

Section 71, Cap and Matter 9.1 & 9.2 Reporting for 2017-18

Guidance for narrative

Introduction

Water resource management overview for the State

Queensland has transitional water resource plans in place for the management of groundwater, overland flows and water in watercourses, lakes and springs within all catchments in the QMDB. These water resource plans are taken to have been accredited under the Commonwealth Water Act and are to be replaced by 2019.

Development of the second generation state-based water plans and compliance with the Basin Plan 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 draft water plan and water management protocol (for the Condamine and Balonne and Border Rivers and Moonie areas) on 11 April 2018. The existing Border Rivers, Condamine and Balonne and Moonie water plans remain current and continue to limit further development until the draft water plans are finalised. The water plan for the Warrego, Paroo, Bulloo and Nebine catchment has been finalised and accredited. Many of the aquifers in the Warrego-Paroo-Nebine Water Resource Plan area have comparatively large volumes of water identified under the SDLs in the Basin Plan, although the water plan provides for only a smaller portion of the available water identified to be released for consumptive use.

Surface water

Surface water in the Queensland section of the Murray-Darling Basin (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: Paroo, Warrego, 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 largely met in the Queensland Border Rivers and 87% of the in-catchment reduction achieved in the Condamine-Balonne. HHWUE has now finished taking applications, with remaining funded projects due for completion 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, various other management tools have been implemented. These include:

- 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 is 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 provides transitional management arrangements prior to finalisation and accreditation of the second generation water plans for these areas, which are currently under development.
- Finalisation of the Warrego, Paroo, Bulloo and Nebine Water Plan in Feb 2016 (provides for management of groundwater resources in this plan area in line with the Basin Plan).
- Implementation of a moratorium on groundwater resources not currently managed under the Border Rivers Water Plan (to limit development while development of the new water plan is underway).

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 transitioned into the amended (in 2014) water plans for the Condamine and Balonne, Border Rivers and Moonie catchments. These provisions, together with the current moratorium in the Granite Belt underground water area help ensure a 'no-growth' position in the higher risk area of peri-urban expansion.

The current focus for Queensland's groundwater systems in the MDB is to meet the Basin Plan SDL in 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. After slow progress was made towards recovery of the required volume of water over the previous 2 water years, 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 has agreed to the proposed approach and is 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.

Cap compliance

Diversions from watercourses and floodplain harvesting reached 75% of the Cap target for the Condamine and Balonne catchment, 89% for the Moonie and 58% for the Warrego. There were no diversions accounted against the Cap target in the Paroo and Nebine catchments for the 2017/18 water year.

Actual take in the Border Rivers catchment exceeded the permitted take as determined by the model by 31 GL but 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 actual take was non-compliant with water access entitlement conditions or statutory management rules.

2017/18 was an unusual year in the Border Rivers in that there were only two limited opportunities to take water by water harvesting and this led to irrigators relying much more heavily on their access to supplemented (regulated) water. A review of the Border Rivers model identified that it did not replicate this user behaviour for the Border Rivers Water Supply Scheme in 2017/18. Additionally, the July 2017 water harvesting event was not triggered in the model, despite gauged flows being sufficient to announce water harvesting under statutory management rules. Held environmental water remaining in-stream was not a factor in the under-estimation of permitted take.

In the Stanthorpe Water Management Area, the volume estimated as actual take under licences which state an area that may be irrigated was substantially greater than the permitted take estimated by the model. There is uncertainty around both numbers as take for direct irrigation is not yet metered (only water allocations with flow conditions are metered) and the current model relies on only one gauging station for reconciliation of flows. Licences in the Stanthorpe Water Management Area are being converted to volumetric water access entitlements through the current water planning process and are proposed to be metered by 31 December 2022.

Queensland is reviewing 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 an updated model with better data will be used following accreditation of the Water Resource Plan package. The updated model will use four additional gauging stations in the Stanthorpe Water Management Area which over time will provide insights into water availability in the subcatchments of the water management area. This model will provide a significant improvement in the estimation of annual permitted take.

