

# Surat Gas Project

## Community information sessions 11-15 November 2013

### Introduction

In November 2013 Arrow Energy (Arrow) held a series of community information sessions to provide an update on the Surat Gas Project. Questions and answers from those sessions were captured by consultants JTA Australia and are presented in this document.

These meeting notes reflect the questions asked and answers provided during the information sessions. While the notes include some paraphrasing and summarising, every effort has been made to preserve the integrity of the discussions.

Questions varied across the five sessions. To ensure that valuable information is shared amongst the communities of the Surat Basin, these notes contain questions and answers asked across all locations and sessions.

The Surat Gas Project community information sessions were held from 11 to 15 November 2013 at:

- Wandoan 11 November
- Miles 12 November
- Chinchilla 13 November
- Cecil Plains 14 November
- Dalby 15 November.

A copy of the presentation given at the November community information sessions is available on the Arrow website at [www.arrowenergy.com.au](http://www.arrowenergy.com.au).

### How to read these notes

Questions and comments from the audience are in bold type. The unbolded type is the response from Arrow staff. In some cases responses have been summarised. In others, additional information is included to provide further context or explanation; this information is italicised following the answer.

If you have questions or comments about the project or these meeting notes, please contact the project team during working hours on:

**freecall 1800 038 856**

**email: [info@arrowenergy.com.au](mailto:info@arrowenergy.com.au)**

## **Acronyms**

APLNG	Australia Pacific LNG (Origin Energy and ConocoPhillips)
CSG	coal seam gas
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EA	environmental authority
EIS	environmental impact statement
FID	final investment decision
GISERA	Gas Industry Social & Environmental Research Alliance
GLNG	Gladstone LNG (Santos, Petronas and Total)
LNG	liquefied natural gas
QCLNG	Queensland Curtis LNG (QGC)

## **Conversions**

1 megalitre (ML) = 1,000,000 litres

1 gigalitre (GL) = 1,000,000,000 litres

## **Queensland Government Acts mentioned**

*Petroleum and Gas (Production and Safety) Act 2004*  
*Mineral Resources Act 1989*

