



Australian Government



Sustainable diversion limit (SDL) accounting framework improvement strategy 2020 – 2025

May 2020

Published by the Murray–Darling Basin Authority
MDBA publication no: 24/20
ISBN (online): 978-1-925762-91-4



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Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray–Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

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Executive summary

Sustainable diversion limits (SDLs) are critical elements of the Basin Plan and represent the long-term average annual limit of consumptive water that can be used in each surface water and groundwater management unit of the Murray-Darling Basin. Assessment of compliance with the SDLs is a core regulatory activity of the Murray-Darling Basin Authority (MDBA) and formally commenced on 1 July 2019.

Compliance with the SDLs will be reported through a system of accounts defined by the *Water Act 2007* (Cwlth) and the Basin Plan 2012. During the transition period to SDL compliance (2012/13 to 2018/19), the MDBA has trialled and published comprehensive and illustrative SDL accounts in transition period water take reports. This SDL accounting framework aims to support a smooth transition to enforceable SDL compliance from 1 July 2019, pending the formal accreditation of all water resource plans (WRPs).

Given the significance of SDLs to Basin Plan outcomes, the SDL accounting framework needs to be recognised as credible and transparent. Ahead of the formal commencement of SDLs, the MDBA engaged an independent panel of experts to review the robustness of the SDL accounting framework. This independent panel analysed progress made to date in SDL accounting and identified opportunities for improvement. While they found the framework conceptually sound, they recommended a range of risks that need to be addressed for continuous improvement and to ensure integrity. The independent panel recommended that the MDBA develop a program of investigation, engagement and communication to address the identified risks.

The MDBA has considered the independent panel's findings and recommendations and has developed a six-year prioritisation schedule presented in this improvement strategy to guide progress against the issues raised. These include material risks to the delivery of the Basin Plan as well as risks to the perception and communication of the SDL accounting framework.

In developing the improvement strategy towards the planned 2026 Basin Plan review, the MDBA prioritised activities by considering the volumetric risk profile of each issue in relation to the SDL accounts, both the MDBA and Basin State's capacity and capability to perform the work, linkages to relative external information improvements and other Basin Plan policy-related timeframes.

This improvement strategy prioritises the identified activities across three tranches (i.e. 2020-2021, 2022-2023 and 2024-2025) and across two categories (i.e. those activities that are core to the SDL accounting framework and those activities that influence the context within which the SDL accounting framework operates). The strategy is not static and prioritisation of activities within it will be re-prioritised as required by legislative, stakeholder, process and environmental needs.

This improvement strategy is intended to communicate broadly to both Basin states and to other stakeholders how improvements will be prioritised by the MDBA over the period. It is not intended to be a detailed work plan, and it is noted that the specific scope and treatment options of some activities are yet to be determined.

The MDBA will work with Basin state governments and relevant stakeholders including the Bureau of Meteorology, the Department of Agriculture, Water and the Environment and the Commonwealth Environmental Water Office to implement this improvement strategy. It does not detail each organisation's responsibilities for the activities and therefore does not consider resourcing. More detailed

work planning, including specific treatments, responsibilities and resourcing will be further negotiated between MDBA, Basin states (via the Basin Officials Committee Alternates group) and other stakeholders as specific activities are progressed.

This improvement strategy is dynamic and adaptable and the MDBA will consider re-prioritising activities, noting activities that are brought forward may cause other activities to be delayed. The MDBA commits to report on implementation progress of this improvement strategy at the end of each tranche.

Background

The sustainable diversion limit (SDL) accounting framework

The Murray–Darling Basin Plan 2012 aims to strike a balance between access to water for Basin communities while also providing water for the environment for the benefit of all Australians. At its core, the Basin Plan sets sustainable diversion limits (SDLs), which limit the amount of consumptive water that can be sustainably taken from the surface and groundwater resources of the Basin for use by towns and communities, irrigators and farmers. The SDLs reflect an environmentally sustainable level of take and underpin the achievement of the Basin Plan outcomes. They cover take from watercourses and regulated rivers, floodplain harvesting, runoff dams, commercial plantations (net take), basic rights and take from groundwater.

SDL compliance commences from 1 July 2019. However, this is contingent on Basin state water resource plans (WRPs) being formally accredited by the Commonwealth Minister for Water. The MDBA has bilateral agreements in place with state governments which allow SDL accounting to commence prior to the full accreditation of all WRPs. SDLs are implemented through WRPs which provide the mechanisms for limiting take to the SDLs. Each SDL applies to a geographic area within or encompassing a WRP area, known as an SDL resource unit. Specified as long-term average volumes, SDLs are determined relative to the amount of water that was used prior to the Basin Plan being implemented, i.e. baseline diversion limits (BDLs)¹. To achieve the SDLs for all surface water and two groundwater SDL resource units, the BDL is reduced by a target environmental water recovery volume and/or an amount determined through the sustainable diversion limit adjustment mechanism (SDLAM). Except for two areas, groundwater SDLs are equal to or higher than the BDLs because water take may be increased sustainably in many groundwater systems².

