

INQUIRY INTO FLOODPLAIN HARVESTING

Organisation: NSW Government

Date Received: 16 August 2021



SELECT COMMITTEE ON FLOODPLAIN HARVESTING

NSW Government Submission

August 2021



Published by NSW Department of Planning, Industry and Environment

dpie.nsw.gov.au

Title: NSW Government Submission

First published: August 2021

Department reference number: INT21/113471

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Acknowledgment of Country

The Department of Planning, Industry and Environment acknowledges the Traditional Owners and Custodians of the land on which we live and work and pays respect to Elders past, present and future.

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NSW Government Submission to the Select Committee Inquiry into Floodplain Harvesting

Executive summary

Floodplain harvesting is a historically legitimate practice that was authorised under the *Water Act 1912* and has not been fully transitioned into the licensing framework provided by the *Water Management Act 2000*. Without licensing and measurement, floodplain harvesting in the northern Basin has grown to the point where it now means that the legal limits for extraction of water at a water source scale set by NSW water sharing plans, the *Water Act 2007* (Cwth) and the Basin Plan are exceeded. The majority of the growth in floodplain harvesting in the northern Basin is historic, with for example more than 80% of the growth in on-farm storage volumes since 1994, when the first legal limit, the Cap on surface water diversions, was established, occurring prior to 2008.

Growth in floodplain harvesting has the potential to adversely affect water users and the environment in the floodplain areas where it occurs. Despite this, evidence shows that negative impacts diminish significantly as flows move across vast floodplain areas and downstream. In fact, this evidence suggests that even completely removing floodplain harvesting from the northern Basin and constraining all other activities to remain the same, would only increase average annual water availability in the NSW Murray by less than 1%.

Had the floodplain harvesting regulations not been disallowed by the NSW Legislative Council on 6 May 2021, then the following controls would now be in place to control future increases in floodplain harvesting:

- accurate, reliable and tamper-proof measurement equipment required to be installed on all on-farm water storages greater than 1000ML used for floodplain harvesting, supplying data on water take in near real time
- licences and water sharing rules that deliver significant reductions in floodplain harvesting across the northern Basin, requiring for example more than a 30% decrease in floodplain harvesting in the Gwydir valley
- licences and water sharing rules that deliver significant environmental benefits, for example a predicted improvement of around 140% in some of the environmental water requirements for waterbirds in the Ramsar-listed Gwydir Wetlands
- water sharing rules that manage floodplain harvesting such that water source scale legal limits are met and reduced available water determinations for supplementary access licences are not required. For example, a 50% reduction in allocations for supplementary access licences in the Gwydir valley is currently required to ensure that total diversions comply with legal limits.

History of floodplain harvesting

Floodplain harvesting is a practice that occurs on all floodplains across the Murray-Darling Basin. It is most prevalent and significant on the northern Basin floodplains where the relatively small public water storages mean that water allocations are much less reliable than they are in the southern Basin¹. It is an intermittent practice, because naturally flowing floodplain water across the

¹ [Water availability in New South Wales Murray-Darling Basin regulated rivers](#)

floodplain occurs on average every 5-7 years, although this frequency varies considerably across floodplains.

Prior to 2000 when the *Water Management Act 2000* was introduced, floodplain harvesting was a practice that was allowed under the *Water Act 1912* without volumetric limit. Since 1984, approvals have been required for major floodplain structures, including on-farm water storages and flow diversion banks. The legal limits established through NSW water sharing plans and the Basin Plan take into account the volumes of floodplain harvesting that occurred prior to 2000, because the practice was considered to be lawful under the *Water Act 1912* which applied up until then.

Floodplain harvesting comprises approximately 25% of irrigation water that can be taken under legal limits in the northern Basin valleys of NSW over the long term² and supports economic activity worth in excess of \$650 million per annum on average³.

It should be noted that, for the purposes of this submission, the term 'legal limits' refers to the limits set by legislation to control overall water take at a water source scale. This includes all surface water taken in a particular water source, valley or catchment. In contrast, legal limits do not exist for an individual who floodplain harvests because the regulatory framework does not yet exist. When the regulatory framework commences, irrigators will be issued with a licensed entitlement and accompanying rules that will determine their individual limits. These individual limits will be set to only authorise take so that the existing legal limit of overall take at a water source scale will be met over the long term.

The NSW Floodplain Harvesting Policy

The [NSW Floodplain Harvesting Policy](#) sets out the process by which the NSW Government intends to control, reduce, measure and enforce regulatory requirements for floodplain harvesting, bringing the practice back within legal limits. It sets out the NSW Government's process for bringing floodplain harvesting into the regulatory framework and describes how shares in the resource will be divided between landholders with eligible works⁴.

Enabling regulations are required to implement the policy and the subsidiary [NSW Floodplain Harvesting Measurement Policy](#) in order to:

- a) return floodplain harvesting to legal limits
- b) improve environment and connectivity outcomes
- c) provide clarity for all water users and the Natural Resources Access Regulator
- d) allow for robust near real-time measurement
- e) provide a foundation for adaptive management.

² [Floodplain Harvesting Entitlements for NSW Border Rivers Regulated River System: Model Scenarios Report](#), [Floodplain Harvesting Entitlements for Gwydir Regulated River System: Model Scenarios Report](#), [Floodplain Harvesting Entitlements for Macquarie Cudgegong Regulated River System: Model Scenarios Report](#)

³ [NSW Legislative Assembly Questions and Answers](#)

⁴ Eligible works are works capable of floodplain harvesting that, on or before 3 July 2008, were (1) constructed on a floodplain in accordance with an approval granted pursuant to Part 2 or Part 8 of the Water Act 1912 or the WM Act; or (2) subject to a pending application for an approval to construct the work on a floodplain under Part 2 or Part 8 of the Water Act 1912 or WM Act; or (3) constructed on a floodplain and for which it can be established, to the satisfaction of the Minister for Water, that the department did not require an approval under Part 2 or Part 8 of the Water Act 1912.

Over the past 20 years, the NSW Department of Planning, Industry and Environment (the department) has consulted widely with all stakeholder groups about the policy and its implementation.

