

ARROW ENERGY – AREA WIDE PLANNING MEETINGS

NANDI SPRINGVALE & GRASSDALE

26 August 2021 9am – 4pm

Introduction

In April 2020, Arrow Energy sanctioned the first phase of its Surat Gas Project (SGP) in southern Queensland. The first phase of the project includes drilling around 600 wells to bring gas to market over 27 years.

To provide information to landholders in the Springvale and Grassdale areas as part of the Area Wide Planning program, Arrow conducted two landholder information sessions

Nandi- Springvale	26 th August 9am – 12pm	Presentation, with a question and answer session
Grassdale	26 th August 1pm – 4pm	Presentation, with a question and answer session

Following is a summary of the questions received and answers given. While this is not a verbatim record, every effort has been made to preserve the integrity of answers.

The presentation is available on the Arrow website: www.arrowenergy.com.au

How to read these notes

Questions and comments from the audience are in bold type, with the responses from Arrow staff below. 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.

Questions that were not answered during the session due to time constraints have also been included in this document.

If you have questions or comments about the project or these Q&As, please contact the project team during working hours on:

Freecall: 1800 038 856

email: info@arrowenergy.com.au

Acronyms

AWP – Area Wide Planning

CSG – Coal Seam Gas

CCA – Conduct and Compensation Agreement

DES – Department of Environment & Science

DXP – Dalby Expansion Project

OGIA – Office of Groundwater Impact Assessment

UWIR – Underground Water Impact Report

RoW – Right of Way

SGP – Surat Gas Project

WMMP – Water Monitoring and Management Plan

ASCRG – Arrow Surat Community Reference Group

IFL – Intensively Farmed Land

Session:	Nandi-Springvale Road
Date:	26/08/2021
Time:	9:00am-12:00pm (AEST)
Venue:	St Ruth Hall
Arrow Energy presenters:	Gary Lees – Land Liaison Manager Michael Watts – Well Operations Field Superintendent Brent Lichtwark – Project Lead Pipelines Zeb Dawson – AWP Land Team Lead Simon Gossmann – Groundwater Manager Richard McLean – Principal Land Liaison Officer Brydie Hedges – Community Manager
Facilitator:	Michelle Zaunbrecher – Acting Vice President, External Relations and Tenure Management

1. How long will there be gas production in the area?

In this area, gas production will occur for approximately 20 years post construction. The average life of a well is 20 years.

2. Are the wells for Nandi Springvale and Grassdale batches in Arrow’s Plan of Operations?

The Plan of Operations, Environmental Authority EPPG00972513 DXP (PL198, PL230, PL238, PL252, PL258, PL260), 6 December 2020 to 5 December 2023 includes proposed projects with the names ‘Nandi Springvale’ and ‘Grassdale’ with footprints that were current as at 6 December 2020:

- Grassdale Road and Cecil
- Nandi South, Broadwater Road, Nandi Springvale, Kupunn Nandi
- Nandi Springvale Part 1
- Nandi Springvale Part 2

3. How many wells in total are planned for the area?

There are roughly 40 wells planned for the Nandi Springvale area. There are a further ~100 wells planned in the Grassdale area.

4. If a Landholder doesn’t want to enter into a Voluntary Deviated Wells Agreement, does this mean that Arrow won’t deviate under them?

Arrow will engage in good faith to understand your farming enterprise. It’s also our intent to offer an agreement to landholders in place of an Entry Notice, and to provide a set fee for the time a landholder will spend engaging with Arrow. Arrow’s petroleum licence permits us to extract gas, and we have an obligation to the State Government to do so. Arrow will have all required approvals and notifications in place prior to drilling deviated wells beneath individual properties.

5. Who is the Voluntary Deviated Wells Agreement offered to? Will the Voluntary Deviated Well Agreements be available for both DXP and SGP wells?

The Voluntary Deviated Well Agreement will be offered to owners and occupiers of land (landholders) under which a deviated well will be located, following early, ongoing and transparent Area Wide Planning engagement. Yes, the Voluntary Deviated Well Agreement will be offered for both Daandine Expansion Project (DXP) and SGP wells, including the 13 legacy wells that have already been drilled.

