



Ms Sam McLean
Executive Director
Office of the Independent Planning Commission of NSW
Via email: samantha.mcLean@ipcn.nsw.gov.au

14 August 2020

Dear Sam

**Narrabri Gas Project (SSD 6456)
Response to Independent Planning Commission Questions**

Thank you for your letters dated 29 June 2020 and 28 July 2020 requesting advice on number of points related to the assessment of the Narrabri Gas Project (SSD 6456).

The attachments to this letter seek to address these questions in detail.

If you have any questions, please contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'D Kitto', with a horizontal line underneath.

David Kitto
Executive Director
Special Projects

Ecologically Sustainable Development

Provide details regarding whether and how the Department considers that the Project (if approved) would be Ecologically Sustainable Development (ESD) and what principles and programs of ESD have been implemented in the Department's assessment of the Project and the Department's recommended conditions of consent

Under Section 4.15 of the *Environmental Planning & Assessment Act 1979*, a consent authority must consider the public interest of a development proposal when it determines the development application.

This includes considering the objects of the Act to the extent that they are relevant to the evaluation of the development application.

During its detailed assessment of the Narrabri Gas Project, the Department determined that at least six of the 10 objects of the Act, including the object to facilitate ecologically sustainable development, were relevant to evaluation of the project; and considered the merits of the project against each of these objects.

Based on this assessment and subject to the recommended conditions, the Department has concluded that the project:

- represents a safe and sustainable use of the State's natural gas resources that would promote the social and economic welfare of the community without compromising the needs of any future generations (Object a);
- represents ESD (Object b – see below);
- is a permissible land use under the relevant planning controls and can be carried out in an orderly and economic way subject to the recommended conditions (Object c);
- would not significantly affect the environment, including protected conservation areas such as the Brigalow State Conservation Area and Brigalow Nature Reserve and listed threatened species and communities (Object d); and
- would not significantly affect the cultural heritage of the region, including Aboriginal cultural heritage, and that the culturally significant resources within the project area can be managed in a sustainable way in consultation with key Aboriginal stakeholders under the recommended conditions of consent (Object j).

Throughout the assessment process, the Department has consulted extensively with key stakeholders and sought to encourage community participation (Object f). Further, the recommended conditions will ensure there are further opportunities for community participation during the implementation of the project. These conditions include requiring Santos to establish and operate a Community Consultative Committee, Water Technical Advisory Group and Aboriginal Cultural Heritage Advisory Group for the project. They also require Santos to make all relevant information on the project publicly available.

Under NSW legislation, ESD requires the effective integration of economic, environmental and social considerations in decision-making processes.

This has been a key driver for the Department in its detailed assessment of the merits of the Narrabri Gas Project, which has included investigating the complex interaction between each of these considerations and weighing up what is in the public interest and consistent with the requirements in Government legislation, policy, guidelines and codes of practice.

The Department has summarised the findings of this assessment in its assessment report and considers ESD to be at the heart of the whole report. Essentially, the report represents the

Department's attempt to effectively integrate the economic, environmental and social considerations of the Narrabri Gas Project in a simply and practical way, and to inform the Commission's determination of the development application.

It also reflects the Department's practice of seeking to avoid a formulaic or template approach to the assessment of ESD on major projects where every principle and program is considered explicitly and in isolation in assessment reports, even if they are irrelevant to the specific circumstances of the project, as this can lead to significant repetition and duplication in reports - due to the complex interaction of economic, social and environmental matters on major projects - and quarantine these matters in a manner that fails to integrate and communicate the key components of ESD with the broader assessment of the merits of the project.

Similarly, the recommended conditions seek to establish a strict regulatory regime for the project should it proceed and represent the Department's attempt to deal with a whole range of economic, social and environmental matters in a wholistic way. It would therefore be a difficult and somewhat arbitrary process to disaggregate the conditions and link them in an explicit way with each of the principles of ESD. The Department is not aware of any other examples where such an exercise has been undertaken for a State significant project, and for the reasons described above, does not consider it is necessary or appropriate in this case either.

Project Represents ESD

Based on its detailed assessment and subject to the recommended conditions, the Department has concluded that the Narrabri Gas Project represents ESD as it:

- is development that meets the needs of the present generation without compromising the ability of future generations to meet their needs;
- would exploit a significant natural gas resource in a sustainable way and provide substantial economic and social benefits for NSW and the Narrabri region;
- would not cause serious or irreversible environmental damage;
- would not adversely affect the biological diversity and ecological integrity of the region, including the Pilliga State Forest;
- is consistent with the principle of internalising the environmental costs of development as Santos would be liable for meeting all the costs associated with avoiding and/or minimising the impacts of the project, with monitoring and reporting on its environmental performance during operations, and with fully rehabilitating the site following operations.

In reaching this conclusion, the Department considered all the principles expressly referred to in the definition of ESD under the legislation that "can be used" to implement ESD, and their relevance to the assessment of the specific impacts of the Narrabri Gas Project.

The Precautionary Principle

Under NSW case law, there are two preconditions for the application of the precautionary principle:

1. Threat of serious or reversible environmental damage; and
2. Scientific uncertainty as to the nature and scope of the threat of environmental damage.

Based on its detailed assessment, the Department concluded that the Narrabri Gas Project would not cause any serious or irreversible environmental damage, and consequently that it did not trigger the first of the pre-conditions for the precautionary principle to be triggered.

While there is some scientific uncertainty about the likely localised impacts of the project, principally due to the limited information available on the deeper geological strata due to the lack of development in these strata historically, the Department considers these uncertainties have been adequately addressed in the assessment through the use of conservative assumptions, and that this assessment clearly identifies the range and magnitude of the potential impacts of the project.

In addition, there is significant potential to reduce these uncertainties further during the carrying out of the project, and the Department has recommended conditions to ensure this occurs, and that the findings of these investigations are factored into any future decisions about the design and implementation of the project. It has also recommended conditions requiring Santos to implement additional preventative measures to avoid and/or minimise the environmental impacts of the project, and to adapt its operations in response to any new findings or changes in circumstances.