Assessing SDL compliance is one of the MDBA's core regulatory activities which undertaken through the SDL accounting framework. Critical to implementing and enforcing the SDLs is a system of accounts that keep track of how much water is taken each year from Basin SDL resource units. The *Water Act 2007* (Cwlth) and the Basin Plan 2012 define the requirements for such a system of accounts and is known here as the SDL accounting framework. Basin states provide water data to the MDBA in accordance with sections 32 and 71 of the *Water Act 2007* (Cwlth) and Matter 9 of Schedule 12 of the Basin Plan. Using this data, the MDBA must establish, maintain and publish a Register of Take (Basin Plan s.6.08). The Register of Take calculates and reports the determination of compliance with the SDL for an SDL resource unit in the water accounting period (water year). Simply, it presents a comparison of the water taken each year with the limits for the year determined under the relevant accredited WRP.

¹ In the Basin Plan, surface water BDLs are described in Schedule 3 and surface water SDLs described in Schedule 2. For groundwater, BDLs and SDLs are set out in Schedule 4.

² SDLs are explained on the MDBA website <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits>

During the transition period, the MDBA, in cooperation with Basin states and other data providers, trialled the SDL accounting framework and published (2012-13 through 2017-18) or will publish (2018-19) the illustrative accounts in transition period water take reports³. During this transition period, the MDBA also published the *SDL Reporting and Compliance Framework*⁴ (2018), which outlines the process by which a Basin state's claim for reasonable excuse will be considered. The transition period of trial SDL accounts is to ensure a smooth transition of SDL reporting and compliance assessment from the 2019/20 water year.

Independent panel review of the SDL accounting framework

As a key element of the Basin Plan, the MDBA is committed to ensuring that the SDL accounting framework is credible and transparent, with continuous adaptation and improvement that ensures that best practice in water management is applied.

Noting progress of the trial SDL accounting framework in the transition period and ahead of formal commencement of SDL compliance, the MDBA commissioned an independent panel of three experts to review progress to date and identify opportunities for improving processes.

To ensure that best practice is applied, the independent panel reviewed the SDL accounting framework against the Organisation for Economic Co-operation and Development's (OCED's) *Health Check for Water Resources Allocation Criteria*, as well as against refined criterion more applicable to the context of water accounting in the Murray-Darling Basin. In its final report of 23 June 2019⁵, the independent panel review found that, "*on the whole, the SDL accounting frameworks that are being trialled by MDBA are conceptually sound*".

The independent panel also identified a range of risks that directly impact the SDL accounting framework, as well those which sit outside the framework but may impact the context within which the SDL accounting framework operates and may affect public confidence in it. Of these issues, transparent communication of the assumptions and uncertainties in the SDL accounting framework was highlighted as key to increasing awareness and demonstrating continuous improvements. The independent panel recommended that the MDBA consider establishing a quality assurance process for all aspects of the accounts and outlined the need for the MDBA to develop a program of investigation, engagement and communication to address the issues identified in the review based on their materiality and risk profile.

This improvement strategy is the MDBA's quality assurance process. It is the response to how the identified risks will be addressed and the priority they will be given over the three tranches from 2020 to 2025.

³ <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/transitioning-cap-sustainable-diversion-limits>

⁴ <https://www.mdba.gov.au/basin-plan-roll-out/basin-wide-compliance-review/sustainable-diversion-limit-reporting-compliance>

⁵ <https://www.mdba.gov.au/publications/independent-reports/sdl-accounting-%E2%80%98health-check%E2%80%99-independent-panel-review>

Basin Plan implementation to date

In 2013, all Basin jurisdictions agreed to the *Murray-Darling Basin Plan 2012 Implementation Agreement*⁶, which was enabled through a collaborative work plan monitored by the Basin Plan Implementation Committee (BPIC). The Implementation Agreement sets out the commitments made by all parties, including:

- to work collaboratively and innovatively to address challenges as they arise, and
- to commit to a long-term and adaptive management framework.

The improvement activities detailed in this strategy are part of the adaptive management approach. Although the methods for determining SDL compliance are accredited as part of WRPs, all jurisdictions have a responsibility for continuous improvement. It should be noted that this strategy does not oblige the parties to new work outside the Implementation Agreement. Instead, it consolidates improvement areas that have been determined through the Basin Plan implementation and WRP development processes to date. Many of the improvement activities are already underway and are considered core responsibilities of Basin jurisdictions.

⁶ <https://www.mdba.gov.au/publications/policies-guidelines/basin-plan-implementation-agreement>

The SDL accounting framework improvement strategy

The issues identified by the independent panel review, as well as additional issues identified since the review was finalised, have informed the development of this strategy, which is set out in Figure 1. The strategy will guide progress on the identified improvement activities towards the 2026 Basin Plan review. The MDBA notes that work on a number of these activities have already commenced with support from the relevant Basin States. This improvement strategy brings together and prioritises all activities which have been identified to date as important to undertake to improve the SDL accounting framework.

