# INDEPENDENT REVIEW OF THE AUSTRALIAN CAPITAL TERRITORY METHOD AND PLANNING ASSUMPTIONS FOR LONG TERM DIVERSION LIMIT EQUIVALENCE (LTDLE) FACTORS FOR SURFACE WATER ENTITLEMENTS IN THE MURRAY-DARLING BASIN

The Independent Review Panel

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# List of Abbreviations

| АСТ          | Australian Capital Territory   |
|--------------|--|
| OoW          | Office of Water, part of the ACT Environment, Planning and Sustainable Development Directorate |
| BDL          | Baseline Diversion Limit   |
| LTDLE factor | Long Term Diversion Limit Equivalence factor   |
| MDBA         | Murray Darling Basin Authority   |
| REALM        | <u>Re</u> source <u>Al</u> location <u>M</u> odel  |
| SDL          | Sustainable Diversion Limit  |
| WRP          | Water Resource Plan  |

## Summary

This is an independent review of the planning assumptions and the calculation methodologies used by the Australian Capital Territory to determine the Long Term Diversion Limit Equivalence (LTDLE) factor for entitlements that the delegate under the *Water Resources Act 2007* (ACT) may grant to the Commonwealth Environmental Water Holder (CEWH).

The LTDLE factors are important because they provide a mechanism for apportioning the long-term limits on water use for the Sustainable Diversion Limit (SDL) resource unit to each licensed entitlement (or class of entitlements) to water.

Consequently, these factors are a key basis for determining whether past and future water recovery under the Basin Plan will 'bridge the gap' from the permitted levels of use under the BDL conditions to the permitted levels of use under the SDLs set in the Basin Plan.

#### **Review Findings**

The surface water Baseline Diversion Limit (BDL) is the ACT's use limit under the Basin Plan at 1 July 2009, which is equivalent to the Murray-Darling Basin Ministerial Council Cap on diversions for the ACT. It is noted that for the ACT, this Cap is higher than current actual use, for a range of reasons including the implementation of water use efficiency initiatives, and was an agreed volume that was not determined by modelling.

The ACT is considering the potential grant of new entitlements of 6.36 GL to the Commonwealth Environmental Water Holder on the Murrumbidgee River just upstream of the point where it leaves the ACT boundary, in the same class as its existing surface water licences held by non-Icon water users. The new entitlements would effectively be given a share of the ACT's BDL via the proposed LTDLE factor of 1. No LTDLE factors are proposed for any other entitlements within the ACT.

The current water use within the ACT is sufficiently below the BDL that apportioning a share of the BDL to the CEWH entitlements (6.36 GL) using a LTDLE factor of 1 will not initially affect the existing water uses.

The ACT have prepared a "future development" surface water scenario (referred to as the SDL scenario) using the Source modelling platform for the catchments and the REALM modelling platform for the urban water supply network, and used the results of this modelling to support an LTDLE factor for the potential new entitlements. The models used to support the development of these BDLs and LTDLE factors have been assessed as being based on the best available information.

The ACT have provided assurance that entitlements have not substantially changed from those on issue in 2009.

The methods and assumptions upon which the factor is based have been reviewed and are considered by the reviewers to be appropriate for the ACT water resource management context and the best available at the current time.

As a result, this review endorses the LTDLE factor developed by the ACT, in relation to the proposal to create 6.36 GL of non-urban entitlement on the Murrumbidgee River just upstream of the point where it leaves the ACT, that may be granted to the Commonwealth Environmental Water Holder.

If there are additional proposals to offer larger volumes of water for the environment (at the same location or another location within the ACT), or to amend the existing policy position that no restrictions will be applied to the annual volume available to non-urban entitlements that are used in-stream, further review of the appropriateness of the LTDLE factor may be required.

It is noted that the entitlements recovered for the environment are unlikely to be taken from the river in the way that consumptive entitlements are, and water accessed under the new entitlement that are under consideration will remain in-stream to achieve environmental outcomes. This water will need to be protected from take within NSW. It is understood that management rules to protect water accounted under the potential entitlement for the Commonwealth Environmental Water Holder are currently being developed by NSW.

