Submission No 550

INQUIRY INTO COAL SEAM GAS

Organisation: South East Forest Rescue

Date received: 7/09/2011

SOUTH EAST FOREST RESCUE

6 September 2011

Dear COMMITTEE,

Re: NO. 5 Inquiry on Coal Seam Gas

Thank you for this opportunity to present submissions to your inquiry.

South East Forest Rescue welcomes the opportunity to provide information to the inquiry and our comments on the terms of reference below. It is on the public record that South East Forest Rescue calls for indigenous ownership of all public native forest, a complete stop on logging of endangered ecological communities, complete transfer of wood product reliance to the plantation timber industry and salvage recycled hardwood timber industry, a single authority for national native forest stewardship modelled on the New Zealand example, and an immediate nation-wide program of catchment remediation and native habitat re-afforestation. We stand by our commitment to native forest protection and take all opportunities presented to advocate for native forest justice. We thank the committee for consideration of our submission to this inquiry.

We note that the Terms of Reference for the inquiry are broad in scope. It would be prudent in this context that a full moratorium on all forms of coal seam gas ("CSG") drilling be in place until the environmental, social and health impacts have been rigorously and independently assessed. This inquiry will go some yards towards this.

Once these assessments have been conducted it must be legislated that:

* all coal seam gas exploration and mining to be made subject to all relevant environmental legislation, including the native vegetation and water management laws,
* there be provision of standing to ensure that the community has full legal rights to challenge and enforce environmental laws under which coal seam gas companies are operating,
* there be provision of a right in the Petroleum (Onshore) Act to allow landholders to refuse consent for coal seam gas exploration or production on their land,
* there be a prohibition on coal seam gas exploration and mining in important remnant forest, bushland, valuable farmland, groundwater aquifers, residential areas and public lands, and

* there be a requirement that all chemicals used in coal seam gas drilling or fracking must be assessed by the chemical regulator for use for that purpose before being approved for use.

1. *Serious environmental and human health risk*

Coal seam gas mining represents a serious environmental and health threat to water resources of the state due to the potential for drawdown and contamination of groundwater aquifers, including the potential for major cumulative impacts on the Great Artesian Basin and the use of large volumes of water for drilling and fracking in water systems that are already over-allocated, such as the Murray-Darling Basin. South East Forest Rescue considers that the location of Coal seam gas wells on sensitive floodplains and in water catchments is a damaging proposition.

Coal seam gas mining increases the risk of pollution of surface water systems from 'waste' water, leading to serious reductions in water quality, risks which have become documented reality in some areas.

Examples we are aware of include:

Discharge of treated 'waste' water by Eastern Star Gas into a creek in the Pilliga;
The location of CSG wells on the floodplain at Casino;
The exploratory drilling near Woronora Dam in water catchment areas of Sydney and the Illawarra; and
The drilling near the Tomago sandbeds water catchment area in the Hunter.

Coal seam gas mining produces vast quantities of waste that represent a serious environmental risk as the management of waste water is highly problematic and leads to environmental degradation where storage, leakage, spillage and discharge occurs. Coal seam gas mining treatment of waste water results in the production of a highly concentrated 'brine' by-product, that is extremely difficult to dispose of without causing harm. Documented examples of this environmental impact include:

Spillage of waste water leading to extensive tree death in the Pilliga;
Deliberate discharge of saline water leading to pollution event near Broke; and
Native animal deaths at drill ponds in the Pilliga.

Coal seam gas mining represents a major threat to natural areas because it leads to extensive clearing and fragmentation of native bushland and threatened species habitat and increases the risk of catastrophic bushfires. Coal seam gas mining transforms major vegetation remnants, refuges and corridors into industrial zones and even protected areas and public lands are not safe because coal seam gas mining can occur in areas bordering National Parks, and is permitted in State Conservation Areas and State Forests. Coal seam gas mining also represents a major threat to wetland systems, even distant ones that are hydrologically connected. Documented examples include:

- The Pilliga region coal seam gas mining will clear at least 2,400 hectares and fragment 85,000 hectares of public lands, including State Forests and State Conservation Areas;
- At Putty drilling is planned next to the World Heritage-listed Wollemi NP;
- At Poggy, drilling is occurring on an inholding in Goulburn River NP;

- In the north-west NSW, Travelling Stock Routes are targeted for drilling and gas pipeline infrastructure;
- In the north-east, a pipeline is proposed through the World Heritage-listed Border Ranges NP.