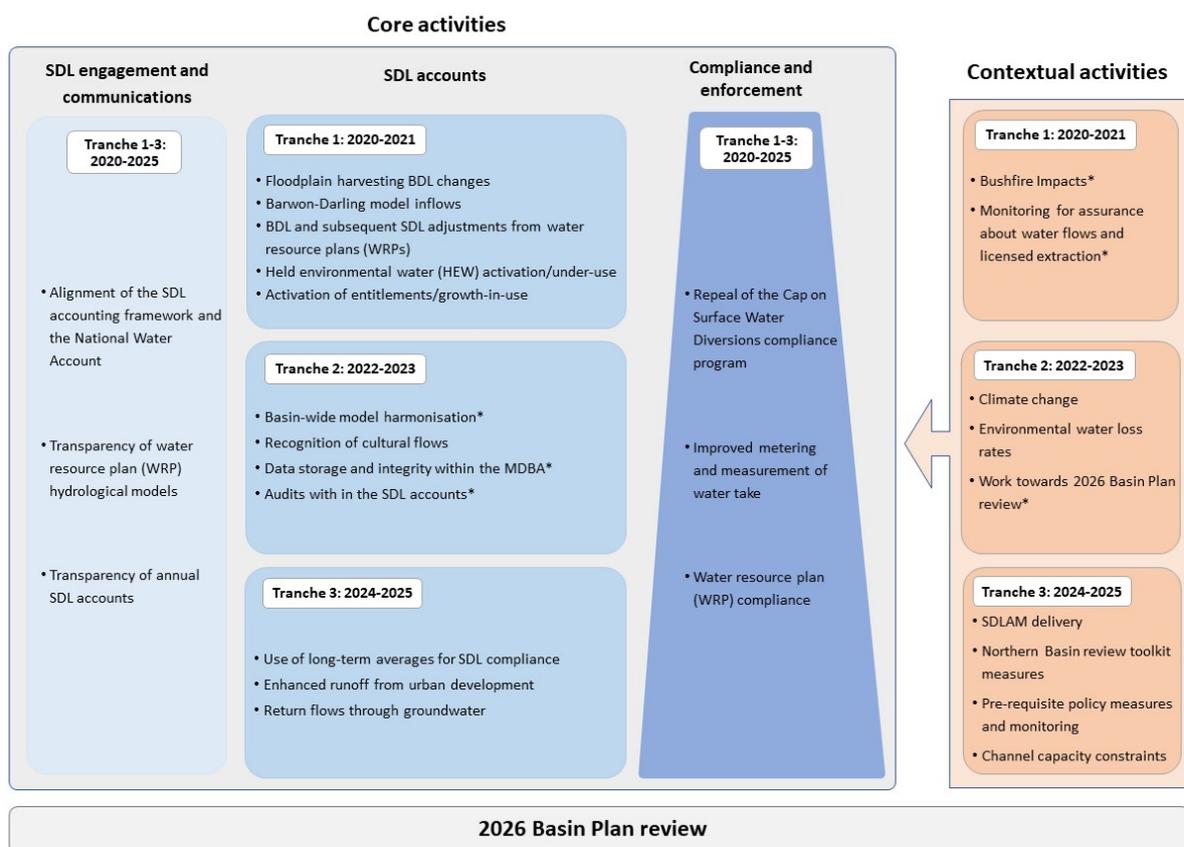


Figure 1: The SDL accounting framework improvement strategy across three tranches and by core activities that directly impact the framework and contextual activities that influence the framework (*additional issues to independent panel review) with the thickness weighting indicating the changes in expected resource intensity required over time.

To determine the priority of each activity for implementation, the MDBA considered several factors including the volumetric risk profile of each issue in relation to the SDL accounts, both the capacity and capability of the MDBA, Basin states and other Commonwealth stakeholders to perform the work, linkages to relative state-based information improvements and other Basin Plan policy-related timeframes.

This prioritisation assessment resulted in activities spread over three tranches of the six-year improvement strategy. These three tranches indicate where in the strategy each activity will be prioritised. It is important to note that the strategy is dynamic and if there are changes to available Basin

State and/or MDBA resources or other changes within the operating environment, then activities within tranches may be re-prioritised.

Across the three tranches, the activities are further separated:

- **Core activities** to the SDL accounting framework, which relate directly to the finalisation of BDLs and SDLs and the accounting for water take in the Basin. To differentiate between the skills and resources required to implement core activities, they are divided into three additional categories: SDL communications and engagement, SDL accounts and compliance and enforcement.
- **Contextual activities** to the SDL accounting framework, which influence the context in which the framework operates and are current ongoing programs. The extent of the impact from these contextual activities is not yet known and may change depending on the progress and outcomes of these activities.

The contextual activities have been prioritised into tranches based on when the MDBA expects work to have progressed far enough to see the possible impact on the SDL accounting framework. For example, the MDBA has already commenced a climate change work program, however the outcome of this program is not yet known, nor how the SDL accounting framework will be impacted. It is expected that possible impacts and an estimation of any work required within the SDL accounting operating environment will be better understood in Tranche 2, 2023-24.

This improvement strategy is adaptable, and activities may be re-prioritised in response to a number of factors present within the Commonwealth or state operating environments. These factors could include resourcing availability, a change in government focus in response to a specific event or a change in government policy. The MDBA will report at the end of each tranche on the implementation progress of the improvement strategy. Any significant activity or prioritization changes will be published on the MDBA website.

Further detail on each activity within the three tranches and across the core and context activities is presented in the next section.

Core activities in the SDL accounting improvement strategy

SDL engagement and communications

Across all identified activities there is a need to communicate and engage with interested parties on the accounting framework. Basin stakeholders need to have confidence that the accounting framework is robust and understand that improvements will be made over time, as part of the adaptive management cycle.