Several speakers at the public hearings claimed the Narrabri Gas Project triggers the precautionary principle, and either may or would result in serious or irreversible damage to the region's groundwater resources, to certain listed threatened species or communities, and to the global climate.

In the Department's view, these speakers focussed primarily on some of the scientific uncertainties associated with the assessment, without providing any new information that materially changes the Department's assessment of these uncertainties, rather than identifying and providing clear evidence of the specific serious or irreversible environmental damage that may or would occur as a result of the project and how likely the threat of this damage is.

For the reasons outlined in the Department's assessment report, which have been expanded upon in the Department's briefings to the Commission during the public hearings, the Department does not believe there is any evidence available to support a conclusion that the project would result in serious or irreversible environmental damage, or even poses a credible threat of such damage occurring. This conclusion is supported by the advice from government and independent experts.

In summary, following detailed assessment the Department has concluded that the project:

- would have negligible impacts on the quantity or quality of water in the region's shallower aquifers, which are highly valued by the community and sustain the regional economy;
- would not result in any significant impacts on listed threatened species or communities, principally because Santos can avoid and/or minimise the impacts of the project on these species and communities during the detailed design and implementation of the project, and that any residual impacts can be significantly reduced by the progressive rehabilitation of the site and offset in accordance with the requirements in the NSW Government's *Major Projects Offsets Policy*; and
- project would not generate significant greenhouse gas emissions either incrementally or in a cumulative sense, particularly when you consider that it would be used to sustain existing gas use in East Coast gas market which has been occurring for decades, and is likely to be more than offset by a range of other initiatives in NSW that are being pursued by the State and Commonwealth governments as well as the private sector. This includes the forecast closure of all of NSW's existing coal-fired power stations in the life of the Narrabri Gas Project and the transition to an energy market dominated by renewable energy as outlined in the recent release of the Australian Energy Market Operator's *Integrated System Plan 2020*.

Intergenerational Equity

During its detailed assessment of the Narrabri Gas Project, the Department considered the three key components of intergenerational equity (intergenerational, intragenerational, and interspecies equity), the three key principles forming the basis of intergenerational equity (conservation of options, quality and access) and the distributive and procedural matters which are fundamental to any consideration of matters of equity.

At a broad level, the Department concluded that the Narrabri Gas Project is consistent with the principle of intergenerational equity as it can be carried out in a way that would maintain the health, diversity and productivity of the environment now and into the future; and that it would promote the social and economic welfare of the current generation without imposing any significant burdens on

individuals or groups within the existing local or regional community and without compromising the needs of any future generations.

The key reasons for reaching this conclusion are set out in the Department's assessment report, and the Department has subsequently expanded on these reasons in its meetings with the Commission and at the recent public hearings.

These reasons include that:

- the project would allow the community to access and use a small proportion of the State's natural gas resources to address a demonstrable demand for gas in NSW and forecast gas supply shortages over the next 25 years, and is important for energy security and reliability in NSW and consistent with current government policy which is seeking to establish a safe and sustainable gas industry in NSW;
- the project would use a very small amount of the region's water resources, particularly when compared to other agricultural water users in the region, and represents a very small fraction of the current sustainable extraction limit for each of the relevant water sources (see below); and like all other water users and in accordance with the water sharing regime established by the NSW Government, Santos would be required to obtain water licences for all of the project's water take, including any direct or induced take;
- all of the direct water take of the project (as opposed to induced water take) would come from the target coal seams; this water has limited beneficial value at this stage due to its high salinity levels and the costs associated with extraction, which is why most of the water in this water source – the Gunnedah Oxley Basin aquifer – remains unallocated;
- all wastes associated the project would be properly managed and either reused or disposed of in a safe and sustainable way, consistent with the waste hierarchy that underpins the objectives of the *Waste Avoidance and Resource Recovery 2001*: in particular, the vast majority of water extracted during the project would be treated to a high standard and put to beneficial use on site or in the surrounding area; and the salt generated during treatment would either be reused or disposed of to a suitably licenced landfill;
- the project would not affect any strategic agricultural land or any designated State conservation areas;
- all the land disturbed by the project would be progressively rehabilitated to a high standard and returned to its previous use;
- all the gas wells would be plugged and abandoned strictly in accordance with the *Well Integrity Code* to ensure they do not create a liability for future generations or create a potential pathway for polluting the region's beneficial water resources;
- the project would not have significant impacts on any of the region's natural or cultural resources (gas, water, land, air, flora and fauna, cultural heritage or built environment, including the Siding Springs Observatory) either now or in the future, and it would not prevent future generations from being able to inherit and benefit from a region that has extensive and diverse natural and cultural resources;
- the project would not adversely affect the health or safety of the community: it can comply with the relevant standards set out in Government legislation, policies and guidelines (air, noise, hazards, bushfire, aquifer interference, lighting, well integrity, etc.), and the likelihood of the project increasing the fire risk of the region during operations remains remote (the lowest possible rating under the relevant risk criteria); if anything, the project is likely to increase the fire-fighting capability of the region during operations;
- the project would result in significant economic and social benefits for both NSW and the local community (investment, jobs, regional spending, gas supply, benefit sharing,

royalties and taxes), and would provide an opportunity for Narrabri Shire Council and others to stimulate local economic development and diversify the economic base of the regional economy; and

- the project would not impose any significant or unreasonable burdens on the local or regional community: development would only occur on private land with the agreement of the landowner; the project can comply with the relevant standards for environmental performance at all private residences; Santos is required to minimise any adverse impacts the project may have on the local employment and housing market or the demand for local infrastructure and services; the State Government will continue to provide to provide essential services to the region (hospitals, schools, etc.) and adjust the provision of these services to match any fluctuations in population levels during the project; under the recommended conditions, the community would be involved in the implementation of the project; and finally, there would be several safeguards in place to protect the local community – including those provided in the recommended conditions – and ensure that they are not burdened by the project and that Santos is responsible bearing the costs associated with the project.

