



Pangaea NT – Hearing Transcript

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10 March 2017

Darwin Convention Centre, Darwin

Speaker: Tim Radburn

Tim Radburn: Good evening Madame Chair and panel members. Firstly, I'd like to acknowledge, the traditional owners Larrakia people, on whose lands in which we meet this evening.

I won't be too boring. I hope to get through some material. I've got a few products that I've placed in front of you with some pictures. Hopefully this stays fairly light for this late at night.

I'd also like to acknowledge the great many traditional owners with whom we have worked, trained, and collaborated closely with in conjunction with the Northern Land Council's support and guidance over the years. As I said, the three supplements that I've given as reference, which I'll speak to, but I'll mostly be referring to the slide pack that you've got in front of you throughout this. I'll refer to it by page number and expand upon it throughout the presentation. But make it clear that I'm not a petroleum engineer, nor geoscientist, so I would like to focus this presentation toward the presented material please.

I do have a support-based positions of SANTOS, Origin, and APPEA, they mentioned this morning, with regards to the technical aspects of the below ground management of our industry, and I'm also prepared to take on advice for return through our submission and further expansion around the economic benefits if required of our position in Northern Territory, or indeed the below subsurface technical aspects, from which our team at Pangaea has, and our partners have, over 10,000 shale stimulations' worth of experience.

Pangaea was established in 1997 and is a private independent Australian company, with a diverse portfolio of oil and natural gas interests across onshore Australia. We employ a collaborative best practise approach in all our business interests, and believe stakeholders, including our employees, partners, local communities, service providers, government and regulatory bodies all have the shared objective of safely developing Australia's energy resources.

Since commencing work in the Beetaloo Basin in 2013, we have undertaken major exploration work programs in our tenements, and have more than doubled our government committed work program commitments. Our



technical focus of the last several years has centred on the unconventional potential of the McArthur and Roper Basins, the accumulated knowledge that we have gathered through seven wells, 1800 kilometres of 2D seismic, 29,000 kilometres of airborne gravity, 3,539 metres of core extraction. LiDAR survey across our entire acreage position, and two vertical well stimulations has systematically, scientifically allowed us to define areas for development and production, and provide focus for additional exploration and appraisal.

In 2016, we lodged our discovery notice with the Northern Territory government, which was subsequently immediately accepted.

What I might do now if I may, is outline our operational model, which I'd like to basically focus on for this presentation, of how we have tailored our business development in the Northern Territory. Which I and our partners, our Northern Territory business partners call the NT Way.

We understand that any successful enterprise starts with people and relationships, and this must have a long-term "begin with the end in mind" approach. We have approached our community integration from working alongside traditional owners, using local content, employing pastoralists or their equipment, developing local businesses, QHC processes, topographical environmental baselining completed by local contractors who understand the environment in the Northern Territory, and not only its extremes, but also its one in 50/100-year event cycles.

Pastoral liaison and counsel based on local pastoralists' recommended approach techniques and senior business territory veterans, are our daily practise in the Northern Territory.

With regards to the slide pack, I'll refer to now slide four. This is the front page of the Natural Gas Industry Information Seminar. The next few slides are direct excerpts from a highly technical industry best practise information briefing pack, which Pangaea led across the water, Northern Territory community last year predominantly, and was widely advertised and supported by local businesses and industry groups alike. Origin, SANTOS and APPEA also participated, and it was hosted jointly by the NT Chamber of Commerce and Katherine Mining and Services Association.

The presentation incorporates in fine detail all aspects of our highly specialised industry, in a consolidated format which can be delivered in our bespoke format further throughout the year to the panel, if and when required.

Slide five I'll refer to on the left-hand slide in your deck, is an editorial in a local indigenous news publication outlining the merits of an indigenous training employment program that we stood up, based on our training methodology of "raise, train and sustain." I've also provided you with a copy of the program synopsis for your review, for your reference. Prior to the moratorium being announced, we had successfully trained 20 traditional



owners from communities within our tenement holdings, through all local nationally accredited trainers and assessors, and local businesses, and three of them were offered full time employment with our local business contractors.