Research has shown there is limited understanding of water management and water reform across the Basin. This is not limited to any one stakeholder group. The level of knowledge required to understand water accounting is detailed and requires an integrated understanding of water management and water reform in the Basin. Broad communication and engagement regarding the basics of water management will be required across the 5-year period, along with targeted engagement on the specifics of water accounting. These communication and engagement activities will aim to increase understanding of water accounting and its role in water reform.

Effective communication is a key activity in the SDL improvement strategy and will be ongoing across all three tranches, noting that each of the other activities also have their own element of communications required. It should also be noted that effective communication is the responsibility of all Basin jurisdictions. Communication efforts should be non-duplicative, with collaboration leading to improved water literacy amongst stakeholders. In addition, these collaborative communication efforts are not confined to implementation of this improvement strategy. There are numerous benefits to improved engagement and increased water literacy across a range of water reform programs.

Alignment of the SDL accounting framework and the National Water Account

Water information (i.e. availability, allocations and take) in the Murray-Darling Basin is owned by the Basin States and reported to the MDBA and the Bureau of Meteorology (BoM). This data is currently reported at a whole of Basin scale by both the MDBA in the transitional period water take reports and by the BoM in the National Water Account⁷ on an annual basis. While both accounts outline concepts such as water available and water used, each account defines these terms differently and the resulting volumes are different. These differences may be confusing to stakeholders and result in misinterpretation and could also undermine confidence in one or both sets of accounts.

The MDBA and the BoM are actively working to align the two accounts with the goal to publish a single Murray-Darling Basin account that meets the needs of all stakeholders and legislative requirements of both agencies. This project will run over tranche 1 and 2 with project completion expected in 2024. An update of progress on this activity will be included in the *Transition Period Water Take Report 2018-19*.

⁷ <http://www.bom.gov.au/water/nwa/about.shtml>

The MDBA and the BOM are also exploring opportunities to avoid duplication of work by sharing of data and other resources. This activity is part of a broader alignment of the work between the MDBA and the BoM with 6 priority areas identified to be streamlined. This project represents efficiencies across multiple Commonwealth agencies and has been identified as a priority with work already commenced.

Transparency of WRP hydrological models

The Independent Panel identified a need to increase the transparency of the hydrological models used in the SDL accounting framework. This modelling will be used for compliance purposes and Basin stakeholders want to understand how decisions are made and compliance is enforced, using these models.

Communication and engagement will be required to raise awareness of the broad approach to compliance across the Basin, as well as focusing on how hydrological modelling is used, how it compares to real world water use and what limitations modelling has in terms of accounting for water use. This includes increasing documentation and understanding of the assumptions, uncertainties, limitations, approaches in modelling and the extent to which inaccuracy in modelling may affect SDL compliance status.

Transparency of annual SDL accounts

The independent panel identified a key area for improvement is stakeholder engagement and transparent communication about the SDL framework inputs, assumptions, uncertainties, risks, and how the MDBA will address these.

As the testing and reporting of the SDL accounts have been developed over the transitional period (2012/13 to 2018/19) prior to SDLs coming into effect on 1 July 2019 (pending accredited WRPs), the MDBA has published a detailed annual transition period water take report. This report has outlined the process for determining compliance with the SDLs as if they were in effect and includes the accounts as well as detailing the annual climatic conditions, policy decisions that affect the accounts and how the annual permitted take and annual actual take are determined. However, this report is currently published as a long pdf report and some stakeholders have found it difficult to quickly and easily locate the information they are looking for.

The MDBA will continue to review and update both the content and format of this report annually and make improvements as resourcing allows. Feedback from stakeholders is welcomed and will be reviewed in this process. This annual review will also consider the progress with other activities in this improvement strategy including stakeholder engagement and communication needs, progress of alignment with the National Water Account and the data storage and integrity project.

SDL accounts

The SDL accounting framework uses the best available data to ensure water is managed to the SDL in the long term, ensuring an environmentally sustainable level of take from our water resources and compliance with the Basin Plan. A number of activities have been identified that will directly affect how data is processed or what specific BDLs or SDLs are.

There are 12 improvement activities identified in the category of SDL accounts. Given the highly technical nature of these activities, there are limited resources within the MDBA and Basin States to address all these at once so they have been prioritised based on volumetric risk and alignment with concurrent activities. This strategy remains flexible and can be adjusted as priorities change, noting available resources means as an activity is brought forward another may be pushed back.

Tranche 1: 2020 – 2021

Six activities have been prioritised for initial focus with work already commenced on these through the development and accreditation of WRPs. The work on floodplain harvesting BDL estimates in particular has been prioritised as it brings a significant volumetric change of existing take into the compliance framework.

Floodplain harvesting BDL changes

As estimates of the amount of water taken by floodplain harvesting prior to the Basin Plan are better understood and as existing take is brought under the licensing framework, this requires re-estimation of BDLs and the subsequent SDLs. Changing previous estimates and the issuing of licences ensure that this form of take is robustly measured and can be monitored to make certain use does not exceed the SDL.

Queensland, New South Wales and the MDBA have identified risks associated with the licensing and improved accounting for floodplain harvesting take as both members of the public and water users may misunderstand the accounting process thinking more water is available for use, which is not the case. The MDBA and Basin states have undertaken to ensure that effective communication of changes to BDLs and SDLs because of better accounting of floodplain harvesting⁸ is shared with stakeholders.