Implementation of the NSW Floodplain Harvesting Policy has also been subject to independent peer-review. The [independent review report](#) has been published, with all 48 recommendations accepted by the department and these are being addressed on a valley by valley basis through the implementation of the [NSW Floodplain Harvesting Action Plan 2019](#).

The legality of floodplain harvesting practices (ToR 1a)

The legality of floodplain harvesting has changed through time as a result of legislative changes: namely the move from the *Water Act 1912* (repealed) requirements to the *Water Management Act 2000* requirements. The current legal uncertainty exists because floodplain harvesting that occurred and was considered lawful under the *Water Act 1912* has not yet been fully transitioned into the current regulatory framework under the *Water Management Act 2000*.

Section 57A of the *Water Management Act 2000*, which was inserted into that Act in 2014, enables the making of transitional licensing arrangements for floodplain harvesting. Such arrangements have not been made because the enabling regulations intended to give them effect were disallowed on 6 May 2021. The intent and the effect of these transitional provisions is to convert volumes of water taken as floodplain harvesting into licenced entitlements which limit take to be within the legal limits established by NSW water sharing plans, the *Water Act 2007* (Cwth) and the Basin Plan 2012.

Importantly, the water source legal limits set for each valley reflect the volumes of water taken by floodplain harvesting at a time when it was managed under the *Water Act 1912*. As it currently stands, the transition process is only partially complete. Specifically, historic floodplain harvesting has already been reflected in legal limits, but there are no licences and approvals in place to manage it, nor is there a licensing exemption.

This incomplete legislative framework is difficult to enforce and has resulted in uncertain obligations and outcomes for all stakeholders. Until there is a clear licensing, measurement and enforcement framework, the current situation will likely persist, although this is contingent on water user behaviour and the actions of the independent Natural Resources Access Regulator. For clarity, the current situation means that the management and measurement of floodplain harvesting will not improve, and reduced allocations to supplementary licences will continue to be used to offset where growth in floodplain harvesting has resulted in overall extraction from a water source now being above legal limits.

The water regulations published on 30 April 2021 (ToR 1b)

On 30 April 2021, the following regulations, which would have amended the *Water Management (General) Regulation 2018*, took effect:

- the Water Management (General) Amendment (Floodplain Harvesting Access Licences) Regulation 2021,
- the Water Management (General) Amendment (Floodplain Harvesting Measurement) Regulation 2021, and
- the Water Management (General) Amendment (Exemption for Rainfall Run-off Collection) Regulation 2021.

These regulations were disallowed by the Legislative Council on 6 May 2021. The regulations would have had the following outcomes, had they not been disallowed:

1. They **gave legal effect** to [NSW Floodplain Harvesting Policy](#) (2013) and the [NSW Floodplain Harvesting Measurement Policy](#) (2020), which set out the licensing and measurement requirements. The NSW Floodplain Harvesting Policy was consulted on in 2008 and 2010. It was first published in 2013 and amended in 2018 to incorporate community feedback and lessons learnt during implementation. The NSW Floodplain Harvesting Measurement Policy was subject to public consultation in 2018 and 2020 and was first published in 2020.
2. The regulations also gave effect to a limited state-wide exemption for runoff from areas developed for irrigation agriculture that is collected in irrigation tailwater return drains⁵. Whilst this state-wide exemption is important to the implementation of floodplain harvesting licensing and measurement requirements in the northern Basin, it also provided legal clarity for water users in the southern Basin valleys of NSW.
3. A temporary licence exemption for certain works ahead of commencement of the licensing framework was also proposed. Following consultation, this amendment was not adopted.

Consultation on the proposed regulations

To assist consultation on the proposed changes, the department developed a comprehensive set of [resource materials](#). Communication was via a broad ranging advertising campaign encouraging submissions that had a reach of 1.5 million people.

The department consulted with the public on the proposed amendments between 23 November and 20 December 2020. The department received 236 submissions, many supported the changes and focused on the opportunity for improved clarity and certainty. Those that did not support the proposed changes disagreed with the existing policy or legislative settings. Making changes to these settings was clearly communicated as being outside the scope of the submission process, which was focussed on seeking comments on the drafting of the regulations.

The regulations that were to amend the *Water Management (General) Regulation 2018* commenced on 30 April 2021. Consultation materials and [‘what we heard’ reports](#) for each of the separate amendments were published for transparency and are available on the department's website.

⁵ The capture of runoff through tailwater drains is a practice that occurs across the Murray-Darling Basin and is prevalent in both the northern and southern Basin valleys of NSW. Specifically, the exemption would remove this proportion of rainfall runoff from the definition of floodplain harvesting and hence water taken under the exemption would no longer form part of floodplain harvesting licences or their measurement requirements. Reports detailing these changes are available online. The development of a state- and Basin-wide approach to accounting for any increase in runoff taken through irrigation tailwater drains is proposed to enable any growth in this form of water take to be managed as an interception activity under the Basin Plan.

How floodplain harvesting can be licensed, regulated, metered and monitored so that it is sustainable and meets the objectives of the Water Management Act 2000 and the Murray-Darling Basin Plan (ToR 1c)

The legal limits established through NSW and Commonwealth legislation are intended, by definition, to define the water that may be taken sustainably from each water source. NSW water sharing plans provide the regulatory control required to enforce these legal limits. The regulation of floodplain harvesting practice through the imposition of licences is needed to bring floodplain harvesting take within the water source limits defined by these plans in a way that does not impact on the rights of other water users. With a regulatory framework in place, future growth in floodplain harvesting can be reduced through transparent available water determinations for that specific activity. Without the framework in place, other water users, such as supplementary access licence holders, must bear the impact of growth in unregulated floodplain harvesting through reduced water allocations.

The objects of the *Water Management Act 2000* require the sustainable and integrated management of the water sources of NSW for the benefit of both present and future generations. Licensing and measurement provide for the orderly, efficient and equitable sharing of water from these water sources and between all water users and the environment as required by the *Water Management Act*. Implementation of the [NSW Floodplain Harvesting Policy](#) through water sharing plans will provide regulatory clarity about who is and is not entitled to harvest water from the floodplain. It will also result in significant restrictions to current levels of floodplain harvesting in valleys where it is necessary to return diversions back from current levels to legal limits. For example, a reduction of 30% in water taken by floodplain harvesting in the Gwydir valley is required, which is likely to deliver significant benefit to localised areas and river reaches. The proposed rules strengthen the legislative protections for the environment and downstream water users and provide the foundation for improved management over time.

