The interim Inspector-General (IIG), Mick Keelty, is inquiring into the arrangements for sharing water in the southern Basin between NSW, Victoria and South Australia. As part of this inquiry the IIG has asked for input to a survey (now closed), and is holding subsequent Town Halls.

The RGA Water Policy Committee have responded to the survey with the following responses. Please consider them if you are attending a Town Hall session.

The Interim Inspector-General has asked for feedback via a survey on the following four themes:

1. ***Inflows and supply into the Murray–Darling Basin.***
   RGA response:
   Over the last 20 years, annual inflows into the Murray River have averaged 5700 GL. This is 63% of the 120-year average of 9000 GL which underpins Murray-Darling Basin Plan modelling and is the basis for water sharing under Murray Darling Basin (MDB) Agreement (MDBA charts provided on request).

   The apparent step change is consistent with predicted climate change impacts, with longer, hotter, drier periods interspersed with rarer but more intense flood events such as in 2010, 2011 and 2016. The in-between 'average' flow years have all but disappeared.

   Various Federal and State agreements and legislation have evolved to mitigate increased supply risks. The mitigation trend started with environmental programs such as extra water to dilute salinity dating back to the 1970s, the creation of the Barmah-Millewa Environmental Water Allowance account, changes in operational rules at the Menindee Lakes and Lake Victoria, and increases in reserves following the Millennium Drought.

   The Menindee Lakes at the bottom of the Darling River system historically contributed an average 39% of annual entitlement flows to South Australia (Source: https://www.academia.edu/15463122/Scientific_Panel_of_Environmental_Flows_in_the_River_Murray). With climate change and increased development upstream, this contribution is less reliable and declining. The proposed Menindee Lakes project under the Sustainable Diversion Limit Adjustment Measures may further erode the Darling system's contribution. It has been claimed the contribution will reduce to as little as 9-11%. This increases the pressure on the Murray system to make up the difference, thereby reducing volumes available to allocate to NSW and Victorian entitlement holders after the upstream States meet their 1850 GL supply obligation to South Australia.

   Since 2000, storage management and river operations in the Murray system have also changed to accommodate greater carryover; a shift in the location, volume and timing of demand for consumptive and environmental water; the water market; changed irrigator behaviour; the large environmental portfolio; and, more conservative water reserve policies.

   The list of changes is long and the impact is always felt by lower security water entitlement holders, such as NSW general security entitlement holders who are last in line to be allocated water only after all other commitments described above have been met first. This is inconsistent with the principles of the 2004 National Water Initiative, that policy reforms would not erode the reliability of anyone's water property rights.

The combination of all the above fundamentally alters the metrics that informed aspects of the MDB Agreement and the Basin Plan. For example, elements of the minimum 2163 GL volume held in storage to meet critical human needs before NSW, Victoria and SA receive any allocations, may now be redundant (see chart https://www.mdba.gov.au/river-information/water-sharing/critical-human-water-needs).

In particular, the need to deliver 696GL over the South Australian border for dilution and loss may now be offset to some degree by the increased volumes of environmental allocations performing the dilution function on their way to the Lower Lakes.

Similarly, the combined 975 GL conveyance reserve to deliver consumptive and environmental allocations from the Murray storages (Hume/Dartmouth) to the SA border, could be offset to some degree by factoring losses into consumptive allocations downstream. This reflects the user pays principle of factoring freight costs into products.

Changes in these aspects of the MDB Agreement could increase the water available to allocate against general security entitlements held by irrigators and the environment, particularly in dry and drought seasons.

2. ***Delivery of water.***

RGA response:

As mentioned above, the location, timing and volume of demand for water is changing, and is different to when the current MDB Agreement on sharing Murray River water was negotiated in the late 1960s. The changes have implications for some aspects of the water sharing arrangements

Demand for water to be supplied further down a constrained river system is completely the opposite of what was originally envisaged under the water market reforms: that demand would move closer to its supply source because supply delivery would be more efficient.