This work has been prioritised in tranche 1 due to the high volumes of water associated and the high risk of mis-communication with stakeholders and the general public. This work has been ongoing throughout the development of WRPs and will continue before being finalised in 2022.

Barwon-Darling model inflows

With the development of the Barwon-Darling WRP by the NSW Government, the Barwon-Darling watercourse annual permitted take model will be updated to utilise the modelled outflows from water models upstream as inflows. This will improve the ability of NSW to assess water take compliance and ensure consistency in approach across the Basin. This will be assessed as part of the WRP assessment and accreditation process to ensure the model is robust and meets Basin Plan requirements. Improved

⁸ <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/floodplain-harvesting-overland-flows>

information inputs may cause a flow on effect to the BDL and SDL although this does not necessarily mean there is more water that can be taken.

Improving the Barwon-Darling model work has been commenced and initial efforts are expected to be most intensive in 2020-21 to align with WRP accreditation timelines. This activity has been prioritised into tranche 1 due to ensure consistency between data used in models, potential BDL and SDL changes and the compliance history in the SDL resource unit and SDL resource units further down the river system.

BDL and subsequent SDL adjustments from WRPs

As part of the development and accreditation of WRPs, Basin States have proposed new BDL estimates. These must be scientifically robust, reflect the best available information and consistent with the Basin Plan's surface water BDL descriptions in Schedule 3, noting BDLs re-estimations will consequently affect the SDLs. As with other core activities, the main risk of increasing BDLs and SDLs is the possible mis-interpretation of an increased volume of water being able to be taken from the river. (Note that groundwater BDLs and SDLs cannot be changed without an amendment to the Basin Plan.) The MDBA has identified that the review of the Source Murray Model, due to be completed by June 2021, may be one example of a potential future BDL and SDL change resulting from a WRP.

As WRPs continue to be accredited, any BDL changes will be communicated through the ongoing maintenance of existing communication products or new communication products as required. This activity has been prioritised in tranche 1 to align with the expected timeline of the WRP accreditation process.

Held environmental water (HEW) activation/under-use

Held environmental water (HEW) is water that is allocated solely for environmental purposes or to achieve an environmental outcome. HEW use does not directly contribute to SDL compliance as SDLs are limits on consumptive use only. However, the SDL accounting framework does report on HEW entitlements and use through the requirements of section 32 of the *Water Act 2007* (Cwlth).

Many HEW rights are owned by the Commonwealth Government and have been acquired through water recovery programs as part of implementation of the Basin Plan. They were previously used for consumptive purposes and may not have been fully utilised. In the future, increased use of these rights (i.e. increased activation of HEW) may change the water available to other similar entitlements and/or activate growth-in-use provisions. These are pre-existing issues based on the way entitlements are specified in state statutes. Such impacts could potentially undermine confidence in the SDL accounting framework.

The MDBA has committed to monitor use of HEW entitlements. A preliminary review of existing data with an examination of trends will be undertaken and published in future water take reports. Given the potential perceived or real impact this issue may have on water users, this activity has been prioritised in tranche 1 and analysis has already commenced.

Activation of entitlements/growth-in-use

There has been concern raised that issued entitlements in the Basin were not fully utilised when the BDL was set. This means that if entitlement holders choose to fully use these entitlements in the future, there may be a change in the water available to other similar entitlements, 'growth-in-use' provisions may be

activated or planned environmental water may be impacted in the short term, potentially undermining the confidence of water users' in the SDL accounting framework. Again, these are pre-existing issues based on the way entitlements are specified in state statutes.

The MDBA recognises this risk and has committed to monitoring level of entitlement activation annually through the Register of Take and assessment of SDL compliance. If excess growth in use (defined as growth greater than 20% of the SDL) is detected in the accounts, the MDBA and the individual Basin state will agree upon compliance actions as per the process outlined in the *SDL Reporting and Compliance Framework* (MDBA, 2018).⁹

Tranche 2: 2022 – 2023

In tranche 2 of the core activities to SDL accounts, the four activities detailed are part of a planned program of work in the MDBA. As a result, they are prioritised here based on the timeframes defined in the work programs for these activities.

Basin-wide model harmonization

Throughout the development of WRPs, a number of hydrological models were updated to reflect best available information, these models are used to determine annual permitted take in a system. These model improvements were largely done on each model in isolation due to the sequencing of WRP development and accreditation, as well as time and resourcing constraints. A whole-of-Basin sequencing is required as this process means that the lower Basin reaches have not incorporated any notable changes that may have arisen in the upper Basin reaches.

By 31 January 2023, the MDBA has committed to commence a Basin-wide model harmonisation that will run the models in sequence from the top of the Basin to the bottom ensuring the outflows from one match the inflows to the next to ensure best representation of SDL conditions. If this model harmonisation identifies any changes required to a WRP model, this will be undertaken by Basin States through an amendment to the WRP and may lead to a BDL or SDL change.

This is consistent with the agreement to move toward a national hydrological modelling platform as agreed by the Council of Australian Governments (COAG) in the National Hydrological Modelling Strategy¹⁰. This activity has been prioritised in tranche 1 to ensure that any major changes to accredited WRP model inflows are identified as soon as possible and any WRP amendments made if required.