Figures

Figure 1: Proposed Surat Gas Project map

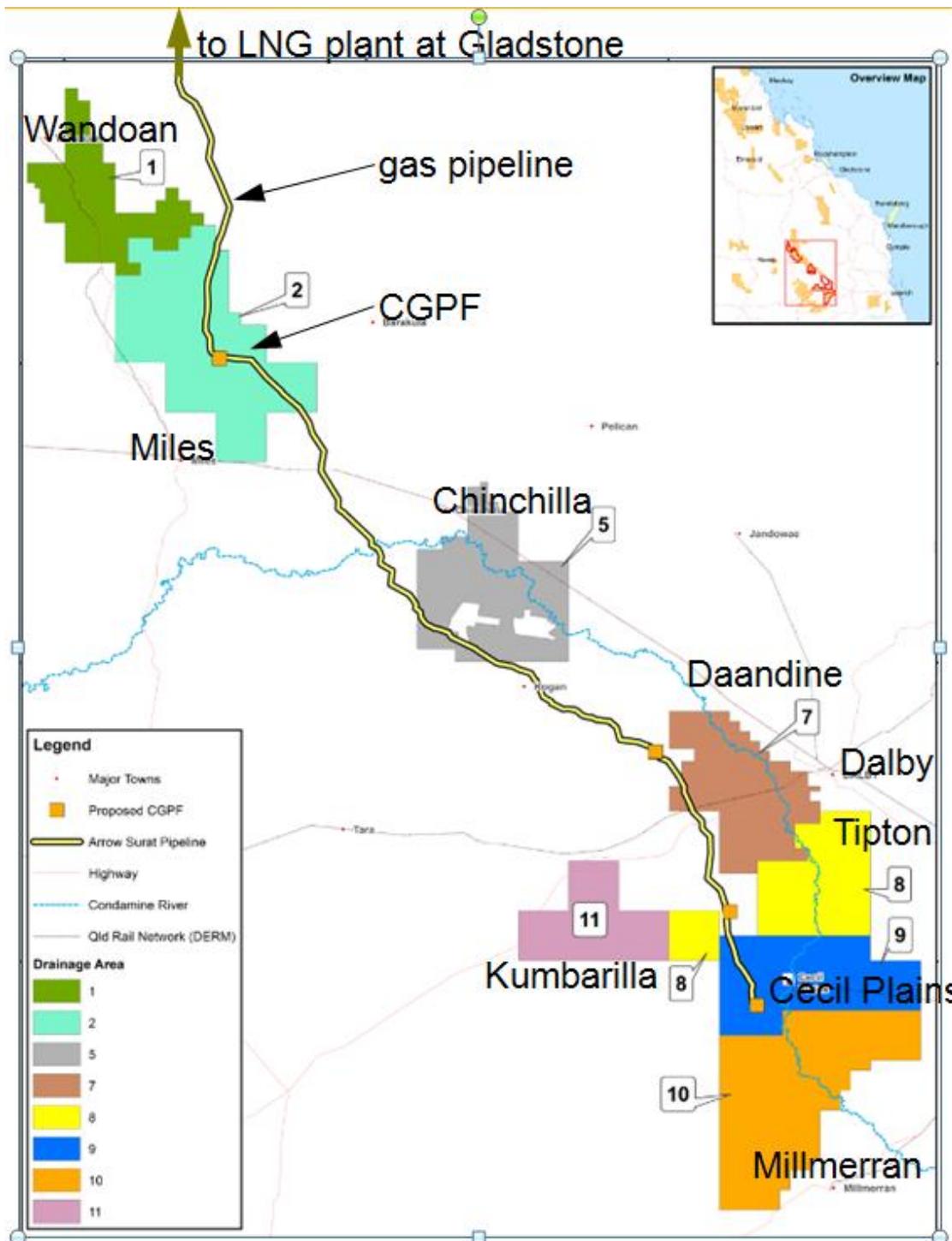


Figure 2: Location of accommodation villages for Surat Gas Project

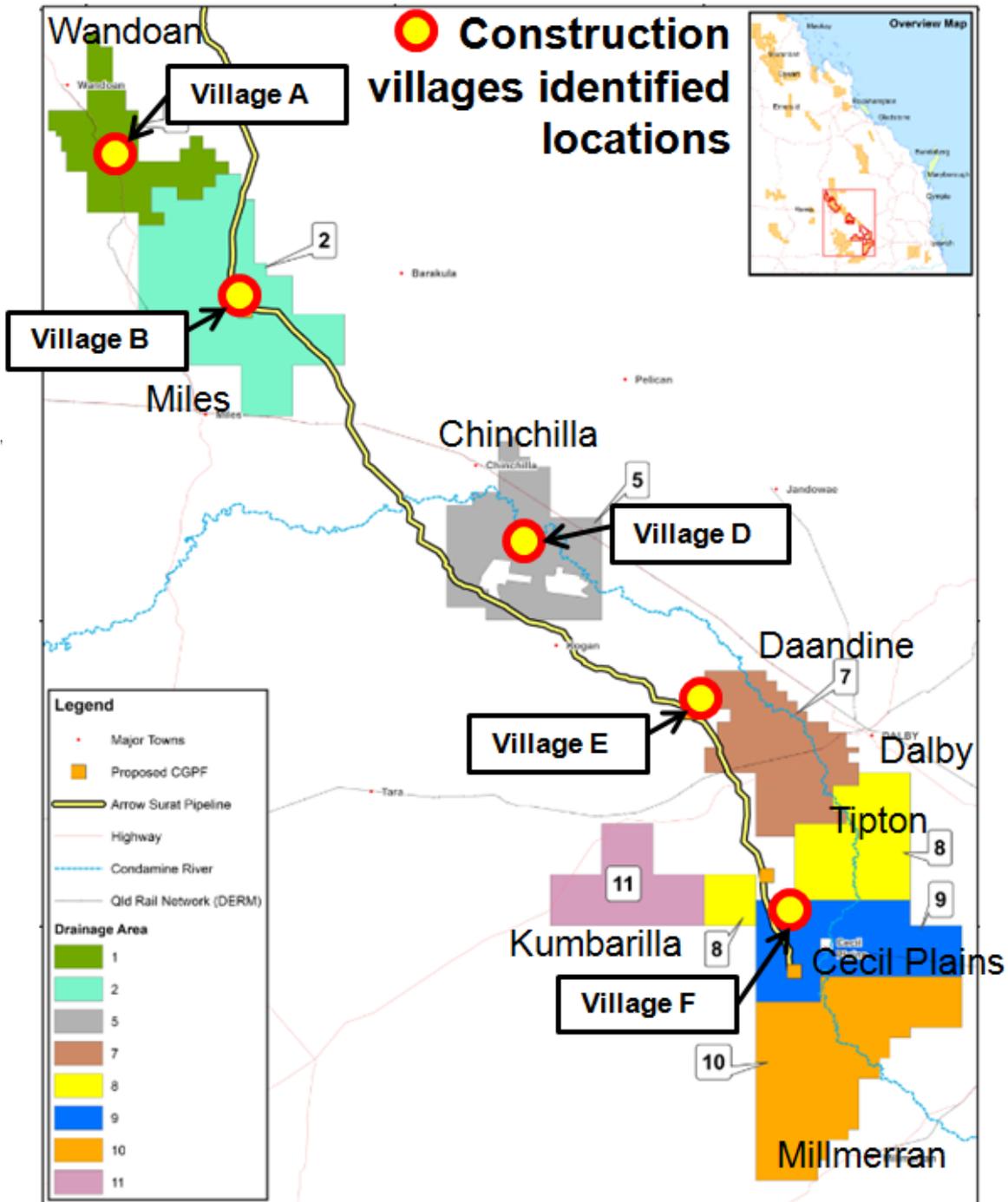


Figure 3: Surat Gas Project development phasing

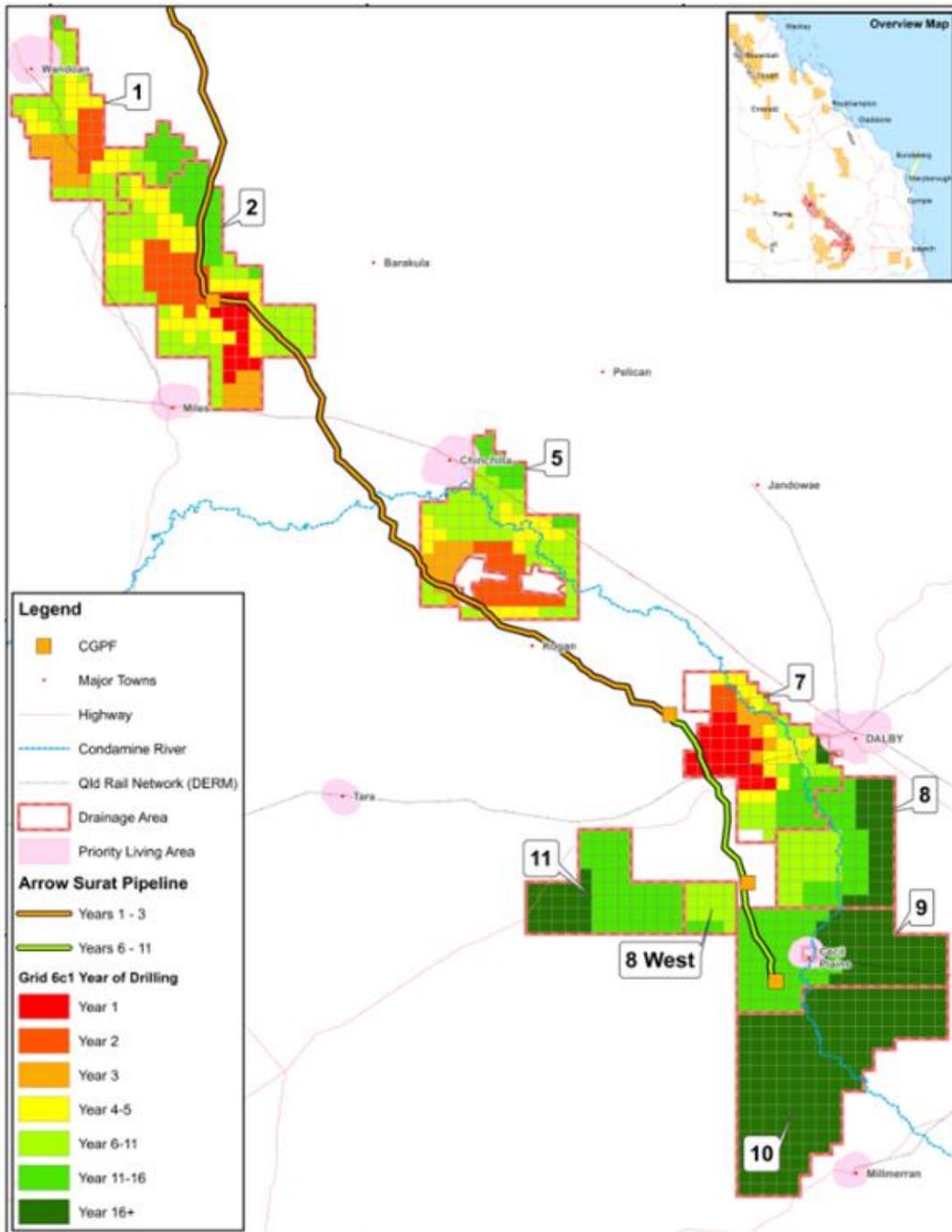
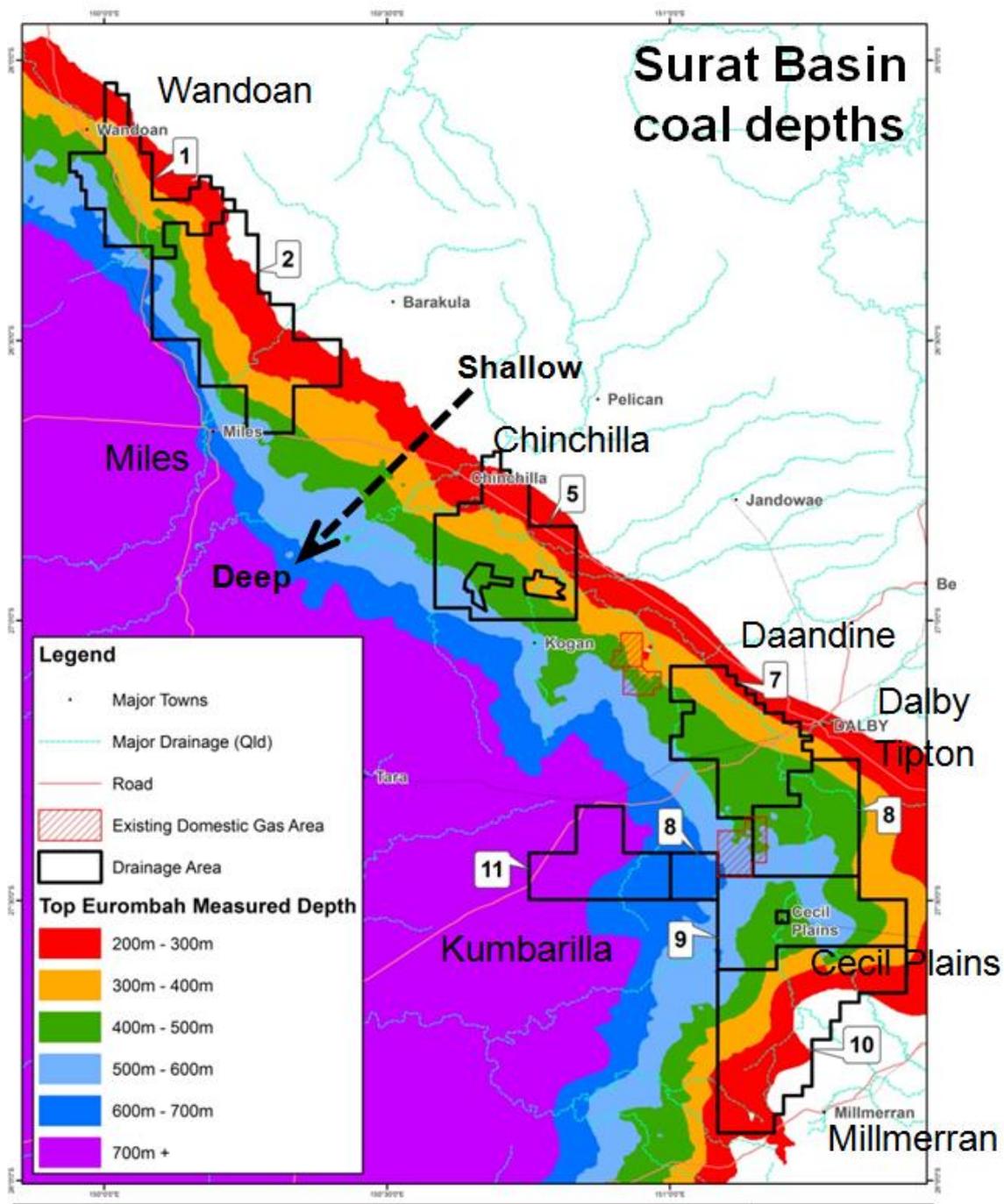