We had agreements and contracts in place with local business to continue our infrastructure and surface development works, creating a "raise, train, and sustain" continuity business model. We had predicated this being based off a significant infrastructure development project which we had worked with Northern Territory government, with multiple agencies in the Northern Territory government over a 12-month period to see its realisation, and that was the sealing of Western Creek Road, which would have given 13 cattle stations all-season access.

All graduates who's completed this initial programme left our program with police checks, drug checks, completed CVs, next stage employment recommendations and nationally accredited civil earthworks competency certificates. They also all left with tens of hours each, in up to six different heavy pieces of machinery and multiple vehicles.

The 2IC the Northern Land Council quoted at the time as she handed each graduate their certificate on our graduation day, "I'm here today with Pangaea as partners to a project that has delivered exceptional outcomes. These outcomes I have overseen over so many years, are aspired to be met by many companies, yet very few companies deliver. In fact, when I first met with Tim and the Pangaea team, and we discussed the yearlong project, I quietly thought that he may be a little ambitious with it, but he and the men standing here today are testament that they have proven me wrong, and I have to say, this does not happen too often. Today's a great day. Congratulations Graduates."

The right side of slide five is a government TV advertisement that ran in 2014, featuring one of our pastoralists at the bottom right, who was also interviewed and whose interview was made public on the internet.

Slide six is a micro benefits and impacts slide. On the left hand side, it lists a number of local employment opportunities, which we have employed contractors and local businesses on over the last few years. We have not flown in any support for any of our operations, and this is obviously quite early in the exploration phase, so that is all still to continue and develop from, but that's just what has happened thus far.

I've drawn an analogue of what the footprint looks like for a seven year development program. I know this has been a contentious point throughout the week and it's been discussed in various forms, but I'd just like to give you our view, and it's an analogue only, of what seven-year development program looks like.

That white box that's on the image there, that is an outline of a standard cattle station in the sturt plateau where our tenements are. The blow-up of



the box on the left is a 200 by 200 shale well, and off on the horizon of that access track stemming to the north there, where that track meets the horizon limit, that is a 3.5 kilometre mark. You can clearly see that it is not a spider web of surface disruption.

Let's say if you need one TCF of gas. At each well, call it eight BCF average at the wellhead, that equals 120 wells. For 12 well pads, that equals 10 pads, that's eight pads at 3.5 kilometre spacing, which equals a small footprint. And as I said, that image that I've got there is to scale. Each of those small red dots is a pad, and you can see that you can't actually see 3.5 kilometres away. Down on the Sturt Plateau where those image is taken from.

Something that we're quite comfortable talking to or submitting further if required, industry development's based on it being a technically led industry. The industry developments last year alone were significant in the shale industry in the United States. I won't go into any further detail here now, but they were forced upon companies due to low oil prices, etc., but they were significant. They were significant in reducing surface footprints, etc.

Next slide seven. There is two IT videos getting around last year, I'm sure you saw them televised. There were two advertisements. It was a gas and graziers advertisement. The man pictured there is one of our pastoralists, and we do a significant amount of work on his cattle station. The jobs to lift community's advertisement, you can see the image there, a lot of those images are what was based on our indigenous training and employment programme, also.

That's not to say we have had a smooth ride the entire time we have been up here. When we first started in 2013, and indeed we are facing an uphill battle. However, through discussion and agreement to a few key principles with all of our pastoralists, 24 of whom were involved at the table at the time, we agreed on a few key principles such as a fair day's pay for a fair day's work, various things around fencing, gates, third-party weed inspections, water descriptors, cattle operational non-disruption detail and inspections amongst others. We have reached a mutually beneficial public benefit position, within our access in compensation agreements.

Slide eight. We have completed significant and extensive environmental surface and subsurface hydrology assessments. We have completed significant flora and fauna characterization reports. They are lengthy and detailed documents. They are based on everything I said before. Local environmental consultants who understand the topographical environment up here, who understand the one and fifty hundred year events, and have based their risks and analysis points of view from that.

We've also done significant downhole water bore baselining, so standing water level baselining and chemical composition baselining. We have provided all of this detail to the Northern Territory government over the



years as we've been doing it, and quite comfortable to provide that to the panel, at any point.

