

## Section 71, Cap and Matter 9.1 & 9.2 Reporting for 2018-19

### Introduction

#### Water resource management overview for the State

Queensland's transitional water resource plans have controlled the management of groundwater, overland flows and water in watercourses, lakes and springs within all catchments in the Queensland section of the Murray-Darling Basin (QMDB). These water resource plans were taken to have been accredited under the *Water Act 2007* (Cwlth) but have since been replaced by new water resource plans that comply with the Basin Plan.

Development of the second generation state-based water plans and compliance with the Basin Plan for the Condamine and Balonne, Border Rivers and Moonie areas commenced in mid-2017 and has involved a suite of consultation and planning and policy work looking at surface water and groundwater matters, such as water licence conversions, water trading frameworks and water management arrangements. This culminated in the release of the final water plans and water management protocols for these areas in February 2019. The Water Resource Plan for the Warrego-Paroo-Nebine water resource plan area was finalised in 2016 and accredited in 2017.

#### *Surface water*

Surface water in the QMDB is divided into three water resource plan areas: Warrego-Paroo-Nebine, Condamine-Balonne and Queensland Border Rivers-Moonie, which are further divided into six separate sustainable diversion limit (SDL) resource units: Warrego, Paroo, Nebine, Condamine-Balonne, Moonie, and Queensland Border Rivers. The Basin Plan requires local reductions in the Queensland Border Rivers and the Condamine-Balonne water resource plan areas, with a gap of 14 GL and 100 GL, respectively, identified in the Basin Plan, as amended in July 2018. The Commonwealth's Sustainable Rural Water Use and Infrastructure Program initiatives of Healthy HeadWaters Water Use Efficiency project (HHWUE) (to provide infrastructure related investment) and Buyback targeted water in these catchments, with the in-catchment reduction now met in the Queensland Border Rivers and 87% of the in-catchment reduction achieved in the Condamine-Balonne. HHWUE has finished taking applications, with remaining funded projects completed by the end of 2018.

#### *Groundwater*

For aquifers in the QMDB, groundwater managed under the Basin Plan includes water in all formations above (and one formation below) the Great Artesian Basin (GAB). Note that water in aquifers in the GAB is managed under the Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017.

Groundwater under the Basin Plan is divided into 16 SDL resource units based on groundwater aquifers that underlie various surface water catchments across the Condamine and Balonne, Border Rivers, Moonie, Warrego, Paroo and Nebine catchments. To ensure ongoing sustainable management of these groundwater systems is in line with the Basin Plan, the following management arrangements have previously been implemented.

- Amendment of water sharing rules in relevant groundwater management areas to authorise relocation (permanent trading) of water licences (to facilitate water recovery by the Commonwealth and to allow increased flexibility for irrigators).
- Creation of a Water Management Plan for the Central Condamine Alluvium, (which was considered to be an Interim Water Resource Plan under the Commonwealth Water Act).
- Amendment of the Condamine and Balonne, Border Rivers and Moonie water plans in December 2014 to include arrangements for the management of the other Basin Plan aquifers. This provided transitional management arrangements prior to finalisation and accreditation of the second generation water plans for these areas.
- Implementation of a moratorium on groundwater resources not managed under the Water Plan (Border Rivers) 2003 (to limit development while development of the new water plan was underway).

These management arrangements have now been superseded by the:

- Finalisation of the Warrego, Paroo, Bulloo and Nebine Water Plan in February 2016
- Finalisation of the Border Rivers and Moonie Water Plan in February 2019
- Finalisation of the Condamine and Balonne Water Plan in February 2019

These plans, accredited under the Basin Plan, now provide for the management of groundwater resources in Queensland SDL areas.

The take of water from an aquifer for stock and domestic purposes by the owner of the land overlying the aquifer is managed under the *Water Act 2000* (Qld). Access for these purposes has previously been limited under the Act (by moratorium) in the Upper Condamine Basalts and the Upper Condamine Alluvium (both Central Condamine and Tributaries), to restrict growth of groundwater use in the expanding peri-urban areas. These provisions have been incorporated into the water plans for the Condamine and Balonne, Border Rivers and Moonie catchments and help ensure a 'no-growth' position in the higher risk area of peri-urban expansion.

A major focus for Queensland's groundwater systems in the MDB has been to meet the Basin Plan SDL in July 2019. There are two key groundwater systems (Central Condamine Alluvium and the Condamine Tributary Alluviums) where the SDL is below the baseline diversion limit (BDL), requiring water to be recovered through buyback of entitlements. Initially, slow progress was made towards recovery of the required volume of water. From 2018, Central Downs Irrigators Ltd, Cotton Australia and Queensland Farmers' Federation worked with the Commonwealth to develop a more incentivised approach to ensure that the target volume would be met before the June 2019 target date. Queensland agreed to the proposed approach and has been working with both the stakeholder groups and the Commonwealth to support the water recovery. The Commonwealth commenced a new tender round which was offered in 3 tranches released on 19 April 2018, 31 May 2018 and 28 June 2018 for buyback of entitlement in the Central Condamine Alluvium and the Condamine Tributary Alluviums. The draft water plan for the Condamine and Balonne provided the incentive by identifying that, under the final water plan, licence volumes would be reduced by 50%. Licensees then were able to decide whether they participated in the 'buyback' process and sold part or all of the volume to the CEWH in advance of the

finalisation of the plan. This process resulted in the Commonwealth acquiring very close to the target volume.

