

# **Macintyre Brook Water Supply Scheme**

## **Operations Manual**

**February 2019**

**Water Plan (Border Rivers and Moonie) 2019**

# Contents

<b>Chapter 1</b>	<b>Preliminary.....</b>	<b>1</b>
1	Short title.....	1
2	Interpretation of words used in this manual.....	1
3	Water supply scheme.....	1
<b>Chapter 2</b>	<b>Operating rules.....</b>	<b>2</b>
4	Minimum operating levels of storages.....	2
5	Supply of water allocations for essential water supply needs .....	2
6	Waterhole management.....	2
<b>Chapter 3</b>	<b>Water sharing rules.....</b>	<b>3</b>
7	Scope of chapter 3 .....	3
<b>Part 1</b>	<b>General water sharing rules.....</b>	<b>3</b>
8	Management of water allocations.....	3
9	Changing to and from management as an individual continuous share .....	3
10	Dealing with inflow.....	3
<b>Part 2</b>	<b>Continuous sharing rules.....</b>	<b>4</b>
11	Application of part 2.....	4
12	Continuous share percentage .....	4
13	Continuous share volume.....	5
14	Continuous share water accounts.....	5
15	Continuous share water account reconciliation process .....	6
<b>Part 3</b>	<b>Bulk sharing rules.....</b>	<b>7</b>
16	Application of part 3.....	7
17	Bulk sharing rules.....	7
18	High priority water allocations .....	7
19	Medium priority water allocations .....	8
20	Maximum volume of water that may be taken.....	8
<b>Chapter 4</b>	<b>Seasonal water assignment rules.....</b>	<b>10</b>
21	Seasonal water assignment rules .....	10
22	Maximum water use .....	11
<b>Attachment 1</b>	<b>Dictionary.....</b>	<b>12</b>
<b>Attachment 2</b>	<b>Border Rivers Water Supply Scheme map.....</b>	<b>13</b>

# Chapter 1 Preliminary

## 1 Short title

- (1) This operations manual may be cited as the Macintyre Brook Water Supply Scheme Resource Operations Licence Operations Manual.
- (2) Reference in this document to 'this manual' means the Macintyre Brook Water Supply Scheme Operations Manual for the Resource Operations Licence.

## 2 Interpretation of words used in this manual

- (1) The dictionary in attachment 1 defines particular words used in this manual.
- (2) References to licence holder in this manual are taken to mean the resource operations licence holder for the Macintyre Brook Water Supply Scheme.

## 3 Water supply scheme

The extent of the Macintyre Brook Water Supply Scheme within the Border Rivers and Moonie plan area is shown on the map in attachment 2.

# Chapter 2 Operating rules

## 4 Minimum operating levels of storages

- (1) The minimum operating level for storages within the Macintyre Brook Water Supply Scheme are specified in table 1.
- (2) Except where provided for under section 5, the licence holder must not release or supply water from storage where the water level in that storage is at or below its minimum operating level.

**Table 1: Minimum operating levels of storages**

Storage	Minimum operating level (m AHD)
Coolmunda Dam	301.19
Whetstone Weir	257.44
Ben Dor Weir	244.26

## 5 Supply of water allocations for essential water supply needs

- (1) Subject to subsection (3), where the water level in Coolmunda Dam is equal to or above 304.53 m AHD the licence holder must—
  - (a) supply high priority water allocations; and
  - (b) supply medium priority water allocations.
- (2) Where the water level in Coolmunda Dam is below 304.53 m AHD the licence holder—
  - (a) must cease the supply of medium priority water allocations;
  - (b) must supply high priority water allocations;
  - (c) may supply high priority water allocations where the water level is below the minimum operating level stated under section 4; and
  - (d) must within one business day of the water level in Coolmunda Dam falling below 304.53 m AHD, notify water allocation holders that only high priority water allocations will be supplied.
- (3) The licence holder must continue to act in accordance with subsection (2) until the water level in Coolmunda Dam increases to a level equal to or above 304.66 m AHD, after which the licence holder must—
  - (a) supply water allocations in accordance with subsection (1);
  - (b) within one business day of the water level in Coolmunda Dam reaching 304.66 m AHD, notify water allocation holders that water allocations will be supplied in accordance with subsection (1).