Coal seam gas mining represents a serious risk to human health due to the potential contamination of water used for human consumption and agricultural production with chemicals used in drilling or fracking, as well as those present in the coal seam from leakage of toxic methane and other gases during gas production and migration of methane into water supplies through the poor management of chemicals and the use of toxic chemicals without full disclosure, particularly during fracking and drilling.
Documented examples include:

- The recent foamy discharge from a well at Camden;
- Methane leaking from gas pipelines and a water drain in the Pilliga and from well-heads at Casino;
- Orica in Stockton(poor management).

Other major environmental problems with coal seam gas mining include:

- The complete failure of remediation, even at the exploratory phase – such as at Casino where drill ponds had not been remediated and in the Pilliga where there has been no rehabilitation of well-pads.
- The fact that regulatory processes, including assessment, approval and compliance, are all demonstrably inadequate – this was evident in the approval of the Gloucester AGL project without details about what it entailed, and the lack of resources or political will to enforce compliance in the Pilliga.
- Coal seam gas is a fossil fuel and a significant source of greenhouse gas pollution. It generates more than 40 times the amount of greenhouse gas per unit of energy generated than solar or wind. Coal seam gas will make a major contribution to global warming, particularly when fugitive emissions and liquefaction prior to export are fully considered.

2. ***Economic and social implications of CSG activities***

Coal seam gas mining causes major social impacts such as:

- Landholders face the prospect of losing control of their land, and property values are degraded and options for re-sale lost once exploration licences are issued.
- The social fabric of communities is drastically weakened, with evidence that communities dominated by fly-in/fly-out workers show higher incidence of violence and crime, soaring rents and worsened mental health outcomes.

The rapid expansion the coal seam gas industry will have major economic impacts for the state such as:

- Food security is threatened by risks to groundwater and loss of arable land.
- The undermining of economic diversity and by leading to a skills shortage in other rural industries which could lead to the collapse of businesses unable to compete for staff.
- The likely negative impact on a whole range of other industries such as organic farming, tourism, vineyards and orchards.

- The risks of important local infrastructure, such as roads, being run-down and damaged at a cost to the taxpayer.

Documented examples include:

- Food security is threatened by CSG mining proposals on the Liverpool Plains, around Moree and Bellata, and the in Northern Rivers region;
- Pipelines threaten to cause major erosion to self-mulching black soil plains around Mullaley; and
- Coal seam gas mining poses a threat to the vital hot springs tourist attractions from Pilliga to Moree.

Other socio-economic issues with coal seam gas mining include:

- Royalties paid to the State create an expectation that projects will be approved, whilst failing to deliver sufficient funds to offset the impact of CSG.
- Local Government and local communities are currently largely excluded from the planning process and public participation and legal standing is inadequate.

3. ***There is no role for CSG in meeting the future energy needs of NSW***

Coal seam gas is not required to meet the future energy needs of NSW as most gas in NSW is extracted for export, not to meet local energy needs. The only way to deliver energy security is to switch to renewable energy now, particularly solar thermal. There are vast solar thermal resources in the major areas where coal seam gas is now proposed, such as Narrabri and Moree. The massive expansion in coal seam gas production is delaying the transition to renewable energy alternatives. There is a lack of information about the whole lifecycle emissions for CSG production. Studies overseas have suggested that unconventional gas has huge fugitive emission impacts.

4. ***The interaction of the Act with other legislation and regulations***

As noted earlier, coal seam gas mining is exempt from a number of other environmental statutes, including the Native Vegetation Act 2003 and the Water Management Act 2000, therefore legislation controlling activities on public lands are inadequate to prevent coal seam gas mining, which when approved effectively privatises public lands. Furthermore, interaction with Federal legislation at the exploration phase is poorly understood and not enforced , for example the extensive exploration without getting Federal approval in the Pilliga.