The Basin Plan has further complicated the challenge by creating a large environmental reserve that must also be delivered to improve environmental health in rivers, wetlands, riparian zones and floodplains from the top in the mountains to the Murray mouth. In effect, the Plan has increased demand for environmental water further down the river system.

These changes affect overall supply as water managers operate the system less efficiently, trying to meet the changed location and timing of consumptive and environmental demand.

The free market model imposed on this dynamic river system does not account for the realities of conveying water vast distances. The Murray, and its major tributaries, the Goulburn, Edwards and Murrumbidgee rivers, contain natural 'choke' points where the channel capacity reduces and limits the volumes that can be conveyed.

Prolonged, high flows to meet changes in the location and increased volume of commercial and environmental demand are further choking the chokes, with increased silt deposits and river banks slumping and eroding. Since February 2008, the instream deliverability of water in the Murray River has reduced by 21% or 1500ML per day, making the Barmah Choke even more prone to overflowing into the surrounding land, further increasing conveyance losses.

Increased conveyance losses directly affect NSW Murray general security allocations, which are made only after all other commitments have been met. Commitments include SA's minimum 1850 GL, and conveyance losses to meet increased downstream demand, in part driven by Basin Plan market reforms enabling a rapid expansion in permanent plantings.

Increased conveyance losses and increased pressure on the Murray River to make up the shortfall in water from the Darling system, along with a drying climate and reduced inflows, are driving down the reliability of NSW Murray general security entitlements, from an historic 82% – that is, 100% allocation in 82 of 100 years – to 50% over the last 20 years. All entitlement types have been affected by less water being available for allocation due to declining annual average Murray inflows since the turn of the century, but to a much lesser degree. NSW Murray high security entitlements, for example, fell from 95% to 90% per cent reliability. Victorian Murray High Reliability Water Shares fell from 97% to 91%. SA high reliability entitlements fell from 100% to 86%.

In any other market, freight costs are factored into the cost of the product. Water should be no different. A precedent has already been set with environmental water: the CEWH account is debited 50 gigalitres up front. A further 20 per cent of the volume delivered through the Murray system is deducted to cover the losses incurred in conveying that water.

In effect, a megalitre of environmental water is a megalitre if delivered from the Hume dam to a site above the Barmah Choke, but is less than a megalitre by the time it gets to Hattah Lakes or the South Australian border. The same principle should be applied to consumptive water traded outside its source entitlement zone.

3. ***Water sharing.***

RGA response:

The MDB Agreement was negotiated a long time ago and is now an archaic document that needs to recognise changed priorities as water travels down the system. Its current Murray water sharing arrangement dates back to 1970, when South Australia's 1547GL under the original 1914 Murray Waters Agreement was increased to the current 1850GL entitlement [Source: River Murray Waters (Amendment) Act 1971 (SA) schedule 1, clause 24]. This 1850GL entitlement includes the 696 GL dilution and loss component.

RGA supports the Murray system water sharing arrangements to the extent they support the property rights of each State's entitlement holders. These arrangements have supported the States in managing their own water entitlement and allocation policies under State legislation.

However, the water sharing arrangements include other aspects that should be reviewed in light of the changes in policy and climate described above. What was assumed to be immutable under 1970 conditions may no longer be justified in view of climate change, greenfield irrigation development, a southern Basin water market, and current storage management and river operations.

This is particularly the case when the current inflexible water sharing arrangement means one group of entitlement holders, those with general security licences, are bearing the

burden of adjustment alone. They are watching their property rights being eroded because they are last in line to get water after all other commitments are met. Perhaps some of those commitments need to be adjusted instead.

For example, the need to deliver 696GL over the South Australian border for dilution and loss may well now be offset to some degree by the increased volumes of environmental allocations performing the dilution function on their way to the Lower Lakes.