## 6 Waterhole management

A waterhole may be drawn down to 0.5 metres below its natural cease-to-flow level to allow water to be taken under a water allocation if the water released by the licence holder will replace the water drawn down in the waterhole and is released prior to the time of waterhole draw down.

# Chapter 3 Water sharing rules

## 7 Scope of chapter 3

This chapter deals with the water sharing rules under continuous sharing accounting rules for—

- (a) water allocations managed under individual continuous share; and
- (b) water allocations managed under the bulk share.

## Part 1 General water sharing rules

### 8 Management of water allocations

- (1) A water allocation must be managed as part of the bulk share unless the water allocation holder elects to have their water allocation managed as an individual continuous share.
- (2) Where a water allocation holder has elected to have their water allocation managed as an individual continuous share, the licence holder must manage that water allocation in accordance with part 2.
- (3) Where a water allocation holder has not elected to have their water allocation managed as an individual continuous share, the licence holder must manage that water allocation as part of the bulk share in accordance with part 2 and part 3.

### 9 Changing to and from management as an individual continuous share

- (1) Where a water allocation holder elects to change the management of a water allocation to management as an individual continuous share, the water allocation holder must notify the licence holder no less than 30 business days before the commencement of the water year.
- (2) Where a water allocation holder elects to change the management of a water allocation to management as part the bulk share, the volume of water held in the continuous share water account for that water allocation must be added to the continuous share water account for all of the water allocations being managed as part of the bulk share.

### 10 Dealing with inflow

- (1) Subject to subsection (3), where the water level in Coolmunda Dam is equal to or above 304.53 m AHD, the licence holder must deal with inflow as follows—
  - (a) release a volume of the inflow in accordance with section 3 of the resource operations licence;
  - (b) for a water allocation managed as an individual continuous share—share a volume of the inflow in proportion to the continuous share percentage<sup>1</sup>;
  - (c) for the group of water allocations managed as the bulk share—share a volume of the inflow in proportion to the continuous share percentage<sup>2</sup> for the group; and
  - (d) any portion of inflow that is in excess of the continuous share volume for a water allocation, or a group of water allocations, must be shared amongst the remaining allocations and group of allocations in accordance with subsections (1)(b) and (1)(c).

---

<sup>1</sup> Refer to section 13

<sup>2</sup> Refer to section 13

- (2) Where the water level in Coolmunda Dam is below 304.53 m AHD the licence holder must—
- (c) cease sharing inflow to medium priority water allocations; and
  - (d) share a volume of the inflow to high priority water allocations in proportion to the continuous share percentage of each high priority water allocation.
- (3) The licence holder must continue to act in accordance with subsection (2) until the water level in Coolmunda Dam increases to a level equal to or above 304.66 m AHD, after which the licence holder must—
- (a) cease sharing inflow in accordance with subsection (2); and
  - (b) recommence dealing with inflow in accordance with subsection (1).

## Part 2 Continuous sharing rules

### 11 Application of part 2

This part applies to water allocations managed as individual continuous shares and water allocations managed as part of the bulk share.

### 12 Continuous share percentage

- (1) The continuous share percentage for a water allocation must be determined using the following formulae—
- (a) for a high priority water allocation—

$$CS\% = 100 \times \frac{NV}{\eta_s} \times \frac{TCSV_{HP}}{\Sigma HP_{EQ} \times TCSV}$$

- (b) for a medium priority water allocation—

$$CS\% = 100 \times \frac{NV}{\eta_s} \times \frac{TCSV_{MP}}{\Sigma MP_{EQ} \times TCSV}$$

- (2) The parameters used in the formulae under subsection (1) are defined in table 2.

