for calculation of the HUFmp factors described in the Technical Report may result in overly conservative estimates of MP HUFs.

Cost recovery performance: Do HUF methodology and proposed values allow SunWater to recover costs as defined in the Amended Referral?

- The methodology would allow for full cost recovery in the event that the balance of costs not met by MP allocation holders were factored into prices/tariffs applied to other water allocation groups.

Reviewer recommendations:

(i) HUFs be calculated from assessment across full period of available data rather than 15-year period returning lowest HUF_{mp}.

(ii) Assessment data set be extended/infilled with recorded data (where available) to provide assessment against all available data,

(iii) method of calculating MP2/HP2 be modified to ratio of nominal volumes rather than ratio of MP1/HP1.

(iv) HUFs be calculated on the basis of existing levels of entitlement only (i.e. no assumption of full MP to HP conversion), with updates to HUFs as required able to be undertaken with conversions as they occur.

An important point to note regarding this assessment is that the original Referral called for recovery of rate of return of existing assets while the Amended Referral specifically excluded consideration of any rate of return on existing rural assets as at 30 September 2011.

This report has been undertaken from the perspective of a methodology for recovering only those costs specified in the Amended Referral. It has not sought to comment on the methodology as a means of recovering a rate of return on existing assets. The outcomes summarised above are relevant to this assessment perspective.

CONTENTS

1 Introduction....8
2 Definition of assessment criteria....10
2.1 Referral/Authority perspective....10
2.2 SunWater perspective....10
2.3 Measures/criteria:....11
3 Review of input data and model sources....12
3.1 Outcome....12
4 Review of calculations....13
4.1 Outcome....13
5 Rigour and robustness of methodology....14
5.1 Rigour....14
5.1.1 Outcome....14
5.2 Robustness....15
5.2.1 Outcome....15
6 Appropriateness of resultant HUF factors....16
6.1 All possible MP to HP conversions undertaken:....16
6.2 Zero inflows assumed in AA calcs:....16
6.3 Selection of lowest HUFmp result:....17
6.4 Outcome....17
7 Summary....18
8 Appendix A – Ministers' Referral Notice (19 March 2010)....19
9 Appendix B – Amended Ministers' Referral Notice (17 December 2010)....20
10 Appendix C – Summary notes regarding HUF results....21
11 Appendix D – Notes regarding each of Sunwater's 26 WSS....22
11.1 Barker Barambah Water Supply Scheme....22
11.2 Bowen Broken Rivers Water Supply Scheme....25
11.3 Boyne River and Tarong Water Supply Scheme....27
11.4 Bundaberg Water Supply Scheme....29
11.5 Burdekin Haughton Water Supply Scheme....32
11.6 Chinchilla Weir Water Supply Scheme....34

11.7 Callide Valley Water Supply Scheme 36
11.8 Cunnamulla Water Supply Scheme 38
11.9 Dawson Valley Water Supply Scheme 39
11.10 Eton Water Supply Scheme.....41
11.11 Julius Dam Water Supply Scheme 43
11.12 Lower Fitzroy Water Supply Scheme 44
11.13 Macintyre Brook Water Supply Scheme 46
11.14 Mareeba Dimbulah Water Supply Scheme.....47
11.15 Maranoa River Water Supply Scheme 49
11.16 Lower Mary Water Supply Scheme 50
11.17 Nogoa Mackenzie Water Supply Scheme 52
11.18 Pioneer River Water Supply Scheme 54
11.19 Proserpine River Water Supply Scheme 56
11.20 St George Water Supply Scheme.....58
11.21 Three Moon Creek Water Supply Scheme 60
11.22 Upper Burnett Water Supply Scheme.....62
11.23 John Goleby Subscheme.....64
11.24 Upper Condamine Water Supply Scheme.....65

1 Introduction

On 19 March 2010, the Premier and the Treasurer (the Ministers) directed the Queensland Competition Authority (the Authority) to develop irrigation prices to apply to 22 SunWater Water Supply Schemes (WSS) from 1 July 2011 to 30 June 2016. The Ministers' Referral Notice (Appendix A) set out the terms by which bulk water supply and channel prices/tariff structures were to be set so as to provide a revenue stream that allows SunWater to recover:

(a) its efficient operational, maintenance and administrative costs

(b) its expenditure on renewing and rehabilitating existing assets, whether through a renewals annuity or a regulatory depreciation allowance

(c) a rate of return on assets valued at 1 July 2011 (the initial regulated asset base (RAB))

(d) after 1 July 2011, a return of, and on, prudent capital expenditure on existing assets or for constructing new assets

(e) for certain hardship schemes, identified in the Ministerial Direction (cl 1.2(c)), after 1 July 2011, prices are to include a return of, and on, prudent capital expenditure to augment existing assets or construct new assets.

An Amended Referral Notice (Appendix B) was subsequently gazetted on 17 December 2011. It gave amended direction to the Authority to set bulk water supply and channel prices/tariff structures to provide a revenue stream that allows SunWater to recover:

- Efficient operational, maintenance and administration costs including but not limited to:
  - Electricity costs
  - Recreation management costs
  - Compliance with workplace health and safety
- Prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity.
- Commercial return of, and on, prudent capital expenditure for augmentation commissioned after 30 September 2011.
- Excluding any rate of return on existing rural irrigation assets (as at 30 September 2011).

The Amended Referral directed that the Authority not consider the regulated asset base (RAB) for existing irrigation assets (commissioned prior to 1 October 2011).

As owner/operators of the specified water supply schemes, SunWater has proposed an approach for apportionment of costs between different water allocation groups based on headworks utilisation factors (HUF's). The HUF methodology seeks to allocate the capital costs of bulk water supply assets between high and medium priority water allocations (including among urban, industrial and rural water users). Dr Sharmil Markar of WRM Water and Environment conducted an independent peer review of the SunWater HUF approach together with underlying data, assumptions and calculations.

To provide independent quality assurance of the expert review undertaken by Dr Markar the Authority commissioned G&S to assess the veracity of the approach taken by Dr Markar in certifying that SunWater's HUF approach is:

- rigourous and robust
- based on reasonable assumptions
- founded on appropriate models and data sources
- results in appropriate calculations for HUF factors.

Our review focused on the following two main components:

1. Direct review of the application of the methodology and calculations was undertaken, including a review of technical assumptions, input data and sources and final calculations to give proposed HUFs, and;
2. Assessment of the wider assumptions inherent in the approach and provides an assessment of the potential effects of these assumptions on the outcomes of the methodology.

Assessment has been undertaken to review and describe the effects of both adopted quantitative values/assumptions (e.g. entitlement volumes, storage capacities, dead storage levels, etc) as well as the underlying, inherently qualitative assumptions that none-the-less impact upon the quantitative outcomes of the method.

A staged approach to assessment has been undertaken with the following main components:

- Definition of assessment criteria.
- Review of input data and model sources.
- Review of calculations.
- Assessment of rigour & robustness of methodology.
- Assessment of appropriateness of resultant HUF factors.

The following sections describe the assessment undertaken and provide summary outcomes at each stage.

2 Definition of assessment criteria

The initial stage in the assessment was to define the desired/required outcomes of the HUF methodology. The following provides a set of objectives against which the methodology has been assessed and outlines the reasoning behind the selection of these criteria.

In defining the assessment criteria a number of information sources have been taken into account including:

- Ministers' Referral Notice (the Referral) dated 19 March 2010 – Queensland Government Gazette No. 74.
- Amended Ministers' Referral Notice (the Amended Referral) dated 17 December 2010 – Queensland Government Gazette No 117.
- Terms of Reference SunWater Water Supply Schemes 2011-2016 Price Paths – Quality Assurance of SunWater's Review of its Headworks Utilisation Factors Methodology.
- SunWater (2010) 'Headworks Utilisation Factors – Technical Paper'.

In defining criteria against which to assess the HUF methodology we have sought to provide a clear and objective set of measures of direct relevance to assessment of the methodology itself as well as the intended application of the resultant values.

2.1 Referral/Authority perspective

Via the Amended Referral the Ministers direct the Authority to set bulk water supply and channel prices/tariff structures to provide a revenue stream that allows SunWater to recover:

- Efficient operational, maintenance and administration costs including (but not limited to) electricity costs, recreation management costs, compliance with workplace health and safety and compliance with Australian and Queensland Government initiatives on water management, planning, trading, accounting, metering and measurement.
- Prudent and efficient expenditure on renewing and rehabilitating existing assets through renewals annuity.
- A commercial return of, and on, prudent capital expenditure for augmentation commissioned after 30 September 2011.

An important element to note is the effect of the Amended Referral in excluding rate of return on existing rural irrigation assets (as at 30 September 2010) from the costs to be recovered under the proposed prices/tariffs structure.

Based on the requirements of the Amended Notice the irrigation prices to be developed by the Authority must allow for recovery of all operational, maintenance and other costs as defined above. Of the 26 Water Supply Schemes (WSS) for which HUFs have been calculated and proposed by SunWater, 22 have multiple Water Allocation Groups meaning that supply for irrigation represents a portion only of total operational cost and scheme revenue. This requires that any costs not recovered via irrigation prices will be recovered by other users (e.g. urban, industrial).

2.2 SunWater perspective

As an owner/operator of water supply schemes throughout Queensland, SunWater has a strongly operational and technical perspective on water use and water sharing. The HUF methodology has been developed on the basis on this operational understanding and perspective and has been designed to be used to:

> *'…apportion the bulk water capital costs in accordance with the benefit or "level of service" attributable to each water entitlement priority group.'*

In order for the methodology to meet this use requires a means of measuring benefit across differing water groups in a consistent and directly comparable manner. SunWater has undertaken to define this measure of benefit via an HUF which is defined as:

> *'... the percentages of a scheme's storage headworks volumetric capacity able to be utilised by each priority group of water*

entitlements in that scheme, taking into consideration:

- *the application of operational requirements, water sharing rules and Critical Water Supply Arrangements associated with the relevant Resource Operations Plan (ROP) or interim resource operations plan (IROL); and*
- *the probability of utilisation of the scheme storages under conditions of relative supply shortage.'*

The applicability of the methodology in meeting its intended use of apportioning costs in accordance with benefit will therefore be defined by the appropriateness of the HUF in measuring the comparative benefit derived from the headworks between water entitlement groups.