## **1** Introduction

#### 1.1 What are LTDLE Factors?

Water allocated to and used under the various classes of entitlement across the Basin varies according to the irrigation crops and practices in each valley, local climate, and water management rules. Long Term Diversion Limit Equivalence (LTDLE) factors provide a conversion between the "face value" or nominal volume of a water entitlement and the long-term average water use limit applying to that entitlement over the reference period used to develop the Basin Plan (1895 – 2009). LTDLE factors are generally specific for an entitlement class within each SDL resource unit for which water resource plans (WRPs) are being prepared under the Basin Plan.

This is an independent review of the planning assumptions and the calculation methodologies used to determine the LTDLE factor for specific entitlements within the Australian Capital Territory (ACT) surface water resource unit. This is the only surface water SDL resource unit in the ACT.

The proposed LTDLE factor has been prepared by the Office of Water (OoW) within the ACT Environment, Planning and Sustainable Development Directorate.

#### 1.2 Why are LTDLE Factors Required?

The Basin Plan sets new Sustainable Diversion Limits (SDLs) for major river valleys and groundwater systems across the Murray-Darling Basin. For surface water these SDLs are set relative to a Baseline Diversion Limit (BDL), which is defined by the Basin Plan for most valleys as the diversions that could be taken under existing State arrangements on 1 July 2009. The ACT is wholly within the Murray-Darling Basin, and its BDL for take from watercourses is equivalent to the agreed level of diversions under the Murray-Darling Basin Ministerial Council Cap on diversions. The overall level of take from surface water in the ACT is currently below the BDL levels, which means that some growth in use is permissible under the previous Cap, and also under current SDLs.

SDLs were set based on the environmentally sustainable level of take from the resource unit and the basin overall, based on the best available information. To implement these SDLs, the Commonwealth has committed to recover water from consumptive users by purchasing entitlements and funding water savings projects, with the aim of reducing the permitted long term water use to the SDL. This process is referred to as 'bridging the gap' from the permitted levels of use under the BDL conditions to the permitted levels of use under the SDLs set in the Basin Plan.

LTDLE factors provide the key basis for determining whether the recovered water entitlements will 'bridge the gap' between BDL and SDL in the future under the WRPs.

#### 1.3 Existing LTDLE Factors

Prior to 2019 there have been other factors developed to reflect the conversion between a surface water entitlement volume and its long-term average water use limit. Some of these factors were referred to as 'Cap Factors' as they were originally developed under conditions reflecting the 'Cap' on diversions established under Schedule E of the Murray-Darling Basin Agreement. These factors

were used to calculate volumes of environmental water recovered as a result of The Living Murray program.

The Murray-Darling Basin Ministerial Council approved the use of a set of LTDLE factors to estimate water recovery in 2011 (known as version 2.05 or 'v2.05' factors), some of which are still formally being used by the Commonwealth. Recognising that these factors could be improved, Basin ministers subsequently requested each state to bring forward appropriate factors in 2015. Due to the limited opportunities for water recovery within the ACT, there are no Cap factors or previous LTDLE factors for ACT water entitlements.

To provide contemporary estimates of water recovery, the ACT has developed a new LTDLE factor for specific entitlements, which is the subject of this review.

## 1.4 Documents Examined and Review Tasks Undertaken

The ACT and MDBA provided the reviewers with a range of material to assist it in reviewing the underlying assumptions and approach to development of LTDLE factors. This material included:

- Development of Source models for the ACT and Region final project report prepared by Alluvium Consulting, December 2017
- ACT Source Model Scenarios final project report prepared by Alluvium Consulting, March 2018
- ACT Outflow Analysis SDL scenario for LTDLE calculation report prepared by ACT OoW, November 2023
- Establishment of ACT Long-term Cap and BDL under the Basin Plan summary note prepared by MDBA
- Long Term Diversion Limit Equivalence Factor for environmental water recovery from the ACT – draft brochure produced by ACT OoW, 2023
- ACT Water Resources (Environmental Flow Guidelines) 2019 (No 2) (DI2019-190)

In the course of its review, the reviewers also sought and received additional information from the ACT and MDBA to address specific questions and information gaps.

