

# NSW Groundwater Strategy - Stakeholder survey

Thank you for taking the time to provide your feedback on the draft NSW Groundwater Strategy.

Groundwater is water found underground in rock formations called aquifers and is an important resource for NSW. For more information about groundwater, [visit the department's website](#).

The draft strategy sets a long-term vision and direction for groundwater management in NSW.

This survey aims to gather your opinion about the draft strategy. Your comments will help us identify community views and key areas of interest and help us to develop the final strategy.

This survey will close on **Sunday 14 August 2022 at 11.59pm (AEST)**.

The survey is structured according to the draft strategy's main chapters:

- Introduction and general overview of groundwater resources and management in NSW.
- Strategic Priority 1 – Protect groundwater resources and the ecosystems that depend on them in the strategy.
- Strategic Priority 2 – Build community and industry resilience through sustainable groundwater use (this part of the survey also includes an opportunity for Aboriginal people to provide cultural-specific feedback).
- Strategic Priority 3 – Improve groundwater management decisions with better information.

## Confidentiality preferences - Publishing your submission

Please indicate if you give permission for your submission to be published on the department's website, and whether you give permission to be identified as the author of the submission or wish to remain anonymous.

I give permission for the department to publish my name with my submission on the department's website.

I do not give permission for the department to publish my name with my submission on the department's website. In selecting this option, I understand that my submission will be published anonymously.

I do not give permission to publish my submission at all.

## Sharing your submission within the department

Please indicate if you give permission for your name and email to be included when sharing survey response data internally within the department.

- I give permission for my name and email to be shared within the department.
- I do not give permission for my name and email to be shared within the department. In selecting this option, I understand that my submission will be shared anonymously.

## Your submission

If you would like to provide additional feedback in an attached document, please add it to this submission when you return the survey.

Please note, if you wish to remain anonymous, please do not include personal information in your attachment.

If you would prefer to email your feedback or if you have any enquiries, please email the department at [nsw.groundwaterstrategy@dpie.nsw.gov.au](mailto:nsw.groundwaterstrategy@dpie.nsw.gov.au).

## Data privacy

The Department of Planning and Environment is subject to the *Privacy and Personal Information Protection Act 1998* in managing your personal information. In the interests of transparency, the department's website intends to publish all feedback received on its website. You can choose to have your feedback published anonymously or not published at all. Please review our [privacy statement](#) for further information.

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## Introduction and overview of groundwater resources and management in NSW

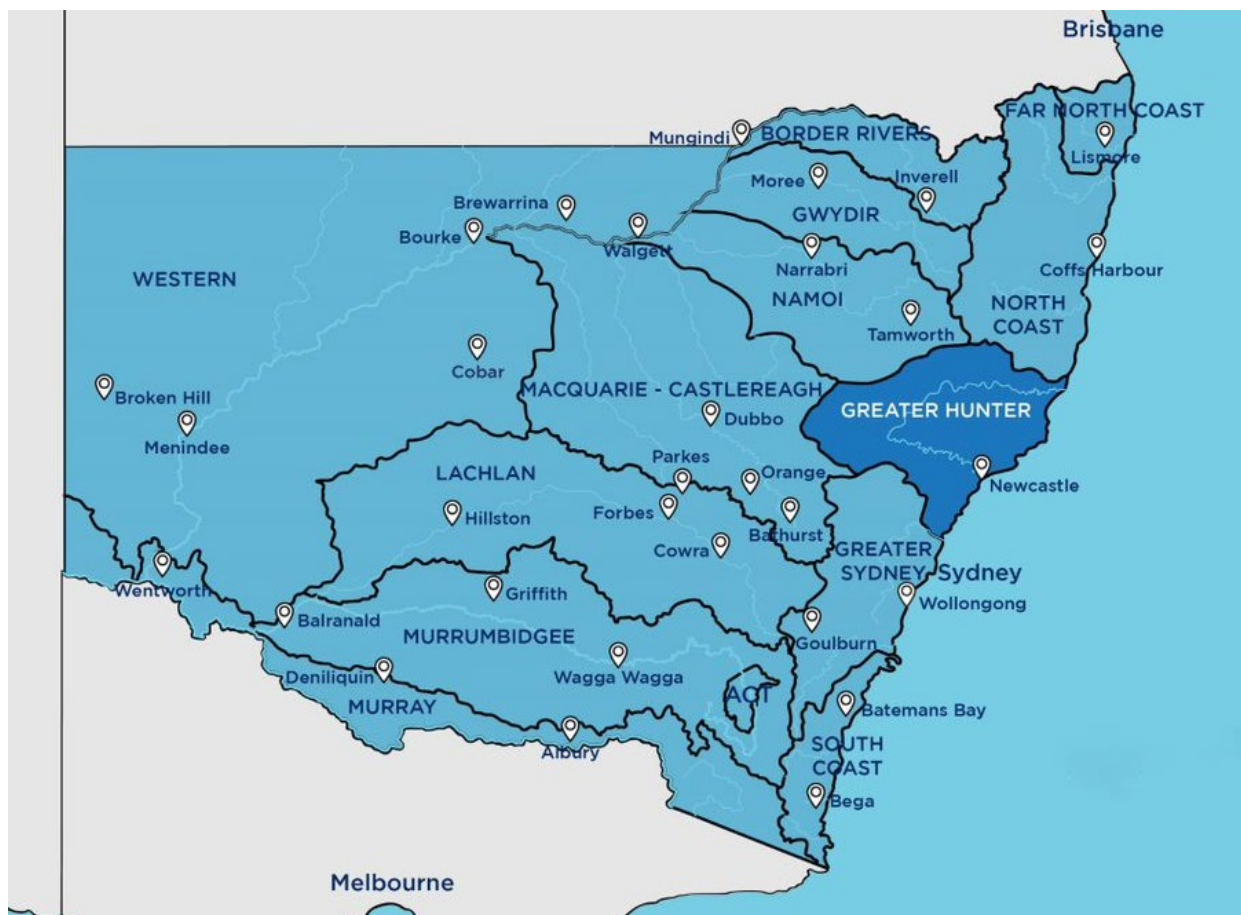
Groundwater is water found below the ground in rock formations called aquifers. Groundwater is also used for a multitude of purposes in NSW such as agriculture, town water supply, and also to sustain important ecosystems.

