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Submission
Draft State Groundwater Strategy

Introduction

The Inland Rivers Network ("IRN") is a coalition of environment groups and individuals that has been advocating for healthy rivers, wetlands and groundwater in the Murray-Darling Basin since 1991.

An international study released by NASA in 2015 showed declines in groundwater resources globally.[1] Australia and NSW are not immune to the challenges posed from declining groundwater resources.

Climate change predictions of lower rainfall and runoff is a clear signal that groundwater sources in NSW will be under greater threat due to lower levels of recharge. Significant impacts on large alluvial aquifers in the NSW inland have already been identified due to increased reliance on groundwater during the millennium drought and more recent 2018 – 2020 intensive drought. These are the aquifers identified as the most productive and economically important.[2]

The draft State Groundwater Strategy (the Strategy) and associated guides fail to recognise or describe the extent of drawdown on NSW groundwater sources and declining trends in water levels. There is no reference to the 2021 review of groundwater levels or outcomes.

The Strategy and associated guides also fail to identify the areas where extraction has exceeded water sharing plan limits. The emphasis of the Strategy to develop more groundwater resource for business opportunities and economic growth is both short sighted and irresponsible in a drying climate.

Current threats to groundwater dependent ecosystems (GDEs) are not clearly identified.

[1] http://www.groundwater.com.au/news_items/op-ed-declining-groundwater-is-a-big-problem-for-australia
[2] Department of Planning and Environment, July 2022. *Draft Guide to Groundwater Resources in NSW* p 6

Recommendations:

1. **The management of aquifer drawdown must be a top priority of the Strategy**
2. **Understanding current condition of aquifer integrity, GDEs and base flow connectivity is essential before any additional access to groundwater sources is considered**
3. **Improved water use efficiency for current extractive users must be a priority**
4. **Identification of all polluted aquifer systems and embargo on further use until remediation has been completed**
5. **No more controlled allocation orders until plan limits in all water sharing plans are reviewed using new knowledge of aquifer recharge in a drying climate**
6. **Any new controlled allocation orders should be offered to local First Nations Groups as a first option**
7. **All groundwater take must be metered**

Key Issues:

1. **The main environmental issues of concern with respect to groundwater are:**

- Lack of data to assess the impacts on groundwater by users and the integrity of aquifers
- Lack of data on the long-term impacts of groundwater take under current water sharing plan limits
- Impacts on groundwater-dependent ecosystems (GDEs) caused by changes in groundwater quantity and quality
- Lack of mapping and ground-truthing of GDEs at the water sharing plan scale
- Poor knowledge about the interconnectivity between surface water and groundwater sources, and groundwater recharge
- Short term thinking, when very long-term cycles of groundwater recharge must be fundamental considerations of all water sharing plans. Recharge times vary from one system to another – maybe a couple of thousands of years for the Great Artesian Basin, to perhaps a single flood for shallow alluvium next to a river.

2. **Condition of GDEs**

The Strategy recognises that currently, over 200,000 ha of GDEs and 69 unique plant types are under threat in NSW. Some of the important groundwater-fed ecosystems include the Gwydir Wetlands, the Macquarie Marshes, the Narran Lakes east of Brewarrina and the systems of artesian springs in the Great Artesian Basin.[3]

It is critical that mapping of all GDEs at a water sharing plan scale including condition and groundwater requirements is a priority action of the Strategy.

3. **Protecting the structural integrity of aquifer systems**

A collapsed or partially collapsed/compacted aquifer cannot provide support for communities, business, or the environment. The fact that the most productive and economically important inland alluvial aquifers have already experienced loss of natural

[3] Department of Planning and Environment, July 2022. *Draft NSW Groundwater Strategy* p 41

water levels should be of great concern to water planners and managers. The loss of natural equilibrium is a sign of potential partial aquifer collapse.