Recognition of cultural flows

Cultural flows are expected to become an increasingly important aspect of Basin water planning and management. Cultural flows are defined as “water entitlements that are legally and beneficially owned by the (First) Nations and are of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Nations”¹¹.

⁹ <https://www.mdba.gov.au/basin-plan-roll-out/basin-wide-compliance-review/sustainable-diversion-limit-reporting-compliance>

¹⁰ <https://www.mdba.gov.au/managing-water/water-resource-modelling>

¹¹ <https://www.mdba.gov.au/about-us/partnerships-engagement/aboriginal-partnerships-programs>

Following the completion of the National Cultural Flows Research Project in 2018, Northern Basin Aboriginal Nations (NBAN) and Murray Lower Darling Rivers Indigenous Nations (MLDRIN) are working with Aboriginal Nations across the Basin to work through the cultural flows assessment methodology developed in the project, ultimately developing cultural flow management plans.

As this work progresses, funding becomes available for the purchase of cultural and economic water entitlements and Basin states consider how to support cultural flows (including through WRPs), it will be increasingly important to explicitly integrate reporting of cultural flows into the SDL accounting framework. This will include the development of a conceptual basis to correctly account for cultural flows that are used for consumptive and non-consumptive purposes.

Whilst work has been ongoing with the development of cultural flows for some time, the project has not yet progressed far enough to begin considering how they will need to be considered in the SDL accounting framework. At this stage, the MDBA is expecting work to begin from an SDL accounting framework perspective in tranche 2. However this timeframe will be flexible as required.

Data storage and integrity within the MDBA

The SDL compliance determination process currently involves manual data entry, validation and cleansing of large volumes of information supplied by each Basin state on an annual basis.

The MDBA is scoping a project to develop an underlying solution to enable a more automated SDL compliance database. The MDBA has already commenced consultation with Basin states and the Bureau of Meteorology to determine project requirements.

The proposed database will support the integrity, transparency and accessibility of Basin water use data and subsequent compliance decisions. In addition, the database will help the MDBA to more efficiently fulfil the timely publication requirements of the Register of Take and the annual water take report. The development of this database is already underway with implementation expected in tranche 2.

Audits within the SDL accounts

Basin Plan s.13.10 provides that the Authority may conduct periodic audits to assess compliance with the Basin Plan and may publish resulting findings. To ensure integrity and confidence in the SDL accounting framework whilst encouraging continual improvement in reporting processes, the MDBA will undertake regular audits and assurance reviews. There are broadly two types of audits: at the SDL resource unit scale and at smaller scales. It is those SDL resource unit audits that will be most directly related to the SDL accounts.

An independent audit will be conducted of the MDBA's systems and processes for the 2019-20 water year once the first non-transition period water take report has been published (i.e. after March 2021). Further, the MDBA will prioritise up to two SDL resource units each year upon which to conduct a data audit, and this could potentially be interspersed with "progressive assurance audits". Progressive assurance audits are for other matters related to SDL compliance.

In addition to audits as the SDL resource unit scale for the purposes of SDL compliance, the MDBA may also conduct audits at smaller scales. As outlined in the *Compliance and Enforcement Policy 2018-21*¹², the MDBA will separately audit and follow up any concerns that it becomes aware of that a Basin state is not appropriately managing any claims of non-compliance at an individual level.

While the MDBA may undertake audits within the SDL accounts at any time, this activity has been prioritised into tranche 2 as it aligns with the timing of the first independent audit of the 2019/20 accounts as set out in the *SDL Reporting and Compliance Framework (2018)*.

Tranche 3: 2024 – 2025

The volumetric risk profile for the three issues detailed here are lower than the issues detailed in tranche 1 and 2. As a result of this and other considerations, they are part of tranche 3 core activities to SDL accounts. Further, MDBA resourcing to consider these issues will be available in tranche 3 noting other higher priorities in tranches 1 and 2.

Use of long-term averages for SDL compliance

For the interception activities *take by runoff dams, net take by commercial plantations* and other activities, water use is not accounted in the rigorous way that take from regulated rivers is accounted. As a result, the data reported under the requirements of s71 of the *Water Act 2007* (Cwlth) are based on long-term average estimates and generally equivalent to the BDL estimates, which is based on the best information available when those estimates were made.

Investigation will begin in 2023 on how more accurate estimates, which could potentially vary annually, for take by interception could be determined. This will be a resource intensive task as it will involve all Basin states and a complex mix of forms of take. Until this work begins, the MDBA will maintain existing communication about this issue and its associated risks. Compared to other activities in the SDL accounting improvement strategy, the associated risk is currently understood to be lower, so this activity is prioritised in tranche 3.

Enhanced runoff from urban development

As urban development increases the extent of surfaces covered by concrete or other impervious surfaces in our landscape, water that would have otherwise soaked into the ground will run off into our river systems. Currently, the BDL and SDL accounts do not recognise these possible increased flows, but instead focus on the various forms of take from the systems as listed in Basin Plan Schedule 3.

There is growing interest from Basin states to quantify the impact of urban development on local and system flows and incorporate this into the SDL accounting framework. This activity is anticipated to be resource intensive as it will involve all Basin states and involve re-evaluating the urban development impact. Whilst important, this activity has been prioritised in tranche 3 due to the resources required and the volumes involved are smaller and lower risk than activities prioritised in earlier tranches. It is noted that some Basin states may commence work to quantify this earlier than 2024, and the MDBA will consider state progress made at that time.