2.3 Measures/criteria:

On the basis of the required outcomes from the Referral, and the stated objectives of the SunWater HUF methodology, the following represents a set of measures and key questions against which the methodology has been reviewed and assessed:

- Appropriate quantitative input data and assumptions: Has approach been founded on appropriate models and data sources?
- Calculation accuracy: Have calculations been undertaken as defined in the SunWater technical report?
- Rigour of methodology: Does the HUF calculation methodology incorporate all factors of significance to cost allocation?
- Robustness of methodology: Does method provide consistent outcomes across all WSS's to which it is applied?
- Appropriateness of methodology: Does the HUF methodology provide an appropriate means of comparing benefit to each water entitlement group and so provide a means to apportion costs?
- Cost recovery performance: Do HUF methodology and proposed values allow SunWater to recover costs as defined in the Amended Referral?

As noted, the original Referral called for recovery of rate of return of existing assets while the Amended Referral specifically excluded consideration of any rate of return on existing rural assets. The SunWater HUF methodology was developed prior to the Amended Referral and as such has been developed from the perspective of:

> '…*the allocation of relevant capital costs (i.e. asset value and renewal costs) associated with SunWater bulk assets*.'

The assessment dealt with in the body of this report has been undertaken from the perspective of assessing the HUF methodology applied to recovery of only those costs specified in the Amended Referral. It has not sought to assess the applicability or appropriateness of the methodology as a means of recovering a rate of return on existing assets.

3 Review of input data and model sources

Review of input data and model sources was undertaken on the following components of input:

- Comparison of all allocation nominal volume values utilised in HUF calculations against DERM allocation register at time of review.
- Review of system Headworks operational data and input assumptions adopted within HUF methodology. Includes Full Supply Volume (FSV), Dead Storage Volume (DSV).
- Review of application to HUF methodology of Water Sharing Rules and Critical Water Sharing Arrangement rules and procedures as specified within the ROP and iROL documentation for each catchment.
- Assessment of IQQM versions and system files utilised within the HUF methodology for each WSS.
- Review of adopted versions of Announced Allocation calculation tools for each WSS.

The available values for some elements of data input can prove to vary over time (e.g. exact entitlement volumes) and as such some minor variations in adopted values were found when compared with independently obtained information.

The adopted values (reported in the Technical report) are however considered reasonable and to be have been applied with diligence and an understanding of the limitations of available information. The potential variations in these values are not considered to be significant in terms of the HUF outcomes obtained.

A full review of all 26 water supply systems for which HUF values are proposed was undertaken. Summary notes of this review are provided in Appendix C with more detailed notes provided in Appendix D.

3.1 Outcome

The input data and model sources were found to be appropriate and applicable to the methodology as developed by SunWater.

4 Review of calculations

Review and independent checking of the calculations to obtain the proposed HUF values was undertaken on the following numerical calculation stages of the HUF methodology:

- Methodology and calculation results for determination of MP0 AA and MP100 AA for each WSS.
- Utilisation of and outputs from IQQM of each WSS. Specifically simulated storage volume for Headworks included in calculations.
- Review of SunWater developed HUF calculation spreadsheet. Specifically review of calculation formulae within spreadsheet and consistency between spreadsheet results and reported outcomes.
- Review of 'apportionment' calculations for WSSs in which resultant HUF was required to apply to more than one water allocation group (Bundaberg WSS, Lower Fitzroy WSS, Upper Burnett WSS).

A full review of all 26 water supply systems for which HUF values are proposed was undertaken. Summary notes of this review are provided in Appendix C with more detailed notes provided in Appendix D.

Feedback from QCA indicated a requirement for further explanation/review of the method of calculation for the "probability of utilization" values. The probability of utilization values are quoted in Section C of the SunWater Appendices detailing calculations for each water supply scheme. In effect the methodology adopted in the SunWater HUF approach is to apportion "slices" of storage to specific user groups depending on their ability to access that water. Put simply, the probability of utilization value is calculated as the average proportion of storage available in each of the "slices" over the 15-year period.

The adopted calculation methodology is the average component storage level divided by the defined capacity of that storage component.

For example, for the Barker-Barambah system the average level of the HP1 storage component was 9,560 ML over the 15-year critical period. This is 87.9% of the HP1 storage component capacity giving 88% probability of utilization.

For the same system (Barker-Barambah) the average volume in the conceptual MP1 storage component was 27,505 ML which corresponds to 45.0% of the MP1 storage component capacity of 61,169 ML.

In the reviewers opinion the method of calculation is consistent with SunWaters intent of providing a reasonable means of quantifying the relative difference in security outcomes between user groups.

4.1 Outcome

The calculations of all 26 water supply systems were reviewed and found to be accurate to the method and input data utilised.

5 Rigour and robustness of methodology

To assess the rigour and robustness of the HUF methodology, our review of the approach has been undertaken from the perspective of:

- Is the methodology rigourous: Have all factors of significance to the operation of the system and the benefit that each user group derives been included in an appropriate and objective manner within the calculation methodology?
- Is the methodology robust: Can the same method be applied consistently and equally across all WSS's to which it has been applied?

5.1 Rigour

Factors of importance in defining the benefit derived from a WSS by a water user range from climatic/hydrologic factors, to the balance between competing user groups and the water sharing rules by which they are governed. Table 5.1 summarises the main groups of information considered important to ensure a rigourous approach to defining relative benefit. Of particular note are the final two factors in Table 5.1.

In seeking to take account of the level or service provided to each user group, the subjective assumption of "lowest HUFmp value returned" effectively sets the projected level of service at a low level, which, by definition, has a low likelihood of occurrence. The selection of this specific period sets the measure of irrigator benefit equivalent to the lowest level estimated to have been able to be provided over the past 110 years. The potential effect on resultant HUF values is discussed further in Section 6 below.

5.1.1 Outcome

The methodology exhibits rigour in the inclusion of significant physical and WSS operational factors within the overall approach.

Table 5.1. Factors influencing water allocation group benefit

Factor	Comment
Climatic/hydrologic characteristics of the catchment	Inclusion within methodology via utilisation of long-term historically based IQQM data sets and recorded storage behaviour data as affected by inflows, rainfall/evaporation, etc.
Specific planning horizon/period of assessment	Included via specification of 15-year assessment period
Water supply system physical characteristics	Included via dam storage characteristics information, outlet release characteristics, channel capacities, etc.
Relative volume of allocations held by each individual user group	Included directly within methodology as input data
Water sharing between user groups	Inclusion within methodology via utilisation of: I. IQQM within which majority of water sharing rules are simulated II. MP0 AA and MP100 AA with inclusion of implications of critical water sharing arrangements and other rules not explicitly simulated with IQQM.
Likelihood of access to allocations for each user group	Indirect inclusion via IQQM simulated or recorded storage behaviour data compared against determined MP0 and MP100 AA levels Note subjectivity in selection of 15-yr climatic period which gives lowest resultant HUFmp (i.e. does not represent true likelihood of access into the future)
Relative operational effort associated with supply to discrete user groups	Not included

Selection of the 15-year period giving the lowest HUFmp leads to estimates of benefit (or LOS) with a high probability of being exceeded (based on historical records) and does not provide statistically objective outcomes.

It is the reviewers recommendation that:

(i) HUFs be calculated from assessment across full period of available data. Removes subjectivity of selected period and allows for improved estimates with improved/extended data sets.

5.2 Robustness

For the method to a considered robust requires that it can be applied equally across all 26 schemes and provides a standard method that can be followed independently to achieve ostensibly similar results.

In general the methodology is consistent and based on a series of logical and structured framework of data selection and steps in calculation.

An element of the methodology that, in the Reviewers opinion, leads to non-robust HUF outcomes is the adoption of the same ratio of MP2/HP2 as calculated for MP1/HP1.

The outcome of this simple assumption for assigning proportion of utilization above MP100 AA between the groups leads to a non-intuitive outcome in that improved MP conditions (i.e. lower level at which MP receives 100 AA) leads to a decreased HUF (implying less utilization/ benefit).

This element of the methodology has been discussed with the relevant QCA and SunWater personnel towards development of an agreed alternative method that maintains the intent of the HUF methodology whilst also ensuring consistent changes between MP benefit and HUF values. The alternative method discussed and agreed with SunWater is for adoption of MP2/HP2 apportionment ratios on the basis of total nominal volumes.

5.2.1 Outcome

The methodology is considered to be generally robust in providing consistent outcomes across the majority of WSS's to which it has been applied.

Adoption of HP1/MP1 ratios for apportioning MP2/HP2 volumes leads in the reviewers opinion to non-intuitive outcomes for varying MP benefit. Development and assessment of an alternative method based on assigning MP2/HP2 on the basis of the ratio of relative total nominal volumes has been discussed with both SunWater and QCA with agreement obtained to its appropriateness for inclusion in an updated HUF methodology.

It is the reviewers recommendation that:

(i) Assessment data set be extended/infilled with recorded data (where available) to provide assessment against all available data,

(ii) method of calculating MP2/HP2 be modified to ratio of nominal volumes rather than ratio of MP1/HP1.

6 Appropriateness of resultant HUF factors

The HUF has been developed to provide a direct and comparable measure of benefit for each user group. Two elements of the definition of HUF are particularly important in terms of affecting the outcomes of the HUF methodology:

1. HUF = percentage of storage capacity able to be utilised = Benefit
2. Benefit is defined by utilisation of storage '*under conditions of relative supply shortage'*.

It is our opinion that the HUF methodology has been developed based on a generally conservative premise in terms of assessing the benefit that irrigators (medium priority water allocation group) derive from the water supply schemes. The rationale behind this conservative approach is given in the Technical report as:

> '*…the proportion of the overall benefit derived from storage headworks by high priority water entitlements is typically greater than their proportion of the nominal volume of entitlements in a scheme. ...It follows that high priority water entitlements should therefore be apportioned a share of the storage assets that is proportionate to this increased utilisation*.'

The application of this rationale has been quantified in a number of adopted values and assumptions within the calculation methodology and these are listed and explained below.

6.1 All possible MP to HP conversions undertaken:

A number of WSSs have some flexibility in allowing for conversion of MP allocations into HP allocations up to a pre-defined limit of volume. By adopting a maximum estimate of possible future HP allocations the resultant HUFmp is reduced relative to the same calculations based on existing allocation volumes.

The Burdekin-Haughton WSS calculation sheet (see Appendix D) details the comparative HUF calculation under an assumption of existing MP and HP allocation volumes (i.e. no additional conversion). Outcomes show significant increase in the HUFmp from 79% to 92% (see Table 6.1).