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*)

Due to the absence of any major weather influences and subsequent heavy rainfall events at any time during the year, runoff volumes were well below the long-term annual averages across the entire Queensland section of the Murray-Darling Basin. Following a dry winter

and early spring, some useful rain was received during the October/November period, particularly over the eastern areas with totals diminishing to the west. Because of the dry antecedent conditions and no better than moderate rainfall in the individual events, only minor stream runoff was recorded. Rainfall during the summer months was highly variable, being characterised by storm events rather than any widespread general rains, which has resulted in the low flow volumes across all catchments for the year. Examination of key sites across the region shows recorded volumes were, almost without exception, well below 20% of the annual average.

River and gauging station location	Average annual flow (GL) ¹	Total volume 2017-2018 (GL)	Percentage of average
Condamine and Balonne catchment			
Condamine River @ Chinchilla	549	17	3
Condamine River @ Cotswold	702	52	7
Balonne River @ Weribone	1202	155	13
Maranoa River @ Cashmere	158	6	4
Balonne River @ St George	1162	73	6
Border Rivers catchment			
Macintyre River @ Goondiwindi	960	239	25
Weir River @ Talwood	148	15	10
Barwon River @ Mungindi	597	75	12
Moonie catchment			
Moonie River @ Fenton	154	9	6
Warrego catchment			
Warrego River @ Cunnamulla	454	70	15
Paroo catchment			
Paroo River @ Caiwarro	508	24	5
Nebine catchment			
Nebine Creek @ Roseleigh Crossing	22	2	9

In the Condamine catchment at Warwick only minor flow events occurred in response to light to moderate rainfall. The continuity and hence the volumes diminished at downstream stations until at Chinchilla gauging station, there was no natural runoff recorded. Releases from Chinchilla Weir constituted all of the volume at the gauging station. Downstream of Chinchilla, the pattern was similar through late spring and early summer; however, a more

¹ Average annual flow is the average for the period of record for that gauging station. It varies from 11 years of record at Roseleigh Crossing to 76 years at Goondiwindi. The numbers are indicative only.

significant rain event in late February 2018 resulted in more substantial runoff in Charleys Creek and other tributaries, which made its way downstream past Cotswold and into the Balonne River.

Water held in dams at the start of the water year in the upper and middle Condamine catchment varied from 18% of capacity in Leslie Dam to 88% in Chinchilla Weir. Leslie Dam had no significant inflows and finished the year at 11% capacity. Chinchilla Weir declined to 35% capacity in February 2018 but benefited from an inflow in March, which increased the capacity to over 90%. Supply of water to water users meant the weir finished the year at 49% capacity. The inputs to Chinchilla Weir in 2017/18 included 5 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 flow patterns replicated those in the Condamine. At Weribone there was some minor runoff in October/November 2017 then recession until a moderate event in mid-March 2018 as a result of better rain upstream. At St George there were releases of stock and domestic water as a result of minor inflows to Beardmore Dam up until mid-March when moderate flows made their way downstream to the distributary system. The total volume passing St George was 73 GL (6% of long-term average).

Beardmore Dam in the Lower Balonne started the year at 86% capacity. The dam level declined to 60% capacity in October, with inflows in October and November 2017 increasing capacity to 75%. By March 2018 capacity was at 6% due to supply of water to water users. Inflows in March filled the dam and triggered water harvesting in the Lower Balonne, with the dam finishing the year at 70% capacity.

Volumes at Goondiwindi in the Border Rivers catchment were largely comprised of regulated releases from upstream storages, although natural flows were sufficient to trigger some waterharvesting in July and October 2017.

Glenlyon Dam in the Border Rivers catchment started the water year at 75% capacity and had no significant inflows, finishing the year at 49% capacity. Likewise, there were no significant inflows to Coolmunda Dam on the Macintyre Brook, which started the water year at 96% capacity, finishing at 40%.

Very similar flow patterns to the Condamine and Balonne catchment occurred in the Moonie catchment: minor flows in the October/December 2017 period, then a moderate event in mid-March 2018, which meant total runoff was low (6% of long-term average at Fenton).

In the Warrego catchment the dry conditions in western Queensland were reflected in the fact that the Warrego River remained dry until a moderate flow event in mid-March 2018. This was followed by a minor peak in early April, after which the river receded to no flow by the end of the year.

In the Nebine catchment a few minor runoff events in November/December 2017 and again in March 2018 were the difference between a meagre runoff total of slightly more than 2 GL and a completely dry year.

There were only four minor flow events in the Paroo catchment during the year resulting in a total volume of 24 GL, 5% of the long-term average.

