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30 January 2012

Madeleine Foley
Principal Council Officer, Committees
NSW Legislative Council
Parliament House
Macquarie Street
Sydney NSW 2000

Dear Ms Foley

Supplementary Questions

I refer to your recent conversations with Mr Sam Crafter in respect of the Supplementary Questions provided to him following Santos' appearance before the General Purpose Standing Committee No. 5 on 17 November 2011.

Below are the detailed responses to the Supplementary Questions. In responding to these questions I also refer you to our letter of 6 December 2011 in respect of information taken on notice from the Committee on 17 November and for convenience, provide a copy of that letter and attachments again with this document (please refer to **Attachment 1**).

Executive Summary

In summary our response to the Supplementary Questions highlights the following key points:

- **Well Established Industry** – the production of natural gas from coal seams is not a new industry. It has been produced in commercial quantities in Australia for two decades and currently supplies 80% of Queensland's and 30% of the Australian East Coast's natural gas requirements. In the USA, CSG has been produced since the 1970s and in the recent detailed study on CSG prepared by the US EPA, it calculated that approximately 2000PJs (i.e. over 3 times East Coast Australia's current total natural gas demand) was produced in 2008 from 56,000 wells
http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/upload/cbm_report_2011.pdf

Landholder Coexistence – Santos has demonstrated that CSG can be produced safely, sustainably and in coexistence with landholders as we have been doing so for nearly 20 years in Queensland. Santos is currently producing 50PJ pa of CSG in Queensland (approximately a third of NSW's total natural gas requirements). During this time there has been no adverse impact to the environment, humans or animals. The main focus of Santos' operations in NSW during the next three years is the drilling of about 50 exploration wells across its circa 62,000 square km permit areas. During this moderate, but essential exploration and appraisal phase Santos will work with local farmers to agree on-farm operating plans and procedures with them to achieve our goal of productive co-existence with agriculture.

- **Well Integrity and Remediation** – CSG wells should be constructed and ultimately remediated in accordance with best practice engineering standards developed over many decades in the oil and gas industry. This involves the use of proven steel and cement protective barriers during the productive

phase and the sinking of high-grade cement plugs through the full well depth up to 1.5 metres below the surface when the wells are ultimately abandoned. This process has been undertaken many thousands of times around the world and is recognised as safe and sustainable.

- **Regulation and Governance** – despite assertions to the contrary, the CSG industry is subject to heavy and stringent regulation in NSW. A detailed review of environmental factors must be prepared by a CSG proponent and approved by multiple regulators prior to the drilling of each exploration well. For commercial scale production applications, the Environmental Impact Assessment process is both complex and far reaching. Santos supports regulatory rigour, clarity and efficiency.
- **Moratorium** – anti-CSG activists seek a halt to all physical activity to enable, as they argue, further scientific assessments to occur. However, the CSG extractive process has already been subject to extensive scientific assessments both in the US and Australia which consistently find that the industry can operate safely and sustainably provided appropriate standards are complied with and the sub-surface geological conditions are suitable. Physical exploration work is essential to obtain the necessary scientific information to establish the suitability of any potential CSG field – from both an operational and a regulatory perspective. This is the stage NSW’s CSG industry is currently in. A moratorium would prevent the industry and regulators being able to scientifically establish that production can safely proceed. Santos’ exploration and appraisal program in NSW will take three years to complete. It involves drilling just 50 wells with a capital expense for this program of \$500 million. Without that investment the science available to regulators will be incomplete.
- **Economic Benefits** – Santos commissioned an independent report from the Allens Consulting Group which highlighted the significant benefits to NSW if our project was to proceed as envisaged. These benefits include, the creation of 3000 jobs and an increase in Gross Regional and State Product of \$470m pa and \$821m pa respectively. In addition NSW is currently reliant on other Australian States for its gas supplies, with 95% being imported. Towards the middle of this decade existing long term gas supply contracts will expire. Developments of its own supply of indigenous gas would provide NSW with a significant improvement to its energy security position. It is important that such benefits are not over looked in consideration of how and when to safely proceed with development of NSW high quality CSG resource.