**Thinking about your relationship to groundwater, which of the following user groups or parts of the community best describes you? (please select only one)**

- General public
- Local Council / Local water utility
- NSW Government department
- Australian Government department
- Domestic and stock
- Agriculture
- Industry
- Manufacturing
- Research / academia
- Environmental group
- Other (please specify) Artesian Borewater Users Assn., & Great Artesian Basin Advisory Group -----

*In NSW, there are almost 80 groundwater sources west of the Great Dividing Range and over 450 sources on the coast.*

**Based on the 13 NSW regions outlined in the map below, in which region are you located?**



Choose your region

- Border Rivers
- Far North Coast
- Greater Hunter
- Greater Sydney
- Gwydir
- Lachlan
- Macquarie-Castlereagh
- Murray
- Murrumbidgee
- Namoi
- North Coast
- South Coast
- Western

*Groundwater is an important resource for NSW. It is used for town water supply, agriculture in the Namoi for example, or industry in the Hunter Valley.*

**How important is it for you to access groundwater as a resource?**

- Not at all important
- Of minor importance
- Neutral
- Important
- Very important

**To what extent do you agree with the following statements? (please select one response per row)**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Groundwater is important for basic human needs (drinking, cooking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater is important for stock watering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater is important for Aboriginal communities and Country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater is important for agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater is important for the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater is important for industrial businesses (including mining)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groundwater is important for manufacturing (water bottling, food processing and others)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Groundwater in NSW currently provides close to 10% of water used for town supply, and over 70% for agriculture, as well as supporting a range of ecosystems. In the context of a growing population and climate change, please answer the following questions.*

**Please indicate what you think NSW's groundwater needs will look like over the next 20-40 years.**

- The same
- Less than current needs
- More than current needs
- Not sure

**Which part/s of the community do you think will have the greatest change in their groundwater needs in the future?**

**Select all that apply.**

- Households
- Agriculture
- Industry
- Manufacturing
- Towns and cities
- Aboriginal communities and Country
- Ecosystems dependent on groundwater
- Not sure
- I don't believe there will be any change

**Do you think you should change the way you will use groundwater in the future?**

- Yes, I've already begun to change my groundwater usage habits
- Yes, I've started doing research and am in the process of making changes
- I've thought about it, but have done nothing more
- No, it hasn't even crossed my mind
- I don't use groundwater

**How well do you know the NSW groundwater management framework, rules and legislation?**

- Not at all
- Not well at all
- Unsure
- Well
- Very well

*The Draft NSW Groundwater Strategy identifies 4 key issues affecting change in groundwater management in NSW.*

**Please rank these issues from most important to least important, where 1 = Most important and 4 = Least important.**

- 1 \_\_\_\_\_ Our climate is changing, and groundwater recharge and demands will be affected by this
- 1 \_\_\_\_\_ The risks to groundwater from development and land use change are increasing
- 2 \_\_\_\_\_ Community notions of sustainability and fair access to groundwater have evolved over time
- 1 \_\_\_\_\_ Our understanding of groundwater, its behaviour and use is improving

With relation to the GAB the science needs to be independently verified and improved and expanded. This is not strong enough now - the three issues with a number 1 above all come under the same 'science' banner. Understanding groundwater, changing climate and risks all need to be independently scientifically proven, understood and acted upon. The damage that CSG mining is already doing to the recharge systems of the GAB, is irreparable. CSG mining does the exact opposite of what we have been achieving with GABSI - GABSI restores the pressure and conserves the water, while CSG mining drains and pollutes the aquifers. We have clear scientific evidence now of the damage that it is doing and this must be recognised by government and the NSW Government stopped. Licenses need to take into account the sustainability of the proposed industry. Agriculture is sustainable forever if managed correctly. Mining can have shorter term economic benefit but at what cost? Longer term dewatering of aquifers increases salinity loads and contamination - which has already happened. This cannot be undone once done. Sustainability for future generations needs to be paramount. We cannot live without water, and I believe our government's responsibility is to protect our precious groundwater, before it's too late.

