

SANTOS – Hearing Transcript

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10 March 2017

Darwin Convention Centre, Darwin

Speakers: Bill Ovenden, Rohan Richardson, Andrew Snars, Che Cockatoo-Collins

Bill Ovenden: Hon. Justice	My name's Bill Ovenden. I'm the administration Vice President at SANTOS.
Rachel Pepper:	Yes, thank you.
Andrew Snars: Hon. Justice	I'm Andrew Snars, the mariner regional manager in Roma.
Rachel Pepper:	Thank you.
Rohan Richardson: Hon. Justice	Rohan Richardson, drilling and completions manager at SANTOS.
Rachel Pepper:	Thank you.
Che Cockatoo-Collins:	I'm Che Cockatoo-Collins, advisor Aboriginal engagement for SANTOS Corporate.
Hon. Justice Rachel Pepper:	Thank you very much. Yes, please proceed.
Bill Ovenden:	Madam Chair, inquiry, panel members, thanks for the opportunity to allow us to appear at the hearing today.
	First of all, I'd like to acknowledge the Larrakeyah people, the traditional owners of the land upon which we meet. I'm joined this morning by Rohan. Rohan's just introduced himself, who's the drilling manager for the town of Brunell in the McArthur Basins key well, and we'll talk about more about the town of Brunell.
	Andrew Snars, as he said, is the mariner regional manager, he'll share some about Queensland unconventional experience with the panel, and Shay will follow with our engagement processes with the traditional owners in the areas that we're active in.
	It's actually a little bit of coincidence, and bear with me, but Rohan I think I only worked this out when we got here last night. Rohan was born in Blackall; Andrew comes from Augathella. I grew up outside of Blackhall and Shay grew up in Queensland as well, we have a real feeling for regional Queensland I think. At any rate let me on to more.

IN THE NORTHERN TERRITORY



Hon. Justice	I should tell you now I support the Blues so you could be in trouble
Nacher repper.	r should tell you now r support the blues so you could be in trouble.
Bill Ovenden:	SANTOS is a long lived leading natural gas company in Australia, we've got more than 60 years of responsible gas exploration. Develop and production across the nation. Over this time, we've successfully worked alongside Australian communities, traditional owners and landholders to our mutual benefit.
	Our connection to the Northern Territory goes back to our foundation in 1954. SANTOS is an acronym actually for South Australian Northern Territory Oil Search so we haven't just arrived on the scene in the Northern Territory. We've drilled over 4,000 onshore wells across Australia and over 40 of those have been in the territory. Hydraulic stimulation, or fracking activities are not new to the industry. Naomi mentioned that the practise has been around since the 1940's, it certainly has, it was first employed by us in the 60's and we've used it consistently since the 1980's to enhance oil and gas recovery. I've been listening to the inquiry over the last few days and well the last week actually and regardless of whether we hydraulically stimulate a tight sandstone or a shale in our processes, in a vertical or horizontal well bore the basic process and the objectives are the same. And that's to fracture the target rock to release hydrocarbons into the well bore.
	To date we've hydraulically stimulated over 4,400 intervals and approximately 1400 wells in south Australia, Queensland and the Northern Territory. Numerous reputable independent reports and inquiries have found that the technical process of hydraulic fracturing to be safe and sustainable when accompanied by operational capability, good management processes, and a robust regulatory framework. We appreciate that this inquiry is also about above ground interactions and community relationships and this is where much of our conversational focus will be today although obviously through question time I'm happy to answer any other questions that arise.
	We have two areas of exploration operations onshore Northern Territory, in the Amadeus space, and in the south where we're searching for conventional gas targets. That is reservoirs that will flow gas naturally to the surface without hydraulic stimulation, I want to make that point. In the McArthur basin in the north where we've identified the presence of large volumes of gas in shale reservoirs these are reservoirs that will require fracking to release that gas into a well bore. The area of focus for our exploration activities is clearly demonstrated by the distribution of area.

exploration activities is clearly demonstrated by the distribution of our seismic line coverage in our licences in the graphics that you should have received. They're the simple striations on the footprint of our licences. I'd like to emphasise how our footprint is mutually exclusive to national parks and reserves, they're embellished in green, in the graphics, and traditional sacred sites.