Reponses to Supplementary Questions

1. Many submission authors have expressed concern about their interactions with coal seam gas companies, and the way that these companies have approached them for access to their land. How can the industry ensure that individual companies interact fairly and respectfully with landholders and local communities?

It is important that all companies within the industry meet the highest standards in dealing with landholders and communities. Santos is supportive of the work being done by APPEA to ensure that high standards are met across the industry [Queensland for example, has recently adopted a uniform land access code of practice which provides a strong benchmark that all in the industry must meet].

Santos has a long track record of working closely with the landholders and communities in which we operate. We have been exploring and producing oil and gas in the north-east of South Australia and south-west Queensland for nearly 50 years. During this period we have developed mutually beneficial and strong relationships with landholders across the States. We have over 500 agreements in place with landholders in Queensland without having had to go to the Land and Environment Court. In NSW we have successfully negotiated over 30 land access agreements with land holders.

We believe that as an industry leader, we can set a standard in fair and respectful interactions with landholders and local communities that will develop a greater awareness of what landholders and communities can and should expect from the companies they deal with. We will continue to promote an understanding of the rights and legitimate expectations of landholders and regional communities within both those communities and also within the industry. This includes our focus on face-to-face consultation and providing open and publically available information and factsheets, including those accessible on our website at <http://www.santos.com/coal-seam-gas.aspx> (these are also provided as an annexure to **Attachment 1**).

Santos has become an important part of many rural communities. There are currently 3,000 people employed in our east coast operations with over a third of these living in regional and rural South Australia.

2. Many Inquiry participants are concerned about whether there will be adequate remediation of coal gas wells and infrastructure, once a site reaches the end of its productive life. This may happen years or even decades later. What requirements are in place to ensure that appropriate remediation takes place?

We will respond to this question in two parts. First, we outline the legislative powers of the Minister in respect of remediation under petroleum titles. Secondly, we provide summary detail about the remediation activities Santos currently undertakes in respect of well sites and refer to the Code of Practice for Constructing and Abandoning Coal Seam Gas Wells recently developed for Queensland.

Part 1 – Legislative powers regarding remediation

The *Petroleum Onshore Act 1991* (NSW) (the **Act**) provides broad powers to the Minister to impose conditions in respect of remediation and conservation protection on holders of petroleum titles.

For example, the Act provides that petroleum titles granted may include 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.

The conditions subject to which a petroleum title is granted or renewed may also include conditions relating to the conservation and protection of:

- (a) the flora, fauna, fish, fisheries and scenic attractions; and
- (b) the features of Aboriginal, architectural, archaeological, historical or geological interest.

The Minister may also amend a petroleum title that does not either contain any of these conditions or contains conditions that are considered to be inadequate.

On granting a petroleum title, the Minister may also impose a further condition that requires the holder of the title to provide security (in an amount determined by the Minister) for the fulfilment of the holder's obligations under the Act in respect of the title.

The NSW Department of Primary Industries has well established frameworks in respect of planning, monitoring and compliance with conservation and rehabilitation conditions, including prescribed Petroleum Operations Plans and Rehabilitation and Environmental Management Processes. More information can be found about these frameworks at <http://www.dpi.nsw.gov.au/minerals/environment/petroleum/applying-for-petroleum-projects>.

Part 2 - Summary of Santos' remediation framework for CSG wells

Santos has nearly 50 years of experience in the oil and gas industry and uses this expertise to ensure all its operations meet world best practice standards.

Once a well has reached the end of its useful life, it is "plugged and abandoned". The process involves filling the wellbore from bottom to surface with 150 m cement plugs. Once a cement plug top is inside the well casing, it is left to set and tagged with 2.5 t to confirm placement as well as pressure tested to 500 psi over formation fracture pressure to confirm isolation. Cement plugs are then pumped one by one to surface.

After this process has been completed the wellhead is cut off 1.5 m below ground level (which, for example allows blade ploughing and thereby enabling cropping land to be returned to full productivity), an abandonment marker welded to the casing and the site rehabilitated. A well cannot be formally abandoned until the government's technical expert regulators have accepted it has been appropriately plugged and abandoned.

The surface area is then rehabilitated to the standard required by Government and the landholder. On agricultural land this generally means the replacement of stored topsoil, recreation of the original topography, and resowing with whatever the landholder requires. Rehabilitation in agricultural areas is normally a very

quick process. In forested or other areas the land is rehabilitated through a formal rehabilitation program, again designed to restore the former values.

