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MURRAY–DARLING BASIN AUTHORITY

South Australian Resource Assessment in the Source Murray Model

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1 Introduction

This report describes the implementation of the South Australian Resource Assessment and South Australian order in the Source model of the Murray and Lower Darling System (SMM). South Australian Resource Assessment is the process by which the South Australian Government decides how to release and distribute to users and hold in reserve the water that South Australia is allocated each month under the Murray-Darling Basin Agreement.

2 Scenarios Configured

Three scenarios have been configured in the SMM:

- Baseline Diversion Limit (BDL) – This corresponds to the baseline conditions for the Basin Plan. It includes all changes to management up to June 2009 including the recovery and use of water for TLM, RMIF and the Snowy River,
- Water Resource Plan (*WRP*) – This represents our best representation of the rules and water sharing arrangements in place for the life of the WRP. It includes the agreement on an MDBA conveyance Reserve and South Australia's use of its Storage Right. It does not include commonwealth water recovery. Its purpose is to calculate permitted take under the Basin Plan.
- Current Conditions *(CUR)* – This includes the WRP and all other changes made since the BDL, most notably Basin Plan water recovery and use of the CEWH's portfolio. The current conditions scenario will be used to undertake future studies and planning scenarios.

These scenarios are tied to "input sets", which allow the modeller to efficiently change between the different configurations. The configuration for South Australian resource assessment corresponding to these three scenarios is described in this report.

3 Representation of South Australian Resource Assessment

3.1 Processes modelled

The key processes modelled in the SMM implementation of SA Resource Assessment are:

- The calculation of the minimum reserve
- The calculation of South Australia's use of CHWN Storage Right (for WRP and CUR scenarios)
- The allocation of available resources to:
    - Metro Adelaide
    - Country Towns
    - Stock and Domestic, riparian and Industrial users
    - TLM
    - Irrigation and other users
    - Losses
    - Dilution Flow

- The calculation of the monthly orders for regulated Flow to SA
- The deferral or callout of SA Storage Right for Critical Human Water Needs
- The cutback in entitlement flow required to supply the South Australian Murray TLM water recovery account
- The maintenance of an account balance for TLM environmental water
- The delivery of ordered water to the South Australian icon sites; Chowilla Floodplain and the Lower Lakes

3.2 Water Year

The allocation of water to South Australia under the Agreement is for the water year 1 June to 31 May. All reserves are defined at 31 May and the decisions regarding SA Storage Right, flow to SA and the allocations to users are based on this water year. For this reason the primary water year for the SA Resource Assessment is June to May. However the allocations made by SA to its water users are for the water year 1 July to 30 June. A second annual allocation system is set up in the SMM for the 1 July to 30 June water year. It is processed after the June to May allocation calculation is completed. The percentage allocations in the second system are set to the allocations made in the 1 June to 31 May allocation system in every month except June. In the second system, allocations in June remain the same as they were in May. The second system is used to manage the allocations, account balances and use limits for retail water users.

3.3 South Australian Entitlements

The entitlements issued in South Australia are summarised in Table 1. These include both the retail entitlements issued to users and the allowances defined in the *Agreement* for flow at the Border and for dilution and loss within South Australia.

Table 1 South Australian Water Entitlements

Account Type	BDL(ML)	WRP (ML)	CUR (ML)
Retail Entitlements			
Metro Adelaide[1]	215,000	215,000	215,000
SA Country Towns	50,000	50,000	50,000
Stock and Domestic, Industrial, Riparian[2]	20,000	20,000	20,000
Other Entitlements	630,041	630,050	630,050
Irrigation	581,701	580,601	425,109
Recreation	4,424	4,424	4,424
TLM	43,916	45,025	45,025
CEWH	0	0	155,492
Total Retail Entitlement	***915,041***	***915,050***	***915,050***
Section 128 Authorisation[3]	0	100	100
SA Annual Flow Entitlements			
Annual flow Entitlement as per Agreement	1,154,000	1,154,000	1,154,000
Net Permanent Trade to SA	35,994	35,994	35,994
Dilution and Loss	696,000	696,000	696,000
Nominal Losses	348,000	348,000	348,000
Nominal Dilution	348,000	348,000	348,000
Full Entitlement Flow to SA (incl. Trade)	***1,885,994***	***1,885,994***	***1,885,994***
Unallocated entitlement (1154,000 + Net Permanent Trade In – Retail Entitlement)	274,953	274,853	274,853
Nominal Dilution component	348,000	348,000	348,000
Effective Dilution component	***622,953***	***622,853***	***622,853***

[1] This volume represents a maximum allocation to Metropolitan Adelaide, not the entitlement held.
[2] This includes 6,128 ML of basic rights for unlicensed stock and domestic purposes. In the current BDL configuration, this component forms part of South Australia's CHWN allocation, but is not extracted.
[3] For the WRP and CUR scenarios, the 100 ML of Section 128 Authorisation entitlement is not used.