The other key Queensland groundwater systems are the Border Rivers alluvium and Border Rivers Fractured Rock aquifers. While the BDL and SDL are similar in the Border Rivers alluvium, entitlement levels are higher (nearly double). This has required the development of specific management rules in this area to enable adherence to SDL over the long term (measured over 10 years). Estimation work completed in the Border Rivers Fractured Rock area will be supplemented by further activity to better define the take from this resource, which is complicated by the surface water / groundwater interaction.

## Cap compliance

Queensland has reviewed the methods used to determine annual permitted take and annual actual take of water from a watercourse during the development of Basin Plan compliant water resource plans. The new methods and updated models with better data are being used for the 2018/19 water year.

Diversions from watercourses and floodplain harvesting reached 77% of the annual Cap target for the Condamine and Balonne catchment, 69% for the Moonie, 39% for the Warrego and 2% for the Nebine. There were no diversions accounted against the annual Cap target in the Paroo catchment for the 2018/19 water year.

Modelled diversions in the Border Rivers catchment revealed that the simulated volumes in major water storage infrastructure at the end of 2017/18 did not allow for an accurate estimate of water available for use in 2018/19. This was due to dam levels simulated by the model being much lower than reality (the model assumed greater take from Glenlyon Dam in 2017/18 than actually occurred). As a consequence, diversions in the Border Rivers catchment exceeded the annual Cap target as determined by the model by 27 GL. This does not trigger the requirement for a special audit (the cumulative debit recorded in the Cap register will not exceed 20% of the long-term diversion Cap). There was no evidence that any diversions were non-compliant with water access entitlement conditions or statutory management rules.

## Transition period section 71 reporting

This section presents a summary of the key section 71 clauses of the *Water Act 2007* for surface water resource plan areas (and SDL resource units where appropriate):

- Available water (*the quantity of water available from the water resources of the water resource plan area during that water accounting period*)

The very dry seasonal conditions experienced in 2017/18 continued across virtually all of the QMDB during the 2018/19 year. The summer period was very dry with no general rain events and minimal storm activity; however, localised storm activity in December 2018 resulted in some minor flows across various catchments as well as moderate events at a couple of gauging stations in the central Condamine catchment. Some heavier and more general rain events during autumn resulted in some moderate runoff in the western catchments; however, lack of any follow-up rain has probably diminished the benefit of these events. The upper Condamine and Granite Belt (Stanthorpe) catchments are now in a diabolical situation as far as water supplies are concerned, due to the absence of any runoff-

producing rain events. A number of the gauging stations in the Stanthorpe area have recorded no runoff for the year. Table 1 shows the recorded volume of flow at key sites across the region.

Table 1: Recorded flow at key sites in the QMDB

River and gauging station location	Average annual flow (GL) <sup>1</sup>	Total annual flow past gauging station 2018/2019 (GL)	Percentage of average
<b>Condamine and Balonne catchment</b>			
Condamine River @ Chinchilla	541	73	14
Condamine River @ Cotswold	690	87	13
Balonne River @ Weribone	1179	78	7
Maranoa River @ Cashmere	156	46	29
Balonne River @ St George	1139	28	2
<b>Border Rivers catchment</b>			
Macintyre River @ Goondiwindi	950	158	17
Weir River @ Talwood	145	11	7
Barwon River @ Mungindi	593	7	1
<b>Moonie catchment</b>			
Moonie River @ Fenton	151	0	0
<b>Warrego catchment</b>			
Warrego River @ Cunnamulla	449	319	71
<b>Paroo catchment</b>			
Paroo River @ Caiwarro	503	214	42
<b>Nebine catchment</b>			
Nebine Creek @ Roseleigh Crossing	21	7	34

The perilous state of stream flow in the upper Condamine catchment is demonstrated by the fact that Warwick has recorded only 4.9% of its average annual runoff volume for the year, with all occurring prior to Christmas. Gauging stations in the central Condamine area (Loudoun, Brigalow, Chinchilla and Cotswold) showed only one moderate flow event occurred, largely resulting from runoff from a single localised storm on 17 December 2018. All of these stations would have recorded zero or very little flow for the year if this event had not occurred.

<sup>1</sup> Average annual flow is the average for the period of record for that gauging station. It varies from 12 years of record at Roseleigh Crossing to 77 years at Goondiwindi. The numbers are indicative only.

