

450 GL 'upwater'

What it means for consumptive water in the Southern Connected Basin

NSW Irrigators' Council

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OVERVIEW

Introduction

This Report has been developed in response to claims that recovery of the additional 450 GL (gigalitres) from farmers under the Murray-Darling Basin Plan will have small or insignificant socioeconomic and water market impacts. The findings of this Report strongly contest that view.

This Report provides critical statistics illustrating the impact of recovering another 450 GL as a proportion of the remaining consumptive water in the Basin's southern connected river systems.

NSWIC does <u>not</u> support recovery of more water, including the 450 GL, from the remaining consumptive water pool available to grow food and fibre. This analysis is intended to ensure the industry, Basin communities and governments understand the potential risks and impacts of recovering more water, to inform decision-making.

The ultimate objective of this Report is to make a case to change course from a simplistic focus on volumetric water recovery to delivering on the Basin Plan's intent, that is, healthier, more resilient river systems without compounding adverse socio-economic and market impacts.



Background

The Basin Plan seeks to recover an annual average yield of 2,680 GL (gigalitres) in entitlement equivalents for the environment by 2024. This water is in addition to the annual average 18,600 GL that was not diverted or intercepted in the Plan's 2009 baseline. To date under the Plan, 2106 GL has been recovered¹, effectively dropping irrigation, town and industry's share of inflows from 35% to 28%.²

The Plan includes the Sustainable Diversion Limit Adjustment Mechanism (SDLAM) which allows for up to 650 GL in 'supply measures', or 'downwater', to achieve equivalent or better outcomes without recovering that water from farmers. The SDLAM also allows for an extra 450 GL above the 2680 GL target through 'efficiency measures', or 'upwater', for enhanced outcomes in South Australia.

This report focuses on the impacts of recovering another 450 GL from the remaining consumptive pool in the southern connected Basin systems. It does not consider any or all of the 450 GL being recovered from the northern Basin, as the 2012 modelling to achieve enhanced environmental outcomes and costings assumes the 450 GL would be recovered through a portfolio of southern Basin entitlements.³

Efficiency measures are specified in the Basin Plan as activities that change water use practices to save water. They involve the transfer of water entitlements equivalent to the savings to the environment. Projects might include:

- Upgrading irrigation systems.
- Lining water delivery channels.
- Productivity gains leading to less water being used.
- Changes in water management practices.



The Water for Environment Special Account (WESA) was allocated \$1.575 billion over 10 years for efficiency measures. Efficiency programs so far have fallen into one of two categories:

- 1. On-Farm Programs implementing water saving efficiency projects on-farm.
- 2. Off-Farm Programs improving efficiency of water delivery to farms via irrigation networks.

So far, only 4 GL of the proposed 450 GL has been recovered through efficiency measures.⁴ The first WESA report published in 2020 found the volume recovered through efficiency measures will be well short of 450 GL by 2024. The report attributes this to the impact of time constraints, current social views, government policies and political positions; and the current program's unattractiveness to participants.⁵

¹ Progress on Murray-Darling Basin water recovery - DCCEEW

² <u>1111-BPKId-water-resource-assessments-development-baseline.pdf (mdba.gov.au); 26 November</u> Sustainable Diversion Limit (SDL)s as at 1 ~ surface water.XLSX (mdba.gov.au)

³ Inquiry report - Murray-Darling Basin Plan: Five-year assessment (pc.gov.au) [p22, p40

⁴ House of Representatives 2022 07 28.pdf;fileType=application/pdf (aph.gov.au) [p49]

⁵ First Review of the Water for the Environment Special Account (awe.gov.au) [p17]

Key Findings Snapshot

Recovering the additional 450 GL (gigalitres) is the equivalent of:

10%

of the remaining total consumptive water (LTDLE) in the Southern Connected Systems



of the remaining HS/HRWS consumptive water (LTDLE) in the Southern Connected Systems

32%

of the remaining total consumptive water (LTDLE) in the Murray, below the Choke. 39.6%

of the remaining HS/HRWS consumptive water (LTDLE) in the Murray, below the Choke.

Recovering the NSW share of the additional 450 GL is the equivalent of:

10%

of the remaining total consumptive water (LTDLE) in the <u>NSW</u> Southern Connected Systems; or

14%

below the Choke

44%

of the remaining HS consumptive water (LTDLE) in the <u>NSW</u> Southern Connected Systems; or

45%

below the Choke

Overall

Recovering the additional 450 GL is the equivalent of:

- **10.27%** of the Long-Term Diversion Limit Equivalent (LTDLE) of total remaining entitlement in the consumptive pool across the southern connected systems; or
- **19.16%** of the LTDLE of High Security/High Reliability Water Share (HS/HRWS) entitlement across the southern connected systems.

New South Wales

Recovering the NSW share (212.4 GL) of the additional 450 GL is the equivalent of recovering:

- **9.9%** of total consumptive water in the NSW southern valleys, or **14.3%** of total consumptive water in the NSW southern valleys below the Barmah Choke; or
- **43.9%** of total HS consumptive water in the NSW southern valleys, or **45.4%** of total HS consumptive water in the NSW southern valleys below the Barmah Choke;

Under a Murray-only scenario, recovering the NSW share is the equivalent of recovering:

- **21.8%** of total consumptive water in the NSW Murray, or **69.7%** of total consumptive water in the NSW Murray below the Barmah Choke;
- **147.72%** of HS consumptive water in the NSW Murray, or **166.2%** of HS consumptive water in the NSW Murray below the Barmah Choke.

Victoria

Recovering the Victorian share (197.1 GL) of the additional 450 GL is the equivalent of recovering:

- **10.5%** of total consumptive water in the Victorian southern Basin valleys, or **12.2%** of total consumptive water in the VIC southern Basin valleys below the Barmah Choke; or
- **13.1%** of total HRWS consumptive water in the Victorian southern Basin valleys, or **15%** of total HRWS consumptive water in the Victorian Basin valleys below the Barmah Choke.

Under a Murray-only scenario, recovering the Victorian share is the equivalent of recovering:

- **19.8%** of total consumptive water in the VIC Murray, or **26.7%** of total consumptive water in the VIC Murray below the Barmah Choke; or
- 23.2% of total HRWS consumptive water in the Victorian Murray, or 30.2% of total HRWS consumptive water in the VIC Murray below the Choke.