6.2 Zero inflows assumed in AA calcs:

A number of the WSS's for which HUFs have been proposed include a "minimum inflow" assumption in the water sharing rules. The minimum inflow assumptions provide some improvement in initial MP access based on an expectation of some inflows over the coming water year. By adopting a zero inflow assumption in all WSS's the calculated MP0 AA and MP100

Table 6.1 Summary of illustrative HUF results

Results	Burdekin-Haughton		Upper Burnett (ML)	Upper Condamine (ML)
	Reported	Comparison case (no conversions)		
MP allocations	979,594 ML	1,108,534 ML	45,460 ML	22,165 ML
HP allocations	99,998 ML	26,841 ML	1,530 ML	3,387 ML
Critical 15-year period	1925-1940	1925-1940	1994-2009	1929-1944
Data source	IQQM	IQQM	Recorded	IQQM
HUFmp	79%	92%	26%	11%
Characteristics of full set of calculated results (HUF outcomes from all 15-year periods for length of available record)				
Minimum	79.0%	92.2%	26.4%	11.0%
Maximum	82.4%	93.5%	75.6%	66.3%
Median	81.2%	93.0%	73.8%	58.1%
Average	80.9%	92.9%	73.8%	51.7%

AA volumes are increased and lead to lower HUFmp values than if minimum inflows were included.

Start of year MP0 AA and MP100 AA volumes applied over full year: The AA calculations for each WSS are based on an ongoing update and re-calculation of MP access throughout the water year. Due to the nature of the water sharing rules if the MP100 AA values in the HUF methodology were to be similarly varying over the water year, the estimated MP access would be increased.

6.3 Selection of lowest HUFmp result:

In the reviewers opinion the selection of the lowest calculated HUFmp value skews the implied measure of probability of access and does not provide an objective measure of projected benefit. Table 6.1 summarises the range of values from which the lowest HUFmp values were selected for a series of water supply systems. In particular, HUFmp values for the Upper Burnett and Upper Condamine illustrate the potentially significant effect on HUF outcomes due to the specific selection of the lowest resultant HUF.

- The Upper Burnett HUFmp of 26% is based on the minimum value obtained for the period 1986-2000 (recorded data). This obtained from a range of 15-year HUFmp values of 26% to 76% with a median of 73%.
- The Upper Condamine HUFmp of 11% is based on the minimum value obtained for the period 1929-1944 (IQQM simulated data). This obtained from a range of 15-year HUFmp of 11% to 66% with a median of 58%.

In effect the HUF values proposed are based on an assumed MP level of service equivalent to the worst 15-year performance expected under climatic conditions experienced similar to those experienced over the past 110 years. It is important to note that the above examples have been selected in order to illustrate the potential effects and not all calculated HUFmp values for all WSSs would be affected to a similar magnitude.

6.4 Outcome

Each of the above assumptions has, to a greater or lesser extent, a conservative effect on the resultant HUFmp value (i.e. leads to a reduced value). The cumulative effect of the above assumptions has not been quantified.

The most significant assumptions in terms of potential impact on HUF values are likely to be:

(i) Conversion of MP to HP allocations and

(ii) Adoption of the lowest HUFmp value returned from the analyses.

It is considered that the methodology for calculation of the HUFmp factors as described in the Technical Report may result in overly conservative estimates of benefit derived from the assets by medium priority water allocation groups.

It is the reviewers recommendation that:

(i) HUFs be estimated based on full period of available data,

(ii) HUFs be calculated on the basis of existing levels of entitlement only (i.e. no assumption of full MP to HP conversion), with updates to HUFs as required able to be undertaken with conversions as they occur

7 Summary

The SunWater HUF methodology has been developed with the aim to provide a measure of the 'benefit' that each water group derives from the Water Supply Schemes Headworks in order to assign a proportion of costs to each group.

Two main components of cost can be defined as the cost of providing the assets for supply of water (asset value) and the operational costs associated with supplying water from those assets to each user group (supply cost).

In accordance with the direction of the Amended Referral, only those costs associated with operational/supply activities were considered in this assessment.

Due to an underlying assumption adopted across all WSSs, the benefit assigned to Medium Priority (MP) allocations is effectively equivalent to the worst performance over the selected planning horizon estimated for the available period of record (of the order of 100 to 110 years).

As an estimate of projected benefit over the coming 15-year period, this represents a highly conservative assumption and is highly likely to underestimate the utilisation of the system via MP allocations and the operational effort/costs that could be attributed to MP water use.

In our view, the underlying assumptions of the methodology, most notably the adoption of the minimum HUF value returned from assessment of multiple 15-year periods, are overly-conservative and thus deserving of reconsideration. Alone or in combination, these assumptions may give rise to a representation that underestimates MP utilisation/benefit with consequent implications for apportionment of costs.

The outcome of the MP2/HP2 assumption for assigning proportion of utilization above MP100 AA between the groups leads to a non-intuitive outcome in that improved MP conditions (i.e. decreased level at which MP receives 100 AA) leads to a decreased HUF (implying less utilization/benefit). This element of the methodology has been discussed with the relevant QCA and SunWater personnel and an agreed alternative method for MP2/HP2 apportionment has been suggested.

Recommendations

(i) HUFs be calculated from assessment across full period of available data rather than 15-year period returning lowest HUF_{mp}.

(ii) Assessment data set be extended/infilled with recorded data (where available) to provide assessment against all available data,

(iii) Modify method of calculating MP2/HP2 to ratio of nominal volumes rather than ratio of MP1/HP1.

(iv) HUFs be calculated on the basis of existing levels of entitlement only (i.e. no assumption of full MP to HP conversion), with updates to HUFs as required able to be undertaken with conversions as they occur.

This report deals solely with the HUF methodology in the context of the Amended Referral only (i.e. operational costs). Given the original referral called for consideration of rate of return on existing assets, general comments and discussion on the appropriateness of the HUF methodology for application to apportioning rate of return on existing asset value have been provided in Appendix E for the information of the Authority.

8 Appendix A – Ministers' Referral Notice (19 March 2010)

QUEENSLAND COMPETITION AUTHORITY ACT 1997
Section 23

MINISTERS' REFERRAL NOTICE

Referral

As the Premier and Treasurer of Queensland, pursuant to Section 23 of the *Queensland Competition Authority Act 1997* (the Act), we hereby direct the Queensland Competition Authority (the Authority) to develop irrigation prices to apply to the following SunWater water supply schemes (WSS) from 1 July 2011 to 30 June 2016:

Barker Barambah	Lower Fitzroy
Bowen Broken Rivers	Macintyre Brook
Boyne River and Tarong	Maranoa River
Bundaberg	Mareeba-Dimbulah
Burdekin-Haughton	Nogoa-Mackenzie
Callide Valley	Pioneer River
Chinchilla Weir	Proserpine River
Cunnamulla	St George
Dawson Valley	Three Moon Creek
Eton	Upper Burnett
Lower Mary	Upper Condamine

1. Matters the Authority must take into consideration

In referring this investigation, the Ministers direct the QCA under section 24 of the Act as follows:

1.1 For water supply schemes, or segments of schemes (except those listed in 1.2 below), bulk water supply and channel prices/tariff structures are to be set to provide a revenue stream that allows SunWater to recover:

a) its efficient operational, maintenance and administrative costs;

b) its expenditure on renewing and rehabilitating existing assets, whether through a renewals annuity or a regulatory depreciation allowance;

c) a rate of return on assets valued at 1 July 2011, as specified in 1.4 (below) (the initial regulated asset base (RAB)); and

d) after 1 July 2011, a return of, and on, prudent capital expenditure on existing assets or for constructing new assets.

1.2 For the following schemes (schemes or segments of schemes identified as unable to meet the full costs of 1.1 a) and 1.1 b) due to hardship):

a) irrigation prices are to be set to maintain current prices in real terms, and improve the level of cost recovery, where the capacity to do so exists;

b) after 1 July 2011, prices are to include a return of, and on, prudent capital expenditure to augment existing assets or construct new assets.

c) the Authority may recommend whether to set prices through the use of a renewals annuity or depreciation-based RAB pricing approach.

These schemes are:

- Redgate Relift in the Barker Barambah WSS
- Callide Valley WSS
- Cunnamulla WSS
- Maranoa River WSS
- Channel Relift in the Mareeba Dimbulah WSS
- Three Moon Creek WSS

1.3 For 1.1 (d) and 1.2 (b), the Authority is to have regard to the agreed level of service between SunWater and the customers of the water supply scheme, including for capital expenditure on existing assets or for the construction of new assets.

1.4 In recommending an initial RAB (1.1 c) for irrigation supply assets (or that part of an asset used for the supply of water for irrigation purpose), the Authority is to:

a) value the following channel distribution systems assets at zero;

- Bundaberg channel distribution system
- Burdekin channel distribution system
- Dawson Valley channel distribution system
- Eton channel distribution system
- Lower Mary channel distribution assets
- Mareeba Dimbulah channel distribution system
- Emerald channel distribution system
- St George channel distribution system
- Callide Valley channel distribution assets
- Yarramalong Pump Station and associated distribution assets in the Upper Condamine Scheme
- Youlambie channel distribution assets in the Three Moon Creek Scheme
- Redgate Relift distribution assets in the Barker Barambah scheme

b) For other schemes or segments of schemes, apply a 'line in the sand' approach[1] to value assets for bulk water supply based upon:

- the level of service attributed to the supply of water for irrigation;
- the efficient operating cost of meeting the required level of service;
- water prices reflecting the irrigators' anticipated capacity to pay;

[1] The 'line in the sand' approach can be used to set an initial regulated asset base between:

- at the upper end, a value at which customers would be better off if the asset was scrapped and a new asset installed – which is what a depreciated, optimised replacement cost provides an estimate of; and
- at the lower end, the value that the assets would have in their next best use, which for sunk investments may be very low.

- water prices achieving a commercial return over a period not longer than 15 years.

The 'line-in-the-sand' approach must not adversely affect the operator's ability to recover full commercial prices from urban and industrial customers.

1.5 In providing pricing recommendations for each scheme, the Authority is to also consider how to treat existing renewals reserves if it considers it appropriate to transition schemes to a depreciation-based RAB pricing approach.