Water held in dams at the start of the water year in the upper and middle Condamine catchment varied from 11% of capacity in Leslie Dam to 49% in Chinchilla Weir. Leslie Dam had no inflows and finished the year at 6% capacity. Chinchilla Weir declined to 32% capacity in December 2018 but benefited from the December rainfall event, which increased the capacity to over 100%. Supply of water to water users caused the weir to decline to 47% capacity by March. An inflow in late March increased capacity to 68%, with the weir finishing the year at 45% capacity. The inputs to Chinchilla Weir in 2018/19 included 4.6 GL of treated coal seam gas (CSG) water discharged into the weir under an approval of a resource for beneficial use. As per licence requirements, the entire volume of treated CSG water was taken within the limits of the Chinchilla Weir Water Supply Scheme. The diversion of treated CSG water is not accounted for under section 71 as this water is sourced from the Great Artesian Basin, not from water resources of the Murray-Darling Basin.

In the Balonne catchment the dry conditions from July to September 2018 enabled substantial repairs to be carried out on the control weir at Weribone. A couple of minor flows in October put the weir repairs to the test and these were followed by a peak in late December at the lower end of the moderate range. This flow was the one that emanated from the central Condamine and made its way downstream to Beardmore Dam. Beardmore Dam had declined from 70% capacity at the start of the year to 26% prior to the December inflow, which increased capacity to 87%. The continuing dry conditions and high irrigation requirements contributed to dam levels dropping to 5% capacity by April 2019. This aligned with planned dam safety repairs to the Thuraggi channel outlet commencing in April 2019 and completed in September 2019. An inflow of approximately 38,000 ML occurred in April 2019 (mostly originating from the Maranoa River). This water was unable to be stored in Beardmore Dam because of the dam safety repair works. Part of the inflow was able to be diverted into offstream storages (for later return to the scheme) but over 9,000 ML was released downstream adding to over 8,000 ML of environmental, stock and domestic release from the event. The releases commencing in mid-April 2019 included supplemented water allocation, environmental, stock and domestic water, and water released to draw down the dam, resulting in a dam capacity at the end of the water year of 6%.

Jack Taylor Weir at St George started the year at 73% capacity and reached a low of 45% in November 2018. Capacity increased to 87% in January 2019, then dropped back to 47% in February. Releases from Beardmore Dam resulted in the weir finishing the water year at 94% capacity.

The only flows recorded at the Lower Balonne tributary gauging stations prior to crossing the border were very minor volumes as a result of releases from Beardmore Dam (which were then passed through Jack Taylor Weir) in April and early May 2019.

Flows at Goondiwindi in the Border Rivers catchment were entirely due to regulated water released from upstream storages. Glenlyon Dam started the year at just 49% capacity. With no inflows and with the release of water to water users, the dam finished the water year at 9% capacity. Coolmunda Dam on the Macintyre Brook started the year at 40% capacity. Other than one small inflow in December 2018, the dam water levels slowly declined over the year to 8% capacity at the end of the water year.

In the Moonie catchment the gauging station at Fenton recorded no runoff for the year, confirming similar low availability of flows for agricultural producers. The gauging station at

Nindigully recorded a few minor flows; however, these dissipated before reaching the Fenton gauge at the lower end of the river system.

Just like the rest of the region, the Warrego catchment wasn't spared the dry conditions for the first nine months of the year. A more substantial rain event in late March 2019 resulted in a flood peak passing Cunnamulla at the lower end of the major flow range. There were a couple of minor events in April and early May 2019 following further rain. Consequently, total volume passing Cunnamulla was nearly three-quarters of the annual average.

Nebine Creek experienced a few minor runoff events from October to December 2018, followed by a very dry period from January to March 2019. Rainfall across the catchment in April and early May (about 60 mm at the gauging station at Roseleigh Crossing) resulted in a series of minor flow peaks that pushed the annual volume to slightly better than a third of the annual average.

A similar runoff pattern was replicated in the Paroo catchment as the Warrego. A minor event in early April 2019 was followed by a moderate flood peak late in the month and another minor event in early May before the stream receded to no flow by the end of June 2019.

- Permitted take (*the quantity of water permitted to be taken from the water resources of the water resource plan area during the water accounting period*)

Water from the Queensland Border Rivers SDL resource unit is permitted to be taken through approved works (equipped with a working meter) in the state of New South Wales under an agreement between Queensland and New South Wales. Note there is no transfer of an approved volume of water from a Queensland water account to a New South Wales water account. Reciprocal arrangements apply to water taken from the New South Wales Border Rivers SDL resource unit through works in the state of Queensland. Annual permitted take will be adjusted for this use.

#### *The take of water from watercourses under an entitlement<sup>2</sup> and from overland flow by floodplain harvesting*

Take of water from watercourses is managed through limits stated on entitlements and by water sharing rules in water management protocols (which implement the provisions of Queensland's water plans). The take of overland flow water (including floodplain harvesting) is managed through a combination of regulation of works and limits on entitlements.