**Please tell us of any other challenges that are affecting groundwater management in NSW.**



In the following sections of this survey, you will be asked questions based on each of the draft NSW Groundwater Strategy priorities. [You can read the draft strategy on our website.](#)

## Strategic Priority 1 – Protect groundwater resources and the ecosystems that depend on them

Strategic Priority 1 aims to sustain our groundwater resources for current and future uses and protect our important ecosystems that depend on groundwater.

In priority 1 of the draft strategy, 4 key challenges affecting groundwater resources and the ecosystems that depend on them are identified.

**Please rank these challenges in order of importance, where 1 = Most important and 4 = Least important.**

- 1\_\_\_\_\_ Our policy framework for sustainable groundwater management needs to be updated to be more responsive to emerging challenges such as climate change
- 2\_\_\_\_\_ Ecosystems that depend on groundwater face increased threats such as intensive groundwater extraction and pollution
- 4\_\_\_\_\_ There is a lack of integration between groundwater, surface water and land management
- 3\_\_\_\_\_ Threats to groundwater quality are growing and need to be addressed

**Please tell us any other challenges you think will affect the protection of groundwater resources and the ecosystems that depend on them.**

The policy framework needs to be updated with transparent stakeholder involvement. MAR needs to be independently researched and proven safe, before any approvals are granted - taking into account the value of stygofauna etc in the water cycle. The govt. departments must listen to the science of the damage that CSG mining is causing. This cannot be 'made good' later, when pollution and adverse biological effects become apparent, which they already are. CSG mining at Narrabri must be stopped now, until the Chief Scientist's recommendations have been met. They are drilling through three Basins, and we have scientifically proven the connectivity between aquifers. This damage is irreparable, and in the future, when we have lost our vital water, people will demand to know how the government departments allowed this to happen.

**How important for you is the protection of groundwater resources and the ecosystems that depend on them?**

- Not at all important
- Of minor importance
- Neutral
- Important
- Very important

The department has put forward a range of draft actions to increase the protection of groundwater resources and the ecosystems that depend on them. The following questions will review each of the draft actions and their sub-actions.

### **Action 1.1 - Refresh and expand our approach to sustainable groundwater management by reviewing and updating our groundwater policy and planning framework.**

**To what extent do you agree with this draft action?**

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

### **Action 1.2 - Better integrate groundwater management with other land and water management processes.**

**To what extent do you agree with this draft action?**

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 1.2?

	Not at all important	Of minor importance	Neutral	Important	Very important
Refresh and expand our approach to sustainable groundwater management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Manage groundwater and surface water together	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Integrate groundwater considerations into land use planning decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improve management of large developments impacting groundwater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strengthen cross-border groundwater management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Action 1.3 - Improve management and protection of groundwater dependent ecosystems and baseflows to streams.**

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 1.3?

	Not at all important	Of minor importance	Neutral	Important	Very important
Review and update our approach to protecting groundwater dependent ecosystems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Deliver a program to improve our understanding of groundwater dependent ecosystems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Action 1.4 - Review and update approaches to sustainable groundwater extraction.**

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 1.4?

	Not at all important	Of minor importance	Neutral	Important	Very important
Review groundwater source extraction limits using new knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Better manage impacts of extraction at a local level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improve clarity around management of groundwater sources with a low long-term entitlement share value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Action 1.5 - Protect groundwater quality within natural limits.**

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 1.5?

	Not at all important	Of minor importance	Neutral	Important	Very important
Review and update our approach to managing groundwater quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Deliver a program to better understand groundwater quality and risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please tell us any other suggested actions you think we should consider in Strategic Priority 1.

These two actions you list above, under Action 1.5, are more than 'very important' - they are absolutely vital!  
 Some thoughts:  
 1.2 - is important if not designed to cut red tape on 'risky' projects allowing easier approval and increased risk of pollution/ over extraction/ changing water flows etc.  
 Box 4 - last line to include towns.  
 1.2.2 paragraph 4 - existing or improved planning & tools?  
 1.4 para 2 #44 - very limited review, less than a third/quarter of the state.  
 Action 1.4 - more must be done to control over allocation and to buy back licenses, especially in the GAB Eastern recharge. Entitlements more than twice the LTAEL are not fair, not sustainable and should not be possible and this must be urgently corrected.  
 1.5 - definition of natural limits - it must be transparent and measurable.

## Strategic Priority 2 – Build community and industry resilience through sustainable groundwater use

Strategic Priority 2 aims to improve water security through the sustainable use of groundwater by urban populations, water dependent cultural, spiritual and economic aspirations of Aboriginal people, and support opportunities for other groundwater dependent development.

The strategy identifies 3 key challenges affecting the resilience of communities and industries using groundwater.

**Please rank these challenges in order of importance, where 1 = Most important and 3 = Least important.**

- 1\_\_\_\_\_ Increasing demand for groundwater undermines town water supply
- 2\_\_\_\_\_ New and expanding industries need to consider groundwater opportunities and constraints
- 3\_\_\_\_\_ Aboriginal rights to and uses of groundwater are not adequately recognised

**Please tell us any other challenge you think will affect community and industry resilience in using groundwater.**

Changes to Basic Landholder Rights could cause great concern to people, as this is what they rely on to survive. This is what makes these areas habitable and allows water for people and stock to drink, in very many cases it is the only water. As has been seen in the Namoi, water becomes a commodity which in times of drought, only the wealthy can buy. BLR, town and aboriginal water must never become a commodity, only available to the rich. Our constitution clearly states this. Water rights should be tied to land ownership, it never should have become a tradeable commodity. If no further allocations are available, ie Eastern Recharge, then there is no further opportunity for new industries to come in and buy all the water. Sustainable industries and beneficial use should be the only consideration. And CSG mining should be stopped until they can answer the Chief Scientist's questions, including what they will do with the wastewater, and how they will dispose of the toxic salt.