The department has prepared a document that explains how the proposed water sharing plan rules for the [Border River Regulated River Water Source](#) meet the objects and principles of the *Water Management Act 2000*. The department has also produced documents for the [Border Rivers](#), [Gwydir](#) and [Macquarie](#) valleys that explain the proposed changes to draft water resource plans. Notably, as well as reducing water take across the northern Basin, licensing floodplain harvesting will improve water accounting and provide better means of ensuring compliance with sustainable diversion limits.

Downstream flows and critical human and environmental needs

Much of the concern expressed by stakeholders about floodplain harvesting relates to river health and water access during extended dry periods. This is despite floodplain harvesting being a practice that is only available during wet periods when there has been sustained heavy rain causing either localised or widespread flooding.

Current analysis indicates that there is no evidence to support a proposition that floodplain harvesting is occurring during cease to flow events or that it could be considered to be contributing to either starting the cease to flow period sooner or extending the cease to flow event in a meaningful way. See the [floodplain harvesting library](#) for more information on this analysis.

Whilst it is acknowledged that floodplain harvesting, like all water extractions, has downstream impacts, it is not possible with current river system models to estimate and assess the effectiveness of event-based restrictions to floodplain harvesting in delivering any specific downstream flow outcome. This is currently beyond the capability of any river system model in Australia. Whilst event-based management of floodplain harvesting extractions cannot be

practically implemented as a routine management tool, the practice can be temporarily restricted in situations when this may compromise downstream critical human and environmental needs, as was the case in February 2020 (the ‘first flush’ response).

Infrastructure, policy and planning options that could lead to improved connectivity across the northern Basin are being actively considered and consulted on as part of the development of regional water strategies. [The draft Western Regional Water Strategy is scheduled to be released for public consultation in November 2021.] Water sharing rule options for restricting floodplain harvesting in situations when this could otherwise impact on downstream critical human and environmental needs will be considered as part of this process and incorporated if necessary when the water sharing plan for the Barwon-Darling valley is remade in 2023.

The NSW Government has also formed a stakeholder reference group to facilitate input on the consideration of options to improve connectivity across the northern Basin. This group will give the department the opportunity to obtain feedback on these options from a range of key representative stakeholders before they are published for broader community input in the draft Western Regional Water Strategy.

There is a widely held view amongst some stakeholders, particularly those in the southern Basin, that floodplain harvesting in the northern Basin has had significant and long-term impact on flows in the Lower Darling system and hence on flows into the Murray River. Evidence does not support this view. The northern Basin provides only modest contributions to southern Basin flows: 14% on average. Due to the unregulated nature of these flows, annual flow contributions from the north to the south vary significantly in response to rainfall, ranging from almost zero during the driest years to more than 10 times the average during the largest flood years. Analysis shows that restricting floodplain harvesting to legal limits in the northern Basin will result in undetectable changes to the NSW Murray system. In fact, even completely removing floodplain harvesting from the northern Basin is not likely to improve average annual water availability in the NSW Murray by more than 1%. See the [floodplain harvesting library](#) for more information on this analysis.

Validity of revised river system models

The department has a long history and retains significant capability in the development and use of river system modelling to support water management decisions. As well as supporting planning assessments, these models are used to determine volumetric estimates of legal limits and to determine changes in actual diversions over time. Existing river system models were built primarily for the purpose of planning for and operating regulated rivers, i.e. those rivers where flows are controlled and dispatched from major dams and weirs. These existing models represent river flows and regulated diversions with a high degree of accuracy. However, they do not accurately represent the adjacent floodplain diversions as they were not designed for this purpose.

As part of the floodplain harvesting reform, the department has invested significant resources into updating the existing models, and in some cases, building new models that not only accurately reflect regulated river flows and diversions but also floodplain harvesting diversions. These new and updated models are the most accurate representation of floodplain and associated waterway conditions that have ever existed for these valleys. They use the best current available technology and data and enable us to better understand diversions at historic reference dates used to calculate extraction limits. Further developments being progressed will consider paleoclimatic data and future predicted climate scenarios, which increase our understanding of current and future water security for communities and the environment.

All of the models used as part of the floodplain harvesting reform have had extensive [review by independent peer experts](#). These reviews were undertaken to provide transparency and give confidence to stakeholders that the technical information and processes used would support policy implementation. The reviews include an assessment of [implementation of the policy](#), as well as the department’s response to review recommendations.

The department is conducting an enhanced and extended review process for modelling of the Namoi valley which uses the new eWater SOURCE model platform. This process is intended to further build stakeholder confidence and validate the overall modelling approach. An additional independent peer expert as well as several key stakeholder representatives will be brought into the review process, enabling them to closely review the data sources, approach and model performance. This enhanced review will be published in late 2021.

Given that methods and data are common across all valleys, the conclusions drawn will also provide increased stakeholder confidence in the models which have already been developed for other valleys.

Managing unapproved flood works

Interconnectedness of over-bank systems, such as wetlands, billabongs and the floodplains themselves are a key element in the health of the Murray Darling Basin.

Floodplain Management Plans have been prepared for the valleys within northern NSW where floodplain harvesting is more prevalent. These plans define management zones, rules and criteria to regulate floodplain development and protect important flow paths that sustain environmental and cultural assets such as floodplain wetlands.

Restoring flood flow connections that are impeded by unapproved works is a high priority for the [Natural Resources Access Regulator](#).

The NSW Government is currently working with the Commonwealth Government to secure \$10.2 million in funding to help deliver an accelerated compliance program for unapproved flood works in high priority areas in the northern Basin.

The program will focus on the acceleration of activities by government and landholders to remove or modify floodplain structures so that they are compliant with floodplain management plans and approval conditions. The aim is to improve hydraulic connectivity to flood-dependent environmental and cultural assets. The major benefits of the project will be environmental and cultural, in the form of improvements to the health of these flood dependent assets.