Slide 10 on your pack. Just a few of the local companies and contractors that we have worked with. My final slide, slide 11, is just something I've inserted this afternoon. There was a question I think this morning to Matt Doman from APPEA around some further detail of the potential of the Deloitte economic imperatives. I've just included in the information that I've given you, a printout of a energy news bulletin release that was published a week or so ago, on the VacaMoto shale in Argentina. There's two points I want to make here, two points of clarity, because this is a contemporary, recent "now" analogue. It's based on a seven/eight-year timeframe, which is comparative to what we're looking to the Beetaloo Basin. It is based on a shale of thickness, area, scale, and depth similar to what we're looking at here in the Beetaloo Basin, and it says at the seven-year mark from first horizontal well being fracked and stimulated, that there is committed capital this year alone in 2017 of \$5,000,000,000, followed by \$10,000,000,000 the following year in 2018.

You can also see the scale footprint almost identical to what we're facing in the Beetaloo, in those images.

Thank you very much.

Hon. Justice
Rachel Pepper:

Thank you very much. The studies that you refer to at page eight or slide eight, you're happy to make those available to the inquiry?

Tim Radburn:

Absolutely.

Hon. Justice
Rachel Pepper:

Thank you. If you could do so in due course, that would be of benefit, and indeed, anything else you wish to put in front of the inquiry, any other economic modelling you've done, or I think you referred to some subterranean technical details as well, or information that you may have, again, I would urge you to furnish that to the inquiry.

Tim Radburn:

Absolutely.

Hon. Justice
Rachel Pepper:

Yes. Professor Priestly.

Prof. Brian Priestly:

I guess just to get some clarity on that particular issue about the baseline data, we've had a number of submissions, which you said that there is no baseline data available. The studies that you've done, are they only being provided to the Northern Territory government so far?

Tim Radburn:

They have.

Prof. Brian Priestly:

So they're not actually public documents, per se.



- Tim Radburn: Correct.
- Prof. Brian Priestly: Presumably, they would become public documents if they are lodged in our website.
- Hon. Justice Rachel Pepper: Yes, they will.
- Tim Radburn: Correct.
- Prof. Brian Priestly: Thank you.
- Hon. Justice Rachel Pepper: Thank you.
- Tim Radburn: Yeah.
- Hon. Justice Rachel Pepper: Ms Coram. Please go on.
- Ms Jane Coram: I'm starting to feel a bit like Alice in Wonderland. I keep hearing conflicting reports of no indigenous engagement, pastoralists don't want fracking, there's no environmental baselines, and no local employment, and on the other hand, I'm hearing exactly the opposite. So we're obviously on a truth-finding mission here as well as a science inquiry.
- But specifically in relation to your surface and groundwater characterization and the flora and fauna characterization, could you provide a little bit more detail around how long you undertook those investigations for how comprehensive they were, what sort of considerations you took into account in your study design?
- Tim Radburn: Yeah. They are significantly extensive. They went for 12 months. We gave our local environmental contractor, who was the government environmental contractor, a choice at the time, what we saw as the most highly respected, etc., and the most qualified. We gave them, I gave them open mandate to set the scope of work under any form of social environmental water, they had free rein to set the scope of work, to set a baseline in environment report for our region. They provided me a very extensive scope of work, and they were left to carry that out how they saw fit over a 12-month period.
- Hon. Justice Rachel Pepper: Yes, Professor Hart?
- Prof. Barry Hart: So could I just clarify that on slide two, so those baselines they counteract each of those four EPs of yours?
- Tim Radburn: Sorry, which slide?



Prof. Barry Hart: Two.

Tim Radburn: Yeah, sorry.

Prof. Barry Hart: I'm just trying to get the scope.

Tim Radburn: We have only been operating in EP 167, 168, and 169. So it's 67, 68, and 9.

Prof. Barry Hart: So those three?

Tim Radburn: That's right. Correct.

Prof. Barry Hart: That was the baseline.

Tim Radburn: Correct. That entire region. That's right.

Prof. Barry Hart: Right. Okay, thank you.

Hon. Justice
Rachel Pepper: Yes, Dr. Jones.