South Australia

Recovering the SA share (38.25 GL) of the additional 450 GL is the equivalent of recovering:

• **10.8%** of the total remaining consumptive water in the SA Murray.

EXECUTIVE SUMMARY

The findings of this Report show that recovery of the additional 450 GL (gigalitres) represents a very large proportion of the remaining water in the consumptive pool in the southern connected systems. Whether the water is recovered through on-farm efficiency programs or buybacks, the reduction in the consumptive pool is the same as both recovery methods involve transferring existing entitlements across to the environment.

Recovery of this water will therefore have significant socio-economic and water market impacts.

Current Basin Plan recovery (2106.4 GL, including 1702 GL in the southern connected systems)⁶, has already increased allocation trade prices in the southern Basin. A 2020 ABARES study found both direct buybacks and on-farm infrastructure programs had added about \$72/ML to allocation prices⁷.

In another study, ABARES forecast that allocation prices to be above \$200/ML in three out of 10 years with current water recovery, but this jumps to eight out of 10 years if another 450 GL is recovered.⁸ This means impacts go beyond program participants, to all water users.

Further, many practical implementation barriers make the 450 GL unworkable in practice, including:

- Constraints (physical, regulatory, legal and environmental) must be relaxed in order for the additional water to reach intended environmental sites. Constraints include negotiating voluntary flood easements with more than 4000 landholders in NSW alone; constraints are not forecast to be relaxed by 2024: in fact, landholder negotiations have barely commenced.
- The incentive for water-holders to participate in efficiency projects is low if not non-existent under current programs.
- Even if water-holders were inclined to participate, current funding is grossly insufficient.

Additionally, the most recent statutory five-yearly review of the Murray-Darling Basin Plan⁹ found:

"Recovering water through efficiency measures has become increasingly divorced from the environmental outcomes it is meant to achieve. The current focus of the program is on meeting the legislated target of recovering an additional 450 GL by 2024. There is little evidence that it has been designed to recover water in the places needed to effectively achieve the enhanced environmental outcomes."

⁶ Progress on Murray-Darling Basin water recovery - DCCEEW

⁷ https://www.agriculture.gov.au/abares/products/insights/economic-effects-of-water-recovery-in-murray-darlingbasin

⁸ https://www.agriculture.gov.au/abares/research-topics/water/future-scenarios-smdb-independent-assessment-social-economic-conditions

⁹ Murray-Darling Basin Plan: Five-year assessment - Public inquiry - Productivity Commission (pc.gov.au)

RECOMMENDATIONS



- 1. Re-invest the allocated funding for the 450 GL to practical on-ground measures (complementary measures) to improve environmental outcomes through habitat restoration, feral species control/eradication, native species breeding, and pollution management.
- 2. MDBA to prepare a report for the Minister for Water, and Murray-Darling Basin Ministerial Council, with advice on the 450 GL as a proportion of the remaining consumptive pool, to ensure its actual extent and potential impacts are understood.
- 3. MDBA to prepare a report for the Minister for Water, and Ministerial Council, with advice on the environmental outcomes being achieved in the Lower Lakes, Coorong and Murray Mouth.
- 4. MDBA to prepare a report for the Minister for Water, and Ministerial Council, with advice on the practical implementation challenges of progressing the 450 GL.
- 5. MDBA to prepare a report for the Minister for Water and Ministerial Council on alternate ways to achieve the intended environmental outcomes of the 450 GL.

PART 1) BREAKING-DOWN THE 450

This section is written in two parts:

- (1) Quantifying the 450 GL (gigalitres) as a proportion of the remaining consumptive pool, including:
 - a. overall
 - b. by above & below the Barmah Choke
 - c. by apportionment of share to Basin states
- (2) Understanding the market impacts of the 450 GL

Key Assumptions

Policy decisions are required to better understand the nature and distribution of potential impacts. For example:

- Will recovery of the additional 450 GL only be from below the Barmah Choke, to overcome river channel capacity constraints and therefore be deliverable to South Australia?
- Will trade rules be respected, such as the IVT limit of 100 GL in the Murrumbidgee and the 400 GL trade limit in the Goulburn?
- What ratio of high and lower reliability entitlements will be sought? Will recovery prioritise high reliability/security entitlements, as the Basin Plan's objectives in South Australia are largely focused on drier periods when low reliability entitlements would not have significant allocation?
- Will recovery be apportioned to Basin states according to existing practice, as outlined in the *Water Recovery Strategy for the Murray-Darling Basin June 2014*?
- Will recovery be targeted strategically to maximise intended environmental objectives?

With many such policy questions unresolved, this report will provide a range of scenarios.

1) Quantifying the 450 GL as a proportion of remaining consumptive pool

<u>LTDLE</u>

The 450 GL is a lot more than 450 GL.

The 450 GL is measured in terms of "*the long-term average quantity of water, in GL per year, that is available under the efficiency entitlements for the unit from time to time*". This means that it is <u>not</u> 450 GL of *entitlements*, but an annual average 450 GL of *actual water*.

To calculate this, Long-Term Diversion Limit Equivalent Factors (LTDLE) are used. This is outlined in the Basin Plan at 7.16 - "*the Authority will use long-term diversion limit equivalent factors to convert water access entitlements into a common unit for the purpose of the determinations*".

The LTDLE method is needed to enable the more than 150 different classes of water entitlements in the Murray-Darling Basin to be compared and considered on equal terms.

The LTDLE factors essentially describe the percentage of entitlement volume allocated on average each year. This is also called 'reliability'. In practice, owners of lower security entitlements such NSW General Security (GS) and Low Reliability Water Shares (LRWS) in Victoria, are only allocated 100% of entitlement volume in wetter years.

The data sources for the LTDLE factors used in this report are below.¹⁰

Remaining Water

Of the water on entitlement (noting not all water is on entitlement) - a portion has already been transferred to environmental water holders (both State and Commonwealth). This equals 29% of the LTDLE volume of water entitlements, based on the below data. Therefore, this Report will focus on the remaining 71% of water on entitlements, which is primarily (but not only) used for irrigation.

Table 1 shows the total volume on issue in different entitlement types, and their LTDLE factors as a percentage. Table 1 shows for each type of water entitlement (column 1):

- The LTDLE Factor (column 2).
- The ML of total entitlement on issue for that zone (column 3).
- The LTDLE factor of total entitlement on issue for that zone (column 4).
- The ML amount of the total entitlement still within the consumptive pool (column 5).
- The LTDLE factor of entitlement remaining in the consumptive pool (column 6).
- The total entitlement already recovered for the environment under the Basin Plan and earlier programs such as The Living Murray (HEW, or Held Environmental Water, column 7).
- The LTDLE factor of the HEW (column 8).