If funding is received, the NSW Government will be able to commence this accelerated program in late 2021 during the public inquiry. Irrespective of Commonwealth funding, bringing unapproved flood works into compliance will continue to be high priority for the Natural Resources Access Regulator.

Conclusion

The NSW Government remains committed to delivering this large and important reform through full implementation of the NSW Floodplain Harvesting Policy. Effective regulation of floodplain harvesting is in all stakeholders', including the environment's, best interest. Without effective regulation, floodplain harvesting may continue to grow unconstrained as it has over the past two decades. Growth in floodplain harvesting is largely historic, driven by large infrastructure increases between 1994 and 2008 with for example, 80% of the total growth in on farm storage volumes attributable to this period. A complete cessation of the activity, however, would lead to diversions across the northern Basin that are well below sustainable diversions resulting in only a very minor increase in total annual water availability in the NSW Murray of less than 1%.

The NSW Government welcomes the inquiry and will provide further details as requested. The additional attachments include frequently asked questions and answers plus links to additional published information.

Appendices

1. Floodplain harvesting – Frequently asked questions
2. Index of supporting material

NSW Government Submission to the Inquiry into Floodplain Harvesting - FAQs

General

Why is the floodplain harvesting reform important and what does the NSW Government hope to achieve?

The floodplain harvesting reform aims to protect the environment and water users from the impact of unconstrained growth in the activity. The majority of the growth in floodplain harvesting in the northern Basin is historic, with more than 80% of the growth in on-farm storage volumes since 1994 occurring prior to 2008.

Growth in floodplain harvesting has the potential to adversely affect water users and the environment in the floodplain areas where it occurs. Growth in this form of take has occurred over time due to changes in legislation without a successful transition to meet the legislation's requirements. The [NSW Floodplain Harvesting Policy](#) was introduced in 2013 to meet the requirements of the *Water Management Act 2000*.

It is important that this reform proceeds and the NSW Floodplain Harvesting Policy is fully implemented in order to provide an enforceable legal framework that:

- reduces take where it has caused an exceedance of the legal limits, and
- prevents further growth.

This will be achieved through the issuing of licences with entitlements and works approvals and through the enforcement of measurement and reporting requirements.

Had the floodplain harvesting regulations not been disallowed by the NSW Legislative Council on 6 May 2021, then the following controls would now be in place:

- accurate, reliable and tamper-proof measurement equipment required to be installed on all on-farm water storages greater than 1000ML used for floodplain harvesting, supplying data on water take in near real time
- licences and water sharing rules that deliver significant reductions in floodplain harvesting across the northern Basin, requiring for example more than a 30% decrease in floodplain harvesting in the Gwydir valley
- licences and water sharing rules that deliver significant environmental benefits, for example improvements of around 140% in outcomes for waterbirds in the Ramsar-listed Gwydir Wetlands
- water sharing rules that manage floodplain harvesting such that supplementary water allocations do not need to be reduced, for example, a 50% reduction in allocations for supplementary access licences in the Gwydir is currently required to ensure that total diversions comply with legal limits.

Regulation will also:

- improve connection with surrounding areas through more regular inundation,
- improve cultural outcomes,

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Attachment A – Frequent Asked Questions

- improved environmental outcomes across a range of metrics (i.e. waterbirds, native vegetation, native fish and water volumes),
- increase flows to downstream communities,
- provide clarity for all water users and the regulator,
- enable compliance through accurate measurement,
- deliver near-real time information via telemetry,
- provide a foundation for adaptive management.

What consultation has occurred during the project?

NSW Department of Planning, Industry and Environment (the department) has undertaken significant consultation, since 2008, in the development and implementation of the [NSW Floodplain Harvesting Policy](#) and the [NSW Floodplain Harvesting Measurement Policy](#). Over the past 12 months, the department has widely communicated opportunities for the community to submit feedback and attend community consultation sessions through multiple communication channels. This includes public notices in local newspapers and radio stations across the state, with a total reach of 1.5 million people, as well as social media posts and email invites to submit feedback to a wide range of stakeholders.

Information on upcoming consultations, past consultation outcomes and other resources relating to the project are available online at Healthy Floodplains Project [stakeholder engagement](#) and the Healthy Floodplains [library](#).

The department has also consulted on eligibility determination of individual properties, validation of on farm infrastructure, measurement requirements, draft licence entitlements, environmental and downstream outcomes, modelling, regulation amendments as well as proposed rules for floodplain harvesting licences. Consultation has been on-going with eligible landholders, the broader community and stakeholder groups, including dryland farmers, environmental groups, southern Basin groups, First Nations people and government agencies. Throughout the project there have been numerous public webinars, targeted sessions, face-to-face meetings, public exhibition and submission periods, site inspections and individually tailored meetings.

For example, consultation methods and totals for the draft water sharing plan rules across all three valleys (NSW Border Rivers, Gwydir, and Macquarie) included public exhibition (477 submissions), six targeted consultation sessions (221 participants), six public information sessions (120 participants), three webinars (198 participants) and ten First Nations consultation sessions. The [‘what we heard’](#) report for the NSW Border Rivers valley summarises the feedback the NSW Government received during the public consultation sessions and from written submissions.

The legal limits of take

What are the different legal limits?

The [Cap on surface water diversions \(the Cap\)](#) is set out in the Murray-Darling Basin Agreement. For NSW, it is based on the amount of water that could have been taken over the long term with the development and management conditions in place as at 1993/94. It will remain in force until it is repealed by the Australian Ministerial Council.

Long-term average annual extraction limits (LTAAELs) are set out in NSW water sharing plans (WSPs). In most surface water WSPs within the Basin, the LTAAELs are the lesser of: 1) the Cap,

or 2) the amount of water that could have been taken under the WSP rules with the development that was in place in 1999/2000.

Sustainable diversion limits (SDLs) are described in Schedule 2 of the Basin Plan and are linked to baseline diversion limits (BDLs) such that $SDL = BDL \text{ minus water recovery plus the SDL adjustment amount}$. Schedule 3 of the Basin Plan states, for surface water regulated river and floodplain harvesting take, the BDL is generally the state water management law in mid-2009. In NSW, state water management law in mid-2009 were LTAAELs in NSW water sharing plans.