1.6 For relevant schemes, the Authority is to review drainage charges and channel water harvesting charges.

1.7 The Authority is to recommend pricing principles to apply for the inclusion of capital expenditure on dam spillway upgrades.

2. Consultation

The Authority must undertake an open consultation process with all relevant parties and consider submissions within the timetable for the delivery of the Final Report to Government. All reports and submissions must be made publicly available, including on the Authority's website.

3. Timing

The Authority must provide to the responsible Ministers and the Minister for Natural Resources, Mines and Energy and Minister for Trade:

a) a Draft Report and draft irrigation prices by no later than 31 January 2011 and;

b) a Final Report and recommended price paths by no later than 30 April 2011.

The Final Report will inform the Government's deliberations for price paths to apply to SunWater's irrigation water prices for the five year period commencing 1 July 2011.

4. Other matters

The Authority may exercise all the powers under Part 6 of the *Queensland Competition Authority Act 1997*.

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9 Appendix B – Amended Ministers' Referral Notice (17 December 2010)

Parliament of Queensland Act 2001

PARLIAMENTARY MEMBERS' SALARY NOTICE (No. 1) 2010

1. Short Title

This Notice may be cited as the *Parliamentary Members' Salary Notice (No. 1) 2010*.

2. Annual Rate of Salary

Pursuant to the *Parliament of Queensland Act 2001*, it is declared that on and from 1 August 2010, the annual rate of salary payable to a Member of the Queensland Legislative Assembly is $133,804.

The *Members' Entitlements Handbook* shall be amended to reflect the increase of 2.5% to salaries of Members of the Queensland Legislative Assembly and additional salaries and Expense of Office allowances payable to Office Holders of the Legislative Assembly, Ministers and Parliamentary Secretaries, effective on and from 1 August 2010.

ENDNOTES

1. Made by the Governor in Council on 15 December 2010.
2. Published in the Gazette on 17 December 2010.
3. Not required to be laid before the Legislative Assembly.
4. The administering agency is the Department of the Premier and Cabinet.

Queensland Competition Authority Act 1997
Section 36

NOTIFICATION OF DECISION

The Decision

As the Ministers under the *Queensland Competition Authority Act 1997*, we hereby declare, under Section 36 of the *Queensland Competition Authority Act 1997* (QCA Act), that we accept the recommendations about pricing practices contained in the Queensland Competition Authority's (the Authority) report, titled, *Final Report Gladstone Area Water Board: Investigation of Pricing Practices 2010* (the Report).

In accepting the recommendations we accept the Authority's recommendation that price transitioning arrangements are a matter for the Gladstone Area Water Board to determine with its customers. We also note the Authority's advice that the Gladstone Area Water Board and the Gladstone Regional Council have reached agreement on an appropriate transitioning arrangement to apply.

Under Section 37 of the QCA Act, this decision is referred to the Minister for Natural Resources, Mines and Energy and Minister for Trade for necessary action.

ANNA BLIGH
Premier
Minister for the Arts

ANDREW FRASER
Treasurer
Minister for Employment and Economic Development

Queensland Competition Authority Act 1997
Section 23

AMENDED MINISTERS' REFERRAL NOTICE

Referral

As the Premier and Treasurer of Queensland, pursuant to Section 23 of the *Queensland Competition Authority Act 1997* (the Act), we hereby **amend our Direction of 19 March 2010 and** direct the Queensland Competition Authority (the Authority) to recommend irrigation prices to apply to the following SunWater water supply schemes (WSS) from 1 October 2011 to 30 June 2016 (the price path period):

Barker Barambah
Bowen Broken Rivers
Boyne River and Tarong
Bundaberg
Burdekin-Haughton
Callide Valley
Chinchilla Weir
Cunnamulla
Dawson Valley
Eton
Lower Mary
Lower Fitzroy
Macintyre Brook
Maranoa River
Mareeba-Dimbulah
Nogoa-Mackenzie
Pioneer River
Proserpine River
St George
Three Moon Creek
Upper Burnett
Upper Condamine

1. Matters the Authority must take into consideration

In referring this investigation, the Ministers direct the Authority under section 24 of the Act as follows:

1.1 For water supply schemes, or segments of schemes (except those listed in 1.2 below), bulk water supply and channel prices/tariff structures are to be set as follows:

a) to provide a revenue stream that allows SunWater to recover:

i) efficient operational, maintenance and administrative costs to ensure the continuing delivery of water services;

For the removal of doubt, costs include, but are not limited to:
- electricity costs;
- recreation management costs;
- compliance with workplace, health and safety; and
- compliance with Australian and Queensland Government initiatives on water management, planning, trading, accounting, metering and measurement.

ii) prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity;

iii) to put beyond doubt, costs exclude any rate of return on existing rural irrigation assets (as at 30 September 2011); unless current prices are already above the level required to recover i) and ii), in which case water prices are to be maintained in real terms based on an appropriate measure of inflation as recommended by the Authority; and

iv) a commercial return of, and on, prudent capital expenditure for augmentation commissioned after 30 September 2011;

b) the Authority is not to consider the regulated asset base (RAB) for existing irrigation assets (that is assets commissioned prior to 1 October 2011);

c) in considering the tariff structures, the Authority should have regard to the fixed and variable nature of the underlying costs; and

d) the Authority is to adopt tariff groups as proposed in SunWater's network service plans. The Authority is not to investigate additional nodal pricing arrangements.

1.2 For the following schemes or segments of schemes, irrigation prices are to be set to:

i) For the price path period, increase in real terms at a pace consistent with the 2006-2011 prices or until such time as the scheme reaches costs sufficient to recover 1.1 a) i) and ii); and

ii) include a commercial return of, and on, prudent capital expenditure for augmentation commissioned after 30 September 2011.

These schemes are:
- Redgate Relift in the Barker Barambah WSS
- Callide Valley WSS
- Maranoa River WSS
- Channel Relift in the Mareeba Dimbulah WSS
- Cunnamulla WSS
- Three Moon Creek WSS

1.3 The Authority must recommend appropriate regulatory arrangements, including price review triggers and other mechanisms, to manage the risks associated with the allowable costs identified in 1.1 (above) outside the control of SunWater.

1.4 For the purposes of this Direction, the Authority is not to consider the recovery in prices of capital expenditure for dam safety upgrades.

1.5 The Authority is to have regard to the level of service provided by SunWater to its customers of the water supply scheme, including for capital expenditure on existing assets or for the construction of new assets.

1.6 In recommending irrigation prices the Authority must have regard for the legitimate commercial interests of SunWater, and the requirement for SunWater to operate as a commercial entity, subject to 1.1 (above).

1.7 For relevant schemes, the Authority is to review drainage charges and channel water harvesting charges.

1.8 If the Authority calculates tariffs for a water supply scheme, or segment of a water supply scheme that may have the effect of a price increase for irrigators that is higher than the Authority's measure of inflation,

a) the Authority must consider the need to implement a price path for the introduction of the price increase to moderate price impacts on irrigators, and that has regard for SunWater's legitimate commercial interests;

b) a price path may be longer than one price path period, however the Authority must provide its reason for the longer timeframe; and

c) if the Authority recommends not to implement a price path, the Authority must give its reasons.

2. Consultation

The Authority must undertake an open consultation process with all relevant parties and consider submissions within the timetable for the delivery of the Final Report to Government. All reports and submissions must be made publicly available, including on the Authority's website.

3. Timing

Sunwater must provide its Network Services Plans and supporting documentation to the QCA by no later than 10 January 2011.

The Authority must provide to the responsible Ministers and the Minister for Natural Resources, Mines and Energy and Minister for Trade the:

a) Draft Report and draft irrigation prices by no later than 30 June 2011; and

b) Final Report and recommended price paths by no later than 31 August 2011.

The Final Report will inform the Government's deliberations for price paths to apply to SunWater's irrigation water prices for the period commencing 1 October 2011 and ending 30 June 2016.

4. Other matters

To put beyond doubt, nothing in this Referral prevents SunWater from setting full commercial prices for urban and industrial customers.

The Authority may exercise all the powers under Part 6 of the *Queensland Competition Authority Act 1997*.

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Queensland Heritage Act 1992

DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT

HERITAGE REGISTER DECISION

Under the provisions of s.54 of the *Queensland Heritage Act 1992*, the Department of Environment and Resource Management gives public notice that on 9 December 2010 the Queensland Heritage Council entered in the Queensland Heritage Register the following as a State Heritage Place HRN 602761:

Dalby	St Columba's Convent (former) 169 Cunningham Street

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Email your submission in Microsoft Word or PDF format to:

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GENERAL & LOCAL GOVERNMENT GAZETTES

All submissions to the General and Local Government Gazettes must be received **before 12 noon on Wednesdays.**

For example:
- Departmental Notices
- Gaming Machine Licence Applications
- Liquor Licence Applications
- Wine Industry - Satellite Cellar Door Applications
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- Land Sales / Resumption of Land
- Meeting Notices
- Dissolution of Partnership Notices
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Email your submission in Microsoft Word or PDF format to:

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OR Fax through your submission to: **...(07) 3866 0292** with a covering letter.

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All payments for non-account submissions must be receipted by Accounts **before 12 noon on Wednesdays.**

— Quotes are available on request —

A proof is then prepared and sent back to you for approval.

The final approval to print must be returned before close of business on Wednesday to be included in Friday's Gazette.

The Gazettes are set to print on Thursday morning and are sent to the printers Thursday afternoon.

Distribution is completed first thing Friday morning.

VACANCIES GAZETTE

Vacancies Section:
Departments must enter their weekly submissions **before close of business Monday** to the Jobs Online Website:

www.jobs.qld.gov.au

Any changes, additions or deletions can ONLY be completed through this website.