Figure 4: Surat Basin Coal Depths



**WANDOAN**

Date:	11 November 2013	
Venue:	Wandoan Cultural Centre	
Presenters:	Tony Knight, Vice President Exploration	Arrow Energy
	David Munro, Development Manager	Arrow Energy
Facilitator:	Jan Taylor, Principal, JTA Australia	

**1. What is the process for the pipeline that takes the gas to Gladstone?**

In terms of the timetable, there are four areas where the pipeline will be built initially over years one to three of the project to take the gas to Gladstone. The pipeline will be extended further south from Dalby later on.

'Year one' refers to when the shareholders will make their final investment decision (FID). This has not been taken yet because there is still an engineering phase of the project to go. I can't tell you which calendar year 'year one' will be, but engineering phases typically take one to two years.

**2. Will you be developing your own pipeline or will you be sharing with one of the other companies that are here already?**

There are potential collaboration opportunities but the current project case is to have our own pipeline.

**3. Have you got any wells in Wandoan yet?**

Yes we have.

**4. Are they in production or are they being drilled?**

They are pilot wells. We have a pilot well in Burunga Lane and we've got wells further down in the Miles area (Castledean and Kedron). It is not like the arrangements we have further south where we have a domestic gas business already running with production wells. We rely on core holes and pilot wells to help us understand what the coal seams look like in the Wandoan area. The most local well is the one in Burunga Lane.

**5. What area does the Arrow lease cover in Wandoan?**

*Please see Figure 1.*

**6. What is your most important job: getting the gas out, or building the pipeline? Which comes first?**

The project cannot work without both of those. It needs the wells, it needs the facilities to remove the gas from the ground. But that is no use to us unless there is then a way to get the gas to the customer. The pipeline, wells and the LNG Plant all have to be constructed for the overall project.

**Comment by local Queensland Gasfields Commissioner:** There is an internet site called **GLOBE** where you can identify your own property with all the known details about it. The site is a collaboration between the government and the Queensland Gasfields Commission. You can bring your property up and it shows you the position of known wells on your property, who has tenements on it, and general knowledge of what's on your property (<http://www.dnrm.qld.gov.au/mapping-data/maps/queensland-globe>).

**7. When you talk about a train, what does it look like and where will it be?**

The train doesn't actually look like a train. It's the giant refrigerated chemical plant that is located in Gladstone on Curtis Island, as are all the LNG trains of the other CSG companies. You won't see it from here because it is located a long way from the Surat Basin in Gladstone. We call it the downstream part of the project.

**8. Will every gas company have its own trains?**

On Curtis Island there are trains owned or being built by QCLNG, APLNG and GLNG, whose major owners are QGC, Origin and Santos respectively. They have their own trains and plants, but not all the gas will go to those plants e.g. Arrow already has gas going to Brisbane and other areas. Although Arrow's LNG Plant has Queensland Government approval we're a long way behind the other companies in time, which is the key difference. There is still a long way for us to go in terms of what we have to do and approvals both external and internal.

**9. Will you have an office in Wandoan or Miles?**

The accommodation villages will have office space associated with them to help look after production facilities. The locations are still undergoing commercial negotiations so I can't show you where they will be on the maps. We are looking at somewhere in the central part of the shaded area shown on the map (see figure 2) covering Wandoan.

**10. Is your FID going to be shifted back again or is it set in concrete for next year?**

We have to put up the best case to our shareholders to help them make this final investment decision. It's a shareholder decision so I can't make an absolute guarantee about when the dates are.

**11. It was supposed to be the end of this year wasn't it?**

Yes, it was supposed to be this year but we've taken longer on the concept select studies. Our experience on these projects means it is important to spend the time upfront because if you get this stage right you set yourself up for a better project in the longer term. It's true we've taken longer than we originally envisaged, and perhaps taken longer than some of the other coal seam gas companies, but we think it's about it getting it right.

**12. With the brine you are taking to Miles, are you going to pipe it or are you going to truck it?**

It would be piped.

**Comment by local Queensland Gasfields Commissioner: the Commission is extremely pleased with the way Arrow has addressed some of the issues. Arrow is prepared to pay landholders for their time which is unusual in the industry.**

## MILES

Date:	12 November 2013	
Venue:	Miles Dogwood Crossing	
Presenters:	Tony Knight, Vice President Exploration	Arrow Energy
	David Munro, Development Manager	Arrow Energy
Facilitator:	Jan Taylor, Principal, JTA Australia	

- 1. To access this proposed camp north of Miles you will have to travel on gravel road. What are you going to do about that? If there are going to be 1,000 people there then it could be 1,000 cars a week that use the road.**

There will need to be an upgrade of roads to reflect the amount of traffic.