Why do the estimates of extraction limits change over time?

All extraction limits, whether set for regulated rivers or unregulated rivers are based on a set of development and legislative conditions at a reference date. They are not set as a specific volume but are volumetrically estimated using models configured with best available information. If we obtain better information about these conditions over time, we can update these estimates. This means that the output of a model at a certain time, which is the volumetric estimate of the limit, can change if better information is used. It doesn't mean the extraction limit changes. It instead means that the volumetric estimate of the extraction limit changes.

The ability to re-estimate volumetric representations of the extraction limits is not unique to NSW or to the floodplain harvesting reform. This is allowed under both NSW and Commonwealth legislation, meaning that every Basin state has undertaken this process as part of water resource plan accreditation. See the MDBA website for more information: [Changing limits](#) and [Current limits](#).

What is the volumetric estimate of the limit for floodplain harvesting?

A commonly quoted estimate of 210 gigalitres per year for floodplain harvesting was made in the 2012 Basin Plan and applies to the entire northern basin, the QLD portion being 160.4 Gigalitres/year and the NSW portion being 46.2 Gigalitres/year. The information that this estimate relied on at that time was poor as in NSW it used the existing regulated river system models that were not built for the purpose of accurately estimating floodplain harvesting. Additionally, the 2012 estimates for NSW excluded the rainfall runoff harvesting being estimated by the models whereas our more recent estimates include the majority of this as floodplain harvesting.

Accordingly, the NSW Government expects that these estimates will change significantly to reflect more accurate information and definitions. For NSW, valley-specific, peer-reviewed technical reports which describe the modelling process and the data relied upon to re-estimate these legal limits, are being published for transparency. For example, see the Border Rivers valley reports: the [river system model build report](#) and the [model scenarios report](#).

Why has floodplain harvesting been allowed to cause an exceedance of the legal limits?

Legal limits for water take are set out in NSW water sharing plans (long term average annual extraction limits), the Murray-Darling Basin Agreement (the Cap on surface water diversions) and the Basin Plan (baseline diversion limits and sustainable diversion limits). The limits apply to an entire water source, rather than an individual form of take such as floodplain harvesting. As such, there is not a floodplain harvesting limit that has been exceeded, but growth in floodplain harvesting, when combined with other forms of water take, has caused overall limits to be exceeded in some valleys.

The limits have been exceeded because floodplain harvesting is currently not licensed, measured or monitored. The NSW Government has invested eight years and \$17million to assess the growth in floodplain harvesting and to work towards its reduction.

How is floodplain harvesting brought within legal limits?

Floodplain harvesting is a historically legitimate practice that has not been fully transitioned into the licensing framework provided by the *Water Management Act 2000*. The majority of the growth in floodplain harvesting in the northern Basin is historic, with more than 80% of the growth in on-farm storage volumes since 1994 occurring prior to 2008.

To address growth in floodplain harvesting that has already occurred and has caused legal limits to be exceeded, implementation of the [NSW Floodplain Harvesting Policy](#) will include an assessment of this growth for each valley. The determination of licenced entitlement and account management rules will then work together to reduce take back to legal limits. The methods for determining the entitlement volumes associated with licences are set out in the [Guideline for the Implementation of the NSW Floodplain Harvesting Policy](#). It states that “the total take of water will be within the relevant extraction limit and that any effects are distributed as equitably as possible among eligible floodplain harvesting properties.” The methods for determining account management rules for each valley are set out in reports to assist community consultation. For example, see [Gwydir: Floodplain harvesting in water sharing plans – Report to assist community consultation](#).

Once floodplain harvesting is brought into the regulatory framework and measurement is undertaken, rules specific to floodplain harvesting licences can be included in relevant water sharing plans. In all water sharing plans, there are a suite of rules that relate to legal limits including how to assess growth and respond to any exceedance. Currently, any growth above legal limits is managed through reduced [allocations to supplementary water access licences](#). When floodplain harvesting licences are issued, a rule will be included in relevant water sharing plans that allows for the assessment of growth in floodplain harvesting and application of reduced allocations to floodplain harvesting licences if there is an exceedance of the legal limit caused by growth in floodplain harvesting.

Modelling

Can I be confident in the modelling, data and reports for the floodplain harvesting reform?

All modelling is independently peer reviewed and access to data, information and assessments relating to floodplain harvesting are made publicly available on the [Healthy Floodplains Project](#) webpages. This ensures complete transparency to increase public confidence.

The models use multiple lines of evidence to understand water flows, irrigation usage and water infrastructure in each valley, including user surveys, on ground inspections, river flow and metered diversions, remote sensing, flood studies and hydraulic models. Details on how the models are developed and the results of the modelling are provided for each valley. For example, see the [modelling reports for the NSW Border Rivers valley](#).

These reports are peer-reviewed by Greg Claydon and Tony Weber who are independent experts in water industry reform, policy development and modelling. The peer reviews validate the technical information, allowing stakeholders to be confident that a rigorous process has been used in model development.

All models have uncertainty and one of the key sources of uncertainty is the lack of metering information for floodplain harvesting that could have otherwise formed an important line of evidence for model calibration. Improved metering and measurement of floodplain harvesting is a

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Attachment A – Frequent Asked Questions

key outcome of the licensing process and will allow the department to refine the modelling over time with any improvements reconciled through the annual water allocation process.

The department is also validating the data used in the models and modelling results on a property-by-property basis. Each eligible landholder has been provided with data applicable to their property, eligible works and farm infrastructure. They are given 28 days to make a submission if they believe the data to be inaccurate. Submissions are reviewed and recommendations made by the Healthy Floodplains Review Committee according to the terms of reference. The committee is comprised of representatives from the NSW Farmers Association, NSW Irrigators Council, the Nature Conservation Council and has an independent chair. For more information, see the Guideline for the Implementation of the [NSW Floodplain Harvesting Policy](#).

Has the policy and modelling been reviewed by external experts? Who are the independent peer reviewers?

Yes. The primary objective of the [independent peer reviews on floodplain harvesting](#) is to provide transparency regarding technical information and provide stakeholders with confidence that technical rigour and supporting processes are suitable to support sound implementation of the [NSW Floodplain Harvesting policy](#).