**How important is it for you that communities and industries using groundwater resources have a reliable and secure supply?**

- Not at all important
- Of minor importance
- Neutral
- Important
- Very important

The department has put forward a range of draft actions to increase the resilience of communities and industries using groundwater. The following questions will review each of the draft actions and their sub-actions.

## Action 2.1 - Support towns and cities using groundwater to improve their urban planning.

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

## Action 2.2 - Support economic growth using groundwater.

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree



How important to you are each of the following sub-actions required under Action 2.2?

	Not at all important	Of minor importance	Neutral	Important	Very important
Provide better information on groundwater opportunities and constraints to communities and industries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Enable the increase of sustainable groundwater use in targeted areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foster innovative groundwater solutions, including Managed Aquifer Recharge (also called 'water banking', to support communities and industries)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Action 2.3 - Support Aboriginal rights, values and uses of groundwater.**

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 2.3?

	Not at all important	Of minor importance	Neutral	Important	Very important
Increase access to groundwater for Aboriginal people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Protect groundwater-dependent places of significance to Aboriginal communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Better integrate Aboriginal knowledge into groundwater management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The following questions focus on groundwater challenges and opportunities for Aboriginal people in NSW.

Please only answer questions 43 to 51 if you identify as Aboriginal or Torres Strait Islander. If you do not identify as Aboriginal or Torres Strait Islander, please go to question 52.

A key objective of the NSW Government is to improve groundwater management outcomes for Aboriginal people across the state. We want to ensure that Aboriginal people and their wisdom and knowledge have a greater influence in groundwater planning and management.

You have indicated that you are of Aboriginal or Torres Strait Islander descent. To help us to better plan for and manage groundwater to support Aboriginal rights, interests and access, please answer these additional questions.

**Do you identify as Aboriginal and/or Torres Strait Islander?**

- Aboriginal
- Torres Strait Islander
- Both Aboriginal and Torres Strait Islander
- Neither
- Prefer not to say

**Please tell us what groundwater health and secure groundwater supply means for you, your family, your clan, your Nation.**

**Please tell us about the changes you have seen in groundwater management in your cultural landscape.**

**Please indicate which of these cultural opportunities you have seen in action in the way groundwater is managed in NSW.**

Select all that apply.

- Cultural wellbeing and healing
- Cultural significance of higher flows to waterways
- Protection and restoration of cultural sites of significance
- Restoring healthy Country
- Cultural ecotourism
- Other (please specify) \_\_\_\_\_

**Please provide any other comments about cultural opportunities or challenges in groundwater management in NSW.**

The strategy strives to provide more cultural and economic opportunities for Aboriginal people in relation to groundwater.

**What are the most important opportunities for you?**

Select all that apply.

- Fairer access to traditional land and resources
- Better contemporary economic opportunities in culture and recreation
- Increased access to employment and commercial opportunities on projects
- Improving awareness of Aboriginal people’s knowledge and contribution to how groundwater is managed in NSW in the next 20-40 years
- Other (please specify) \_\_\_\_\_

**Please provide any other comments about benefits of cultural and economic opportunities and how we realise those benefits in groundwater management and planning in NSW.**

This concludes the questions specific to your cultural heritage. If you would like to provide additional material to support your position, please email them along with this document.

**Please tell us any other suggested actions you think we should consider in Strategic Priority 2.**

As admitted in the information provided there are still huge gaps in the known science around the GAB. Before new technologies, which may or may not be harmful, are trialled - much more needs to be known about the 'actuals', how much water there is, quality, recharge rates and water flows, and potential damage. If this information is not known before-hand there is no baseline figure to measure these effects. Similarly, regarding increased water take, the quantity of water in the GAB, recharge rates and water flow and amount of take are all arbitrary figures 'according to an educated guess'. Many previous governments have consistently 'over allocated' water take from all water systems (GAB eastern recharge over double) which has cost huge amounts of money in buybacks. Before more water is sold the science needs to be shored up to determine exactly what is there and how long it takes to recharge before achieving a short term 'economic benefit' which is worth nothing if there is not quality water left for future generations. The quantity of water is not the only consideration, other factors must all work together such as pressure. Without pressure, it becomes uneconomic (if not impossible) to pump GAB water in most cases. No further economic benefit and the loss of the current economic and community benefit. action 2.2 - economic growth must be the right tool in the right area, not at the expense of long term and sustainable industries and community. If water is allocated for economic purposes, then it must be permanently sustainable no jus fo short-ter benefit

### **Strategic Priority 3 – Improve groundwater management decisions with better information**

Strategic Priority 3 aims to support better groundwater management and investment decisions with improved innovation and knowledge.