6. Why is a deviated well not compensated for in the same way as the Landholder with the Infrastructure?

The Department of Resources has provided guidance in a fact sheet release in August 2021 which advises:

- *Directional drilling below the surface of the land on a neighbouring property will be considered a preliminary activity for the land access framework if there is no impact, or only a minor, impact on a landholder's business or land use activities.*
- *Where the impact on a landholder's business or land use activities is greater and falls under the category of 'advanced activity', either a conduct and compensation agreement, a deferral agreement, or an opt-out agreement would be required.*
- *Each circumstance should be assessed individually and considered on a case-by-case basis. Directional drilling below the surface of land on a neighbouring property will be an advanced activity where:*
 - *the neighbouring property is less than 100 hectares and is being used for intensive farming or broadacre agriculture; or*
 - *the directional drilling has a major impact on a landholder's business or land use, or where it affects the lawful carrying out of an organic or bio-organic farming system.*
- *Conduct and compensation agreements, deferral agreements, or opt-out agreements are required for advanced activities.*
- *Further information is provided in the Department's fact sheet published online: https://www.resources.qld.gov.au/__data/assets/pdf_file/0010/1574119/directional-drilling-considerations.pdf*

7. Why are all of the wells on private land and not on council owned areas or easements?

While Arrow cannot speak on behalf of council, there are some challenges with locating infrastructure in council-owned easements, where specific right of way and well pad widths are required.

Arrow's development is designed around both sub-surface and surface factors, meaning that wells are placed in a pattern in order to recover gas from the coal seam, across a geographic area. Arrow also engages with landholders to understand property operations, which further informs the development layout.

In order to reach the gas within the coals across a geographic area, Arrow requires access to private landholdings. There are some instances of Arrow accessing State land for development purposes. Arrow also regularly engages with Council on a number of matters relating to its development. Arrow is constantly looking for opportunities to reduce impacts on local landholders wherever possible and will continue to do so.

8. Will DXP carry over to SGP?

DXP covers some SGP wells on the tenures it authorises SGP is the larger project, which includes the DXP. DXP tenure includes Petroleum Lease (PL) 194, 198, 230, 238, 252, 258 and 260.

9. Can Arrow Energy guarantee that there will be no infill wells in the area?

An infill well refers to a well that is drilled on a new well pad in close proximity to existing or planned well infrastructure. This approach is costly and not in Arrow's best interest to include in its field development, and this is not part of Arrow's base case for its Surat development. In the rare scenario where a well is not successful due to issues encountered during the drilling or operations, Arrow will plug and abandon it and re-drill a new hole close to the old one on the same well pad.

10. Has the impacts of deviated wells been considered in regards to property valuation?

There is no evidence of any decrease in property value as a result of CSG activities in an area. If wells are at a depth as to have no impact on the property or place any restrictions on the Landholder, then no impact is expected.

11. Will you be engaging with surrounding farmers about deviations before signing a CCA for infrastructure?

Yes, through the Area Wide Planning process Arrow will discuss the well trajectory concurrently with neighbouring CCA engagements (for well origin).

12. Have you considered landscaping around the wells, for example low shrubbing natives, to help with aesthetics and noise?

While Arrow has considered this approach in our Environmental Impact Statement (EIS) for larger facilities, it has not, to date, been considered it for well sites and smaller infrastructure on cropping land. Arrow appreciates the feedback, and will take it back to the business for consideration.

13. How many years do you have to monitor a plugged and abandoned site before relinquishing it?

There are no environmental statutory timeframes for monitoring the rehabilitation of a plugged and abandoned site before relinquishing the tenure. However, under Arrow's environmental authorities, significantly disturbed areas that are no longer required for the on-going petroleum activities are to be rehabilitated within 12 months to meet the 'acceptance criteria', therefore monitoring typically occurs during this period. Monitoring post this period is dependent on the success of meeting the acceptance criteria, final acceptance criteria (if relevant) and applications to Department of Environment and Science for either progressive certification and/or surrender of environmental authority.

14. Is there a time limit between rehabilitation completion and DES sign off?

There are no environmental statutory timeframes for obtaining Department of Environment and Science's progressive certification on the rehabilitation of significantly disturbed areas. However the department will not surrender the environmental authority until they are satisfied the land on which the resource activity has been carried out has been satisfactorily rehabilitated.

15. Are you able to make the noise modelling for the area public to the community?

Arrow is happy to discuss noise modelling with landholders on a case by case basis. However it is an internal planning document which is not typically released to the public.

Arrow develops noise and vibration management plans as required by relevant environmental authorities. These plans, combined with verified modelling, help to ensure that Arrow does not impact on local residents or sensitive receptors (homes) during construction or operation of its facilities.

Likewise, the potential for odour, dust and light impacts from Arrow's activities have been modelled and mitigations constraints adopted, where required, to reduce potential impact and to comply with legislation.

We also undertake monitoring to verify that the models are accurate. In instances where modelling indicated a potential short-term exceedance, Arrow will develop an appropriate 'alternative arrangement' agreement with impacted landholders.

16. Is it true that the Landholder will have to prove that subsidence occurs on their property? This seems like a high bar.