Note that not all of South Australia's Entitlement to water has been issued as a retail entitlement. The unallocated Entitlement contributes dilution benefits along the River Murray in South Australia and the conveyance requirements to the barrages.

3.4 Frequency of Assessments

South Australian Assessments are conducted at the start of each month.

3.5 Can Allocations Be Reduced?

Source has the capacity to enable allocations for different account types to be reduced as the year progresses or to prevent them from being reduced. As implemented in the SMM, allocations for Reserves, Dilution Flows and Losses may be reduced, but allocations to the retail entitlements of Metro-Adelaide, Country Towns, Stock and Domestic, Industrial, All Other Purposes and Lower Murray Swamps can only increase as the water year progresses (i.e. allocations once announced cannot decrease). The same is true of the basic rights riparian entitlement, which is not a retail entitlement.

3.6 Available Resource

The Resource that is applied to the ARA Table is equal to:

1 South Australia's one third share of the available water (*Agreement* Clause 102),
2 Less one third of the conveyance Reserve (*Agreement* Clause 102D),
3 Plus the Special Accounts Imbalance (*Agreement* Clauses 125 to 127),
4 Plus any advances made between the States under Agreement Clause 102C to ensure the supply of Critical Human Water Needs (CHWN).
5 The Sum of items 1 to 4 are limited to the sum of South Australia's Diversion Entitlement until 31 May with any remaining water supplying the Minimum Reserve (Limited to 835,000 ML) (*Agreement* Clause 103).
6 Plus South Australia's Dilution and Loss Entitlement (58,000 ML/month) for the rest of the year to 31 May,
7 Plus the outstanding balance for SA Flow adjustments for interstate trade.
8 Plus the Assumed Use for the Year to Date as described in Section 3.7.

3.7 Accounting for Use to Date

In NSW and Victoria, users are required to order water and releases from storage are based upon those orders. In addition, most of the larger water users are monitored on a daily basis. It is therefore possible to make good estimates of the water use for the year to date. In those States, this water use is added to the water in storage and the forecast inflows before entering the ARA table. In South Australia, flow delivery at the Border is generally based on the Agreement and not on orders. As most water use is not telemetered, and meter readings are taken quarterly, it is more difficult to determine licensed diversions for the year to date.

In the absence of measured data patterns of use for each of its water user classes have been assumed. These patterns are used for determining both the target flow to SA and the use for the year to date that is part of the available resource applied to the ARA table.

For each entitlement type, the assumed water use this month as a percentage of the remaining allocation is presented in Table 2.

Table 2 Assumed monthly water use as a percentage of the remaining allocation (from MDBA 2009).

	Metro-Adelaide	Country Towns	Irrigation
Jun	4.9	5.6	2.4
Jul	5.7	6.0	2.0
Aug	8.2	6.6	3.8
Sep	11.6	8.0	6.0
Oct	14.9	10.9	10.0
Nov	16.6	13.3	13.5
Dec	21.6	18.6	21.5
Jan	26.1	25.0	32.1
Feb	30.5	29.2	37.8
Mar	40.5	40.3	49.4
Apr	52.4	54.4	60.9
May	100.0	100.0	100.0

When determining the monthly use by these three classes of entitlements, the outstanding balance is multiplied by the percentages in Table 2. Note that 'The Rest' includes Irrigation, TLM, Stock and Domestic, Industrial and Riparian.

The water supplied at the Border to meet dilution and loss is included in the use for the year to date that is added to the available resource that is applied to the ARA table.

3.8 Interstate Trade Adjustments

3.8.1 Permanent Interstate Trade

There is permanent trade into South Australia from the Goulburn, NSW Murray and Victorian Murray systems. In each selling system, a trade account is credited when water is allocated to the sold entitlements. The trade accounts are debited when traded water is delivered at the SA border. This delivery occurs in the same monthly pattern as the September – April diversion entitlement at Clause 88(a) of the Agreement. As a fraction of the outstanding trade balance, the monthly delivery fractions are listed in Table 3.