The strategy identifies 3 key challenges affecting the use of information to manage groundwater resources sustainably.

**Please rank these challenges in order of importance, where 1 = Most important and 3 = Least important.**

- 1 \_\_\_\_\_ Being underground and difficult to investigate, information about groundwater is lacking
- 2 \_\_\_\_\_ There are gaps in our scientific knowledge and research capabilities
- 3 \_\_\_\_\_ Our groundwater monitoring network is ageing and has limited coverage

**Please tell us any other challenge you think is affecting the use of information and data to manage groundwater resources.**

Information that was readily available on the website, has been moved or taken down, and it is simply too difficult to find relevant information. New information should be constantly put on Websites. For example, the latest GISEA/CSIRO report on underground connectivity "ha reveale fault-relate vulnerabilit o groundwater particularl i th nort wes o th Narrabr Ga projec area represente b th localitie o Bohem Creek Wilg Par an Yarr Lake Fault ar geologica structure whic ca allo movemen o ga an contaminant fro th coa seam t aquifers Plea ere dt efulrepo t n ths lik Informati n th tw s readiy availab e h s be n mov d r tak n dow , a d t s simp y t o difficult o fi d releva t informatio N w informati n shoud e constant y p t n Website F r exampl ,t e late t GISEA/ SI O repo t n underground connectivi y "h s reveal d fault-relat d vulnerabili y f groundwater , particular y n t e nor h we t ft e Narrab i G s proje tare , represent d y t e localiti s f Bohe a Cree , Wil a Pa k a d Yarr e Lak . Faul s a e geologic l structur s whi h c n all w moveme t f g s a d contaminan s fr mt e co l sea s o aquifer Ple se r ad he f ll rep rt ont is l n - Assessm nt of he influe ce of geologi al structu es on aquier connectivi ty in he Pill ga For st ar a, W an integr ted hydrogeologi al, geophysi al, hydrochem cal and environme tal tr cer appr - A d l ill at ach docum t.

**How important is it for you to have access to more information and data about groundwater management and use?**

- Not at all important
- Of minor importance
- Neutral
- Important
- Very important

**How interested are you in finding out more about how groundwater is managed and used?**

- Not at all interested
- Of minor interest
- Neutral
- Interested
- Very interested

**What ways could the department use to communicate with you and others in your community about groundwater management?**

We hear complaints from the department about not enough attendees at meetings, but when people do actually take the time to travel long distances and turn up at meetings, they ask questions regarding the relevant topic and these questions are 'taken on notice'. Even when these information sessions are in regard to submissions that the dept wants completed, they do not provide any answers to the questions as promised. People then don't bother completing the submission as they feel that no-one is listening - and they then do not turn up to any more meetings. This also wastes the time of people in organizations such as ABWUA as they spend considerable time ringing & emailing people to get them to attend. The common response to us is 'why bother, they aren't listening'. And also people feel there is such a lack of transparency in water dealings with the dept, and people do not trust what they are told. So much more could be achieved by working together but with no information or the wrong information there is a lack of trust.

**Please tell us what type of information and data about groundwater resources you would like available on our departmental website?**

As ABWUA is solely concerned with the GAB, including recharge from other water sources etc, our members would like to see more detailed maps which have towns so you can work out where the zones are. Then maps could show recharge rates, flow lines, estimated storage etc. The ability to zoom in to greater detail on maps is very important. The BOM radar page is great and just has buttons to add towns, railway lines etc which is really easy. We have asked for a diagram for distribution and website which shows the interaction between State, Federal and local rules and regulations, WSP, WRP, Acts, MDB plan, strategies etc. And were laughingly told someone had tried and it was impossible. If it is impossible to draw it, how on earth do you expect the lay person on the street to even try to understand it? And then this strategy adds another layer of complexity.

The department has put forward a range of draft actions to improve the use of data and information to make groundwater management decisions. The following questions will review each of the draft actions and their sub-actions.

### **Action 3.1 - Develop a groundwater knowledge plan to improve how we use groundwater information to make decisions.**

**To what extent do you agree with this draft action?**

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

### **Action 3.2 - Better share and integrate groundwater information.**

**To what extent do you agree with this draft action?**

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree



How important to you are each of the following sub-actions required under Action 3.2?

	Not at all important	Of minor importance	Neutral	Important	Very important
Expand the range of knowledge and insights products including information systems, platforms and interfaces for storing, managing, accessing and interrogating groundwater data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improve and diversify how we communicate information on groundwater resources and their management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Support strategic planning and decision-making by councils and groundwater users with improved access to information on groundwater and its management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Develop a unified framework to consolidate and analyse all groundwater data across all relevant agencies and groundwater users and impacting activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Support data and database integration across agencies to address data gaps and improve customer service delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Action 3.3 - Improve our understanding of groundwater resources.

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 3.3?

	Not at all important	Of minor importance	Neutral	Important	Very important
Expand our multi-disciplinary understanding of groundwater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improve our groundwater models where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase our capacity and capability to apply leading groundwater science	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Action 3.4 - Expand our groundwater data collection.

To what extent do you agree with this draft action?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

How important to you are each of the following sub-actions required under Action 3.4?