5. ***The impact similar industries have had in other jurisdictions.***

The coal seam gas mining experience from Queensland and overseas has highlighted many concerns such as:

- significant problems with leaking wells;
- impacts on groundwater evidenced from drops in bore levels;
- growing social discord; an exploding well at Dalby;
- major impacts on natural values near Gladstone;
- alienation of farmland and clearing of bushland;
- regular fires associated with CSG wells, pipelines and facilities;

- chemicals used in fracking shown to be toxic to humans;
- systematic contamination of groundwater with methane; and
- increased incidence of earthquakes after fracking.

6. Pollution and GGEs

Coal seam gas is a fossil fuel and a significant source of greenhouse gas pollution. On a life-cycle basis it generates more than 40 times the amount of greenhouse gas per unit of energy generated than solar or wind.[1]

Liquefying natural gas consumes at least 20% of its energy value. When compared to coal CSG negates more than 30% of its "clean" character.

To export CSG, liquefaction is required. Full life cycle analyses show that the ultimate benefit is far less and in some cases results in higher CO_2 emissions[2] than coal fired power generation

Queensland is the largest producer of greenhouse gases in the country[3] and by far the highest per capita emitter.[4]

The total domestic emissions per year from the three LNG projects[5] approved so far in Queensland amount to 24.14 million tonnes of CO_2 equivalent (Mtpa CO_2-e).

Over the next three years, the CSG industry alone will increase Queensland's emissions by 16%. This will impact on NSW.

Burning the LNG from just these three projects will emit 136 Mtpa CO_2-e. This represent a 2-3% increase in TOTAL global emissions of fossil fuel based greenhouse gas.

[1] Valuing the greenhouse gas emissions from nuclear power: A critical survey, (online) <http://www.nirs.org/climate/background/sovacool_nuclear_ghg.pdf>.

[2] Comparative Life Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation, (online) <http://www.lcacenter.org/InLCA2006/Jaramillo-presentation.pdf>.

[3] Courier Mail, June 24th 2008 Queensland largest greenhouse gas emitter in country, (online) <http://www.couriermail.com.au/news/features/states-gas-emissions-surge/story-e6freowx-111116723526>.

[4] Queensland's greenhouse gas emissions 2005, (online) <http://www.climatechange.qld.gov.au/pdf/climateqreport/climateqreport-chapter3.pdf>.

[5] Australia Pacific LNG Project Environmental Impact Statement Executive Summary (online) <http://www.dip.qld.gov.au/resources/project/aplng/eis-executive-summary.pdf>;
Queensland Curtis LNG Project (BG/QGC) (online) <http://qclng.com.au/uploads/docs/Queensland_Curtis_LNG_Project_IAS.pdf>;
Changes in Atmospheric Constituents and in Radiative Forcing Table 2.14. Lifetimes, Radiative Efficiencies and Direct Global Warming Potential (GWP) relative to CO2, (online) <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf>; Carbon Dioxide Emission Factors for Stationary Combustion, (online) <http://www.eia.doe.gov/oiaf/1605/coefficients.html>.

The production, export and burning of CSG for energy may be little or no better for our climate future than coal.

As a gas, CSG is alleged to burn cleaner than coal, yielding only 56% of the CO_2 for the same heat output of coal.[6] It also tends to produce fewer emissions of sulfur oxides (SOx) and nitrogen oxides (Nox).[7] However as stated to simplify the pollutant emissions in this way is merely grasping the lowest hanging fruit and will be detrimental in the long term.

The gas industry alleges 'gas-fired power stations emit up to 70 per cent less greenhouse gases than existing coal-burning plants'.[8] Perhaps the '70 per cent less' figure may be accurate if the only consideration is combustion. However these calculations do not include the emissions associated with producing the gas; the land degradation, the drilling of wells,[9] the fracking process, the compression, dehydration, scrubbing and liquefying of the gas; nor the exporting of the CSG, purging, boil-back from cryogenic transfers, leakage during LNG transfers, boil-back in transit, powering of LNG ships; and finally, re-gasification before use. These calculations also ignore the impact of deforestation of woodland for the production well sites, pipelines, service facilities, roads and power easements.

