Submission
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INQUIRY INTO COAL SEAM GAS

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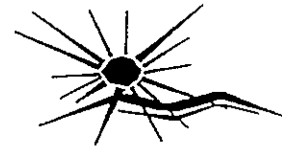

Submission to NSW Legislative Council Inquiry into Coal Seam Gas

12 September 2011

The EDO Mission Statement:

To empower the community to protect the environment through law, recognising:

- the importance of public participation in environmental decision making in achieving environmental protection
- the importance of fostering close links with the community
- the fundamental role of early engagement in achieving good environmental outcomes
- the importance of indigenous involvement in protection of the environment
- the importance of providing equitable access to EDO services around NSW

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Introduction

The Environmental Defender's Office NSW (**EDO**) welcomes the opportunity to comment on the NSW Inquiry into the impacts of Coal Seam Gas (**CSG**).[1] The EDO is a community legal centre with over 25 years' experience specialising in public interest environmental and planning law.

The CSG industry in NSW is expanding rapidly. At the same time, the community is becoming increasingly concerned that the legal protections in place do not ensure thorough environmental assessment, community consultation or long-term strategic planning. The community at present has little recourse through the law to address these failures. In light of these problems, legal reform is needed around the assessment, consultation, approval, compliance monitoring and enforcement of CSG activities.

The EDO has been extensively involved in law reform and litigation over a number of years dealing with the regulatory framework for CSG exploration and extraction in NSW. In June 2011 the EDO published a discussion paper on *Mining Law in NSW* (**EDO Mining Discussion Paper**) to promote discussion of the current legal framework, particularly for coal mining and CSG. The Discussion Paper recommends key changes across three areas (environmental and planning, community, and compliance and enforcement issues) to promote positive environmental outcomes. It seeks to make current processes more sustainable, robust, equitable and transparent. This submission draws on aspects of that Discussion Paper, available on our website and in hard copy.[2]

In addition to its policy and litigation work, the EDO runs community legal education workshops across regional and rural NSW, to explain the law on a range of topics based on community interest. In 2010 we conducted one workshop on mining and CSG. In 2011, that has increased to six to date, with another four planned to meet demand.

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[1] See: http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/29AE48525CFAEA7CCA2578E3001ABD1C.

[2] Available at: http://www.edo.org.au/edonsw/site/pdf/pubs/110628mining_law_discussion_paper.pdf.

Key community concerns raised at those workshops include:

- Lack of notification and consultation regarding petroleum exploration licences
- Difficulty obtaining information about petroleum exploration licences
- Concern about environmental, social and economic impacts associated with CSG exploration and production – especially on water, health and property values
- Confusion and concern about the assessment and approval process, and the role of landholders in that process
- Concern about negotiating access arrangements and the ability to protect properties from damage caused by CSG activities.

The Parliament's scrutiny of the impacts and risks associated with CSG, and how to better manage them, is therefore timely. In brief, the Inquiry's Terms of Reference (**TORs**) call for comment on these five areas:

1. **The environmental and health impacts of CSG activities**
2. **The economic and social implications CSG activities**
3. **The role of CSG in meeting the future energy needs of NSW**
4. **The interaction of the *Petroleum (Onshore) Act 1991* with other legislation and regulations, including the *Land Acquisition (Just Terms Compensation) Act 1991***
5. **The impact similar industries have had in other jurisdictions.**

This submission deals with these areas (aside from TOR 3), drawing on the EDO's expertise in environmental law and policy. **Appendix 1** is a standalone paper that examines the inadequacy of the "review of environmental factors" (**REF**) process for CSG exploration.

The submission focuses on how a better legal or regulatory response can be developed to prevent and respond to the detrimental environmental impacts of CSG activities. For example, we recommend:

- underpinning CSG and planning laws with principles of ecological sustainable development (**ESD**), including the precautionary principle and intergenerational equity
- conducting comprehensive baseline studies on environmental qualities, to provide a benchmark for ongoing monitoring of systems affected by CSG
- reforms to the EP&A Act, Petroleum (Onshore) Act and regulations, to ensure environmental assessments are rigorous and accurate (see **Appendix 1**).
- reinstating mandatory 'concurrence' powers of other agencies for CSG projects, and better whole-of government coordination more generally
- improving notification and information rights, updating compensation provisions and mandating proper community consultation
- developing strategic land use policies that have legal effect, and address cumulative impacts
- introducing compulsory environmental bonds and a wider range of enforcement tools to punish breaches.

Term Of Reference 1: The Environmental and Health Impacts of CSG

1.1. Effects of CSG relating to water systems, use of chemicals, and 'fraccing' (Terms of Reference 1(a)-(c))

i) Environmental Impacts

There is a great deal of uncertainty surrounding the immediate and long term consequences of CSG activities. This is underlined by the relative infancy of the CSG industry in NSW,[3] coupled with plans for its rapid expansion.[4] Communities, scientists, environmental groups and the farming industry continue to raise concerns about the environmental and health impacts arising from CSG prospecting and extraction.

In particular, a 2010 position statement released by the National Water Commission (**NWC**) demonstrates how the three issues of ground and surface water, use of chemicals and hydraulic fracturing ('**fraccing**') are closely interrelated. The NWC's position statement identified five areas of potential risk to sustainable water management as a result of CSG activities:

1. *Extraction of large volumes of water, which will impact on connected groundwater and surface water systems*
2. *Impacts on other water users and the environment due to depressurisation of the coal seam. Impacts include:*
    - *changes in pressures of adjacent aquifers, and resulting changes in water availability*
    - *reductions in surface water flows in connected systems*
    - *land subsidence over large areas, affecting surface water systems, ecosystems, and agricultural lands;*
3. *Production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and significantly affect water quality, river and wetland health. There is an associated risk that, if water is overly treated, 'clean water' pollution of naturally turbid systems may occur*
4. *Hydraulic fracturing has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality*
5. *The reinjection of treated waste water into other aquifers has the potential to change the beneficial use characteristics of those aquifers.*[5]

The NWC further notes:

> *The Commission is concerned that CSG development represents a substantial risk to sustainable water management given the combination of material uncertainty about*

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[3] See, eg, Roth L., NSW Parliamentary Library Research Service, *E-brief 1/2011: Regulation of the coal seam gas industry in NSW*, p 2, This article notes CSG production has occurred in Queensland since 1996; while the major Camden Gas Project has been operating in NSW since 2001.

[4] Both the former and current NSW Governments have committed to the expansion of the CSG industry. As a result of NSW Government initiatives, there has been an unprecedented level of petroleum exploration activity within NSW. Over $20 million was spent in 2003-2004, and $30 million in 2004-2005 on this type of exploration. In 2007-2008, CSG production in Queensland and NSW grew 40%. ("CSG – Firing up Australia's gas industry", Gas Today, May 2008.)

[5] National Water Commission (Dec. 2010), "Coal Seam Gas and Water Position Statement". Available at: http://www.nwc.gov.au/resources/documents/Coal_Seam_Gas.pdf.

water impacts, the significance of potential impacts, and the long time period over which they may emerge and continue to have effect.[6]

Other sectors echo this concern about uncertain impacts from CSG activities on ground and surface water systems, including the extraction and disposal of large volumes of (often saline) water from aquifers.[7] Where CSG drilling intercepts aquifers, a vertical connection between aquifers can result. That can lead to groundwater of different pressures or hydrology mixing. The implications of this mixing would depend on the environment, and may range from no harm to major impact.

In a 2010 report, Geoscience Australia highlights concerns around coal seam gas extraction and its potential interference with hydrological systems in Queensland. The report recommends that:

> *Given the resulting levels of uncertainty in relation to... a number of CSG developments, a precautionary approach should be taken in relation to approving proposed and potential CSG developments, recognising the fundamental principle that excessive rates of groundwater extraction will have impacts on groundwater and connected surface water systems.*[8]

In this context, the EDO submits that the NSW Government's regulatory approach for CSG should be underpinned by the precautionary principle – alongside other principles of ecologically sustainable development (**ESD**). That is:

> *...if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as reason for postponing measures to prevent environmental degradation.*[9]

In addition to a more precautionary approach, the EDO emphasises the need for additional, comprehensive baseline data on environmental qualities,[10] to provide a benchmark for ongoing monitoring of environmental systems affected by CSG. Without sufficient baseline data on environmental systems, it is impossible to accurately ascertain the true impact of processes associated with CSG extraction. Knowledge gaps regarding hydrological implications, and a myriad of other potential impacts that arise from CSG activities, highlight the importance of testing, monitoring and effective adaptive management – to continually increase the understanding of such impacts. Further recommendations on reducing the environmental impact of CSG activities are discussed in response to TOR 4 below.

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[6] National Water Commission, ibid (emphasis added).

[7] See, for example, the NSW Farmers Association media release "Better checks needed for Coal Seam Gas", 16 November 2010 at http://www.nswfarmers.org.au/__data/assets/pdf_file/0018/68013/211.10nr.pdf.

[8] Geoscience Australia et al (Sept 2010), "Summary of advice in relation to the potential impacts of coal seam gas extraction in the Surat and Bowen Basins, Queensland", report for the Australian Government Department of Sustainability, Environment, Water, Population and Communities, available at: www.environment.gov.au/epbc/notices/pubs/gladstone-ga-report.rtf.

[9] See s 6(2) of the *Protection of the Environment Administration Act 1991*.

[10] Such as sub-artesian water flows and locations.

Aquifer interference regulation

The EDO welcomes the introduction of the aquifer interference regulation[11] that commenced on 30 June 2011. This requires that proponents obtain an Aquifer Interference Approval where CSG activities interfere with groundwater systems.[12]

However, the EDO is concerned that the regulation provides an exemption for the requirement to obtain a Water Access Licence[13] for all CSG prospecting activities that extract under three mega litres of water per year (Part 1, Schedule 5). This is inconsistent with ESD principles (particularly intergenerational equity, the precautionary principle and the internalisation of environmental costs), as it threatens the ongoing viability of groundwater sources.

Other environmental impacts of CSG (see **Appendix 1**)

There are a range of environmental impacts relevant to CSG that are not specifically referred to in the Inquiry's terms of reference. These include biodiversity loss, land clearing, impact of bushfire and flood risks, traffic increase and heritage issues (which have environmental and social impacts). Like the aquifer interference regulation, there is a need to re-establish the requirement for concurrent approvals in relation to these matters, as discussed further under 4.2 below.

While we have not dealt with these issues comprehensively, the attached **Appendix 1** details the inadequacies of current environmental assessments for CSG exploration (under the "review of environmental factors" or **REF** process), and uses four case studies to demonstrate this inadequacy.[14]

The current changes to major project ('State Significant Development') assessment are an opportunity to dramatically improve the adequacy of environmental assessment processes. It remains to be seen whether the Parliament and the Government seizes this opportunity through more detailed assessment requirements, penalties, audits and active enforcement.[15]

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[11] *Water Management (General) Amendment (Aquifer Interference) Regulation 2011* under the *Water Management Act 2000.*

[12] Section 91 of the *Water Management Act 2000.* Such an approval confers a right on its holder to carry out one or more specified aquifer interference activities at a specified location, or in a specified area, in the course of carrying out specified activities (s 91). It is an offence to carry out an aquifer interference activity without an approval; anyone who conducts activities outside the approval carries a tier 2 penalty (s 91F).

[13] Under the *Water Management Act 2000* (NSW).

[14] A recent report also suggests CSG activities in the Pilliga are having a significant impact on biodiversity and habitat of national environmental significance (under the federal *Environment Protection and Biodiversity Conservation Act 1999*). See *Under the Radar – How Coal Seam Gas Mining in the Pilliga is Impacting on Matters of National Environmental Significance.* Joint paper from The Wilderness Society, Nature Conservation Council of NSW and the Northern Inland Council for the Environment. Available at: http://www.wilderness.org.au/files/Under%20the%20Radar%20Eastern%20Star%20Gas%20EPBC%20Report%20email.pdf.

[15] See further TOR 4 discussion; and the conclusion to Appendix 1 of this submission.

ii) Health Impacts

Environmental and health concerns about CSG impacts are inextricably linked. When principles of ESD such as 'intergenerational equity' are seriously considered, environmental and health impacts can be equally damaging to human communities. Also, both often emerge over the long term and result from cumulative causes.

