



18/05/2017

To: the NSW Department of Planning and Environment

This is a submission to the Narrabri Gas EIS.

Artesian Bore Water Users Association of NSW Inc. (ABWUA) objects to this project. The EIS asks more questions than it answers.

**We find it amazing that Santos, in their Foreward, state that " In addition, the project is not located within a major recharge zone of the Great Artesian Basin." ABWUA commissioned a report by SoilFutures Consulting Pty Ltd into the recharge systems and petroleum and gas licenses. (SoilFutures, 2015) (appendix 1 - [http://abwua.com.au/Portals/37/Documents/GAB-Report-Second-Edition\\_Final10032015.pdf](http://abwua.com.au/Portals/37/Documents/GAB-Report-Second-Edition_Final10032015.pdf) )**

**This report clearly states that:**

- In NSW, the main occurrence of recharge > 30mm is in the east Pilliga between Coonabarabran and Narrabri.
- Only 0.2% of the GAB has effective recharge of 30 – 79mm/yr.
- Both of the Pilliga and the northern Surat gas fields or licence areas occur in the very limited critical recharge (>30mm) areas of the GAB.

**Santos are very careful with their wording but even though they qualify their statements with 'main' it is obvious that the NGP is situated above the GAB recharge. As it is a critical recharge area that should be considered a 'main' recharge area. Santos do not say the NGP is not above the recharge area, they just try to downplay the extent.**

**Other proof of the location of the GAB recharge in relation to the Narrabri Gas Project (NGP) is various and comprises maps used by both Queensland and NSW State Governments and the Australian Federal Government. Other resources are listed in the reference section of the report which is attached. (appendix 1) Please consider those reports and articles part of this submission and read it in its entirety.**

**The Pilliga stretches across half a million hectares of National Park, State Forests and State Conservation areas. In an area this big there are no big rivers that flow out of the woodlands. It is designed to act as a big sponge to recharge the GAB.**

**Other findings in the report include:**

- Excessive draw down of pressure heads in the recharge zone of the GAB associated with gas extraction, has the potential to reduced pressure heads on artesian waters across much of the GAB, and potentially stopping the free flow of waters to the surface at springs and bores.

- Draw down of many hundreds of metres is reported in Ransley and Smerdon (2012) for the northern Surat basin coal seam gas fields where coal seams are being dewatered to release gas.” **Santos claim “0.5m drawdown”. This is unsubstantiated and any modelling is totally contradictory to what has been found in practise in Qld and other gas fields around the world. The argument of ‘that is a different company or area’ doesn’t fly. Santos has encountered greater drawdown in Queensland but when trying to obtain groundwater level data off their website you get an error message. There is no data available. People near Chinchilla have experienced a drawdown of 10 metres. (appendix 2)**

<http://www.couriermail.com.au/extras/qweekend/fff/features/pdfs/239.pdf?nk=b0e010168540675d750f07fdc4f3c6d8>

**A factsheet prepared by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development states:** “This can be as much as several hundred metres of drawdown. It may take up to five years of pumping to lower the water pressure to the required level for gas to be released. Pumping continues at the rate necessary to maintain water pressure at the target level until gas production declines to non-economic levels.” **(appendix 3)**

<http://www.iesc.environment.gov.au/system/files/resources/2ba90930-f3f1-471d-8e94-85ca8edefdce/files/fact-sheet-connectivity.pdf>