Several speakers at the public hearings claimed the Narrabri Gas Project was contrary to the principle of intergenerational equity because there should be no new extraction and use of fossil fuels, or because the cumulative greenhouse gas emissions (scope 1, 2 and 3 emissions) of the project would exceed the carbon budget approach to climate stabilisation and contribute to unacceptable impacts on the global climate, which would have adverse effects on current and future generations.

These claims have been raised consistently by objectors throughout the assessment process and have been fully considered by the Department in accordance with the requirements in Clause 14 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP), having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

Climate change is a critical global issue requiring urgent action, and the success of this action will be essential for ensuring intergenerational equity.

The responsibility for reducing greenhouse gas emissions and addressing climate change is spread across the globe and global action is driven principally through the Paris Agreement.

Australia is a signatory of the Paris Agreement and has committed to reduce its emissions by 26 to 28% from 2005 levels by 2030.

The NSW Climate Change Policy Framework:

- seeks to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current emerging and national policy settings and actions to address climate change;
- endorses the Paris Agreement and commits to taking action that is consistent with the level of effort to achieve Australia's commitments to the Paris Agreement and complement national action; and
- has a long-term aspirational objective of achieving net zero emissions by 2050.

This framework is supported by the *Net Zero Plan 2020-2030*, which seeks to reduce greenhouse gas emissions in NSW by 35% from 2005 levels by 2030 and has four net zero priorities:

- drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living;
- empower consumers and businesses to make sustainable choices;

- invest in the next wave of emissions reduction innovation to ensure economic prosperity from decarbonisation beyond 2030; and
- ensure the NSW Government leads by example by bringing sustainable goods, services and practices into the market and maximising the environmental values of the assets it oversees.

There is nothing in Australia's commitment under the Paris Agreement or the NSW climate change policy and associated action plan that would support claims for stopping or prohibiting the approval of any further fossil fuel projects or the ongoing use of fossil fuels in NSW over the next 20-30 years or the lifetime of the Narrabri Gas Project.

Instead, both Commonwealth and State policies are seeking to facilitate an orderly transition to a lower emissions economy in a sustainable way through the implementation of various programs and plans, including the *Integrated System Plan 2020*.

The Integrated System Plan notes that Australia is currently amid one of the world's fastest energy transitions during a period of "great complexity and uncertainty" and identifies a range of future scenarios for the future development of the East Coast energy market. These scenarios essentially involve:

- the gradual closure of most existing coal-fired power stations over the next 20 years;
- ongoing use of gas (particularly for heavy industry but also potentially for providing dispatchable energy); and
- the development of an augmented electricity grid dominated by distributed energy resources (rooftop solar), variable renewable energy (wind and solar) and dispatchable energy (pumped hydro, batteries and gas).

So, in the Department's view the Narrabri Gas Project is consistent with all government policy on climate change and the aim of ensuring an orderly transition to a lower emissions economy, just as it is consistent with the policy of the NSW government to facilitate the development of a safe and sustainable gas industry in NSW.

Several groups have advocated for the adoption of a "carbon budget", both globally and at a national and regional level, and for its use in the assessment of the Narrabri Gas Project. However, carbon budgets have not been adopted in any international agreements on climate change and there is no policy support for their use in Australia or NSW.

While they provide useful tools for policy analysis, there are significant conceptual difficulties with developing carbon budgets for countries and regions within countries, such as NSW, and using them to assess the merits of individual projects.

Consequently, the Department does not support the use of the carbon budget approach to the Narrabri Gas Project. Instead, the project should be assessed in accordance with existing government policy, which is set out in the Mining SEPP.

Under Clause 14 of the Mining SEPP, a consent authority must consider an assessment of the greenhouse gas emissions (including any downstream emissions) of a project and consider whether conditions are required to ensure that greenhouse gas emissions are minimised to the greatest extent practicable.

The Department has done this in its detailed assessment of the project.

This assessment concluded that the direct emissions of the project (around 17% of the total emissions) are likely to be low, and could be reduced by prohibiting the use of flares for pilot wells (given the gas could be used in the nearby Wilga Park power station) and targeting the more prospective gas resources within the project with lower CO₂ levels. Under the recommended conditions, this would be achieved through the assessment and approval of the Air Quality and Greenhouse Gas Management Plan.

The remaining emissions (or indirect or downstream emissions) are associated with the ongoing use of gas in NSW over the next 20-25 years by heavy industry, business and over 1.4 million households.

As the Department pointed out in its assessment report, these emissions are likely to occur whether the Narrabri Gas Project is approved or not.

Essentially, these emissions form part of the “background” emissions in NSW and would be more than offset by the substantial reduction in greenhouse emissions that is likely to occur as a result of NSW’s coal-fired power stations and as a result of the implementation of a range of other State and Commonwealth policy initiatives aimed at ensuring there is an orderly transition to a lower emissions economy in NSW.

Certainly, there are no express policy initiatives at present that would lend any support to calls to phase out gas use in NSW over the next 20-30 years. On the contrary, gas is seen as being an important part of the energy mix in NSW during this period.

Given the current policy setting in NSW, the Department does not consider it to be necessary or reasonable to impose conditions on Santos requiring it to reduce the greenhouse gas emissions of its customers.

These emissions are the direct emissions (scope 1 and 2 emissions) of their customers, and it should be up to these customers to determine the best way to reduce their emissions. This is consistent with the approach taken to greenhouse gas emissions in all national and international agreements and the associated arrangements for accounting and reporting on these emissions.

Again, there is no policy support at either the State or Commonwealth level that would support the imposition of conditions on an applicant to minimise the scope 3 emissions (i.e. the downstream emissions of third parties) of its development proposal.

Consequently, the Department has not recommended any conditions requiring Santos to reduce the scope 3 emissions of the Narrabri Gas Project.

This is consistent with the valuation principle of ESD where environmental goals – such as reducing greenhouse gas emissions – should be pursued in the most cost effective way.

In summary, the Department does not consider the Narrabri Gas Project to be inconsistent with the principle of intergenerational equity.