The EDO's expertise lies in environmental law rather than public health law. Below we highlight aspects of the regulatory regime in this area; some of the health concerns being raised by communities, public health groups and other experts. We then consider government regulatory responses to environmental and health impacts under iii) below.

Regulation of chemicals and pollution

The EDO understands there is a lack of on-the-ground monitoring, as well as academic research, on the health impacts of chemicals and air quality from CSG and coal mining. The National Industrial Chemicals Notification and Assessment Scheme (**NICNAS**) aims to regulate "industrial chemicals for the protection of human health and the environment". However, questions have been raised about the scheme's effectiveness in achieving this goal. In a recent briefing paper, the National Toxics Network raised concerns that:

> *...of 23 common fracking chemicals used in Australia, only 2 have ever been assessed by NICNAS, Australia's industrial chemicals regulator. The two that were assessed, have never been assessed for use as fracking chemicals.*[16]

The onus should be on the industry and the regulator to improve the safety of CSG technology in advance of widespread rollout. The effective testing of chemicals and processes must also be supplemented with sufficient auditing by the industry and regulators. Communities lack the resources or expertise to continually monitor industry developments in these areas. Inadequate auditing and enforcement may promote a culture of minimal compliance.

The *Protection of the Environment Operations Act 1997* (NSW) (**POEO Act**) is intended to regulate air pollution. However, under the development assessment processes for most CSG production,[17] an environment pollution licence cannot be refused if it is necessary for State Significant Development. The limitations on NICNAS to identify and regulate toxic chemicals, and the overriding of POEO Act processes for pollution licences, may result in significant health implications.

Community concerns and specific public health issues

As legal regulation and monitoring struggles to keep pace with industry expansion, there is concern that such techniques may be used without a sufficient precautionary approach. Community concerns continue to surround CSG extraction techniques, including the potential impacts of 'fraccing' and use of chemicals – BTEX[18] or others.

[16] Available at: http://ntn.org.au/2011/02/21/call-for-moratorium-as-report-finds-fracking-chemicals-have-never-been-tested-for-safety/.

[17] Along with other major projects or State Significant Development, under the new Part 4, Division 4.1 of the EP&A Act (and the Part 3A transitional regime).

[18] Benzene, toluene, ethylbenzene, and xylenes (BTEX). We understand that Industry and Investment NSW has stated that BTEX hasn't been used in NSW to date. This raises two broader issues – (1) whether

A recent paper accepted for the *International Journal of Human and Ecological Risk Assessment* notes that "many chemicals used during the fracturing and drilling stages of gas operations may have long-term health effects that are not immediately expressed."[19]

Similarly, Doctors for the Environment Australia (**DEA**) has noted that:

> *Coal seam gas mining (CSG) may have adverse impacts on human health by contamination of drinking and agricultural-use water, and air. Contaminants of concern include many of the chemicals used for fracking, as well as toxic substances produced through this process and mobilised from the sedimentary regions drilled. Some of these compounds can produce short-term health effects and some may contribute to systemic illness and/or cancer many years later.*[20]

According to DEA, chemicals used in CSG activities:

> *can cause immediate effects... including skin and eye irritation, nausea and vomiting, acute breathing difficulties, and acute neurological disturbance such as dizziness, headaches, weakness, numbness, fainting even convulsions.*[21]

Also according to DEA, long term effects of exposure to these chemicals can "have effects on endocrine systems, fertility, reproduction, normal development and also cancer."[22]

Clearly there are a range of potential impacts of CSG on water supply, contamination, waste treatment and human health. In developing an effective response to such impacts, consultation between relevant departments is fundamental (e.g. health, environment, primary industries and planning). For example, the *Health Administration Act 1992 (NSW)* provides that the Minister for Health has the responsibility of formulating general policies for the purpose of:

> *promoting, protecting, developing, maintaining and improving the health and well-being of the people of New South Wales to the maximum extent possible having regard to the needs of and financial and other resources available to the State.* (s 5)

If regulation and monitoring of CSG operations continue in the current manner, the responsibility of "maintaining and improving the health and well-being of the people of

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rules or regulations actually *prevent* such use in future, based on a precautionary approach and proper risk assessment; and (2) as noted below, *any* process or chemical use requires rigorous testing and approval.

[19] Colborn, T., Kwiatkowski, C., Shultz, K., Bachran, M., 'Natural Gas Operations from a Public Health Perspective', accepted for publication in the *International Journal of Human and Ecological Risk Assessment*, September 4, 2011. We note that "CSG is a natural gas consisting primarily of methane, which is adsorbed into coal. Once produced, it can be used for the same purposes and applications as conventional natural gas". Source: Queensland Government. Department of Environment and Resource Management. *Coal Seam Gas Water Management Policy*. June 2010..

[20] Submission to the Rural Affairs and Transport References Committee Inquiry into management of the Murray Darling Basin – impact of mining coal seam gas, June 2011.Submission from Doctors for the Environment Australia Inc. David Shearman, Hon Secretary. Available at: http://dea.org.au/images/uploads/submissions/MDB_CSG_Senate_submission_June_2011.pdf.

[21] Lecture by Dr Helen Redmond on Health and Coal Seam Gas Extraction. Available at: http://dea.org.au/resources/file/dr_helen_redmond_on_health_and_coal_seam_gas_extraction.

[22] Ibid.

NSW" deserves greater scrutiny. Accepting the veracity of the health impacts noted above, the Government should take additional steps to carry out its general duty of care to monitor, protect and maintain the health and wellbeing of NSW residents.

It is salient to note that the principles of ESD include the need to factor in environmental and social costs as well as economic benefits.[23] A failure to adequately pre-empt and address these environmental and health impacts will have extensive flow-on economic and social impacts, especially on communities in close proximity to CSG operations (see further discussion, TOR 2).

iii) Regulatory responses

In July, the NSW Government extended a moratorium on 'fraccing' until the end of 2011; and announced it 'is introducing' a ban on the use of BTEX and evaporation ponds for CSG activities 'in future'.[24] However, it is understood that the form and scope of these bans will not be finalised until 2012 (following public exhibition).[25] It is also not clear how the announcement applies to *existing* CSG exploration and production licences. A 60-day moratorium on new licences provided some breathing space, however, vast areas of the State are already covered by exploration licences.

In responding to environmental and health impacts of CSG, the EDO emphasises that:

- ongoing regulation needs to be based on clear legal protections rather than temporary rules or departmental guidelines;
- new generations of chemicals and drilling processes must be rigorously tested, proven safe for use, and effectively monitored;
- protections applied to new CSG applications should also apply to existing operations, reflecting a clear, consistent approach that requires adaptive management by industry;[26]
- assessment and approval of CSG projects and industry practices requires whole-of-government coordination, and should not centralise power within one department;

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[23] See, eg, s 6, *Protection of the Environment Administration Act 1991* (NSW).

[24] NSW Resources and Energy Minister, Chris Hartcher, media release, 21/7/2011. The Minister announced that *in future*, all new coal and coal seam gas (CSG) exploration and mining licence applications referred to the Division of Resources and Energy will be subject to new rules, including:

- A ban on the use of BTEX chemicals (benzene, toluene, ethylbenzene and xylenes) as additives during CSG drilling. The Government's Stakeholder Reference Group is reviewing this process;
- An extended moratorium until 31 December 2011 on the use of hydraulic fracturing or 'fraccing' during CSG drilling;
- A regulation that requires extraction of more than 3 megalitres per year from groundwater sources to hold a water access licence; [as previously announced]
- A ban on the use of evaporation ponds relating to coal seam gas; and
- New public consultation guidelines to increase transparency and accountability to be finalised in consultation with the Government's Stakeholder Reference Group.

[25] Personal communication, Department of Planning and Infrastructure, 9/9/2011.

[26] Adaptive management itself, however, cannot be seen as a replacement for effective regulatory oversight.

- decision-making must take greater account of long-term environmental and health risks – and their impact on communities and public spending – in addition to the immediate economic benefits of CSG activity
- there should be an independent audit of compliance and enforcement activities in relation to CSG and other mining operations in NSW, including assessing the adequacy of agency resources. This would help to ensure that environmental assessments and consent conditions for CSG projects are being complied with.

1.2. Nature and effectiveness of remediation under the *Petroleum (Offshore) Act* (TOR 1(e))

i) Regulatory standards and ministerial discretion

At present, placing rehabilitation orders on CSG activities is not compulsory, and is open to ministerial discretion. The PO Act provides that the Minister for Resources and Energy may grant or renew a petroleum title subject to conditions relating to:

> *(a) the rehabilitation, levelling, regrassing, reforesting or contouring of any part of the land the subject of the title that may have been damaged or adversely affected by operations, and*
>
> *(b) the filling in or sealing of excavations and drill holes,*
>
> *as may be prescribed by the regulations or as the Minister may, in any particular case, determine.*[27]

Instead, we believe there should be binding contractual obligations that appropriate rehabilitation activities take place following any CSG activities in NSW. Rigorous standards should be set in regulations, with ministerial discretion reserved for raising, not lowering, the bar.

ii) Introduction of compulsory environmental bonds

Even where such conditions are in place, existing levels of monitoring and enforcement are unlikely to encourage compliance. For example, as case study 3 in **Appendix 1** notes:

> *It is also apparent that the conditions on rehabilitation set out in the REFs are not being followed by [the company].*[28] *There has been no successful rehabilitation of abandoned drill holes and there are serious weed incursions at almost every corehole site...*

The EDO recommends that proponents should be required to deposit compulsory environmental bonds prior to commencing any CSG prospecting or extraction activities. This would assist in ensuring compliance with approval conditions that are imposed for the rehabilitation of sites after CSG activities have ceased. This recommendation aligns with the polluter pays principle of ESD, and the National Water Commission's proposed principles on CSG and water protection.[29]

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[27] Section 76(1) of the *Petroleum (Onshore) Act 1991*.

[28] See report by TWS, NCC and Northern Inland Council for the Environment, "Under the Radar-How Coal Seam Gas Mining in the Pilliga is impacting matters of National Environmental Significance", pg. 26.

[29] See National Water Commission (Dec. 2010), "Coal Seam Gas and Water Position Statement", available at: http://www.nwc.gov.au/resources/documents/Coal_Seam_Gas.pdf.

iii) Past performance as a relevant indicator

Finally, this Inquiry could usefully explore evidence on the past performance of the mining industry in NSW, and CSG operators here and elsewhere, regarding successful rehabilitation. It could also explore the adequacy of companies' and departments' responses to community concerns about unrehabilitated sites. In the absence of long-term, well-enforced rehabilitation requirements, the benefits of CSG extraction may leave a damaging environmental legacy, long after mining companies and their investments have moved on.

1.3. Impact of CSG activities on greenhouse gas and other emissions; and relative air quality and environmental impacts compared to other fossil fuels (TOR 1(f)-(g))

i) Effect on greenhouse gas and other emissions

When comparing the greenhouse gas impacts of CSG to other fossil fuels, it is important to take into account not only the emissions generated from *combustion*, but also those emissions generated during *extraction* (as well as transport etc). As explored below, we believe there is insufficient scientific data on greenhouse gas emissions over the lifecycle of CSG to claim any major savings compared with other fossil fuels. We note current research suggesting that fugitive emissions from CSG extraction may outweigh the benefits of its relatively efficient combustion.

The extraction of fossil fuels generates greenhouse gases, which are a major contributor to human-induced climate change.[30] The global warming potential of methane is estimated to be 56 times greater over a 20-year period than carbon dioxide.[31] During CSG extraction, leakages of methane of up to 7.9% of the total extracted gas can occur.[32] These 'fugitive' emissions increase the ratio of greenhouse emissions from CSG compared with other fossil fuels. CO_2-equivalent emissions from CSG *extraction* can be up to 20-50% higher than coal and oil extraction, respectively.[33] As a result, despite the more efficient *combustion* of CSG compared with coal, the lifecycle analysis of emissions from CSG and coal are relatively similar.[34]

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[30] Professor Ross Garnaut noted in his 2011 update reports:

Emissions from fossil fuels are the largest source of atmospheric carbon dioxide from human activities. Carbon dioxide emissions from fossil fuel combustion increased by about 2 per cent per year in the 1970s and 1980s, and by only around 1 per cent in the 1990s. Between 2000 and 2008, the annual increase in fossil fuel emissions grew to 3.4 per cent.

