I'm writing to request that the Modification 4 (Beneficial use of Coal Seam Gas) near Narrabri is rejected. I understand that this means that further development of coal seam gas can move ahead in and around the Pilliga State Forest and surrounding lands.

I have spent several months around the Narrabri district in the last 2 years, and have followed with interest the fate of the Pilliga Forest which is such an important recharge area to the Great Artesian Basin, so it is because of this I am writing to request that you reject this proposal. Santos have been proven as ignoring 'world's best practice' on many occasions at it's mining sites and I have witnessed spills from their exploratory wells which continue to poison surrounding soils, flora and fauna.

Santos' initial Review of Environmental Factors (REF) application for the Leewood water facility was riddled with 'inaccuracies' and 'inadequate' information. To your credit, the Government, including your division of Resources and Energy, asked Santos for further information to address fundamental problems in the project design or risk the application being rejected. However, Santos' response has been anything but reassuring. It shows that the project is fundamentally flawed and cannot be solved with quick tweaking.

Water is such a vital resource in Australia, particularly aquifer water, without which inland Australia and all its industries cannot be sustained. Regarding CSG activities, the *Groundwater Essentials,* by the National Water Commission, 2012, found that,
'The pumping of groundwater lowers the watertable immediately around the bore, causing a dimple, called the cone of depression, to form in the watertable around the well. The cone of depression grows larger as the pumping rate is increased but once pumping stops the watertable will eventually return to its original shape, although the water quality may have changed.' (p.23)

'Extraction of water from a bore lowers the water level in the aquifer around it. Water levels will drop in other bores supplied by the aquifer, reducing the rate at which water can be extracted. Generally, closely spaced bores, together with high extraction rates, cause the greatest water-level interference. It is therefore important that the regulating authorities and neighbouring bore owners are consulted to ensure the location of a new bore minimises interference on surrounding bores. State and territory government water plans take this into account when allocating water extraction licences.' (p.26)

'Failure to address the range of challenges to the sustainable management of groundwater in Australia could result in irreversible degradation of this vital resource. Degradation may, in turn, lead to long-term detrimental impacts on industries, communities and environments that rely on groundwater.' (p.27) This does not include Cesium 137, lubricants and other toxins used in the gas extraction process.

Well casings are very unreliable: All gas drilling casings inevitably all deteriorate over time (http://oilprice.com/Energy/Energy-General/Shale-Gas-Casing-and-Cementation-Will-Fail-but-When.html). Initially, gas wells will cause depressurisation to the Basin causing private bores to cease, meaning an end to the properties and communities it sustains. But with the casing deterioration, the Basin will be irrevocably contaminated which spells disaster to a water poor environment.

The NSW Government specifically requested additional details of soil monitoring and location of monitoring stations in the treatment of produced water. Santos dodged the question and replied 'the potential for impacts to groundwater are considered negligible'.

At the end of its exploration activities in 2018, Santos estimates that up to 500 million litres of concentrated toxic brine may be stored in the mega-dams at the Leewood water treatment plant. The Government raised concerns that Santos has no way of disposing of this waste.

Santos has dismissed the concerns outright stating, they 'commit to within two years to lodge a plan for the processing of brine, transport and disposal of salt'. This is not good enough! Santos have

admitted that radioactive material will be present in the produced water, however they do not outline any ongoing testing to monitor the levels in the irrigation water. The Government raised concerns about Santos' plans for reusing waste water from the plant for agriculture, including that the soils on the irrigation site are highly unsuited to irrigation and that test crops proposed by Santos are likely to fail. Santos did not change or update its plans.

I am deeply concerned about the potentially serious environmental harms inherent in Santos' plans for CSG expansion in the proposed Pilliga gas field and their lack of knowledge and consultation with local Gomeroi/Kamilaroi who are very much against this development. I believe that this project could have a significant impact on the environment. This type of project should, in future, be assessed by a full INDEPENDENT Environmental Impact Statement (EIS).

Given the multiple problems and manifest inadequacies of Santos' plans, we cannot afford to risk our precious groundwater, cultural and an agricultural heartland being left with a toxic legacy. I would argue that there is no beneficial use of coal seam gas.

Claudia Caton