Crucially all of our activities occur only following extensive stakeholder interaction and accord. We acknowledge that we must have a social licence to operate in the specific areas where we have activities, and we have invariably actively pursued and almost invariably gained that licence. To investigate the social licence issue further let me turn briefly to an instance in our McArthur basin programme in 2014. We drilled a definitive well the Tanumbirini well located on the Tanumbirini pastoral lease and on native title land. Prior to drilling the well and substantially in advance of any proposed activities SANTOS engaged with both the station owners and the northern land council, which represents the traditional owners of the area in a respectful and constructive manner. An access agreement was negotiated with Tanumbirini station covering how we communicate, the timing of our activities, the location of infrastructure, compensation and conditions specific to the property. We upgraded farming infrastructure whilst we were on the property.

To date SANTOS has negotiated and executed 29 such conduct and compensation agreements with pastoral holders across our Northern Territory exploration permits without the need for third party intervention. If there ever was an issue that couldn't be resolved the Northern Territory has an arbitration process that involves all stakeholders, and that can take about three months. 90 days can add significant cost and delay to our programmes and our activities, but it does avoid protracted legal recourse.

You'll hear from Andrew shortly about our experience in Queensland, but in that state we have 1450 land access agreements for long term gas infrastructure. Our relationship with Tanumbirini station as in Queensland has been built on respect, honesty and doing what we say we're going to do. We know there's a push in some states for the landholder to have a right of Veto, it's been discussed again rather extensively this morning. We question the motive and the need for this. In the Northern Territory government approval is required for the start of any oil and gas related activity, will not be granted in the absence of an access agreement. I can dig into some specifics if you have any further queries on that later. Actually I'll also elaborate a little, we are also unable to engage in any activity without an upper clearance, and Shay'll talk about that more later.

Constitutionally the rights to the resources in the ground belong to all Territorians, statutory royalty streams flowing from successful resource projects go to the territories people through government funding, schools, infrastructure, roads, hospitals and the like. The traditional owners are also key stakeholders. Our relations with traditional owners are also founded on respect and a belief in the premise of self-determination. Shay will talk to you about our relationship with traditional owners in the McArthur basin and what we've done there and the importance of the informed consent that sits behind all our agreements.

In summary for me while it's early days, and actually we're far from a viable enterprise in our exploration in either the [inaudible 00:08:37] or the



McArthur we believe the unconventional resources of the McArthur basin		
offer an extraordinary opportunity for the territory. The basin has sufficient		
potential to provide gas for markets to the north and satiate east coast gas		
demand for many decades and that's certainly something that's very much		
in the press at the moment. That's for the benefit of all Territorians and		
many other Australian energy users, but the shell reservoirs must be		
hydraulically stimulated or fracked for this to occur.		

Economically success is about energy security, self-determination, long term employment, supply line business opportunity, royalties for infrastructure, hospitals and schools and local community investment. In the US advances in the fracking of unconventional reservoirs have created energy independence, stimulated economic resurgence, and a new wave of manufacturing and opportunity. Accompanied by a significant reduction in CO2 emissions. Emissions in the US in the first half of last year were at their lowest level since 1991. Having fallen about 13% from their peak in 2007 with a replacement of coal by gas and electricity generation the biggest factor in those reductions.

We understand that fracking activity should not be at the expense of the environment and Rohan will now touch on why well integrity lies at the core of a sustainable unconventional industry. Where potable water isolated behind proper cement, for example, is not exposed to produce hydrocarbons when there is well bore integrity. Essentially the result of appropriate design, reputable operatorship, and robust regulation.

Rohan Richardson: Thanks Bill. Hon. Justice **Rachel Pepper:** Yes. Rohan Richardson: We didn't want to spend too much time today on the technical aspects of drilling and fracture stimulation. Many of the panel have seen what we do and how we do it on the recent Cooper Basin field trip, we will include further details on these topics in our written submission. However, we felt it necessary to get the importance of well integrity on the record today. When effectively regulated and executed a properly constructed well is the key to addressing most of the subsurface environmental concerns raised by the community. Well integrity is about creating and maintaining well barriers through the life of the well. Wells are designed to completely isolate shallow formations particularly aquifers from the deeper producing reservoir. The well barrier

comprises of steel casing cemented in place. Both cement and casing are specifically designed for each well. The cement is lab tested prior to pumping and reviewed against the engineering design. Prior to fracture stimulation activities the well barrier is pressure tested to verify integrity and cement bond imaging is conducted to confirm cement placement.

