20 AUGUST 2020

IAH Australia submission to the Productivity Commission

The International Association of Hydrogeologists (IAH) is a professional association for groundwater-related professionals. IAH's mission is to further the understanding, use and protection of groundwater resources throughout the world. IAH raises awareness of groundwater issues and works with national and international agencies to promote the appropriate use of groundwater. IAH Australia represents over 500 professional hydrogeologists. Its members represent government agencies, consultants, university academics and related scientists and engineers.

IAH Australia recognises that many aspects of Australian water reform and water policy are world-leading. However, IAH Australia sees important areas for improvement with respect to groundwater-related National Water Initiative (NWI) issues, as outlined.

INFORMATION REQUEST ITEMS

INFORMATION REQUEST 1

The Commission welcomes feedback on: whether signatories are achieving the agreed objectives and outcomes; areas of slow progress; deviations from NWI objectives and other useful data and information sources for assessing progress.

RESPONSE

The NWI includes agreements that water management plans: recognise connectivity between surface water and groundwater systems; and manage connected systems as a single resource. Previous Productivity Commission reviews of NWI water reforms concluded that jurisdictions have largely achieved these objectives, whilst acknowledging that the number of plans that fully integrate surface water and groundwater management remains small. However, a much faster pathway to adequate implementation of conjunctive water management (CWM) practices is required. CWM in this submission focusses on managing the total water resource in an optimum manner (as opposed to managed aquifer recharge [MAR] specifically), while taking into account the fundamentally different behaviour of groundwater and surface water (table below).

Though most plans recognise connectivity, many aim to minimise impacts on surface water resources from groundwater extraction, rather than managing the systems in an integrated manner. Limiting CWM to a matter of managing groundwater impacts on streamflow: is not optimal resource usage; is counter to the objective of single-resource management approaches; and does little to address emerging challenges. Water management plans typically fail to define hydrologic connectivity (the strength of surface water and groundwater resources' interconnection) adequately.

Some states have attempted to manage connectivity by specifying distance rules, whereby groundwater extraction within a defined distance of the river is prohibited. All this achieves, in most cases, is delaying impacts, not impact-reduction, and it is very sensitive to the time scale of response being considered. The NWI also includes overland flow (an important source of recharge to groundwater systems) in the definition of connectivity.

Based on members' experience in working with water management plans:

- Groundwater management plans (at best) address seasonal connected-system impacts but rarely address impacts over greater-than-seasonal timeframes.
- Very few connected systems' plans adequately consider the impacts of climate change and water scarcity in the context of conjunctive management (for example, the Lower Gwydir groundwater source within the Gwydir Alluvium Water Resource Plan in NSW).
- The science and models required for surface water and groundwater assessments often have different: spatial scales; temporal scales; and data-availability. Investment in strengthening the technical basis for management of connected systems is required, including a timetable of progress.

Parameter	Characteristic	
	Groundwater	Surface water
Response time	Slow	Fast
Time lag	Long	Short
Size of storage	Large	Small
Security of supply	High	Low
Spatial management scale	Diffuse	Generally linear
Flexibility of supply	Very flexible	Not flexible

Recommendation: Include CWM in a meaningful way in state water planning processes, especially for drought and climate change planning.

INFORMATION REQUEST 2

Is the NWI adequate to help Governments address the identified challenges? Are there any other current or emerging water management challenges where the NWI could be strengthened?

RESPONSE

Groundwater resource management is increasingly overlapping with relatively new forms of energy exploitation, including unconventional hydrocarbons (coal seam gas, shale gas) and geothermal energy. Investment in groundwater science and groundwater management is critical to maximising the outcome of these increasingly-overlapping industries. These issues usually occur at <300m depth; however, NWI's focus is almost always on shallower water resources. For example, in Victoria's Latrobe Valley there's an overlap between: water management associated with coal mining; agriculture; geothermal energy; and (possibly, in the future) water demand from a nascent hydrogen-fuel industry. In some states, water conservation practices (such as aquifer injection) are not currently recognised in the licensing framework for energy projects.

Recommendation: NWI: recognise the challenges and opportunities of the increasing overlap between groundwater and energy; and provide guidance regarding a workable regulatory and compliance framework for states to follow.

INFORMATION REQUEST 4

How effective are water plans at managing extreme events such as severe drought? Are NWI principles being applied at these times? What steps have been undertaken — or should be undertaken — to plan for long term changes in climate? What lessons have recent extreme events (bushfires and COVID 19) provided for planning?