See *Garnaut Climate Change Review Update 2011*, available at: http://www.garnautreview.org.au/update-2011/garnaut-review-2011/chapter1.html.

[31] Available at: http://unfccc.int/ghg_data/items/3825.php. The source quoted by the UNFCC is Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22.

[32] Howarth, R *et al* (2011). Methane and the greenhouse-gas footprint of natural gas from shale formations. *Climatic Change* 106:679-690.

[33] Depending on the time scale of the modeled scenario, and the depth at which coal seam gas is extracted. Howarth, R *et al* (2011). Methane and the greenhouse-gas footprint of natural gas from shale formations.*Climatic Change* **106**:679-690.

[34] Howarth, R *et al* (2011). Methane and the greenhouse-gas footprint of natural gas from shale formations.*Climatic Change* 106:679-690.

In addition, we note that in terms of *lifecycle emissions*, including extraction to production, CSG is inherently different to natural gas. While the EDO considers the use of natural gas may be viable as a transition fuel, we remain sceptical of the greenhouse reduction benefits of CSG without further independent research and better environmental regulation. The emissions generated during extraction, combined with the potentially serious detrimental environmental impacts created by extraction (discussed above) may well outweigh the benefits gained from more efficient combustion. In any event, the EDO recommends increased requirements on industry to monitor and reduce its emissions during extraction.

ii) Relative air quality and environmental impacts compared to alternate fossil fuels

As noted earlier, we understand monitoring and research on air quality regarding CSG has been limited to date. Although we do not consider this issue in depth, case study 1 in **Appendix 1** provides an example of the inadequacy of air quality assessment in 'reviews of environmental factors' (**REFs**) for CSG projects:

> *The [company's] REF also claimed that the impact on air quality will negligible, localised and insignificant. This was despite [the company] not providing estimates of the amount of diesel used to power the drill rigs and the resulting greenhouse gas emissions before making such a claim. [The company] also failed to mention fugitive emissions which are common in all drilling operations at such depths.*

The Inquiry's terms of reference specifically refer to the air quality and environmental impacts compared to other fossil fuels. However, we believe that the Committee should also consider and compare these impacts with renewable energy sources.

EDO scientific officers have prepared the following table as an illustrative comparison of greenhouse gas intensity and environmental impacts across a range of non-renewable and renewable energy sources. Please note that this table is intended only as a guide to potential impacts, and is not a definitive source.

Table 1: Illustrative comparison of energy sources – greenhouse emissions and environmental impacts

Energy Source	Greenhouse gas intensity[35] (kT CO2-e/GWh)	Water impacts	Atmospheric impacts	Damage to agricultural land	Loss of biodiversity
Brown coal (new subcritical)	1.175	- increase in suspended solids[36] - increase in heavy metal contamination[37]	- release of GHGs[39] - dust production	- land clearance[40]	- land clearance[41]
Black coal (new	0.941				

[35] Adapted from Lenzen, M. (2008) Life cycle energy and greenhouse gas emissions of nuclear energy: A review. *Energy Conversion and Management* 49: 2178-2199.
[36] Environmental Defender's Office (2011) *Mining Law in New South Wales.* EDO: Sydney, p13.
[37] Ibid.

Energy Source	Greenhouse gas intensity[35] (kT CO2-e/GWh)	Water impacts	Atmospheric impacts	Damage to agricultural land	Loss of biodiversity
subcritical)		- acidification[38]			
Black coal (supercritical)	0.863				
Coal seam gas	Studies show similar intensities to coal[42]	- high levels of groundwater extraction[43] - change in groundwater pressure[44] - reduction in surface water flow[45] - injection of chemicals into groundwater during fraccing process[46]	- release of GHGs[47]	- land subsidence[48]	- alteration of natural water flow patterns leading to loss of habitat [49] - land subsidence leading to loss of habitat[50]
Natural gas (open cycle)	0.751	- methane contamination of nearby water	- release of nitrous oxides[52] - release of ozone[53]	- affected by changes to water and	- affected by changes to water and

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[39] Ibid, 14.
[40] Ibid, 16.
[41] Ibid, 16.
[38] Ibid.
[42] Howarth, R *et al* (2011). Methane and the greenhouse-gas footprint of natural gas from shale formations. *Climatic Change* 106:679 – 690.
[43] EDO, above n 2, 18.
[44] Ibid.
[45] Ibid.
[46] Environmental Protection Agency (2004) *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs, Chapter 4: Hydraulic Fracturing Fluids.*
[47] EDO, above n 2, 14.
[48] Ibid.
[49] Ibid.
[50] Ibid.
[52] Kemball-Cook, S et al. (2010). Ozone Impacts of Natural Gas Development in the Haynesville Shale. *Environmental Science and Technology* 44(24): 9357–9363.
[53] Ibid.

Energy Source	Greenhouse gas intensity[35] (kT CO2-e/GWh)	Water impacts	Atmospheric impacts	Damage to agricultural land	Loss of biodiversity
Natural gas (combined cycle)	0.577	sources[51]		atmosphere	atmosphere
Photovoltaics	0.106	Nil	Nil	Some potential loss – no damage	- behavioural changes leading to decrease in populations[54]
Wind turbines	0.021	Nil	Nil	Some potential loss – no damage	- possible bird strike[55]
Hydroelectricity (run-of-river)	0.015	- mercury contamination[56]	- release of GHGs[57]	- alteration of nature flow patterns leading to erosion[58] - loss of land through flooding[59]	- alteration of natural water flow patterns leading to loss of habitat[60] - decrease in populations[61]

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[51] Osborn, S G et al. (2011). Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. *Proceedings of the National Academy of Sciences of the United State of America* 108(20): 8172 – 8176.

[54] Horváth, G, Blahó, M, Egri, A, Kriska, G, Seres, I and B Robertson (2010) Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. *Conservation Biology 24(6): 1644 – 1653.*

[55] Heemskirk Wind Farm DPEMP (2003) *Vol.1 – Wind Farm Site, Chapter 10 – Avifauna.*

[56] Rosenberg, D M et al. (1995) Environmental and social impacts of large scale hydro-electric development: Who is listening? *Global Environmental Change* 5(2): 127 – 148.

[57] Ibid.

[58] Bogen, J (2001) The impact of a hydroelectric power plant on the sediment load in downstream water bodies, Svartisen, northern Norway. *The Science of the Total Environment* 266(1-3): 273.

[59] Rosenberg, above n 19.

[60] Vranovský, M (1997) Impact of the Gabcíkovo hydropower plant operation on planktonic copepods assemblages in the River Danube and its floodplain downstream of Bratislava. *Hydrobiologia* 347(1-3): 41 – 49.

[61] Yde, C A and A Olsen (1984) *Wildlife impact assessment and summary of previous mitigation related to hydroelectric projects in Montana: Volume one, Libby Dam project – operator, U.S. Army Corps of Engineers.* Montana Department of Fish, Wildlife and Parks: Montana.

Term Of Reference 2: The Economic and Social Implications of CSG

2.1. Legal rights of property owners and property values (TOR 2(a))

Under the *Petroleum (Onshore) Act 1991*(NSW) (**PO Act**), all petroleum in its natural state (including CSG) is the property of the Crown.[62] A petroleum title must be granted by the Crown to acquire rights to prospect for or extract CSG.[63] To access occupied land once an exploration licence has been granted, a mining company must enter an 'access arrangement' with relevant landowners voluntarily, via arbitration or by the order of the Land and Environment Court.[64]

Fundamentally, where there are CSG deposits under a property owner's land, the owner doesn't have the right to say 'no' to CSG exploration or extraction.[65]

Adding to complexity and community confusion, specific procedures sometimes diverge between the PO Act and the *Mining Act 1992* (NSW) which regulates coal and other mining. For example, there are some discretionary 'exceptions to exceptions' under the PO Act.[66]

In these circumstances – where impacts are uncertain, the industry is rapidly expanding, legal processes are complex and inconsistent, and landowners' rights are limited – it is not surprising that land access for CSG activities has created such controversy.

Improving community consultation and public participation in decision-making

This submission now analyses how community consultation and public participation can be improved throughout the following stages of CSG process:

a) Notification of exploration activities;

b) Access arrangements with landholders;

c) CSG production; and

d) Compensation under the PO Act.

a) Notification of Exploration Activities

The PO Act does not require proponents to directly notify landholders or other stakeholders affected by an application for a petroleum exploration licence.

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62 *Petroleum (Onshore) Act 1991*, s. 6.

63 *Petroleum (Onshore) Act 1991*, Pt. 4

64 *Petroleum (Onshore) Act 1991*, Pt. 4A.

65 Unlawful obstruction of authorised activities under an exploration title carries a max.penalty of $11,000.

66 These reduce clarity, certainty and consistency of the law. For example, under Part 5 of the PO Act, a CSG titleholder may not exercise title rights over certain "exempted areas" or "land under cultivation" – unless the Minister consents. By comparison, exceptions to protect "agricultural land" in the *Mining Act 1992* (NSW) are more clearly defined, and provide better appeal rights than for the Minister's decisions on cultivated land in the PO Act. See, eg *Mining Act 1992* (NSW), Schedule 1, cll 20-23.

Rather, Departmental guidelines require applicants to publish notice of such an application in a newspaper[67] before a licence is granted.[68] We believe this is insufficient.

For most landowners, the first time they see a notification of CSG activity occurring in or around their land will be their first exposure to such activities. As such, landowners need to be informed of the processes and options available to them – with sufficient time to assess their options and exercise their rights. There is also a need for clear protocols to direct CSG companies in their dealings with landowners; and protections for landowners in access negotiations given their unequal bargaining power.

Opportunities for community engagement need to be increased through:

- direct notification of potentially affected landowners;
- proper, guaranteed public exhibition periods;
- merits review of exploration licence decisions.

b) Access arrangements with landholders – negotiation, arbitration and court processes

As noted above, CSG proponents must have an access arrangement with the landholder before petroleum exploration can commence (under a licence or assessment lease). Failure to do so is a breach of the PO Act.

However, the legislation is geared towards facilitating exploration activities. If arbitration occurs because the parties can't reach agreement, in practice the decision relates to what *conditions* will be attached to access arrangements, as opposed to *whether* an access arrangement should be granted at all.

This highlights the need for proper strategic planning, including the development of no-mining zones (as discussed under TOR 4 below). There needs to be a recognition that access arrangements are unacceptable in some pre-determined areas.

The arbitration process is intended to be a cost effective option, with no requirement for representation, hearings in regional areas, and each party to bear their own costs. However, individual landowners still face a significant power imbalance in the process.

Where matters proceed to the Land and Environment Court, this imbalance is exacerbated by geographical remoteness from the Court in Sydney, compared with CSG proponents. Those companies have a far greater share of resources, experience and expertise to secure a favourable outcome. Furthermore, as court proceedings have potentially extensive costs implications, there are concerns regarding the financial capacity of landholders to object, should questions of land access or compensation escalate to the Land and Environment Court.

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67 The advertisement must be placed in the "The Land" newspaper and in another newspaper where circulation covers the biggest population base of interested parties where the exploration licence application has been lodged. See: http://www.dpi.nsw.gov.au/minerals/titles/guidelines_for_diagrams for newspaper notice guidelines.

68 Note that the application forms for a petroleum exploration licence and assessment lease do not specify this requirement. The Department of Primary Industries confirmed that it also requires notice of petroleum applications to be published in a newspaper.

Other issues relevant to landowners' rights are explored under TOR 4, including compensation provisions for government-acquired land, and improving opportunities for public interest court proceedings.

c) CSG Production

Once petroleum deposit is identified, the holder of an exploration title is required to obtain a production lease before they are entitled to extract the gas.[69] For petroleum or CSG, a proponent must publish a notice in a State-wide newspaper that they have lodged, or intend to lodge, an application for a production lease.[70] Without the written consent of the occupier, an exploration licence, assessment or mining lease cannot be exercised over the *surface* of land within 200 metres of a person's home, 50 metres of a garden, or on land on which there is any improvement.[71]

Reforms are needed to ensure that in practice, "landowner consent" means free, prior and informed consent. One suggestion to increase the understanding of individuals impacted by mining activities is to introduce standard procedures or templates when a landowner is notified of a CSG lease. This would highlight the rights and responsibilities of landowners and mining companies (for example, in relation to land access, exploration, approval, and land acquisition), and the sections of the PO Act that require the landowner's consent. A mandatory notification template, developed by the Government following consultation, would help to level the playing field and provide more certainty for all parties.