Annual permitted take from watercourses under an entitlement, including permitted take under entitlements held by the Commonwealth Environmental Water Holder (CEWH), is determined using a hydrologic model<sup>3</sup>. The permitted take by the CEWH is then subtracted from the total. The volume of annual permitted take by floodplain harvesting in areas other than the Lower Balonne is not able to be modelled with any confidence and so is based on

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<sup>2</sup> Entitlement is used in this document as a generic term referring to water access entitlements (called water allocations in Queensland) and water licences (authorities to take water which are attached to land).

<sup>3</sup> For the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas this is the relevant eWater Source computer program reviewed by the Authority as part of the preparation of the water resource plans. For the Warrego-Paroo-Nebine water resource plan area it is the relevant IQQM computer program reviewed by the Authority as part of the preparation of the water resource plan.

estimated take. For the Lower Balonne Floodplain, annual permitted take by floodplain harvesting is estimated by the hydrological model.

No flow event management rules were activated in the Lower Balonne in 2018/19, as flows were not sufficient to allow waterharvesting to occur.

#### *The take of water from watercourses under basic rights*

The take of water from a watercourse, lake or spring for basic rights (stock or domestic purposes) by the owner of the land adjoining the water source is permitted under the *Water Act 2000* (Qld). Potential increase in take is limited due to the right to take water being limited to properties with riparian access to water. The annual permitted take of water from a watercourse for basic rights is estimated using the methods outlined in the Water Accounting Methods Reports for the Condamine-Balonne, Queensland Border Rivers-Moonie and Warrego-Paroo-Nebine water resource plans.

#### *The take of water by runoff dams (including take under basic rights)*

The take of overland flow water for basic rights by an owner of the land on which the water collects is permitted (within limits) under the Queensland regulatory framework. Any increase in take for basic rights will be related to rural population growth and/or an increase in stock numbers.

Under water plan provisions, no increase in overland flow take is permitted for uses other than basic rights, except for certain limited cases, such as when capture of overland flow water is necessary to satisfy the requirements of an environmental authority.

The annual permitted take of water by runoff dams in the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas is considered to be the long-term annual average limit estimated by the Murray–Darling Basin Authority (the Authority) and which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports. The annual permitted take of water by runoff dams in the Warrego, Paroo and Nebine catchments is estimated using the method outlined in the Water Accounting Methods Report for the Warrego-Paroo-Nebine Water Resource Plan.

#### *The take of water by commercial plantations*

In Queensland, the take of water by commercial plantations is not regulated under any legislation. There are few commercial plantations in the QMDB.

The annual permitted take of water by commercial plantations is considered to be the long-term annual average net take estimated by the Authority and which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports.

- *Water allocations (details of the water allocations made in relation to the water resources of that area in relation to that water accounting period)*

Under the *Water Act 2007* (Cth) and for the purposes of the Basin Plan, water allocation<sup>4</sup> means the specific volume of water allocated to water access entitlements in a given water accounting period.

For surface water in Queensland, water allocations apply only to supplemented water (water provided through water supply schemes) managed under a mixture of *announced allocation* and *continuous sharing*.

#### Announced allocations

Water access entitlements in the Upper Condamine and Chinchilla Weir water supply schemes in the Condamine-Balonne water resource plan area are managed under an annual announced allocation system. At the start of the water year, water in the scheme's storage/s is first set aside for 24 months' supply for high priority users (mainly town water supply and associated water losses during storage and distribution). The medium priority entitlement holders are then granted the remaining water as a percentage of their water access entitlement, taking into account losses associated with storage and distribution for the remainder of the water year. Medium priority entitlement holders in the Upper Condamine Water Supply Scheme may also be granted access to natural flows in the river downstream of the storage in accordance with the 'stream flow period' rules for the scheme.

The announced allocation is recalculated each month but only reset if the announced allocation would increase by 5 or more percentage points or would increase to 100% (due to more water becoming available through inflows into the scheme). The usage in a water year may be no greater than 100% of the entitlement.

Water access entitlements in the Cunnamulla Water Supply Scheme in the Warrego catchment are also managed under an annual announced allocation system. There is no high priority water in the Cunnamulla Water Supply Scheme; otherwise, announced allocations are made in a similar way to those in the Upper Condamine and Chinchilla Weir water supply schemes.

#### Continuous share schemes

The St George Water Supply Scheme in the Condamine-Balonne water resource plan area and the Macintyre Brook Water Supply Scheme in the Queensland Border Rivers-Moonie water resource plan area provide management options which include both announced allocation and continuous share. Most of the entitlements in the scheme are managed under continuous share arrangements. All medium priority entitlements in the Border Rivers Water Supply Scheme are managed under continuous accounting rules.