My second slide shows the formations we encountered below the Tanumbirini station when drilling Tanumbirini 1 in 2014. It's important to understand depth and scale, the picture here is to scale and compares a conceptual horizontal shale gas well, which is the long line on the right, with a water bore on the left and not easily visible. There is 3,000 metres between the surface aquifer and the vale carry shale zone where we want to produce from. The impermeable rock in between forms a natural barrier, the fact that the hydrocarbons are still in place further demonstrates the impermeable nature of the barrier and it's for this reason that we need to hydraulically stimulate the shale to allow hydrocarbons to flow to the well bore and be produced. Madam chair and the panel, the point I want to emphasise this morning is that well integrity is a key safe guard to sustainable production of conventional and unconventional gas. In this regard, SANTOS has demonstrated long term capability. Thank you. And I'll pass over to Andrew. Andrew Snars: Thank you Rohan. As mentioned I'm based in Roma in the Maranoa Region and I'm responsible for the companies' landholder and community liaison teams. That we're cross natural gas operations throughout the Surat and Bowen basins. My background is in farming, I grew up out in the west and until recently had an interest in the grazing business which was in the middle of the natural gas fields at Dulacca just east of Roma. My whole career's been in agriculture and irrigation prior to joining SANTOS in 2009 and as such I have a strong understanding of how the agriculture and the natural gas industry interact. It's pretty well known that significant investment has occurred over the past few years due to unconventional natural gas developments in Queensland. The SANTOS led GLNG project alone has invested 15.4 billion dollars in materials and services from across Australia. Of that, 8 billion dollars has been spending in Queensland alone with more than 1 billion dollars spent in the regional areas. More than 10,000 people have worked on the construction operation of GLNG and many more suppliers and businesses have benefited. Unemployment in my home town of Roma has been low for many years and remains so. Recent government figures show the towns unemployment rate to be 1.9% compared to the Queensland average of 6.1%. Since starting work in the region GLNG has paid 63 million dollars in compensation to landholders hosting natural gas activities on what are mostly free held properties in our area. This compensation has not only safeguarded many many farming businesses during the years of sever drought. It has enabled them to actively grow and improve in that time. In other words, farms hosting natural gas activities are in a much stronger economic position today than they would have otherwise have been. In the community we've



invested 65 million dollars in regional projects and some examples are listed in the slide pack there. We've also invested over 140 million dollars in road upgrades and maintenance to date and this will continue throughout the project.

At SANTOS we believe that any good relationship is built on respect and openness and all of our dealings with landholders are based on this premise. Our landholder liaison team lives locally in Roma and comprised of locals who know the area and the people who live there. They understand the landholder's perspective what it means to run an agriculture business and the impacts that natural gas activities can have. We speak to landholders as early as possible in the process for example we're out there now talking to landholders about activities that aren't scheduled to begin for at least 18 months' time. We take the time to try and understand the unique characteristics of their properties, we look for homesteads, water courses, cultural heritage sites, land ways, cattle yards, and we then adapt our development plans in agreement with the landholder to minimise the impact of the infrastructure, as much as we can.

A good example of our commitment to open a thorough communication is through our ready reckoner, I have copies here which I will provide to the panel following this. The ready reckoner explains every possible activity that could occur through the exploration, development, production, and rehabilitation phases. The results of our approach speak for themselves, as Bill mentioned we have approximately 1,450 land access agreements in place with over 400 landholders in our region to place long term natural gas infrastructure on their properties. That figure is actually over 2,000 when we include agreements for short term activities such as exploration and securing pipeline easements.

When looking more broadly at the community relationships the principles of open and regular communication are just as important. A successful project requires commitment and input from all parties. Natural gas companies, governments, regulators, agriculture groups, community leaders, business leaders, and specialist bodies such as the gas fields commission in Queensland. Before a project begins it's also important to recognise the two distinct phases of activity. You've got the short term construction, and the long term operation and we need to prepare for them accordingly. While there are members of the community that still have questions and concerns about our industry I can say with confidence, based on my personal experience as a grazier who had gas companies working on our property, I can say that the agricultural and natural gas sectors can work together for mutual benefit, and I'm sure that Queensland will continue to provide a positive example to other communities considering hosting natural gas activities including those in the Northern Territory.