To address these and related community issues, the recent EDO Mining Discussion Paper recommended steps to ensure comprehensive, guaranteed rights of community consultation and public participation – in both the *Mining Act* and *Petroleum (Onshore) Act* – including for large-scale projects.[72] Requirements should include:

- direct notification of exploration licence applications to potentially affected landowners
- merits review of exploration licence decisions
- adequate public consultation periods, and timely notification of mining activities
- improved land access provisions that ensure the free, prior and informed consent of landowners – assisted by a template outlining landowners' rights and mining company responsibilities
- seeking consent to underground mining activities (not just surface activities) in close proximity to homes, gardens and significant improvements.

To reduce complexity, consideration should also be given to harmonising relevant processes under the *Mining Act 1992* and the *Petroleum (Onshore) Act 1991*.

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[69] Section 7 of the *Petroleum (Onshore) Act 1991*.

[70] Section 43 of the *Petroleum (Onshore) Act 1991*.

[71] Section 72 of the *Petroleum (Onshore) Act 1991*.

[72] EDO NSW, *Mining Law in NSW* (June 2011), recommendation 9. Available at http://www.edo.org.au/edonsw/site/pdf/pubs/110628mining_law_discussion_paper.pdf.

Such harmonisation should start with a 'highest common denominator' approach to environmental protection – and enshrine best environmental practice in the law, in line with the principles of ESD.

d) Compensation under the Petroleum (Onshore) Act

The PO Act outlines a limited regime for compensation to affected landholders under Part 11.[73] The holder of a petroleum title is "liable to every person having any estate or interest in any land injuriously affected, or likely to be so affected, by reason of any operations conducted".[74]

A key inadequacy when it comes to CSG is that compensation is limited to impacts on the *surface* of the land, and to the boundaries of each individual property. Another key omission is that there are no direct references to water access, or damage to water systems. Under s 109 of the PO Act, if compensation is assessed by the Land and Environment Court, the assessment is to be of the loss caused or likely to be caused:

> *(a) by damage to the surface of land, and damage to the crops, trees, grasses or other vegetation on land, or damage to buildings and improvements on land, being damage which has been caused by or which may arise from prospecting or petroleum mining operations, and*
>
> *(b) by deprivation of the possession or of the use of the surface of land or any part of the surface, and*
>
> *(c) by severance of land from other land of the landholder, and*
>
> *(d) by surface rights of way and easements, and*
>
> *(e) by destruction or loss of, or injury to, or disturbance of, or interference with, stock on land, and*
>
> *(f) by damage consequential on any matter referred to in paragraphs (a)–(e).*

The limitations of this compensation regime highlight a failure to keep pace with the CSG industry's development and potential impacts (including on health). Many of the concerns associated with prospecting and extraction of CSG do not necessarily cause visible damage to the land's surface. As discussed earlier, they may have more serious impacts on underground systems (seemingly excluded above), such as disturbance to aquifers and water flows. These shortcomings maintain an uncertain and inequitable compensation system for landowners in relation to CSG impacts.

Furthermore, in NSW, many CSG activities are located in areas of high environmental and agricultural value. These lands rely on groundwater systems to support ecosystem services (such as salinity control and biodiversity protection) and maintain various industries. Even if individual landholders are adequately or partially compensated, the unknown cost of long-term land and ecosystem degradation will be borne by future generations and governments.

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[73] Compensation arrangements can be: included in access arrangements; included in standalone agreements; included in arbitration determinations; or assessed and determined by the Land and Environment Court (see eg s 108, *Petroleum (Onshore) Act 1991*).

[74] Section 107(1) of the *Petroleum (Onshore) Act 1991* (NSW).

These concerns require a holistic assessment involving strategic land use planning; wide-ranging baseline data on environmental qualities; and a development assessment process that mandates strict environmental protection and local consultation.

2.2. Food Security and Agricultural Activity (TOR 2(b))

The EDO emphasises the relevance of intergenerational equity (maintaining adequate resources for current and future generations to meet their needs) to questions of food and agricultural security. This is consistent with the objects under a range of NSW laws that promote ESD, which includes taking intergenerational equity into account in decision-making.[75]

We note the NSW Government's commitment to 'triple bottom line' assessment in its three-year strategic land use policy process.[76] The need for strategic planning is amplified in an economic climate where CSG activities are increasing significantly.[77] The need to develop strategic land use plans and ensure they are appropriately enforceable is discussed in more detail under TOR 4 below.

2.3. Royalties payable to the State (TOR 2(c))

In an August 2011 speech, the federal Treasury Secretary, Dr Martin Parkinson, put forward the notion of 'sustainable wellbeing' as a benchmark for guiding Australia's economic future. To maintain sustainable wellbeing, the Secretary acknowledged the importance of *environmental and social capital* in addition to traditional notions of physical, financial and human capital. He emphasised the need to balance all of these elements:

> *Running down the stock of capital in aggregate diminishes the opportunities for future generations. In the case of minerals and energy, arguably society is not sharing sufficiently in the returns from their exploitation, with the vast bulk of the benefits accruing to the shareholders of the firms doing the mining.*[78]

[75] A stated purpose of the NSW *Local Government Act 1993*, under s 7(e) is "to require Councils, Councillors and Council employees to have regard to the principles of Ecologically Sustainable Development in carrying out their responsibilities". An objective of the *Environmental Planning and Assessment Act 1979* is "the sharing of the responsibility for environmental planning between the levels of government in the State" and "to encourage ecologically sustainable development". On the consideration of ESD in planning decisions generally see *Minister for Planning v Walker (2008)* 161 LGERA 423, paragraphs 39-56.

[76] See NSW Liberals and Nationals policy. *"Strategic Regional Land Use Planning"*, available at: http://grip.org.au/documents/doc-47-strategic-regional-land-use-policy---document.pdf. See also the Hon Brad Hazzard MP, Minister for Planning and Infrastructure, media release, *"NSW Government Adopts Rigorous Strategic Approach to Regional Land Use Planning"*, 21 May 2011, available at: http://www.nsw.liberal.org.au/news/planning/nsw-government-adopts-rigorous-strategic-approach-to-regional-land-use-planning.html.

[77] As the former NSW Government's *Coal and Gas Strategy Scoping Paper* (March 2011) noted, "there has been a significant increase recently in coal seam gas exploration... This exploration could result in a substantial increase in coal seam production over the next 25 years."

[78] Parkinson M. (Aug 2011), *"Sustainable Wellbeing- An Economic Future for Australia"*. Address for the Shann Memorial Lecture Series. Available at: http://www.treasury.gov.au/documents/2134/PDF/shann.pdf

While the EDO's expertise is in legal rather than economic policy, we seek to apply that lens to CSG regulation in NSW. In doing so, we acknowledge the complexities of royalties issues, including questions of state and federal interaction.

Under the *Petroleum (Onshore) Regulation 2007* (**PO Regulation**) royalties are not payable to the Crown for five years from the first commercial production date.[79] The five-year royalty exemption is a considerable incentive for accelerated development of the CSG industry.[80]

The EDO urges the Committee to consider whether the five-year royalty exemption continues to be justified in light of the following considerations:

- the potential for the subsidy to encourage rapid industry expansion at the expense of adequate environmental and community safety;
- objectives under pollution and planning laws to promote and adhere to the principles of ESD (including the precautionary principle, intergenerational equity and full-cost accounting);
- community concern over the proportion of profit flowing to mining companies, at the potential long term cost to the environment, public amenity and wellbeing;[81]
- the limited resources available to research and monitor mining activities, and enforce compliance with regulations; and
- the federal Treasury Secretary's comments that "In the case of minerals and energy, arguably society is not sharing sufficiently in the returns from their exploitation..."

In EDO's view, the intent behind removing the five-year royalty exemption would be:

- the removal of an artificial incentive for CSG activities, at the very time that stakeholders are urging a more precautionary approach;
- that the payment of royalties falls directly on the mining companies profiting from the extraction of Crown resources; and not on the public at large, via governments' compensation to those companies.[82]

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[79] *Petroleum (Onshore) Regulation 2007, r. 23.*

[80] As a result of NSW Government initiatives, there has been an unprecedented level of petroleum exploration activity within NSW. Over $20 million was spent in 2003-2004, and $30 million in 2004-2005 on this type of exploration. In 2007-2008, CSG production in Queensland and NSW grew 40%. ("CSG – Firing up Australia's gas industry", Gas Today, May 2008.)

[81] See, eg, R. Gittins, *The Age*, "Parkinson's lore and the law of sustainability", 7/9/11, at http://m.theage.com.au/business/parkinsons-lore-and-the-law-of-sustainability-20110826-1jeg8.html. See also, *EcoNews*, "Survey says miners should pay fair share of taxes", 6/9/11; but see also counterclaims in *EcoNews*, "Mining industry pays record $23.4bn in taxes, royalties", 6/9/11.

[82] We note the recently announced increase in NSW mining royalty payments, by companies subject to the federal Mineral Resources Rent Tax, which will result in the companies themselves being "shielded" through compensation commitments by the Australian Government. See, eg, R. Gittins, *Sydney Morning Herald*, "O'Farrell to raise mining royalties", 6/9/11, available at http://www.smh.com.au/nsw/ofarrell-to-raise-mining-royalties-20110905-1jubr.html.

Term of Reference 4: The interaction of the *Petroleum Onshore Act 1991* with other legislation

This part analyses the interaction of the PO Act with other State legislation and regulations, including the *Environmental Planning and Assessment Act 1979, Land Acquisition (Just Terms Compensation) Act 1991*, and *Mines Subsidence Act 1961*. We will again refer to a number of recommendations made in the recently released EDO Mining Discussion Paper.[83] We will discuss the relevant interactions under the following headings:

4.1 Reintegrating the elements of ESD into the decision-making process
4.2 EP&A Act assessment – reinstating mandatory concurrence approvals
4.3 Interaction with the *Land Acquisition Act*, federal law and the *Mine Subsidence Compensation Act*
4.4 Strategic land use plans – development, legal force & cumulative impacts
4.5 Introduction of a wider range of enforcement tools
4.6 Improving opportunities for public interest court proceedings.

4.1 Reintegrating the elements of ESD into the decision-making process

As an overarching recommendation, touched on throughout this submission, the EDO submits that any CSG operations and infrastructure in NSW should be assessed and developed in accordance with the principles of Ecologically Sustainable Development (**ESD**). This would mean giving effect to the following principles in the *Petroleum (Onshore) Act*, and in other mining and planning laws:

- the precautionary principle;[84]
- the principle of inter- and intra-generational equity;
- conservation of biological diversity and ecological integrity;
- internalisation of environmental costs (or full-cost accounting); and
- the polluter pays principle.[85]

The EDO believes ESD principles are critical benchmarks to underpin all environmental and planning decisions. As noted above, other NSW laws include ESD in their objects, although much more needs to be done to activate those principles in Ministers' and authorities' decision-making. Requiring that each of these principles be adhered to in the assessment, approval and operation of CSG activities in NSW would substantially reduce the risk of negative environmental and social impacts.

4.2. EP&A Act assessment – reinstating mandatory concurrence approvals

One of the primary impediments to the appropriate environmental assessment of CSG activities is the removal of 'concurrence approvals'. This is a result of the interaction between the PO Act and the *Environmental Planning and Assessment Act 1979* (**EP&A Act**).

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[83] Available at: http://www.edo.org.au/edonsw/site/pdf/pubs/110628mining_law_discussion_paper.pdf.