The water entitlement acronyms are as follows:

- HRWS: High Reliability Water Share (Victoria)
- LRWS: Low Reliability Water Share (Victoria)
- HS: High Security (NSW and SA)
- GS: General Security (NSW)

¹⁰ NSW: <u>https://www.industry.nsw.gov.au/</u><u>data/assets/pdf_file/0019/162181/techncial-paper-derivation-technical-factors-nsw.pdf</u>

Victoria: <u>https://www.water.vic.gov.au/mdb/achievements-murray-darling-basin-plan/ltdle</u> South Australia: <u>https://cdn.environment.sa.gov.au/environment/docs/fact-sheet-ltdle-factors.pdf</u>

Table 1: Water on Entitlement in the Southern Connected Systems (data sources, see below).

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
	LTDLE Factor %	Total Entitlements on Issue (ML)	Total Entitlements on Issue (LTDLE)	Total Consumptive (ML)	Total Consumptive Entitlement (LTDLE)	Total HEW (ML)	Total HEW (LTDLE)
Murrumbidgee HS	0.977	382,516	373,718	368,336	359,864.272	14,180	13,854
Murrumbidgee GS	0.591	1,891,995	1,118,169	1,489,093	880,053.963	402,902	238,115
NSW Murray HS	0.873	192,947	168,443	163,705	142,914.465	29,242	25,528
NSW Murray GS	0.699	1,674,096	1,170,193	1,169,741	817,648.959	504,355	352,544
Campaspe HRWS	0.95	27,402	26,032	0	0	27,402	26,032
Campaspe LRWS	0.571	19,175	10,949	10,766	6,147.386	8409	4,802
Goulburn-Broken HRWS	0.967	1,068,888	1,033,615	674,362	652,108.054	394,526	381,507
Goulburn-Broken LRWS	0.583	469,083	273,475	245,992	143,413.336	223,091	130,062
Loddon HRWS	0.624	21,391	13,348	17,565	10,960.56	3,826	2,387
Loddon LRWS	0.05	8,079	404	7,552	377.6	527	26
Vic Murray HRWS	0.974	1,244,789	1,212,424	855,491	833,248.234	389,298	379,176
Vic Murray LRWS	0.543	311,607	169,203	269,771	146,485.653	41,836	22,717
SA Murray HS	0.882	607,898	536,166	394,171	347,658.822	213,727	188,507
Totals (LRWS/GS & HRWS/HS)		7,919,866	6,106,139	5,666,545	4,340,881.3	2,253,321	1,765,257
Total (HS/HRWS only)		3,545,831	3,363,746	2,473,630	2,346,754.41	1,072,201	1,016,991

Data Sources:

* Murray-Darling Basin Authority (2021) 'Water Markets Product Information' < https://www.mdba.gov.au/managing-water/water-markets-trade/water-markets-product-information

* Australian Government, Department of Climate Change, Energy, the Environment and Water (2022) 'Environmental water holdings' < https://www.dcceew.gov.au/water/cewo/about/water-holdings>

* NSW Government, Department of Planning, Industry & Environment - Water (2022) 'Current water holdings' < <u>https://www.environment.nsw.gov.au/topics/water/water-for-the-environment/about-water-for-the-environment/current-water-holdings</u>>

*Victorian Government, Victorian Environmental Water Holder (2020) 'How much water is available to use for environmental watering?' < <u>https://vewh.vic.gov.au/watering-program/how-much-water-is-available</u>>.

* Government of South Australian, Department for Environment and Water (2022) 'Water for the environment' < <u>https://www.environment.sa.gov.au/topics/river-murray/improving-river-health/environmental-water</u>>.

Table 1 shows the LTDLE of total entitlement remaining in the consumptive pool across the zones to be 4,363,174 ML of which 2,369,047 ML (54%) is HS/HRWS.

This can then be considered in the context of the 450 GL (i.e. 450,000 ML).

- 450,000 / 4,363,174 = **10.31%** of the LTDLE of total entitlement remaining in the consumptive pool across the zones;
- 450,000 / 2,369,047 = **18.99%** of the LTDLE of HS/HRWS entitlement remaining in the consumptive pool across the zones

Break-down (i) By Above & Below the Barmah Choke

The Barmah Choke, which runs through the Barmah-Millewa Forest, is the narrowest section of the Murray River with an estimated in-channel capacity of 7,000 ML per day. The narrowness presents river managers with significant limitations in delivering water downstream, particularly given it is downstream of Hume Dam.¹¹

The Choke has led to trade restrictions from areas upstream to downstream. Trade downstream can only occur when there is sufficient matching trade capacity available in the opposite direction, called 'back trade'. This is to avoid delivery of water downstream exceeding the Choke's in-channel capacity.

The Choke is relevant to consideration of the 450 GL as it presents a significant limitation on the ability to deliver water to meet downstream demand, particularly to meet the Basin Plan's environmental objectives in South Australia.

Whilst no policy decision has been made to-date, it is generally assumed that recovery would need to come from below the Choke to overcome these limitations, and in order to meet objectives. In the absence of a policy decision, this Report will proceed by looking at a range of scenarios for both below and above Choke.

This report also considers the impact if recovery of the 450 GL is from the Murray only. While the Murrumbidgee and Goulburn rivers both enter the Murray below the Choke, Inter-valley Trade (IVT) restrictions on both tributaries may limit the ability to deliver the water downstream if any of the 450 GL is recovered in these two valleys.

Table 2 presents similar data to Table 1, sorted into above or below Choke, based on trade zone. For background, trade zones are displayed in Figure 1 below.

¹¹ <u>https://www.mdba.gov.au/water-management/water-markets-trade/barmah-choke</u>

Figure 1: Interstate Trading Zones¹²



¹² <u>https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade</u>

Table 2: Water on Entitlement in the Southern Connected Systems, sorted as above or below Choke, based on trade zone (data source - Aither*).