**Table 2 Continuous share percentage parameters**

Parameter	Description
CS%	The continuous share percentage of the water allocation.
$\eta_s$	The relevant storage factor that applies to the zone for the nominal location for the water allocation (refer to table 3).
NV	Nominal volume of the water allocation.
$\Sigma MP_{EQ}$	The sum of the nominal volume for each medium priority water allocation in the Macintyre Brook Water Supply Scheme, divided by the applicable storage factor for each medium priority water allocation (refer to table 3).
$\Sigma HP_{EQ}$	The sum of the nominal volume for each high priority water allocation in the Macintyre Brook Water Supply Scheme, divided by the applicable storage factor for each high priority water allocation (refer to table 3).
TCSV	The total conceptual storage volume for the Macintyre Brook Water Supply Scheme. This volume is equal to the sum of the respective full supply volumes for Coolmunda Dam, Whetstone Weir and Ben Dor Weir minus their respective minimum operating volumes. TCSV = 69 973 megalitres
TCSV <sub>HP</sub>	A volume that provides for sufficient storage reserve to supply projected high priority water allocation demands and associated evaporation and seepage losses for up to two years. This volume preserves the relative shares between high priority and medium priority water allocations. TCSV <sub>HP</sub> = 9300 megalitres
TCSV <sub>MP</sub>	TCSV <sub>MP</sub> = TCSV – TCSV <sub>HP</sub> = 60 673 megalitres

**Table 3 Storage factors**

Location	Storage factor (ηS)
Macintyre Brook Zone A	1.00
Macintyre Brook Zone B	0.85
Macintyre Brook Zone C	0.65

**13 Continuous share volume**

- (1) The licence holder must determine the continuous share volume for a water allocation using the following formula—

$$CSV = \frac{TCSV \times CS\%}{100}$$

- (2) The parameters used in the formula under subsection (1) are defined in table 2.

**14 Continuous share water accounts**

- (1) The licence holder must establish a continuous share water account for—
- (a) each water allocation managed as an individual continuous share; and
  - (b) the group of water allocations managed as the bulk share.
- (2) The maximum volume of water that may be held in a continuous share water account is the continuous share volume for that water allocation or group of water allocations.
- (3) The minimum volume of water that may be held in a continuous share water account is zero megalitres.
- (4) The licence holder must estimate the volume of water held in each continuous share water account a minimum of every five business days.
- (5) The volume of water held in each continuous share water account must be determined using the following formula—

Estimated continuous share water account volume

**Equals**

Previous estimated continuous share water account volume

**Less**

Estimated share of storage losses in the period since the last estimate or reconciliation determined under section 15

**Less**

Water withdrawals from the continuous share water account in the period since the last estimate or reconciliation determined under section 15

**Plus**

Water deposits into the continuous share water account in the period since the last estimate or reconciliation determined under section 15

**Plus**

Estimated share of inflow in the period since the last estimate or reconciliation determined under section 15

- (6) The parameters used in the formula under subsection (5) are defined in table 4.

**Table 4 Parameters used to estimate the volume held in a continuous share water account**

Parameter	Description
Storage losses	Storage losses are estimated by applying the daily values listed in table 5 to the number of days since the last estimate or reconciliation, and assuming no contribution to the storages from rainfall falling directly into the storages.
Water withdrawals	<p>Withdrawal of water from a continuous share water account is equal to the sum of—</p> <p>(1) the water orders for the period since the last estimate or reconciliation determined using the following formula—</p> $\text{withdrawal} = \frac{\text{water order}}{\eta_s}$ <p>Where—</p> <p>Water order = the volume of water ordered by a water allocation holder for delivery to the location of take.</p> <p><math>\eta_s</math> = the storage factor that applies at the location of that take as shown in table 3.</p> <p>(2) the volumes of water transferred to other continuous share water accounts by seasonal assignment for the period since the last estimation or reconciliation.</p> <p>Note – A water order supplied from tributary inflow or from a storage within the scheme is taken to be a withdrawal.</p>
Water deposits	A water deposit is the sum of volumes of water transferred from other continuous share water accounts for the period since the last estimation or reconciliation.
Share of inflow	<p>Inflows for the period since the last estimate or reconciliation are estimated using the approved methodology for the storage inflow derivation technique and shared in accordance with section 10.</p> <p>Note – Downstream tributary inflows within the scheme that are used to supply orders are treated as an inflow, and distributed through the reconciliation process under section 15.</p>