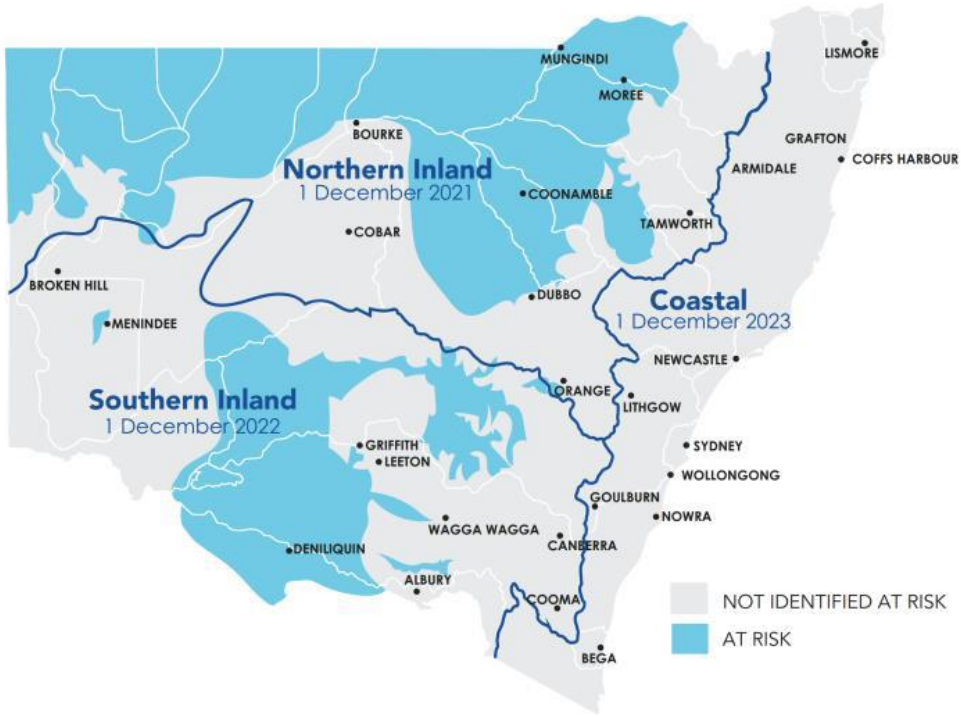
There are very few references to aquifer integrity within the documents provided – '*the aquifer structure itself could be damaged if it is dewatered*.'[4] This is in relation to rules regulating new bores and not to regulating existing impacts. '*Aquifer compaction*' is also referred to in relation to local impact rules.[5] The overall level of extraction under plan limits must also be a key consideration for protecting aquifer integrity

The section of the Strategy considering challenges [6] makes no reference to the need to understand threats to aquifer structural integrity or the need to better research and acknowledge current condition.

The 2021 review of groundwater levels in alluvial groundwater sources in inland NSW is not referred to in the Strategy nor in the associated guides. This report also fails to address the issue of aquifer integrity or impacts on GDEs of drawdown up to 70% of total available water. This is a key failing in the NSW Government approach to groundwater management and protection of GDEs.

