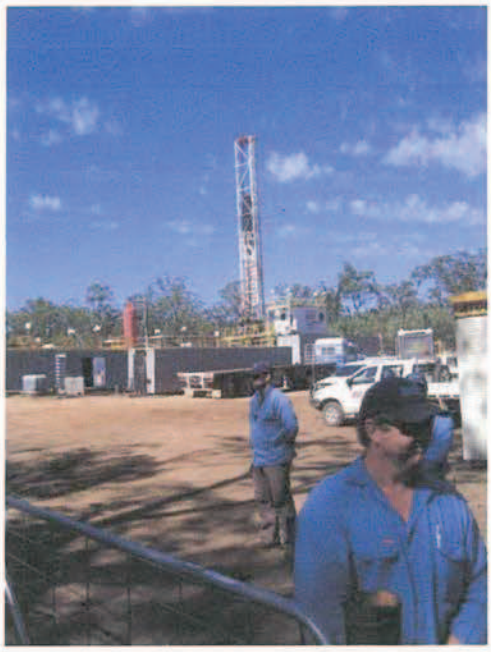
ATTACHMENT 1

Pilliga State Forest
Narrabri, NSW
December, 2013

YAAMA Welcome to Gomeroi Country
The camp at Ten Mile dam.
[3745]

Pipes near the entrance to Dewhurst 22
[3754]



Front gate Dewhurst 22
[3762]

'Protectors' rally outside front gate of Dewhurst 22
[3768]

The side fence at Dewhurst 22
[3788]

Tree clearing and road widening
[3799]

Tree clearing and road widening
[3800]

Tree clearing and road widening
[3803]

The Bohena 2 - old spill site
This site was 10 years old at the time the photo
was taken in December, 2013
[3804]

The Bohena 2 - old spill site
This site was 10 years old at the time the photo
was taken in December, 2013
[3805]

The Bohena 2 - old spill site
This site was 10 years old at the time the photo
was taken in December, 2013
[3806]

Bohena Creek Road, Pilliga East forest
Pipes being installed
[3807]

Bohena Creek Road, Pilliga East forest
Pipes being installed
[3810]

X Line Road – Tree clearing and road widening
[3826]

ATTACHMENT 2
Transcript in part
7.30 REPORT – Friday 14.03.2014

http://www.abc.net.au/news/2014-03-14/uranium-isotopes-in-aquifers-raises-csg-debate/5322652

Uranium isotopes in aquifers raises CSG debate

Posted Fri 14 Mar 2014, 8:24pm AEDT

A leak of pond-water is prompting a renewed political and scientific debate over the risks presented by uranium isotopes leaked by CSG plants into freshwater aquifers near Narrabri.

Quentin Dempster:
(7.30 Report Presenter)
"As contamination goes it's alarming isn't it?

Professor O'Kane:
(NSW Chief Scientist and Engineer)
"On the surface its very alarming and I've asked for a full report from the EPA over the incident and exactly what is that measurement is it, its just extract, is it a constant because the waters concentrated in some way."

James Baulderstone:
(Vice President of Santos)
"It's really important to get the right science with any project. That's why it was very important that we had the opportunity of drilling these current pilot wells so that we can act with absolute certainty around the geological formations underlying the surface. We believe that the Narrabri area is the best area in this State for producing natural gas. Going forward we're extremely confident that we can operate safely and sustainably and with state of the art treatment facilities that will be in operation in about a months time. We are very confident that the public can look at those facilities and see that what we say is backed up by fact.

Quentin Dempster:
"From Seven Thirties report last year we know that the Narrabri project will produce a lot of briny water along with the coal seam gas. The extraction of salt and its removal will be a significant risk.

James Baulderstone:
"The amount of water and salt produced from the Narrabri gas project ah in context is quite small um the new facilities we're building is about a 600 meg dam again in context in the farming community that's quite a small pond if what other operators use. The amount of salt we're talking about on average over the life of the project, it's about 50 tonnes per day, so you're talking about an amount of salt around the

20,000 tonns per annum. So not huge amounts in the scheme of the project that will deliver close to 50% of the natural gas requirements for NSW.

Quentin Dempster:
"50 tonns per day sounds like an awful lot of salt?

James Baulderstone:
"Ah its two truck loads Quentin.

Phillip Pells:
(Groundwater specialist – UNSW Adjunct Professor and Independent consultant to industry)
"They are saying in their only answer that they will produce 22 cubic metres per day for each bore of water that will contain on average 16 grams per litre of salt which equated to 3 ½ tonnes of salt per day per bore hole. Now if we assume that when they have the operation field they might have a hundred or so bores operating um at one time as they roll more in and old ones die. Then that works out at 350 tonnes of salt per day not 50 tonnes of salt per day and if they have 200 bores operating at one time that's 700 tonnes of salt a day not 50 tonnes of salt a day and these are their numbers they're not my numbers.

Quentin Dempster:
"We asked groundwater specialist Phillip Pells a University of NSW Adjunct Professor and independent consultant to industry for a preliminary risk assessment from publicly available documents on planning departments and Santos websites he noted what he believes is a glaring omission.