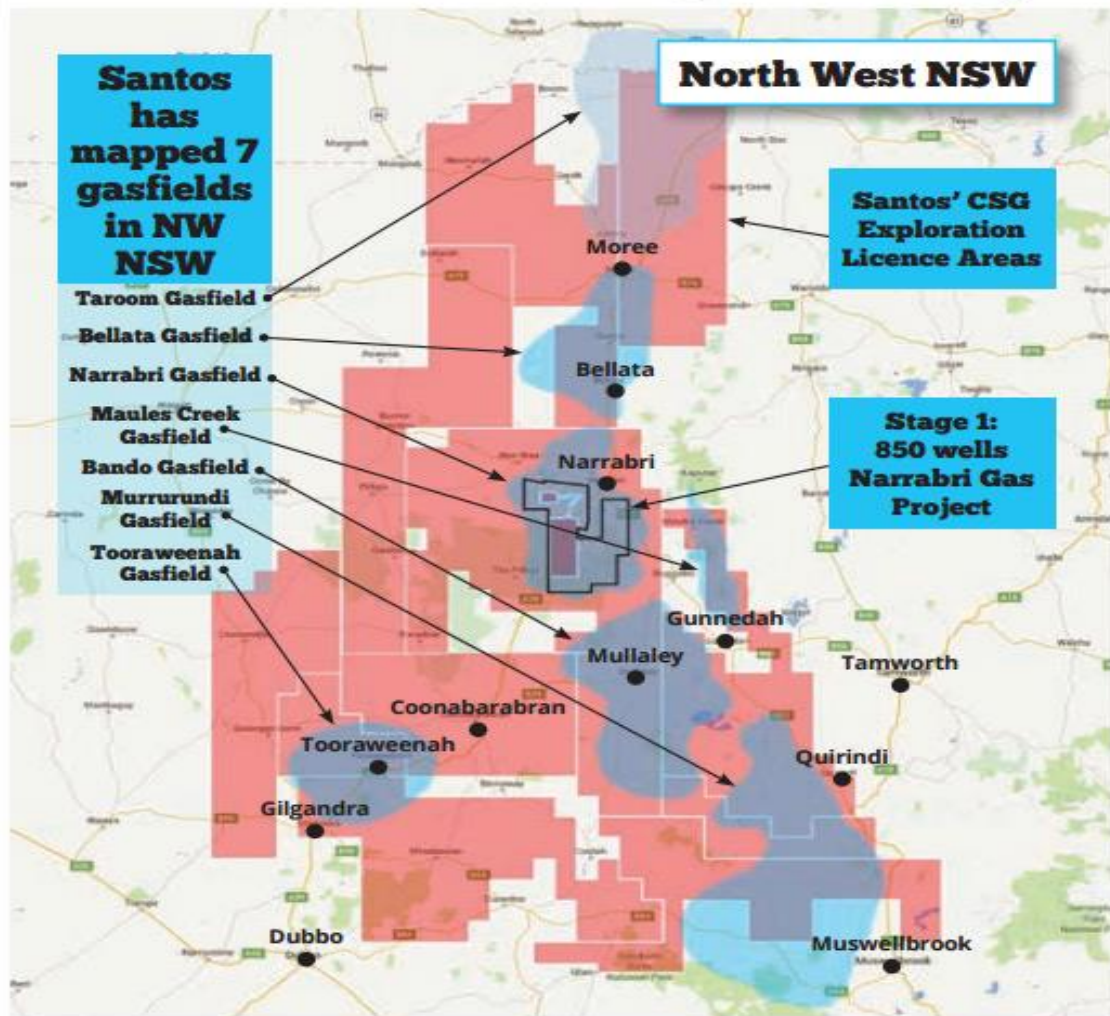
**If this drawdown occurs on private property who pays to lower the bores that are now dry?**

- **Other queries arising from the forward of the EIS:**

“Due to the geology of the deep coal seams, hydraulic fracturing will not be needed to extract the gas and Santos is not seeking approval to use this technology.” **Why did Eastern Star Gas need to frack when they owned the licence? Does the fact ‘Santos is not seeking approval to use this technology’ mean they will never frack no matter what? A change of management or shareholder pressure will never mean fracking is on the table? Will it be written into any sale contract that the purchaser can’t frack? What legal stipulation will ensure they don’t change their mind?**

“The EIS found the project will have minimal risk of impact on agricultural and domestic water sources”. **Queensland has shown this is not the case. Broadacre Farming and agriculture can not co-exist. Does Santos still stand by this claim when they extend into their neighbouring PEL’s and find a different type of landuse such as broadacre, intensive and irrigated farming. If Santos don’t plan to expand into the surrounding PEL’s they currently hold that have expired why have they not extinguished them?**

# The threat of Coal Seam Gasfields has not gone away!



**The Narrabri Gas Project in the Pilliga is Santos' Trojan Horse to access the farming country of our region.**

Santos should be explaining the extent of their future plans and these should be treated cumulatively.