[84] Defined in Principle 15 of the *Rio Declaration (1992)*: where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

[85] ESD is referred to in numerous pieces of legislation in NSW, and the accepted definition can be found in the *Protection of the Environment Administration Act 1991*, s 6(2).

i) From Part 3A to State Significant Development (SSD)

Most mining and CSG production in recent years required development consent under Major Project provisions (formerly Part 3A) in the EP&A Act.[86] For CSG, this covers:

> *Development for the purpose of drilling and operation of petroleum wells (including associated pipelines) that:*
>
> *(a) has a capital investment value of more than $30 million or employs 100 or more people, or*
>
> *(b) is in an environmentally sensitive area of State significance, or*
>
> *(c) is in the local government areas of Camden, Wollondilly, Campbelltown City, Wollongong City, Wingecarribee, Gosford City, Wyong, Lake Macquarie City, Newcastle City, Maitland City, Cessnock City, Singleton, Hawkesbury, Port Stephens, Upper Hunter or Muswellbrook, but only if the principal resource sought is coal seam methane.*[87]

The Part 3A Major Project provisions are under repeal, although a number of CSG operations will be dealt with under transitional provisions. Part 3A is to be replaced with a new Part 4, Division 4.1 under the EP&A Act.[88] In the near future, most mining activities will be dealt with as "State Significant Development" (**SSD**)[89], pending a full review of the planning system.

The recent draft State and Regional Development State Environmental Planning Policy (**SEPP**) proposes to *expand* the type of CSG developments classified as State Significant Development. It does this by removing the previous capital investment and geographic thresholds under (a) and (c) above.[90] This may be an improvement if it means CSG projects, including exploration, will require a more fulsome environmental impact assessment as SSD. However, details are yet to be finalised or fully consulted on.

ii) Safeguards still bypassed for State Significant Development

One of major remaining problems with the SSD regime is that the EP&A Act will still override the requirement to obtain 'concurrence' approvals from various agencies under other laws. The new amendments[91] still provide that the following extensive list of authorisations – which usually act as environmental safeguards – *are not required* for State Significant Development such as CSG projects:

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[86] Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW). Designated development for mining (under Part 4) has survived in name only, while small-scale activities might be dealt with by Councils (also covered by Part 4), or exempt from development consent under the Mining SEPP (such as for exploration). As Appendix 1 explains, exploration activities are generally assessed under Part 5 "reviews of environmental factors".

[87] See clause 5(1) of the *SEPP (Major Development) 2005*.

[88] *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011*.

[89] State Significant Development will include major projects that have the potential to deliver a significant economic input to the NSW economy and large-scale or complex projects that may involve significant environmental impact.

[90] *SEPP (Major Development) 2005*, Schedule 1, cl 6, "Petroleum (oil, gas and coal seam methane)".

[91] *Environmental Planning and Assessment Amendment (Part 3A Repeal) Bill 2011*

> *(a) the concurrence under Part 3 of the Coastal Protection Act 1979 of the Minister administering that Part of that Act,*
>
> *(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,*
>
> *(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,*
>
> *(d) an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,*
>
> *(e) an authorisation referred to in section 12 of the Native Vegetation Act 2003 (or under any Act repealed by that Act) to clear native vegetation or State protected land,*
>
> *(f) a bush fire safety authority under section 100B of the Rural Fires Act 1997,*
>
> *(g) a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the Water Management Act 2000.*[92]

Furthermore, the following authorisations *cannot be refused* if they are necessary for carrying out the SSD that is authorised by a development consent under Part 4, Div. 4.1:

> *(a) an aquaculture permit under section 144 of the Fisheries Management Act 1994,*
>
> *(b) an approval under section 15 of the Mine Subsidence Compensation Act 1961,*
>
> *(c) a mining lease under the Mining Act 1992,*
>
> *(d) a production lease under the Petroleum (Onshore) Act 1991,*
>
> *(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),*
>
> *(f) a consent under section 138 of the Roads Act 1993,*
>
> *(g) a licence under the Pipelines Act 1967.*[93]

It is counter-intuitive that the projects with the greatest significance, and likely environmental impacts, are exempt from (or rubber stamped with) the very approvals designed as a 'check' on those impacts. The new requirement for an Aquifer Interference Approval[94] for certain CSG and other activities needs to be replicated for the management of biodiversity, native vegetation, threatened species and bushfire risk (among other things).

This absence of concurrence approvals and whole-of-government coordination of CSG reflects an outmoded view of planning and development typified by the former Part 3A. Other state agencies' inability to deny authorisations for inappropriate CSG activities will continue to undermine the environmental checks and balances that would minimise negative environmental consequences from CSG operations. The approval of CSG operations without such input and expertise heightens the risk of serious environmental, social and economic consequences. This approach also prioritises immediate economic efficiencies over a more strategic, expertise-based, precautionary approach.

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[92] Section 89J of the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011.*

[93] Section 89K of the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011.*

[94] *Water Management (General) Amendment (Aquifer Interference) Regulation 2011* under the *Water Management Act 2000.*

4.3. Interaction with the *Land Acquisition Act*, federal law and the *Mine Subsidence Compensation Act*

i) Compensation under the Land Acquisition Act (NSW) and its federal equivalent

The compensation regime under the PO Act is described at 2.1(d) above. The PO Act process applies to surface impacts of private companies' CSG activities on land.

The *Land Acquisition (Just Terms Compensation) Act 1991* (**LA Act**) deals with circumstances where land is compulsorily acquired by an *authority of the State*. For example, this may include where portions of property are acquired to construct roadways or pipelines between CSG wells. The LA Act does not compensate landowners for costs they would incur to transfer their existing activities to a new piece of land when CSG operations disrupt them.

In contrast, the compensation process under federal law provides some useful avenues for reform in NSW. Under the *Land Acquisition Act 1989 (Cth)*, the landowner is entitled to compensation for the 'net acquisition cost' or the land's present day market value – *whichever is greater*.[95] Importantly, the federal Act sets out a formula for the 'net acquisition cost', which factors in:

- the (likely) cost to the person in acquiring the interest in a new area of land;
- *plus* the (likely) amount of expenses incurred from ceasing to use the old land which has been compulsorily acquired, and starting to use the new land for the same purpose;
- *minus* any real and substantial saving gained as a result of the relocation.[96]

This formula provides a more transparent and equitable process for valuation. It aims to provide landholders with the resources to cease activities on their current property, and be provided adequate compensation to begin activities of a similar nature elsewhere. Introducing a similar process into State law would result in a much more equitable process for compensation to landowners. This could also be considered in relation to private acquisition of land under the PO Act (discussed above) – particularly where existing mining has already diminished land values.

ii) No compensation for CSG under the Mine Subsidence Compensation Act (NSW)

A separate compensation regime exists in NSW for damage due to subsidence of land. However, the *Mine Subsidence Compensation Act 1961* defines 'subsidence' only in relation to the extraction of and prospecting for coal and shale. Any subsidence due to CSG

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[95] *Land Acquisition Act 1989 (Cth)*, s 58. Where an interest in land is acquired from a person by compulsory process, the market value of the acquired interest on the day of the acquisition is taken to be the greater of

a) *the amount that, apart from this section, would be the market value (if any) of that interest on that day; and*

b) *the net acquisition cost in relation to the interest in the new land.*

[96] Section 58(3) of the *Land Acquisition Act 1989* provides the following formula for how to arrive at the net acquisition cost: *CA + E – FI = Net Acquisition Cost*

"CA" is the amount of the cost, or likely cost to the person in acquiring the interest in a new area of land. "E" is the amount of expenses incurred, or likely to be incurred, as a result of ceasing to use the old land which has been acquired and commencing to use the new land for the same purpose. Finally "FI" is the present value of any real and substantial saving gained by the person as a result of the relocation.

prospecting and extraction is not currently covered. This is both inadequate and inequitable.

The law should be amended to provide for similar relief from the impacts of CSG activities. Alternatively, consistent or amalgamated compensation provisions could be considered to cover all forms of mining and related impacts. In that case, the EDO would advocate a 'highest common denominator' approach that maximises compensable matters and the public's rights.

4.4 Strategic land use plans – development, legal force, and cumulative impacts

There are three main elements to this section:

- that strategic land use plans (SLUPs) be developed;
- that SLUPs development proceed on a scientific basis; and
- that such plans are given appropriate legal force.

Firstly, the EDO welcomes the intention to introduce SLUPs in NSW that properly value environmental areas and ecosystem services.[97] Strategic regional planning should help to pre-empt certain land use conflicts, and redress the failure to adequately account for cumulative impacts. There is a need to move away from the ad hoc process of assessing CSG projects on an individual basis only,[98] to a process that considers cumulative environmental impacts of existing and likely future projects in an area.

Secondly, it is fundamental that the SLUPs are developed based on robust scientific evidence, and thorough 'triple bottom line' assessment. If this occurs, it is anticipated there will be areas where mining operations should be prohibited due to an area's environmental, agricultural or cultural values. The EDO believes the identification of no-mining zones is necessary to encourage a more structured approach to CSG activities. In the process, the SLUP process could reduce some of the complex exceptions and discretionary approvals by the Minister under the PO Act.[99]

Thirdly, SLUPs should be given appropriate legal recognition and force. They should be enforceable, and not merely a policy document "to be considered" but not necessarily acted upon. The EDO recommends that decision makers should instead be bound to "act consistently with" SLUPs.

Finally, we note that strategic land use plans must be complemented by meaningful notification and consultation rights for those affected by individual mining projects (see TOR 2).

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[97] See NSW Liberals and Nationals policy. *"Strategic Regional Land Use Planning"*, available at: http://grip.org.au/documents/doc-47-strategic-regional-land-use-policy---document.pdf.

[98] See, eg, Appendix 1, case study 3.

[99] See, eg, Part 5 (Restrictions on titles).

4.5 Introduction of wider range of enforcement tools

The EDO believes there is a real need to broaden the range of enforcement tools available to address breaches of environmental protections arising from CSG activities. These tools should be suited to target corporate offenders as well as individuals.

Firstly, both mining and planning laws should adopt a tiered system of offences to address varying levels of malfeasance.[100] The High Court in *He Kaw Teh*[101] classified statutory offences into three categories as follows:

- Category 1 (serious offences) - *mens rea* (guilty mind) applies in full and therefore proof of a person's intention is necessary in order to convict them of a crime
- Category 2 (mid-range offences) - strict liability where only the *actus reus* (the guilty act causing a proscribed effect) needs to be proved to convict a person of a crime. The only defence to a strict liability offence is a pleading of 'honest and reasonable mistake of fact' (the defendant was not aware of the facts that led to the commission of the offence)
- Category 3 (minor offences) - absolute liability where there is no defence that can be pleaded.

In addition, the EDO believes that there should be provision for Ministers or Departments to revoke or suspend licences and consents to prospect or extract CSG. Such measures should also be available to landowners if the terms of access agreements are being breached. Prior conduct (including site rehabilitation and other compliance) should also be taken into account when granting or renewing titles.

4.6 Improving opportunities for public interest court proceedings

The EDO recognises that certain laws provide broad standing provisions to bring public interest actions against CSG operations; for example, seeking an injunction where a company is breaching consent conditions or pollution licences. However, the threat of an adverse costs order is still a practical deterrent to litigants seeking to bring public interest proceedings in the Land and Environment Court.[102] As former High Court Justice, Toohey J, noted, 'there is little point in opening the doors to the Courts if litigants cannot afford to come in'.[103]

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[100] For example, we note the well-recognised enforcement framework provided by the seminal case *He Kaw Teh v* R (1985) 157 CLR 523. In that case the High Court provided guidance on how to interpret criminal offence provisions in statutes, by confirming the common law presumption that *mens rea* (a guilty mind through intention, recklessness or negligence) is an essential element of every criminal offence, unless expressly or impliedly displaced by statute.

[101] Ibid.

[102] As has occurred in *Blue Mountains Conservation Society v Delta Electricity*, see www.edo.org.au/edonsw/site/casework_key.php#delta. See also L. Ogle, "Community Experience of the Court", Promises, Perception, Problems and Remedies, Land and Environment Court and Environmental Law 1979-1999, Conference proceedings, p 26. See further K. Ruddock, "The Bowen Basin case" in Bonyhady T &Christoff P (eds), *Climate Law in Australia* (2007), Federation Press, pp 184-185.

[103] Justice Toohey, paper delivered to the National Environmental Law Conference (1989).