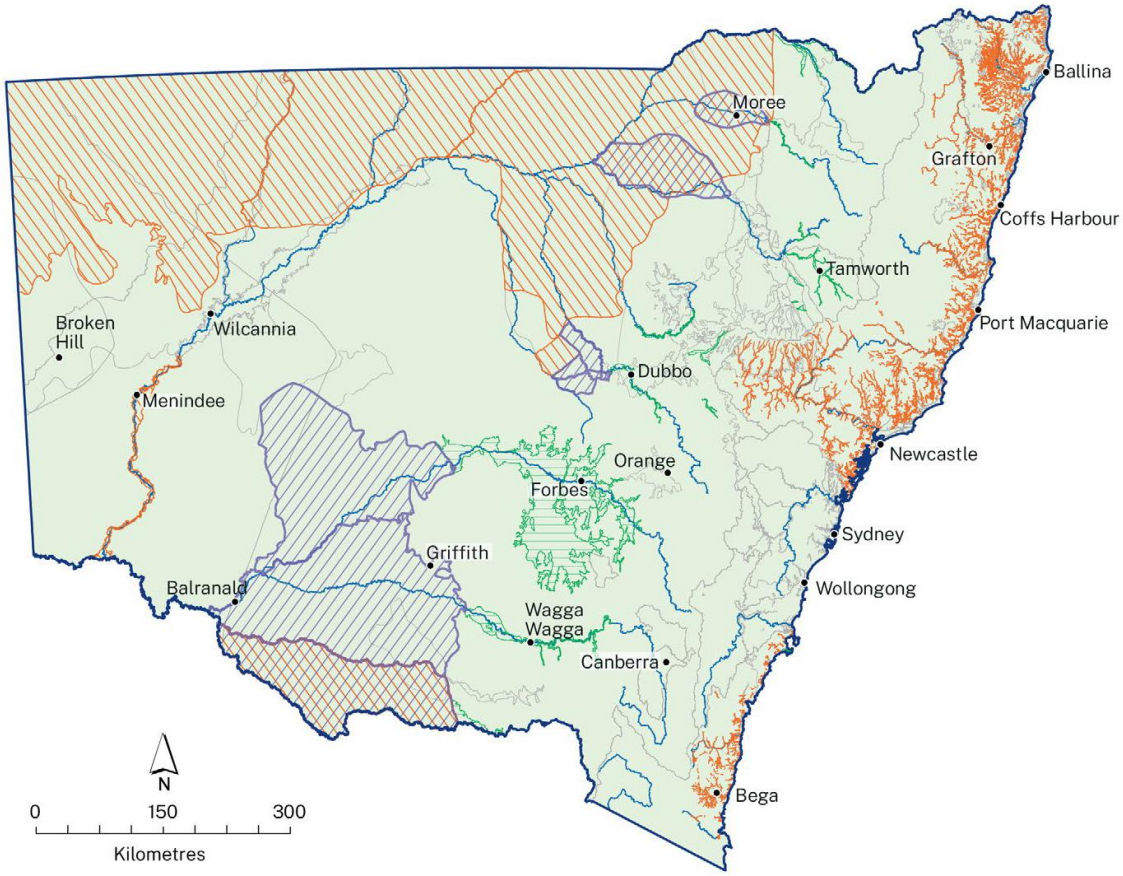
4. Poor process for developing current water sharing plan extraction limits

The 'at-risk' groundwater sources [7] match the areas where negotiated plan limits and other non-science-based plan limits occur in water sharing plans:



[4] *Draft Guide to Groundwater Resources in NSW* p 6
[5] *Draft NSW Groundwater Strategy* p 55
[6] Ibid p 41 - 46
[7] WaterNSW, September 2021. *At-risk groundwater sources*

Figure 14. Map of groundwater sources where different methods are used to calculate LTAAEL [8]



LTAAEL calculation methods:
Light green % recharge
Blue diagonal % recharge + negotiation
Orange diagonal % Entitlements
Green hatch % Usage

Source: Based on data from the Department of Planning and Environment.

The range of different methods used to calculate the Long Term Annual Average Extraction Limit (LTAAEL) in groundwater source water sharing plans is a key issue that must be addressed to ensure sustainable use of groundwater into a future with a drying climate.

The current processes are not based on science but on history of use. The 'at-risk' groundwater sources are the aquifers that have suffered significant drawdown and have not recovered to natural equilibrium.

It is essential for statutory limits to groundwater extraction to be based on science and climate change predictions that demonstrate lower levels of recharge. Knowledge of aquifer condition and GDE and cultural site location, watering requirements and condition must also inform new limits to groundwater extraction in all water sharing plans.

[8] Department of Planning and Environment, July 2022. *Draft Guide to Groundwater Management in NSW* p 41

5. Floodplain Harvesting

It is acknowledged that '*Floodplain levees and harvesting activities interfere with flood flows, reduce inundation areas and reduce groundwater recharge volumes*'[9] and that '*Floodplain recharge processes are especially important for the large inland alluvial groundwater systems associated with major rivers in the Murray–Darling Basin.*'[10]

It is of particular concern to IRN that this important issue has not been adequately considered or addressed in the recent gazettal of new floodplain harvesting entitlements and rules in water sharing plans for the Border Rivers, Gwydir and Macquarie catchments where some of the large inland alluvial groundwater sources occur. Adequate understanding and protection of recharge processes is essential in these river systems where groundwater sources are identified as 'at-risk' and have significant issues with declining groundwater levels and over extraction.

The Macquarie and Gwydir catchments also contain the important groundwater-fed ecosystems: the Ramsar listed Macquarie Marshes and Gwydir Wetlands.