Thanks. Che?

IN THE NORTHERN TERRITORY



Che Cockatoo-Collins:

To the Larrakeyah, traditional owners, elders, and law people. Yes, my name is Che Cockatoo Collins and I'm the SANTOS advisor for Aboriginal engagement and like Andrew Snars was our pastoralist in Queensland, I'm the person on the ground working and interacting with the traditional owners directly affected and the land councils, the respective land councils. This is heading into my tenth year of the company, let me start with SANTOS's aboriginal engagement policy.

The Aboriginal engagement policy outlines our organisations commitment to working with Aboriginal peoples, communities in a way that respects aboriginal cultures. This policy has been contributed to and informed by the organisations aboriginal employees, and it is one that we endorse and one that we are very proud of. We are proud of it because its intent is genuine, and importantly it carries the full support and authority of our organisations executive. SANTOS's commitment to positive and proactive engagement with our host communities allows us to deliver mutual benefits to the communities in which we operate, as well as the company.

Our policy focuses on the elements of native title, cultural heritage, employment and training, enterprise development, community capacity and corporate social responsibility. Our approach is to engage early, and where appropriate use interpreters so communication can also take place in language, and to ensure our aboriginal stakeholders are fully informed and similarly so are we as to understand their concerns and interests. We work closely with traditional owners to identify and protect sacred sites, and other elements of significance for aboriginal people. Our approach is simple, identification, protection, and avoidance, this process ensures that traditional owners are engaged early and are indeed part of the planning of the project. This way we know very early the areas that need to be maintained as exclusion zones or sensitive areas.

In the McArthur basin all of our activities carry sacred site certification, all of our activities carry sacred site certification from the Aboriginal Areas Protection Authority, otherwise known as AAPA. So AAPA certification is the final approval we seek after carrying out extensive scouting and cultural heritage clearance work with traditional owners, who during these activities are supported by their statutory representative body, the northern land council. SANTOS has negotiated almost 50 agreements relating to cultural heritage, native title, and access to land based on early and fully informed consent without arbitration. We have not and we will not conduct activities until traditional owners have agreed to those activities, and sacred site certification is in place.

The photos on your slides are of a welcome to country given to us by traditional owners of that particular region in a visit to our McArthur basin sites. Traditional owners take very seriously as we are all aware, their responsibility of keeping people safe who are visiting on their land. Welcome to Country has been performed between different groups, so it's not merely a nicety or practise we conduct for non-aboriginal people it's



quite a significant practise of importance. The smoking ceremony, which you have in front of you, a couple of slides is about cleansing new visitors of spirits that may have travelled with them the ceremonial so is intended to keep those visitors safe, and for them to understand their responsibility in looking after the land.

When I explain this to my team, the SANTOS team I described it as an akin to a health and safety induction, and that works. In that particular welcome to country we had two of our workers who are on the night shift, that happened during the morning, everybody participated those two guys from Canada wanted to be involved, they wanted to be woken up so they could attend. We take that very seriously and we take that as a compliment for our staff understanding. The purpose of it is for those visitors to be welcomed and for them to return safely to their families. Both SANTOS and origin received welcome to country ceremonies which above all else should demonstrate to outside parties that there are traditional owners where known resources are who have been working in partnership with companies for many years, and who want to continue to work in partnership with industry.

So I make a plea that their rights are as much respected as the rights of those who wish to make an alternative decision. Indeed, it's what past elders, and only a few remaining with us today had fought long and hard for and that is the legislative right to say no, or in this case the right to say yes.

Thank you.

Rachel Pepper: Thank you. Yes, Dr. Jones

Hon. Justice

- Dr. David Jones: I have a question to Mr. Richardson. I know you said the technical details were a lot and you weren't going to talk much about them, but in many ways much of the community concern that we've heard seems to relate to this so called new practice of horizontal drilling, and that somehow that practise of horizontal drilling with fracking is very different in its risk profile to a vertical well situation in a conventional gas field. This is coming out as a really critical issue and maybe you could just elaborate on that issue of perception.
- Rohan Richardson: There's no difference. Technically executing the operation there's difference but from a risk profile zero difference. We have in the last five years, drilled three of five horizontal wells, three of those fracked in shale in the Cooper basin without an issue.
- Dr. David Jones: So there's this much longer pipeline that's involved, probably more multistage fracking involved I guess with the horizontal drilling. There's no increase in the risk profile as a result of the number of fracking stages that need to be done?