We therefore submit that the *Land and Environment Court Rules 2007* should be amended to stipulate that in all 'public interest proceedings' in the Court's jurisdiction, public interest litigants are *exempt* from adverse costs orders, and orders for security of costs. Furthermore we believe the *Land and Environment Court Rules 2007* should be amended to prevent public interest litigants from having to give 'undertakings as to damages' as a condition of granting an interim injunction.

These amendments would assist the community in ensuring CSG operations are operating in accordance with their environmental obligations. They would also more effectively supplement regulatory powers to prevent serious environmental harm.

The following is a case study of public interest litigation currently being run by the EDO.

Case study: Barrington-Gloucester-Stroud Preservation Alliance Incorporated v Planning Assessment Commission and AGL Upstream Infrastructure Investments Pty Limited

The EDO NSW, on behalf of Barrington-Gloucester-Stroud Preservation Alliance Inc, has commenced judicial review proceedings against two decisions of the Planning Assessment Commission (**PAC**) to approve a concept plan and stage one of the Gloucester Gas Project.

The concept plan involves extraction of coal seam gas within a 210km area between Barrington and Great Lakes, transporting the gas from the processing facility to the existing gas supply network, via a 95-100 km pipeline traversing several LG areas, to a gas delivery station at Hexham.

The 'stage one' project approval is for 110 gas wells and gas and water pipelines between Gloucester and Stratford; a central processing facility; gas transmission pipeline 95-100 km in length; and the Hexham gas delivery station.

The BGSP Alliance is concerned about the risks of surface and groundwater contamination as a result of the fraccing process used to extract the gas from the coal seam, and the lack of data about groundwater impacts in the context of the geological receiving environment, which contains numerous cracks and fissures in the coals seams.

The grounds of appeal contend that certain conditions of approval, relating to the groundwater and waste water disposal/reuse, leave open the possibility of a significantly different development with significantly different impacts from that approved. The grounds also contend a failure to consider the precautionary principle in light of scientific uncertainty and lack of information on the threat of environmental damage. The hearing is listed for 17-20 October 2011.

TOR 5: The impact of similar industries in other jurisdictions

The CSG industry in NSW is still relatively in its infancy in comparison to other jurisdictions. The following domestic and international examples demonstrate that an unplanned, ad hoc and non-consultative approach to CSG regulation is much more likely to risk community dissatisfaction and negative environmental consequences.

5.1 Queensland

This section will briefly touch on some of the consequences that have arisen as a result of the rapid expansion of CSG activity in Queensland; and some other recent developments in that State.[104] The EDO Queensland and North Queensland offices have highlighted a range of changes needed to ensure adequate notification, information rights and decision-making safeguards in relation to CSG projects.[105]

In February 2011, the Queensland Coal Seam Gas Company accidently connected the Springbrook aquifer to the coal seam below. The concerns with this were:

> *that chemicals used in the process – which included 130 litres of THPS[106] – may have migrated in the water supply; that water from the difference aquifers could intermingle, affecting the water quality; and also that water levels in the aquifer could fall.*[107]

Secondly, in May 2011, an Arrow Energy coal seam well accident caused water and gas to discharge 40 metres into the air, covering agricultural land. The levels of pollutants in this water were unknown, with the landholder unaware of "the damage it may have done to the pasture..."[108]

i) Strategic land use

One of the more positive steps is Queensland's process to develop policy to reconcile competing land use interests. The Queensland Government's process of developing a strategic cropping land (**SCL**) policy could be instructive in our own State's Strategic Land Use Policy (**SLUP**) process. However, EDO Queensland has recently noted the weakening of the legislation under pressure from developers.[109] The SCL policy[110] seeks to ensure that decisions are made within a clear planning framework[111] and according to

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[104] EDO NSW is pleased to draw on information provided by EDO Queensland and North Queensland offices, and their firsthand experience with CSG developments.

[105] See, eg, EDO Q. & N.Q., Letter to Premier Bligh, "Mining and CSG – Access to information, fair process and the Land Court", 15/6/2011, available at: http://www.edo.org.au/edoqld/edoqld/new/2011-06-15%20Ltr%20to%20Premier%20on%20mining%20&%20CSG%20processes.pdf.

[106] Tetrakis (hydroxymethyl) phosphonium sulphate.

[107] Available at: http://www.abc.net.au/news/stories/2011/02/21/3144688.htm?site=southqld.

[108] Available at: http://www.abc.net.au/news/stories/2011/05/24/3225059.htm?site=southqld.

[109] *Environmental Manager* No. 820, "Qld resources transition to SCL" 5/7/2011.

[110] Queensland Department of ERM (2010) "Strategic cropping land: Policy and planning framework", Discussion Paper. Available at: http://www.dip.qld.gov.au/croppingland. May 2011 update available at: http://www.derm.qld.gov.au/land/planning/strategic-cropping/index.html .

[111] The policy hopes to introduce a new planning framework which consists of four main elements:

stated criteria. The policy proposal suggests that, based on these criteria, there would be various classes of strategic cropping land to ensure that "standards of development assessment can be matched to the significance of the resource."[112]

ii) Public health

The Queensland Government is also examining the health impact of the mining industry on affected communities. One such example is the response to the community concerns over the coal and aluminium industries in the Gladstone region. The Queensland Government committed to undertake detailed air quality and health studies to measure the impacts of these industries and release information about these issues. Similar independent health and air pollution studies should accompany any new CSG projects that the NSW Government intends to approve. The results of these studies should be publicly released, to enable the community to make more informed comments and decisions about the regional impact of the CSG industry.

5.2 International examples

The triple bottom line impacts of the CSG industry have been noted across other jurisdictions within Australia and abroad.[113] In Canadian studies, similar environmental concerns have arisen in relation to CSG developments, primarily in relation to water, surface disturbance and noise pollution. Such effects have also been noted in the USA and South Africa.[114]

In response to these impacts there have been initiatives by several jurisdictions to address the problem. For example, the states of New York and New Jersey have placed moratoriums on fraccing; whilst France has announced a nationwide ban on the technique.[115] South Africa has also announced a full inquiry in tandem with a moratorium

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- Mapping of strategic cropping land across the state
- Introducing a new planning instrument to ensure local government schemes and regional plans recognise areas of strategic cropping land
- Amending resources sector legislation to ensure strategic cropping land is considered in applications related to resource development
- Issuing guidelines and establishing processes and criteria for assessing for development proposals on strategic cropping land.

[112] Queensland (2010) Strategic cropping land: Policy and planning framework, Discussion Paper. Available at: http://www.dip.qld.gov.au/croppingland at p 4.

[113]Helihy.C.S. 2009.*Trading Water for Gas: Application of the Public Interest Review to Coal Bed Methane Produced Water Discharge in Wyoming.*Wyoming Law Review.v.9, No.2, p. 456.

[114]Laffin.J M. 2001.*The Development of Coal Bed Methane: Legal Considerations in the Development of Coal Bed Methane.* Alberta Law Review.Vol 39 (1), pp 127-151; Helihy.C.S. 2009. *Trading Water for Gas: Application of the Public Interest Review to Coal Bed Methane Produced Water Discharge in Wyoming.* Wyoming Law Review.Vol 9(2), p. 455-482; Environmental Protection Authority. 1987. *Report to Congress: Management of Wastes from the Exploration, Development and Production of Crude Oil, Natural Gas, and Geothermal Energy.* Vol (1). Available online: http://www.nytimes.com/interactive/us/drilling-down-documents-7.html#document/p1/a27935

[115]Lederman, J. 2011. *Chris Christie Fracking Ban: New Jersey Governor Proposes 1 Year Gas Drilling Moratorium.* Huffington Post. Available online: http://www.huffingtonpost.com/2011/08/25/chris-christie-fracking-ban_n_936822.html ; Patel, T. 2011. *France Vote Outlaws 'Fracking' Shale for Natural Gas, Oil Extraction.*Bloomberg. Available online: http://www.bloomberg.com/news/2011-07-01/france-vote-outlaws-fracking-shale-for-natural-gas-oil-extraction.html

on CSG fraccing. This moratorium has been implemented pending results from a government inquiry after an increased level of CSG exploration of the Karoo region.[116]

International jurisdictions are beginning to understand the potentially devastating impacts that the industry can have on such resources as natural groundwater systems. Accompanying this realisation is a shift by some countries towards a more precautionary approach that relies on science-based decision making when considering the expansion of the mining and gas industries. The EDO submits that such precautionary measures should begin to be replicated within NSW.

5.3 Conclusion

As we have noted in this submission and in the recent EDO Mining Discussion Paper, the current trajectory of CSG regulation in NSW is unsustainable. The law needs to better engage with risks to the State's long-term environmental, social and economic future to secure our sustainable wellbeing.

There are sufficient domestic and international examples that document the potential environmental, economic and social consequences of inadequate CSG regulation. With CSG activities still in their relative infancy in NSW, and with appropriate political leadership, there is no reason why the pitfalls of other jurisdictions need be replicated here.

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For further information on this submission please contact Mr Nari Sahukar, Acting Policy and Law Reform Director, EDO NSW,

Attached separately:

Appendix 1: "Ticking the box" – Flaws in the Environmental Assessment of Coal Seam Gas Exploration

[116] In April 2011, South African Minister of Mineral Resources, Ms Susan Shabangu MP, announced that:

> *Given the intensity and scale of the issue and the fact that this [shale gas exploration] has never been done before on our shores, my department will conduct a comprehensive study which will assist us to formulate our approach after which we will go back to cabinet.*

Sebati, P. 2011. "Media Release: Minerals Department will neither accept nor finalise current applications for shale gas exploration". South Africa Minerals Department via Center for Environmental Rights, available at: http://cer.org.za/wp-content/uploads/2011/05/DMR-Statement-29-April-2011.pdf

EDO Submission to NSW Legislative Council Inquiry on CSG, Appendix 1: “Ticking the box” – Flaws in the Environmental Assessment of Coal Seam Gas Exploration

September 2011

Photograph - Dewhurst 8 exploration wells, Pilliga, May 2010

Executive Summary

The Environmental Defender's Office (**EDO**) is a community legal centre with over 20 years' experience specialising in public interest environment and planning law. The coal seam gas (**CSG**) industry in NSW is expanding rapidly. At the same time, the community is becoming increasingly concerned that the legal protections in place do not ensure a thorough environmental assessment of exploration activities. In our view, the legal process for CSG exploration provides little independence and rigour in terms of an assessment process. As a result, the Reviews of Environmental Factors (**REFs**) provided to comply with this process are of poor quality, and often constitute a fairly generic lists of impacts. The community at present has little recourse through the law to address these failures. This paper is aimed at outlining the nature of the problem and to illustrate through some case studies the deficiencies in the legal processes. In light of these problems, legal reform to the assessment of CSG exploration is necessary.

Expansion in CSG exploration in NSW

CSG exploration has been expanding in NSW at a considerable rate. As a result of NSW Government initiatives, there has been an unprecedented level of petroleum exploration activity within NSW. Over $20 million was spent in 2003-2004, and $30 million in 2004-2005 on this type of exploration.[1] In 2007-2008, CSG production in Queensland and NSW grew 40%.[2]

NSW contains sedimentary basins with extensive coalfields, and therefore considerable potential for vast coal seam methane resources. The main coal basins in NSW extend from South of Sydney around Wollongong, through the Hunter and Gunnedah basin, north west from Narrabri to the Queensland border. There are five main coal fields in the Hunter, Newcastle, Southern, Western and Gunnedah areas, as well as small coal fields near Oaklands and Gloucester.

There are currently eight CSG projects awaiting project approval under Part 3A of the EP&A Act in the Narrabri gasfield, Illawarra and Camden Gas projects.[3] The number of Petroleum Exploration Licences has risen from 11 in 1993 to 30 in December 2005.

Since 2004, most of the production has occurred in the Sydney Basin near Camden by Sydney Gas Company (now in a joint venture with AGL), where there are over 80 wells and three petroleum production leases. Metgasco is actively exploring in the Clarence-Moreton Basin near Casino. There are major markets for gas around NSW and overseas, further driving the present expansion in CSG exploration in NSW.