The Narrabri Gas Project Environmental Impact Statement – factsheet from the Santos NGP webpage  
Water and the Narrabri Gas Project

+ The water extracted is not the water accessed by local agricultural or community bores and is not from the Great Artesian Basin. It comes from coal seams much deeper underground (500-1200 metres) and is salty. **Our bore is 820 metres. I believe that is between 500-1200 metres. It was capped and piped under GABSI so the Department of Water obviously believes it is Artesian water.**

+ Geologically, the rock formations in this area isolate those coal seams from the water used by farmers and the community. **The GAB consists of intricate layers of rock, aquifers and other geological formations which all work together to form the structure. There is not enough known about the GAB to ensure Santos' assertions are correct. In fact most research will say**

## **the opposite.**

- + The Government assesses water sources and then sets sustainable extraction limits. The Project is projected to extract an average of 1.5 gigalitres of water per year. This equates to about 1% of the sustainable extraction limit of the water source targeted
- + All of the water extracted will be licensed by the Government, as is the case for any other user. **GAB water licenses in NSW are for stock and domestic purposes, town water use and some irrigation. There has only been one sale of GAB water in NSW in 2009. These licenses were purchased for feedlot and tourism (Moree Bore Baths) purposes. With this precedent Santos should be paying for their water, especially as it is considered a waste by-product.**
- + The water extracted will be desalinated so the majority can be reused for purposes like irrigation. **Desalination removes salt and some other chemicals which are attached to the salt. It does not remove all heavy metals and chemicals.**
- + The salt remaining after the treatment process will be disposed of in accordance with environmental regulations, **If Santos has a plan for this salt why is it not in the EIS?**

**ABWUA has been instrumental in the continuation of GABSI. Through continued lobbying GABSI has been renewed and it was announced last week that the federal government has renewed GABSI for phase 5.**

**Information on GABSI is available at <http://www.water.nsw.gov.au/water-management/water-recovery/cap-and-pipe-bores>**

## **"Great Artesian Basin Sustainability Initiative**

The Cap and Pipe the Bores program is part of the Great Artesian Basin Sustainability Initiative (GABSI), jointly funded by the Australian and NSW governments. GABSI phase 1 was implemented between 1999 and 2004 with \$25 million funding. Phase 2 built on this with \$32 million funding from July 2004 until June 2009. DPI Water has targeted remaining free flowing bores through the Cap and Pipe the Bores program under GABSI phase 3, which finished in June 2014.

Some of the savings made under GABSI include:

## **Achievements**

In the past, up to 95 per cent of artesian water was being wasted through evaporation and seepage. Today, the Cap and Pipe the Bores program has improved water supply through the following achievements:

- saving 78,500 ML of water every year
- supplied approximately 4.2 million ha with permanent, reliable, efficient and strategically located watering points
- controlled 398 free flowing bores
- removed over 10,000 km of bore drains
- installed 18,000 km of piping
- improved water use efficiency and reduced water wastage
- improved water quality for stock and domestic use
- increasing artesian pressure, increasing access to water
- reducing salt discharge by 62,800 tonnes every year
- reducing greenhouse gas emissions by 41,600 tonnes every year
- assisted land managers to achieve more sustainable property and stock management.



Increases in artesian bore pressure are being observed in many areas as a result of capping and piping. The program is achieving many other landscape benefits such as improving biodiversity conservation and feral animal control."



Why when all these savings are applauded as benefits to the environment can Santos even threaten to undo all the good work done? Millions of dollars of both the State and Federal government ( \$118.9m Frontier Economics 2016) and the individual landholders (no figures available but at least double including trust and private bores) stands to be wasted. GABCC figures quoted in the Frontier Economics Report (see below) state that to replace all 34,591 estimated bores in the GAB will cost approximately \$5b (2016 \$). Who will pay to repair all these, plus the exponential increase in well numbers due to CSG wells when they reach the end of their useful life?

It has become evident from the Queensland experience that Santos WILL cause a lowering of the water table. This is incontestable as they dewater the aquifer to get the gas – they have said that.

They have no answer to what they propose to do with the salt they will bring to the surface. Something GABSI was designed to do was reduce the salt brought to the surface.

The water saved by GABSI will be treated by Santos as a waste by product that becomes a problem to dispose of.

## Current status of GABSI

Barnaby Joyce announced last week an extra \$8m in federal funding for GABSI 5.

[http://minister.agriculture.gov.au/joyce/Pages/Media-Releases/\\$8-million-top-up-to-support-water-management-in-the-Great-Artesian-Basin.aspx](http://minister.agriculture.gov.au/joyce/Pages/Media-Releases/$8-million-top-up-to-support-water-management-in-the-Great-Artesian-Basin.aspx)

The Office of Water has stated that bores that impact on springs will be focussed on. 20 – 30 of these bores will be done in the next 3 years.

