



**OzEnvironmental**  
*Delivering true progress*

***Submission to***  
***Senate Standing Committee on***  
***Rural Affairs & Transport***  
***Management of the Murray-Darling Basin***  
***- Impact of Mining Coal Seam Gas***

*28 July 2011*

## 1. OzEnvironmental Pty Limited Credentials

OzEnvironmental Pty Ltd is a business that provides technical and strategic advice on industrial land use planning and corporate strategy.

The Principal of OzEnvironmental Pty Limited is Mr Warwick Giblin B Sc, Dip Env Stud, Dip Educ, FEIANZ. He is one of Australia's leading environmental management practitioners with over 30 years executive experience in impact assessment, water, waste, biodiversity conservation, environmental education and spent time as a Ministerial policy adviser.

Mr Giblin is also an elected member of the Council of the Royal Agricultural Society of NSW and the Founding President of the Environment Institute of Australia & New Zealand (EIANZ) (NSW Division) in 1989, and now a Fellow. (The EIANZ is the professional association for environmental practitioners).

Mr Giblin's credentials relevant to this topic are outlined below:

- Prepared numerous environmental impact statements for mining & other industrial projects;
- Former adviser to the Governments of The Federated States of Micronesia and The Marshall Islands on environmental impact assessment and landuse planning;
- Former Director of Environment Business Australia;
- Former member, NSW Catchment Areas Protection Board;
- Former member, NSW Total Catchment Management Interdepartmental Committee;
- Engineers Australia: Former Environmental Engineering Committee member;
- Standards Australia: Former Environmental Management Committee member;
- Conducted an extensive number of environmental audits of operating industrial facilities; and
- Former Director of Greening Australia (NSW).

OzEnvironmental clients include the Hunter Valley Wine Industry Association and the Basin Sustainability Alliance (Queensland), both of whom have major concerns about the coal seam gas industry.

## 2. Introduction

A strict precautionary approach needs to be adopted to ensure that the CSG industry is only permitted to operate if it can satisfy the fundamental principles of Ecologically Sustainable Development.

The industry, by its own admission – see below - does not really know what the impact will be on the groundwater system – and this resource is one of the most precious in rural Australia and one that underpins a vibrant agricultural industry.

## 3. General Comments

### 3.1 The regional hydrogeology is not known well enough

It is reasonable to conclude at the present time that wherever CSG mining is proposed (or already under way) throughout Eastern Australia the regional hydrogeology is inadequately understood.

This is clearly evident in a recent submission by Queensland Gas Company (QGC) to the Queensland Department of Environment & Resource Management (DERM) seeking amendments to the consent conditions for extraction in the Ruby area. In a document seeking a review of the original decision dated 12 July QGC acknowledges that:

- a) There is no regional groundwater model for the Ruby Area– the Queensland Water Commission is currently developing one (p33);
- b) QGC will be “*better able* to map groundwater contours” once the baseline bore assessments have been completed. The results from the monitoring of such bores is “many months” away (p33); and
- c) Information regarding the location and types of aquifers “will be much better” once baseline assessments are completed (p32).

**Clearly QGC does not have accurate, quantitative information about the groundwater system that it will impact.** So how can the regulator accurately determine the risks and impacts? It cannot. What QGC should have established long before deciding on the merits or otherwise of CSG extraction was:

- a robust, independently verified, regional model to evaluate impacts of aquifer dewatering;
- a specific local model to evaluate dewatering consequences;
- model outputs that quantify the anticipated drawdown and how it propagates laterally and vertically over time;
- a scientifically supported quantification of the long term changes to the water balance in the aquifers; and
- all model predictions rated for detailed statistical sensitivity and uncertainty analyses.

Furthermore, government regulatory agencies should be requiring such modelling and analytical work BEFORE there is any consideration of impacts.

The CSG industry is without doubt ‘learning by doing’. This is risky state of affairs and the industry should be told to pause until the community knows the facts about what the impact may be on the groundwater regime, or how to adequately manage the salt mobilised and brought to the land surface.

In this instance QGC proposes to construct 1,200 wells in the Ruby Area, across an area of 91,500 ha. Each well will have an area of disturbance of 1 ha during construction (total area of 1,200 ha). Each megalitre of CSG water brings up approximately 5 – 8 tonnes of salt that was previously stored safely underground.

The paucity of detailed scientific data is akin to ‘jumping into a pool of water head first without knowing how deep it is’.

And could potentially be about to cause catastrophic damage to the hydrogeology of Australia’s main food producing catchment.

For instance, if all planned CSG development in Queensland and NSW located in the Great Artesian Basin goes ahead, then up to 350,000 megalitres (about two-thirds of the amount of water in Sydney Harbour) of associated water will be extracted per year, along with approximately 1.5-

2.0 million tonnes per year of salt. This is 55% more water than is currently extracted. How resilient is the Great Artesian Basin to such additional stresses? We simply do not know, as is admitted by QGC in its comments mentioned above about the absence of a baseline regional groundwater model.

Based on a prudent, scientific approach, this industry should be halted until there is accurate, quantitative data on exactly what the hydrogeology picture is. Then and only then can the impacts on the baseline environment be realistically determined.

### **3.2 The groundwater experts say we should be very cautious**

The independent groundwater leaders in Australia are urging caution in how the nation approaches CSG extraction and development. See below regarding advice from Geosciences Australia and the National Water Commission.