Table 3 Fraction of the remaining trade balance that is supplied to SA each month

Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
0	0	0	0.079	0.126	0.156	0.241	0.318	0.399	0.624	1.000	0

3.8.2 Temporary Trade

Temporary trade is incorporated into the SMM through a plugin, MDBARasTriggers, developed by the MDBA and implemented as a trigger in the Resource Assessment phase of the model process. Documentation of the trigger is provided at the following link:

https://wiki.ewater.org.au/display/SC/MDBA+Ras+triggers

Water users are selected to trade in the temporary trade plugin based upon the eligibility of their held entitlements to be traded. Information on Murray Darling Basin water trade can be found at (https://www.mdba.gov.au/managing-water/water-markets-trade/water-markets-product-information).

The Temporary Trade plugin executes at the Resource Assessment Triggers phase of each model timestep. For the set of selected water users, there are various rounds of temporary trade, which occur in sequence each day:

1) *Intrastate temporary trade,* in which NSW, Victoria and South Australia each conduct temporary trade within state boundaries.
2) *Trade within the Lower Darling and, separately, trade among all other water users.* These trades can occur at all times, irrespective of Menindee Lakes control.
3) *Trade among all configured water users in the model, regardless of location.* This round of temporary trade only occurs if the Menindee Lakes storage is under MDBA control.

Water entitlements held by environmental water holders are not assumed to be traded. In the South Australian Murray the following water users are configured to trade:

- Riverlands,
- LMRIA,
- Angas Bremmer, and
- Lower Lakes.

Each day, the SA order at the border is adjusted by the net temporary trade into South Australia. In the BDL and WRP configurations, the South Australian irrigation nodes use regression equations for the water demand, scaled up to the AOP and Lower Murray Swamps Cap limits. Therefore, allocation trade out of South Australia is turned off. This is accomplished within the MDBARasTriggers plugin by detecting a Time Series Demand type, and then checking a function value in the model to read the customised daily trade volume for a given irrigation water user. This function is configured to prevent outward trade, but to seek inward trade if the irrigator's account volume is insufficient for the next two days' unrestricted demand. The CUR scenario uses crop models rather than regression equations to generate a water demand. In the CUR scenario, the MDBARasTriggers plugin uses the generic representaton allowing the South Australian irrigators to conduct both inward and outward allocation trade.

3.9 Minimum Reserve

The Minimum Reserve is effectively part of South Australian share that is held in reserve by the upper States on South Australia's behalf. The Minimum Reserve is equal to the SA Share of the available water (see section 3.6) less the SA Diversion Entitlement until 31 May.

3.10 South Australian Allocation Priorities (ARA Table)

SMM uses an Available Resources Versus Allocation (ARA) table to assign the priorities for allocating the available water to the different classes of users, flows and reserves. Each column in this table corresponds to a class of user, a flow or a reserve. Each column has an entitlement which may either be the issued entitlement or a function. Each row in the table relates to a change point in the allocation priorities and typically holds user-defined % allocations made to each of the columns at that change point.

Whenever a resource assessment is made, each row is processed to determine the resources it requires, the rows are sorted in ascending order of required resource and the % allocations for each column are interpolated in accordance with the available resource applied to the table.

In the model, one table is used to represent the BDL and WRP allocation frameworks. This is accomplished with functions to specify the ARA table entries for the Metro Adelaide, Country Town and Irrigation entitlement types. At the start of a BDL or WRP simulation, these functions are set to the values specified in the corresponding input set. For reference, we list the BDL scenario's ARA table as percentages in Table 4 and volumes in Table 5, while the WRP scenario's ARA table is represented as percentages in Table 6 and volumes in Table 7. More description of the rows and columns used in the table is given below. Note that the CHWN Reserve is not allocated to in the BDL scenario while the WRP scenario includes a nominal entitlement of 0.1 GL for allocations made under Section 128 of the Natural Resources Management Act 2004.

Table 4 ARA Table of percentage allocation for the BDL scenario.

Water Available (GL)	Loss (%)	Dilution (%)	Metro Adelaide (%)	Country Town (%)	S&D IR(%)	All Other Purposes (%)	Unallocated Entitlement (%)	IVT Out (%)
0	0	0	0	0	0	0	0	0
348	100	0	0	0	0	0	0	0
683.4	100	96.38	0	0	0	0	0	0
696	100	96.38	0	0	0	2	0	0
897	100	96.38	69.77	62	100	2	0	0
909.6	100	100	69.77	62	100	2	0	0
909.7	100	100	69.77	62	100	2	0	2
1290	100	100	69.77	62	100	62	0	62
1549.9	100	100	69.77	100	100	100	0	100
1614.9	100	100	100	100	100	100	0	100
1889.9	100	100	100	100	100	100	100	100

Table 5 ARA Table of allocation volume in Gigalitres for the BDL scenario.