	LTDLE Factor %	Total Entitlements on Issue (ML)	Total Entitlements on Issue (LTDLE)	Total Consumptive (ML)	Total Consumptive Entitlement (LTDLE)	Total HEW (ML)	Total HEW (LTDLE)
Above Choke							
NSW Murray trade zone 10 HS	0.873	22,811	19,914.00	18,312	15,986.38	4,499	3,927.63
NSW Murray trade zone 10 GS	0.699	1,301,236	909,563.96	936,476	654,596.72	364,760	254,967.24
Vic trade zone 6 Murray (Dart to Barmah) HRWS	0.974	320,450	312,118.30	203,161	197,878.81	117,289	114,239.49
Vic trade zone 6 Murray (Dart to Barmah) LRWS	0.543	130,679	70,958.70	112,496	61,085.33	18,183	9873.37
Below Choke							
NSW Murray trade zone 11 HS	0.873	166,894	145,698.46	146,384	127,793.23	20,510	17,905.23
NSW Murray trade zone 11 GS	0.699	372,860	260,629.14	252,947	176,809.95	119,913	83819.19
NSW Murrumbidgee trade zone 13 HS	0.977	364,279	355,900.58	348,213	340,204.10	16,066	15,696.48
NSW Murrumbidgee trade zone 13 GS	0.591	1,891,995	1,118,169.05	1,413,604	835,439.96	478,391	282,729.08
Vic trade zone 1A Greater Goulburn HRWS	0.967	983,459	951,004.85	681,304	658,820.97	302,155	292,183.89
Vic trade zone 1A Greater Goulburn LRWS	0.583	427,267	249,096.66	377,638	220,162.95	49,629	28,933.71
Vic trade zone 7 Murray (Barmah to SA) HRWS	0.974	937,737	913,355.84	669,709	652,296.56	268,028	261,059.27
Vic trade zone 7 Murray (Barmah to SA) LRWS	0.543	179,515	97,476.65	15,6125	84,775.88	23,390	12,700.77
SA Murray trade zone 12 HS	0.882	608,000	536,256.00	403,000	355,446.00	205,000	180,810.00
Totals							
Total		7,707,182	5,940,142.19	5719369	4,381,296.85	1,987,813	1,558,845.35
Total HS/HR			3,234,248.04		2,348,426.06		885,821.98
Total (Above Choke)			1,312,554.96		929,547.24		383,007.72

Total (Above Choke) - NSW		929,477.97		670,583.10		258,894.87
Total (Above Choke) - VIC		383,077.00		258,964.14		124,112.86
Total (Below Choke)	5,932,006	4,627,587.23	4,448,924	3,451,749.61	1,483,082	1,175,837.61
Total (Below Choke) - NSW		1,880,397.23		1,480,247.25		400,149.98
Total (Below Choke) - VIC		2,210,934.00		1,616,056.36		594,877.63
Total (Below Choke) - SA		536,256.00		355,446.00		180,810.00
Total (Below Choke) - Murray Only		1,953,416.09		1,397,121.63		556,294.46
Total (Below Choke) - HS/HR only				2,134,560.87		
Total (Below Choke) - NSW HS		501,599.05		467,997.33		33,601.71
Total (Below Choke) - VIC HR		1,864,360.69		1,311,117.53		553,243.16
Total (Below Choke) - SA HS		536,256.00		355,446.00		180,810.00
Total (Below Choke) - Murray Only HS/HR		1,595,310.30		1,135,535.80		459,774.50

Data Sources:

* Aither, 'Water Markets Report: 2020-21 Review and 2021-22 Outlook', *Total entitlement market size and value*, < <u>https://www.aither.com.au/wp-content/uploads/2021/08/2021-Water-Markets-Report.pdf</u>> [P 30]. Data in source based on Victorian, New South Wales and South Australian water registers, 2021.

Note: The data in this source included only 'major southern Murray-Darling Basin' entitlement areas. In the interests of data integrity / consistency, and noting this includes the vast majority of water, further entitlement areas were omitted (4a, 4c, 5a, 3, 6b, 14; these include Campaspe and Loddon valleys in Victoria). Further data in this Report is drawn from Table 2. Data from these omitted areas is shown in Table 1 (sourced separately). Data was not merged to ensure data integrity / consistency.

Table 3 takes the Total Consumptive Entitlement (LTDLE) data from Table 2, to calculate the 450 GL as a proportion of various key components. This is to show the significance of recovering an additional 450 GL from the remaining consumptive pool available to grow food and fibre.

Totals	Total Consumptive Entitlement (LTDLE)	450GL as a proportion of Total Consumptive LTDLE (%)
Total	4,381,296.85	10.27
Total HS/HRWS	2,348,426.06	19.16
Total (Above Choke)	929,547.24	
Total (Above Choke) - NSW	670,583.10	
Total (Above Choke) - VIC	258,964.14	
Total (Below Choke)	3,451,749.61	13.04
Total (Below Choke) - NSW	1,480,247.25	
Total (Below Choke) - VIC	1,616,056.36	
Total (Below Choke) - SA	355,446.00	
Total (Below Choke) - Murray Only	1,397,121.63	32.21
Total (Below Choke) - HS/HR only	2,134,560.87	21.08
Total (Below Choke) - NSW HS	467,997.33	
Total (Below Choke) - VIC HRWS	1,311,117.53	
Total (Below Choke) - SA HS	355,446.00	
Total (Below Choke) - Murray Only HS/HRWS	1,135,535.80	39.63

Table 3: Calculating the 450 GL as a proportion of Total Consumptive LTDLE across key components

From Table 3, the following findings can be drawn.

Recovering the additional 450GL is the equivalent of recovering:

- 10% of total consumptive water remaining in these Southern valleys.
- 13% of total consumptive water remaining in these Southern valleys, below the Choke.
- 32% of total consumptive water remaining in the Murray, below the Choke.
- 21% of HS/HRWS consumptive water remaining in these Southern valleys, below the Choke.
- 39.6% of HS/HRWS consumptive water remaining in the Murray, below the Choke.

To reiterate, this is not to suggest recovery strategies; rather, this is to put the additional 450 GL into perspective, to demonstrate the significance of attempting to recover another 450 GL from the remaining available water in the consumptive pool to grow food and fibre.

Break-down (ii) By State apportionment

The Basin Plan apportions the southern Basin's shared component of the SDL reductions based on each jurisdiction's share of average surface water baseline diversions (less interceptions) as per the 'Water Recovery Strategy for the Murray-Darling Basin June 2014'.13

It remains a policy question as to whether this same strategy will apply to the additional 450 GL.

Assuming this same strategy will be applied, Table 4 below shows each State's share of the 450 GL expressed as a percentage and respective GL.