The global warming potential (GWP) of Methane is 72 times[10] more potent than CO_2, making any fugitive emissions (leakage) of CSG more damaging. Methane emissions from the natural gas industry are equivalent to 1.4% of gross natural gas production. [11]

Fracking is a technique used to speed up the flow of methane gas from underground rock formations. It makes the rock that has contained the gas for tens of millions of years permeable. This increases the risk of fugitive emissions. This fact is not being addressed by the CSG industry.

A 3% methane leakage rate cancels any greenhouse gas emissions advantage claimed for CSG over coal.[12]

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[6] Carbon Dioxide Emission Factors for Stationary Combustion, (online) <http://www.eia.doe.gov/oiaf/1605/coefficients.html>.

[7] Comparative Life Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation, (online) <http://www.lcacenter.org/InLCA2006/Jaramillo-presentation.pdf>; Courier Mail, June 24th 2008 'Queensland Largest Greenhouse Gas Emitter in Country', (online) <http://www.couriermail.com.au/news/features/states-gas-emissions-surge/story-e6freowx-111116723526>; Australian Petroleum Production & Exploration Association, (online) <http://www.appea.com.au/images/stories/mb_files/CSG_environment.pdf>.

[8] Australian Petroleum Production & Exploration Association, above n 7.

[9] Australia Pacific LNG Project Environmental Impact Statement Executive Summary, (online) <http://www.dip.qld.gov.au/resources/project/aplng/eis-executive-summary.pdf>; Queensland Curtis LNG Project (BG/QGC) (online) <http://qclng.com.au/uploads/docs/Queensland_Curtis_LNG_Project_IAS.pdf>; Changes in Atmospheric Constituents and in Radiative Forcing Table 2.14. Lifetimes, radiative efficiencies and direct Global Warming Potential (GWP) relative to CO2, (online) <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf>.

[10] Methane Emissions from the Natural Gas industry, US epa (online) <http://p2pays.net/ref/07/06348.pdf>.

[11] Queensland Curtis, above n 9.

[12] Changes in Atmospheric Constituents and in Radiative Forcing Table 2.14. Lifetimes, radiative efficiencies and direct Global Warming Potential (GWP) relative to CO2(online), <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdfChanges, above n 3; Ian Dunlop 'Facing our limits, A Full World' (online) <http://morethanluck.cpd.org.au/making-it-last/facing-our-limits/>.

It is alleged that CSG may be cleaner than coal, however in our view it is not clean, nor can it be classed as 'green'.

Attached is an Excel Spread-sheet that may be of use, marked ('Appendix A').

Case Studies - Two Pipeline Proposals

Eastern Star Pipeline

The Eastern Star Pipeline project involves NSW largest coal-seam gas field in the iconic Pilliga, an export terminal at Newcastle, and pipelines to Wellington and Newcastle, has been called in for environmental assessment by the Commonwealth.

The EIA would require community consultation, consideration of environmental impacts on 85,000 hectares of forest, 1600 km of pipeline, a RAMSAR wetland, the marine environment, and the Great Artesian Basin which includes habitat for threatened species, endangered ecological communities, and an area protected under legislation for its natural values. There would need to be two separate EIA, and separate approvals by state and federal agencies.

The proposed pipeline is located in proximity to one World Heritage Property, one National Heritage Place, three Wetlands of International Significance, five Threatened Ecological Communities, ninety one threatened species and sixty nine migratory species.[13]

The Queensland Hunter Gas Pipeline

A comparison with another proposal, the Queensland Hunter Gas Pipeline project, may be useful. This project proposes a 840 kilometre pipeline to transport coal seam gas from southern Queensland gas fields near Wallumbilla, to the Newcastle region in New South Wales has been deemed 'not a controlled action' by DEWHA.[14]