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Rohan Richardson:	No. I can't say that there's any increase in the risk profile, from the number of hydraulic stages that are executed.
Dr. David Jones:	Second question, relates to management of water and wastes which actually comes back as flow back water, and maybe Mr. Collins could perhaps comment on this. In previous works that I've done I've found that there can be a reluctance from some traditional owner groups, or aboriginal groups to allow waste from their land to be transported elsewhere. Have you detected any of that kind of sensitivity in your discussions?
Che Cockatoo-Collins:	No, but I would have no doubt that there would be that concern. What I'd say though in these circumstances, and which I've explained before we're talking about a particular group or lands trust which are made up of several family groups so if I'm talking to Professor Priestly about our activities and our activities impact directly on you and a portion of Dr. Becks than what we find are people in different communities talking, who are not directly affected wanting to know more. We understand that, but legislative requirements under the acts tell us that we are only to talk to the relevant people, the relevant people who are being impacted on our activities, and we're okay with that.
Che Cockatoo-Collins:	Did that answer your question?
Dr. David Jones:	One example could be for example if you produce a certain amount of waste water which needs to be managed free or handled and the treatment facility is on another groups country, how would you handle that?
Bill Ovenden:	Tanumbirini was certainly on another groups country because we had to truck our drilling fluids, our mud system back to South Australia, funnily enough, which seems almost incredible. We are looking at certainly investigating the option around recycling water, recycling drilling fluids, in fact we're doing that in our operations in the Cooper basin at the moment. It's certainly one of the avenues that we're looking at because it's a relatively straightforward process now to recycle drilling fluids and use them again and again. Ultimately we will comply with the regulatory impositions
Hon. Justice	
Rachel Pepper:	Dr. Beck, sorry professor, try that again. Professor Hart, and then Dr. Beck.
Prof. Barry Hart AM:	I'm seeking from you a little bit more clarity about the land footprint of the industry. We've got no clarity at the moment, so we've got situations where people are saying, it'll just be like in the US, thousands of wells all over the place. We had another suggestion that it was going to be a few, what's SANTOS's view as to where it might end up in 20 - 30 years? Crystal ball?
Bill Ovenden:	Yeah, okay, and it's never straight forward but if I go back to a slide Naomi put up where she mentioned there might be 18,000 wells in the Amadeus basin tacking an unconventional gas resource. In the Amadeus we're looking at as I mentioned conventional prospects so not unconventional plays and we would be targeting prospects that might be in the order of 200 sq.



Kilometres in terms of their subsurface aerial extent. We might over that 200 sq kilometre area, if we're lucky enough to be able to produce viable hydrocarbons from that field and we have a discovery, we might develop that field with something in the region of 50 to maybe even 200 wells.

That's what it might look like in the Amadeus, actually I always get hammered for saying Amadeus, I know it's Amadeus but it's just something that's been with me all my life I think.

Prof. Barry Hart AM: You are a Queenslander.

Bill Ovenden: I am. In the unconventional play one of the graphics we put in front of you shows our area of interest. It shows EP161 and it shows a pink area which would be our estimated extent of what might be viable and we're a long way from that as I've mentioned but what might be viable in the McArthur basin in terms of a subsurface target area. It doesn't look like much there, it's about 1800 square kilometres.

Our modelling at the moment, and it's all about the ability to evacuate molecules, and what we might get from an individual well bore, but if we're modelling something in the range of 3-4 terajoules a day coming from an individual frack well bore. A single horizontal section in a frack well bore, and our objective would be to take 300 terajoules a day to Queensland, for example, or to Darwin. Then we would require on average about 100 wells to do so, or 100 intersections of the reservoir to do so. As Naomi pointed out the technology now, in her octopus graphic I think she called it. We have the capability now to drill many horizontal sections from a single well pad, and reduce the surface footprint. If we've got 10 producing well bores on a single pad, then Barry we might have ... and we need 100 wells to produce 300 million cubic fields, 300 terajoules a day the maths are fairly straightforward.