NSW well abandonments are completed in accordance with the Schedule of Onshore Petroleum and Production Safety Requirements, August 1992. To supplement this, a NSW Code of Practice is being developed by the state government built from the Code of Practice for Constructing and Abandoning Coal Seam Gas Wells in Queensland rolled out last year. Santos complies with this standard for NSW abandonments (please refer to **Attachment 2** for a copy of the Code).

The wells are also abandoned to best industry practice otherwise known as 'Good Oilfield Practice'. This process is engineered by Santos engineers in consultation with qualified cementing companies and aligns with industry standards such as the recommended practices from the American Petroleum Institute, (API).

3. The creation of jobs in regional areas is often said to be a key benefit of the coal seam gas industry. However Inquiry participants have expressed concern regarding the fly in fly out phenomenon, which does not create jobs in local areas. What evidence do you have regarding the contribution of the coal seam gas industry to local economies and in particular, local employment?

If Santos is able to develop its planned NSW CSG business we will create 3000 jobs in regional areas. Along with our joint venture partners we will spend approximately \$1 billion over the next 3-5 years in pursuit of exploring and appraising CSG resources in NSW. This would bring Santos and its partners' investment in NSW to \$2.5 billion. It is our intention to undertake a long-term commitment to the area, with a potential of over \$16 billion invested between now and 2035. This is by no means an investment based on a fly-in, fly-out operation. Although in NSW our operations are in a developmental phase, most of our Energy NSW team already live in the State, with the majority of the Narrabri workforce living locally.

In 2011 Santos commissioned Allens Consulting Group to undertake economic modelling of a coal seam gas development in north-west NSW. Attached is a copy of the report (please refer to **Attachment 3**).

The report: *The economic impacts of developing coal seam gas operations in Northwest NSW* found that the economic benefits from a fully-developed CSG industry in north-west NSW could include:

- \$470 million per year (or \$8.5 billion to 2035) increase in the Gross Regional Product of Northwest NSW;
- \$821 million per year (or \$15.2 billion to 2035) increase in NSW Gross State Product;
- approximately 3000 ongoing full-time positions (with many in regional communities);
- \$531 million per year (or \$10.7 billion to 2035) boost to Australia's GDP; and
- an extra 5GL per year of water from coal seams, which after treatment by Santos could boost agricultural production in the region by an average of nearly one per cent per annum.

An example: Santos' Queensland CSG activities

Santos has a policy of encouraging its employees to live locally wherever possible and this has proved successful in our Queensland business where we have a workforce of approximately 100 living in Roma and the surrounding areas. There are also substantial numbers of staff based in Gladstone and Brisbane, and these numbers will continue to increase as the project reaches its full operational phase.

Right now, there are 1,800 people working on the Santos GLNG project (including 230 new employees in the three months to January 2012). The development in Gladstone of the GLNG and other LNG projects to use coal seam gas as feedstock will generate significant economic benefits for the region, the state, and the nation.

The Queensland Government expects these projects will create around 18,000 jobs, increase State Domestic Product by 1%, and generate around \$1 billion per annum in state revenue.

Most jobs and economic activity associated with the industry will be in regional areas. The towns of the Surat Basin, where most activity is centred, are now booming. Today there are more than 8500 people working in the CSG industry

In relation to a moratorium on the Coal Seam Gas (CSG) Industry:

4. a) If a moratorium was imposed on the CSG Industry and a broad scientific assessment was conducted on the industry in order to determine future viability, what would be the impact on the environment and water sources (aquifers and catchments), how long do you believe such a thorough scientific assessment would take?

Proponents of such a moratorium appear to not understand that the only way to obtain the scientific information to establish, for example, that deep coal seams are not connected to surface aquifers or that produced water can be reinjected, is to undertake physical exploration and appraisal drilling activity. To be clear, the scientific assessment required to establish the suitability of any CSG field requires physical exploration activity.

For the next 3 years Santos plans to undertake a detailed research and information gathering exploration program. Any moratorium would simply stop the ability to obtain the data essential to both the industry and regulators to make informed decisions and to provide the community with assurances about the proposed CSG production operations. The Santos program over the next three years involves a capital investment of around \$500 million to obtain this scientific data and evidence, all of which will be made available to regulators for their assessment processes.