In a continuous accounting system, water users have storage accounts, which are proportional to their share of the total entitlement in the scheme. The storage account increases when distributions are made (i.e. there is inflow into the water storage) and decreases with water use, evaporation and seepage losses (except in the Border Rivers

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<sup>4</sup> In Queensland, a *water allocation* refers to a water access entitlement (which is defined by the Commonwealth Water Act as 'a perpetual or ongoing entitlement, by or under a law of a State, to exclusive access to a share of the water resources of a water resource plan area'). Basin Plan terminology is used in this report.

Water Supply Scheme where evaporation and seepage losses are managed as a separate account).

In any water year, the volume available under an entitlement managed as an individual continuous share is the volume in the storage account at the start of the water year plus any water distributed to the account under the rules in the relevant operations manual following an inflow into the scheme, capped at 100% of the nominal volume of the water access entitlement (plus any carry over or forward draw made available in the St George Water Supply Scheme).

The announced allocation for water supply schemes in the QMDB in 2018/19 is shown in table 2. In the continuous share schemes, the announced allocation shown in the table applies only to water access entitlements managed as part of the bulk share.

Table 2: Announced allocations for QMDB water supply schemes

<b>Water supply scheme</b>	<b>Announced Allocation – high priority (%)</b>	<b>Announced Allocation – medium priority (%)</b>	<b>Comments</b>
<b>Condamine and Balonne catchment</b>			
Upper Condamine	100	0	Access to flows in the river from runoff downstream of the storage may be made available to entitlement holders separately to the announced allocation from the storage and is accounted against entitlements.
Chinchilla Weir	100	100	
Maranoa River	N/A	N/A	Announced allocations do not apply to this scheme.
St George	N/A	81*	Announced allocations only apply to entitlements managed as part of the bulk share.
<b>Border Rivers catchment</b>			
Border Rivers	N/A	N/A	
Macintyre Brook	100*	100*	Announced allocations only apply to entitlements managed as part of the bulk share.
<b>Warrego catchment</b>			
Cunnamulla	N/A	100	

\* Announced allocations for the continuous share schemes (St George Water Supply Scheme and Macintyre Brook Water Supply Scheme) are as announced for the bulk share component. These numbers are different to those reported in the Excel spreadsheet for onward calculations.

- *Actual take (the quantity of water actually taken from the water resources of the water resource plan area during the water accounting period)*

A summary of the methods for determining actual take is provided below. More detail is available in the Condamine-Balonne, Queensland Border Rivers-Moonie and Warrego-Paroo-Nebine water accounting methods reports.

For the purpose of accounting for annual actual take from the Queensland Border Rivers SDL resource unit, the quantity of water actually taken for consumptive use by each form of take from the SDL resource unit is interpreted to only apply to actual take *within* the resource unit. Actual take of water from the New South Wales Border Rivers SDL resource unit in Queensland is reported in accordance with the annual water use information provided by New South Wales. Approximately 31 GL of water from the New South Wales Border Rivers SDL resource unit was used in Queensland and less than 1 GL of water from the Queensland Border Rivers SDL resource unit was used in New South Wales.

*The take of water from watercourses under an entitlement and from overland flow by floodplain harvesting*

Diversion in the QMDB is generally characterised by much greater volumes of unsupplemented water compared to supplemented water; however, due to the dry conditions in 2018/19, the take of supplemented water was 65% of the total take (excluding take by runoff dams, net take by commercial plantations and take under basic rights), take of unsupplemented water was 21% and overland flow (floodplain harvesting) 15%.

The works of the major water users in the QMDB have been metered to improve reliability in monitoring use. The installation of instruments to measure off-stream storage levels in the Lower Balonne was completed in the 2012/13 water year. Combined with measurement of direct take from the watercourse, this informs estimates of floodplain harvesting take in the area. A combination of estimates and measurement of water use are provided for all watercourse take and significant areas of floodplain harvesting.

*The take of water from watercourses under basic rights*

Water taken from watercourses under basic rights is not measured and is estimated using the method outlined in the Water Accounting Methods Report for the relevant water resource plan area.

*The take of water by runoff dams (including take under basic rights)*

The annual permitted take of water by runoff dams in the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas is considered to be the long-term annual average limit estimated by the Authority and which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports. The annual permitted take of water by runoff dams in the Warrego, Paroo and Nebine catchments is estimated using the method outlined in the Water Accounting Methods Report for the Warrego-Paroo-Nebine Water Resource Plan.

### *The take of water by commercial plantations*

The annual permitted take of water by commercial plantations is considered to be the long-term annual average net take estimated by the Authority and which is listed in Schedule 3 of the Basin Plan and identified in the relevant water accounting methods reports.

There are no commercial plantations in the Moonie, Warrego, Paroo and Nebine catchments.

### *Summary of surface water take*

Diversions from a watercourse and by floodplain harvesting reached 179 GL (77% of the water permitted to be taken) for the Condamine and Balonne catchment, 1 GL (69%) for the Moonie, 10 GL (39%) for the Warrego, 0 GL (0%) for the Paroo and 0.1 GL (2%) for the Nebine catchment for the 2018/19 water year. Diversions in the Border Rivers catchment (70 GL) were above permitted take as estimated by the model. See section on 'Cap compliance' for further details.