In 2018, the department, with the Murray-Darling Basin Authority (MDBA), commissioned an independent peer review of implementation of the NSW Floodplain Harvesting Policy in northern NSW. See the report at [Independent review of NSW Floodplain Harvesting Policy implementation](#). See the fact sheet at [An independent review into floodplain harvesting factsheet](#).

This review provided 16 key recommendations and 48 other recommendations. These were accepted in full and addressed in the [Floodplain Harvesting Action Plan](#).

The department has engaged expert reviewers who are recognised nationally and internationally as experts in their respective fields. They were not involved in any activities regarding the modelling and/or implementation of the NSW Floodplain Harvesting Policy prior to their commencement of the review tasks. It therefore was a truly independent review without any preconceptions of departmental influences on the approach or considerations. The expert reviewers are Tony Weber and Greg Claydon. See [information about the reviewers](#) online.

Following their report on the policy, the reviewers have continued to work to review key modelling reports and other activities relating to the recommendations. They are reviewing the modelling reports for each of the five valleys as they become available. For example, see the review summary for the [NSW Border Rivers Model Build, Scenarios and Environmental Outcomes reports](#).

In 2019, Maddocks Lawyers undertook a [probity review](#) of certain elements relating to implementation of the policy. This probity review found that the processes under review were lawful and well-documented. This probity review is currently being extended to examine and cover the role of the review committee and its consideration of landholder submissions through the farm scale validation process. The findings of this extended probity review are expected to be published during the inquiry.

How are licensed entitlements determined for each valley to ensure floodplain harvesting is within the legal limits?

For those properties associated with a regulated river¹, modelling is used to determine entitlements in a way that ensures overall water take for the water source does not exceed the legal limits. This requires the department to simulate several scenarios with different levels of development. The process involves three steps, as set out in the [Guideline for the Implementation of the NSW Floodplain Harvesting Policy](#):

1. A determination of the volumetric estimate of the legal limits based on legislation.
2. An estimation of the volume being taken under current levels of development. Where current take exceeds legal limits, floodplain harvesting entitlements are calculated to reduce this component to that within the legal limits.
3. A determination of the share of the total floodplain harvesting take for each eligible property using an 2008/09 scenario based on eligible development. The number of entitlements for each property, combined with certain accounting rules is then determined with the model. This is further described at Modelling and data collection for implementing floodplain harvesting.

Details on how the models were developed and the results of the three scenarios are provided in two modelling reports for each regulated river system. These reports have been independently peer reviewed. The reports for the NSW Border Rivers valley, as an example, can be found at:

- [Model build report](#) - a river system model to inform water management
- [Model scenarios report](#) - estimates the extraction limit for each valley, individual entitlements, and account management rules to meet the legal limit.

Connectivity and downstream outcomes

Will licensing floodplain harvesting in the northern Basin mean more inflows to downstream systems?

Growth in floodplain harvesting has the potential to adversely affect water users and the environment in the floodplain areas where it occurs. Despite this, evidence shows that negative impacts diminish significantly as flows move across vast floodplain areas and downstream. In fact, this evidence suggests that even completely removing floodplain harvesting from the northern Basin, would increase average annual water availability in the NSW Murray system by less than 1%.

In areas where there has been growth in floodplain harvesting causing an exceedance of the legal limits, such as the NSW Border Rivers and Gwydir valleys, licensing of floodplain harvesting will result in water being returned to floodplains, rivers and creeks.

¹ Regulated rivers in the five northern valleys are those that receive the benefit of flows that are sourced from public storages constructed upstream of the Border Rivers, Gwydir, Namoi and Macquarie floodplains. Principally, the affected rivers will be the regulated sections of the Macintyre, Gwydir, Namoi and Macquarie Rivers. However, there are a number of effluent streams that will also be affected, such as the Mehi River in the Gwydir valley and Pian Creek in the Namoi valley. The relevant water sharing plans prescribe those rivers and streams that are considered to be regulated rivers.

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Attachment A – Frequent Asked Questions

Modelling indicates that licencing floodplain harvesting in the NSW Border Rivers and Gwydir valleys will return an average of 58.4 gigalitres per year to these floodplain areas. These floodplain flows are important to support groundwater recharge, wetlands, vegetation and other agricultural systems and only a proportion of this additional water will return back to rivers and creeks.

Unfortunately, being able to accurately assess the quantum and timing of these floodplain flows returning to rivers and creeks is beyond the capability of river system models worldwide. However, to inform the public debate the department has undertaken a sensitivity analysis to assess the range in possible benefit. Even if 100% of these additional floodplain flows returned to rivers and creeks, the improvements to Barwon-Darling flows and Menindee inflows as a result of reducing floodplain harvesting back to legal limits in the Border Rivers and Gwydir valleys will be modest and there will be no detectable change to Lower Darling or NSW Murray water allocations.

The most significant impacts on allocations in the Murray system result from changed inflows upstream of Albury, which have decreased by more than a third in the last 20 years relative to the past century. This is caused by a combination of factors including: low rainfall, high temperatures and catchment modification (including farm dams).

More information on the downstream effects of licensing floodplain harvesting in NSW Border Rivers and Gwydir valleys can be found at [Modelled downstream effects of licensing floodplain harvesting](#).

How do floodplain harvesting events in the northern Basin and cease-to-flow events in the Barwon-Darling River correlate?

It has been suggested that floodplain harvesting diversions cause, or at least contribute to, cease-to-flow events in the Barwon-Darling River. The department has analysed modelled daily floodplain harvesting diversions across the NSW Border Rivers, Gwydir and Namoi valleys from the last 30 years and compared these to observed flows at Walgett over the same period. These modelled diversions assume that no licensing framework is in place and there are no other floodplain harvesting restrictions.

The analysis shows that there is no evidence to support a proposition that floodplain harvesting is occurring during cease-to-flow events and could be considered to be contributing to either starting the cease-to-flow period sooner or extending the event in a meaningful way. It also shows that, during period when floodplain harvesting is occurring with similar timing as cease-to-flow events, floodplain harvesting accesses a portion of the flow event and the remainder continues downstream to relieve the cease-to-flow conditions which are occurring. See the [floodplain harvesting library](#) for more information on this analysis.