RESPONSE

Groundwater trading is not as straightforward as surface water trading. The viability of a trade depends on not only the catchment's total allocation, but also localised pumping impacts (drawdown) and water quality. A key tool for facilitating groundwater trading is water management plans. Water management plans' multiplier effects are significant in supporting other industries. They need adequate investment to support this economic process.

Water management plans require regular reviews and updates to address the ongoing impacts of climate change. However, water management plans are typically insufficiently reviewed, usually due to underfunding of regulatory agencies. A mechanism is needed to recognise and learn from the exceptions, such as the Daly River NT water management plan.

Recommendation: Provide adequate budget for reviews and updates of water management plans, including assessments of the ongoing impacts of climate change.

INFORMATION REQUEST 5

How could the NWI be amended to support best practice monitoring and compliance across jurisdictions?

RESPONSE

Underfunding of groundwater science and groundwater management is an ongoing theme in Australia's groundwater industry. The NWI has instruments such as cost recovery; however, these instruments are rarely used.

Recommendation: Provide adequate budget for groundwater monitoring and groundwater compliance assessments, including: the development and maintenance of monitoring bore networks; investment in data-capture and data-storage processes; and regular updating of conceptual and numerical models. Consider adopting NWI instruments such as cost-recovery to support these ongoing requirements.

INFORMATION REQUEST 6

Are environmental outcomes: specified clearly in water plans; supported institutionally and administratively; sufficiently integrated with complementary natural resource frameworks; cost effectively managed; sufficiently monitored and assessed; effectively managed using adopting adaptive management during the recent drought; being maximized by environmental water managers to achieve social or cultural outcomes alongside environmental watering? How could this be improved?

RESPONSE

Some significant work has gone into groundwater dependent ecosystem (GDE) research. All states have now enacted legislation to protect GDEs. However, there is wasted effort and costly delays in GDE assessments. For example, there is no agreed process for assessing stygofauna's value and management methodologies. There needs to be improvements in assessment methodologies, including the application of new technologies and knowledge and reviewing past experiences. The Commonwealth has a role in coordinating best practice guidelines for including GDEs in the planning processes, both for environmental impact studies and water plans.

Recommendation: The Commonwealth establish best practice guidelines for GDE assessments and management plans.

INFORMATION REQUEST 11

Is further guidance on implementing an integrated water cycle management approach for delivering water supply, wastewater and stormwater management services required? This includes: the interface between different scales of water and urban planning; definitions of roles and responsibilities; clear-definition of the role of water in delivering amenity and liveability; consideration of tradeoffs with other NWI outcomes; and clearly-defined funding frameworks.

RESPONSE

Australian cities such as Adelaide have demonstrated a commitment to maximising the value of water, including the adoption of innovative water banking/managed aquifer recharge (MAR) projects. However, the economic return from these projects is being hampered. Whilst regulatory agencies are usually supportive, in principle, of innovative urban water projects, their funding is invariably insufficient to properly support them. Numerous worthwhile schemes have floundered due to underfunded agencies' inability to properly assess projects, whereby agencies have: not had advocates for change; and have not been equipped to assess uncertainty and project benefits.

Recommendation: The NWI develop an improved funding model for the states, as underfunding of state groundwater agencies is severely affecting the delivery of groundwater services and approvals.

INFORMATION REQUEST 12

Are there examples of projects that have not met the NWI criteria for new water infrastructure investment?

What principles should inform government funding or financing of new water infrastructure?

RESPONSE

Groundwater plays an important and increasingly recognised role in managing water storage. The NWI has developed an economic framework for water use; however, market mechanisms are not being applied to water storage. For example, major surface water storage infrastructure (dams, pipelines etc.) is usually state-subsidised, whereas equivalent groundwater schemes (such as water banking/MAR) typically are not.

Groundwater's role in longer-duration storage is critical, especially for future climate-resilience. However, present management strategies don't necessarily reflect this. In drought conditions groundwater is invaluable. Market mechanisms don't necessarily reflect this.

Recent examples whereby market mechanisms have not been applied include the investment decision regarding the Broken Hill water supply project, whereby a pipeline option was chosen over a lower-cost and lower-impact alternative (MAR).

Recommendation: Review the application of NWI principles with respect to water storage.

IAH members' feedback emphasises the requirement for increased investment in groundwater governance, education and monitoring to address the challenges outlined in this letter. Groundwater science and education have a strong role in optimising the NWI's economic and environmental outcomes.

Opportunities for further input

IAH is pleased to provide further input regarding the issues outlined in this letter. Please feel free to contact the undersigned.

Yours sincerely,

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This submission is based on IAH members' input.