- Decisions affecting permitted take (*details of any other decisions made by, or under the law of, the Basin State, that permit the taking of water from the water resources of that area during that water accounting period*)

A total of 50 ML of surface water was made available in the QMDB for short-term use (construction) under water permits. Less than 2 ML was actually taken.

- Trade details (*details of the trading or transfer of tradeable water rights in relation to the water resources of that area during that water accounting period: within the area; and into the area; and from the area*)

Temporary and permanent trading of unsupplemented water access entitlements within a water management area and of supplemented water access entitlements within a water supply scheme (subject to specific rules in the water plan, water management protocol and operations manuals) may occur in all water resource plan areas in the QMDB. Water management protocols prohibit some trades where it has already been assessed that trade cannot occur without impacts.

Out of 44 GL of water permanently traded in the QMDB in 2018/19, 24 GL was traded separately from land and 20 GL traded with land, with 43% of the total volume of permanent trades occurring in the Queensland Border Rivers, 34% in the Condamine-Balonne, 22% in the Warrego and 1% in the Moonie SDL resource unit.

The New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 (the IGA) provides for permanent and temporary interstate trade of supplemented and unsupplemented water. This applies to water access entitlements in the Border Rivers water supply schemes and the Border Rivers Water Management Area. Take of water through works that are permanently linked to an entitlement for supplemented or unsupplemented water in the other state is not reported as trade for section 71 purposes.

In the Border Rivers catchment in 2018/19, 4.7 GL of New South Wales supplemented water was authorised through temporary trade for use in Queensland and less than 1 GL of

supplemented water was authorised for use in New South Wales. No Queensland unsupplemented water was available for use in New South Wales.

There was no temporary trade between consumptive and environmental entitlement pools in 2018/19 and no environmental entitlements were traded back for consumptive use.

## Groundwater

This section presents a summary of the key section 71 clauses of the *Water Act 2007* for groundwater resource plan areas (and SDL resource units where appropriate).

- Available water (*the quantity of water available from the water resources of the water resource plan area during that water accounting period*).

For reporting purposes there is not considered to be any change to the available water overall (the available water being based on the long term average recharge as per the RRAM report).

- Permitted take (*the quantity of water permitted to be taken from the water resources of the water resource plan area during the water accounting period*).

The permitted take is the total volume of water able to be taken from an aquifer in the QMDB and is considered to be the permitted take of water from the aquifer under entitlements plus the take of water permitted under basic rights. The total permitted take (for a particular aquifer) equals the SDL identified for that aquifer.

Entitlements to take water from aquifers in the QMDB are in the form of water licences, water allocations or water permits, and these have conditions that identify the nominal entitlement (volumetric limit) and the particular aquifer (source). The final water plans (February 2019) enabled the conversion from water licences to water allocations for some alluvial aquifer subareas. In a number of aquifers where the total entitlement volume is less than the permitted take volume, the water plan identifies a volume of water as unallocated water.

The take of water (from aquifers) for basic rights is authorised under the *Water Act 2000* (Qld) and does not require a water entitlement in the aquifers managed under the Basin Plan. The volume taken is not metered; however, significant work has been undertaken to determine take under basic rights for the various aquifers in the QMDB area.

- Decisions affecting permitted take (*details of any other decisions made by, or under the law of, the Basin State, that permit the taking of water from the water resources of that area during that water accounting period*).

The primary change to permitted take values has resulted from the work completed (PB, 2011) to better determine take under basic rights across the QMDB area, as well as additional work completed in the Stanthorpe Water Management Area by WSP (2018)<sup>5</sup>.

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<sup>5</sup> WSP, 2018, Methodology for determining growth in take of groundwater and accounting for groundwater take in the Granite Belt Underground Water Area.

This supplements the early work completed by Parsons Brinckerhoff report (2011)<sup>6</sup>. These changes have been included in the Water Accounting Methods Report for the Queensland Border Rivers - Moonie Water Resource Plan and Condamine - Balonne Water Resource Plan.

- *Water allocations (details of the water allocations made in relation to the water resources of that area in relation to that water accounting period).*

Access to the nominal entitlement for entitlement holders in a number of sub areas is managed under an announced percentage. Access to the nominal entitlement for any entitlement holder can be limited when the groundwater systems are under stress or decline, either over the longer-term (e.g. the Central Condamine Alluvium) or seasonally (e.g. tributary catchments and fractured rocks).

Access in the Central Condamine Alluvium is managed on a long term basis and the level of access in this area was limited to announced percentages of 50% or 70% depending on their location within the system. The Central Condamine Alluvium limitations have remained consistently at this level since 2011 while the water recovery process has been progressing. The Oakey Creek management area remained at 80% announced access while the Dalrymple Creek area remained at 100%. The more localised basalt systems generally show falling storage responses to dry conditions first and the access in the Upper Hodgson Creek (basalt) system was reduced to 70%. The continued dry conditions are likely to result in further reductions in the 2019/20 water year.