- Prof. Barry Hart AM: And what's the...
- Bill Ovenden:10 well pads. Yeah, and you guys have seen what a well pad footprint looks
like.
- Prof. Barry Hart AM: What's the overall area we're talking about, your pink area?
- Bill Ovenden:The overall pink area which is ... actually has a phenomenal amount of
entrain gas associated with it in place is 1,800 sq. Kilometres.

Prof. Barry Hart AM: Thank you.

Bill Ovenden: Approximately.

Hon. Justice

Rachel Pepper: Yes, thank you. Dr. Beck.

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Dr. Vaughan Beck:	I think I've got two questions; one is a follow up question. The 300 terajoules per day, is that the estimate for the SANTOS production?
Bill Ovenden:	Yes. That's the sort of volume that we would be targeting over the next depending on how things pan out, over the next seven or eight years. To be moving to a facility that might receive that gas.
Dr. Vaughan Beck:	I don't have at hand, but Deloittes have done a report on the Billaboo basin, I'd be interested to get some commentary from SANTOS on the estimates that might be in the Deloitte report versus what you are expecting to produce.
Bill Ovenden:	What I'll offer there is a submission of, I mean the Deloitte's report doesn't perhaps have our detailed understanding of what we think is emerging, so there will be variances both in the number of wells and what might be required or supported and ultimately also in what they deem to be the economic benefit. We'll be making that a pretty intimate part of our submission to the inquiry.
Dr. Vaughan Beck:	Good, that's excellent. Thank you very much for that.
	Question to Mr. Richardson.
Rohan Richardson:	Yes.
Dr. Vaughan Beck:	You mentioned about a properly constructed well will isolate aquifers, so we understand that a properly constructed well will do that, but we have evidence from the United States most recently via the USA EPA report on hydraulic fracturing and the impacts upon drinking water that failures do occur and they've documented some of those failures. What we are looking for is whether we have to rely on the evidence that is coming from the United States, and whether there is any equivalent evidence in Australia and I just acknowledge that I've asked the same question of Origin Energy this particular issue. We're looking toward obtaining data which is relevant to Australia and secondly any commentary that SANTOS may wish to make in respect of the USA EPA report that was just recently published on the failures of wells and contamination of drinking water in the United States.
Dr. Vaughan Beck: Rohan Richardson:	You mentioned about a properly constructed well will isolate aquifers, so we understand that a properly constructed well will do that, but we have evidence from the United States most recently via the USA EPA report on hydraulic fracturing and the impacts upon drinking water that failures do occur and they've documented some of those failures. What we are looking for is whether we have to rely on the evidence that is coming from the United States, and whether there is any equivalent evidence in Australia and I just acknowledge that I've asked the same question of Origin Energy this particular issue. We're looking toward obtaining data which is relevant to Australia and secondly any commentary that SANTOS may wish to make in respect of the USA EPA report that was just recently published on the failures of wells and contamination of drinking water in the United States. Okay so address the first question. We have, like Bill said, over 4,000 wells in the Cooper basin, 1500 independent frack jobs and not one primary barrier has ever failed throughout pumping a fracture stimulation job. To my knowledge we have not had a primary barrier failure onshore Australia through fracture stimulation when executing the job.
Dr. Vaughan Beck: Rohan Richardson: Dr. Vaughan Beck:	You mentioned about a properly constructed well will isolate aquifers, so we understand that a properly constructed well will do that, but we have evidence from the United States most recently via the USA EPA report on hydraulic fracturing and the impacts upon drinking water that failures do occur and they've documented some of those failures. What we are looking for is whether we have to rely on the evidence that is coming from the United States, and whether there is any equivalent evidence in Australia and 1 just acknowledge that I've asked the same question of Origin Energy this particular issue. We're looking toward obtaining data which is relevant to Australia and secondly any commentary that SANTOS may wish to make in respect of the USA EPA report that was just recently published on the failures of wells and contamination of drinking water in the United States. Okay so address the first question. We have, like Bill said, over 4,000 wells in the Cooper basin, 1500 independent frack jobs and not one primary barrier has ever failed throughout pumping a fracture stimulation job. To my knowledge we have not had a primary barrier failure onshore Australia through fracture stimulation when executing the job. So you'll document that in your