State	% Apportionment	Share of 450GL (LTDLE)
NSW	47.2	212.4
Victoria	43.8	197.1
SA	8.5	38.25
ACT	0.5	2.25
TOTAL	100	450

Table 4: Apportionment of water recovery by Basin states, as applied to the 450GL

Data from Table 2 specific to each state is copied below for reference.

New South Wales

Recovery in NSW equal to 47.2% involves recovery of 212.4GL (LTDLE).

				2			
NSW Table	LTDLE Factor %	Total Entitlements on Issue (ML)	Total Entitlements on Issue (LTDLE)	Total Consumptive (ML)	Total Consumptive (LTDLE)	Total HEW (ML)	Total HEW (LTDLE)
Above Choke							
NSW Murray trade zone 10 HS	0.873	22,811	19,914.00	18,312	15,986.38	4499	3927.6
NSW Murray trade zone 10 GS	0.699	1,301,236	909,563.96	936,476	654,596.72	364,760	254,967.2

3927.63

4,967.24

Table 5: Water entitlements in NSW southern Basin valleys

¹³¹³ https://www.circleofblue.org/wp-content/uploads/2015/06/water-recovery-strategy-mdb2.pdf

Below Choke							
NSW Murray	0.873	166,894	145,698.46	146,384	127,793.23	20,510	17,905.23
trade zone 11 HS							
NSW Murray	0.699	372,860	260,629.14	252,947	176,809.95	119,913	83,819.19
trade zone 11 GS							
NSW	0.977	364,279	355,900.58	348,213	340,204.10	16,066	15,696.48
Murrumbidgee							
trade zone 13 HS							
NSW	0.591	1,891,995	1,118,169.05	1,413,604	835,439.96	478,391	282,729.08
Murrumbidgee							
trade zone 13 GS							
Total		4,120,075	2,809,875.20	3,115,936	2,150,830.35	1,004,139	659,044.85

Table 6: The NSW share of the 450GL (212.4GL) as a percentage of the remaining water available in the consumptive pool in NSW southern valleys

NSW Table	Total (LTDLE)	NSW share of the 450 (212.4GL) as a % of the LTDLE of:
Total consumptive LTDLE (GS&HS)	2,150,830.35	9.88
Total consumptive LTDLE (HS)	483,983.71	43.88
Total consumptive LTDLE (GS&HS) - below choke	1,480,247.25	14.35
Total consumptive LTDLE (HS) below choke	467,997.33	45.38
Total consumptive LTDLE (GS&HS) - Murray only	975,186.29	21.78
Total consumptive LTDLE (HS) - Murray only	143,779.61	147.73
Total consumptive LTDLE (GS&HS) - Murray only - below choke	304,603.19	69.73
Total consumptive LTDLE (HS) below choke - Murray only	127,793.23	166.21

Recovering the NSW proportion (212.4 GL) of the additional 450 GL is the equivalent of recovering:

- 9.9% of total consumptive water in the NSW southern valleys, or 14.3% of total consumptive water in the NSW southern valleys below the Choke; or
- **43.9%** of total HS consumptive water in the NSW southern valleys, or **45.4%** of total HS consumptive water in the NSW southern valleys below the Choke;

This analysis then looks at a NSW 'Murray only' recovery scenario, given the risk that intervalley trade (IVT) restrictions may curtail water being delivered from the Murrumbidgee if recovery occurs there as well. The analysis is explicitly not suggesting a way forward, but rather, understanding the severity of potential impacts if recovery was concentrated in the Murray, to make a case for alternative policy to deliver intended environmental outcomes.

Under a Murray-only scenario, recovering the NSW proportion (212.4 GL) of the additional 450 GL is the equivalent of recovering:

 21.8% of total consumptive water in the NSW Murray, or 69.7% of total consumptive water in the NSW Murray below the Choke; • **147.72%** of NSW HS consumptive water in the NSW Murray, or **166.2%** of NSW HS consumptive water in the NSW Murray below the Choke.

These findings show that recovery of the NSW portion of the 450 GL would remove a substantial proportion of water from the remaining consumptive pool, which would come with significant socioeconomic and water market impacts.

From Table 5, it can be identified that **23.5%** of total entitlements on issue (calculated as LTDLE) in the NSW southern Basin valleys are now already HEW, which is in addition to the undiverted river flows not on an entitlement (i.e. Planned Environmental Water). These findings need to be considered as a cumulative impact in addition to recovery of existing HEW.

The finding that there is simply not enough NSW HS water in the NSW Murray valley to meet the NSW share of the 450 GL, neither above or below the Choke, should be of particular note. Even when other valleys (i.e. Murrumbidgee) are factored in, recovery of this portion of HS is approaching removing half of the HS water from the NSW southern connected systems. This is a very concerning risk, which would come with severe socio-economic and water market impacts.

Victoria

Recovery in Victoria to equal 43.8% of the 450GL involves recovering 197.1GL (LTDLE).

VIC Table	LTDLE Factor %	Total Entitlements on Issue (ML)	Total Entitlements on Issue (LTDLE)	Total Consumptive (ML)	Total Consumptive Entitlement (LTDLE)	Total HEW (ML)	Total HEW (LTDLE)
Above Choke							
Vic trade zone 6 Murray (Dart to Barmah) HRWS	0.974	320,450	312,118.30	203,161	197,878.81	117,289	114,239.50
Vic trade zone 6 Murray (Dart to Barmah) LRWS	0.543	130,679	70,958.70	112,496	61,085.33	18,183	9873.37
Below Choke							
Vic trade zone 1A Greater Goulburn HRWS	0.967	983,459	951,004.85	681,304	658,820.97	302,155	292,183.90
Vic trade zone 1A Greater Goulburn LRWS	0.583	427,267	249,096.66	377,638	220,162.96	49,629	28,933.71
Vic trade zone 7 Murray (Barmah to SA) HRWS	0.974	937,737	913,355.84	669,709	652,296.57	268,028	261,059.30

Table 7: Water entitlements in Victorian southern Basin valleys

Vic trade zone 7	0.543	179,515	97,476.65	156,125	84,775.88	23,390	12,700.77
to SA) LRWS							
Totals		2,979,107	2,594,010.99	2,200,433	1,875,020.51	778,674	718,990.50

Table 8: The Victorian share of the 450GL (197.1GL) as a percentage of the remaining water available in the consumptive pool in Victoria's Murray and Goulburn valleys