The simple fact is no single project can affect the global climate on its own, and the direct and indirect greenhouse gas emissions of the Narrabri Gas Project would be very minor compared to annual global emissions.

Climate change is a collective problem that requires urgent strategic action across the globe; and in the Department’s view the Narrabri Gas Project is consistent with all State and Commonwealth policy settings to transition to a lower emissions economy in an orderly and sustainable way, and for NSW to meet its long-term aspirational goal of achieving net zero emissions by 2050.

Finally, during its assessment the Department has consulted extensively with key stakeholders and sought to encourage community participation. These efforts have gone well beyond the statutory requirements in the EP&A Act, and they have included making all the information associated with the project publicly available, exhibiting the EIS for 90 days, holding public information sessions, meeting with key stakeholders, and visiting the site and surrounds. The Department has also considered and weighed up all the matters raised during this consultation, including submissions received during the public exhibition period, in its evaluation of the project. Further, the recommended conditions seek to encourage ongoing community participation during the implementation of the project should it be approved and provide for community involvement via the Community Consultative Committee, Water Technical Advisory Group and Aboriginal Cultural Heritage Advisory Group. They also require Santos to make all relevant information on the environmental performance of the project, including compliance with the recommended conditions, publicly available during the project.

This is consistent with the concept of ensuring a fair process, which is implicit in the principle of intergenerational equity.

Conservation of Biological Diversity and Ecological Integrity

These matters were a fundamental concern during the Department's detailed assessment of the biodiversity impacts of the project.

Following this assessment, the Department concluded that there is strategic support for the use of the land for the project under the *Brigalow and Nandewar Conservation Act 2005*, Santos's assessment of the biodiversity impacts of the project was conservative and carried out in accordance with the requirements of the *Major Projects Offset Policy*, and the project would not have any significant impacts on any State or Commonwealth-listed threatened species or ecological communities.

It also concluded that the biodiversity impacts of the project could be reduced substantially during operations, principally through the detailed design of the gas field, the implementation of standard mitigation measures and the progressive rehabilitation of the site to a high standard.

It has recommended conditions to ensure this occurs, and to require all residual biodiversity impacts to be fully offset in accordance with the government's *Major Projects Offset Policy*.

With these conditions in place, the Department considers the Narrabri Gas Project would not result in adverse impacts on the biological diversity or ecological integrity of the region.

Improved Valuation, Pricing and Incentive Mechanisms

The Department has applied this principle in its assessment of the Narrabri Gas Project.

Consistent with both the polluter pays and user pays principles, Santos will be required to pay the full costs associated with:

- ensuring the project is designed and implemented in accordance with the relevant standards, including the *Well Integrity Code*;
- mitigating and/or offsetting the impacts of the project;
- managing any waste produced by the project in a safe and sustainable way and in accordance with the NSW government's waste minimisation hierarchy;
- using any natural resources, including obtain water licences for all the water take of the project, paying royalties for the right to extract gas, and compensating landowners for the use of their land.

Under the recommended conditions and other statutory instruments, Santos will also be liable for being the full costs associated with addressing any incidents or compensating landowners for any property damage in the unlikely event they occur.

With these requirements and safeguards in place, the Department considers the Narrabri Gas Project is consistent with the valuation principle of ESD.

Recommendations – Chief Scientist & Engineer Review

Response to the Chief Scientist and Engineer's 2014 report and recommendations on Coal Seam Gas Activities in NSW, with respect to how the major concerns were addressed in the Department's Assessment Report and are reflected in the draft conditions

In 2013-14, the NSW Chief Scientist & Engineer conducted a review of coal seam gas (CSG) activities in NSW which included detailed community consultation and extensive investigations by experts into a range of technical and regulatory matters.

This review was based on the potential development of a significant gas industry in NSW, with the Camden Gas Project already operating, the Gloucester Gas project approved for production, and over 60% of the State being subject to petroleum exploration licences.

Following this review, the Chief Scientist found that the risks of gas development in NSW could be effectively managed with the right regulation, engineering solutions and ongoing management and research.

In her final report, the Chief Scientist made 16 recommendations.

In November 2014, the NSW Government adopted all these recommendations and published the *NSW Gas Plan* which seeks to establish a safe and sustainable local gas industry in NSW that balances the needs of the community, the economy and the environment.

The Government has subsequently responded to 15 of the 16 recommendations and is currently finalising its response to the last recommendation (cost recovery for regulatory).

As indicated in the its assessment report, the Department has considered the findings and recommendations of the Chief Scientist's review as well as the government's response to the review and the major reforms it has introduced since 2011 to address community concerns about coal seam gas development in NSW, including:

- cancelling and buying-back petroleum exploration licences so only 5% of the State is now subject to a licence;
- establishing the Strategic Release Framework for the release of any new petroleum exploration licences;
- establishing the EPA as the lead regulator of gas development in NSW;
- passing legislation to harmonise the regulation of onshore minerals and petroleum and strengthen the compliance and enforcement tools;
- expanding the state's groundwater and surface water monitoring network;
- establishing codes of practice for well integrity, produced water management and fracture simulation;
- strengthening the landowner compensation requirements, including providing advice on benchmark compensation rates for gas development;
- establishing the community benefit framework under the petroleum legislation to allow gas projects to share the benefits of production with local communities;
- establishing the Legacy Wells initiative to ensure existing gas well were properly rehabilitated in accordance with the *Well Integrity Code*;
- establishing a duties-based framework to ensure workers in the petroleum industry were appropriately trained and competent to perform work safely;
- putting in place coal seam gas exclusion and buffer zones;

- banning the use of BTEX chemicals; and
- establishing the *Aquifer Interference Policy*.

With these reforms in place, the Government considers the existing legislative and policy framework is consistent international best practice and is suitable for ensuring the development of a safe and sustainable gas industry in NSW.

In addition, the Department notes that the scale of the gas industry in NSW is likely to be substantially smaller now than was envisaged during the Chief Scientist's review with the Camden Gas Project scheduled to close in 2023, AGL announcing it will not proceed with the approved Gloucester Gas Project, and only 7% of the State now being subject to petroleum exploration licences.