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Dr. Vaughan Beck: Hon. Justice	Thank you.
Rachel Pepper:	Thank you, yes.
Dr. Vaughan Beck:	Can I just follow up? We do have evidence of these failures in the United States so I invite SANTOS if they wish to, to provide commentary on that data.
Rohan Richardson:	So I'm not across that data, what I can state is that from fracture stimulation through the next 20 years of producing the well or the well life, we have maintenance programmes in place routinely every year to confirm and reassure ourselves of the original design as still in place. Through the shallower formations where we have aquifers present we have two barriers in place. Should the primary barrier for any reason not be in the same integrity or state that we originally set that well in place, we would go in there and intervene and restore that to original condition of the design.
	The total primary barrier failures in the Cooper is less than half a percent and there has, to my knowledge been no secondary or environmental impact as a result of well integrity in the Cooper basin.
Dr. Vaughan Beck:	Can I just follow up, how do you know whether there has been a primary failure, and then what's the method of detection?
Rohan Richardson:	It's a good question. Primary barrier we can tell from the annulus, or the surface casing void, so if pressure is going from your primary casing string to the secondary, pressure is immediately detected and again our asset integrity monitoring system will pick that up immediately and allow us to restore the condition of the well back to original design. We can also intervene on the inside of the pipe with various pressure testing and logging tools to determine the status of the pipe throughout its well life, and that includes wall thickness and any other deterioration that may occur.
Dr. Vaughan Beck:	Thank you, so if you could put some of that information to us in your submission.
Rohan Richardson:	We'll include that in our submission.
Dr. Vaughan Beck: Hon. Justice	Thank you very much.
Rachel Pepper:	Yes, Ms. Coram.
Ms. Jane Coram:	Well thank you, that was pretty much my question, but I'll try another one. You made the comment that whilst you're still in an exploratory phase you believe these Amadeus, and McArthur basins are highly prospective. You cited the possible benefits for Territorians and Australians, but the feedback that we've received in the course of this week has been very strongly that there's a concern that the benefits are actually not for Territorians and that the gas supplies will be exported overseas. How confident are you that

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Hon. Justice



where the gas will end up? Will it end up in Australia, or is it more likely to go overseas?

Bill Ovenden: You know again, it's a bit of a crystal ball thing but certainly what we're seeing at the moment is a lot of issue around gas supply ... well the emergence of concern around gas supply to the east coast, domestic gas markets. Where there's a market, we're happy to supply. If we can ... we're not doing it for the, let's say we'll be doing that on behalf of our shareholders but we're very, very comfortable and we've done it for many many years. Supplying gas into the domestic market the scale ... when we haven't achieved a viable threshold, we're a long, long way from it in the McArthur, but I do believe the potential is there to not only and I think I said it in my sum up, I know I said it in my sum up. If the basin is working the way, we think it can it's an irrelevance as to whether it's supplying to LNG or domestic gas because the quantities of gas that are able to be delivered from the resource will meet all requirements.

Dr. Vaughan Beck: Irrelevance to you, not necessarily.

Bill Ovenden:No, no I mean the volumes are such varied that the demand can be met, and
in fact obviously if the supply is of that scale than that puts a lot of pressure
on gas price, and pushes it down and energy becomes more affordable.

Rachel Pepper: Yes, Professor Priestly last question.

Prof. Brian Priestly: I'm struck by the dichotomy between the success you've claimed in regard to negotiating the land access where you've talked about over 1,450 agreements and the submissions and comments that have been made to the inquiry from landowners which have been very largely highly negative. Are you suggesting that SANTOS has a different approach to other companies or is this simply that some landowners have such concerns that they're not going to be able to reach agreement no matter who they're negotiating with.

Bill Ovenden: Yeah I think that's potentially an outcome, I mean we have an Abu Dhabi landowner, a large Abu Dhabi landowner in the Amadeus basin and we have been unable to achieve a land access agreement with that Abu Dhabi landowner, or leaseholder and we are not working on his property. It's sitting in the middle of our lease and we have regulatory compliance issues around our lease. You have committed yourself to do this work, SANTOS, but we can't get access. We're not going on that land, ultimately there has to be ... I mentioned we have to have a social licence and we have to reach accord, and there will always be people who are either philosophically opposed to the fossil fuels industry or opposed to us entering their leasehold position.
Hon. Justice

Rachel Pepper: Thank you very much gentleman for appearing today. Thank you.