The Study Area is a linear corridor and is 200 metres wide. The Study Area begins at the Wallumbilla gas hub and proceeds in a southerly direction towards the NSW-Queensland border. It crosses the border near the town of Boomi before proceeding south east towards Moree in central northern NSW. The Study Area then passes Moree immediately to the east, where it also crosses the Gwydir and Mehi Rivers, as well as the Newell and Gwydir Highways. It proceeds south from Moree to Narrabri, where it traverses between the township of Narrabri to the west and Mount Kaputar to the east. It then proceeds south east towards Murrurundi, intersecting the Oxley and New England Highways, Namoi River and the Main Northern railway line. From Murrurundi, the Study Area aligns east to avoid the Towarri National Park, turning southwards to avoid

[13] DEWHAS Referral of Proposed Action Eastern Star Gas Coolah to Newcastle Gas Transmission Pipeline April 2011

[14] Department of Environment, Water, Heritage and the Arts, Environment Assessment Branch, 23 December 2008, Ref No 4620, Z23102531.

Camerons Gorge Nature Reserve, passing to the immediate west of Scone and east of Muswellbrook. It then heads south east towards Singleton, passing between the Greater Blue Mountains World Heritage Area to the south west and Barrington Tops National Park to the north east. From Singleton, the Study Area proceeds eastwards, intersecting several power transmission lines, the North Coast railway line and crossing the Hunter River before terminating at Kooragang Island at Newcastle.[15]

> 'As the exact route is yet to be determined, biodiversity loss cannot be quantified.'

However the screening of species revealed a number of endangered populations, Endangered Ecological Communities (EECs) and threatened flora and fauna species which have the potential to be impacted by the proposal. The Environmental Assessment identified 23 EECs with the potential to occur along the length of the proposal. As a result of the screening process, twelve of these EECs were expected to occur and have the potential to be impacted by the pipeline corridor. Twenty-six threatened species and three endangered populations were identified as a result of the screening process with the potential to occur within the pipeline corridor and be impacted by the proposal.

EEC impacted upon by proposal:
Brigalow (*Acacia harpophylla* dominant and co-dominant)
Coolibah Black Box woodland EEC (TSC and EPBC)
Dichanthium spp. Dominant grasslands of the Brigalow belt Bioregions (EPBC)
Myall woodland EEC
White Box Yellow Box Blakeley's Red Gum Grassy Woodland and derived Grassland with exotic groundcover (TSC Act)
Box Gum Woodland EEC (TSC and EPBC)
Lower Hunter Spotted Gum Ironbark Forest EEC
Swamp Oak Floodplain Forest EEC
Swamp Sclerophyll Forest EEC
Patches of Mangrove-Estuarine Complex EEC
River-Flat Eucalypt Forest on Coastal Floodplains of the NSW north coast EEC
Mangrove-Estuarine Complex & Coastal Saltmarsh EEC

Further the project impacts on sites of cultural significance. One group of TOs stated:

> • that the reliance on predictive modelling fails to properly utilise the knowledge of culturally significant sites held by traditional owners and poses an additional risk when relied on without complementary information provided by Gomeroi people and that minimal effort has been made to provide opportunities for knowledge holders to participate.

[15] NSW Department of Planning, Director-General's Environmental Assessment Report Section 75I of the *Environmental Planning and Assessment Act 1979* (NSW), February 2009, (online) <http://majorprojects.planning.nsw.gov.au/page/project-sectors/transport--communications--energy---water/pipelines/?action=view_job&job_id=25>.

• that information gathered from the AHIMS register was incomplete and for this reason should not be relied on in isolation from information provided by Gomeroi traditional owners.

• all Aboriginal sites and artefacts should not be disturbed. The TOs also stated that the Gomeroi people are opposed to the research programme to offset any loss of low to moderate heritage sites, described in Section 10.1.5 of the EA.

DECCW stated:

Some relevant past Archaeological studies (e.g. those relating to mining developments in the Boggabri/Gunnedah basin) do not appear to have been considered in the predictive modelling.

'the Proponent's assessment raises the issue of cumulative impact of loss of many artefact scatters.'