In relation to potential impacts of exploration activity, the NSW regulatory regime already requires comprehensive assessments to be undertaken before any on-the-ground CSG activities can be undertaken. This requires extensive and detailed studies such as groundwater studies, long term environmental impacts and disposal of waste to be completed and approved before any physical exploration work can be undertaken. These involve detailed on-site and desktop studies that are subject to approval prior to the commencement of any physical works. Please find **Attachment 4**, by way of example of the current assessment requirements, details in respect of the most recently approved Review of Environmental Factors (**REF**) prepared by Santos for a pilot test well.

It is important to reiterate that the CSG industry has operated safely, sustainably and in coexistence with agriculture in Eastern Australia for over two decades. Some 90% of gas used in Queensland is CSG and 30% of all gas currently used on the eastern seaboard is natural gas produced from coal seams.

Whilst the industry is often criticised for having a lack of environmental scientific assessment and study, this is simply not true. For the Santos operated Queensland GLNG project alone, the cost of the environmental studies (the majority independently undertaken by internationally recognised consultants) was in excess of \$20 million and the EIS itself was over 20,000 pages in total. This was made public, and assessed and approved by both the Queensland and Commonwealth Governments.

b) Does the NSW State Government have the ability to conduct such an assessment?

The NSW Government as regulator of all activities has the knowledge and data required to conduct the current thorough environmental impact assessments that are required before any activities are undertaken under petroleum titles.

The current regulatory assessment process is rigorous. As an example, an application for a REF for one exploratory corehole or a Pilot site (as outlined in **Attachment 4**) is highly detailed and generally takes approximately 3 months for determination once it is lodged. While approval under Part 5 is only determined by the NSW Department of Trade and Investment, Regional Infrastructure and Services (**DTRIS**), Resources & Energy Division after referral and advice by each of the NSW Office of Water, NSW Office of Environment and Heritage and NSW Department of Planning prior to determination by DTRIS Resources and Energy.

c) Would such a scientific assessment require Federal Government intervention or partnership to help the State Government and Industry complete an assessment?

The CSG industry is already regulated by a wide range of Government departments that require detailed scientific assessments prior to each stage of a CSG development being approved.

In addition, the Federal Government has announced that it will work closely with the State Governments as it implements its proposal for a scientific panel to assess resources projects. The Commonwealth Government is already closely involved in the Namoi Catchment Water Study with one of their senior hydrogeologists being a Member of the Ministerial Oversight Committee. This is the key body that manages the Study.

d) What processes and practices does your company already put in place to assess the impact of CSG exploration drilling?

As with the answers to 4a) and 4b) above, Santos goes through each of the current assessments required for its exploration activities. In our pilot testing projects we have also drilled specific shallow aquifer monitoring bores to give us a data set of the pressure movements on the shallow aquifers prior to, during and after our activities occur. We share this data with the landholders, the Government, the broader community and the Namoi Catchment Water Study. Santos has established a web portal <http://www.santoswaterportal.com.au/> to provide general public access to this data.

5. Has Santos/Eastern Star Gas (ESG) established any partnerships with private research companies or universities to help compile and list data that would be vital for such an environmental impact assessment?

Santos, in partnership with the University of Queensland and QGC have committed up to \$20 million to create a Centre for Coal Seam Gas to further increase the knowledge and skills base of the growing coal seam gas industry. The Centre for Coal Seam Gas aims to be the pre-eminent global authority on the industry, drawing on the capabilities from some 16 Schools and Centres across the University of Queensland as well as other universities in Australia and overseas.

The Santos GLNG Project is also entering into an Australian-first million-dollar-plus-partnership with SkillsTech Australia to establish a specialised Coal Seam Gas and Gas Transmission Pipeline Operations Training Centre in Acacia Ridge, Brisbane. The Centre will offer 60 places for gas field operations and 10 for underground gas transmission pipeline operations.

Santos is also in the preliminary stages of investigating other initiatives/opportunities with Australian research organisations which will be focussed on addressing community concerns specific to the growth of the CSG industry in NSW. Further details around these initiatives will be made available when they are confirmed.