Consistent with the principle of ensuring the regulatory response to any matter should be proportionate to the risk of the matter, the Government is likely to implement some of the specific recommendations of Chief Scientist – particularly those recommendations relating to cumulative or basin-wide impacts using complex automated systems and a standing expert advisory body – in stages, starting on a project by project basis and expanding this to an industry-wide basis should the scale and nature of the industry warrant it at some stage in the future.

Finally, it should be noted that many of the Chief Scientist's recommendations were directed to the broader regulatory and policy framework for gas development in NSW, and in many cases are not directly applicable to the assessment of individual gas projects such as the Narrabri Gas Project.

Nevertheless, the Department has considered all relevant aspects of the Chief Scientist's review during its assessment of the project and sought to ensure the recommended conditions give effect to the intent of these recommendations, and that these conditions are proportionate with the relevant risks of the project.

These conditions would be supported by additional conditions under the pollution control, petroleum and water legislation as well as other actions undertaken by the NSW Government during the ongoing implementation of the recommendations of the Chief Scientist's review.

Based on its detailed assessment, the Department considers the Narrabri Gas Project to be precisely the type of project that is consistent with the recommendations of the Chief Scientist and the subsequent *NSW Gas Plan*.

The table below provides a simple summary to the consideration of the Narrabri Gas Projects against the Chief Scientist's recommendations.

Table 2 | Reconciliation of Chief Scientist and Engineer’s 2014 Review Recommendations

Recommendation		Application to Narrabri Gas Project (NGP)
1	That government make clear its intent to establish a world-class regime for extraction of CSG.	<p>A world class regime is already in place in NSW and applies to the NGP.</p> <p>The Department has assessed the Narrabri Gas Project against this regime, including the:</p> <ul style="list-style-type: none"> • Strategic framework – NSW Gas Plan: commitment to develop a safe, sustainable local gas industry & Mining SEPP • Regulatory framework – EP&A Act, POEO Act, Petroleum (Onshore) Act & WM Act • arrangements for ensuring fair compensation for landowners – statutory reforms to arbitration, IPART benchmarks for compensation rates, compensable loss provisions in PO Act • Policies, guidelines and codes of practice identifying relevant standards and performance requirements for coal seam gas; and • Ongoing research being conducted by both GISERA and IESC.
2	That government ensure clear and open communication on CSG matters is always maintained .	<p>The NSW Government has maintained clear and open communication with the community on its coal seam gas reforms and will continue to do so.</p> <p>The Department has carried out extensive community consultation during its detailed assessment of the Narrabri Gas Project and considered all the issues raised by the community during this assessment. It has also published all the information on the Narrabri Gas Project on the Major Projects Portal.</p> <p>If the Narrabri Gas Project is approved, it will need to comply with strict regulatory requirements set in the development consent, environment protection licence and petroleum production licence.</p> <p>These requirements require Santos to involve the community in the implementation of the project, including setting up several advisory groups with community representatives. They also require Santos to monitor and publicly report on its environmental performance, and to make all relevant information associated with the project publicly available.</p> <p>As the lead regulator for gas development in NSW, the EPA will continue to keep the community informed about its regulatory activities on the project</p>

3	That government investigate as a priority a range of practical measures for implementation (or extension of current measures) to allow affected communities to have strengthened protections and benefits including fair and appropriate	<p>There are already measures in place to protect affected communities, and these measures will apply to the NGP, including:</p> <ul style="list-style-type: none"> • Statutory changes to land arbitration procedures in the PO Act • IPART benchmarking of compensation rates for landholders • Compensable loss provisions in the PO Act • Voluntary Land Acquisition & Mitigation Policy, which can be applied through development consents to address exceedances of applicable environmental standards • Voluntary Planning Agreements to provide local councils to provide infrastructure and services for projects • Financial insurance/assurance obligations that can be applied under the EP&A Act and POEO Act • Compliance powers under the regulatory regime to require proponents to rectify any damages caused by development • State Government grants to support mining-impacted communities, such as the Regions for Regions program. <p>Subject to the recommended conditions, the Narrabri Gas Project is not expected to result in any significant impacts of the community or the environment.</p> <p>Nevertheless, there will be several safeguards in place to protect the community.</p>
4	That the full cost to government of the regulation and support of the CSG industry be covered by the fees, levies, royalties and taxes paid by industry, and an annual statement be made by government on this matter as part of the Budget process.	Not applicable.
5	That government use its planning powers and capability to designate those areas of the State in which CSG activity is permitted to occur, drawing on appropriate external expertise as necessary.	<p>The Government has done this.</p> <p>The Narrabri Gas Project is located where CSG development is permitted to occur. It sits within existing petroleum titles and is permissible with development consent under both the <i>Mining SEPP</i> and <i>Narrabri Local Environmental Plan</i>.</p> <p>The Department's assessment, which incorporates the advice of independent experts, has found that the project can be carried out in a safe and sustainable way without causing any significant impacts on people or the environment.</p>

6	That government move to a single Act for all onshore subsurface resources (excluding water) in the State, constructed to allow for updating as technology advances. This will require a review of all major Acts applying to the resources sector.	Not applicable.
7	That government separate the process for allocation of rights to exploit subsurface resources (excluding water) from the regulation of the activities required to give effect to that exploitation (i.e. exploration and production activities); and that it establish a single independent regulator.	The EPA is lead regulator for all coal seam gas activities in NSW and has the technical capability and powers to be able to do this effectively on the Narrabri Gas Project should it be approved.
8	That government move towards a target and outcome-focused regulatory system.	<p>This is system already in place and applies to the NGP.</p> <p>In particular, there are clear policies, guidelines and codes of conduct in place setting out the relevant standards and performance requirements for coal seam gas activities in NSW. These documents are all publicly available on the Major Projects Portal.</p> <p>The recommended conditions set clear standards and performance measures for compliance on the Narrabri Gas Project, and would be strictly enforced by the EPA as the lead regular for all gas development in NSW</p>
9	That government consider a robust and comprehensive policy of appropriate insurance and environmental risk coverage of the CSG industry to ensure financial protection short and long term.	<p>Government has committed to using a three-layered policy to provide suitable safeguards for any risks associated with CSG activities, and this will be implemented on the NGP (if it is approved).</p> <p>The three layers are comprised of:</p> <ul style="list-style-type: none"> • security deposits for rehabilitation under the PO Act • insurance/assurance mechanisms required under the EP&A Act or POEO Act • ongoing implementation of the Legacy Mine Program to deal with any impacts associated with legacy petroleum wells. <p>All three layers will be in place for the Narrabri Gas Project, and supplemented by the recommended conditions and other statutory protections.</p>