Threatened flora identified:

- *Sida rohlenae*
- *Digitaria porrecta* EPBC - E
- *Zannichellia palustris*
- *Bothriochloa biloba* EPBC - V
- *Rhizanthella slateri* EPBC - E
- *Lepidium monoplocoides* EPBC - E
- *Dichanthium setosum* EPBC - V
- *Diuris tricolor*
- *Swainsona murrayana* EPBC - V
- *Eucalyptus parramattensis* subsp. Decadens EPBC - V
- *Homopholis belsonii* EPBC - V
- *Cyperus conicus*
- *Grevillea parviflora subsp. parviflora* EPBC - V

One hundred and eighty bird species were recorded along the pipeline route over the survey period, seven of which are threatened species listed as vulnerable under the TSC Act. Forty species of mammals were recorded, of which thirty-one were native (of which eight were threatened) and nine were introduced species. Thirty-nine species of reptile were also recorded, and included a diverse range of species groups, such as snakes, skinks, geckos, monitors and a turtle. The threatened Five-clawed Worm Skink was recorded and habitat with high potential for the Pale-headed snake (TSC Act – Vulnerable) was identified. Fourteen amphibian species were recorded, including the threatened Green and Golden Bell Frog, which is listed as Vulnerable under the EPBC Act and Endangered under the TSC Act.

Examples of EPBC Act threatened fauna identified:

- Green and Golden Bell Frog V – EPBC Act E – TSC Act
- Large-eared Pied Bat V – EPBC Act V-TSC Act
- Koala (not on EPBC Act yet)

- Five-clawed Worm Skink V – EPBC Act E – TSC Act
- Squatter Pigeon (*Geophaps scripta scripta*) EPBC Act –V

Hunter Bird Observers Club stated that no suitable areas of compensatory habitat existed for replacement of any destroyed wetland habitat.

The original proposed pipeline route is 350 metres from National Trust listed buildings and a Heritage Preservation area.

Watercourse crossings
The proposed pipeline would cross many major and minor watercourses, and would be located in the vicinity of groundwater bores. The sensitivity of waterways has been determined based on data from aerial photography, Department of Natural Resources' stream categories database, NSW Fisheries' Classification and Characteristics of Waterway Type (2003), SEPP 14 and RAMSAR listings records and water bore licences. The proposed pipeline would cross a maximum total of 178 watercourses, the identified crossings are based on desktop analysis and are categorised as follows:
• 33 crossings reflecting high sensitivity, this includes crossings within the Gwydir, Boomi, Quirindi, Hunter. Macintyre/Barwon, Namoi and Pages systems;
• 20 crossings reflecting moderate sensitivity; and
• 126 water crossings.

As shown by these two case studies the amount of environmental damage caused by CSG mining is enormous. The cumulative impacts and actual on-ground damage can in no way be seen to be beneficial to the state or citizens. At this stage in our evolution we cannot afford any biodiversity loss and as Aboriginal Cultural heritage is priceless, any loss would be profound.

Australia is only now, slowly, coming in from the cold. After eleven years of ridicule from international quarters the NSW Government has the chance to gain international respect if the right decisions are made. The residents of NSW and the environment are, by definition, stakeholders all government decisions and have an interest in the results of mining operations when their environment is impacted upon or damaged. The majority of residents of NSW are very concerned about climate change, deforestation and mining. Thus the 'better outcome' for communities and the environment would be for the government to cease any coal seam gas operations.

Chemicals Page

Health Effects codes (columns H through U)

S	Suspected of causing an adverse health effect
P	Suspected of promoting cancer (column O)

References can be viewed by hovering over the box with the red triangle, or by choosing the box and pressing the shift and F2 keys together

Products Page

Health Effects codes (columns E through R)

1-20	Corresponds to the number of chemicals in the product that affect that health category

Product composition can be viewed by hovering over the box with the red triangle, or by choosing the box and pressing the shift and F2 keys together

Volatile and Soluble Codes

X	Chemical is soluble or volatile
L	Partially soluble or volatile
T	Slightly soluble or volatile
M	Miscible
D	Dispersable

Protective Clothing Codes

(recommended when handling the chemical)

R	Respirator or mask
G	Gloves
E	Goggles or eye protection
C	Coveralls or protective clothing

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