- 2. Are you intending to fly your workers to the airport out here, bus them out or do they have to make their own way to the camps? What will be the impact on the traffic flow?**

Our base case is to bus in/bus out, but there is an opportunity we're looking at to fly in/fly out of Miles Airport.

*Note from Arrow: Workers will be transported to and from accommodation villages to site each day by bus. The use of buses for workers will limit local traffic impacts. A road traffic management plan will be developed for each village.*

- 3. Is your entire workforce based in Brisbane?**

No, it depends on the labour we can get. If there is local labour available we will employ them, we're not excluding the local workforce. They will have to drive to the camps and then get on the bus to wherever they are working.

- 4. Earlier on you said you wouldn't be fracking but now you are talking about accessing deeper wells. Will any of these deeper wells require fracking?**

Fracking is a recognised industry technique for improving the productivity of wells. As the coals become shallower the flow properties in the coal improve so in the Arrow tenure where the coals are relatively shallow, we don't believe we need to use fracking as there is no case for it. In the environmental impact statement (EIS) we've said we don't need to frac.

- 5. What is the average life expectancy of a production well?**

There is a range; the longest would be 15-20 years, and the shortest would be 5-10 years.

- 6. What happens to the wells after that?**

We abandon the wells by putting cement down the wells and rehabilitating the well site.

- 7. What happens with the maintenance of access tracks on land other than freehold land?**

The type of activity requiring access would be travel to the well site. Because each well has a pump in it to draw water out, if the pumps fail we need to take a small rig in to pull the pump out and replace it. We would need to maintain the tracks at a certain condition to take those rigs in and repair the wells when needed. That will happen over the life expectancy of the wells.

- 8. Has Arrow done any baseline studies on gas migration? The ground is full of cracks, fissures and faults and once you decrease the pressure, the gas will be released and it will start to make its way to the surface by whatever route it can find as we've seen with the Condamine River. We need to know this industry isn't going to be releasing methane straight into the air because it contains a high percentage of CO<sub>2</sub>. Will you be doing surveys of the area?**

Gas migration (or release) occurs naturally at any basin in the world and it explains the bubbling in the Condamine River. But there is also the potential for induced migration. There is a group out of the CSIRO called GISERA (Gas Industry Social & Environmental Research Alliance) doing a study on gas migration. Origin Energy is also doing research around the Condamine River.

Arrow's EIS addressed gas migration issues around wells. We're looking at potential gas release pathways around them. There are also Federal Government studies taking place around gas released from pipelines; this has been an issue raised as a result of the shale gas industry in the USA where gas has apparently been released to surface there. All those lines of investigation are now being pursued.

- 9. The problem with what is happening at the Condamine is that industry is telling us that it's natural but nobody bothered to test beforehand. Are you going to survey your area before you start?**

The CSIRO GISERA study I mentioned before has three parts, and the second part of that is a study where they drive around with sensors picking up methane in the air using the same technology that Southern Cross University used some months ago. A company called Picarro, the inventor of the technology, has recently replicated that study and found low levels of methane. It attributed the level of methane in the air to cattle, and that's from the inventor of the technology itself.

- 10. When are you anticipating opening up the camp north of Miles?**

The Miles facility is one of four that will be built in years one to three of the project. Miles is one of the development areas in the initial stages of the project. We are at the end of the phase of concept select studies. We've got engineering design work to do and will start the Area Wide Planning. Arrow will then put the best project case to its shareholders as part of the final investment decision (FID). When that decision is taken, the clock then starts on year one. We still have work to do before that year starts but we anticipate that the facility north of Miles will be built in year one.

- 11. Do you expect that to happen next year?**

The engineering phase usually takes a year but ultimately it's up to our shareholders to decide when to make the FID. The other CSG projects are in the construction phase already.

- 12. Is Arrow planning to re-inject the water it takes out of the coal seams back into the aquifers? And what will the quality of the water be?**

The water produced will go to a reverse osmosis treatment plant where it is cleaned up. There will then be a concentrated brine stream and a clean stream and the latter will go to beneficial use. One of the options is re-injection but there are other options as well. We haven't arrived at the final project decision on facility locations and the balance of beneficial use.

- 13. The nightmare for us is that there was a shonky decision between the Council and QGC where it was allowed to destroy the roads; Council refuses to fix them and we've been living with trashed roads for six to seven years. Will you tell these people that you promise to fix the roads to a suitable standard before you start bringing in 1,000 trucks a day? I've seen 93 vehicles going into Brentleigh Park between 6am-7am. When your industry gets going it can destroy a road in a couple of weeks.**

Arrow doesn't own or control the roads so the decision about how the roads are maintained is up to local or state governments. We're obliged to enter into an agreement with the local council or the state government so that a certain amount of money is contributed for that purpose. However, we have no control over how the money is actually spent.

- 14. The problem is that Council is getting the money but we're not getting the roads. When the roads are becoming dangerous you shouldn't use them and instead put the heat on Council to fix them.**

**Cr Graeme Moore:** we are always going to be playing catch-up with our roads and it would be great if the roads were built up front from the start. In the recent rounds of Royalties for the Regions the Tara area did quite well with the funding for major infrastructure. Council has turned it into road infrastructure agreements with QGC and we're almost at the final stage with Origin. Arrow has started early negotiations with our engineering team and is required to restore the road to its original condition; in a lot of cases though the roads are being restored to a better condition. Council realises there are areas that still need improvement but it is working on those areas. If roads are being damaged please report them to Council as we can't be on every road checking them.

**Comment:** Arrow needs to understand that one person on our road is dead already, and two hours later the Council had a grader there to fix the road to remove the evidence. Arrow should promise to do better than QGC because leaving it to the Council isn't good enough.

## CHINCHILLA

Date:	13 November 2013	
Venue:	Chinchilla Great Western Motor Inn	
Presenters:	Tony Knight, Vice President Exploration	Arrow Energy
	David Munro, Development Manager	Arrow Energy
Facilitator:	Jan Taylor, Principal, JTA Australia	

**1. Can you reach a commercial agreement with the other companies to use their water treatment plants so you don't have to re-visit building your own?**

The water we produce will need to be treated but if we can't reach an agreement then we will need to build our own treatment plant.

**2. I notice that the location of your gas processing facility for Chinchilla is not on your map and nor is your camp. Can you give us some idea of where they are going to be?**

The location of the facility is still subject to negotiations so it isn't on the map. Once the negotiations are done and we have confirmed the location we'll be able to show you where it is. We have deliberately left it off but we're aiming for somewhere central in the drainage area (see figure 3). The phasing of the development is radiating out from the general intended area of the facility.

**3. What are the white areas shown in the middle of that Chinchilla area?**

The one on the left is Linc Energy which has done its underground coal gasification pilot; there is an area around that which at the moment is excluded from the development of CSG. It's a similar story with another company which has mining tenure further to the east. We do have overlapping tenure with the mining companies and the white areas reflect the status of the mining tenure.

**4. Will you turn the salt into fertiliser or another use?**

The intent of the joint industry plant is to turn it into selective salts to be marketed commercially.