In September 2010 Australia's premier geotechnical organisation, Geosciences Australia (GA), released a review of potential groundwater impacts from CSG mining in Queensland's Surat and Bowen Basins. GA concluded that 'the overriding issue in CSG development is the **uncertainty surrounding the potential cumulative, regional scale impacts of multiple developments**'. GA also stated that the information provided in EIS documents is **not adequate for understanding the likely impacts of widespread CSG development** across the Surat and Bowen Basins; nor will any level of information or modelling that can be provided by individual proponents.

Any reasonable observer would surely deduce that GA's message is that the community cannot trust any models, and that we won't know what will happen till it has happened! Taken at face value, this is a totally unacceptable situation.

GA recommends a process for 'staged adaptive management of CSG development' along the following lines:

- **Apply the precautionary principle**. Assume excessive groundwater extraction will have impacts. GA recommended that there should be explicit requirements to minimize and mitigate any groundwater impacts during gas production;
- **A regional-scale multistate and multilayer model of cumulative effects of multiple developments, and a regional-scale monitoring and mitigation approach** should be developed to assess and manage these impacts; and
- **Whatever modelling is undertaken, there is very high level of predictive uncertainty involved**, so proponents should consider actions to minimize potential impacts on water balances.

In addition, in December 2010 the National Water Commission (NWC) issued a Position Statement on CSG and Water. Inter alia, the NWC states:

**Extracting large volumes of low-quality water will impact on connected surface and groundwater systems, some of which may already be fully or over allocated, including the Great Artesian Basin and Murray-Darling Basin.**

**Impacts on other water users and the environment may occur due to the dramatic depressurisation of the coal seam, including:**

- **changes in pressures of adjacent aquifers with consequential changes in water availability;**

- reductions in surface water flows in connected systems; and
- land subsidence over large areas, affecting surface water systems, ecosystems, irrigation and grazing lands.

The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health.

The practice of hydraulic fracturing to increase gas output has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.

The NWC is concerned that CSG development represents a substantial risk to sustainable water management given the combination of material uncertainty about water impacts, the significance of potential impacts, and the long time period over which they may emerge and continue to have effect. Therefore, an adaptive and precautionary management approach will be essential to allow for progressive improvement in the understanding of impacts, including cumulative effects, and to support timely implementation of 'make good' arrangements.

A precautionary and adaptive approach to managing and planning for CSG activities is essential to enable improved management in response to evolving understanding of current uncertainties.

Therefore, the NWC strongly argues for the careful, transparent and integrated consideration of water-related impacts in all approval processes.

Clearly there is a strong and consistent message from GA and NWC. Let's do as they say!

### **3.3 Australia needs to adopt the fundamentals of pursuing genuine wellbeing and progress**

Australia needs an explicit CSG policy that acknowledges that human wellbeing and the economy are dependent on healthy ecosystem services. Economic policies moving forward should be cognizant of environmental limits.

The CSG assessment process needs to acknowledge that Australia's natural systems are often under stress and may reach an ecological threshold or tipping point where a major change of state occurs and the system will no longer function in the same way as before. Hence as part of any assessment we need to know the capacity of natural systems to absorb further disturbance or change.

### **3.4 There is no clearly defined strategy regarding how to manage the salt extracted from the aquifers.**

Each megalitre of CSG water extracts approximately 5 – 8 tonnes of salt that was previously stored safely underground. How will we manage millions of tonnes of salt? There appears to be no settled answer yet. Australia needs robust answers to this before we embark on coal seam water extraction.

#### 4. Conclusion

Australia's leading independent experts on groundwater are clearly very concerned that CSG development represents a substantial risk because of:

- a) material uncertainty about water impacts;
- b) the significance of potential impacts; and
- c) the long time period over which they may emerge and continue to have effect.

Given the overwhelming and unambiguous message from the independent hydrogeological experts the Federal Government is urged to strive for the delivery of good quality information that will enhance impact assessment.

The Australian community is relying on the national government to safeguard the environment and protect the national interests, in accordance with legislative responsibilities.

Most in the community do not have the technical knowledge to make representations to ensure the health of our environment is maintained, and nor should that be necessary. That is why we have environmental laws and officials to implement the law. The Federal Government is urged to amend the laws to apply due rigour to this emerging and rapidly growing industry.

In summary, OzEnvironmental implores the Federal Government to heed the advice of the independent experts and adopt a **precautionary management approach**. An approach that will allow for progressive improvement in the understanding of impacts, including cumulative effects, and to support timely implementation of 'make good' arrangements.

#### 5. Call for Action

The Federal Government is urged to:

1. Impose a moratorium on all coal seam gas exploration and production until accurate and comprehensive information is known about regional groundwaters and how extracted salt may be sustainably managed;
2. Amend the Environment Protection & Biodiversity Conservation Act (EPBC Act) to add coal seam gas extraction as a matter of national environmental significance. Or use some other federal legislation to achieve the same outcome. At the end of the day the Federal Government must play a key role in determining the future destiny of the NSW/Qld rural landscape;
3. Direct all States via COAG to adopt the precautionary principle 'front & centre' in assessing all CSG proposals; and
4. Landholders affected by CSG proposals must be given better legal standing in negotiations with CSG companies. At present it is a very unlevel playing field with farmers feeling vulnerable in the face of corporations flexing their economic, technical and political muscles.

A key matter that needs to be addressed in land valuation is the acknowledgement that the mere prospect of CSG mining immediately sterilizes the ability of landholders to sell their assets. This places farmers in a vulnerable and uncertain position and simply



accentuates the unlevel playing field, with all the power and influence held by the CSG proponents.

Thank you for the opportunity to comment. I look forward to seeing strong and effective Government leadership to safeguard our rural landscape and its social fabric.

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