**Table 5 Scheme storage losses**

Month	Monthly (mm/month)	Daily (mm/day)
Jul	76	2.45
Aug	101	3.26
Sep	133	4.43
Oct	177	5.71
Nov	212	7.07
Dec	238	7.68
Jan	243	7.84
Feb	201	7.18
Mar	185	5.97
Apr	133	4.43
May	92	2.97
Jun	72	2.40

## 15 Continuous share water account reconciliation process

- (1) The licence holder must apply a continuous share water account reconciliation process at least once every 30 business days.
- (2) The continuous share water account reconciliation process must calculate the difference between the total volume of water estimated to be available in the

conceptual storage and the total volume of water held in all continuous share water accounts using the following formula—

Water volume difference

**Equals**

Total volume of water estimated to be available in the conceptual storage

**Less**

Total volume held in all water accounts managed as individual continuous shares and the bulk share.

- (3) Where the water volume difference is greater than zero, the water available must be shared amongst continuous share water accounts in proportion to the continuous share percentage for a water allocation or group of water allocations.
- (4) Where the water volume difference is less than zero, the shortfall must be applied as a reduction to continuous share water accounts in proportion to the volume of water held in the continuous share water accounts.

## Part 3 Bulk sharing rules

### 16 Application of part 3

This part applies to water allocations managed as part of the bulk share.

### 17 Bulk sharing rules

- (1) The licence holder must—
  - (a) determine an announced allocation for each priority group;
  - (b) use the water sharing rules in this part to determine announced allocations throughout the water year;
  - (c) determine and set the announced allocation effective from the first day of each water year;
  - (d) redetermine the announced allocation whenever the continuous share water account reconciliation process under section 15 is applied and reset the announced allocation where the redetermination indicates that the announced allocation would—
    - (i) increase by five or more per cent; or
    - (ii) increase to 100 per cent;
  - (e) publish details of the announced allocation and parameters for determining the announced allocation within five business days of setting or resetting an announced allocation; and
  - (f) not reduce the announced allocation during a water year where the licence holder is supplying water allocations in accordance with section 5(1).
- (2) The announced allocation must not be greater than 100 per cent.

### 18 High priority water allocations

- (1) The announced allocation for high priority water allocations must be—
  - (a) 100 per cent where the announced allocation for medium priority water is greater than zero per cent; or
  - (b) determined using the following formula where the announced allocation for medium priority water ( $AA_{MP}$ ) is zero per cent—

$$AA_{HP} = 100 \times \frac{UV_{BS} - TOA_{BS} + DIV_{BS}}{AA_{MP}}$$

$$HPA_{BS}$$

- (2) The parameters used in the formula under subsection (1) are defined in table 6.

## 19 Medium priority water allocations

- (1) Subject to section 5, the announced allocation for medium priority water allocations must be determined using the following formula—

$$AA_{MP} = 100 \times \frac{(UV_{BS} - HPA_{BS} - RE_{BS} - TOA_{BS} + DIV_{BS})}{MPA_{BS}}$$

- (2) The parameters used in the formula under subsection (1) are defined in table 6.