Appointments Section (Part I - Appealable and Part II - Non-Appealable):
Departments must email their weekly submissions **before 12 noon on Tuesday** to:

gazette@sds.qld.gov.au

10 Appendix C – Summary notes regarding HUF results

Scheme	SunWater HUFmp	Comments	HUFmp Min	HUFmp Max	HUFmp Med	HUFmp Weighted average over full period of data	HUFhp SunWater	HUFhp Max	HUFhp Min	HUFhp Med	HUFhp Wt Ave	
Barker-Barambah	75%		75.4%	83.8%	80.1%	79.8%	25%	25%	16%	20%	20%	
Bowen Broken Rivers	0%	Example of HUF not representing measure of benefit	0.0%	17.0%	15.2%	13.0%	100%	100%	83%	85%	87%	
Boyne River & Tarong	9%		9.0%	13.5%	11.4%	11.4%	91%	91%	87%	89%	89%	
Bundaberg	80%	331,457 ML MP, 44,372 ML HP	79.9%	83.7%	82.0%	82.2%	20%	20%	16%	18%	18%	
SunWater Headworks	82%	207,457 ML MP 24,372 ML HP			83.8%	84.0%	18%			16%	16%	calcs in "Apportionent calcs.xls"
Burnett Water Headworks	77%	124,000 ML MP 20,000 ML HP			79.1%	79.3%	23%			21%	21%	
Burdekin Haughton	79%		79.0%	82.4%	81.2%	80.9%	21%	21%	18%	19%	19%	
	92%	Comparative case	92.2%	93.5%	93.0%	92.9%	8%	8%	6%	7%	7%	calcs with no conversion from current allocation levels
Chinchilla Weir	12%		12.3%	22.4%	18.4%	18.0%	88%	88%	78%	82%	82%	
Callide Valley	9.80%	IQQM (1900-1995)	3.0%	27.5%	17.7%	17.5%	90%	97%	73%	82%	83%	
		Recorded (1985-2010)	9.8%	45.2%	25.4%	26.7%		90%	55%	75%	73%	
		Combined (recorded adopted for overlap)	9.0%	45.2%	18.3%	20.6%		91%	55%	82%	79%	
Cunnamulla	100%	Single water allocation group					0%					
Dawson Valley	70%	56,253 ML MP	70.2%	74.6%	73.0%	72.7%	30%	30%	25%	27%	27%	
Medium priority	46%	36,944 ML MP										
Medium-A priority	24%	19,309 ML MP										
Eton	80%		79.7%	83.0%	82.0%	81.9%	20%	20%	17%	18%	18%	
Julius Dam	100%	Single water allocation group					0%					
Lower Fitzroy	11%		10.9%	10.9%	10.9%	10.9%	89%	89%	89%	89%	89%	
Lower Fitzroy WSS	7%						93%					
Fitzroy Barrage WSS		Not reported										
Macintyre Brook	87%	n/a (continuous sharing)					13%					
Mareeba Dimbulah	46%		45.9%	58.6%	53.3%	53.4%	54%	54%	41%	47%	47%	
Maranoa River	100%	Single water allocation group					0%					
Lower Mary	42%		42.2%	44.3%	43.3%	43.3%	58%	58%	56%	57%	57%	
Nogoa Mackenzie	40%		40.0%	49.9%	49.2%	48.0%	60%	60%	50%	51%	52%	
Pioneer River	44%		43.5%	52.9%	51.5%	50.8%	56%	57%	47%	49%	49%	
Proserpine River	27%		26.7%	45.2%	43.1%	41.0%	73%	73%	55%	57%	59%	
St George	94%	n/a (continuous sharing)					6%					
Three Moon Creek	60%	IQQM (1890-2000)	72.5%	77.0%	76.2%	76.0%	40%	28%	23%	24%	24%	
		Recorded (1998-2010)	59.5%	72.4%	71.2%	68.9%		41%	28%	29%	31%	
		Combined (recorded adopted for overlap)	59.5%	77.0%	76.1%	75.2%		41%	23%	24%	25%	
Surface water	8%											
Groundwater	52%											
Upper Burnett	26%	IQQM(1890-1997) (MP = 45,460 ML HP = 1,530 ML)	69.4%	75.6%	73.8%	73.8%	74%	31%	24%	26%	26%	
		Recorded (1985-2009)	26.4%	73.6%	68.6%	60.0%		74%	26%	31%	40%	
		Combined (recorded adopted for overlap)	26.4%	75.6%	73.2%	70.3%		74%	24%	27%	30%	
SunWater headworks	18%				62.1%	58.5%	82%			38%	42%	calcs in "Apportionent calcs.xls"
Burnett Water Headworks	100%						0%					
John Goleby Weir	100%						0%					
Upper Condamine	11%		11.0%	66.3%	58.1%	51.7%	89%	89%	34%	42%	48%	

11 Appendix D – Notes regarding each of Sunwater's 26 WSS

11.1 Barker Barambah Water Supply Scheme

Reviewer's Summary: With the exception of the MP Nominal Volume all input data and calculations were found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	32079 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 32079 ML
	37643 ML (from the current register)				
***Reviewer's comments:* The DERM Allocation Register is changing constantly, and we assume that the number in the SunWater's calculations was correct at the time the work was performed**					
High Priority	2236 ML	→	= HPA		HPAmax = 2236 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 11245 ML	
Adjustments	• The Burnett ROP (August 2009) details the Critical Water Supply Arrangements in Att 4.3E, s1.4.1. This CWSA specifies in the Stage 1 trigger, the storage volume as 12000 ML below which MP are cut off. It should be noted that a subsequent ROP amendment (April 2010) has introduced other CWSA, which effectively work more as "normal" water sharing rules on an interim basis. In this HUF analysis, SunWater has retained the 12000ML cutoff volume as being more representative of future water sharing arrangements in the Barker Barambah WSS.`	
MP0	= max {MP0 AA , CWSA Adjustment}	12000 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 73169 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	73169 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	136190 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	1122 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 53506 ML	HP2 = 9515 ML	P3 = 7%	MP2util = 3963 ML	HP2util = 705 ML
MP1 = 61169 ML		P 2 = 45%	MP1util = 27510 ML	
HP1 = 10878 ML		P1 = 88%	HP1util = 9562 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	75%	Medium Priority	**75%**
HPA	25%	High Priority	**25%**

The Critical 15 year Period is from 01/07/1900 to 30/06/1915

HUF estimations with the current MP nominal Volume:

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = **81707 ML**	
MP100	= min (MP100 AA, Adjustment Volume)	**81707 ML**

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 47128 ML	HP2 = 7355 ML	P3 = 0.5%	MP2util = 220 ML	HP2util = 734 ML
MP1 = 69707 ML		P 2 = 46%	MP1util = 31797 ML	
HP1 = 10878 ML		P1 = 93%	HP1util = 10160 ML	

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	76%	→	Medium Priority	**76%**
HPA	24%	→	High Priority	**24%**

The Critical 15 year Period is from 01/07/1932 to 30/06/1947

Reviewer's comments: ***The change in the MP Nominal Volume doesn't have significant impact on the HUF estimations, however it affects the timing of the critical period.***

11.2 Bowen Broken Rivers Water Supply Scheme

Reviewer's Summary: *All input data and calculations were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	5676 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 5676
High A1 Priority (*)	11649 ML	} →	= HPA		HPAmax = 33254
High A2 Priority (*)	21605 ML				

Note * With reference to water sharing rules for BBWSS (Burdekin ROP, s131 and s132), High A1 Priority and High A2 Priority are considered to be comparable products for the purposes of this HUF analysis

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 53189 ML	
Adjustments	• Burdekin ROP (Chap 2, s32) specifies Reserve Volume for future allocation to SunWater of 8744 ML that is not included as a term in the current water sharing rules	
MP0	= Sum of MP0AA and Reserve Volume provision =	61933 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 65867 ML	
Adjustments	• Burdekin ROP (Chap 2, s32) specifies Reserve Volume for future allocation to SunWater of 8744 ML that is not included as a term in the current water sharing rules	
MP100	= min (MP100 AA, Adjustment Volume)	74611 ML
	Reviewer's comments: While the above formula defines the MP100 as the minimum of MP100 AA and the Adjustment Volume, the figure 74611 ML represents the sum of the two. If we consider the ROP description of the adjustment, it implies that the adjustment volume has not been previously included and it has to be added to the MP100 AA. Therefore the above number is correct, and the formula in this particular case needs to be amended.	

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	118573 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	1241 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 7596 ML	HP2 = 36366 ML →	P3 = 0% →	MP2util = 0 ML	HP2util = 0 ML
MP1 = 12678 ML →		P 2 = 0% →	MP1util = 0 ML	

HP1 = 60692 ML → P1 = 47% → HP1util = 28610 ML

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping
MPA	0%
HPA	100%

Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
Medium Priority	0%
High A1 Priority	35%
High A2 Priority	65%

11.3 Boyne River and Tarong Water Supply Scheme

Reviewer's Summary: *With the exception of the HP and MP Nominal Volumes, all input data and calculations were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	11809 ML **11235 ML** (from the current register)	→	= MPA	Burnett ROP Conversion Factor (Att 4.4H) = 2.5	MPAmin = 10934 ML
High Priority	32990 ML **33220 ML** (from the current register)	→	= HPA		HPAmax = 33340 ML **37714 ML** (from the current register)
Reviewer's comments: ***The DERM Allocation Register is changing constantly, and we assume that the numbers in the SunWater's calculations were correct at the time the work was performed. With the existing numbers the conversions of MPAmin (with specified HPAmax) are correct.***					

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 119856 ML	
Adjustments	• Burnett ROP Att4.4F, s1.2 specifies a storage cutoff volume to protect HP as 70000 ML	
MP0	= max (MP0 AA, Cutoff Adjustment)	119856 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 137742 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	137742 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	204200 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	8360 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 =9187 ML	HP2 = 57271 ML	P3 = 17%	MP2util =1553 ML	HP2util =9679 ML
MP1 = 17886 ML		P 2 = 45%	MP1util = 8050 ML	
HP1 = 111496 ML		P1 = 79%	HP1util = 87759 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	9 %	Medium Priority	9 %
HPA	91 %	High Priority	91 %

The Critical 15 year Period is from 01/07/1912 to 30/06/1927

HUF estimations with the current allocation volumes:

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:	Water entitlement grouping (in HUF calc.) :		
Medium Priority	**11235 ML**	= MPA	Burnett ROP Conversion Factor (Att 4.4H) = 2.5	MPAmin = 10934 ML
High Priority	**33220 ML**	= HPA		**HPAmax = 37714 ML**

The DERM allocation register gives the **HP and MP Nominal Volumes** and the **maximum HP volume**. The conversion of the additional HP volume to MP volume shows that for this WSS it is allowed for the total nominal volume of MP allocations to be converted to HP allocations.