The enabling regulations

Why do we need to amend the Water Management (General) Regulation 2018?

The key reasons why legislative amendments are required is **to give legal effect to the policies and to provide legal clarity**.

By amending the Regulation, the department can ensure that the process used to determine floodplain harvesting entitlements will be the same throughout NSW and the measurement requirements will be consistent for all floodplain harvesting licences. It will also provide legal clarity on the practical inability to distinguish and measure rainfall runoff in some situations.

NSW Government Submission to the Inquiry into Floodplain Harvesting



Attachment A – Frequent Asked Questions

The proposed amendments to the Regulation allow licenses to be issued, measurement requirements to be enforced and a state-wide exemption for tailwater drains to be established. They are designed to promote confidence in the process of regulating floodplain harvesting by improving transparency.

What was the consultation process on the proposed changes to the regulations?

The amendments made to the Regulation were informed by an extensive and extended consultation that commenced with the publication of the [NSW Floodplain Harvesting Policy](#) in 2013.

The government published [four packages of proposed amendments to the Regulation](#) on 23 November 2020 and invited public feedback through a formal submission process. The department accepted submissions from 23 November until 20 December 2020 and 236 submissions were received during this period. In early 2021, consultation outcomes reports ([Licence determination and measurement](#), [Tailwater drain exemption](#), [Transitional exemption](#)) were published for each of the proposed amendment packages.

Many of the submissions supported the new rules and focused on the improved clarity, certainty and transparency they would bring. Those that did not support the proposed changes disagreed with the existing policy or legislative settings. Making changes to these settings was clearly communicated as being outside the scope of the submission process. Another key theme from the consultation was a concern about how floodplain harvesting in the northern Murray-Darling Basin affects downstream systems.

What were the three packages of amendments to the Water Management (General) Regulation 2018?

Following consultation in late 2020, the NSW Government made the decision to proceed with the making of three out of the four packages of amendments. Based on the submissions received and the limited period that it would apply, the NSW Government decided not to proceed with amendments that would provide a transitional exemption from the need to hold a licence and works approval.

The three packages of amendments were a significant step towards bringing floodplain harvesting into a clear and enforceable regulatory framework, ensuring that floodplain harvesting is within legal limits. They included:

Licensing determination process

This amendment clearly set out the process used to determine eligibility for a floodplain harvesting access licence, the category of licence and share component. It was consistent with the [NSW Floodplain Harvesting Policy](#) and [Guideline for the Implementation of the NSW Floodplain Harvesting Policy](#). The objective of this amendment was to ensure the process is consistent for water users in each valley where licences are issued, now and into the future. It gave water users clarity about their eligibility for licenses and the determination process for licence categories and share components.

Measurement requirements

All water taken under a floodplain harvesting licence will need to be measured. These amendments clearly set out the rules for measuring floodplain harvesting and required storages to

be fitted with compliant and tamper-proof metering, data logging and telemetry equipment. Equipment must be installed and signed off by a duly qualified person. The deadline for installing compliant equipment will depend on the size of the storage and its frequency of use.

Tailwater return drain exemption

This regulation provided an exemption from the need for a water supply work approval for the use of tailwater drain, and an exemption from the need for a water access licence for the collection of rainfall run-off in a tailwater drain during periods when it is the only structure collecting rainfall runoff. This amendment gave NSW water users clarity and certainty about what they need to measure and account for and when.

On 6 May 2021, the three packages of amendments were disallowed by the NSW Legislative Council. More information about the disallowance is provided in the covering submission.

Environmental outcomes of policy implementation

What are the predicted environmental outcomes following implementation of the policy?

The predicted environmental outcomes of licensing floodplain harvesting are directly related to how much growth in extraction there has been above legal limits. Where growth has occurred, the licensing process will result in water returning to the environment by reducing the amount that can be taken through floodplain harvesting. The benefits to downstream users and the environment are detailed in various resources available online. See the video on [predicted environmental outcomes of implementation of the policy](#). Specific environmental outcomes as a result of implementing the policy are modelled for each valley. For example, see [Environmental Outcomes for Border Rivers valley](#).

Measurement

How will floodplain harvesting take be measured?

The NSW Government published the [NSW Floodplain Harvesting Measurement Policy](#) (Measurement Policy) in 2020. The Measurement Policy outlines the measurement requirements to be applied to works used to take water under a water access (floodplain harvesting) licence. See the video [Measuring floodplain harvesting take](#).

The Measurement Policy requires all eligible floodplain harvesting works to have an automated measurement device with near-real time telemetry connected to the NSW Government's cloud-based platform. Measurement devices must be tamper-proof and be installed and certified by a duly qualified person. These devices, and supporting notification and reporting requirements, will allow Government to determine how much water is taken against a floodplain harvesting access licence during a flood event. This will help to ensure licence holders can only take the allocations in their water account.

The Department has made significant progress implementing the Measurement Policy, including:

- establishing, in partnership with Irrigation Australia Limited, a specific training and certification program for installers of floodplain harvesting measurement equipment. To date, 40 people have obtained this certification

- establishing a facility at Manly Hydraulics Laboratory to test devices used to measure floodplain harvesting
- publishing information about suitable floodplain harvesting measurement devices and a process for manufacturers of devices to have their devices accredited as suitable for use
- releasing technical guidelines for installers of floodplain harvesting measurement equipment.
- developing ICT systems to allow floodplain harvesting measurement devices to be ordered, configured and associated with the relevant licensing information
- upgrading its telemetry system to receive data from floodplain harvesting measurement devices.