Water Available (GL)	Loss (GL)	Dilution (GL)	Metro Adelaide (GL)	Country Town (GL)	S&D IR(GL)	All Other Purposes (GL)	Unallocated Entitlement (GL)	IVT Out (GL)
0	0	0	0	0	0	0	0	0
348	348	0	0	0	0	0	0	0
683.4	348	335.4	0	0	0	0	0	0
696	348	335.4	0	0	0	12.6	0	0
897	348	335.4	150	31	20	12.6	0	0
909.6	348	348	150	31	20	12.6	0	0
909.7	348	348	150	31	20	12.6	0	0.1
1290	348	348	150	31	20	390.6	0	2.4
1549.9	348	348	150	50	20	630.041	0	3.9
1614.9	348	348	215	50	20	630.041	0	3.9
1889.9	348	348	215	50	20	630.041	275	3.9

Table 6 ARA Table of percentage allocation for the WRP scenario.

Water Available (GL) *	Loss (%)	Dilution (%)	Metro Adelaide (%)	Country Town (%)	S&D IR(%)	S128 auth. (%)	All Other Purposes (%)	Unallocated Entitlement (%)	IVT Out (%)
0.0	0	0	0	0	0	0	0	0	0
348.0	100	0	0	0	0	0	0	0	0
683.4	100	96.38	0	0	0	0	0	0	0
696.0	100	96.38	0	0	0	0	2	0	0
850.0	100	96.38	46.5	68	100	0	2	0	0
862.6	100	100	46.5	68	100	0	2	0	0
862.8	100	100	46.5	68	100	100	2	0	2
1281.2	100	100	46.5	68	100	100	68	0	68
1500	100	100	46.5	100	100	100	100	0	100
1615	100	100	100	100	100	100	100	0	100
1889.9	100	100	100	100	100	100	100	100	100

Table 7 ARA Table of allocation volume in Gigalitres for the WRP scenario.

Water Available (GL)	Loss (GL)	Dilution (GL)	Metro Adelaide (GL)	Country Town (GL)	S&D IR(GL)	S128 auth. (GL)	All Other Purposes (GL)	Unallocated Entitlement (GL)	IVT Out (GL)
0.0	0	0	0	0	0	0	0	0	0
348.0	348	0	0	0	0	0	0	0	0
683.4	348	335.4	0	0	0	0	0	0	0
696.0	348	335.4	0	0	0	0	12.6	0	0
850.0	348	335.4	100	34	20	0	12.6	0	0
862.6	348	348	100	34	20	0	12.6	0	0
862.8	348	348	100	34	20	0.1	12.6	0	0.1
1281.2	348	348	100	34	20	0.1	428.4	0	2.6
1500	348	348	100	50	20	0.1	630.05	0	3.9
1615	348	348	215	50	20	0.1	630.05	0	3.9
1889.9	348	348	215	50	20	0.1	630.05	274.853	3.9

3.11 Losses

The first priority is to meet losses. The entitlement for losses is set to 348,000 ML. This corresponds to a nominal loss of 29,000 ML/month. The accepted pattern of actual losses is shown in Table 8.

Table 8 Accepted Pattern of Losses Between SA Border and Wellington (ML/month)

Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
4372	9398	15310	22270	33800	49430	54350	53150	42660	33800	19180	10280

3.12 Dilution Flow

The South Australian water entitlement nominally allocated to dilution is 348,000 ML, corresponding to a flow of 29,000 ML/month. Once the Loss entitlement has been allocated, the Dilution entitlement is nominally allocated, except that 12,600 ML is used to allocate 2 % of the All-Other Purposes and Lower Murray Swamps entitlements.

3.13 Critical Human Water Needs

The third priority is to supply CHWN. In the BDL scenario, the CHWN for SA has been set at 201,000 ML/year. This comprises 150,000 ML for the Metro Adelaide account type, 31,000 ML for the SA Country Towns account type and 20,000 ML for Stock and Domestic, Industrial and Riparian account type. In the WRP and Current scenarios, the CHWN requirement for SA is 204,000 ML, with the SA Country Towns component being 34,000 ML, and the Metro Adelaide account type being 150,000 ML. The WRP scenario restricts Metro Adelaide allocation to 100,000 ML until the Irrigation and Country Towns account types reach full allocation. If the expected maximum full-year Metro Adelaide demand exceeds current-year allocation, the CHWN component of SA Storage will be used to boost allocation (see Section 4 below).