The calculation of surface water LTDLE factors is primarily based on the simulation of the long-term permitted water use behaviour using various hydrologic models. The ACT has developed a long-term hydrologic model using the Source modelling platform. This model has been used to support the determination of surface water LTDLE factors, but it has not been within the scope of the review to undertake an assessment of the accuracy of the model.

The reviewers have relied on the information provided in these reports, the further material and in verbal advice provided by ACT OoW staff in formulating the conclusions provided in this report. The MDBA and ACT OoW have also been given the opportunity to review a draft of this report for factual accuracy prior to its finalisation.

# 2 Method Proposed by ACT

## 2.1 Entitlement classes which require LTDLE Factors

LTDLE factors are required for all entitlement classes or entitlements where water recovery via purchases have occurred or are likely to occur under the Basin Plan. In addition, LTDLE factors are needed where water entitlements have been created including through savings projects currently underway or proposed to occur.

In the ACT, the Minister is empowered to issue water access entitlements (WAEs) under Part 4 of the *Water Resources Act 2007 (ACT)*. Icon Water<sup>1</sup> holds significant volumes of WAEs (total 71 GL), however these rights set the upper limit, or maximum volumes that can be taken. The water security necessary to meet the urban water needs of Canberra is generated by Icon Water's storages and the operating practices and procedures Icon Water uses to manage these water resources.

Non-urban water use is also managed through WAEs. A total volume of 5.64 GL of non-urban WAEs are on issue in the ACT. Icon Water does not release water from its storages to meet any non-urban WAE demands, and since there are no other publicly managed storages in the ACT, all of the non-urban WAEs are classed as unregulated entitlements.

The ACT Government is considering the grant of an unregulated WAE of 6.36 GL/year to the Commonwealth Environmental Water Holder (CEWH), consisting of 4.9 GL/year to meet the ACT's shared reduction amount, and an additional 1.46 GL/year.

The ACT OoW has advised that entitlements for water recovered for the environment under the Basin Plan will not be based on releases from Icon Water storage. All environmental entitlements will be issued as standard non-urban WAEs, on the Murrumbidgee River just upstream of the point where it leaves the ACT boundary.

There is only a single class of non-urban WAEs on issue in the ACT. An LTDLE factor has only been developed for the specific entitlement under consideration for environmental water recovery within the ACT surface water resource unit.

## 2.2 Use of the ACT Source model

The ACT have set out their methodology for determining the LTDLE factor in the report "ACT Outflow Analysis - SDL scenario for LTDLE calculation".

The ACT Source model provided the foundation for the assessment of LTDLE factors. This model has been configured to simulate a number of scenarios<sup>2</sup>, including a "future development" scenario with Icon Water take and non-Icon Water take increased such that the long-term average diversions were equal to the BDL for the ACT. This is referred to by the ACT as the SDL scenario within the ACT Source model for the ACT surface water resource unit, and the results from this model scenario are used to estimate water availability and water use from watercourses extrapolated from 2009 levels of development to future full utilisation of the SDL plus recovery of the Shared Reduction Amount.

<sup>&</sup>lt;sup>1</sup> Icon Water Limited is an unlisted public company wholly owned by the ACT Government. It is responsible for provisions of potable water and sewerage services for the ACT and the bulk of Queanbeyan.