6. Economic value of groundwater use

It is concerning that the highest use of groundwater is for annual crops that have a much lower economic value per GL than other uses. [11] It is essential that the Strategy focus on more efficient use of groundwater before encouraging greater dependency on 'at-risk' groundwater sources. It is environmentally and economically unsustainable for groundwater to be used for flood irrigation on annual crops particularly during drought and periods of high evaporation and high temperatures. More efficient irrigation technology must be required for groundwater use to safeguard groundwater sources and aquifer integrity in future periods of predicted climate extremes.

This should be a top priority of the Strategy.

Comments on the Strategy Priorities

1. Protect groundwater resources and the ecosystems that depend on them

This top priority is in line with the NSW Water Management Act 2000 priority to protect the environmental health of all water sources and is fully supported by IRN.

1.1 Refresh and expand our approach to sustainable groundwater management

This action needs to acknowledge the poor condition of many of the large inland aquifer systems so that it is clear that the Strategy is working from a low level of sustainability in the face of climate change predictions. This action must emphasise an improvement in groundwater management through strengthening the groundwater policy and planning framework.

This action should outline all areas of policy to be updated rather than leaving this detail to an implementation plan.

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[9] *Draft Guide to Groundwater Resources in NSW* p 21
[10] Ibid p 22
[11] *Draft NSW Groundwater Strategy* Fig 7 p 28

1.2 Better integrate groundwater management with other land and water management processes

IRN fully supports that land use planning processes and major project approvals actively consider and protect groundwater sources and their dependent ecosystem functions. The NSW Aquifer Interference Policy must be reviewed under Action 1.1 as it currently fails to protect groundwater sources from severe impact of mineral and gas extraction. The issuing of Environmental Pollution Licences by the EPA also needs to be overhauled to improve protection of groundwater quality.

We note that the Great Artesian Basin [12] (GAB) is used as an example of protecting groundwater sources through the cap and pipe program. The Strategy fails to note that the most recent water sharing plan for the NSW GAB increased the extraction access including 30 % of the water saved through capping artesian surface flows. IRN submitted a strong objection to this increased access which was duly ignored. [13]

1.3 Improve management and protection of GDEs and baseflows to streams

IRN supports that the location, extent and condition of GDEs be mapped and that the environmental water requirements of GDEs are better understood. This must be done at the water sharing plan scale so that the Schedule informing rules to protect GDEs fully identifies mapped GDEs.

Better understanding of gaining and losing streams will improve groundwater management for the protection of baseflows. Connectivity between surface and groundwater is a significant issue during drought including condition of important drought refugia.

1.4 Review and update approached to sustainable groundwater management

This section of the Strategy identifies the aquifer systems that are fully committed and those brought back under existing plan limits. However, it fails to discuss the condition of those aquifers and the review of water levels.

This must be a priority action for an updated approach to sustainable groundwater management. Aquifer systems that are already functioning under a lower than natural water level or 'new equilibrium' must be prioritised for all improved management actions within the Strategy.

1.5 Protect groundwater quality within natural limits

IRN supports the actions to better manage contamination of groundwater sources.

The identification of all polluted aquifers and a remediation plan should be a top priority of the Strategy. An embargo on any further use or interference must be in place until such time as the problem is remediated.

The legacy of past poor land use planning cannot continue to be handed on to future generations.

2. Build community and industry resilience through sustainable groundwater use

IRN does not support the focus on increasing opportunities for economic development using inland groundwater sources. Many are already over-committed and 'at-risk'. Improved water use efficiency of existing industries must be a key focus before encouraging any new economic development using finite groundwater resources in a drying climate.

[12] Ibid p 51

[13] https://irnnsw.files.wordpress.com/2020/04/nsw-gab-wsp-2020-submission-irn.pdf

2.1 Support towns and cities using groundwater to improve their urban water planning

IRN does not support the increasing emphasis on accessing town water supply from groundwater. We do support that towns and cities improve urban water planning. The National Water Initiative 2004 identified the need for urban integrated water cycle management strategies. It is irresponsible that most inland councils have not been supported to develop these. Top priority should be to improve water use efficiency in towns including the establishment of purified water recycling systems before exploring new licencing options for groundwater-based drought resilience. Recycling is a preferable technology to desalination of highly saline groundwater sources.