**5. I noticed you put down sorghum as the least profitable crop on the Downs. With such a lack of understanding of agriculture in this region (and getting the EIS approved with that included in it), how can we trust you going forward?**

Arrow demonstrates trust in a number of ways, and one of them is us fronting up tonight to talk to the community about what we do. There is also the EIS, submissions in response to it, and our response to those. I'm not sure if there is an error in the EIS but I don't think that means we have somehow broken trust. I think we should differentiate between perhaps an error on our part and a breakdown in trust. We don't seek to mislead anybody in what we do. I would use tonight and the community forums that we run as examples of that.

**6. In Section 13.3.5 Agricultural Activities it says *the crops include grains, maize, sorghum and sunflower in the summer, and wheat, barley, canary and grain oats in the winter. Although sorghum provides a lower return compared to other crops, the stubble that remains after harvesting or when a crop fails retains moisture and can be used for grazing and to provide protection against soil erosion.* What I'm suggesting here is that the statement is so ridiculously off the mark it shows contempt of the agricultural community at large in my opinion and that's why I'm asking about trust.**

We would normally look to public sources of information for that type of data. We certainly don't try to mislead people; everything is available and all the sources of information are cited. The data was sourced by another company on our behalf but I'm sure the primary source is the Australian Bureau of Statistics so it's government data that we have access to. I think the paragraph that you read from doesn't say it's the lowest form of crop. It's not that sorghum isn't valuable, it's just that the crops produced on the Downs include a lot of other grains and sorghum is at the lower end of production for value. It may be the most profitable because there is a lot of sorghum grown; it's not just per kilo or per tonne or per acre because there is a lot grown.

*Note from Arrow: Data used within the EIS, and the extract quoted, was from the ABS (Australian Bureau of Statistics) which is sourced from census and tax data provided by the residents of the region.*

- 7. In one of the early slides that looked at progress, it said you are yet to reach financial close by the shareholders and yet there are wells going down in 12 months within the Chinchilla area. Does that mean financial close is a *fait accompli*?**

We are already running domestic gas operations at our Tipton field for contracts that we've had in place since 2005. The production wells we've got are around those areas. We have exploration wells across the region to define the character of the coals. The years you are talking about are project years so if the FID is to proceed that becomes year one, whenever that year might be. It's up to our shareholders to decide whether the project will go ahead or not, it's not Arrow's decision.

- 8. Does this mean the drilling in the Chinchilla area will happen in the first 12 months after the financial close, or is it 12 months from now?**

The Area Wide Planning and discussions with landholders will start in the next 12 months, but the physical drilling of wells would be in year one, which is after the final investment decision has been taken.

- 9. What is the estimated production of the gas fields? How many years will the project run for?**

It's designed for 30 plus years. The gas production will climb to a plateau; we'll produce along that plateau until it starts to decline at the end. The plateau length depends on how the coals perform but the total production period can be 30 years or more.

- 10. Does that depend on whether it's cost-effective to produce?**

You can open up or close different areas or wells to be cost-effective but it's primarily a function of how well the coals actually perform. There's a range of outcomes for the coal and it will mostly reflect those and how much gas is down there. We drill pilot wells to learn and reduce that uncertainty rate but we'll obviously learn a great deal more from the larger number of wells that are drilled during the production period.

- 11. I have heard talk of shale gas. Do you know anything about that?**

In our area of tenure in the Surat Basin, which is on the very eastern edge, we drill through the basin into basement rock. There is no shale that we would target beneath us. As you go further west you actually have the Bowen Basin beneath the Surat Basin. The Bowen Basin is then joined to the Sydney Basin. Some companies are drilling wells down into the Bowen Basin beneath the Surat which is what QGC is doing in some areas. In our tenure we don't have that situation.

**12. Is there none in this area or just none in your tenure?**

There is none in our tenure and to my knowledge, bearing in my mind we don't explore out there, I don't think there's shale west of us. There is what's called tight gas which is sandstone, another form of unconventional gas.

**13. One of our bugbears in the past was that gas companies would come in, negotiate with landholders to put in a number of wells; they would drill for a while, produce gas for a year or so, and then say they were going to put in 20 times more wells and destroy the original concept plan. Are you telling us that when you come with your Area Wide surveying that you come with one plan which will meet landholder requirements and that's it. Or will you be coming back later to tell us you are doubling the number of wells?**

The term sometimes used for this is infill wells. Our plan with the Area Wide Planning is that we come with a life cycle view of what we want to achieve in that area. We would not come back for a later phase of more closely spaced wells; it would be the life cycle view. That is what we aim to do in Area Wide Planning and we have given an undertaking that we don't come closer than 800 metres with surface well sites, so if we come in and drill 800 metres from the outset then there is no scope for any infill. We aim for a life cycle view.

**14. When you come to our area will there be any compensation for us as landholders if we use solicitors to draw up the negotiations rather than putting all the stress on us?**

We do pay professional fees.

**CECIL PLAINS**

Date:	14 November 2013	
Venue:	Cecil Plains Hall	
Presenters:	Tony Knight, Vice President Exploration	Arrow Energy
	David Munro, Development Manager	Arrow Energy
	Simon Gossmann, Groundwater Manager	Arrow Energy
Facilitator:	Glenda Viner, Manager Community Relations	Arrow Energy

**1. Why are you changing from two trains to one?**

This has allowed us to de-couple the decision-making between the first train and the second train. When we made a decision for up to 80 per cent gas from Surat with two trains, it required an answer for where the other 20 per cent plus was coming from, and the timeline associated with it. This allows us to de-couple the decision-making between separate trains and in doing that, it changes the profile of the project and to some extent the economics.

**Comment: The water connectivity in the Arrow Energy tenement is bang on where the good water and irrigation bores are. The area east of Bongeen is where the water gets salty and I know that because we've a bore on our farm. I know where the water improves on the edge of it and that's a few hundred metres from where Arrow Energy's lease runs out. We're playing Russian roulette with the water, and you can't go underground and fix it. Once you crack it open or depressurise those wells, that's it. The whole area east of Cecil Plains has had farmers come here and call it God's country because it's a thin sliver of decent soil. I'm not arguing with the fact you might make some quick economic gain over 30 years and you might provide some short-term jobs, but what we're dealing with here goes way beyond that.**

**2. You say the updated volume model shows there is less impact predicted, is that right?**

That's correct. The update reveals lower impacts than we used, for example, in the EIS.

**3. Is the pipeline to Gladstone on government land?**

It's a mixture.

**4. With regards to your map that showed coal depths, your stated intent of minimising your footprint on the floodplain by using pad wells doesn't seem to coincide with your coal depths. Are you confident you can utilise pad drilling situations on the flood plains? And secondly, will any or all of your commitments be part of your environmental approval process? Will you be legally obligated to abide by those commitments or will they be an open-ended commitment like a lot of them where they are 'where possible' or 'if possible'?**

To answer the question on wells, the multi-well pads mean a significant reduction on the overall impact and we recognise that is a key objective. They work in the deeper levels of coal but are technically more challenging than vertical wells so we can't do them everywhere. I do look to future technology improvements on where they can be applied, but it's not everywhere on the flood plain, it's only in the deeper coals. It's roughly in the green area and deeper (see figure 4), and we recognise the importance of progressing drilling and pump technology and the run line for those pumps to make the wells work.

With regard to commitments, the environmental authority (EA) would be the instrument that captures all the conditions although it doesn't include specific conditions around things like water substitution and property. The EA is not the instrument that would be used for that kind of purpose.