<sup>&</sup>lt;sup>2</sup> ACT Source Model Scenarios – final project report prepared by Alluvium Consulting, March 2018

The SDL scenario has been developed using the Source modelling platform, which is the accepted national hydrologic modelling platform for Australia. However, Canberra's urban water demand (the largest use of water in the ACT) and return flows from sewage treatment plants are modelled in a separate REALM<sup>3</sup> model developed by Icon Water, with the simulated diversions and return flows from the REALM model used as inputs to the Source model that covers the whole of the ACT and upstream catchments. The key features of the ACT Source model are:

- Inflows into the ACT reflect water resource development and policy conditions as of 2009, modelled over the historical climatic period of 1895 - 2009.
- Inflows generated in the ACT reflect 2009 level of development conditions, modelled over the period 1895 - 2009.
- Diversion rules from the ACT rivers and water supply dams reflect the infrastructure and operating rules current in 2009.
- System returns (via two sewage treatment plants (STPs)) reflect the current infrastructure and operating rules as of 2009.
- Water take from the ACT water management areas (referred to as 'non-urban take') reflect the patterns and behaviour of water resource utilisation in the ACT water management areas current in 2009.

Separately to the development of the ACT Source model, the ACT BDL has been determined as 58.34 GL/year<sup>4</sup>. Details of the make-up of this BDL are shown in the table below.

Table 1: ACT BDL estimate

| Item                               | Volume<br>(GL/year) |
|------------------------------------|---------------------|
| Net take from water courses        | 42.7                |
| Take by runoff dams                | 4.64                |
| Net take by commercial plantations | 11                  |
| BDL                                | 58.34               |

In the ACT, existing urban and non-urban entitlements are not fully utilised, so the current level of net take from water courses is considerably less than the 42.7 GL included in the BDL estimate. This means that there is scope for further growth in water use in the ACT under its SDL (refer section 3.1 for further details). ACT OoW staff advised that there is little or no potential change in the take by runoff dams, and the extent of commercial plantations is not expected to change materially in the foreseeable future.

#### 2.2.1 Calculation of LTDLE factors

The ACT Government is considering the potential grant of an unregulated WAE of 6.36 GL/year with an LTDLE factor of 1.0 to the Commonwealth Environmental Water Holder (CEWH), consisting of 4.9 GL/year to meet the ACT's shared reduction amount, and an additional 1.46 GL/year. If the environmental entitlement for the shared reduction amount (4.9 GL/year) is granted to the

<sup>&</sup>lt;sup>3</sup> REsource ALlocation Model (REALM) is a monthly step hydrologic model package developed in Victoria for urban and rural applications. For rural applications, this model has been superseded by the Source.

<sup>&</sup>lt;sup>4</sup> The approved ACT WRP included an improved assessment of take by runoff dams, which is an update on the BDL numbers shown in the Basin Plan

Commonwealth Environmental Water Holder, this will result in the ACT meeting its commitment to reduce annual permitted take from the BDL of 58.34 to the SDL of 53.44 GL/year (58.34 – 4.9). If the entitlement for an additional 1.46 GL year is granted to the Commonwealth Environmental Water Holder, this will further reduce the SDL to 51.98 GL/year.

In order to assess the reliability of the water volume (6.36 GL/year) under consideration for the CEWH entitlements (the CEWH volume), the ACT used the outputs from a "future development" source model scenario (SDL scenario) that represents the full water use permissible under the Baseline Diversion Limit (BDL) set by the Basin Plan:

- In every year, non-urban take was scaled by a factor of 4.8 to provide an average use of 4.69 GL/year to represent higher utilisation of existing entitlements (5.64 GL). The overall volume allowed for non-urban take was not restricted in any year.
- Icon Water gross take (and sewage treatment plant outflows) was scaled up to ensure that the long-term total net-take (i.e. Icon + non-urban take) was equal to the net take from water courses allowable under the ACT BDL. This provided an average use of 42.49 GL/year.

The ACT then made a number of changes via post-processing of these outputs to represent the following:

- An additional 6.36 GL/year of non-urban take (the CEWH volume) was assumed on the Murrumbidgee River where it leaves the ACT.
- In every year, take was scaled to equal full utilisation of existing non-urban entitlements and the CEWH volume (5.64 +6.36 = 12 GL/year). The overall volume allowed for non-urban take was not restricted in any year.
- Icon Water gross take (and sewage treatment plant outflows) was scaled down to ensure that the long-term total net-take (e.g. Icon + non-urban take) was equal to the net take from water courses allowable under the ACT BDL. This provided an average Icon net take of 30.7 GL/year.