Dr. David Jones: I'm just looking at how comprehensive the work quality, so the baseline was, were all parameters looked at, including hydrocarbons and radon, and those sorts of things?

Tim Radburn: In the water chemicals

Dr. David Jones: Yeah.

Tim Radburn: Assessments? We have tests on, I can't remember exactly, the chemicals that are in the list. They are ALS chemical composition listing, and there are, I can't remember every single one, but they are extensive, they're ALS certified. A list of testings tests for everything that we use, everything we expect to use. They are done pre, during, and post all our operations throughout a dry season or operational use cycle, and we started them prior to us working. So we have them pre us commencing.

Dr. David Jones: Ok I'll pick that detail up from the documentation when you submit it.

On a different issue, talking about your indigenous training program and other things, what effect has the implementation of the moratorium had on ongoing engagement of the local community and employment and general attitudes in the community?

Tim Radburn: I'll do my best not to speak on behalf of anyone. My observation's are that with the training employment program that we set out, I think I mentioned a couple of the graduates from that were given full time employment with one of our local contractors. The intent of that was to carry on through our infrastructure construction projects for the following year, and in



conjunction with that, we were going to start to run these training cycles throughout a full dry season, to be employed throughout the next year. So that all stopped.

The sealing of the Western Creek Road stopped. We had submitted that was real. All these contracts were real, that was submitted to the government. Our environmental management plans were all submitted and we were ready to go, and they were all stopped, so to follow one from who was involved with that with our local businesses is off the back of that.

Hon. Justice
Rachel Pepper:

Yes, Dr. Beck.

Dr. Vaughan Beck:

I recognise that you put some caveats on your expertise at the beginning of the presentation, but following the presentations by both Origin Energy, and SANTOS, we just wanted to acknowledge that the community have been very concerned about spills and leakages and contamination of drinking water. The panel is looking to obtain any data that's applicable to Australia in terms of the frequency of spills and contamination. So if your company can provide any information along those lines, we'd be most grateful. And there has been a recent report prepared by the United States EPA on the contamination of drinking water in the United States. Now that report notes that there's not systemic failure of wells and spills, but it does note that there have been instances of contamination from a variety of causes. And we have invited both Origin and SANTOS to provide any commentary on that report, and we'd like to do the same with you as well.

Tim Radburn:

I appreciate it. Thank you. Yeah, we will.

Dr. Vaughan Beck:

Thank you. Any comments and feedback, we'd be most grateful.

Tim Radburn:

Acknowledged.

Dr. Vaughan Beck:

Yeah. And the context of that is the concerns of the community here.

Tim Radburn:

I understand. No problems at all.

Hon. Justice
Rachel Pepper:

Professor Hart.

Prof. Barry Hart:

Just to clarify your last slide, the comparison with the Argentinian situation, what were you trying to get at there? What one well pad should look like, or what you'll do in seven years?

Tim Radburn:

No, absolutely not. So the comparisons of the development and the wells is not the point. It's just a recent analogue of shale, a recent shale analogue of time and when the funds get committed so this morning the question was asked, "something more from the Deloitte Access Economics report that we can look to," that is the most recent example that I can think of. It was



published a number of weeks ago. It's just similar to the Deloitte Access Economics metrics that they used.

Prof. Barry Hart: Okay, thank you. Good.

Dr. Vaughan Beck: While were looking at that photograph in Argentina, I think you mentioned before that it was about 3.5 kilometres basing and you were planning to be a development program, which would lead to about 3.5 kilometre distance between well pads. What's the projected distance between well pads in Argentina?

Tim Radburn: Unsure.

Dr. Vaughan Beck: Right.

Tim Radburn: Unsure. So when we get down to that sort of detail, it's dependent on things that arguably may not be similar to our rock mechanics, volumes, access to reservoir content, etc.

Dr. Vaughan Beck: Right. Okay. I know you said some data at the beginning, and I started to write it all down, but I couldn't follow you. Can I just take you back where you said, "If there was one trillion cubic feet," and I lost the next few lines before, would you mind just taking me through that please?

Tim Radburn: No problems, yep. This is based on our development analogue, and it's all in row.

Dr. Vaughan Beck: ya, mm-hmm (affirmative).