10	That government commission the design and establishment of a Whole-of-Environment Data Repository for all State environment data including all data collected according to legislative and regulatory requirements associated with management, gas extraction, mining, manufacturing, and chemical processing activities.	<p>The Government has set up the SEED portal and will continue to enhance its capabilities over time.</p> <p>All relevant information on the Narrabri Gas Project will be made publicly available, on the SEED and/or the Major Projects Portal.</p> <p>The Government is also installing a deep groundwater monitoring network in the Narrabri region, which will provide robust baseline data against which any impacts of the Narrabri Gas Project can be compared should it proceed.</p>
11	That government develop a centralised Risk Management and Prediction Tool for extractive industries in NSW. This would include a risk register, a database of event histories, and an archive of Trigger Action Response Plans.	<p>Given the limited scale of coal seam gas activity in NSW, the Department does not support the establishment of such a sophisticated tool at this stage. Instead, it considers projects should be assessed on their merits on a project by project basis.</p> <p>The cost of establishing such a tool may be warranted in the future once the gas industry matures in NSW.</p> <p>However, the Narrabri Gas Project has been subject to detailed risk assessment by the NSW Government in accordance with relevant:</p> <ul style="list-style-type: none"> • Australian standards • NSW policies, guidelines and codes of practice. <p>If it is approved, the Narrabri Gas Project will be subject to strict conditions that:</p> <ul style="list-style-type: none"> • set clear limits and performance standards • require regular monitoring and public reporting on compliance • require detailed management plans to be submitted for approval prior to each stage of the project • require regular independent environmental audits to be carried out.
12	That government establish a standing expert advisory body on CSG (possibly extended to all the extractive industries).	<p>There is insufficient coal seam gas activity in NSW at present to justify the establishment of such a body at this stage.</p> <p>During the assessment of the Narrabri Gas project, the Department has sought and considered expert advice from:</p> <ul style="list-style-type: none"> • key NSW Government agencies • the NSW Gateway Panel • the Commonwealth Independent Expert Scientific Committee

		<ul style="list-style-type: none"> • key Queensland government agencies responsible for regulating coal seam gas activities in Queensland • independent experts from a broad range of fields (including geology, petroleum engineering, hydrogeology, surface water treatment, hazards and risks, Aboriginal heritage, economics and social impacts), some of whom provided advice to the Chief Scientist during the review • experts appointed by special interest groups who are opposed to the project. <p>The Department has also reviewed and applied the relevant findings of the following to its assessment of the Narrabri gas Project:</p> <ul style="list-style-type: none"> • the inquiries into unconventional gas activities that have been held in Victoria, WA and the NT since the Chief Scientist completed the review of CSG activities in NSW; • Bioregional assessment for the Namoi subregion of the Northern Inland Catchments bioregion, which provides useful baseline information on the land and water resources that could be affected by the NGP; • the research commissioned by the IESC on CSG activities; • the research prepared by GISERA on CSG in Australia, including the Narrabri region; and • the findings of the research on the potential health impacts of unconventional gas development in different jurisdictions across Australia and overseas. <p>The Department has recommended the establishment of an independent Water Technical Advisory Group to oversee the implementation of the project and provide advice to government.</p> <p>The Department will recover the costs associated with operating this body from Santos.</p>
13	<p>That government establish a formal mechanism consisting of five parallel but interacting steps. The five steps include.</p> <ul style="list-style-type: none"> • Companies or organisations seeking to mine, extract CSG or irrigate as part of their initial and ongoing approvals processes should, in concert with the regulator, identify impacts to water resources, their pathways, their consequence and their likelihood, as well as the baseline conditions and their risk trigger thresholds before activities start. These analyses and systems should be incorporated in project management plans to meet regulator-agreed targets. Appropriate monitoring and 	<p>This is either in place already or will be addressed prior to the commencement of the Narrabri Gas project should it proceed:</p> <ul style="list-style-type: none"> • full risk assessment has been carried out • detailed assessment of risks and potential mitigation measures has been provided in the EIS and other associated information provided by Santos • detailed baseline information has been gathered and will be enhanced prior to operations (if the Narrabri Gas Project proceeds) • Government is gathering additional information to supplement this baseline data, especially on the region's groundwater resources • the public has had access to all the available information and been given several opportunities to comment • independent experts have provided advice to the Department on key risks, and consulted with key stakeholder groups and their experts • the Department has consulted extensively with other jurisdictions, including the Commonwealth and Queensland.