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Title	URL
Healthy Floodplains Project	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project
Healthy Floodplains Stakeholder Engagement	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting-stakeholder-engagement
Healthy Floodplains Library	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting/document-library
Healthy Floodplains Frequently Asked Questions	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/fags
Policies	
NSW Floodplain Harvesting Policy	https://www.industry.nsw.gov.au/data/assets/pdf_file/0017/143441/NSW-Floodplain-harvesting-policy.pdf
NSW Floodplain Harvesting Measurement Policy	https://www.industry.nsw.gov.au/data/assets/pdf_file/0006/317859/floodplain-harvesting-measurement-policy.pdf
Guideline for the implementation of the NSW Floodplain Harvesting Policy	https://www.industry.nsw.gov.au/data/assets/pdf_file/0007/272338/guideline-for-implementation.pdf
Legislative amendments	
Changes to the Water Management (General) Regulation 2018 for floodplain harvesting in NSW	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/about/legislative-amendments

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Title	URL
Legislative amendments: Licence determination and measurement – what we heard report	https://www.industry.nsw.gov.au/data/assets/pdf_file/0019/368110/What-We-Heard-Licence-Determination-and-Measurement-Regulation.pdf
Legislative amendments: Tailwater drain exemption – what we heard report	https://www.industry.nsw.gov.au/data/assets/pdf_file/0020/368111/What-We-Heard-Tailwater-Drain-Exemption.pdf
Legislative amendments: Floodplain harvesting transitional exemption – what we heard report	https://www.industry.nsw.gov.au/data/assets/pdf_file/0003/368112/What-We-Heard-Transitional-Exemption-Regulation.pdf
Action Plan	
Floodplain Harvesting Action Plan	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting/action-plan
Independent Review	
Independent peer reviews on floodplain harvesting	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting
Independent review of NSW Floodplain Harvesting Policy implementation proposed matters for detailed review	https://www.industry.nsw.gov.au/data/assets/pdf_file/0019/210772/nsw-fph-policy-implementation-review.pdf
An independent review into floodplain harvesting factsheet	https://www.industry.nsw.gov.au/data/assets/pdf_file/0003/272712/Independent-Peer-Review-Review-Report-Fact-Sheet.pdf

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Independent review of NSW floodplain harvesting policy implementation	https://www.industry.nsw.gov.au/data/assets/pdf_file/0004/272146/Final-floodplain-harvesting-independent-review.pdf
Independent peer reviews of the Policy and independent modelling reports	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting/policy-modelling-reports
Independent peer reviewers	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/harvesting/independent-peer-reviewers
Probity review into floodplain harvesting licensing	https://www.industry.nsw.gov.au/data/assets/pdf_file/0008/226691/Probity-review.pdf
Review of NSW Border Rivers Model Build, Scenarios and Environmental Outcomes reports relevant to Floodplain Harvesting Policy implementation	https://www.industry.nsw.gov.au/data/assets/pdf_file/0009/331875/reports-review.pdf
Review Committee	
NSW Healthy Floodplains Review Committee terms of reference	https://www.industry.nsw.gov.au/data/assets/pdf_file/0005/308336/terms-of-reference.pdf
Compliance with water management principles - Water Sharing Plan for the Border Rivers Regulated River Water Source 2020	https://www.industry.nsw.gov.au/data/assets/pdf_file/0019/350236/compliance-with-water-mgmt-principles.pdf
Community Consultation	

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Title	URL
NSW Border Rivers: Floodplain harvesting in water sharing plans - Report to assist community consultation	https://www.industry.nsw.gov.au/data/assets/pdf_file/0005/326048/assist-community-consultation-report.pdf
Gwydir: Floodplain harvesting in water sharing plans - Report to assist community consultation	https://www.industry.nsw.gov.au/data/assets/pdf_file/0017/350207/community-consultation-report.pdf
Macquarie valley: Floodplain harvesting in water sharing plans - Report to assist community consultation	https://www.industry.nsw.gov.au/data/assets/pdf_file/0004/356098/report-to-assist-community-consultation.pdf
NSW Border Rivers: Floodplain harvesting in water sharing plans - What we heard report	https://www.industry.nsw.gov.au/data/assets/pdf_file/0020/350237/what-we-heard-report.pdf
Environmental Outcomes	
Environmental outcomes of implementation of the Floodplain Harvesting Policy	https://www.youtube.com/watch?v=5G3XfpTgdbY
Summary of predicted environmental outcomes of implementing the NSW Floodplain Harvesting Policy	https://www.industry.nsw.gov.au/data/assets/pdf_file/0004/368140/summary-of-predicted-environmental-outcomes.pdf

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Environmental outcomes of implementing the Floodplain Harvesting Policy in the Border Rivers Valley	https://www.industry.nsw.gov.au/data/assets/pdf_file/0003/326091/environmental-outcomes-report.pdf
Modelling	
Reduced supplementary water access allocations in Border Rivers and Gwydir – 2021-22	https://www.industry.nsw.gov.au/water/allocations-availability/allocations/how-water-is-allocated/faqs
Modelling and data collection for implementing floodplain harvesting	https://www.industry.nsw.gov.au/data/assets/pdf_file/0003/179931/Floodplain-harvesting-water-modelling-overview.PDF
Building the river system model for the Border Rivers Valley regulated river system	https://www.industry.nsw.gov.au/data/assets/pdf_file/0020/326090/model-build-report.pdf
Floodplain harvesting entitlements for the NSW Border Rivers regulated river system	https://www.industry.nsw.gov.au/data/assets/pdf_file/0009/326088/model-scenario-report.pdf
Floodplain Harvesting licence rules in the water sharing plans for NSW Border Rivers	https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/water-sharing-plan-rules/border-rivers
Modelled downstream effects of licensing floodplain harvesting	https://www.industry.nsw.gov.au/data/assets/pdf_file/0011/350201/modelled-downstream-effects-if-licensing-floodplain-harvesting-nsw-border-rivers-and-gwydir.pdf

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Impact of lower inflows on state shares under the Murray–Darling Basin Agreement	https://www.igwc.gov.au/sites/default/files/2020-09/iig_final_report.pdf
Measurement	
Measuring floodplain harvesting take	https://www.youtube.com/watch?v=tYlXnSaqLts
Compliance	
Our regulatory priorities 2021-22	https://www.dpie.nsw.gov.au/nrar/about-us/our-regulatory-priorities
MDBA	
The Cap - Providing security for water users and sustainable rivers	https://www.mdba.gov.au/sites/default/files/archived/cap/cap_brochure_0.pdf
Changing limits	https://www.mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/changing
Current diversion limits for the Basin	https://www.mdba.gov.au/basin-plan/sustainable-diversion-limits/current-diversion-limits-basin

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