The post-processed results were then analysed to confirm that the long-term average volume of 6.36 GL/year could be provided under the potential CEWH entitlements, while still ensuring compliance with mandated existing minimum environmental flow limits. This assessment showed that the potential CEWH unregulated entitlement would be available in full every year under a repeat of the historical climatic from 1895 – 2009, with no restrictions applied to the entitlement volume in any year, so the ACT has proposed an LTDLE factor of 1. The ACT is not proposing LTDLE factors for any other entitlements within the ACT.

# **3** Using LTDLE factors to 'bridge the gap' – review of key assumptions

#### 3.1 Assumptions and uncertainties in calculating LTDLE factors

The Commonwealth government will use LTDLE factors to provide confidence that the water recovery will reduce the BDL levels of permitted take to SDL levels of permitted take in each valley (i.e. 'bridge the gap').

The MDBA has noted that, in some locations (such as in Queensland, ACT and South Australia) the surface water BDL was set at levels higher than the actual use in 2009. This reflects arrangements previously negotiated as part of the Murray-Darling Basin Cap on diversions and is represented within the BDL models used to underpin the BDL estimates<sup>5</sup>.

The aim of water recovery is to reduce the diversion limit (as opposed to diversions as they were in 2009) from the baseline to the sustainable diversion limit, noting that some allowable growth in actual take may occur up to those limits over the life of the WRP.

Within the ACT, the BDL has been set based on the level of actual per capita urban water use in 1991, adjusted for population growth to 2009, plus allowance for non-urban water use (estimated to be 42.7 GL/year in total). However, the significant water efficiencies made in Canberra's water use over the last 30 years have resulted in actual water use for the significant urban supply managed by Icon Water (estimated to be 19.9 GL/year<sup>6</sup>) that is about half of that assumed within the BDL.

For the ACT and other states where the BDL exceeds current levels of water use, this means that the LTDLE factor may not directly represent the change in current actual diversions that occurs as a result of water recovery. Water recovery in these valleys will reduce the use limit below the BDL in line with the LTDLE factors developed, which will in turn reduce use or prevent future increases in use that would have been permissible under the original BDL.

The intention is to ensure the resultant LTDLE factors provide a consistent measure of the relative contribution of different entitlements to 'bridging the gap' (i.e. reducing the use limits), both within and between valleys, and that the best available information has been used. Given that the Basin Plan water recovery was developed on the basis of modelled BDL conditions, the most consistent approach to calculating LTDLEs is with respect to the BDL, being the *diversion limit* at that time.

Across the Basin, LTDLE factors have generally been established for an entitlement class and not for an individual entitlement. This assumes that all entitlements share the diversion limit attributable to that class of entitlement under the BDL equally. This involves distributing the use limits across individual licences based on their share of the entitlements for an entitlement class within a valley.

Using an average factor for each entitlement class is appropriate for entitlements recovered from consumptive use, where the estimate of long-term average use from models is also aggregated, and all of the entitlement holders have equal access to their entitlements and an equal right to utilise

 <sup>&</sup>lt;sup>5</sup> However, it is noted that the ACT Source model was not used to underpin the BDL estimate for the ACT in the Basin Plan.
<sup>6</sup> ACT Source Model Scenarios (Alluvium 2018), prepared for ACT Government Environment Planning & Sustainability Development Directorate, Canberra.

their entitlements. This is the situation that generally applies to private water users in regulated water sources. However, for some classes of entitlement in rivers where the flows are "unregulated" by major storages, the location of each individual licence will uniquely influence their access to water. Where these entitlements are modelled individually, these variations in water access can be accounted for and their share of the use limit can be estimated directly from the modelling, and there is a case for using individual LTDLE factors based directly on the modelled reduction in water use, which has occurred in some Queensland catchments. The ACT has not modelled these unregulated river entitlements individually. Instead the ACT modelling has analysed flow conditions at the point where the CEWH entitlement is proposed to be issued. Accordingly, a single LTDLE factor is appropriate for this potential unregulated CEWH entitlement in the ACT.