2.2 Support economic growth using groundwater

IRN does not support this Strategy action. It fails to recognise that groundwater is a finite source and is already too heavily relied upon.

The Strategy identifies that agriculture is responsible for 75% of groundwater use while generating less than 27% of the total economic value. [14] Figure 16 shows that the Lachlan and Namoi groundwater use generates the most economic value. However, these are two areas where groundwater levels have dropped significantly and have a declining trend.

The Strategy fails to recognise the long-term economic cost of failing aquifers. This must be included in any cost-benefits analysis associated with new industries. Existing industries must be encouraged to become more efficient water users. It is environmentally and economically unsustainable for groundwater to be used for wasteful flood irrigation when far more efficient irrigation technology has been available for many years.

The six Special Activation Precincts [15] identified to encourage increased economic development are mostly in regions with known declining groundwater levels or high contamination problems.

IRN does not support any more Controlled Allocation Orders until actions on establishing new plan limits are completed.

2.3 Support Aboriginal rights, values, and uses of groundwater

IRN supports the actions proposed to improve First Nation water rights. The mapping and statutory protection for cultural sites should be a top priority of the Strategy.

3. Improve groundwater management decisions with better information

IRN strongly supports the improvement of on ground knowledge to better inform groundwater management decisions.

3.1 Develop a groundwater knowledge plan to improve how we use groundwater information to make decisions

[14] Ibid p 64
[15] Ibid p 65

The knowledge plan must prioritise the mapping of GDEs and culturally significant groundwater dependent sites, better understanding of connectivity and recharge, and aquifer condition.

Sustainable management of groundwater must have this basic information to work from.

3.2 Better share and integrate groundwater information

Groundwater data collected by State Significant Development and major infrastructure projects must be subject to independent review before including in data sharing arrangements. The proponents of these large projects generally submit advocacy documents where information needs to be independently verified.

The accounting of all groundwater use is critical in understanding the current state of play in the economic development of and impact to groundwater sources.

3.3 Improve our understanding of groundwater resources

Understanding and acknowledgement of current environmental degradation of GDEs, cultural sites, aquifer integrity and water quality is a critical first step in the process of improving sustainable management of groundwater resources.

It is imperative that current condition is fully understood before any direction towards encouraging increased use of groundwater is undertaken.

3.4 Expand our groundwater data collection

IRN fully supports increased investment in groundwater monitoring. It is also essential that all groundwater extraction is metered including basic rights.

4. Implementation timeline [16]

IRN notes that 3 timeline horizons have been nominated for meeting various Strategy actions. These are 1 – 5 year delivery, 5 – 10 year delivery to commence within 2 years and 10 years and over in a 20 year Strategy.

We do not support that action 1.3.1 *Review and update our approach to protecting GDEs* and action 1.3.2 *Deliver a program to improve our understanding of GDEs* are pushed out to Horizon 2 (5 – 10 yrs). It is critical for sustainable groundwater management that all information about GDEs is given top priority and suitably resourced.

We also do not support that action 2.3.2 *Protect groundwater-dependent places of significance to Aboriginal communities* and action 2.3.3 *Better integrate Aboriginal knowledge into groundwater management* are commenced in Horizon 2 with the bulk of the work occurring in Horizon 3 (10 yrs and over). This ongoing approach of the NSW Government to push out any consideration of First Nations interests and knowledge into a distant future timeframe is reprehensible.

[16] Ibid p 85

We note that all actions involving economic development are proposed to commence in Horizon 1 (1 – 5 yrs). This exemplifies the unbalanced approach taken by the NSW Government in all water management. There will be no sustainable management of groundwater in NSW under the Strategy while ever the key focus is on economic development at the expense of environmental and social considerations.

Conclusion

Improved management of groundwater sources in NSW must commence with a thorough understanding of the current condition of aquifers, GDEs and culturally significant groundwater-dependent places. Without this knowledge there can be no sustainable management because there is nothing to measure it by.

The Strategy must be strengthened so that the current status of groundwater sources including structural integrity, water level trends, water quality, connectivity and current pressures are clearly understood with actions that provide a pathway to improvement.

This must occur in the context of climate change predictions and have precedence over any action to foster economic development.

We include links to the various submissions that IRN has made to groundwater related matters:

For more information about this submission please contact:

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