3.14 Other Entitlements

The last four rows of the ARA Table (Table 4 and Table 5 for BDL, or Table 6 and Table 7 for WRP) define the process for increasing the allocation for other entitlements:

- Starting at CHWN + Conveyance the next improvements go to increasing All-Other Purposes Allocations to 62% for the BDL scenario, or 68 % for the WRP scenario,
- Next, All-Other Purposes and Country Towns increase to 100% allocation,
- Next the Metro Adelaide allocation increases to 100 %,
- Finally, Residual Dilution Flow allocations increase from 0 to 100 %.

4 South Australian Storage Right

The WRP configuration includes the capacity for South Australia to defer entitlement flow for CHWN and Private Carryover, as per Clause 91 and Schedule G of the Murray-Darling Basin Agreement. The principles of Schedule G govern the movement of SA Storage water to upstream storages, the incremental net evaporative loss at each storage, and the impact of SA Storage water on upper state internal spills. In addition, Schedule G refers to a Deferred Water Storage and Delivery Plan, by which South Australia is to set out an annual plan for its use of SA Storage Right. The SMM model's assumptions on planned use of SA Storage Right follow the Storage Right assumptions of MSM, which were revised during a 2017 consultancy commissioned by the South Australian Department for Environment and Water (SA DEW), and which underpin the Department's current Water Allocation Plan for the River Murray Prescribed Water Course. The SA DEW advises that private carryover functionality will not be utilized until environmental water is explicitly represented in the model. Therefore, private carryover is not discussed further here.

At the start of each month from August to May inclusive, the model forecasts a maximum annual usage of the Metropolitan Adelaide allocation, based on year-to-date usage. Any surplus allocation is deferred in the same monthly pattern as the Metropolitan Adelaide use from Table 2, and stored in Lake Victoria, subject to airspace and a cap of 306,000 ML on the CHWN component of SA Storage across the four major storages. There is a corresponding reduction in the monthly order at the SA Border. In dry years, when the forecast Metropolitan Adelaide annual usage exceeds current-year allocation, the CHWN component of SA Storage is used to increase the effective Metropolitan Adelaide allocation to a maximum of 150 GL.

At each of the major storages (Dartmouth Dam, Hume Dam, Menindee Lakes and Lake Victoria), the model keeps account of the total SA Storage volume. At the end of each month, any SA Storage volume in a downstream storage may be virtually and instantaneously transferred to an upstream storage, to the extent that the volume of non-deferred water in the downstream storage remains below the end-of-month target for bulk transfers. Thus, deferred water is first stored in Lake Victoria, but may be transferred upstream to Menindee Lakes, Hume Dam and Dartmouth Dam. In Menindee Lakes the SA Storage volume is capped at that volume above the reserve of 480 GL. As the storage draws down, surplus SA Storage volume is transferred to Lake Victoria.

At each storage, the following accounting principles are followed, in accordance with Schedule G of *The Agreement:*

- *Net Evaporation of SA Storage volume is calculated as the difference between the net evaporation with the deferred water in storage and the net evaporation without the deferred water in the storage;*
- *Internal spill between the upper states is calculated by ignoring any deferred volume;*
- *Any deferred volume in Menindee Lakes is ignored when calculating additional dilution flow (Section 5.3).*
- *During a storage spill or pre-release, the SA Storage volume spills before any upper state accounts.*

5 Ordering the Flow to South Australia

5.1 Basic Ordered Flow to SA

The Agreement provides for South Australia to receive its Dilution and Loss Entitlement of 58,000 ML/month plus its Diversion Entitlement as specified in paragraph 88(a) of the *Agreement*. Subclause 128(1) of the *Agreement* allows for the Diversion Entitlement for the rest of the season to be restricted and subclause 128(2) gives South Australia the right to decide when to deliver the restricted entitlement for the rest of the year provided that the diversion entitlement delivered in any month does not exceed the monthly value specified in paragraph 88(a).

The simplest method for distributing a restricted allocation over the year is to scale down all the monthly entitlements in paragraph 88(a) by the same factor. The monthly flow calculated by this method is given by equation 1.

Basic Ordered Flow to SA = 58,000 ML/month + DEA % of the monthly diversion entitlement +

Monthly Trade adjustment (See Section 4.8) {1}

Where:

DEA is the percentage of the SA diversion entitlement that can be supplied before May 31, and

The monthly diversion entitlements are specified in Clause 88(a) of the *Agreement*.