<p>characterisation systems would be developed as part of these project management plans and then installed. The monitors would measure baseline conditions and detect changes to these, as well as providing data on impacts and triggered risk thresholds.</p> <ul style="list-style-type: none"> • Data from the monitors should be deposited (either automatically or in as close to real time as possible) in the State Whole-of-Environment Data Repository by all the extractive industries. Increasingly automated tools to interrogate data in the Repository should be developed, and these used to search data for discontinuities and compliance alerts. • As a separate process, the expert advisory body would examine on a frequent basis all data relevant to a region or a sedimentary basin. This data would come from a range of sources (the companies' monitoring data along with triangulation/cross validation data such as that from satellites, reports from local councils, seismic data, subsidence maps, information from cores, etc.). The expert body would use this data review to check for any factors signalling problems in that region and, if any are found, recommend to government the appropriate action to be taken with regard to the relevant parties. • In a parallel process, the government should commission, construct and maintain a variety of models of each region and in particular one that seeks to address cumulative impacts. These models should feed into the land use planning process and the activity approvals processes, and should assist in target setting for new projects. 	<p>If the Narrabri gas Project is approved, it will be subject to strict conditions (see above) requiring public reporting on performance.</p> <p>Given the limited scale of coal seam gas activities in NSW, there is no justification for the Government to develop detailed models of each subregion at this stage, particularly because no cumulative impacts are expected to occur as a result of the Narrabri Gas project or other resource projects in the Gunnedah basin.</p> <p>However, the Government remains committed to improving its understanding of the various sedimentary basins across NSW and the impacts of mining on these basins.</p>
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	<ul style="list-style-type: none"> government, working with other appropriate Australian governments, should commission formal scientific characterisation of sedimentary basins starting with the East Coast basins, and concentrating initially on integration of groundwater with the geological, geophysical and hydrological context. Viewing these integrated systems in models and in interpretation could be described as a 'Glass Earth' approach to understanding the dynamics of activities and impacts in the basins. 	
14	That government ensure that all CSG industry personnel, including subcontractors working in operational roles, be subject to ongoing mandatory training and certification requirements. Similarly, public sector staff working in compliance, inspections and audits should be given suitable training and, where appropriate, accreditation.	This is already in place, under the mine safety legislation, and will apply to the Narrabri Gas Project.
15	That government develop a plan to manage legacy matters associated with CSG. This would need to cover abandoned wells, past incomplete compliance checking, and the collection of data that was not yet supplied as required under licences and regulations. There will also need to be a formal mechanism to transition existing projects to any new regulatory system.	Not applicable.

16	That government consider whether there needs to be alignment of legislation and regulation governing extraction of methane as part of coal mining and the application of buffer zones for gas production other than CSG with the relevant legislation and regulation provisions governing CSG production.	Not applicable.
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Water Sharing Plans

Provide further details on the relevant water sharing plans for the region and whether any reviews of these plans are occurring.

Under the water legislation, Water Sharing Plans set the strategic framework for the management of each water source across NSW.

The key drivers for these plans are to:

- allocate water to users and set rules for water trading;
- protect the environmental health of the water source; and
- ensure the use of the water source is sustainable in the long term.

In general, they are reviewed and updated every 10 years.

To ensure consistency with the Commonwealth Basin Plan, the Water Sharing Plans relevant to the Narrabri Gas Project were recently reviewed and updated, and copies of the revised plans were published on the NSW legislation website in June/July 2020.

The revised plans included new sustainable extraction limits (Long-term Annual Average Extraction Limits – LTAAEL) for each of the groundwater sources in the region.

The table below summarises the maximum predicted water take from each of the relevant water sources relative to the sustainable extraction limits or LTAAEL.

This water take includes the direct take of water from the target coal seams, which forms part of the Gunnedah Oxley Basin (GOB) groundwater source, and the induced take of water from the shallower aquifers, which form part of the Namoi Alluvial and Great Artesian Basin (GAB) groundwater sources.

The direct take of water from the GOB groundwater source would be capped at 37.5 GL over the life of the project with a maximum take of 3.55 GL a year during the early years of the project and an average take of 1.5 GL a year. This take represents less than 2.8% of the sustainable extraction limit of the GOB groundwater source.

As there is limited demand for the water in this groundwater source, due to its depth and high salinity levels, most of this water (77%) remains unallocated. Consequently, Santos should have no difficulties in securing the necessary water licences to extract the water it requires from this water source.

The induced water take from the shallower aquifer is predicted to be very low (less than 60 ML a year) and to peak well into the future (200-250 years). This water would come from the Lower Namoi Alluvial (4 ML a year), Upper Namoi Alluvial (1 ML a year – from Management Zone 5), GAB Southern Recharge (57 ML a year) and GAB Surat (0.2 ML a year) groundwater sources.

This take represents a very small fraction of the sustainable extraction limit of each of these groundwater sources, ranging from 0.02 to 0.15% of this limit.

As the take of water from each of the groundwater resources is fully allocated, Santos would be required to obtain a water licence for the take of water from each groundwater sources on the open water market, and in accordance with the water trading rules in the relevant Water Sharing Plan.

Given the small amounts of water involved, the Department cannot see any reason why Santos would be unable to do this, and has recommended a condition (B28) which requires Santos to demonstrate to the satisfaction of the Planning Secretary prior to each phase of the project that it has adequate water licences to account for the maximum predicted take of the project (including both short term and long term direct and indirect water take) during that phase of the project.

Table 1 | Water Sharing Plans

Water Sharing Plan	Relevant Water Sources	Status	Predicted peak water take due to coal seam gas extraction (ML) ⁽¹⁾	LTADEL (ML) ⁽²⁾ / Peak Take % of LTADEL
<i>Upper Namoi and Lower Namoi Regulated River Water Sources 2016</i>	Lower Namoi Regulated River Water Source	<ul style="list-style-type: none"> Commenced July 2016 In effect until June 2026 	Nil	N/a
https://www.legislation.nsw.gov.au/#/view/regulation/2015/631				
<i>Water Sharing Plan for the Namoi and Peel Unregulated Rivers Water Sources 2012</i>	Namoi Unregulated Management Area comprising 26 water sources	<ul style="list-style-type: none"> Commenced October 2012 In effect until June 2023 Project area predominantly located within Bohena Creek and Bundock Creek Water Sources. 	Nil	N/a
https://www.industry.nsw.gov.au/_data/assets/pdf_file/0012/313500/namoi-and-peel-unregulated-rivers-ws-2012.pdf				
<i>Water Sharing Plan for the Namoi Alluvial Groundwater Sources 2020</i>	Lower Namoi Alluvial (LNA)	<ul style="list-style-type: none"> Commenced July 2020 In effect until June 2030 Replaced <i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2019</i> 	4	LNA 88,255 (0.00%)
	Upper Namoi Alluvial (UNA)	<ul style="list-style-type: none"> LTADEL effectively fully allocated across most management zones 	1	UNA total 123,403 (0.00%) UNA (Zone 5) 16,128 (0.02%)