The ACT is considering the potential grant of new entitlements to the CEWH in the same class as its existing surface water entitlements held by non-urban water users. The new entitlements would effectively be given a share of the ACT's BDL via the proposed LTDLE factor of one. However, the current water use within the ACT is sufficiently below the BDL that apportioning the resulting share of the BDL (6.36 GL) to the CEWH entitlements will not affect the existing water uses.

Icon Water holds the majority of all water entitlements in the ACT, with 71 GL of urban water utility entitlement. Of these entitlements, 70 GL cannot be traded. The current net use by Icon Water is modelled to be 19.9 GL/year<sup>7</sup>. OoW staff advised that the ACT Government will manage net use of water to remain within the SDL.

#### 3.2 Representativeness of surface water models

All models are only approximations, and to the extent that these models contain approximations of reality, this creates some uncertainties in the model results.

For most valleys in the Murray-Darling basin, the BDL models used to prepare the Basin Plan 2012 have been previously reviewed and adopted as the best estimates of BDL conditions at the time. However, the ACT first produced a Source model that covered all of the ACT in 2017, and this model was not used to prepare the Basin Plan or reviewed as part of the ACT's Water Resource Plan accreditation.

This model simulates the runoff from catchments in the ACT and those above the ACT in NSW, and simulates water use by licensed water users. However, the Source model does not directly simulate urban water use in Canberra, and instead relies on the output of a REALM model prepared and used by Icon Water. These models have been prepared for use in representing the ACT's BDL and SDL, and have been reviewed by the MDBA. The reviewers have been advised that these models are appropriate and best available, noting that any assessment of these models is outside the scope of this review.

## 3.3 Changes in surface water management rules

If a jurisdiction was to change the management rules in a water system, this could potentially lead to a change in the reliability of water availability for some or all entitlement classes in a system. The

<sup>&</sup>lt;sup>7</sup> ACT Source Model Scenarios (Alluvium 2018), prepared for ACT Government Environment Planning & Sustainability Development Directorate, Canberra.

key elements of the ACT's water management framework are the Water Resources Act (2007), the entitlements on issue, and the Environmental Flows Guidelines (the Guidelines).

The ACT OoW have advised that there has been no material change in the ACT water management framework since the implementation of the Basin Plan. The Guidelines were first set in 1999, and have been regularly reviewed since then. The ecological objectives in the 2013 iteration of the Guidelines used to assess the results of Source model scenarios have remained "near identical" since the 2006 revision<sup>8</sup>. The current iteration (2019) of the Guidelines includes some changes, but the OoW advised that the changes do not have a material impact on water use.

## 3.4 Water recovery in surface water systems without regulated flows

The ACT is considering the potential grant of 6.36 GL of its standard "unregulated river" water entitlements to the Commonwealth Environmental Water Holder that permit access to water if and when there are flows in the river, whereas water entitlements in rivers where flows are regulated by storages (and can therefore order water) represent the majority of water recovery elsewhere in the basin.

To provide confidence that water recovery will "bridge the gap", a key input that underpins LTDLEs for unregulated river water entitlements is how often flows would be available to take. The ACT has analysed outputs from its Source model to assess how often flows would be available to these new entitlements if the ACT was otherwise fully using its existing water entitlements. To do this, an "SDL scenario" has been implemented in the Source model and further adjusted through post-processing with the existing water entitlements utilised up to the limit of its SDL. This modelling indicates that there would still be sufficient flows available at the Halls Crossing flow gauging station on the Murrumbidgee River (near where it leaves the ACT) to allow the full 6.36 GL of proposed entitlement to be taken in every year over the modelled 1895-2009 period and also still meet the ACT's environmental flow guidelines.

It should be noted that since these are unregulated entitlements, there is no guarantees as to the specific timing of when this water will be available during each year. It is noted that, depending on the particular streams where they are located within the ACT, other non-loon water users may not be able to access their full entitlements in all years. The ACT's assessment of annual water availability at Halls Crossing for the proposed entitlements for the Commonwealth Environmental Water Holder conservatively assumes full use of the other non-loon water use, which is appropriate.