	Not at all important	Of minor importance	Neutral	Important	Very important
Improve our groundwater monitoring infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improve our groundwater monitoring programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please tell us any other suggested actions you think we should consider in Strategic Priority 3.

action 3.3.3 - research must be independent, not conducted by bodies with a vested interest in the outcome. Research conducted by a body who stands to gain from favourable answers by researching what they want specific answers to will never be trusted. New monitoring bores etc specific to a region and industry should be paid for by the industry ie coal basin monitoring should be paid for by coal companies. There is a difference between paying for and 'undertaking' the research under another name and putting money into a fund that you have no say over, that pays for the infrastructure. Research must be independent.

If you have any further feedback, please provide any final comments or upload additional material here.

If you are undertaking a new state wide NSW Groundwater Strategy, I believe this should be completed before undertaking smaller regional ones. At least then they can all be in the same format which makes it much easier to understand. The website says there are 20 regional drafts. We wanted to know if there is one for the GAB specifically, so searched draft regional water strategy and got to page three and had only found 8 out of the 20. Things are very hard to find, things are often taken off the website, you have to know which dept unless you can add notes in each section it is limiting the information you receive. The dept really has to build up trust again to achieve the best outcomes. A printable version of information would be greatly appreciated, as many people can't undertake all this reading solely on a computer. Re page 7 - does the "70" for agricultural " include stock & domestic " or pigging? To comment regarding water sale: it follows common law raised in Water Sharing Plan meeting in 2011. If further water is sold to the people let at the end of the year by capping and piping should be given the first chance to buy the water as they, along with federal and state government, should consider the same of money to achieve the savings. A precedent was set at the 009 GAB water auction in Walgett where we would like to see continued. It was promised that the proceeds of the GAB water auction had day would go to the Caping and Piping program. We believe any future sales should go towards cap and pipe to ensure these savings are continued as relevant independent research. But I strongly believe that no further sale of GAB water should be allowed until all the studies are completed and can be categorically proven that it will not impact the future of the AB. I have mainly commented in this submission solely regarding the GAB, this is what our members of BWUA would not. I am a so bore and member of GABAG a dam passed about six years ago. I have the comments I would like to make but he is no more. I will attach a separate document.

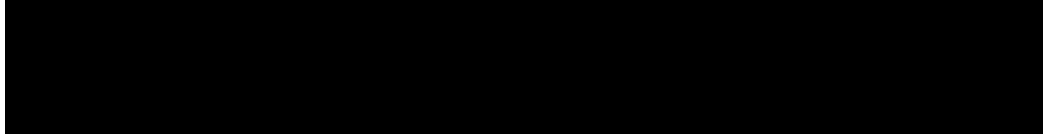
## About you

We appreciate your time in responding to this survey. Before you submit your survey response, we would appreciate your feedback to help us more broadly understand our audience. This enables us to communicate more clearly and to customise messages to the community. Please choose 'Prefer not to say', if you would rather not answer a question.

The information you provide will only be used for the purposes of this survey, to assist us in preparing the final NSW Groundwater Strategy and in the development of new groundwater policies and plans for NSW.

### Personal information

Please note, your personal information will only be shared if you granted permission for this to occur.



Your business name (if you are responding on behalf of an organisation)  
Artesian Bore Water Users Assn. And member of GABAG.  
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**How did you hear about this survey?** Select all that apply.

- Community group
- Department's website
- Email or e-newsletter from the department
- Newspaper
- NSW Government announcement
- Radio
- Social media - Facebook
- Social media - Instagram
- Social media - LinkedIn
- Television
- Word of mouth
- Work in the Water industry
- Other (please specify) individual email from dept - had not received general information. Had not received info as member of GABAG either. -----
- Prefer not to say

**What age bracket do you fit into?**

- Under 18 years
- 18 - 24 years
- 25 - 34 years
- 35 - 44 years
- 45 - 54 years
- 55 - 64 years
- 65 - 74 years
- 75 + years
- Prefer not to say

**How do you describe your gender?**

- Female
- Male
- Non-binary
- Other
- Prefer not to say

**Do you speak a language other than English at home?**

- Yes (please specify) \_\_\_\_\_
- No
- Prefer not to say

**Do you identify as a person with a disability?**

- Yes
- No
- Prefer not to say

Enter your postcode:

Thank you for completing this survey. Please email to [nsw.groundwaterstrategy@dpie.nsw.gov.au](mailto:nsw.groundwaterstrategy@dpie.nsw.gov.au)

**From:** [REDACTED] <[REDACTED]>  
**Sent:** Monday, 19 September 2022 11:29 AM  
**To:** [REDACTED] <[REDACTED]>  
**Subject:** FW: UNREPORTED CSIRO/GISERA Faulting study cause for concern  
**Importance:** High

Hi [REDACTED]  
This (below) was the email I received last week (from [REDACTED]) – which I wanted to forward to you, as to me it indicates how much more information and clear evidence is coming out all the time, about the damage that will be done to the GAB, if CSG mining is allowed to proceed, especially at the Narrabri Gas Project. We have had many scientific studies, by groundwater engineers etc, for the past ten years – of this evidence - but this new report is by GISERA/CSIRO, who are both govt organisations. There are many links to information in this email – which is why I wanted to forward it to you as is.  
Also I have many, many scientific that reports I would love to send you - especially a study done into Stygofauna and GDE's (groundwater-dependent-ecosystems) - but I don't want to overburden you with all this stuff!! Please let me know if you would like us to send you any more information, or to which contact or dept. to send it to, if you wanted it?  
Thank you again, so much, for all your patience with me!  
Kind regards,  
[REDACTED]  
[REDACTED]

(Forwarded email below):

### **Latest GISERA/CSIRO report reveals groundwater vulnerability hot spots in Narrabri**

A delayed GISERA/CSIRO report on underground connectivity has revealed fault-related vulnerability of groundwater particularly in the north west of the Narrabri Gas project area, represented by the localities of Bohena Creek, Wilga Park and Yarrie Lake. Faults are geological structures which can allow movement of gas and contaminants from the coal seams to aquifers.