Difference = HPAmax – HP = 37714 – 33220 = 44940 ML

44940 x ROP CF = 44940 x 2.5 = 11235 ML of MP allocations could be converted to HP

Nominal Volume MP = 11235 ML

This gives MPAmin= 0 ML

With MPAmin= 0 ML, HPA HUF = 100%

Under this conditions, the critical period shifts to **01/07/1890 – 30/06/1905**

11.4 Bundaberg Water Supply Scheme

Reviewer's summary: *Only the input data was reviewed for this WSS. The flow DA file was not provided and the IQQM model was not run. The listed storage levels which were provided were only for the reported 15 year critical period, therefore a check of the calculations for the whole simulation period was not possible.*

All the input data was found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group * (in ROP or IROL):	Nominal Volume:	Water entitlement grouping (in HUF calc.) :		
Medium Priority (SunWater)	*207457 ML*	MPA =331457 ML	ROP Conversion Factor = N/A	MPAmin = 331457 ML
High Priority (SunWater)	*24372 ML*	HPA = 44372 ML **HPA = 47372 ML** (from the current register)		HPAmax = 44372 ML
Medium Priority (Burnett Water)	*124000 ML*			
High Priority (Burnett Water)	*20000 ML*			
***Reviewer's comments:* The DERM Allocation Register is changing constantly, and we assume that the numbers in the SunWater's calculations were correct at the time the work was performed.**				

* Water entitlements in Bundaberg WSS consist of SunWater allocations and Burnett Water allocations.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA (**KOLAN SUBSCHEME** DURING SPLIT SCHEME)	Announced allocation water sharing rules give minimum storage volume in the sub-scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 19538 ML	
Adjustments	• Bucca Weir release rule as per Burnett ROP, Att 4.1E, Table 6 {(380 x 31) + (380 x 28) + (380 x 31) + (380 x 30)} = 45600 ML	
MP0_kolan	= (MP0 AA + Bucca Adjustment)	65138 ML

MP0 AA (BURNETT SUBSCHEME DURING SPLIT SCHEME)	Announced allocation water sharing rules give minimum storage volume in the sub-scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 69165 ML	
Adjustments	• None	
MP0_burnett	= MP0 AA	69165 ML

MP0	= MP0_kolan + MP0_burnett	**134303 ML**

MP100 AA (JOINED SCHEME)	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 637363 ML	
Adjustments	• Bucca Weir release rule as per Burnett ROP, Att 4.1E, Table 6 {(380 x 31) + (380 x 28) + (380 x 31) + (380 x 30)} = 45600 ML	
MP100	= MP100 AA + Bucca Adjustment Volume	**682963 ML**

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	**937420 ML**
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	**29590 ML**

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 213676 ML	HP2 = 40781 ML	P3 = 19 %	MP2util = 40004 ML	HP2util = 7635 ML
MP1 = 548660 ML		P 2 = 74 %	MP1util = 406534 ML	
HP1 = 104713 ML		P1 = 100 %	HP1util = 104737 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	DISAGGREGATING* FOR SUNWATER & BURNETT WATER INFRASTRUCTURE	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	80 %	→	*Medium Priority (SunWater)*	82 %
HPA	20 %	→	*High Priority (SunWater)*	18 %
		→	*Medium Priority (Burnett Water)*	77%
		→	*High Priority (Burnett Water)*	23%

*** HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING AND THEN EXPRESSED AS A PERCENTAGE TOTALLING 100% FOR EACH HEADWORKS**

11.5 Burdekin Haughton Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	979,594 ML 1,108,534 ML	→	= MPA	Burdekin ROP s106 Conversion Factor = (1/ 0.565)	MPAmin = 979,594 ML
High Priority	99,998 ML 26,841 ML	→	= HPA		HPAmax * = 99,998 ML

* CONSIDERED TO BE AT THE HIGH PRIORITY CONVERSION LIMIT FOR PRACTICAL PURPOSES

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 271913 ML	
Adjustments	• None	
MP0	= max (MP0 AA and CWSA Adjustment)	271,913 ML 106,965 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a max. (100%) at the commencement of the water year = 1767325 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	1,767,325 ML 1,855,900 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	1,875,900 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	7,870 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 92281 ML 18,928 ML	HP2 = 16294 ML 1,072 ML	P3 = 19 % 16%	MP2util =17688 ML 3,026 ML	HP2util = 3123 ML 171 ML
MP1 = 1495411 ML 1,748,935 ML		P 2 = 65 % 67%	MP1util = 976166 ML 1,116,730 ML	
HP1 = 264043 ML 99,095 ML		P1 = 99% 100%	HP1util = 261223 ML 99,118 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	79 % 92%	Medium Priority	79 % 92%
HPA	21 % 8%	High Priority	21 % 8%

11.6 Chinchilla Weir Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	2884 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 2884 ML
High Priority	1165 ML	→	= HPA		HPAmax = 1165 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = NOT APPLICABLE	
Adjustments	• 6757 ML = storage volume below which HP AA<100% on 1 July according to the water sharing rules (Condamine & Balonne ROP, Chap 9, s197)	
MP0	= max (MP0 AA and CWSA Adjustment) = ML	6757 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Full Supply Volume of Chinchilla Weir =9780 ML	
MP100	= min {MP100 AA, Adjustment Volume (FSV) }	9780 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	9780 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	120 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 0 ML	HP2 = 0 ML	→ P3 = 0 % →	MP2util = 0 ML	HP2util = 0 ML

MP1 = 3023 ML	→	P 2 = 24 %		MP1util = 724 ML
HP1 = 6637 ML	→	P1 = 78 %		HP1util = 5147 ML

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	12 %	→	Medium Priority	12 %
HPA	88 %	→	High Priority	88 %

11.7 Callide Valley Water Supply Scheme

Reviewer's summary: *Only the input data was reviewed for this WSS. The provided version 5.7 of the IQQM model was not functioning. The listed storage levels which were provided were only for the reported 15 year critical period, therefore a check of the calculations for the whole simulation period could not be performed.*

All input data was found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority (GW)	19527 ML	→	{ 19970 ML = MPA	ROP Conversion Factor = N/A	MPAmin = 19970 ML
Risk Priority (Surf. W) *	443 ML				
High Priority	4311 ML	→	= HPA		HPAmax = 4311 ML

Note * As described in s2.3 of the Callide Valley IROL, Risk Priority (Surface Water) is generally available as a result of releases from Callide Dam and is therefore considered to be a comparable product to Medium Priority (Groundwater) for the purpose of HUF analysis.

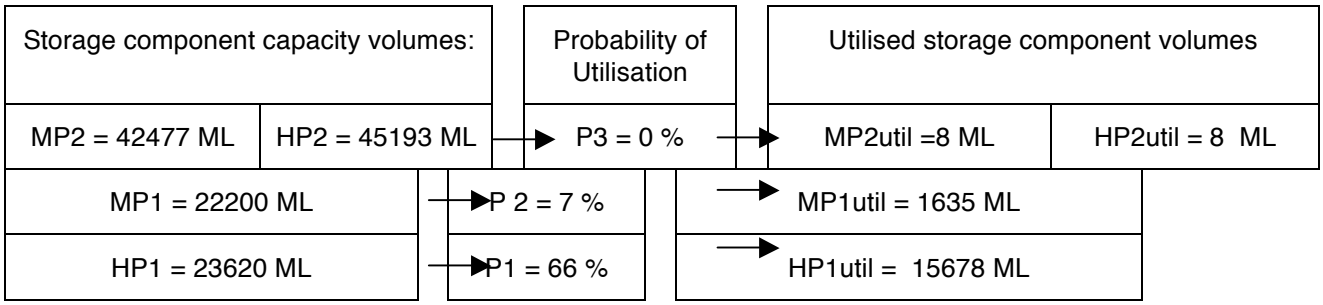
B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = NOT APPLICABLE	
Adjustments	• 26500 ML = storage volume for HP reserve (Callide Valley IROL, s2.3, Item 8)	
MP0	= max (MP0 AA, Reserve Adjustment)	26500 ML

MP100 AA	Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Maximum fill volume for Callide Dam in recent years (May 2003) LESS volume typically stored from the Awoonga scheme = 48700 ML	
MP100	= min (MP100 AA, Adjustment Volume)	48700 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	136370 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	2880 ML

C. PROBABILITY OF UTILISATION



D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group*
MPA	10 % }	Medium Priority (GW)	9.8 %
		Risk Priority (Surf. W)	0.2 %
HPA	90 %	High Priority	90.0 %

*** NOTE THAT HUF RESULTS FOR THE WATER ENTITLEMENT GROUPINGS ARE ROUNDED AND THEN DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING**

11.8 Cunnamulla Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	2612 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 2612 ML
High Priority	None	→	N/A		

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	100 %	→	Medium Priority	100%

11.9 Dawson Valley Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	36944 ML	}	MPA = 56253 ML	ROP Conversion Factor = N/A	MPAmin = 56253 ML
Medium-A Priority *	19309 ML				
High Priority	5579 ML		= HPA		HPAmax = 5579 ML

Note * With reference to water sharing rules for DVWSS (Fitzroy ROP, Att. 4.1F), Medium-A Priority and Medium Priority are considered to be comparable products for the purposes of this HUF analysis

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 17475 ML (This volume is a combination of results from the Upper and Lower Dawson subschemes.)	
Adjustments	• None	
MP0	= max (MP0 AA, Adjustment)	17475 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• The sum of the weir full suppply volumes in both Upper and Lower Dawson subschemes = 60780 ML (excluding Orange Creek Weir which is not included in the water sharing rules as per ROP,Att 4.1F, s5)	
MP100	= min (MP100 AA, Adjustment Volume)	60780 ML

FSV Hwks	the full supply volume of the major headworks storage/s (weirs) in the scheme, excluding Orange Creek Weir	60780 ML
DSV Dam	the dead storage volume of the major headworks storage/s (weirs) in the scheme, excluding Orange Creek Weir	6160 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 0 ML	HP2 = 0 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 = 43305 ML		P 2 = 58 %	MP1util = 25192 ML	
HP1 = 11315 ML		P1 = 95 %	HP1util = 10705 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	70 %	{	Medium Priority	46 %
			Medium-A Priority	24 %
HPA	30 %		High Priority	30 %

*** HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING**

11.10 Eton Water Supply Scheme

***Reviewer's summary:* No reference was found in the ROP or in the current DERM allocation register regarding Eton Allocations and the Allocation input data cannot be confirmed.**

The rest of the data and the calculations were found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
High B Priority	58970 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 58970 ML
High A Priority	3089 ML	→	= HPA		HPAmax = 3089 ML
Risk (*)	504 ML		Not included		