Similarly, the combined 975 GL conveyance reserve to deliver consumptive and environmental allocations from the Murray storages (Hume/Dartmouth) to the SA border, could be offset to some degree by factoring losses into consumptive allocations downstream. This reflects the principle of factoring freight costs into products.

For example, compare the difference in conditions in the Lower Lakes in 2009 and a decade later in 2019 after the Basin Plan reforms and associated river management.

In mid-December 2009, after two seasons with extremely low inflows into the Murray, the Lower Lakes were 38% full and Lake Alexandra's salinity was 5250-5900EC; the target is 1500EC which it stayed under until 2007 despite the Millennium Drought starting in 1997. Hume/Dartmouth storages then were a combined 31% [Source: MDBA weekly river reports]. NSW Murray general security entitlement allocation was 10%. [Source: https://waterregister.waternsw.com.au/water-register-frame]

Fast forward 10 years to mid-way through the second of two very dry seasons. Hume/Dartmouth in mid-December 2019 were a combined 44% full. The Lower Lakes were 92% full and Lake Alexandrina was 840-870EC, well below the Basin Plan's 1500EC KPI [Source: MDBA weekly river reports]. NSW Murray general security entitlement holders are on 0% allocation.

No season is the same and comparisons can be fraught given that hydrological conditions reflect diverse variables in time and scale across a vast and complex river system. It is also unclear how much CEWH water has been delivered annually into the Lower Lakes, but clearly a lot to sustain this high water level and low EC reading after one very dry year in 2018-19, followed by severe drought year in 2019-20.

The question is whether SA still needs the entire 696 GL for dilution to maintain water quality, when it is also receiving large volumes of additional environmental flow under the Murray-Darling Basin Plan serving the same purpose.

Equity is the key to this discussion. Other opportunities exist with how water is managed and accounted for. In late 2018, water flooded through the Barmah-Millewa Forest providing beneficial environmental flooding, yet this was deemed an operational loss that reduced the water available to allocate to general security entitlements. This is ridiculous.

The initial principle of CEWH water being traded during droughts needs to be revisited, with perhaps an environmental aspect. Rice is essentially an ephemeral wetland with extraordinary ecological value. Specific river-reach environmental strategies with localised

solutions are required, rather than simplistic volumetric flow targets that can have a negative impact in one reach on the way to having a positive impact elsewhere.

Essentially, we need a holistic approach where water is water and it has a multitude of purposes rather than dividing it up into buckets under rigid water sharing arrangements.

4. ***Potential opportunities for enhancement.***

RGA response:

RGA has consulted groups across the rice industry, including SunRice which supports RGA's survey responses. Potential opportunities for enhancement include:

1. A holistic approach to water sharing, where water is water with a multitude of purposes, rather than dividing it up into buckets under rigid water sharing arrangements.
2. Flexibility for river operators to adjust dilution and loss commitments under the Murray Darling Basin Agreement when environmental water is serving the same purpose in reducing salinity in the Lower Lakes, particularly in dry and drought years.
3. Reducing Lower Lakes levels in drought years to reduce conveyance and evaporation losses, and to share drought impacts more equitably across the southern Basin.
4. Total South Australian transparency and accountability on how it manages Murray River water once it crosses the border, particularly CEWH flows, the dilution and loss entitlement, and its own environmental entitlement under the MDB Agreement.
5. A comprehensive and modern gauging network across the Murray River system and its tributaries to accurately determine the location and volume of conveyance losses, to enable more efficiency in river operations and assignment of losses.
6. Conveyance losses factored into all allocation trades downstream from their entitlement source zone in the Murray and its tributaries. The conveyance losses for commercial trades should be based on a rigorous analysis of losses through the system, rather than relying on the environment's arbitrary 'rule of thumb' scale.
7. This change would help to restore the reliability of NSW Murray and Murrumbidgee general security entitlements, consistent with commitments in the 2004 National Water Initiative, the Water Act 2007 and the 2012 Murray-Darling Basin Plan that the policy reforms would not erode the reliability of anyone's water property rights.