5. **How will your commitments become binding? Your commitments run into the hundreds. I have been inviting Arrow to make a formal commitment to ‘making good’ on the Condamine Alluvium or to offset the impact on the Condamine Alluvium, and Arrow keeps saying it is volunteering to do it. That’s not good enough. We need some sort of security or certainty that you are tied to your impact on the Alluvium, or won’t do it if you can’t ‘make good’ the impact. It’s not just the Alluvium, it’s a whole host of commitments. Are they just a grand idea, or will you be legally obligated to carry out those commitments?**

There is no simple mechanism to capture those commitments. I understand you are saying you don’t have a degree of faith in the commitments; however, we stand by those commitments as a company. There is no mechanism like an EA for us to put them into our approvals so we can only take that on as a suggestion at this time because I don’t know of any mechanisms that would satisfy what you are after.

6. **You made a statement before about Arrow offsetting any impact on water. We’ve got several water uses including using it for irrigation, and also for home use such as showering. People have developed the underground sub-artesian system to use for irrigation, and when you say you will offset, how do you propose to offset if you find these bores run dry? Where will the water come from if my bores run dry, or my household can’t get any water?**

With the commitments specifically around the Condamine Alluvium, the mechanisms available to offset are substitutions of allocations, providing treated water, potentially purchasing allocations or water injection. They have different scales or scopes or timelines for how they can happen but there are different mechanisms available. The ultimate fall-back is ‘make good’.

7. **So you are comfortable that you will be able to compensate landholders with water they now have access to?**

Yes, that’s right. The proviso there is that we will offset our impacts. There is a lot of drain on water resources across the state; that has been happening for a long time so we will mitigate our impacts when we start working in the area, but we can’t compensate for past impacts.

8. **We’re not talking about the past, we’re talking about the future. We’ve lived with the past where we have had allocations reduced by 50%. We’ve also lived with the fact that we couldn’t put down any new irrigation development for the last 20 years if we couldn’t put a new bore down.**

The requirement on us is to offset our impacts. There are mechanisms as we’ve explained and the ‘make good’ agreement spells out the tools and mechanisms we have available. That is why the modelling and monitoring is so important. It shouldn’t reach failure point for us to be able to effectively react to it. That is fundamental and that’s why we have the groundwater monitoring and modelling system; it shouldn’t get to the point where all of a sudden it drops off a cliff and stops. We can detect that and react in time.

**Comment: You are assuming this development will happen. You’re also assuming that the landholders are happy with the outcome. You’re also assuming that the compensation is adequate. Two years ago you started talking about coexistence, however what we’ve been presented with today speaks nothing about coexistence. All it does is speak about Arrow using our farmland to develop its business. Jeff Seeney’s Regional Plan for the Darling Downs came up with a draft policy of coexistence. Since that there has been a lot of work put in by some farmers here, Cotton Australia, Queensland Farmers’ Federation (QFF) and AgForce to further develop coexistence. Part of that work on coexistence is in a draft paper up for**

discussion; it will be published tomorrow and anyone who wants a copy of it can see Graham or me about it. Part of that document says there should be no presumption that a coexistence outcome is possible in all circumstances. If one or more criteria cannot be met then coexistence will not be possible, so I hope you think about that.

Jeff Seeney has said, 'there will be no material loss of land'. The outcome required is that the resource activity does not result in a material loss of land use for either priority agricultural land uses (PALU) or the sort of country we are farming. The work done with QFF says that the resource activity will not occur on land being used unless there is agreement with the landholder or landowner, and that is reflected throughout this coexistence work. So until you start working through your agreement with the landowner, I don't think you can presume to be able to come on to this land.

9. **There is a big impact on the Walloon Coal Measures and a lot of people rely on those as well as the Condamine Alluvium, so I'd like the water issue addressed. What are the provisions going to be? Are you going to tap into a deeper aquifer?**

Making a bore deeper is one of the mechanisms.

10. **The irrigators here are providing food for millions of people. We're in a raging drought at the moment. No amount of money from you is going to fix any problems. People in the city don't understand. We've been living here our whole lives and we've never even been asked about all this activity. We just come to this meeting and are told it's not a problem. It is a problem. It's not just loss of water, it is water quality too. If you contaminate this water, what have we got left? Your 'make good' doesn't bring back good water, so what are we left with?**

'Make good' does include water quality.

11. **In Sydney they have put a stop to coal seam gas near their drinking water. Why are we any different up here?**

That is why Arrow is taking its time to get this right and not charging in here overnight. There is a huge amount of work and study going into it. These things do not happen overnight. That is why monitoring is so important.

12. **You can monitor everything, but once you wreck it, it's gone.**

I disagree because it doesn't reach that final point. We have time to react.

**Comment: We saw a lawyer about 'make good' concerning some of our bores and the reality is there are multiple options for 'make good'. One of the options, which may be a quick and easy one, is valuation of your property with and without water and a one-off cash payment. We need to know whether you are looking at that option because it's not a very lucrative option for us.**

13. **The last time we were here I had a chat with Tony out the front and you said if you can't reach a Conduct and Compensation Agreement with the landholder during the production phase, you would stack them up and run them through the Land Court and gain access in six weeks. Is that still the case or are you going to be like Santos?**

That use of language may be your recollection but that's not what I would normally say. We have always said that it's our preference as a business to enter into a business relationship with landowners. We do not use the Land Court as a first port of call. It's not what we prefer to do. It takes time and money and doesn't build good relationships. Our preference is for good relationships, and that's why we come here to talk to the community.

**14. Is that a yes or no? If a landholder doesn't want you on their property will you stay off?**

It's not as simple as that. We go through a process of negotiation. We would like to think we can reach agreement. The Land Court is a reserve power that is provided, but it's not our first port of call.

**15. Are you going back on this statement from the notes from the community feedback session on June 2010 when the question was asked: 'if you choose to access farms, will you be in contact with law enforcement agencies to gain access?' The answer was: 'no, Arrow does not intend to force entry onto properties.'**

The context of that was whether we would use police and the answer is no, we're not going to use the police.

**16. With the Area Wide Planning, are you talking about starting discussions in our area in about 11 years?**

We would typically start our discussions on Area Wide Planning one to two years before drilling.

**17. In the slide you showed about camps you talked about how they are self-contained, and your policies on behaviour etc. Will you have medical facilities on-site or will you be drawing on the community's medical facilities for those camps?**

I anticipate they will have some emergency medical capability.

**18. The CEO of Santos on Q&A last night was asked directly if Santos could not come to an agreement with the farmer, would it enter the farmer's land? His reply was, 'we are in business and we will be here for 10, 15, 20, 30 years. We cannot afford to be on the land with a farmer who doesn't want us. My question to Arrow is will you be prepared to make that commitment? Was the Santos CEO the most farmer-friendly gas CEO in the world or was he lying?**

We can't speak on behalf of any other company or CEO. We seek to negotiate and reach agreement with landowners.

**19. If you don't reach agreement, will you leave the landowner alone?**

We will make a decision at that time on a case-by-case basis.

**20. Most of the underground water has large quantities of salt, and I understand there is a plant at Chinchilla desalinating the water. But what is going to happen to all this salt, much of which is in ponds at the moment? What are you going to do with the millions of tonnes of salt that have already been generated?**

The joint industry brine treatment plant involves several coal seam gas companies. It's a selective salt plant that turns the salt into particular salt products which can be used for industrial purposes.