Note * For the purpose of this HUF analysis, the Risk water allocations along Mirani Diversion Channel are considered to be based on opportunistic access and are not based on storage capacity. Section 91 of the Pioneer ROP stipulates that these water allocations may only be distributed subject to the proviso that the security of other Eton WSS allocations is not affected.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 8423 ML	
Adjustments	• none	
MP0	= max (MP0 AA , Adjustment) = ML	8423 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Full supply volume = 62800 ML	
MP100	= min (MP100 AA, Adjustment Volume)	62800 ML

FSV Hwks	the full supply volume of the major headworks storage/s in the scheme	62800 ML
DSV Hwks	the dead storage volume of the major headworks storage/s in the scheme	600 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 0 ML	HP2 = 0 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 = 54377 ML		P 2 = 49 %	MP1util = 26577 ML	
HP1 = 7823 ML		P1 = 87 %	HP1util = 6769 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	80 %	High B Priority	80 %
HPA	20 %	High A Priority	20 %
None		Risk	0 %

11.11 Julius Dam Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	None	→	N/A		
High Priority	48850 ML	→	= HPA	ROP Conversion Factor = N/A	HPAmax = 48850 ML

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
HPA	100%	→	High Priority	100%

11.12 Lower Fitzroy Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:	Water entitlement grouping (in HUF calc.) :		
Medium Priority (Lower Fitzroy WSS)	3101 ML	14711 ML = MPA	Fitzroy ROP Conversion Factor (att 4.3H, s1.2) = 1.5	MPAmin = 13216 ML *consisting of LFWSS= 2562 ML FBWSS = 10580 ML*
*Medium Priority (Fitzroy Barrage WSS)**	*11610 ML*			
High Priority (Lower Fitzroy WSS)	25520 ML	76003 ML = HPA		HPAmax = 77000 ML *consisting of LFWSS= 25800 ML FBWSS = 51200 ML*
*High Priority (Fitzroy Barrage WSS)**	*50483 ML*			

Note* As described in Appendix 1, Step 5 of this report, the operational rules outlined in the Fitzroy Basin ROP (Att 4.3F and Att 4.4F) necessitated the calculation of initial HUF results for the combined Lower Fitzroy and Fitzroy Barrage schemes. The initial HUF results are then disaggregated so that only the results for the water allocations in the Lower Fitzroy WSS (operated by SunWater) are provided. Results for Fitzroy Barrage WSS (operated by Fitzroy River Water) are not provided.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Fitzroy ROP Att 4.3F, s2.1.1 stipulates an MP cut off volume of 40,500 ML	
MP0	= max (MP0 AA , Cutoff Adjustment)	40500 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Fitzroy ROP Att 4.3F, s2.1.1 stipulates the resumption of MP supply occurs at 41,600 ML	
MP100	= min (MP100 AA, Adjustment Volume)	41600 ML

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	117200 ML
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	31550 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised Storage component volumes	
MP2 = 8275 ML	HP2 = 67325 ML	P3 = 88 %	MP2util = 7311 ML	HP2util = 59487 ML
MP1 = 1100 ML		P 2 = 100 %	MP1util = 1096 ML	
HP1 = 8950 ML		P1 = 100 %	HP1util = 8943 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	DISAGGREGATING* RESULTS SO THAT SCHEMES ARE SEPARATED	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	11 %		Medium Priority (Lower Fitzroy WSS)	7 %
HPA	89 %		High Priority (Lower Fitzroy WSS)	93 %
			Medium Priority (Fitzroy Barrage WSS)#	Not reported
			Medium Priority (Fitzroy Barrage WSS)#	Not reported

Note # Results for Fitzroy Barrage WSS (operated by Fitzroy River Water) are not provided.

Note * HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING AND THEN EXPRESSED AS A PERCENTAGE TOTALLING 100% FOR EACH HEADWORKS

11.13 Macintyre Brook Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	24509 ML	→	= MPA	ROP Conversion Factor = N/A	MPA min = 24509 ML
High Priority	488 ML	→	= HPA		HPA max = 488 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

This scheme is operated under Continuous Sharing water sharing rules.

C. PROBABILITY OF UTILISATION

MPutil	= MP1util + MP2util Refer to Border Rivers ROP, Table 3 for details of continuous sharing parameters	60137 ML
HPutil	= HP1util + HP2util Refer to Border Rivers ROP, Table 3 for details of continuous sharing parameters	9300 ML

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	87 %	→	Medium Priority	87 %
HPA	13 %	→	High Priority	13 %

11.14 Mareeba Dimbulah Water Supply Scheme

***Reviewer's summary**: With the exception of the HP allocations data and conversions, all input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.):		
Medium Priority	204425 ML	→	= MPA	Barron ROP Conversion Factor (s89) = 1 /0.7	MPAmin = 176034 ML
High Priority	14026 ML	→	= HPA		HPAmax = 33900 ML

Reviewer's Comments: In the ROP there is reference only to the HPAmax volume. No reference was found (in the ROP or in the current register) to the HP nominal volume and the conversion calculations could not be checked.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 102561 ML	
Adjustments	• Volume of Tinaroo falls Dam required to supply hydro releases in first month of Water Year (Barron ROP s78 (2)) = 24700 ML	
MP0	= MP0 AA volume and hydro release volume adjustment	127261 ML

MP100 AA	Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 329461 ML	
Adjustments	• Volume of Tinaroo falls Dam required to supply hydro releases in first month of Water Year (Barron ROP s78 (2)) = 24700 ML	
MP100	= MP100 AA volume and hydro release volume adjustment	354161 ML

FSV Hwks	the full supply volume of the major headworks storage/s in the scheme	438920 ML
DSV Hwks	the dead storage volume of the major headworks storage/s in the scheme	1300 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 54503 ML	HP2 = 30256 ML	P3 = 8 %	MP2util = 4121 ML	HP2util = 2287 ML
MP1 = 226900 ML		P2 = 41 %	MP1util = 93171 ML	
HP1 = 125961 ML		P1 = 89 %	HP1util = 112544 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	46 %	Medium Priority	46 %
HPA	54 %	High Priority	54 %

11.15 Maranoa River Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	805 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 805 ML
High Priority	None	→	N/A		

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	100 %	→	Medium Priority	100%

11.16 Lower Mary Water Supply Scheme

Reviewer's summary**: With the exception of the MP nominal volume, all input data for this WSS was found to be consistent. **The HUF calculations give results with 1% difference.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	32688 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 32688 ML
***Reviewer's Comments**: The source of information for the MP Nominal Volume could not be located, and the number could not be confirmed.*					
High Priority	1809 ML	→	= HPA		HPAmax = 1809 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 12193 ML	
Adjustments	• None	
MP0	= max (MP0 AA, Volume Adjustment)	12193 ML

MP100 AA	Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 16700 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	16700 ML

FSV Hwks	the full supply volume of the major headworks storage/s (barrages) in the scheme	16700 ML
DSV Hwks	the dead storage volume of the major headworks storage/s (barrages) in the scheme	7065 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 0 ML	HP2 = 0 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 = 4507 ML		P 2 = 80 %	MP1util = 3596 ML	
HP1 = 5128 ML		P1 = 96 %	HP1util = 4916 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
	SunWater	**Review**		
MPA	42 %	**43 %**	Medium Priority	42 %
HPA	58 %	**57%**	High Priority	58 %

11.17 Nogoa Mackenzie Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	190620 ML	→	= MPA	Fitzroy ROP Conversion Factor (Att 4.2H, s1.4) = 3.0	MPAmin = 156729 ML
High Priority	44703 ML	→	= HPA		HPAmax = 56000 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	= Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 233238 ML	
Adjustments	• None	
MP0	= max (MP0 AA, Adjustment)	233238 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 445930 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	445930 ML

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	1,343,960 ML
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	19,520 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 447934 ML	HP2 = 450096 ML	P3 = 6 %	MP2util = 26921 ML	HP2util = 27051 ML
MP1 = 212691 ML		P 2 = 57 %	MP1util = 120090 ML	
HP1 = 213718 ML		P1 = 91 %	HP1util = 193313 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	40 %	Medium Priority	40 %
HPA	60 %	High Priority	60 %

11.18 Pioneer River Water Supply Scheme

Reviewer's summary: *With the exception of the MP Nominal Volume all input data and calculations for this WSS were found to be consistent. The difference in the MP nominal volume is negligeble (8 ML) and it is not affecting the final results.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
High B Priority	47357 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 47357 ML
High A Priority	30753 ML **30745 ML** (from current register)	→	= HPA		HPAmax = 30753 ML
Reviewer's comments: ***The DERM Allocation Register is changing constantly, and we assume that the number in the SunWater's calculations was correct at the time the work was performed***					

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 44035 ML. The corresponding high priority announced allocation at this volume at the commencement of the water year is 80%.	
Adjustments	• Under water sharing rules in s100 and 101 of the Pioneer Valley ROP, the storage volume at which high priority announced allocation is 100% is 56478 ML which is 12443 ML greater than MP0 AA. The corresponding medium priority announced allocation at this volume at the commencement of the water year is 10%. • Adjustment = 7030 ML = 12443 x ((100% - 80%) x 30753) / (10% x 47357 + (100% - 80%) x 30753)	
MP0	= MP0 AA + Adjustment	51065 ML

MP100 AA	Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 102292 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	102292 ML

FSV Hwks	the full supply volume of the major headworks storage/s in the scheme	164980 ML
DSV Hwks	the dead storage volume of the major headworks storage/s in the scheme	8950 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 34404 ML	HP2 = 28284 ML	P3 = 19 %	MP2util = 6494 ML	HP2util = 5339 ML
MP1 = 51227 ML		P 2 = 55 %	MP1util = 28375 ML	
HP1 = 42115 ML		P1 = 95 %	HP1util = 39944 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	44 %	High B Priority	44 %
HPA	56 %	High A Priority	56 %

11.19 Proserpine River Water Supply Scheme

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	38075 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin =38075 ML
High Priority	22000 ML	→	= HPA		HPAmax =22000 ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 69965 ML	
Adjustments	• None	
MP0	= max (MP0 AA, Adjustment) = ML	69965 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 127055 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	127055 ML

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	491400 ML
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	970 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 164972 ML	HP2 = 199372 ML	P3 = 2 %	MP2util = 3965 ML	HP2util = 4792 ML
MP1 = 57090 ML		P 2 = 33 %	MP1util = 18963 ML	
HP1 = 68995 ML		P1 = 84 %	HP1util = 58080 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	27 %	Medium Priority	27 %
HPA	73 %	High Priority	73 %

11.20 St George Water Supply Scheme

Reviewer's summary: *With the exception of the MP Nominal Volume all input data and calculations for this WSS were found to be consistent. The AA calculations were checked using the formulae on page 70-71 of the ROP and the difference in the MP nominal volume does not affect the final results.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	81554 ML **81575 ML** (from current register)	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 81554 ML
***Reviewer's comments:* The DERM Allocation Register is changing constantly, and we assume that the number in the SunWater's calculations was correct at the time the work was performed**					
High Priority	3000 ML	→	= HPA		HPAmax = 3000ML

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

This scheme is operated under Continuous Sharing water sharing rules.