During the recent drought, when diversion entitlement allocations were very low, it was realised that the flows derived using Equation 1 did not well match the pattern of diversions and losses that were expected and that a more sensible pattern could be derived. An alternative pattern is given by Equation 2.

Basic Ordered Flow to SA = Monthly Loss Allowance (Table 8) +

*Remaining Metro Adelaide Balance * Assumed MS Monthly Use % +*

*Remaining Country Towns Balance * Assumed CT Monthly Use % +*

(Stock & Domestic, etc Allocation + 'Other' Allocation –

*'The Rest' use for Year to Date) * Assumed 'The Rest' Monthly Use % +*

*29,000 ML/month * Min (100%, Dilution Flow % Allocation from ARA Table)* *{2}*

The assumed monthly use percentages are presented in Table 2. The monthly trade adjustment is not included in Equation 2 since it was added to the total resource and is already included in the user balances.

Equation 2 will not supply all the water allocated to SA when there is unallocated entitlement flow. In this case, a transition between equations 2 and 1 can be made using the ordered flow specified in equation 3.

Basic Ordered Flow to SA = Equation 2 Flow + Max (0, Equation 1–Equation 2 Flow for month) /

$$\sum^{May}_{i=1} Max\ (0,\ Equation\ 1\ –Equation\ 2\ Flow\ for\ month\ i) \qquad \{3\}$$

In the SMM implementation:

- Basic Ordered Flow to SA = Equation 1 *when the % Allocation for other entitlements > 81%*
- Basic Ordered Flow to SA = Equation 2 *when the % Allocation for other entitlements < 82% and the % allocation from the ARA Table is <= 100%,* and
- Basic Ordered Flow to SA = Equation 3 *at other times*.

A plugin demand model has been built to represent the SA Order. This allows the order to be varied on a daily basis, which is required for the daily model of the Murray and Lower Darling System.

With SA Storage in place, as in the WRP scenario, the monthly order is built from the individual entitlements as per Equation (2), with adjustments to the Metro Adelaide allocation to account for deferral to, or callout from, SA Storage.

5.2 Adjustment to the Ordered Flow for environmental water recovered within SA

Under both TLM and the Basin Plan, SA retail entitlements have been purchased for the environment. If the water allocated to these entitlements is to be delivered at the times that the environment requires, it is necessary to cut back on the deliveries to SA at other times.

The SMM maintains an environmental account and credits it with the water allocated to SA environmental entitlements. In any month the cutback in the Ordered Flow to SA is set to the allocation to that account multiplied by the trade adjustment percentages presented in Table 3.

5.3 Additional Dilution Flow

According to rules agreed by the Murray-Darling Basin Commission in 1986 and 1989, when the storage in Menindee Lakes exceeds specified triggers, the Ordered Flow to SA is increased by 3,000 ML/d. The Additional Dilution Flow is calculated in the SMM and this volume is added to the Ordered Flow to SA.

5.4 Environmental Water Deliveries

The Living Murray Environmental water can affect the Ordered Flow to SA through deliveries for Chowilla and the Lower Lakes, Coorong and Murray Mouth. These deliveries are added to the Ordered Flow to SA. The method for calculating these orders are detailed in Attachment E to MDBA (Technical Report 2018/16.

5.5 Ordered Flow to SA

The Ordered Flow to SA = *Basic Ordered Flow to SA (Section 5.1)*

– Environmental Cutback (Section 5.2)

+ Additional Dilution Flow (Section 5.3)

+ TLM Environmental water deliveries (Section 5.4)

+ Trade adjustments (Section 3.8)

6 SA Environmental Entitlements

The SMM implementation maintains an available water balance for the SA TLM environmental entitlements. This is maintained by the generic Source code for the July to June water year. Water is allocated to the account by the ARA table process. The callout of SA TLM environmental water from this account is determined by an environmental flow node, which simulates environmental demands at Chowilla Floodplain and the Lower Lakes. In addition, surplus flow from unused upstream icon sites is occasionally captured in Lake Victoria and credited to the SA TLM Environmental Account. These credits are added to the environmental balance using an ‘adjustment’ trigger in the Resource Assessment.

References

MBDA (2018) Modelling environmental flows in the Source Murray Model, Technical Report 2018/16, Attachment E, May 2018.

MBDA (2009) Modelling South Australia's allocations and critical human water needs reserve, Technical Report 2009/12