6. What research is Santos/ESG able to provide to a broad scale scientific assessment of the industry, if conducted?

Santos already makes its research information available for more broad scale investigations. For example, information already obtained by Santos through its exploration activities relating to groundwater resources in the Gunnedah Basin has been provided to the Namoi Water Catchment Study.

Santos will continue to develop a wide range of research and data as part of its explorations activities, and particularly its major project approval process. That data will be specific to the region and communities within which our development will focus.

The types of research that will be able to be made available in NSW in the future will include studies in the areas of groundwater, threatened species, land use activities (e.g. agricultural characteristics of a region) and socio-economic analysis.

7. What does Santos/ESG believe is the most appropriate terms of reference that such a broad scale scientific assessment requires?

As detailed in response to questions 4(a) and 4(b), Santos believes that the requirements of the current environmental assessment required in the major project approval process are thorough and enable a detailed and rigorous assessment of the proposed activities to occur.

With regard to a broader Study, Santos believes the Namoi Catchment Water Study is appropriately scoped to meet this need. Publicly available information from the Commonwealth shows that the annual water extraction from the Namoi Catchment by all users currently is approximately 500GL per annum. The projected

extraction from the Santos project is in the order of 5GL per annum and sourced from deep coal seams (i.e. approximately 1% of current water extracted from surface aquifers), with the intent that 80% of the coal seam water be returned to the system as treated, useable water.

8. If an assessment was conducted, do you believe that a broad scale assessment would represent the industry and its operations as a whole in NSW?

Any assessments are best done taking into account the specifics of what development is being proposed and the environment it is being proposed to occur in. That is why the current major project approval process is appropriate as it undertakes a rigorous assessment of the impacts on the environment, water and communities in the areas where the development is proposed.

Broad scale assessments of an industry's potential impact are appropriate where there are potentially overlapping and competing development proposals. This is not the case in NSW as with the recent acquisition of ESG by Santos, we are now in a position to develop the Gunnedah Basin under a single operator.

In relation to the number of wells:

Santos acquired ESG on 17 November 2011 and at the date of these responses is still conducting a detailed review of ESG's past operations and those of the companies from which ESG acquired some of its acreage historically. Accordingly, the information provided in response to question 9 is to the best of our knowledge at this time.

9. a) In total, how many wells has Santos/ESG drilled in NSW?

Santos/ESG have drilled and operated 131 wells.

Santos/ESG have a total of 157 wells; 26 of these wells are legacy or wells operated by JV partners such as Australian Coalbed Methane.

b) How many of these were exploratory wells?

In NSW there is currently no differentiation between appraisal and exploration wells. We have identified all wells to date as exploratory wells.

c) How many of the exploratory wells have been capped since being drilled and how many are being used for gas production?

There are a total of 90 wells that have been plugged and abandoned. Again, a number of these were legacy wells in the ESG acreages. There are 27 wells flowing small volumes of gas in the exploration and research stages only.

d) How many of these wells have been considered operational for CSG mining?

These wells have all been drilled for the purpose of exploration, gathering data about the coal seams and the surrounding rock strata and aquifers. Small amount of gas 1-2 TJ/day are supplied to a 10 mega watt power station (currently being expanded to 16 MW) as part of managing the natural gas being produced by this appraisal program. The alternative would be to vent or flare the gas which is not a good environmental outcome. The construction of the power station is the most uneconomical option for this gas, but the environmental benefits outweigh the economic cost.

e) Was fracking used in any of the well drillings?

Fracture stimulation was used in 9 wells by Eastern Star Gas and three wells by the company that preceded Eastern Star Gas as operator of PEL 238.

f) How many wells required fracking to access the coal seam?

Fracture stimulation is a technique that is used to stimulate or enhance the production of natural gas from a coal seam once it has been drilled. The benefit of enhanced production is the need for fewer wells on the surface and therefore a smaller footprint.

As above we understand there are 12 wells where fracture stimulation was used historically.

g) How many wells does Santos/ESG plan or have planned to drill?