Victorian Table	Total (LTDLE)	Vic share of the 450 (197.1GL) as a % of the LTDLE of:
Total consumptive LTDLE (LRWS&HRWS)	1,875,021.51	10.51
Total consumptive LTDLE (HRWS) - Total consumptive LTDLE (LRWS&HRWS)	1,508,996.35	13.06
below choke	1,616,056.38	12.19
Total consumptive LTDLE (HRWS) below choke	1,311,117.54	15.03
Total consumptive LTDLE (LRWS&HRWS) -		
Murray only	996,036.59	19.79
Total consumptive LTDLE (HRWS) - Murray only Total consumptive LTDLE (LRWS&HRWS) -	850,175.38	23.18
Murray only - below choke - Total consumptive LTDLE (HRWS) below choke	737,072.45	26.74
Murray only	652,296.57	30.22

Recovering the VIC proportion (197.1 GL) of the additional 450 GL is the equivalent of recovering:

- **10.5%** of total consumptive water in the Victorian Murray and Goulburn valleys, or **12.2%** of total consumptive water in the Victorian Murray below the Choke and the Goulburn; or
- **13.1%** of total HRWS consumptive water in the Victorian Murray and Goulburn valleys, or **15%** of total HRWS consumptive water in the Victorian Murray below the Choke and the Goulburn.

This analysis then looks at a Victorian 'Murray only' scenario, given the risk that intervalley trade (IVT) restrictions may curtail water being delivered from the Goulburn valley if recovery occurs there as well. As above, this is not suggesting a way forward, rather understanding the severity of potential impacts, given the significance of this portion of water in the context of remaining consumptive water in the Victorian Murray valley, to make a case for alternative policy.

Under a Murray-only scenario, recovering the Victorian proportion (197.1 GL) of the additional 450 GL is the equivalent of recovering:

- **19.8%** of total consumptive water in the Victorian Murray, or **26.7%** of total consumptive water in the Victorian Murray below the Choke; or
- 23.2% of total HRWS consumptive water in the Victorian Murray, or 30.2% of total HRWS consumptive water in the Victorian Murray below the Choke.

Similarly to NSW, these findings show that recovery of the Victorian share of the 450 GL would be remove a substantial proportion of water from remaining consumptive pool, which would come with significant socio-economic and water market impacts.

From Table 7, it can be identified that **28%** of total entitlements on issue (calculated as LTDLE) in the Victorian Murray and Goulburn valleys are now already HEW, which is in addition to the undiverted river flows not on an entitlement. These findings need to be considered as a cumulative impact in addition to recovery of existing HEW.

South Australia

For recovery in SA to equal 8.5% of the 450 GL, this involves recovery of 38.25GL (LTDLE).

SA Table	LTDLE Factor %	Total Entitlements on Issue (ML)	Total Entitlements on Issue (LTDLE)	Total Consumptive (ML)	Total Consumptive Entitlement (LTDLE)	Total HEW (ML)	Total HEW (LTDLE)
Above Choke							
N/A							
Below Choke							
SA Murray HS	0.882	608,000	536,256	403,000	355,446	205,000	180,810
Totals		608,000	536,256	403,000	355,446	205,000	180,810

Table 9: Water entitlements in SA Murray Basin valley.

Table 10: The SA share of the 450 GL (38.25 GL) as a percentage of the remaining water available in the consumptive pool in the SA Murray valley.

SA Table	Total (LTDLE)	SA share of the 450 (38.25GL) as a % of the LTDLE of:
Total consumptive LTDLE	35	55,446 10.76

Recovering the SA proportion (38.25 GL) of the additional 450 GL is the equivalent of recovering:

• 10.8% of the total consumptive water in the SA Murray.

This is in addition to the **33.7%** of the total entitlements on issue in the SA Murray valley that is already HEW (calculated based on LTDLE), in addition to river flows not on entitlement, and is thus a cumulative impact.

2) Understanding the market impacts of the 450 GL

Recovering an additional 450 GL from the remaining consumptive pool in the southern Basin will impact the water market, particularly temporary (annual allocation) water prices. Impacts are the result of:

- increased demand in the market (i.e from the Government being a market participant);
- increased willingness to pay in the market (i.e. given government will pay the equivalent of 175% of market value); and
- long-term decreased supply in the consumptive pool.

Prices are forecast above \$200/ML in three out of 10 years at current recovery (2106 GL, including 1702 GL in the southern Basin), but this jumps to eight out of 10 years if another 450GL is recovered.¹⁴ This means significant impacts on all water users, whether they choose to participate in the program or not.

Figure 2: Weighted water allocation price by scenario, southern Murray-Darling Basin (source: ABARES¹⁵)

To understand the market impacts of recovering the 450 GL, we analysed yearly allocation volumes and prices (\$/ML) as if an additional 450 GL had been recovered from the consumptive pool over the past decade. Figure 3 shows irrigation allocations (blue columns), current HEW allocations (dark green columns), and an additional 450 GL of HEW (light green columns). Prices (\$/ML) are shown at current recovery levels (yellow line), and under a scenario of additional 450 GL recovery (red dotted line).

The key finding from Figure 3 is that the \$/ML under a 450 GL recovery scenario (red dotted line) is significantly higher than the \$/ML under a current recovery scenario (yellow line). This impact is most stark in drier years. For example, in 2015-16, prices are modelled at \$430/ML under a 450 GL scenario, compared to \$225/ML at current recovery levels - nearly double.

¹⁴ https://www.agriculture.gov.au/abares/research-topics/water/future-scenarios-smdb-independent-assessmentsocial-economic-conditions

Figure 3: Yearly allocation volumes (Southern Murray-Darling Basin) with additional 450GL recovered from consumptive pool

Yearly allocation volumes - Southern Murray-Darling Basin - with additional 450GL recovered from consumptive pool

High reliability and general security entitlements

Blue: allocations against entitlements for productive use

Green: allocations against entitlement

Note: HEW (green bars) is in addition to PEW which makes up the bulk of environmental water (not pictured).

Part 1 Conclusions

This section of the Report - on breaking down the 450 GL - finds that recovery of the 450 GL represents a substantial share of the water remaining in the consumptive pool. The significance is identified in analysis of the overall impact, and then further broken down to analysis of above/below the Barmah Choke, and when the volume is apportioned to Basin States.