The long-awaited [Assessment of faults as potential connectivity pathways](#) has been finally released with no media and no announcement, just as a quiet addition to the GISERA and CSIRO websites. This important study was not released until late April 2022 after being initially due for completion by the end of 2020. It was unremarked upon by the gas industry, and was not reported on by Santos to the May meeting of the Narrabri Gas Project Community Consultative Committee.

Despite the claim of “no prima facie evidence” of “significant connectivity”, a serious concern of groundwater users of the Namoi Alluvium and the Great Artesian Basin, the truth appears to be hiding in plain sight in the report, whose full name is [Assessment of the](#)

[\*influence of geological structures on aquifer connectivity in the Pilliga Forest area, NSW – an integrated hydrogeological, geophysical, hydrochemical and environmental tracer approach.\*](#)

There are growing indications that Santos is not being transparent with the NSW Government about the hydrogeological conditions present at its Narrabri Gas Project. Santos has yet to submit the Field Development Plan for the proposed 850-well gas field.

Two things are clear from the Report. First, fault lines appear under Bohena Creek, the ephemeral sandy waterway (pictured above) which traverses the Pilliga Forest south to north. The second is that the protective “aquitard”, the rock formation which Santos relies on in its claims that there is no connectivity between its drilling and the Namoi Alluvium, thins out and disappears in the north and north west of the Narrabri Gas Project.

CCC members probed the company’s representatives for answers about what notice, if any, had Santos provided to any NSW Government Authority or interested body of finding more “faults” or suspected weakness in the geological strata between the surface and the coal seam that Santos targets for gas or other fossil fuel extraction.

When the Narrabri Gas Project Water Technical Advisory Group, a sub-group of the Narrabri Gas CCC, [met on February 16<sup>th</sup> 2022](#), GISERA (the Gas Industry Scientific Environmental Research Alliance) gave a presentation in which they used the same wording that is repeated in the new study: *“No prime facie evidence was found for significant connectivity pathways between the coal measures and the Pilliga Sandstone aquifer.”*

The risk of leakage – euphemistically referred to as “interaction” – between the Namoi Alluvium and Great Artesian Basin (GAB) aquifers, and the water chemistry differences between coal seams and overlying formations, were subjects of concern by CCC members. Santos rejected suggestions that corrective action triggers being proposed are not fit to protect the high value water sources like Namoi Alluvium and GAB aquifers.

At the [May 2022 CCC meeting](#), Santos failed to respond adequately and appeared evasive in the face of heavy questioning by Narrabri-based community group, [People for the Plains](#):

“With regard to the GISERA Presentation, these questions centre around the geo faults found through seismic testing.

- a. Did Santos have prior knowledge of the faults, if so, why did Santos not disclose these?



- b. Given Santos and ESG have undertaken many Seismic Surveys, can we be advised how many more faults have been located, and their locations?
- c. Santos is about to embark on more Seismic Surveys around the Dewhurst South and nearby gas fields, so will Santos release and declare any more faults if found?"

### Gaps in GISERA/CSIRO Fault Study

Like [the GISERA/CSIRO study from Queensland](#) which was widely lampooned for making assertions about the [safety of hydraulic fracturing](#) based on a small handful of selected Origin coal seam gas wells, there are questions about gaps in the latest fault study.

<https://www.youtube.com/watch?v=-uXo7wtGW7M>

Several omissions point to Santos withholding pertinent information relevant to the likelihood of leakage between gas infrastructure and Great Artesian Basin, or alluvial aquifers. *"Faults, igneous intrusions, and their associated hydraulic properties have not been considered in the groundwater models developed to predict potential impacts from the proposed Narrabri Gas Project or subsequent groundwater models (as discussed by Turnadge et al., 2018; NSW DPIE, 2020)." (page 12)*

No mention is made in the new fault study of [historical hydraulic fracturing](#) which spanned over a decade. There is no mention that important data used by the study is taken from a [nested bore](#) that has been [placed between two previously fractured wells](#) and whose well completion reports display evidence of underground fire, water flows and gas kicks and no mention of BTEX or CO2. Finally, there is no discussion of the role that sulphate-reducing bacteria can play in causing microbiologically-influenced corrosion which is [fatal to well integrity](#) and can play a role in connecting aquifers to coal seams. |

There is no apparent awareness that the NSW Environment Protection Authority (EPA) effectively dismantled Santos' reporting requirements under the former [groundwater monitoring network](#) which severely limits our understanding of the interaction between lower geological Namoi Alluvium. This occurred after Santos persuaded the EPA this reporting was no longer relevant to Santos' potential impacts. The downsizing included dozens of monitoring points, with some that have in the past shown [concerning anomalies](#).