Tim Radburn: So if we needed one TCF of gas, at each well producing say eight BCF on average,

Dr. Vaughan Beck: At each ...

Tim Radburn: Each well producing eight BCF average,

Dr. Vaughan Beck: Okay, yeah.

Tim Radburn: That equals 120 wells, for 12 well pads,

Dr. Vaughan Beck: Mm-hmm (affirmative).

Tim Radburn: So we're basing on 12 well pads.

Dr. Vaughan Beck: Yes.

Tim Radburn: That equals 10 pads, so eight pads at 3.5 kilometres is a very small footprint.

Dr. Vaughan Beck: Good, Thank you very much for going back for that.



- Tim Radburn: So yeah, depending on what the gas requirement is.
- Dr. Vaughan Beck: Yes. I understand.
- Tim Radburn: Sure.
- Hon. Justice
Rachel Pepper: I don't know whether you've been following earlier this evening's presentations, but the NT Cattlemen's Association has said that at least one of the things that they'd be looking for in regulatory reform, would be a right of veto. What would your attitude be to that?
- Tim Radburn: I don't think there's a requirement for right of veto based on our experience in the Northern Territory. We have managed to get to a negotiated position of mutual benefit. And have enjoyed working with all of our stakeholders. It has actually been very enjoyable. We have seen the local community, and our immediate contact with pastoralists, their families alike being overly beneficial. It has benefited these stations. We have put in significant improvements to their cattle stations and the operations of their businesses. So it has been enjoyable from that aspect, as much as anything.
- Hon. Justice
Rachel Pepper: So your attitude that there is no requirement for right of veto, is that and again please correct me if I'm wrong, effectively saying you don't need it, because it's not required? Or it's not justified rather, because it's not required?
- Tim Radburn: It's not required because we have, in our experience, managed to get an agreed position through negotiation.
- Hon. Justice
Rachel Pepper: You'd be losing nothing then, if you accepted a right of veto.
- Tim Radburn: We don't think it's a requirement to have a right of veto.
- Hon. Justice
Rachel Pepper: It's certainly not a requirement, but were it a requirement, based on what you've said, presumably, if it's not needed because you're able to negotiate sufficient access, then you'd be giving nothing up by a right of veto being imposed on you.
- Tim Radburn: I think the question asked also this morning was, when a right of veto may come into effect, so I think there's a lot of grey area around what the definition of right of veto is, at this point. So at this point, I'd suggest that it's not a requirement, from our experience. The current regulation and legislation, as it stands now, works, and throughout the exploration phase, is sufficient.
- Hon. Justice
Rachel Pepper: Okay.



- Dr. Vaughan Beck: Can I just follow up, just on some detail. I think you mentioned in McArthur Basin, maybe the Roper, that you'd drilled seven wells since 2013, so the Beetaloo, right?
- Tim Radburn: Right.
- Dr. Vaughan Beck: So how many pastoralists have you had to negotiate with for those seven wells?
- Tim Radburn: In 2013, we signed 24 access agreements for 20, I might be off by one or two here, but it's on an average of 13 since that point, so the 2013 24 access agreements was based on us doing the 2D seismic, which was over an extensive period. And then as we narrowed our scope down further. We've averaged 13 pastoral access agreements for each stations that we've accessed since then. We have not had complications with any of our stations.
- Dr. Vaughan Beck: So when you say more recently 13 access agreements, that's with 13 pastoralists.
- Tim Radburn: Correct.
- Dr. Vaughan Beck: Okay. Thanks for that.
- Tim Radburn: Individually negotiated based on circumstances, and their operations and ours, and ...
- Dr. Vaughan Beck: Yes, and of those 24 plus 13, they were included in those seven wells that were being drilled then?
- Tim Radburn: Correct.
- Dr. Vaughan Beck: Thank you.
- Tim Radburn: This is following, mind you, our traditional owner work program on country meetings, scouting, and our program being amended as required, based on those meetings as well. So we do that first, that process is first, and each time we have those work program meetings, there's in excess of between 80 to 100, 120 TO's at those. Then we get the affected TO's, seniors in the scouting work program detail, and then we go out on country, we drive around, we fly around, we go through and explain until everyone understands it. Then if amendments are required to our operation, we make those, and then we go to the pastoralists and then go through the access agreement process. In that order.
- Dr. Vaughan Beck: Okay, if you wouldn't mind,
- Hon. Justice
Rachel Pepper: No no, sir.