**21. We've heard about the draft Regional Plan by Mr Seeney and I'd like to bring your attention to the fact that he said land on Priority Agricultural Areas (PAA) will be protected. The agriculture on the land can never be displaced, never be constrained or restricted by any resource industry. We know that this isn't legislation but how do you feel about that as a gas company with that sort of restriction?**

Arrow is subject to numerous legislation, policies, regulations and conditions. If that is conditioned on our project then we live with that. We work within the bounds that we have.

- 22. Four years ago we were told that if the majority of the community didn't want Arrow, you would not go on the land. Your commitments don't mean anything until they are legally binding. For example, if there is a problem with connectivity and all of a sudden there is a drop in the water levels in our aquifer, you need to state that you will cease operations until it's fixed or you withdraw and then we will have confidence in you, but none of these commitments mean anything.**

**We want to see legally binding commitments, not just your words because your words have changed from four years ago. It terrifies me that you have said one of the options you are considering to 'make good' is purchasing a water allocation. We're not interested in your money because it's peanuts for a start. We want to grow crops and we want our children to grow crops for many years after you've gone. We're the stewards of this land for future farmers, and I'm very concerned about what you said.**

We understand the importance of water - that's why we have so many in-house water experts like hydrologists, hydro-geologists and so on. That's why we spend so much time developing those groundwater models because we don't underestimate the importance of water. The monitoring process is critical because we think we can do this right, but it's important that we check as we go.

We have already made a prediction of what will happen, and you've heard the figures about draw-down and that information is available. We then monitor how nature behaves against that model. If it doesn't do as we expect, we can either stop the process or take action to mitigate or reduce the impact. We hear what you are saying about what is a failsafe, and that is something for us to digest regarding how to provide that confidence.

- 23. Regarding the offset impact, can someone provide figures on what the predicted quantity impact will be now and over what period of time?**

I believe 63 gegalitres is the mid-case over 100 years, which works out to be 0.63 gegalitres per year.

- 24. How are you going to offset the impact in 98 years' time?**

It's an aggregate impact and we build that level of offset over the period of the project.

- 25. Does that mean you are saying to offset that 100 year impact, you are going to substitute allocations or re-inject in a big way over the next 20-30 years or as long as the project lasts to offset the impacts that are going to happen in 100 years' time?**

The commitment is around offsetting the impact over the course of the 100 years. Water production will be available within the project timeframe, and that is the timeframe in which we will have to take action to make that offset.

- 26. Do you think it's imprudent to use the water for beneficial use given that you are going to have to offset the impacts for 70 years after the point that you will actually be producing water? Shouldn't you be offsetting everything you can now? A lot of these impacts aren't going to be seen in the short-term and by the time we see a whole lot of them there might not be any water.**

The point of the offset is it's done during the period that we are operating. There will be more water available than we require to offset so our commitment is to maximise the beneficial use of the water. Keep in mind that all the water is produced from the Walloon Coal Measures and all the data we have today, including modelling, indicates there is a very limited connection to the Condamine Alluvium so only a small proportion of the water will come from the Condamine Alluvium. The offset component is only a small part of what we produce.

- 27. Is the salt processing plant a trial or is there actually a plant being constructed to turn the salt into a useful product?**

It's a joint industry project which is in the front end engineering and design phase so it's in the detailed design phase. There hasn't been a final decision taken on it, but it's further advanced at this stage than the Arrow CSG project.

- 28. You said that the Surat Basin will now supply 100 per cent of the gas for the first train, but you made some comments about the second train. Is there an assumption or an option that some of the gas from Surat will be used for a second train as well?**

There is a possible case where we may increase the size of the facilities but it would be limited in terms of how much would come incrementally from Surat, so it would be something like 20 per cent absolute maximum.

- 29. Area 11 is your worst area and your coal depths there were 600-700 plus metres. You have said that you will not be fracking in the Surat Gas Project area but proponents with tenure adjacent to that area are fracking. Will you need to frac there because your neighbours are at those same depths?**

Fracking is a recognised technique and Arrow doesn't have a philosophical problem with it. You are correct that Area 11 is deeper but the property of the coals in the generally shallow coal depths in Arrow's tenure means we don't need to frac. Fracking is not included in Arrow's EIS.

- 30. Previously a fair chunk of this community was involved with the Area Wide Planning process with Arrow and it was, even in your words, unsuccessful. We were told by Arrow that the process failed in this area. From our perspective it failed because the design was inaccurate, it wasn't to scale, it didn't have everything on it etc. Are you going to reinstate that process so that this community can actually attempt to begin to understand what a gas field looks like because that's we want out of that process.**

We did two pilots of Area Wide Planning, one in Dalby and one in Cecil Plains. It was a pilot for a learning exercise. We recognise there were shortcomings in the material we were able to present. In the Dalby area we were able to do it through one-to-one discussions and arrive at a layout which conceptually may be acceptable. We were trying to understand the shortcomings.

In the Cecil Plains area I think the first meeting was relatively successful where we shared information, but we weren't able to progress to those one-to-one discussions, and some of the limitations that we learnt about, like not being able to describe the phasing of the project and the location of our facilities, prevented us from moving forward. I recognise from a Cecil Plains perspective that it didn't reach a satisfactory conclusion. We did learn a lot about the process and what we needed to do better, and that will be embedded in the process of Area Wide Planning as we go forward. The intent is not to go ahead and do overall Area Wide Planning in Cecil Plains until the time period of the project but we do see more focussed Area Wide Planning, for example through the IFL (Arrow Intensively Farmed Land) committee, is appropriate going forward.

- 31. The failure of that process really knocked our confidence in Arrow Energy because from our perspective you are meant to be experts in designing and constructing gas fields and you failed to deliver that on a reasonably small area. That led the community to conclude that you don't know what you are doing or you have something to hide.**

I recognise the frustration when we were doing the Area Wide Planning. We learned not only from the shortcomings in Cecil Plains, but we also learned from our experience in the Dalby area.

**Comment:** so it was good for you but a waste of time and rubbish for us.

**32. When you go through this process in this community again, do you intend to have those discussions with individuals or with small groups?**

It needs to be more than just individuals because the impacts from one property on the layouts on neighbouring properties may be material, so we can't reach a conclusion by only talking to individuals. It will be done on a case-by-case basis to decide the appropriate group to bring together.

**33. Section 185 of the *Petroleum Gas Act* gives you the right to take or interfere with unlimited quantities of water in your tenure area, and that includes not just the water you are pumping but any water you might need for any resource activity. Do you have plans to use non-Walloon water to undertake any other necessary activities that you might have, for instance water that might be required for drilling a well, the water you need to feed a mining camp etc.? We're concerned we are restricted on the amount of water we can take, and we have particular concerns about the Walloons and the Condamine Alluvium. You have the right to take as much Condamine Alluvium water as you want. Will you be accessing the right you have to take water from the Condamine Alluvium given that it's a potable water supply?**

We will have to take that question on notice because I don't know the answer.

*Note from Arrow: In Arrow's Supplementary Report to the SGP EIS, the sources of water for Arrow's own activities were listed as either:*

- 1) water from authorised water suppliers (Water Service Providers);
- 2) Arrow's own CSG water (treated as necessary); or
- 3) approved water bores drilled into an aquifer above or below the coal seams (Arrow would apply for a temporary license under the Water Act).