The government can't afford to cap less than 250 bores still uncapped in NSW alone. Who will ever be able to cap thousands of bores when Santos has long gone and they all need recapping. 7% of bores fail initially, 30% within 20 years and 100% within 100 years. Bores do not last 'forever' as stated by Santos. Concrete and metal do not have a perpetual lifespan. This damage is permanent. Over time it will be like a pincushion with rusting pins. Who is liable for capping them? Will it be the landowner? Farmers around the NGP have been told that once they accept payment from Santos they are liable for any problems into the future.

A report was commissioned by the Australian Government and Great Artesian Basin Jurisdictions titled "Economic output of groundwater dependent sectors in the Great Artesian Basin" by Frontier Economics (Frontier, 2016) (appendix 4) In table 1 it states that the combined value of industries dependent on GAB water resources in NSW is as follows: livestock, irrigated agriculture and urban water totals \$1132.3m, mining and CSG \$576m annually. **Livestock, agriculture and the provision of water to towns is sustainable into the unending future. Mining and CSG have a limited lifespan and will leave irreparable damage and costs forever. Is a short term benefit worth the long term, permanent pain? Instead of replicating the report in this submission we ask you to consider all the information in the report as part of our submission.**

Make good is another joke of the CSG industry. How do you fix the GAB which covers 22% of Australia and is Jurassic water? Where do you get the water to replace the 'dewatering'? Where do you put the poisonous, chemical laden water you take out? Where do you get the water to 'refill' it? Re-injection has caused problems the world over with increased seismic activity and earthquakes in re-injection areas.

ABWUA has commissioned a report into the Stygofauna population in the Pilliga. Due to the time consuming task of data collection and analysis this report is not yet completed. We will forward a copy of the report as an annexure to this submission when we receive it.

Dr Peter Serov has previously completed a report for a private individual which I can not include but details are as follows:

### ABC

## Ancient stygofauna could halt Santos' Pilliga coal seam gas project

By Catherine Clifford and ABC Online staff

Updated 12 Jul 2013, 11:42pm

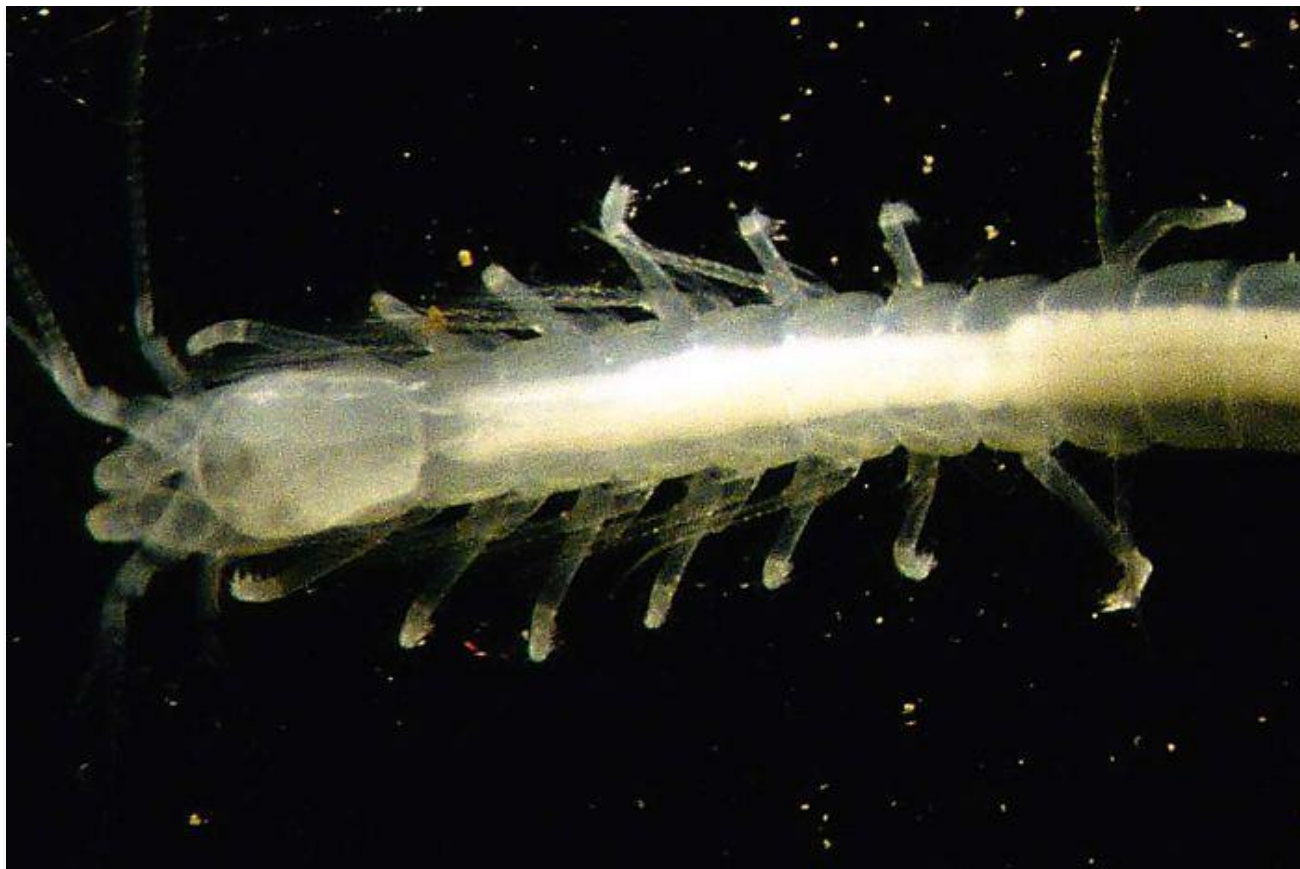


PHOTO: [Stygofauna are blind, colourless and they've been around for millions of years.](#) (Supplied)

## **A microscopic collection of worms and mites could play havoc with Santos' biggest coal seam gas project in the New South Wales Pilliga State Forest.**

The ancient, subterranean creatures that live deep in an underground aquifer are only one millimetre long and thinner than a human hair.

They are known as stygofauna and they play an important role in filtering and determining the quality of groundwater.

The new evidence about the stygofauna is contained in one of 1,800 submissions to the Federal Government opposing Santos' plans to drill 18 gas wells in the Pilliga State Forest near Narrabri.

Santos had estimated the project could supply 25 per cent of New South Wales' gas needs.

The Government will now use its recently-passed "water trigger" laws to determine if Santos can go ahead with the drilling.

Hydro-biologist Dr Peter Serov, who found the two new species of stygofauna, says the creatures could be at risk because they are extremely sensitive to changes in water quality.

"There needs to be a lot more rigorous sampling and monitoring of both water chemistry and biodiversity across the region to determine what the ultimate ranges of these species are and what their environmental requirements are at this point in time," he said.

## Blind, clear, subterranean creatures



PHOTO: [There are calls for more research to be done on the stygofauna.](#) (Supplied)

Dr Serov says stygofauna are highly specialised organisms that have been around for hundreds of millions of years.

"They are a group that have adapted over millions of years to occupy a very, very specialised niche," he said.

"Initially all of them would have been surface invertebrates, but due to the vast changes that the environment of Australia has gone through... they have colonised the subterranean environment and over time they've developed their own body forms to actually live exclusively in this situation."

"They have no colouration, they're usually totally clear or white, they have no eyes, they have specialised sensory organs that enable them to determine whether they're going up or down," Dr Serov said.

But Santos groundwater expert, Dr Peter Hancock, says he wants to know just where the tiny animals were found.

He says they may not exist in the deep aquifers that coal seam gas wells drill down to.

"The deeper coal seam aquifers are unlikely to have stygofauna in them. It's the shallow alluvial aquifers that are most likely to have them," he said.



But retiring New England Independent MP, Tony Windsor, who introduced the water trigger laws, says the scientific process must go ahead before the coal seam gas company moves in.

"We don't fully understand the scientific nature of some of these groundwater systems and until we do at a scientific level, I think the political process should step back and the industry process should step back until we get the science right and then make the decision," he said.

<http://www.abc.net.au/news/2013-07-12/4815736>

**Using science but on a practical level. Why is water in the GAB not stagnant and dirty. It is underground and moves infinitesimally slowly. There must be something that keeps it clean. I believe this is the stygofauna so it is vitally important. I also believe that taking this water out of the aquifers and running it through the reverse osmosis plant will destroy the stygofauna. Therefore the delicate balance will be destroyed. Re-injection will put too much water in, too fast, with no stygofauna to sustain the delicate balance.**

**Australia is the driest inhabited continent on the planet. How can we allow an industry that states 'that to get to the gas it dewateres the aquifer'. Our most precious resource is being treated as a toxic byproduct.**



**The GAB is 22% of Australia. Is it worth the risk?**

**Water and air are the most valuable things on this planet. How can we risk them?**

Sonya Marshall

Secretary ABWUA

NB: **BOLD lettering is submission and** non bold is quotes or information from reports or other sources.