- Dr. Vaughan Beck: When you're having discussions with aboriginal communities, are you using an interpreter? How do you go about engaging with them?
- Tim Radburn: So we have worked closely with the NLC anthropologists and staff, over the years, and in timings recommended by them, we approach TO's and the NLC coordinate those
- Dr. Vaughan Beck: So, I'm losing it. TO's?
- Tim Radburn: Traditional owners.
- Dr. Vaughan Beck: Oh, I see. Okay.
- Tim Radburn: The NLC coordinate the effective traditional owners to work their specific work program meetings. And we carry on from that point.
- We haven't needed interpreters. We have the NLC anthropologists and staff up with the senior TO's in our meetings, at the front. We describe and we talk and it goes on, and it's mediated as such, and explained by the anthropologists. We just go at the pace required. We haven't needed interpreters.
- Dr. Vaughan Beck: Thank you for that.
- Hon. Justice Rachel Pepper: Yes, Ms. Coram.
- Ms Jane Coram: I may have missed this, but I'm assuming you haven't actually fracked the horizontal well that you've drilled, is that correct? Or you did frack it?
- Tim Radburn: We haven't drilled any horizontal wells. We've vertically stimulated two.
- Ms Jane Coram: In the Valkyrie shale, it says the first horizontal well drilled and tested in 2016.
- Tim Radburn: So the Valkyrie is the shale target on the Beetaloo Basin. That was Origin as well.
- Ms Jane Coram: Oh, okay. Sorry, I misunderstood. Nonetheless, in your planning, where would you be sourcing the water and the sand from, were you to go ahead with development of the gas resources?
- Tim Radburn: Well we're looking at options. We have intersected a Jamison sandstone which shows potential at this point. We've only intersected it in one location. We've gathered preliminary information around what that looks like, it looks prolific at this point. Other companies may or may not have intercepted sandstones as well that holds prolific water sources. They have potential once we get underway again.



Indeed, the program that we put on hold in 2016, that we had seen as part of our operational program, was to shoot a 3D seismic survey over our region, and that would have identified further detail on that, as would have the additional penetrations into it, because we could have targeted that region specifically. So it looks like, at this point, there may be other sources there, but it needs further work.

Hon. Justice
Rachel Pepper:

Yes, Dr. Jones.

Dr. David Jones:

Just following up on that particular item about the sandstone. Is that potable quality water, or is that more saline water that wouldn't be suitable for other uses?

Tim Radburn:

There's a cattle station in our region that is supplying cattle from it, we think, based on the depth of what his bore's at. One of our drillers actually drunk the water, he's fine.

Dr. David Jones:

The reason I asked that question is because the community has expressed a preference for non-potable waters to be used for this particular purpose. If you've got a potable water source, and it might be a big resource, but you just need to think about in your planning, the quality of that water and what its other uses might be, in terms of potential competition. That's a sensitivity we've picked up.

The second thing was, you said you've done seven vertical wells. Two have been fracked?

Tim Radburn:

Correct.

Dr. David Jones:

With the chemical measurements that were made in the baseline studies, I think you said that you had before and after measurements of water, or the monitoring was done during it?

Tim Radburn:

Correct.

Dr. David Jones:

And flow back water's being characterised as well.

Tim Radburn:

Correct.

Dr. David Jones:

Okay.

Tim Radburn:

All right. No, not flow back water, no. So, we have, yes, we've tested the flow back water, but of our chemical composition and standing water level baseline tests, they have been done down bores with electronic water loggers, etc., of their regional effects.

Dr. David Jones:

Ok, so it was more physical measurements, rather than the chemistry, in that sense.



Tim Radburn: Correct, yeah.

Hon. Justice
Rachel Pepper: Anything further?

Thank you very much, Mr. Radburn, for attending this evening. It's much appreciated, and we look forward to the additional material that you'll submit.

Tim Radburn: Thank you.

Hon. Justice
Rachel Pepper: Thank you.