Access in the remaining systems was unchanged from the previous year with the remainder of the basalts limited to 80%, and the majority of the remaining alluvial systems remaining at 100%, as per the 2017/18 year, with the exception of North Myall (75%) and Moola (50%). Further reductions in access in future water years are likely without significant recharge.

- *Actual take (the quantity of water actually taken from the water resources of the water resource plan area during the water accounting period)*

#### *The take of water from aquifers under an entitlement*

In many highly developed groundwater systems, the works of entitlement holders have been metered to improve the reliability in monitoring use. In those systems that are unmetered, the nominal entitlement, adjusted for any limitations, is considered to represent the actual use. The estimated data are combined with the metered data to provide a picture of the total water use.

The diversion of water from groundwater taken under entitlements for 2018/19 is just over 170 GL from a combination of metered and estimated use. This does not include take under basic rights.

#### *The take of water from aquifers under basic rights*

Queensland does not require works (infrastructure that includes bores, wells, spears and excavations) that take water for the purpose of basic rights to be metered. Accordingly, use

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<sup>6</sup> Parsons Brinckerhoff, 2011, Methodology for estimating the take of groundwater for stock and domestic purposes.

volumes have been estimated. Previously the estimated volume of take reported has been the volume used by the MDBA in the determination of the SDL.

For the Queensland Border Rivers-Moonie, Condamine-Balonne and Warrego-Paroo-Nebine water resource plan areas, the permitted take for basic rights has been estimated using the method outlined in the Water Accounting Methods Report for the respective water plan area. The method is based on the Queensland Murray Darling Basin Methodology for Estimating the Take of Groundwater for Stock and Domestic Purposes (Parsons Brinckerhoff, 2011) and also takes into account the recently completed report 'Methodology for determining growth in take of groundwater and accounting for groundwater take in the Granite Belt Underground Water Area' (WSP Parsons Brinckerhoff, 2018) which allows stock or domestic use to be separated from non-stock or domestic in the Granite Belt Underground Water Area.

- Trade details (*details of the trading or transfer of tradeable water rights in relation to the water resources of that area during that water accounting period: within the area; and into the area; and from the area*).

Permanent trading (relocation) of water licences is permitted throughout the Upper Condamine Alluvium (Central Condamine Alluvium) area as well as in the Oakey and Dalrymple Creek Alluvium areas within the Upper Condamine Alluvium (Tributaries). Temporary trading (seasonal assignment) is also available across these areas, as well as in parts of the Upper Condamine Basalts (Toowoomba City Basalts, Upper Hodgson Creek Basalts) and in part of the Queensland Border Rivers Alluvium (Border Rivers Alluvium) areas. These permanent and temporary water sharing rules have now been included in the Water Management Protocol and allow for greater water entitlement flexibility for licensees.

Permanent trades during the year totalled 37.6 GL; however, this included a large number of trades as part of the 'buyback' process. Excluding sales to the CEWH, there were 11 trades totalling 1.1 GL. Temporary trade (through seasonal water assignments) was very active again during the year and exceeded the levels reached during the peak of the millennial drought. A new record of 8.1GL of groundwater under 141 seasonal water assignment notices was temporarily traded across the QMDB area.

#### *Summary of groundwater take*

Rainfall totals for this year were well below average across the QMDB area. Totals in the eastern part of the catchment were generally around three quarters of average and dropped in the central and western areas to half to two thirds of average. The dry finish to last year continued into this year with well below average rainfall through winter, spring and summer into autumn resulting in significant groundwater extraction to assist pre-watering for summer crops and finishing of the crops. October was the only month to experience above average rainfall during this period across most areas, although November was slightly above average in the western areas. The above average rainfall in October led to many farmers making the decision to plant; however, with the next meaningful rainfall not falling until March (April in the west) there was a significantly increased demand on groundwater sources. The year finished as it started – with a run of three very dry months, record lows in many cases. Overall, all groundwater systems are continuing to deplete and in some areas are nearing the record low levels reached during the millennial drought period. The groundwater levels

in most aquifers have been steadily falling since the exceptionally wet 2010/11 water year. Announced entitlement levels have already started to be reduced and consideration is again being given to an appropriate response in terms of the implementation of limitations in other areas.

Total diversion of groundwater in the QMDB in 2018/19 for all SDL resource units was similar to last year. Diversions for all aquifer units were at or within the respective SDLs except for the Border Rivers alluvium (GS54) which was 103% of SDL and the Central Condamine Alluvium (GS64a) which was measured at just over 125% of SDL, but still well below BDL. It is noted that use volumes in the Central Condamine Alluvium should reduce in future years following the completion of the 'buyback' program and compliance with Basin Plan SDLs will be required for all aquifers from the 2019/20 water year. For Queensland's other two most developed systems, diversions in the Upper Condamine Basalts was down to 75% and the Upper Condamine Alluvium (Tributaries) was up a little to 90% of the respective SDLs.