Laws that apply to CSG exploration

CSG exploration and mining in NSW is regulated by the *Petroleum (Onshore) Act 1991* (**P(O) Act**). "Petroleum" is defined to include "any naturally occurring gaseous hydrocarbon", which appears to include methane.[4]

An exploration licence grants its holder the "exclusive right to carry out such surveys and other operations, and to execute such works, as are necessary to explore the land comprised in the licence

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[1] Department of Primary Industries, at www.dpi.nsw.gov.au/minerals/resources/petroleum/activity-in-NSW .
[2] "CSG –Firing up Australia's gas industry", Gas Today, May 2008.
[3] See planning website at www.planning.nsw.gov.au.
[4] P(O) Act, s.3.

for petroleum".[5] The environmental assessment procedure for the granting of an exploration licence is set out in Part 5 of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**).[6] No other requirements of the EP&A Act apply.[7] Part 5 of the EP&A Act applies to any activity that relates to the carrying out of work for which development consent is not required. Only in a limited number of local government areas, such as Camden, Wollongong, Singleton and Muswellbrook amongst others, require development consent.[8]

We understand that under the new State Significant Development provisions and accompanying draft SEPP, almost all CSG exploration and production activities would be dealt with under the new Division 4.1 of the EP&A Act. However, the various instruments are not yet finalised and their adequacy and robustness are yet to be seen.

Part 5 of the EP&A Act contains different consideration to those under Part 4 of the EP&A Act (the part that generally applies to Council decisions). Section 111 sets out the matters that need to be considered by the Minister for Resources and Energy in considering the proposal. It states:

> *(1) For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.*

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (the **Regulation**) states:

> *(1) For the purposes of Part 5 of the Act, the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment include:*
>
> *(a) for activities of a kind for which specific guidelines are in force under this clause, the factors referred to in those guidelines, or*
>
> *(b) for any other kind of activity:*
>
> *(i) the factors referred to in the general guidelines in force under this clause, or*
>
> *(ii) <u>if no such guidelines are in force, the factors referred to subclause (2)</u>*
>
> *(2) <u>The factors referred to in subclause (1) (b) (ii) are as follows:</u>*
>
> *(a) any environmental impact on a community,*
>
> *(b) any transformation of a locality,*
>
> *(c) any environmental impact on the ecosystems of the locality,*
>
> *(d) any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality,*
>
> *(e) any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations,*

[5] P(O) Act, s.29
[6] P(O) Act, s.46
[7] P(O) Act, s.47
[8] Schedule 1, clause 6 of *State Environmental Planning Policy (Major Development) 2005.*

(f) *any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974),*

(g) *any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air,*

(h) *any long-term effects on the environment,*

(i) *any degradation of the quality of the environment,*

(j) *any risk to the safety of the environment,*

(k) *any reduction in the range of beneficial uses of the environment,*

(l) *any pollution of the environment,*

(m) *any environmental problems associated with the disposal of waste,*

(n) *any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply,*

(o) *any cumulative environmental effect with other existing or likely future activities.*

In practice, the environmental assessment for the purposes of Part 5 of the EP&A Act is usually done through a short "Review of Environmental Factors" (**REF**), which is prepared by the proponent. The Department of Primary Industries (**DPI**) is responsible for approving them (discussed further below). If an exploration title is likely to have a significant impact on the environment, the proponent must provide the Minister for Resources with a more detailed Environmental impact Statement (**EIS**) – also discussed below.

Limited requirements for compliance, consultation or transparency

The case law of the Land and Environment Court indicates that the assessment under s 111 must be rigorous.[9]However, in *Drummoyne MC v Roads and Traffic Authority* (1989)[10], Stein J stated that the question to be asked under s 111 is "Did the respondent examine and take into account to the fullest extent *reasonably practicable* all matters affecting or likely to affect the environment by reason of the activity?" His Honour went onto note:

> *In my opinion the length of deliberation and the detail of the consideration must, to some extent, be conditioned by the actual proposal. And when examining the considerations one must have regard to the context of the proposal and the environment which is likely to be affected by the proposed activity. That is not to say that the examination of the committee need not be a thorough one, nor indeed that it need be a minute examination of every conceivable affectation on the environment without regard to reasonable practicality.*

In *Prineas v Forestry Commission of New South Wales* (1984)[11], the NSW Court of Appeal held that strict compliance of an EIS with the regulatory requirements was not necessary for a valid decision to be made, but "substantial compliance" was adequate for a valid decision. It is therefore difficult in many cases to argue that smaller issues of concern will invalidate an approval.

There are no requirements in the EP&A Act or Regulation that require the Minister to undertake consultations or publicly advertise a Part 5 activity, prior to a determination. The REFs are only published once the exploration has been approved. As noted, the REFs are also prepared by the proponent.

[9]*Warren v Electricity Commission of NSW* (LEC case no 40389/89).
[10]67 LGRA 155, at 158.
[11]53 LGERA 160.

Lack of comprehensive assessment of local environmental impacts

The NSW Office of Environment and Heritage **(OEH**) does not have a specific role in examining REFs. In their own words, "companies do not need to undertake comprehensive environmental assessments to determine what environmental values are present on exploration or lease areas, or what impacts they will have on the environment."[12]OEH has acknowledged that CSG exploration has significant impacts on the environment.[13] Firstly, companies often need to construct surface infrastructure including access roads, pipelines and other works that can fragment existing land uses and wildlife habitat. Secondly, the actual recovery of CSG creates other environmental problems. Methane is held within coal seams by water pressure, and the water must be removed to extract the gas. The extracted water is highly saline and can contain different contaminants and therefore must be disposed of responsibly. The groundwater extraction can also deplete natural groundwater reserves and aquifers.[14]Further concerns exist in relation to the hydraulic fracturing ('**fraccing**') process.

Adequacy of departmental assessment of REFs

As noted, the Department of Primary Industries (**DPI**) is the agency responsible for approving REFs. Communities have expressed considerable concern about whether DPI undertakes a proper assessment of the REFs when lodged. To our knowledge, no EIS has been required for any CSG exploration licence, despite in most areas such as Pilliga, Putty and Wollombi, exploration occurring in sensitive environmental areas where threatened species exist. Nor have any exploration activities been delayed because the REFs are inadequate or inaccurate.

Many communities have expressed concern to the EDO about the deficiencies in the environmental assessment process for CSG exploration. We have documented below a number of case studies outlining these deficiencies to highlight the problem with the assessments.

No merits challenge to REF adequacy

The difficulty for these communities is that despite the REFs often having considerable deficiencies, there is no ability to challenge the *merits* of the environmental assessment. Unless an issue is missed entirely, there would be little redress through *judicial review* proceedings in the Courts. Despite the fact that many REFs contain misleading or sometimes incorrect information, there has been no prosecution of any companies for these offences. This is because clause 283 of the EP&A Regulation requires the company involved to know the information is misleading and false. Given the significance for local communities of the decisions that rely on this information, we believe a stricter standard should apply.

[12]Department of Environment and Climate Change (as OEH then was), Minute for Executive Meeting, EPRG Coal Mining Project, 28 May 2008.
[13]Ibid, pg. 39.
[14]Ibid, pg. 39.

Case study 1: Santos Glasserton Pilot wells – Liverpool Plains-Gunnedah Basin[15]

Santos is proposing exploration drilling under Petroleum Exploration Licence (**PEL**) 1 to assess the CSG potential of the Gunnedah basin. It includes three new pilot wells known as Glasserton 2, 3 and 4 that are located on privately owned land. There are many inaccurate statements made in the REF.[16]

One of the major concerns is that it states water will be extracted from the Bluevale subcatchment.[17] The Bluevale subcatchment is located between Gunnedah and Boggabri. The Glasserton project is located at the Yarraman/Goran Lake basin and not the Bluevale subcatchment. This is a serious error given the sensitivity of the aquifers in the area to drilling activities.

The REF claims that the Pilliga Nature Reserve is located 50kms west of the Glasserton site.[18]The Pilliga Nature Reserve is located some 150kms to the north west of Glasserton and is not in PEL 1. The REF does not mention the close proximity of Goran Lake which covers over 6000 acres to the north of Glasserton. It is a significant ephemeral wetland and supports a wide variety of rare, endangered and vulnerable species.[19]

Social and economic impacts, including consultation

The statements made about the social and economic impacts of the development also seem misleading.[20]As a measure of transparency, Santos should have revealed that the landholder who owns the property where exploration is occurring is a director of the company Carbon Minerals. Carbon Minerals is a subsidiary of Australia Coal bed Methane which holds exploration leases over the Liverpool Plains. The wells at Glasserton 3 and 4 are located on the boundary of the property. The location of these two wells will impact upon the neighbouring properties in a number of ways. Drilling into the fragile aquifer system will alter the pressures within the aquifer and may well divert water away from existing stock and domestic bores. Any construction on the fragile floodplain will result in impacts upon the floodplain. The establishment of a gravel pad, extra roads and sump ponds will create water diversions onto the plain and result in erosion and water run-off, which will affect the seedbed of the neighbouring paddock and beyond. If sump ponds are not correctly constructed, and there is run-off of the magnitude seen in the heavy rains of2011,it is likely that the soil will be sterilised from flooding.

There was also a failure to substantiate comments that the "impacts on landholders will be negligible".[21]The residents of a nearby homestead Rowena, within 400 metres of the accommodation camp, have not been notified of Santos activities. Given the location of the homestead, they are subjected to increased dust and noise from construction, drilling and vehicle movement, night time lights and 24 hour activity.

The REF states that it will consult with the local Aboriginal Land Council. In fact the local Aboriginal Land Council is the Walhalow Land Council, and not the Red Chief Local Aboriginal Land Council based in Gunnedah, as quoted in the REF.

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[15]The community group involved in this issue is the Caroona Coal Action Group – see www.ccag.org.au.
[16]Santos, Review of Environmental Factors, Glasserton Pilot wells-Drilling and Completions PEL 1 - Gunnedah Basin, 19th October 2010.
[17]Ibid, pg. 56.
[18]Ibid, pg.45.
[19]http://www.nrm.gov.au/nrm/nsw-namo.html
[20] Santos, Review of Environmental Factors, Glasserton Pilot wells-Drilling and Completions PEL 1 - Gunnedah Basin, 19th October 2010, pg. 62
[21]Ibid, pg. 5

Air Quality

The REF also claimed that the impact on air quality will negligible, localised and insignificant.[22] This was despite Santos not providing estimates of the amount of diesel used to power the drill rigs and the resulting greenhouse gas emissions before making such a claim. Santos also failed to mention fugitive emissions which are common in all drilling operations at such depths.

Water risks

The REF also states that adverse effects on water resources will be negligible. It is not possible to make such a statement as it is simply unknown. The aquifers in this area are part of a "fractured basin" which allows for water seepage in a vertical manner. The community has serious concerns about impacts upon the water quality through contamination of introduced chemicals via drilling muds and cross-aquifer contamination. Community members were apparently advised at consultation at Spring Ridge in 2009, that of the 30,000 litres of driller's mud used, between 0% and 100% of these fluids will not be recovered (which seems to mean the likelihood is 'unknown'). The REF also states there will be no significant use of, or impact on, natural resources including groundwater.[23] Fresh water is also required in the drilling process, and Santos has not given a clear indication where this water will be sourced.

Cumulative environmental impacts

The REF also claims there will be no significant cumulative environmental impacts, which is a significant unknown. Dust, noise, erosion and damaged aquifers leading to the escape of groundwater are significant environmental impacts for any farmer. There are also comments in the REF about the impacts being temporary, however this seems misleading, in that if a viable resource is found, the impacts are likely to continue with the production phase.

Waste and chemicals

The REF did not set out proper processes for dealing with the driller's mud and other wastes and the chemicals used in the process. The aquifers in the area are used for not only irrigation but stock and domestic consumption, so there are real concerns about whether chemicals could be absorbed into the food chain. Santos has not supplied estimations of quantities used or indeed well depths to allay these concerns.

[22] Santos, Review of Environmental Factors, Glasserton Pilot wells-Drilling and Completions PEL 1- Gunnedah Basin, 19th October 2010, pg. 5

[23] Ibid.