C. PROBABILITY OF UTILISATION

MPutil	= MP1util + MP2util Refer to Border Rivers ROP, Table 15.2 for details of continuous sharing parameters	88170 ML
HPutil	= HP1util + HP2util Refer to Border Rivers ROP, Table 15.2 for details of continuous sharing parameters	5490 ML

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	94 %	→	Medium Priority	94 %
HPA	6 %	→	High Priority	6 %

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	88500 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	650 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 47562 ML	HP2 = 14223 ML	P3 = 1 %	MP2util = 655 ML	HP2util = 196 ML
MP1 = 20065 ML		P 2 = 37 %	MP1util = 7365 ML	
HP1 = 6000 ML		P1 = 88 %	HP1util = 5268 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	60 %	{	Medium Priority (Surface Water)	8 %
			Medium Priority (Groundwater)	52 %
HPA	40 %		High Priority (GW)	40 %

* **HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING**

11.21 Three Moon Creek Water Supply Scheme

Reviewer's summary: *Only the input data was reviewed for this WSS. The IQQM model was not run since the "tmc.aal" data file was not provided. The listed storage levels which were provided were only for the reported 15 year critical period and they were based on historical records for the last decade. A check of the calculations for the whole simulation period could therefore not be performed.*

All input data was found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:	Water entitlement grouping (in HUF calc.) :		
Medium Priority * (Surface Water)	1940 ML	MPA = 14561 ML	ROP Conversion Factor = N/A	MPAmin = 14561 ML
Medium Priority * (Groundwater)	12621 ML			
High Priority (Groundwater)	580 ML	= HPA		HPAmax = 580 ML

Note * As described in s2.1 of the Three Moon Creek IROL, Medium Priority (Surface Water) and Medium Priority (Groundwater) are both classified as Medium Priority.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = NOT APPLICABLE	
Adjustments	• 6650 ML = Effective reserve volume (Three Moon Ck IROL, s2.3 and s1.1 (2) (c))	
MP0	= max (MP0 AA, Reserve Adjustment)	6650 ML

MP100 AA	Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = NOT APPLICABLE	
Adjustments	• 26715 ML = Volume equivalent to storage level of 319.18 mAHD (Three Moon Ck IROL, s2.3)	
MP100	= min (MP100 AA, Adjustment Volume)	26715 ML

FSV Hwks	= to the full supply volume of the major headworks storage/s in the scheme	88500 ML
DSV Hwks	= to the dead storage volume of the major headworks storage/s in the scheme	650 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 47562 ML	HP2 = 14223 ML	P3 = 1 %	MP2util = 655 ML	HP2util = 196 ML
MP1 = 20065 ML		P 2 = 37 %	MP1util = 7365 ML	
HP1 = 6000 ML		P1 = 88 %	HP1util = 5268 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	60 %	Medium Priority (Surface Water)	8 %
		Medium Priority (Groundwater)	52 %
HPA	40 %	High Priority (GW)	40 %

* **HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING**

11.22 Upper Burnett Water Supply Scheme

Reviewer's summary: *Only the input data was reviewed for this WSS. The IQQM model was run and the storage volumes were listed for the simulation period, however we were not able to extend the storage volume data with the historical records for the last 10 years, since no information was provided for Kirar Weir (HW GS 136121). Therefore the 15 year critical period was not confirmed and a check of the calculations could not be performed.*

All input data was found to be consistent.

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement * Priority Group (in ROP or IROL):	Nominal Volume:	Water entitlement grouping (in HUF calc.) :		
Medium Priority (SunWater)	*27230 ML*	MPA = 45460 ML	ROP Conversion Factor = N/A	MPAmin = 45460 ML
High Priority (SunWater)	*1530 ML*	HPA = 1530 ML		HPAmax = 1530 ML
Medium Priority (Burnett Water)	*18230 ML*			
High Priority (Burnett Water)	*0 ML*			

* Water entitlements in Upper Burnett WSS consist of SunWater allocations and Burnett Water allocations.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = NOT APPLICABLE	
Adjustments	• Storage volume above which MP AA >= 24% on 1 July. Refer to Critical Water Supply Arrangements for Upper Burnett (DERM website http://www.derm.qld.gov.au/wrp/burnett.html) = 24524 ML • Maxiumum storage volume in the scheme at which CWSA triggers MP cutoff = 15254	
MP0	= max (MP0 AA , 24% AA adjustment volume, MP Cutoff Volume)	24525 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 92403 ML
Adjustments	• None

MP100	= min (MP100 AA, Adjustment Volume)	92403 ML

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	191460 ML
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	2581 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 74857 ML	HP2 = 24200 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 =67878 ML		P 2 = 10 %	MP1util = 6853 ML	
HP1 = 21944 ML		P1 = 87 %	HP1util = 19068 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	DISAGGREGATING FOR SUNWATER & BURNETT WATER INFRASTRUCTURE	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	26 %		*Medium Priority (SunWater)*	18 %
HPA	74 %		*High Priority (SunWater)*	82 %
			Medium Priority (Burnett Water)	100 %
			High Priority (Burnett Water)	0 %

*** HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING AND THEN EXPRESSED AS A PERCENTAGE TOTALLING 100% FOR EACH HEADWORKS**

11.23 John Goleby Subscheme

(not included in the above analysis of Upper Burnett Water Supply Scheme due to separate water sharing rules in the Burnett ROP, Att. 4.2F, s1.3 and s1.5)

Reviewer's summary: *All input data and calculations for this WSS were found to be consistent.*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	1560 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 1560 ML
High Priority	None	→	N/A		

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping		Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	100 %	→	Medium Priority	100%

11.24 Upper Condamine Water Supply Scheme

Reviewer's Summary: *With the exception of the HPA Nominal Volume all input data and calculations were found to be consistent*

A. INPUT DATA FROM WATER ALLOCATION REGISTER (DERM)

Water Entitlement Priority Group (in ROP or IROL):	Nominal Volume:		Water entitlement grouping (in HUF calc.) :		
Medium Priority	22165 ML	→	= MPA	ROP Conversion Factor = N/A	MPAmin = 22165 ML
High-A Priority (*)	3262 ML **3712 ML** (from the current register)	} →	HPA = 3387 ML		HPAmax =3387 ML
High-B Priority (*)	125 ML				
***Reviewer's comments:* The DERM Allocation Register is changing constantly, and we assume that the number in the SunWater's calculations was correct at the time the work was performed**					
Risk A (#)	7320 ML		Not included		
Risk B (#)	925 ML		Not included		

Note * With reference to water sharing rules for UCWSS (Condamine & Balonne ROP, Chapter 8, s167 and s168), High Class A Priority and High Class B Priority are considered to be comparable products for the purposes of this HUF analysis. These are both intended to be urban supplies.

Note # With reference to water access rules for UCWSS (Condamine & Balonne ROP, Chapter 8, s172 and s171), Risk Class A Priority and Risk Class B Priority are considered to be comparable products for the purposes of this HUF analysis. Risk Class A is a streamflow product (available on an opportunistic, run--of-the-river basis and is not related to storage capacity). Risk Class B is a low value water product which is not expected to result in significant access to water over the period of analysis.

B. WATER SHARING RULES & OPERATIONAL REQUIREMENTS (ROP)

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 21357 ML	
Adjustments	• None	
MP0	= max (MP0 AA , Adjustment Volume)	21357 ML

MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which

	medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 59253 ML	
Adjustments	• None	
MP100	= min (MP100 AA, Adjustment Volume)	59253 ML

FSV Hwks	full supply volume of the major headworks storage/s in the scheme	106200 ML
DSV Hwks	dead storage volume of the major headworks storage/s in the scheme	2130 ML

C. PROBABILITY OF UTILISATION

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 31146 ML	HP2 = 15802 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 = 37896 ML		P 2 = 5 %	MP1util = 1842 ML	
HP1 = 19227 ML		P1 = 78 %	HP1util = 14941 ML	

D. HUF RESULTS

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	11%	Medium Priority	11 %
HPA	89%	High-A Priority*	86 %
		High-B Priority*	3 %
None		Risk A	0 %
None		Risk B	0 %

*** HUF RESULTS DISAGGREGATED IN PROPORTION TO THE VOLUME OF WATER ENTITLEMENTS IN THE RESPECTIVE GROUPING**

HUF estimations with the current MP nominal Volume:

MP0 AA	Announced allocation water sharing rules give minimum storage volume in the scheme above which medium priority announced allocation is greater than 0% at the commencement of the water year = 21967 ML	
MP0	= max (MP0 AA , Adjustment Volume)	21967 ML
MP100 AA	= Water sharing rules give minimum storage volume in the scheme at which medium priority announced allocation is at a maximum (100%) at the commencement of the water year = 59782 ML	
MP100	= min (MP100 AA, Adjustment Volume)	59782 ML

Storage component capacity volumes:		Probability of Utilisation	Utilised storage component volumes	
MP2 = 30446 ML	HP2 = 15975 ML	P3 = 0 %	MP2util = 0 ML	HP2util = 0 ML
MP1 = 37815 ML		P 2 = 4.4 %	MP1util = 1673 ML	
HP1 = 19837 ML		P1 = 76.2 %	HP1util = 15111 ML	

Water entitlement grouping (in HUF calc.) :	Headworks Utilisation Factor for Grouping	Water Entitlement Priority Group (in ROP or IROL):	Headworks Utilisation Factor for priority group
MPA	10%	Medium Priority	**10 %**
HPA	90%	High-A Priority*	**87 %**
		High-B Priority*	**3 %**

The critical Period remains the same – 01/07/1929 – 30/06/1944