Prior to being acquired by Santos, ESG had lodged a concept plan with the Department of Planning under the former Part 3a of the *Environmental Planning and Assessment Act 1979* (NSW). That plan outlined 1100 wells. Santos announced at its appearance before the Committee on the day that it acquired Eastern Star Gas that it would be reviewing all of Eastern Star Gas' plans and that it would submit those plans under the new Part 4 of the *Environmental Planning and Assessment Act*.

Santos' preliminary estimate at this stage of exploration and field development planning is that a development that would provide \$150 million per annum of royalties to NSW would require significantly less than 1000 wells.

h) How many wells have been drilled that have now been capped?

Please refer to the answer to c) above.

i) How many wells would be required to meet Santos/ESG proposed CSG operational requirements?

As per answer to g) above.

In relation to Santos/ESG Exploration Licenses:

10. a) What is the total distance in kilometres of Santos/ESG exploration licenses?

62,718 square kilometres.

b) How much of this area is residential and/or commercial zoned?

All of the exploration and appraisal activities are in rural zoning

c) Within this area, how much area/land mass consists of coal seam?

Area in blocks

Santos/ESG blocks = 27,314 km²

Orion Blocks = 4,765 km²

Total potential coal seam area in acreage = 32,079 km² (subject to exploration results)

d) What are the names of the coal seams?

Black Jack Group

-Upper Black Jack (Trinkey)

-Breeza Coal Measures

-Howes Hills Coal Measures

-Caroona Coal Measures

-Hoskissons Coal Measures

-Melvilles Coal Measures

-Lower Black Jack

Maules Creek Formation

-Upper Maules Creek Coal Measures

Rutley, Namoi, Parkes (main seam in PEL 238)

-Lower Maules Creek Coal Measures
Bohena (main seam in PEL 238)

****The major gas bearing seams of interest are highlighted and in bold above.**

In relation to pipeline requirements:

11. a) For Santos/ESG future proposed/planned expansion, will it require a pipeline access for export or to a gas power plant?

Yes, a pipeline or pipelines will be required to get the gas to whatever market should a commercial development proceed.

b) What are the proposed pipeline routes?

At this point in time there are no defined pipeline routes. Eastern Star Gas had formerly proposed a route for a pipeline from Narrabri to Wellington and from that also a pipeline from Coolah to Newcastle. As we informed the Committee on 17 November 2011, Santos is withdrawing the application for the Narrabri to Wellington pipeline whilst we determine the commercial path for our exploration in NSW.

Once we have determined where the gas will need to go we will then undertake a thorough community consultation process to determine the pipeline route.

Any pipeline development in NSW must of course comply with all environmental protection and planning requirements. In addition to that Santos has publicly committed to undertaking a rigorous public consultation process on the options available prior to lodging any applications for a pipeline.

c) Do they go through any main residential and/or commercial areas?

As above, we do not have any proposed routes at this point in time.

However, it should be pointed out that an extensive network of natural gas pipelines criss-cross NSW and Australia, and that they have operated safely for decades. These pipelines deliver natural gas from Bass Strait and the Cooper Basin to customers including in metropolitan Sydney, Newcastle and Wollongong. The delivered gas is vital for homes and industry.

The Central Ranges pipeline already crosses the Liverpool Plains. Santos constructs its pipelines appropriately to allow historic surface activities such as agriculture to continue. In Queensland for example, pipeline depths have been varied to allow activities such as deep ripping to continue unabated above them.

In relation to mediation and consultation with landowners:

12. How many of your wells are on private property?

12 wells.

13. What is the estimate royalty scheme/plan that you have arranged with landowners?

Santos, like all resources companies in NSW, pay compensation to the landholders for the use of their land. We outline below an indicative range of payments made to landholders.

14. What royalties do property owners receive if they have:

a) 1 well on their property?

Resources recovered in Australia fall under the ownership of the Crown, not the titleholder of the surface land. For this reason, prescribed royalties are payable to the State in respect of petroleum produced rather than the property owners.

Santos does not currently produce any CSG for commercial purposes in NSW and accordingly, has paid no royalties to the State at this time. Per our submission to the Committee on 17 November 2011, Santos' potential production in NSW could generate approximately \$3 billion in royalties for the state of NSW over the next 20 years, which equates to \$150 million per annum.