- 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 take of water from watercourses under an entitlement² and by floodplain harvesting

Take of water from watercourses is managed through limits stated on entitlements and by water sharing rules in resource operations plans (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. The permitted take by the CEWH is then subtracted from the total. Annual permitted take by floodplain harvesting is not able to be modelled with any confidence and so is based on estimated take, supported by storage measurement in the Lower Balonne.

Flow event management rules for managing low flows (under section 277 of the Condamine and Balonne Resource Operations Plan) were activated in the Lower Balonne in March 2018, as it had been more than twelve months since the last flow through event and the release of environmental, stock and domestic water alone was not likely to result in a flow through event. A flow through event occurs when water has flowed through the Balonne River and its distributary system and passed all five reference points. These are located on the Barwon, Culgoa, Birrie, Bokhara and Narran rivers and listed in section 269 of the Condamine and Balonne Resource Operations Plan.

Application of the low flow event management rules triggered:

1. a reduction of 10% to the maximum rate of take stated on a water entitlement for 5 days during the announcement period;
2. release of 10% of the volume stored in private weirs downstream of Jack Taylor weir;
3. release of 10% of the inflow into Beardmore Dam that would have been stored for supplemented water allocations in the St George Water Supply Scheme; and
4. management of the bifurcation weirs to distribute a larger proportion of environmental, stock and domestic water to the Balonne-Minor, Narran, Bokhara/Ballandool and Birrie rivers.

The annual permitted take has been reduced accordingly.

The flow event management rules for managing medium flows and Narran Lakes filling flows under sections 279 and 281, respectively, of the Condamine and Balonne Resource Operations Plan did not apply.

² 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).

The take of water from watercourses under basic rights

The take of water from a watercourse, lake or spring for basic rights (stock and 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 not currently estimated, except in the Warrego, Paroo and Nebine catchments, where take 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 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 is currently 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, except in the Warrego, Paroo and Nebine catchments, where take 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 currently 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.

- *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 Commonwealth Water Act and for the purposes of the Basin Plan, water allocation³ means the specific volume of water allocated to water access entitlements in a given water accounting period.

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*.

³ 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.

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.

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 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.

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 resource operations plan 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 2017/18 is shown in the table below. In the continuous share schemes, the announced allocation shown in the table applies to water allocations managed as part of the bulk share.

Water supply scheme	Announced Allocation – high priority (%)	Announced Allocation – medium priority (%)	Comments
Condamine and Balonne catchment			
Upper Condamine	100	10	
Chinchilla Weir	100	100	
Maranoa River	N/A	N/A	Announced allocations do not apply to this scheme.
St George	N/A	87	Announced allocations only apply to entitlements managed as part of the bulk share.
Border Rivers catchment			
Border Rivers	N/A	N/A	
Macintyre Brook	100	100	Announced allocations only apply to entitlements managed as part of the bulk share.
Warrego catchment			
Cunnamulla	N/A	100	

- 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 watercourses under an entitlement and 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 2017/18, the take of supplemented water was 55% of the total take, take of unsupplemented water was 44% and overland flow (floodplain harvesting) 1%.

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 currently not included in annual estimates of take, except in the Warrego, Paroo and Nebine catchments, where take 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 runoff dams (including take under basic rights)

Water taken by runoff dams is not measured and is currently considered to be the long-term annual average limit estimated by the Authority and which is listed in Schedule 3 of the Basin Plan, except in the Warrego, Paroo and Nebine catchments, where take 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 actual take of water by commercial plantations is currently 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.

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 161 GL (75% of the water permitted to be taken) for the Condamine and Balonne catchment, 15 GL (89%) for the Moonie, 8 GL (58%) for the Warrego, 0 GL (0%) for the Paroo and 0 GL (0%) for the Nebine catchment for the 2017/18 water year. Diversions in the Border Rivers catchment (91 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*)

Approximately 420 ML of surface water was made available in the QMDB for short-term use (construction and town water supply) under water permits.

- 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 and resource operations plan) may occur in all water resource plan areas in the QMDB. Resource operations plans prohibit some trades where it has already been assessed that trade cannot occur without impacts.

Out of 76 GL of water permanently traded in the QMDB in 2017/18, 48 GL was traded separately from land and 28 GL traded with land, with 49% of the total volume of permanent trades occurring in the Queensland Border Rivers and 50% in the Condamine-Balonne water resource plan area.