Water Sharing Plan	Relevant Water Sources	Status	Predicted peak water take due to coal seam gas extraction (ML) ⁽¹⁾	LTADEL (ML) ⁽²⁾ / Peak Take % of LTADEL
https://www.legislation.nsw.gov.au/regulations/2020-346.pdf				
<i>Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020</i>	GAB Southern Recharge	<ul style="list-style-type: none"> Commenced June 2020 In effect until June 2030 	57	38,700 (0.15%)
	GAB Surat	<ul style="list-style-type: none"> Replaced the <i>Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008</i> GAB Southern Recharge LTADEL fully allocated GAB Surat around 70% LTADEL allocated 	0.2	43,446 ⁽³⁾ (0.00%)
https://www.legislation.nsw.gov.au/regulations/2020-354.pdf				
<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2020</i>	Gunnedah Oxley Basin MDB	<ul style="list-style-type: none"> Commenced June 2020 In effect until June 2030 Replaced the <i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i> Around 23% of the LTADEL allocated for stock and domestic and water licences. 	3,553	127,500 (2.8%)

<https://www.legislation.nsw.gov.au/regulations/2020-349.pdf>

- (1) Based on base-case water take of 37.5 GL water from the Gunnedah Oxley Basin MD Water Source which the Department has strictly conditioned (Condition A14) as the maximum take of water over the life of the project, including the water production profile used for the groundwater assessment.
- (2) Long-term average annual extraction limit (LTADEL) which also equates to the long-term average sustainable diversion limit of the Basin Plan under the Commonwealth's *Water Act 2007*
- (3) This is the minimum LTADEL currently set– the WSP allows for an increase subject to success of water savings from cap and pipe projects

Salt Management

Provide particulars of the storage and beneficial reuse of salt waste in the Queensland gas field context

The Queensland government has implemented policies encouraging the beneficial use of coal seam gas (CSG) water through the *Coal Seam Gas Water Management Policy 2012* (https://environment.des.qld.gov.au/data/assets/pdf_file/0034/89386/rs-po-csg-water-management-policy.pdf).

This policy is consistent with the NSW EPA's waste management hierarchy which would be applied to the Narrabri gas project, and includes a hierarchy for managing saline waste including:

- **Priority 1:** Brine or salt residues are treated to create useable products wherever feasible
- **Priority 2:** After assessing the feasibility of treating the brine or solid salt residues to create usable and saleable products, disposing of the brine and salt residues in accordance with strict standards that protect the environment.

The policy identifies management options and principles for salt and brine management options for beneficial reuse or disposal including:

- For beneficial reuse:
 - Identify potential uses; and
 - undertake feasibility assessment of potential uses
- For disposal:
 - demonstrate that all reasonable and feasible reuse options have been considered;
 - convert the waste to solid product where feasible;
 - undertake risk assessment of disposal options
 - dispose of brine and salt away from sensitive receiving environments and good quality agricultural land

The policy identifies brine injection underground and/or disposing of salt waste to regulated waste facilities as suitable options.

The Department has recommended conditions consistent with Queensland's approach to the management of waste and the waste management hierarchy outlined in the NSW Government's *Waste Avoidance and Resource Recovery Act 2001* which promotes avoidance, followed by resource recovery, followed by disposal options.

The recommended conditions include:

- **Condition B35** – Water Management Performance Measures for Salt Management requiring the proponent to:
 - maximise beneficial reuse of produced salt, as far as reasonable and feasible;
 - dispose salt waste not able to be beneficially reused to appropriately licenced waste facility
- **Condition B38** – Water Management Plan including:
 - Salt Management Plan including a program for investigating and implementing beneficial reuse options for the salt product, in accordance with the Produced Salt Beneficial Reuse and Disposal Study;
- **Condition B63** – Waste Operating Conditions including requirements to:
 - implement all reasonable and feasible measures to maximise beneficial reuse of waste;

- minimise the residual waste generated by the development
- dispose of all waste at appropriately licensed waste facilities;
- monitor and report on the effectiveness of waste avoidance, minimisation and management measures;
- *Condition B65* – Produced Salt Beneficial Reuse and Disposal Study including:
 - an assessment of reasonable and feasible beneficial reuse options;
 - strategy for maximising beneficial reuse for identified reasonable and feasible reuse options; and
 - a strategy for disposal of any produced salt that is not able to be beneficially reused, including demonstrating that occupiers of waste facilities can lawfully accept and will permit the volume and composition of salt waste.

Currently in Queensland, brine from the treatment of produced water is currently being stored in appropriately engineered storage ponds in accordance with Queensland’s regulatory requirements. As the brine is predominantly a chloride-based salt there are fewer beneficial reuse options than is the case for carbonate-bicarbonate salts that would be generated by the Narrabri Gas Project. The CSG companies

Secretary's Environmental Assessment Requirements

Provide details regarding how the Secretary's Environmental Assessment Requirements have been addressed by the Applicant

The Department undertook a comprehensive review of the contents of the Environmental Impact Statement (EIS) prior to accepting it for exhibition to ensure that it adequately addressed the Secretary's Environmental Assessment Requirements (SEARs), including the general requirements required under Schedule 2 Clauses 6 and 7 of the *Environmental Planning & Assessment Regulation 2000*.

In undertaking this review, the Department was satisfied the EIS addressed the SEARs and incorporated the relevant information.

However, consistent with other complex state significant projects of high public interest, throughout the assessment process the Department sought a broad range of additional technical information from Santos to address concerns raised in submissions, advice from agencies and independent technical experts.

This is consistent with the statutory process envisaged for State significant development under the EP&A Act.

All of this information was made publicly available on the Department's Major Projects Portal.

Appendix A of the EIS includes a complete list of the environmental assessment requirements and references to the relevant sections of the EIS wherein these are addressed.

This Appendix is available on the Department's website under "EIS" at <https://www.planningportal.nsw.gov.au/major-projects/project/10716>.