In respect of Santos' current exploration activities in NSW, we have successfully negotiated over 30 land use and access agreements. As indicated above, Santos compensates property owners for land access and use associated with this exploration. The indicative range of payments within these agreements is set out below.

Payment for a corehole which takes between 4-6 weeks to drill before being fully rehabilitated is \$5000. If it is a pilot well that remains on the property the landholder also receives between approximately \$1500 - \$3000 per well per annum.

As I outlined in my letter of 6 December 2011, we are focussed on face-to-face and individual consultation with landholders in our areas of exploration. As part of the further development of our approach to land access arrangements as we continue to grow our operations in NSW, we are in the process of updating the base terms of our land access and compensation agreement. In doing this we will seek to consult with landholders and representative bodies to ensure that the agreement provides landholders with plain-language, relevant terms they feel comfortable with, including compensation arrangements, and that continue to provide mutual benefit.

b) Up to 5 wells on their property?

As above.

c) 10 wells and less than 20 on their property?

As above.

d) More than 20 wells on their property?

As above.

15. Have you purchased any property from a private owner to continue operations?

We have purchased a small land parcel near Warrah of approximately 100 acres. There is no dwelling located on the land.

16. Do you organise a legal service (law firm) that property owners can access?

Most commonly to date we have offered payment of reasonable legal fees for property owners to seek their own legal advice on our access agreements.

In relation to employee numbers:

17. How many employees does ESG/Santos currently employ?

There are currently 3000 people employed that work on Santos' east coast oil and gas operations. We have 125 employees dedicated to our NSW operations.

18. How many does it expect to employ through the expansion of its operations?

We have estimated that our direct employees will grow to 200 over the next 3 years of exploration and appraisal. We would also expect that an equal number of contractors will be engaged during this period. If Santos' development can proceed to the production phase the Allens Report (please refer to **Attachment 3**) predicts that Santos' direct employees combined with associated employment in other sectors (including key areas of manufacturing and retail) would grow to 3000.

In relation to the CSG Industry:

19. The "precautionary principle" as understood in the community means that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action. Does Santos/ESG believe that the precautionary principle should be applied to the development of the coal seam gas industry in NSW?

As with all industry, natural gas extraction from coal seams must establish that it can occur safely and sustainably. Santos has done that for nearly 20 years in Queensland. Santos is currently producing the equivalent of nearly a third of NSW's natural gas requirements (50 PJ) today from coal seams.

As we emphasised in our response to questions from the Committee on 17 November 2011 and the preceding questions of this document, we believe the current process for petroleum exploration approvals in NSW is rigorous and provides for a comprehensive assessment of the impacts of activities conducted under Petroleum titles. We note that the level of regulation already applicable to the industry is orders of magnitude above other industries.

Also as outlined above for the next 3 years Santos is primarily undertaking research and preliminary exploration that is highly regulated. These activities are critical to gather the scientific data that will allow informed decisions about future development, including environmental and water impact assessments. This data will also provide the community with assurances about the impacts of CSG.

Santos fully supports the Government taking a considered and properly assessed approach to its activities. It is important that the "precautionary principle" not be misinterpreted to stop or delay developments that are subject to appropriate rigorous ongoing review and assessment. Santos believes the current NSW Government review of the *Environmental Planning and Assessment Act* framework to be the appropriate place where the assessment framework is considered, developed and implemented. That will ensure a complete and equitable framework for all development proposals across the State.

20. Does Santos/ESG believe that coal seam gas mining warrants its own specific legislative and regulatory framework?

Coal seam gas is simply natural gas contained in coal seams and therefore should be regulated by the same suite of legislation as other hydrocarbon energy sources. We believe the existing regulatory regime provides comprehensive regulation and assessment of the industry and its practices. Santos supports strong regulation that will give the community confidence about the safe extraction of coal seam gas (and is happy to work with the regulator in respect of regulatory developments) but that should not be interpreted as saying that the current system does not have strong safeguards in place.

Again, as noted above there is already a substantial review of this framework being undertaken by the NSW Government. This matter should be dealt with within that framework.

Once again I thank the Committee for the opportunity to appear before it on 17 November and will be happy to address any further queries in respect of the Inquiry.

Yours sincerely



James Baulderstone
Vice President Eastern Australia
Santos Limited