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. Under the IGA, the State of origin accounts for water taken under an entitlement granted by the State of origin. Therefore, water temporarily traded from Queensland to New South Wales is accounted for as actual and permitted take under Queensland water access entitlements in accordance with the IGA. Likewise, water traded from New South Wales to Queensland is not accounted for as actual take by Queensland. Consequently, there is no requirement for Queensland to adjust permitted take to account for interstate trade.

In the Border Rivers catchment in 2017/18, 7 GL of New South Wales supplemented water was authorised for use in Queensland and 17 GL of Queensland unsupplemented water and 1 GL of supplemented water was authorised for use in New South Wales.

There was no temporary trade between consumptive and environmental entitlement pools in 2017/18 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 take of water from aquifers under an entitlement

Entitlements to take water from aquifers in the QMDB are in the form of water licences (or water permits) and these include conditions that identify the nominal entitlement (volumetric limit) and the particular aquifer (source). The draft water plans (released 11 April 2018) propose the conversion from water licences to water allocations for some alluvial aquifer subareas.

The take of water from aquifers under basic rights

Permitted take 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.

Permitted take for all aquifers (entitlement and basic rights total) is equal to or less than SDL, except for the Border Rivers alluvium where it is higher but will be managed down to equal or less in actual long-term take via the use of rules identified in the draft Water Plan. The Upper Condamine alluvium (both Central Condamine and Tributaries) is also higher; however, is subject to water recovery reducing levels of permitted take. The Central

Condamine alluvium will also have rules in the Water Plan to manage actual long-term take to align with the SDL.

- 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 occurred in the Granite Belt Underground Water Area following the completion of the WSP Parsons Brinckerhoff report (2018)⁴. These changes are proposed to be included in the Water Accounting Methods Report for the Queensland Border Rivers-Moonie Water Resource Plan and more accurately separate take under basic rights from other authorised take. A moratorium on new works to take groundwater for purposes other than basic rights is in place in this area. The new water plan is proposed to continue to prevent any increase in authorised take in this area.

- 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 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). There was a reduction in access in the Upper Hodgson Creek (basalt) system with all other systems remaining at the same level of access for entitlement holders as per the previous (2016/17) year although messaging was again provided around the need for recharge to prevent a reduction in access in the future. While the majority of aquifers and management areas were able to take 100% of their nominal entitlements, the more closely managed Central Condamine Alluvium Groundwater Management Area (GMA) is an exception, with the licensees in this area either limited to 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 access in other aquifers has risen and fallen over time as a result of changes in seasonal conditions.

- 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. Estimated data is combined with the metered data to provide a picture of the total water use.

The diversion of water from groundwater taken under licensed entitlements for 2017/18 is 201.7 GL from a combination of metered and estimated use. This does not include take under basic rights.

⁴ WSP Parsons Brinckerhoff, 2018, Methodology for determining growth in take of groundwater and accounting for groundwater take in the Granite Belt Underground Water Area, Sydney.

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 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. This volume has again been used, for all catchments except for the Warrego-Paroo-Nebine (currently the only accredited plan) where the permitted take for basic rights has been estimated using the method outlined in the Queensland Murray Darling Basin Methodology for Estimating the Take of Groundwater for Stock and Domestic Purposes (Parsons Brinckerhoff, 2011). This methodology may also be used for the other water plan areas – however, work has recently started on a more holistic basic rights use assessment. Until the methodology is settled the basic rights estimation will remain unchanged.

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) allows stock or domestic use to be separated from non-stock or domestic in the unregulated Granite Belt Underground Water Area and will assist in the development of an updated basic rights estimation methodology.

- 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) area. These water sharing rules allow for greater water entitlement flexibility for licensees and has enabled the buyback of entitlements by the Commonwealth in the Central Condamine Alluvium as well as in the Oakey and Dalrymple Creek Alluvium areas.

Permanent trades during the year totalled just under 1.8 GL across 9 trades. 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. Just over 5.8 GL of groundwater across 93 seasonal water assignment notices was temporarily traded across the QMDB area.