This section of the Report also identifies significant water market impacts with further upward pressure on prices under a 450 GL recovery scenario, particularly temporary water prices. This means impacts are extended beyond program participants, to all water users trading in the water market. To put it another way, it would not matter which State the water was recovered from, the water market operates across southern NSW, Victoria and South Australia, and therefore all water users across the three States would be affected by the greater scarcity and increased prices.

The actual extent and nature of impacts - if the policy is progressed - would depend on government decision-making on key aspects and assumptions. Further analysis is required to better understand potential impacts across various scenarios and assumptions - such as the relative distribution of proposed recovery within States and valleys (taking into consideration trade rules such the Intervalley Trade (IVT) limits), and distribution between entitlement types.

Ultimately, however, the significance of the findings in this analysis should call into question both the feasibility and desirability of recovering the 450 GL, compared with other measures to achieve its intended environmental outcomes. The impacts on the irrigation industry should a matter of major concern, including further curtailing the capacity to produce food and fibre for domestic and global markets and to contribute billions of dollars to local, state and national economies, and the flow-on additional adverse socio-economic impacts to Basin communities.

PART 2) MOVING FORWARD

This section is divided into two parts:

- Identification of the practical implementation barriers making the 450 GL undeliverable;
- Exploration of the Basin Plan's environmental objectives.

1) Practical implementation barriers

This section looks at the practical implementation barriers making the 450 GL undeliverable. Simply, despite the significant socio-economic and water market risks and impacts identified in Part 1, this section pragmatically looks at whether the program is even deliverable, regardless of political willingness/unwillingness.

The barriers identified in this section are why, so far, only 4 GL of the proposed 450 GL of water has been recovered through efficiency measures.¹⁶

Barrier (1) If the appropriate constraints are not relaxed, the recovered water cannot yet be used to enhance environmental outcomes

Water recovered through efficiency measures is intended to enhance environmental outcomes in South Australia and the southern Murray-Darling Basin.¹⁷ Before many of these outcomes can be delivered, physical and operational constraints to water flow must be relaxed. Voluntary flood easements on private property must first be negotiated and agreed before this can occur.

The First Review of the Water for the Environment Special Account says: "Constraints measures program will not be delivered by 30 June 2024".

The Productivity Commission's five-year assessment of the Murray-Darling Basin Plan¹⁸ advised that rushing to recover 450 GL without the appropriate constraint programs in place could result in a large volume of water being 'recovered' but unable to be used for some time. The Report estimates that a failure to appropriately align constraints relaxation with water recovery could cost the Australian Government an additional \$203 million.¹⁹

¹⁸ <u>Inquiry report - Murray-Darling Basin Plan: Five-year assessment (pc.gov.au)</u> [page 22]
 ¹⁹ *Ibid.*

¹⁶ <u>House of Representatives 2022 07 28.pdf;fileType=application/pdf (aph.gov.au)</u> [p49]

¹⁷ Basin Plan 2012 (legislation.gov.au) [Schedule 5]

NSWIC recommends that Basin governments prioritise constraints management. While NSWIC does not support further water recovery from the consumptive pool, if progressed, off-farm recovery should be aligned with progress on constraints management to ensure water is at least 'usable'.

Barrier (2) Incentive for water-holders to participate in efficiency schemes and relinquish entitlements is low if not non-existent.

Through the current Efficiency Program, Government will pay 175% of the current market value. Longterm benefits of holding onto the entitlement, however, are generally considered by farmers to be worth more than 175% of water entitlement value, when factoring in both the entitlement value and forgone production potential. Water users are substantially more likely to upgrade their water efficiencies through personal investment, use water more efficiently, and retain their water licences - particularly with relatively low interest rates.

Barrier (3) Even if water-holders were inclined to participate, current funding is grossly insufficient.

The 2020 First Review of the Water for the Environment Special Account found water entitlement prices in the southern Basin were about 200% more expensive since the Basin Plan was made in 2012²⁰. The report found if the Government was to purchase water entitlements at 175% of their 2020 market value, it would cost an estimated \$4.8 billion, more than three times the \$1.575 billion budgeted.²¹

The First Review of the Water for the Environment Special Account says: *"Based on current water market prices and the current program's funding formula, the Special Account allocation would <u>fund</u> <u>around a third of the cost to recover 450 GL by 30 June 2024."</u>*

A recent proposal to upgrade Nap Nap Station through efficiency funding would deliver 130ML to the environment at a cost of \$1.87 million.²² Recovering the remaining 450GL at this rate would cost over \$6.4 billion.

Barrier (4) Removing 450 GL from the productive pool will have negative socio-economic impacts

Under the Basin Plan, efficiency programs must only result in neutral or improved socioeconomic outcomes, based on criteria agreed by the Basin Ministerial Council in 2018. Socioeconomic neutrality

²¹ *Ibid.* [Page 27]

²⁰ First Review of the Water for the Environment Special Account (agriculture.gov.au) [Page 28]

²² Off-farm efficiency program | Water (nsw.gov.au)

is critically important to communities, but unachievable in practice for any water recovery program, particularly given the extent of impacts identified in section 1.

The Productivity Commission Inquiry considers this a difficult threshold to pragmatically meet, as even if a project's net impacts are overwhelmingly positive, taking water out of the productive pool will inevitably have socioeconomic impacts. For example, water prices will inevitably increase due to significant new demand in the market (i.e. the government intervening in the market) and willingness to pay above market value.²³

Based on these practical implementation barriers, there inevitably needs to be a change of course.

2) Basin Plan's environmental objectives

The objectives of the 450 GL are written into legislation, as below.

²³ Inquiry report - Murray-Darling Basin Plan: Five-year assessment (pc.gov.au) [page 23]

(c)	ensuring the mouth of the River Murray is open without the need for dredging in at least 95% of years, with flows every year through the Murray Mouth Barrages;
(d)	discharging 2 million tonnes of salt per year from the Murray-Darling Basin as a long-term average;
(e)	further increasing flows to the Coorong through the Murray Mouth Barrages, and supporting fish migration;
(f)	in conjunction with removing or easing constraints referred to in subparagraph (h)(ii), providing opportunities for environmental watering of an additional 35,000 hectares of floodplains in the River Murray System, to do the following:
	(i) improve the health of forests and the habitats of fish and birds;
	(ii) improve connections between the floodplains and rivers in the River Murray System;
	(iii) replenish groundwater;
(g)	increasing the flows of rivers and streams, and providing water to low and middle level floodplains and habitats that are adjacent to rivers and streams, in the River Murray System:
	(i) to enhance environmental outcomes within those floodplains, habitats, rivers and streams; and
	(ii) to improve connections between those floodplains and habitats, and those rivers and streams;
(h)	in any other way that is consistent with:
	 (i) the Authority's modelling of the effect of increasing the volume of the Basin water resources that is available for environmental use by 3200 gigalitres; and
	 (ii) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin.