Table 3: 2018/19 Snapshot of water diversions in the QMDB

<b>Resource</b>	<b>Annual actual take 2018/19 (GL)</b>	<b>Annual permitted take 2018/19 (GL)</b>	<b>Annual actual take 2017/18 (GL)</b>
Surface water	699	746	704
Groundwater	190	399	201

## Environmental water – held and planned

In Queensland, water planning incorporates provisions for balancing the often competing interests in water between human consumptive needs and the environment. Environmental water requirements are primarily met through the various water sharing rules specified in the water plans. In addition, there is held environmental water consisting of water access entitlements gifted by the Queensland Government to the Commonwealth and water which has been recovered by the Commonwealth from entitlement holders through the Water for the Future programs of buyback and investment in on-farm water use efficiency works.

Annual permitted take is reduced by the modelled volume of held environmental water entitled to be taken.

Information about the volume of held environmental water and its use can be found at <http://www.environment.gov.au/water/cewo/catchment>.

For the purposes of reporting under Matter 9.2 (volume of planned environmental water), Queensland has reported the volume of water provided for environmental purposes under specific flow event management rules in the relevant water management protocols. These rules include: flow event management arrangements and preservation of tributary inflows in the Border Rivers; low, medium and Narran Lakes flow event management arrangements in the Lower Balonne; and flow event management arrangements in the Warrego. In 2018/19

these rules provided in-stream benefits in the Warrego River (through flow event management arrangements) and Lower Balonne distributaries (through release of environmental, stock and domestic water).

No trading of environmental water occurred in the year. The CEWH is continuing to evaluate event based mechanisms for achieving improved environmental watering outcomes in the Lower Balonne.

## Progress of water reform

The Warrego-Paroo-Nebine Water Resource Plan was accredited in June 2017. Queensland submitted water resource plans for the Condamine-Balonne and Queensland Border Rivers-Moonie water resource plan areas for accreditation in February 2019. The water resource plans were re-submitted in April 2019, following some minor amendments. These plans apply to both surface water and groundwater and were accredited in September 2019.

### *Surface water*

Work continues on the Rural Water Management Program, which is Queensland's response to the 'Independent audit of Queensland non-urban water measurement and compliance' and commitments made in the Murray-Darling Basin Compliance Compact.

The program will improve rural water management across the state and ensure Queensland's valuable water resources are used, measured and monitored effectively. This will be achieved by building on existing programs and delivering projects to:

- strengthen water measurement;
- provide transparent water information;
- enhance Queensland's regulatory approach; and
- enable robust compliance.

A key project is the development of an overland flow measurement standard and risk-based overland flow measurement program to improve the measurement and accounting of take of overland flow.

Since 2000, Queensland has had a moratorium on new overland flow works in the QMDB water resource plan areas. Licensing of overland flow works started in these areas in the mid-2000s and has been completed in the Lower Balonne. A third of the works are currently licensed in the Border Rivers. The metered overland flow licences in the Lower Balonne will be reviewed as part of the program.

The Water Plan (Border Rivers and Moonie) 2019 commits to measuring the relevant take of overland flow water by 31 December 2022. Improvements to measurement will help meet this commitment, while improving monitoring and compliance.

More information is available at: <https://www.dnrme.qld.gov.au/land-water/initiatives/rural-water-management/projects/measurement-overland-flow>.

### *Groundwater*

All groundwater systems have been fully incorporated into Queensland's water plans in readiness for the implementation of the Basin Plan in July 2019.

The Authority, in conjunction with Queensland, have been engaged in several projects to gain a better understanding of various aspects of groundwater systems in the QMDB. The projects have primarily focussed on the more heavily utilised and lesser known groundwater systems to improve collective knowledge and assist in future management directions. Two of the projects have involved the Upper Condamine Alluvium and Upper Condamine Basalts and have been ongoing across a number of reporting periods.

#### Upper Condamine Alluvium modelling

Improved assessment and modelling of the Central Condamine Alluvium (CCA) will help to inform the longer term sustainable capacity of the system and look at potential changes in the system as buyback recovers entitlements. The Upper Condamine Alluvium project is ongoing with the incorporation of the tributary alluvial systems into the CCA model. The construction and calibration of the model according to currently accepted modelling guidelines were completed in January 2018. The first three stages have been completed, with full completion due for finalisation in late 2019.

#### Upper Condamine Alluvium (UCA) (Tributaries) – Hydrogeological and hydrochemical characterisation of recharge and connectivity

This work is investigating geochemical and thermal signatures of various water sources to assist in determination of the degrees of connectivity (if any), which will improve knowledge and better inform future management and trade arrangements.