As these are new entitlements that, if granted, would be accounted on the Murrumbidgee River where it leaves the ACT, rather than pre-existing water entitlements with existing water use, there is no requirement for measures to protect instream flows accounted against the new entitlements from access by other ACT water users.

In order to ensure that the in-stream flows accounted against the CEWH's new water entitlements are not available to be accessed by other consumptive users of water downstream in NSW, there is a need to protect the accounted flows from extraction. It is understood that these management rules are currently being developed by NSW.

<sup>&</sup>lt;sup>8</sup> Appendix 1, ACT Water Resources (Environmental Flow Guidelines) 2019 (No 2) (DI2019-190)

The reviewers note that whilst NSW has obligations to implement suitable measures to protect environmental flows as part of their proposed Water Resource Plans and has also committed to do this as part of its implementation of the Basin Compliance Compact, detailed consideration of these matters is outside the scope of this LTDLE factors review.

## **4** Conclusions

#### Overview:

The ACT is considering the potential grant of new entitlements on the Murrumbidgee River just upstream of the point where it leaves the ACT, to the CEWH in the same class as its existing surface water entitlements held by non-Icon water users. The new entitlements would effectively be given a share of the ACT's BDL via the proposed LTDLE factor of 1. No LTDLE factors are proposed for any other entitlements within the ACT.

The ACT have prepared a "future development" surface water scenario (referred to as the SDL scenario) using the Source modelling platform for the catchments and the REALM modelling platform for the urban water supply network, and used the results of this modelling to determine an LTDLE factor for the surface water. The models used to support the development of these BDLs and LTDLE factors have been assessed as being based on the best available information.

The methodology used to determine the LTDLE factors is based on the BDL set out in the Basin Plan (and updated through the accredited ACT WRP).

The ACT have provided assurance that entitlements have not substantially changed from those on issue in 2009.

The methods and assumptions upon which the factor is based have been reviewed and are considered by the reviewers to be appropriate for the ACT water resource management context and the best available at the current time.

As a result, this review endorses the LTDLE factor developed by the ACT, in relation to the proposal to create 6.36 GL of non-urban entitlement on the Murrumbidgee River just upstream of the point where it leaves the ACT, that may be granted to the Commonwealth Environmental Water Holder.

If there are additional proposals to offer larger volumes of water for the environment (at the same location or another location within the ACT), or to amend the existing policy position that no restrictions will be applied to the annual volume available to non-urban entitlements that are used in-stream, further review of the appropriateness of the LTDLE factor may be required.

#### In detail:

The ACT has clearly set out how the proposed LTDLE factor has been calculated.

The surface water BDL is the ACT's use limit under the Basin Plan at 1 July 2009, which is the Murray-Darling Basin Ministerial Council Cap on diversions for the ACT. It is noted that for the ACT, this Cap is higher than current actual use, for a range of reasons including the implementation of water use efficiency initiatives, and was an agreed volume that was not determined by modelling.

The current water use within the ACT is sufficiently below the BDL that apportioning a share of the BDL to the CEWH entitlements (6.36 GL) using an LTDLE factor of 1 will not initially affect the existing water uses. Icon Water holds the majority of all water entitlements in the ACT, with 71 GL of WAEs for urban use. Of Icon Water's entitlements, 70 GL cannot be traded. The current net use by Icon

Water is modelled to be 19.9 GL/year. OoW staff advised that the ACT Government will manage net use of water to remain within the SDL.

It is noted that the entitlements recovered for the environment are unlikely to be taken from the river in the way that consumptive entitlements are, and water accessed under the new entitlement proposed by the ACT will remain in-stream to achieve environmental outcomes. This water will need to be protected from take within NSW. It is understood that management rules to protect water accounted under the proposed entitlement for the Commonwealth Environmental Water Holder are currently being developed by NSW.