**Table 6 Announced allocation parameters**

Parameter	Description
AA <sub>BS</sub>	Medium priority announced allocation percentage. The percentage of the annual resource cap for a medium priority water allocation managed as part of the bulk share that may be taken for the water year.
AA <sub>BS</sub>	High priority announced allocation percentage. The percentage of the annual resource cap for a high priority water allocation managed as part of the bulk share that may be taken for the water year.
HPA <sub>BS</sub>	High priority water allocations. The total nominal volume of high priority water allocations managed as part of the bulk share.
MPA <sub>BS</sub>	Medium priority water allocations. The total nominal volume of medium priority water allocations managed as part of the bulk share.
UV <sub>BS</sub>	The usable volume in the bulk share. The volume of water available for water allocations managed as part of the bulk share minus projected storage losses determined using the following formula—  $UV_{BS} = CV - SL$ <p>Where—</p> <p>CV= the current volume in the bulk share water account.  SL= the projected storage loss associated with the water allocations being managed as part of the bulk share for the remainder of the water year. Storage losses include evaporation and seepage. The monthly storage loss depths to be applied are given in table 5.  The storage loss volume is applied as a reduction to the total volume held in all water accounts managed as the bulk share in proportion to the volume of water held in the continuous share water accounts.</p>
RE <sub>BS</sub>	Reserve (high priority). An allowance set aside to provide for the supply of water to high priority water allocations managed as part of the bulk share. The reserve must be equal to a volume based on 12 months' supply from the end of the current water year, including storage losses and a transmission operational allowance.
TOA <sub>BS</sub>	Transmission operational allowance. An allowance for the river transmission and operational losses expected to occur in supplying water to the end of the water year to water allocations managed as part of the bulk share. TOA <sub>BS</sub> varies with the amount of water allocation being managed as the bulk share that remains to be delivered to each location. TOA <sub>BS</sub> is based on application of the storage factors in table 3 for the locations of the water allocations managed as part of the bulk share.
DIV <sub>BS</sub>	Diverted volume: The volume of water diverted by high and medium priority water allocations managed as part of the bulk share since the start of the current water year.

## 20 Maximum volume of water that may be taken

- (1) The maximum volume of water that may be taken in a water year under a water allocation is—

- (a) for a water allocation managed as an individual continuous share, a volume equal to the annual resource cap for the water allocation; or
  - (b) for a water allocation managed as part of the bulk share, a volume equal to the annual resource cap for the water allocation multiplied by the announced allocation that applies to that water allocation.
- (2) The annual resource cap is determined using the following formula—

$$\text{ARC} = \frac{\text{NV} \times \eta_{\text{C location}}}{\eta_{\text{C nominal location}}}$$

- (3) The parameters used in the formula under subsection (2) are defined in table 7.

**Table 7 Annual resource cap parameters**

Parameter	Description
$\eta_{\text{C location}}$	The relevant cap adjustment factor that applies to the location of the water allocation as specified in table 8.
$\eta_{\text{C nominal location}}$	The relevant cap adjustment factor that applies to the nominal location of the water allocation, as specified in table 8.
NV	Nominal volume associated with the water allocation.

**Table 8 Cap adjustment factors ( $\eta_{\text{C}}$ )**

Location	Storage factor ( $\eta_{\text{c}}$ )
Macintyre Brook Zone A	1.00
Macintyre Brook Zone B	0.85
Macintyre Brook Zone C	0.65

# Chapter 4 Seasonal water assignment rules

## 21 Seasonal water assignment rules

- (1) The licence holder may approve a seasonal assignment of water if the total water use in a water year for each zone does not exceed the maximum allowable use volume for each zone.
- (2) The licence holder may approve a seasonal water assignment from the Macintyre Brook Water Supply Scheme to Border Rivers Zone B where the sum of the—
  - (a) total volume of water delivered to the Border Rivers Water Supply Scheme under seasonal assignment; and
  - (b) total volume of water used in the Macintyre Brook Water Supply Scheme in a water year;
 does not exceed the maximum allowable use volume defined for Macintyre Brook Zone C shown in table 10.
- (3) The licence holder must not approve a seasonal water assignment of a water allocation with the purpose 'bulk water supply commitment'.
- (4) When seasonally assigning unused annual resource cap from a water allocation managed as an individual continuous share, the volume that may be seasonally assigned must be determined as follows—

$$\text{assignable unused annual resource cap} = \frac{\text{existing unused annual resource cap} \times \eta_{C, \text{new location}}}{\eta_{C, \text{old location}}}$$