**Comment:** Can you provide the community with your exploration plans for this area? One thing Arrow has to be commended on is that it has community committees. A lot of the other companies don't do this. However, you also have to provide us with information about your exploration plans so that we don't get the rude shock we received three to four years ago.

*Note from Arrow: Arrow continues to run a program of groundwater monitoring bores within the Surat Basin for investigation and modeling purposes. Arrow follows a notification process for exploration activities that includes updates on Arrow's website and correspondence with affected landholders and neighbours.*

**34. Will this presentation be available on your website?**

Yes.

**Comment:** In general in this community, unlike three to four years ago, there is now acceptance that there is a huge reserve of energy lying under the flood plain we all value. Somewhere down the track Arrow Energy bought the access. We understand the state tenure laws whereby you have the right to come on to our land to exploit that energy reserve on behalf of the people of Queensland. We also have a right with regards to our surface activities. I think your stated aims about coexistence are commendable. However, coexistence is a many varied thing. If you want a sustainable and lasting coexistence you need to create the conditions that lead to that outcome. It comes down to three key things for this community. The first thing is you do it here last. There is no doubt that the floodplain here is the most sensitive of all your tenure so it makes sense that you develop first in your least sensitive areas.

I note that's the intent but I go back to my original question on how these commitments are formalised and how binding they are. The second condition of coexistence would be to have a binding commitment or a binding obligation about your groundwater impacts and your ability or intent to mitigate your impact on the Condamine Alluvium. We're all forced to work within a framework regarding the amount of impact we have. We want to see you forced to work within the same framework. You have no legal obligation to conform to that intent and that's not good enough. The third condition for coexistence, and probably the most important, is that the landholder must have the same legal say about the siting of the infrastructure in these rights of ways as you have.

It's all well and good for you to say that you want to negotiate with the landholder but back in 2010 when we challenged some of the conditions in your Environmental Authority, the regulator wrote to Arrow and advised the landholders wanted to have some legal input into the management of top soil, amongst a whole host of things, and you replied to the regulator that you could not tolerate a position where the landholder would have any legal say in your project.

That's not good enough. If you want a sustainable coexistence we need to have some skin in the game. We're not asking for power of veto because we understand that's not possible with the state tenure laws but in the most sensitive part of your tenure, the landholder deserves to have equal authority about what happens on his farm and what it looks like. If you can meet those three criteria then you can talk about coexistence and really mean it. If you can't meet those three criteria then you are going to continue to have a problem.

Comment: I beg to differ on the third point. I believe we should have a veto right simply because that's the opinion of our Prime Minister and our Federal Resource Minister as well.

35. **How is the Theten trial going? For all we know substitution is not a possibility and you are reluctant to do re-injection. What if the water can't be beneficially used and therefore substitution as an offset mechanism is not feasible?**

We believe the water can be beneficially used and Theten is a demonstration of that concept. It's not an experiment.

36. **I don't trust in your beliefs. I want to know what the science is.**

In terms of trusting our views versus an independent one, the Condamine Interconnectivity Research Project being undertaken by the Office of Groundwater Impact Assessment (OGIA - Department of Natural Resources and Mines) has reviewed our work. They have an independent technical expert who commented, *'this is how long Arrow needs to pump for, this is how long the irrigator needs to pump for and this is the volume of water that needs to be taken out, these are the formations where the monitoring bore should be screening etc.'* We accepted all those recommendations.

37. **What is the suitability of the water to substitute? We've got potable water that we drink and bathe in etc. Where is the science at with substituting our perfect water with this cleaned up Walloon water? What happens if you can't substitute? Then you have a problem with your offsets and your 'make good' arrangements.**

Supply of treated water is not a 'make good' measure that we would use on many occasions. We're thinking along the lines of modifying existing infrastructure. It's unlikely that there would be many circumstances where it would make sense to pipe water to people

because we only have that water for a limited period of time. We can't put a solution in place that isn't viable when we leave.

In terms of substitution, Theten is a demonstration facility. There is nothing to suggest that substitution water cannot be used for irrigation; Theten is a demonstration that it can be useful.

- 38. How many seasons has it done? Last season was the first season of its trial and we had a wet summer so what I'm saying is that the theory of substitution is not proven, particularly on susceptible soils. Where is the science at? How are you progressing that theory because all this talk of offsetting is nonsense without actually doing that science?**

The water we have there has been through reverse osmosis. There's nothing in it in that sense, we have to add things back into it to restore the sodium balance and other minerals to make it suitable. There are no impurities in that water at all, so there is no doubt you can drink it or irrigate with it. We are growing crops successfully so there is no doubt it can be used for farming or for stock and domestic purposes.

- 39. But will you be proving it?**

That is exactly what the Theten demonstration farm is for. The farm is ongoing, it is a live farm. We've done one season, there is a second crop and we will keep cropping. That information will be available once the parameters around the research are finalised.

**DALBY**

Date:	15 November 2013	
Venue:	Dalby BMO	
Presenters:	Tony Knight, Vice President Exploration	Arrow Energy
	David Munro, Development Manager	Arrow Energy
Facilitator:	Jan Taylor, Principal, JTA Australia	

**1. Are you going to put the deviated wells into the shallower coals that are underneath the intensively farmed land?**

The well type is driven by the coal depth. We would like to maximise the use of those multi-well pads because it does reduce the footprint but with current technology we can't do that at the shallower depths. The cut-off is around 400m so we can't do multi-well pads everywhere at those shallowest areas.

**2. Will it be too shallow at Cecil Plains?**

In the furthest areas to the east it is too shallow to use multi-well pads using current technology.

**3. Does that mean you are on intensively farmed land and not able to use multi-well pads where you would like to be creating less disturbance?**

That's correct. We are looking to improve that technology over time but that is where the current technology is.

**4. Have you some sort of assessment to see what percentage of the land there you would be able to have multi-well pads on?**

Looking at the overall well count across the Surat Basin, about 60 per cent are multi-well pads. There isn't intensively farmed land further north.

**5. Are you going to be using multi-well pads up at Wandoan?**

It's driven by the coal depths so if the coal depth allows multi-well pads, that's what we intend to use (see figure 4).

**6. Irrespective of whether it's intensively farmed land or not?**

The multi-well pads greatly reduce our footprint so we see it as a good idea irrespective of the land type. Yes, intensively farmed land is the most sensitive, but we aim to use multi-well pads wherever the coal depth allows.

**7. You were only talking about licensed bores for your 'make good' arrangements; what about bores that are used for domestic, household, spraying, stock and everything else? You're cutting them out, aren't you?**

If a bore is only used for stock and domestic use, then it is still considered a licensed bore so Arrow is also required to 'make good' on those bores.

**8. Domestic bores aren't necessarily licensed, so are you going to treat them as licensed?**

It's a licensed bore by virtue of the law so even though you don't have any papers, we are still obliged to 'make good'.

**9. What is the difference between multi-well pads and horizontal drilling? Are they the same technology?**

The coal measures are a series of relatively thin layers within an overall package so a horizontal well will typically target a single thick coal layer and run through it. We need a well that goes through all the layers which are typically about 300 metres in total thickness. However, we need a deviated well that runs at an angle through all of the coal measures so it's not really horizontal.

**10. Are you saying you are prepared to factor in the landowner's costs for working on the compensation agreement?**

Yes, that's correct.

**11. What about legal costs?**

Yes, I believe legal costs are covered as part of professional costs.

*Note: Professional fees are included in Arrow's compensation framework.*