However, the Productivity Commission's 2018 five-year assessment of the implementation of the Basin Plan found:

"Recovering water through efficiency measures has become **increasingly divorced from the environmental outcomes it is meant to achieve**. The current focus of the program is on meeting the legislated target of recovering an additional 450 GL by 2024. There is little evidence that it has been designed to recover water in the places needed to effectively achieve the enhanced environmental outcomes."²⁴

Given the significant risks and impacts to irrigated agriculture and Basin communities, the intended objectives must be carefully examined, including the ability for policy mechanisms to achieve them.

Furthermore, before progressing such measures, it would be important to understand the extent to which many of these environmental outcomes are already being met, the ability (if any) for proposed policy mechanisms to further address them (and to what extent), as well as alternative options which may cause fewer and less severe socioeconomic impacts.

²⁴ Inquiry report - Murray-Darling Basin Plan: Five-year assessment - Productivity Commission (pc.gov.au) [Page 22].

There is now significant data to show that a number of the key environmental objectives under the Basin Plan are being met, or exceeded, even during the recent, exceptionally severe drought.

An example is meeting the Part 2AA–Water for the Environment Special Account, 86AA (2) (iii) objective to maintain average daily salinity in Lake Alexandrina at less than 1000 microsiemens per centimetre for 95% of years and 1500 microsiemens per centimetre all of the time.²⁵

The South Australian Government reports that:

"The delivery of water has enabled the improvements in condition to be sustained through the following measures...:

- Restoration of salinities in the Lakes that is:
 - reflective of pre-drought conditions
 - below critical targets (i.e. <1500 EC in Lake Alexandrina and <2000 EC in Lake Albert).²²⁶

In another example, the South Australian Government has published that:

"Implementation of the Basin Plan to date has supported:

• improved connectivity between the Lakes, Coorong and Murray Mouth with 10 years of continuous flow and increased barrage flows

• maintenance of lake levels and salinities within optimal ranges

• increased resilience of fish populations in dry times

• improved health of Ruppia in the Coorong."27

The MDBA also reports that even in the exceptionally dry 2019-20 water year, "*the Murray Mouth remained open year-round, assisted by dredging*"²⁸.

Positive environmental outcomes being achieved through the use of the HEW already recovered are being observed across the Basin. For example, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) recently reported that:

"It's been a big year for waterbirds, with the most widespread breeding across the Murray-Darling Basin in more than 20 years ...

²⁵ MDBA River Murray Data <<u>https://riverdata.mdba.gov.au/system-view</u>>

²⁶ South Australian evaluation of environmental outcomes under the Basin Plan | 2020 - DEW, Government of South Australia.

²⁷ Technical information supporting the South Australian Basin Plan Environmental Outcome Evaluation -

Coorong, Lower Lakes and Murray Mouth Priority Environmental Asset - DEW, Government of South Australia (October 2019)

²⁸ Lower Lakes, Coorong and Murray Mouth Report Card 2019-20 - MDBA

"Estimated numbers so far include:

- 10,000 pairs of waterbirds, mainly Straw-necked ibis, at Dharriwaa (Narran Lakes)
- *30,000 pairs of waterbirds including Royal spoonbills, Cormorants, Egrets, Nankeen night herons, Glossy ibis and Straw-necked ibis in the Gwydir Wetlands*
- 150,0000 nests of Ibis, Egrets, Spoonbills and Night herons at Macquarie Marshes
- 15,000 Pelican pairs at Lake Brewster, 25,000 Ibis pairs at Lake Cowal and 25,000 Ibis pairs at Booligal Swamp in the Lachlan valley
- *30,000 pairs of Ibis and Spoonbills and over 10,000 pairs of breeding Pelicans in the lower Murrumbidgee wetlands*
- over 2,600 mixed nests of Australian white ibis, Straw-necked ibis, Royal spoonbills, Nankeen night herons in Barmah-Millewa Forest
- 7000 Black swans in the Coorong, an increase of 34% from 2021.²⁹

It is important to recognize that the Basin Plan is already hitting its KPIs and delivering on its environmental objectives with the water already recovered, including in South Australia, and even during severe drought. Improving these outcomes is no longer a matter of just add more water, but rather investing instead in addressing the threatening processes driving biodiversity decline despite the improving environmental water availability. Threatening processes include feral and introduced plants, animals and fish; habitat degradation; cold water pollution; barriers to fish movement and so forth.

²⁹ Waterbird resurgence in the Murray-Darling Basin - DCCEEW, Australian Government (13 July 2022)

CONCLUSION

This report finds that recovery of an additional 450 GL under the Murray-Darling Basin Plan would represent a substantial portion of water from the remaining consumptive pool available mainly, but not only, for irrigated agriculture. This would, necessarily, have significant socio-economic and market impacts.

These impacts need to be considered cumulatively, in the context of Basin communities that have already undergone significant transition under the Basin Plan to reach its Sustainable Diversion Limits.

These significant impacts and risks, coupled with the practical implementation barriers, and increasing detachment from environmental outcomes, presents a case for change.

Recommendations

- 1. Re-invest the allocated funding for the 450 GL to practical on-ground measures (complementary measures) to improve environmental outcomes through habitat restoration, feral species control/eradication, native species breeding, and pollution management.
- 2. MDBA to prepare a report for the Minister for Water, and Murray-Darling Basin Ministerial Council, with advice on the 450 GL as a proportion of the remaining consumptive pool, to ensure its actual extent and potential impacts are understood.
- 3. MDBA to prepare a report for the Minister for Water, and Ministerial Council, with advice on the environmental outcomes being achieved in the Lower Lakes, Coorong and Murray Mouth.
- 4. MDBA to prepare a report for the Minister for Water, and Ministerial Council, with advice on the practical implementation challenges of progressing the 450 GL.
- 5. MDBA to prepare a report for the Minister for Water and Ministerial Council on alternate ways to achieve the intended environmental outcomes of the 450 GL.