- (5) The parameters used in the formula under subsection (4) are defined in table 9.
- (6) When seasonally assigning from a water allocation managed as part of the bulk share, the volume of water available in the continuous share water account at the new location must be determined by the following formula—

$$\text{volume available to assign} = \frac{\text{volume being assigned} \times \eta_{C, \text{new location}}}{\eta_{C, \text{old location}}}$$

- (7) The parameters used in the formula under subsection (6) are defined in table 9.

**Table 9 Seasonal assignment parameters**

Parameter	Description
$\eta_{C, \text{new location}}$	The relevant cap adjustment factor, as defined in table 8, which applies to the location of the water allocation to which the unused annual resource cap is being assigned.
$\eta_{C, \text{old location}}$	The relevant cap adjustment factor, as defined in table 8, which applies to the location of the water allocation from which the unused annual resource cap is being assigned.
existing annual resource cap	The annual resource cap as determined under section 20 minus the volume of water taken at the location of the water allocation from which the unused annual resource cap is being assigned.

## 22 Maximum water use

For this chapter—

- (a) the maximum volume of water that may be used in a zone in a water year for the Macintyre Brook Water Supply Scheme is the maximum allowable use volume shown in table 10 for each zone;
- (b) total water use in a zone is the total volume of water used under water allocations of all priority groups managed by the licence holder for the zone.

**Table 10 Maximum allowable use volumes for the Macintyre Brook Water Supply Scheme zones**

<b>Parameter</b>	<b>Macintyre Brook Zone A</b>	<b>Macintyre Brook Zone B</b>	<b>Macintyre Brook Zone C</b>
Maximum allowable use (megalitres)	23 146	19 674	21 945

## Attachment 1 Dictionary

Term	Definition
AHD	Australian Height Datum, which references a level or height to a standard base level.
AMTD	Adopted Middle Thread Distance, is the distance in kilometres, measured along the middle of a watercourse, from a specific point in the watercourse to the watercourse's mouth, the watercourse's junction with the main watercourse or the border between the State and New South Wales.
Announced allocation	For a water allocation managed under a resource operations licence, means a number, expressed as a percentage, which is used to determine the maximum volume of water that may be taken in a water year under the authority of a water allocation.
Cease to flow level	For a waterhole, the level at which water stops flowing from a waterhole over its downstream control.
Full supply level	The specified maximum volume of water within the ponded area of a dam, weir or barrage, which corresponds to the full supply level
Megalitre (ML)	One million litres.
Minimum operating volume	For a dam or weir, the specified minimum volume of water within the ponded area of the storage that cannot be released or used from the storage under normal operating conditions.
Outlet	Means an arrangement on a dam or weir that allows stored water to be released downstream.
Ponded area	Area of inundation at full supply level of a storage.
Priority group	A grouping of water allocations for taking supplemented water from a water supply scheme with the same Water Allocation Security Objective (WASO).
Release	Water from a dam or weir that passes downstream from the dam or weir through the dam or weir outlet works.
Resource operations licence	A licence granted under the <i>Water Act 2000</i> to make provision for how infrastructure and water are managed under an approved resource operations licence.
Resource operations licence holder	The holder of the resource operations licence for the Macintyre Brook Water Supply Scheme.
Supplemented water	Water supplied under an interim resource operations licence, resource operations licence or other authority to operate water infrastructure.

# Attachment 2 Border Rivers Water Supply Scheme map