Case study 2 – Macquarie Energy drilling at Putty

Macquarie Energy is proposing to drill one bore hole near Putty to investigate the potential CSG resource within PEL 460 held by Macquarie Energy.[24]

Photograph from recent protest at Putty (at http://putty.nsw.au/pics)

Community Consultation

The community at Putty only became aware of the drilling when they were contacted recently about providing accommodation for drilling contractors. The community has several concerns about the REF for the proposed drilling and lack of notification of the approval of the REF.

In particular, the community was concerned about the claim in the REF that Macquarie Energy is undertaking a program of community and stakeholder engagement and will continue with this program until all works have been completed.[25] Macquarie Energy had no consultation with relevant community organisations during the REF process. The Putty Community Association is a well-established organisation in the area with 114 members. Their monthly newsletter goes to members and non-members and is the best way of informing the community. No one in the community was officially informed of Macquarie Energy's intentions.

Access Agreements

The REF also claimed that Macquarie Energy had a land access agreement with the landowner regarding access, compensation and rehabilitation. The community understands that a land access agreement with the landowner was never signed. The landowner took the document to his solicitor who advised him not to sign it.

Bushfire Risk

The REF also appears misleading in stating that the bushfire risk of the area had been taken into account and an Emergency Management Plan would be implemented. The community is concerned that there is only one road into Putty and therefore one road out. A fire can cut off this escape route

[24] Macquarie Energy, PEL 460 Review of Environmental Factors Drilling Operation, October 2010.
[25] Ibid, pg. 4.

very quickly. If a fire breaks out at the site and is not controlled, it will not take long to get into the National Parks. Fires in the National Parks have been known to burn for weeks. The clandestine location of the Wollemi pine forest is believed to be in the National Parks near Putty.

Adjacent landowners and condition of the environment

The REF also contained detail about adjacent landowners to the drilling site that was incorrect and based on old data. Similarly, the comments about surface water in the REF noted that the Putty Creek area has been cleared and riverbanks damaged, as a result of historic agricultural land use and uncontrolled grazing. It also mentioned the area was sparsely settled. The area is no longer sparsely settled, with most of the land subdivided into 100 acre lots. Land owners are increasingly fencing off Wollemi and Putty Creeks to stock, have introduced rotation grazing and planted trees to rehabilitate the riverbanks. Many land owners are members of Landcare and are keen to preserve the wetlands in Putty Valley and have spent hours of voluntary time getting rid of weeds in the creeks.

Licensed Bores

The REF also states that no known licensed bores for extracting groundwater in the immediate area have been identified. This is incorrect, as licensed bores for extracting groundwater are nearby.

Heritage Issues

The heritage work undertaken was limited and relied on databases as opposed to heritage values of the area. The REF noted that a search was undertaken using the NSW Heritage Office Heritage Database on 8 October 2010 for Putty and no records of registered State Heritage items were identified. A search of the NSW OEH Aboriginal Heritage Information Management System (AHIMS) was conducted to identify any known indigenous heritage items recorded near the proposed core hole site. A review of the Singleton Local Environmental Plan also showed no records of heritage items or significance are identified for Putty.

There are, however, significant heritage items in the area. Due to Putty's isolation and the people's attitude to preservation, it has not been considered necessary to seek Heritage Listings for old buildings or the remaining parts of the first road built north of Sydney, the Bulga Road, opened in 1823 (before the Great North Road which was started in 1826). The location of many Aboriginal cave paintings in the Putty Valley and the Wollemi National Park are known to property owners, scientists and rangers.[26]

Traffic Impacts

The REF also notes that the core hole site would be accessed via existing access tracks and would include the arrival and departure of drilling contractors daily, and the intermittent delivery of materials. The drilling contractor would have several heavy vehicles such as the drill rig and ancillary equipment. Most would remain at the drill sites until the completion of each hole. Given the rural and relatively remote nature of the drill site, and temporary duration of the proposed works (traffic levels would return to normal conditions once the drilling at each site has completed), traffic impacts are not considered significant. In response, the community notes that a memorial for truck drivers killed on the Putty Road is at Milbrodale. It is narrow and very windy and is favoured by motorcycle and car clubs. Many of the roads within Putty have blind corners and are too narrow for two vehicles to pass. Fully loaded logging trucks use this road already.

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[26] See http://www.australiaforeveryone.com.au/aborsites_wollemi.htm

Case study 3: Eastern Star Gas exploration in the Narrabri-Pilliga region[27]

Eastern Star Gas is currently undertaking exploration activities under PEL 238 and Petroleum Assessment Lease 2 (**PAL2**) in the Pilliga scrub area, known as the Narrabri Coal Seam Gas project. The exploration is occurring on both private land and public land, including the Pilliga State Forest and the Pilliga State Conservation Area.

Lack of cumulative impact assessments

One of the issues with the REFs conducted for this project is that they have been viewed in isolation in relation to each part of the exploration activities. For example separate REFs have been done for each area of the exploration, and other REFs have been done for associated activities.[28] The entire action in PEL 238 and PAL2 have not been assessed in accordance with the EP&A Act and Regulation.

Flora and Fauna Surveys

The REFs have often not done targeted flora and fauna surveys. In relation to the Dewhurst 8 lateral production pilot, the REF states that the impact of the activities was based on survey reports which were sufficient to understand the impacts of the proposed exploration. The surveys relied on occurred over a very limited geographic area and were not undertaken in the vicinity of the production pilot site.[29]

Heritage Issues

The Cultural Heritage surveys for the exploration are also ad hoc. At least one of the REFs for the Tintsfield Water management works did not include any cultural heritage surveys or assessments, or discuss the issue with the local Aboriginal community. It stated that consultation of existing Aboriginal heritage databases indicate that the proposed locations do not present any risk to known sites of Aboriginal heritage significance.[30]

Out of date information

The REFs have also been not updated when the exploration works change. For example, the water treatment works at Bibblewindi, show that the water extraction is 1ML per day from 9 producing wells. There are now over 20 producing wells in the area, and the REF has not been updated. Enquiries from landholders to the Department of Primary Industries indicated that companies can just write a letter to vary the REF. However when this occurs it is not published, so it is difficult for the community to know what procedures are being followed.

Rehabilitation

It is also apparent that the conditions on rehabilitation set out in the REFs are not being followed by Eastern Star Gas.[31]There has been no successful rehabilitation of abandoned drill holes and there are serious weed incursions at almost every corehole site, as shown in the photo below.

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[27] Groups working on this issue including the Wilderness Society, Nature Conservation Council of NSW and Northern Inland Council for the Environment as well as nearby residents.

[28] Such as the Tintsfield Water Management Plan.

[29] See report by TWS, NCC and Northern Inland Council for the Environment, "Under the Radar-How Coal Seam Gas Mining in the Pilliga is impacting matters of National Environmental Significance" pg. 25

[30] Eastern Star Gas, Tintsfield Water Management Plan, Narrabri Coal Seam Gas Project, PEL 238, February 2010.

[31] See report by TWS, NCC and Northern Inland Council for the Environment, "Under the Radar-How Coal Seam Gas Mining in the Pilliga is impacting matters of National Environmental Significance", pg. 26.

Photo of Dewhurst 5 exploration - abandoned well, Pilliga Eastern State Forest, June 2011

Case study 4: Sydney Gas Operations- Hunter Corehole drilling near Wollombi

Sydney Gas, in joint venture with AGL, is aiming to extract CSG in the Hunter region. It proposed six corehole drill sites within PEL 267 at Rothanal near Belford, Roughit, Wollombi, Paynes Crossing, Maison Dieu and Mt Thorley. They submitted an REF that dealt with exploration at five of those drill sites to DPI in April 2008. The comments below are focused on the REF so far as it dealt with the Wollombi drill hole, about 1.2 km south of Wollombi village.

Flood Risks

There is some mention in the REF of flood issues under the heading "climate".[32] It notes that increased rainfall rate and reduced ground cover can result in a higher risk of soil erosion. There is no mention of any of the area of the exploration work being flood prone

or the possibility that access to the site could be restricted by flood conditions. Residents have advised that the site was under water in 2008, and such flooding could prevent access to the site to ensure that de-watering and other conditions were met. Flooding in the area is not an isolated incident, and a thorough investigation of the Wollombi area should have uncovered this possibility.

[32] GHD, Sydney Gas Operations Pty Ltd, Hunter Corehole Drilling Program (five sites) Review of Environmental Factors for PEL 267, April 2008, pg. 20.

Photo by Peter Ferminger of Wollombi 01 Proposed drill site (WAGE website)

Heritage Issues

The REF also found that there is no significant evidence of any such historical activity or other potential non-indigenous heritage items within the proposed access routes or corehole drilling sites around Wollombi.[33]This assertion is incorrect, because Wollombi is a historic village classified as a Conservation zone under the *Hunter Regional Environment Plan (Heritage) 1989*. The Plan also identifies various areas such as Mulla Villa as of regional environmental significance. The entire valley is also classified as a listed visual landscape by the National Trust. Wollombi is also of significant importance to Indigenous people because it is used as a meeting place. There are also 17,000 mapped paleo-art sites in the area.

Yet none of these issues have been raised as impacts in the REF. There could also be significant cumulative impacts on the heritage values and the conservation area because of increased traffic and clearing in the area, but these were not considered in the REF.

Water

There are also significant concerns about the type of exploration undertaken, and whether that will impact on groundwater and hydrogeology. The REF states that the access roads and corehole sites could interrupt the existing hydrological regimes.[34] There is also mention of the impacts on watercourses in the area of the coreholes, as well as a discussion about run-off from de-watering.[35] There are some limited comments to the effect that groundwater contamination would be avoided as all coreholes would be cased-off, and there is no need for any specific mitigation measures. Such

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[33] GHD, Sydney Gas Operations Pty Ltd, Hunter Corehole Drilling Program (five sites) Review of Environmental Factors for PEL 267, April 2008, pg. 52
[34] Ibid, pg. 43
[35] GHD, Sydney Gas Operations Pty Ltd, Hunter Corehole Drilling Program (five sites) Review of Environmental Factors for PEL 267, April 2008, pg. 22-23

an approach seems to overlook the significant environmental issues associated with drilling and waste water from CSG exploration.

Bushfire Risk

The Wollombi area is susceptible to bushfires. There is no mention of bushfires in the REF and what impact that may have on the drilling.

Surrounding Land Uses

There is some information in the REF about surrounding land uses at Wollombi. The REF notes that the area is surrounded by paddocks used for agriculture and grazing activities.[36] There is no mention of surrounding tourist uses. There is adjoining tourist accommodation at Mulla Villa, as well as adjoining rural residential parcels that are dependent on tourism of the convict trail and wine trail. This information is not mentioned in the REF, and may mean that it is arguable that the cumulative impact on tourism and rural residential uses has not been properly considered under Part 5 of the EP&A Act.

Conclusion

Taken together, we believe these case studies highlight a systemic lack of rigour or seriousness in the environmental assessment of CSG exploration projects under Part 5 of the EP&A Act. This is unacceptable particularly at the very time these activities are expanding rapidly in NSW.

As we understand it, recent amendments to the major project development assessment process[37] will ensure that most CSG projects including exploration will now require a full Environmental Impact Assessment.[38] While this situation will be an improvement, it is vital that there are further reforms to the *EP&A Act* and the *Petroleum (Onshore) Act 1991,* and associated regulations to ensure that these assessments are rigorous and accurate.

In particular, there is little independent environmental assessment of the real impacts of exploration on the environment. Nor is there any ability for OEH to regulate these developments under pollution or threatened species law. In fact, the recent planning reforms have perpetuated the system whereby OEH only provides 'advice' on these projects at the full assessment stage – and is not able to stop inappropriate impacts from occurring once approved. Importantly, also, CSG companies face little penalty if they do not undertake vigorous and factual assessments.

Without further reforms to address these issues, communities will continue to feel frustrated about the lack of rigour of these assessments, particularly when exploration is authorised on freehold land.

[36] GHD, Sydney Gas Operations Pty Ltd, Hunter Corehole Drilling Program (five sites) Review of Environmental Factors for PEL 267, April 2008, pg. 4

[37] Formerly Part 3A, EP&A Act; now State Significant Development under Part 4, Div. 4.1.

[38] See draft *State Environmental Planning Policy (State and Regional Development) 2011*, NSW Department of Planning and Infrastructure, Sept 2011.