EPL Monitoring Point 13 is the only point that now monitors the Purlawaugh (since the downsizing) and shows a sudden decrease then increase in Standing Water Level in the during the same time period that workover operations were occurring (please note the Santos Water Monitoring Portal is 12 months out of date).

## Indicative location of faults

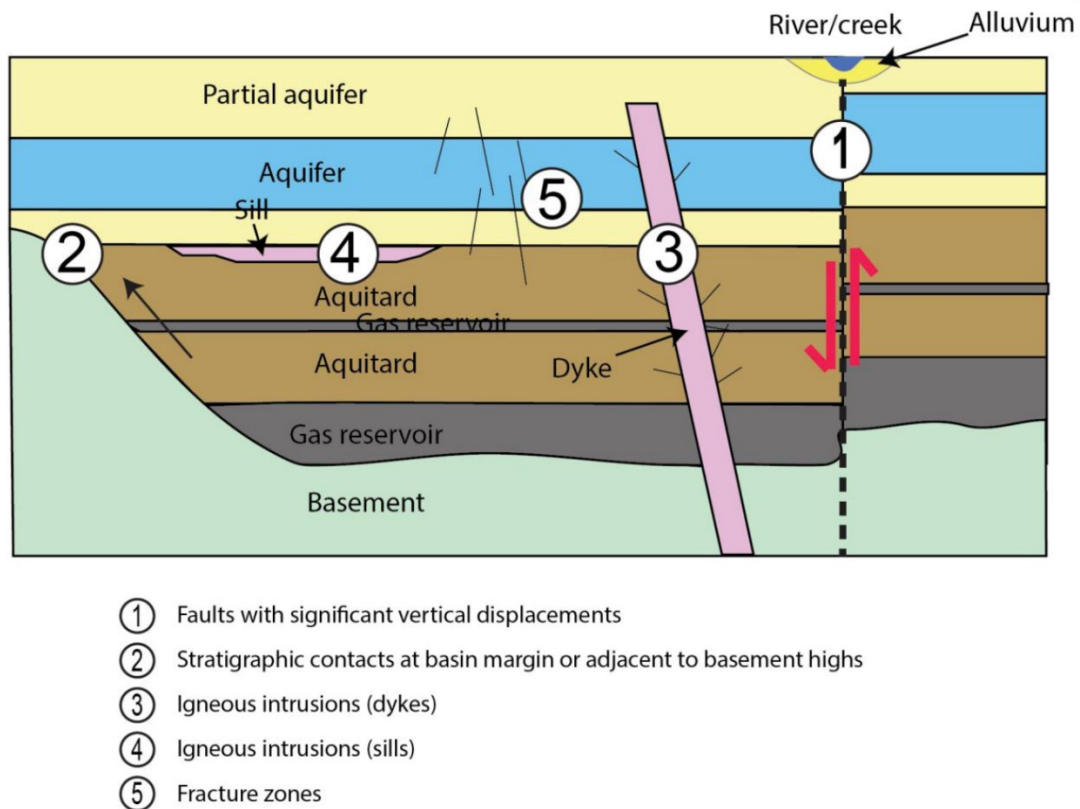


Figure 4 – Potential structural and hydrogeological connectivity pathways considered in this study.

Diagrams included in the fault report (above) clearly show fault lines appearing below the blue creek line for Bohena Creek, igneous intrusions are red and the thinning of the protective aquitard, the Purlawaugh formation, is shown in pale pink.

In the diagram below the thinning of the Purlawaugh could expose Namoi Alluvium groundwater users to the risks of contamination from Santos' underground activities.

### Cumulative impacts with Narrabri underground coal mine

The study appears to have been completed before the Narrabri Underground Stage 3 Public Hearing was held in February 2022. There is no mention that "Control" sites on the eastern side of the Pilliga are close to Narrabri Underground coal mine, one of which was

decommissioned after pointing to the problems of leakage from the Whitehaven Coal mine into the Digby Formation. The EPA failed to disclose the evidence of leakage from Whitehaven's longwalls into the Santos gasfield, altering the groundwater chemistry: ["NSW Environment Protection Authority did not provide information in its agency advice concerning groundwater migration from the Narrabri Mine to Digby Formation via an unknown pathway."](#)

### **New research projects by GISERA/CSIRO**

This fault study has led to two further avenues of research:

- [Geochemical modelling](#) and geophysical surveys to refine understanding of connectivity between coal seams and aquifers.
- [Groundwater modelling and predictive analysis](#) to inform CSG impact assessment, monitoring and management.

Over four years after the Independent Expert Scientific Committee called for fault data to be applied to the Santos groundwater model, it is only now happening.

Did the faulting study achieve its objective of allaying community concerns? The short answer is no, it has exacerbated them. North West Protection Advocacy has been following this story for several years and we have detailed all the steps along the way. We will be writing more about this study in coming weeks and will further examine the hypothesis of a fault that follows the southern course of Bohena Creek and the thinning of the Purlawaugh aquitard in the west and what this means for areas like Yarrie Lake.