Phillip Pells:
"What I find most disturbing having gone through the studies one for this both for the Eastern gas time and also now by Santos is they are in fact silent on the Great Artesian Basin, the words' actually not even used and I find that's quite staggering that um in the environmental impact statement after environmental impact statement when they talk about impacts on the groundwater and the surface water there's no mention of the Great Artesian Basin.

Quentin Dempster:
"Phillip Pells says the onus is now on Santos to clearly show that its CSG project area is within the south eastern section of the Great Artesian Basin recharge zone and for the Planning Assessment Commission to place this fact at the top of any depressurisation, water depletion and contamination risk assessment.

Quentin Dempster:
"Great Artesian Basin at risk nothing to worry about says Santos."

James Baulderstone:
"Santos has a great deal of experience in dealing with the Great Artesian Bain it is actually ah the aquifer that underlie our traditional Cooper Basin so we have a great deal of knowledge and experience in dealing with that aquifer system the amount of water we're going to extract is pretty small again in the scheme of things, to put that into context we're talking a maximum extraction rate of between 3 to 5 gigalitres per

annum. Again what the local community currently draws from the system is in the order of from between 300 and 500 so we're talking about 1% of the traditional draw.

Quentin Dempster:
"With the O'Farrell Governments recently signed MoU with Santos to deliver investor confidence in the Narrabri CSG project there is now great scepticism that the coming Planning Assessment Commission process will be turned into a rubber stamp.

Phillip Pells:
"When the impacts do occur they're irreversible, so we have to be very certain and very careful at the start that we don't generate a system that causes unexpected and significant impacts which we can do nothing about, it's too late then.

Quentin Dempster:
"Do you acknowledge there's a crisis of public confidence in the coal seam gas industry in this State?

Professor O'Kane:
"Absolutely, yes there is.

Quentin Dempster:
"The Chief Scientist and Engineer has been reviewing the CSG industry. Professor O'Kane agrees that the creditability of both the industry and of the O'Farrell Governments compliance regime now depends on the thoroughness of the science of risk assessment, data collection and operational practice. It's your view that ah the risks are manageable.

Professor O'Kane:
"I believe that they can be completely manageable and that's we're working through that as a, as a nation, we're beginning to understand as with most engineering things we develop layers of risk and regulation and responsiveness, but you still have accidents.

ATTACHMENT 3

Ahttps://twitter.com/ABCNews24/status/835987514737336320?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Etweet

ABC NEWS 24 – Monday, 27.02.2017

"The race is over: wind and photovoltaics have won." Study by ANU finds the Australian energy grid can be powered by 100% renewable energy

Kathryn Robinson:

Is there a suggestion with this research that it could eliminate the need for coal and gas fired power.

Professor Blakers:

Absolutely two thirds of Australia's current coal and gas fleet will reach the end of its technical life time by 2036, it needs to be replaced by something and the cheapest thing to replace it is photovoltaic's and wind PV and Wind is now being deployed around the world at the same rate as everything else put together, that's coal, oil, gas, nuclear, hydro, all other renewables. So the race is over, photovoltaic's and wind have won the race. It's 100% new generation technology in Australia and our research has shown that 100% deployment of, for the entire electricity system supported by pumped hydro delivers stability and reliability and affordability.

Kathryn Robinson:

So what would it take to roll out this sort of technology.

Professor Blakers:

Well in fact all that we need to do is keep doing what we are doing, there's a lot of activity in solar and wind leading up to the renewable energy target which finishes in 2020, and if we contribute, continue that roll out and expand it a little, then we can reach 100% by 2030 or 2035 and towards the mid 2020's we'll have to embark on a the construction of a number of pumped hydro systems in order to support the PV and wind as it pushes up towards 100% but there's nothing particularly to invent it's all off the shelf technology, all deployed around the world at scale of 150,000 megawatts or more.

Kathryn Robinson:

Do the federal and state governments need to clear a pathway for you?

Professor Blakers:

Not particularly, it would be very helpful if there was a very clear retirement schedule for gas and coal, so that it can be managed rather than ad hoc as was the case with the Hazelwood power station closure in Victoria in March. So if there was a very clear faze out of wind, of gas and coal then wind and PV would slot in behind it smoothly to maintain the electricity grid in a way that you don't notice that its actually changed from coal gas to wind PV.

ooOoo

http://www.abc.net.au/radionational/programs/throsby/professor-andrew-blakers/7501326

Professor Andrew Blakers is the foundation director of the Centre for Sustainable Energy Systems at the Australian National University (ANU).

Professor Blakers is a world-leading scientist in photovoltaic technology and is responsible for several key innovations in solar technology including SLIVER cells, a unique solar cell technology commercially valued at more than $100 million.

He has extensive knowledge of photovoltaic's and grid integration, particularly in remote and rural areas. He is also knowledgeable about wind and thermal renewables.

He is a member of the Advisory Committee of the Australian Renewable Energy Agency (ARENA).