Summary of groundwater take

Rainfall totals for this year were around average across the QMDB area. However, it was a very dry start to the year with well below average rainfall through winter and into spring resulting in significant groundwater extraction to assist pre-watering for summer crops. October experienced significantly above average rainfall across all but the Warrego and Paroo catchments with this prompting widespread late planting. Rainfall totals through late spring and summer were close to average however the rain came in sporadic storms. The dry periods and large crop area contributed to an increase in water use from groundwater sources. Rainfall totals over the autumn and into the winter period were significantly drier

than average with record lows in many cases. Overall, the groundwater systems with a high degree of connectivity to surface water 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 2017/18 for all SDL resource units was higher than last year. Diversions for all aquifer units were at or within the respective SDLs except for the Central Condamine Alluvium (GS64a) which was measured at 110% of SDL but still well below BDL. Compliance with Basin Plan SDLs will be required from 2019. Use in the Central Condamine Alluvium has been reduced by limiting take for most entitlements to 50% and 70%. Diversions in this system should move into alignment with the SDL as buyback progresses. For Queensland's other three most developed systems, diversions in the Queensland Border Rivers Alluvium was just over 100% while the Upper Condamine Basalts was around 95% and the Upper Condamine Alluvium (Tributaries) was again at around 80% of the respective SDLs.

2017/18 Snapshot of Water Diversions in the QMDB

Resource	Diversion 2017/18 (GL)	Permitted take 2017/18 (GL)	Diversion 2016/17 (GL)
Surface water (take from a watercourse and by floodplain harvesting)	274	305	1115
Groundwater	202	311	192

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.

Water gifted to the Commonwealth has been provided from unallocated water identified in the statutory water plans for the Warrego, Nebine, Moonie and Border Rivers catchments. This previously unallocated water has never been included in the Cap target. Water recovered by the Commonwealth from entitlement holders has previously been included in the Cap target as irrigation water and the Cap target 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 resource operations plans. 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 2017/18 these rules provided in-stream benefits in the Warrego, Lower Balonne distributaries and Border Rivers.

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 is currently reviewing the transitional water resource plans for the Condamine and Balonne, Border Rivers and Moonie catchments under the *Water Act 2000* (Qld) in consultation with regional stakeholders. Draft water plans and water management protocols (which will replace existing resource operations plans in accordance with an amendment to the *Water Act 2000* (Qld) enacted in 2016) were released on 11 April 2018 and submissions closed on 1 June 2018. These plans apply to both surface water and ground water and, once finalised, will form part of the Water Resource Plans to be submitted to the MDBA for accreditation in 2019.

Surface water

There are categories of take defined in the BDL for which Queensland is not able to provide updated estimates of the take of water with any confidence due to lack of data. These include:

- Take from watercourses under basic rights;
- Take from runoff dams;
- Take by commercial plantations.

Methods for determining permitted and actual take have already been developed for the Warrego-Paroo-Nebine Water Resource Plan and are in the process of being developed as part of water resource plan accreditation for the remaining QMDB catchments. However, management and monitoring of related infrastructure is seen as an alternative approach to estimating take. Infrastructure-based management strategies are already in place to limit the take of water in those categories where there is a high risk of growth in take compromising diversion limits. For example, water plans limit the purposes for which a new runoff dam can be constructed and the construction of new stock and domestic bores in areas serviced by town water supply in the Upper Condamine. Infrastructure growth in other areas of take will be monitored over time and management strategies reviewed in regards to changes in the risk to the resource.

Risk assessment processes for the Condamine-Balonne, Border Rivers and Moonie water resource plan areas have been carried out to inform the review and development of the next generation water plans.

Groundwater

All groundwater systems will be fully incorporated into Queensland's water plans prior to the implementation of the Basin Plan in 2019. The planning process to include the aquifers under the Warrego, Paroo, Bulloo and Nebine area in the second generation water planning process has been finalised and this water plan has been accredited under Basin Plan provisions. Draft water plans have been released for aquifers underlying the Condamine and Balonne as well as the Border Rivers and Moonie catchments.

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. Three 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 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 was completed in January 2018. The first three stages have been completed, with full completion due for finalisation in late 2018. The tributary systems are hydraulically linked to the CCA and as such, impact on how the CCA operates longer-term.

Office of Groundwater Impact Assessment (OGIA) interconnectivity project

OGIA engaged the Queensland University of Technology to undertake research on connectivity within and between groundwater and surface water systems in the Upper Condamine Tributaries. This project was finalised in 2017.

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.