¹² <https://www.mdba.gov.au/sites/default/files/pubs/MDBA-Compliance-and-enforcement-policy-2018.pdf>

Return flows through groundwater

Within the MDB, a large number of rivers are connected with groundwater systems. Where water is used in irrigation and not taken up by the plantings, this excess water will make its way through the groundwater system back to the river. Stakeholders have raised concerns that irrigation projects that increase water use efficiency as well as increased SDLs in groundwater systems may lead to less water returning to the river through these return flows. The concern is that this in turn offsets the benefits of surface water recovery projects for the environment.

In response to these concerns, the MDBA commissioned an independent review of the risks posed by these activities (i.e. return flows)¹³. The review found that reduced return flows are not undermining the outcomes that can be achieved through the Murray–Darling Basin Plan. It also stated that the MDBA needs to continue to monitor and improve understanding of return flows so that the uncertainty of the estimates can be reduced. The MDBA recognises the need for more work in this area. However, based on the independent review, considers the risks of this activity are low and as such work has been prioritised into tranche 3.

¹³ <https://www.mdba.gov.au/publications/independent-reports/return-flows-independent-review>

Compliance and enforcement

Through the *Water Act 2007* (Cwth), Basin Plan and accredited WRPs, the MDBA regulates water users and managers including Basin state governments across the Basin. Basin state governments are responsible for ensuring state compliance systems are effective and for enforcing the rules. The three compliance and enforcement activities detailed within this strategy relate to those for which the MDBA has responsibility. It does not detail compliance and enforcement activities that are the responsibility of Basin state governments. Broadly, the MDBA's *Compliance and Enforcement Policy 2018-2021*¹⁴ outlines its regulatory approach, and each Basin state government may have different approaches.

Compliance and enforcement is an ongoing function of the MDBA and, with the exception of the repeal of the Cap on diversion compliance program which will be completed as soon as possible, these activities will be ongoing across all three tranches.

Repeal of the Cap on Surface Water Diversions compliance program

Introduced in 1995, the Cap on Surface Water Diversions (the Cap) introduced long term limits on how much water could be taken from rivers in 24 designated river valleys. The commencement of the Basin Plan in 2012 began the transition of Cap to the current SDL compliance program, which commenced from 1 July 2019, through accredited WRPs and bilateral agreements with Basin States where WRPs are not yet accredited. The Cap compliance program does not automatically cease with the commencement of SDLs, instead it will continue to run in parallel with SDL accounting under Schedule E of the Murray-Darling Basin Agreement. This will continue until the Murray-Darling Basin Ministerial Council (MinCo) agrees to change or repeal at least the reporting and assessment requirements of Schedule E of the Murray-Darling Basin Agreement.

The MDBA has commenced working with Basin states to allow the repeal of Schedule E, and it is anticipated that MinCo will make that decision once all WRPs are accredited and formally in place to support SDL compliance. Stakeholder communication regarding the cessation of Cap compliance will be important to support public understanding of this process. This activity has been prioritised in tranche 1 to align with expected WRP accreditation as well as the obvious efficiency benefits of operating only one compliance process, noting this is a lengthy process which may take up to two years to achieve.

Improved metering and measurement of water take

As stated in the *Compliance and Enforcement Policy 2018-2021*, improving metering and measurement of water take is one of the MDBA's core regulatory roles. The MDBA recognises that accurate measurement is critical to managing the Basin's water resources and water compliance and is undertaking multiple concurrent activities to improve the metering and measurement of water take.

Through the Murray-Darling Basin Compliance Compact¹⁵, the Basin states committed to a series of actions to improve the metering and measurement of water extracted from the Basin. This included

¹⁴ <https://www.mdba.gov.au/sites/default/files/pubs/MDBA-Compliance-and-enforcement-policy-2018.pdf>

¹⁵ <https://www.mdba.gov.au/sites/default/files/pubs/Basin-Compliance-Compact-12-December-2018.pdf>

actions to improve the quality and coverage of water information for compliance and enforcement, including from hydrometric networks and hydrologic models.

Under the Compact, in 2019, Basin states were required to review their water requirements, and publish a water improvement program to address any gaps or issues. States are required to report annually on progress against the improvement program and conduct a five-yearly review of their water information systems. The MDBA reports annually on the progress and performance of states meeting their Compact commitments.

Separately to this, the MDBA is also coordinating the Metrological Assurance Framework project, a joint initiative with all Australian governments to make it easier for water users to select meters that are compliant with the Australian standard for accuracy, and to maintain meters throughout their life. This work will improve and increase confidence in the quality of meter data which is used for SDL reporting.

WRP compliance

The *Water Act 2007* (Cwlth) requires that an agency of a Basin state, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The *Compliance and Enforcement Policy 2017-2021* identifies SDL compliance and enforcement as one of the MDBA's key compliance areas, where SDL non-compliance is a subset of WRP compliance.

The MDBA will monitor and enforce compliance of all regulated entities with accredited WRPs. The MDBA will also identify and monitor risks to non-compliance with WRPs through a regular and annual risk assessment process, which informs compliance and enforcement activities. The MDBA ensures compliance with the SDLs by coordinating SDL accounting and assurance, monitoring SDL compliance and regulating SDL non-compliance.

While WRP compliance may be monitored or audited in line with the SDL Reporting and Compliance Framework, the importance and intensity of this work is expected to increase from 2020 onwards at the end of the 2019-20 water year.

Contextual activities

These activities are work programs in their own right and influence the context within which the SDL accounting framework operates. There are nine activities included in this section that may or may not impact directly on the SDL accounting framework. The indirect impacts may include policy decisions regarding the effectiveness of the Basin Plan and SDLs to achieve their intended outcomes. These contextual activities are included here to recognise the need for the SDL accounting framework to ensure the continued use of the best available information and be adaptive as provided for in the Basin Plan.

These activities are underway through other work planning and resourcing agreements between Basin jurisdictions. They have been prioritised in tranches that reflect the point of the process when they have progressed enough to consider the impacts on the SDL accounting framework.

Tranche 1: 2020 – 2021

Bushfire impacts

The 2019-2020 summer bushfires across the Basin will have ongoing impacts that may need to be considered in the SDL accounting framework in the future. This is because the large scale and intensity of this event has not been seen in Australia over the historical climatic sequence (1985-2009) which is used to determine SDLs. Given the recent nature of these events, the impacts and possible consequences have not yet been assessed or realised. The MDBA will monitor and consider policy implications as they arise.¹⁶

Monitoring for assurance about water flows and licensed extraction

The MDBA is building its capacity to use remote sensing technology to monitor water flows as they occur across the Basin¹⁷. For compliance purposes, the data from satellite imagery, combined with hydrological (gauge flow data) analysis, allow the MDBA to identify unexpected changes in the landscape and/or rivers, including any changes in flow that may be the result of unauthorised take. Some of this work is done at the request of other agencies, such as Basin state regulatory agencies or other Australian Government agencies.¹⁸

This monitoring allows the MDBA to ensure the water take volumes reported by the Basin State Governments largely matches on ground evidence and provides assurance that the SDLs are being met and gives credibility to the MDBA.

Tranche 2: 2022 – 2023

Climate change

The SDL framework uses a long-term climate record to determine SDLs and is robust in assessing performance against annual variability in climatic conditions. However, the framework has not been

¹⁶ <https://www.mdba.gov.au/managing-water/water-quality/bushfires-water-quality>

¹⁷ <https://www.mdba.gov.au/basin-plan-roll-out/monitoring-evaluation/remote-sensing-our-use-satellite-imagery/>

tested for effects of long-term climate change and the potential impacts on flows or overall resource availability and ecosystem needs.

The MDBA is developing a climate change work program to inform the next Basin Plan review, planned for 2026. A detailed and updated assessment of climate change risks to inform this review is mandated in the Basin Plan (s6.06(3)) and will include risks to SDLs.

Environmental water loss rates

Where water is ordered and delivered for the environment, there is a volume of water which is considered 'lost' and does not flow down the river. Referred to as environmental water 'loss' but is perhaps more appropriately called environmental water use, it is water used by the targeted area of the environment or may be seepage, evaporation and/or transpiration, which are all natural processes. Environmental loss rates have impacts on how much water is able to be shared between the consumptive pools (irrigators, town water supply, etc.) and the environmental pools. It is important that environmental loss rates are as accurate as possible. However, the highly variable nature of these losses is challenging to accurately determine.

Environmental water loss rates in the River Murray system are determined by the Basin Officials Committee (BOC). The loss rates and their review process are detailed in the *Objectives and outcomes for river operations in the River Murray system*¹⁹. The MDBA is in the process of documenting how environmental water is accounted (through the requirements of s.32 of the *Water Act 2007* (Cwlth)) and will undertake a program of work with Basin states to improve environmental water accounting. When updated environmental loss rates are determined, these will need to be incorporated into the SDL accounting framework, specifically in the way held environmental water is accounted, which is expected to occur in tranche 2.

Work towards 2026 Basin Plan review

Ahead of the Basin Plan review in 2026, this activity will reflect on the lessons learnt from Basin Plan 2012 and assess new information and science available since then, including in relation to climate change as described in the MDBA work program above. This program of work, starting in tranche 2 and carrying into tranche 3, will feed into the 2026 Basin Plan review.

¹⁹ <https://www.mdba.gov.au/sites/default/files/pubs/Objectives-and-outcomes-for-river-operations-in-the-RMS-2019.PDF>

Tranche 3: 2024 – 2025

These four activities are ongoing projects outside the SDL accounting framework but may influence BDL/SDL volumes. These projects will be reconciled in 2024 and the outcomes will need to be taken into consideration in the SDL accounting framework. Further details for each project are on the MDBA website.

SDL adjustment mechanism delivery

- SDL adjustment mechanism - <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/sdlam>

Northern Basin review toolkit measures

- Northern Basin review toolkit measures - <https://www.mdba.gov.au/basin-plan-roll-out/northern-basin-projects>

Pre-requisite policy measures and monitoring

- Pre-requisite policy measures - <https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/prerequisite-policy-measures>

Channel capacity constraints

- Channel capacity constraints - <https://www.mdba.gov.au/basin-plan-roll-out/managing-constraints>

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