Arrow manages potential subsidence impacts as described in our Surat Gas Project CSG Water Monitoring and Management Plan (WMMP), under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1994*, approved by the Federal Government.

Arrow monitors and assesses potential impacts by collecting water and surface data (including bi-annual LiDAR – aerial ground surface imagery), which will be shared with landholders and regulators.

We will honour our obligation to address any loss as a result of the CSG-related impact, as detailed in our WMMP.

This process applies equally to all landholders, whether they hold an agreement with Arrow (such as a CCA) or not, and indeed whether or not they have any Arrow gas infrastructure on, or under, their land.

We will also conduct a thorough and timely investigation and share a comprehensive report with you, if you believe that subsidence from Arrow's activities has altered the drainage of your property causing you loss.

17. Who is able to see the data from the Soil Gas Monitoring points in the region?

Arrow has publicly shared a summary of results and conclusions of this monitoring to date with its ASCRG and IFL committee. A version of that presentation is available here:

https://www.arrowenergy.com.au/_data/assets/pdf_file/0006/33198/Central-Condamine-GWNet_20210608.pdf

18. Is the Springvale area in SGP or DXP for the purpose of the WMMP?

Development in the Springvale area is part of the SGP. Arrow must therefore comply with the obligations detailed in the Surat Gas Project CSG Water Monitoring and Management Plan (WMMP) in relation to these activities.

19. Are monitoring bores privately owned by Arrow Energy?

The majority of Arrow's monitoring bores are privately owned by Arrow. However, Arrow does monitor a small number of bores which are owned by the Queensland Government.

For some of the bores Arrow monitors we are obliged to provide these results to the Queensland Office of Groundwater Impact Assessment (OGIA).

OGIA make these results publicly available following review. We monitor other bores to comply with our Environmental Authority requirements and provide assessment results to the Department of Environment and Science.

20. How much proof is there that subsidence is caused by CSG?

Arrow has publicly shared its assessment of the magnitude of subsidence in its WMMP, with information published online:

- (https://www.arrowenergy.com.au/__data/assets/pdf_file/0006/29994/Arrow-Energy-Stage-1-CSG-WMMP.pdf)
- (https://www.arrowenergy.com.au/__data/assets/pdf_file/0004/33079/Surat-Gas-Project-Area-wide-planning-update-14-May-2021.pdf).

This analysis of subsidence indicates:

- average gradient changes due to CSG-induced subsidence were consistent with previously presented modelling indicating only a minor impact, and
- CSG-induced subsidence is unlikely to be imperceptible at property scale and small compared with natural variability (such as from rainfall).

21. Why has a monitoring bore into the Hutton only recently been drilled?

The OGIA specified that Arrow was required to install an additional Hutton Sandstone monitoring bore in its Underground Water Impact Report (UWIR) released in December 2019.

Arrow installed the bore in May 2021 and ran the completion on 12 June 2021. This was compliant with the time frames for installation of this bore as required by the regulator (the Department of Environment and Science).

22. What happens when Arrow Energy is no longer in the area and Landholders have issues with their bores?

The *Water Act 2000* specifies that underground water obligations for a tenure holder continue despite the ending of the tenure. When the tenure ends, a Final Report must be prepared which includes, among other things:

- a summary of information about all water bores in the Long-term Affected Area
- a summary about how the make good obligations for each bore have been complied with or not been complied with and
- a plan about how the make good obligations which have not yet been complied with will be complied with.

The tenure holder must make the report available for consultation including to provide a copy to each water bore owner in the area to which the report relates.

Written submissions on the report may be given and the tenure holder must consider each properly made submission and provide a summary of submissions to the regulator.

The regulator will decide whether the final report can be approved or modified.

23. Will the data from the Plainview Pilot Condamine Alluvium connectivity study be made publicly available?

Data from all monitoring bores at the Plainview Pilot site has been shared with OGIA. In addition, Arrow has previously shared its assessment of connectivity between the Walloon Coal Measures and Condamine Alluvium at Plainview with its committees.

A version of that presentation is available here:

https://www.arrowenergy.com.au/_data/assets/pdf_file/0006/33198/Central-Condamine-GWNet_20210608.pdf

24. What is the drawdown circumference of the wells?

Eight wells drilled on a single multi-well pad can drawdown an area of approximately 1400 acres. This allows a well spacing of approximately 2.5km between 8 wells on a single multi well pad, compared to the traditional 750m grid placement of single vertical wells.

25. Are the drill cuttings potentially toxic?

Drill cuttings typically include:

- clay from the top section of the drill hole
- pulverised rock
- coal seam water
- traces of drill fluid

Drill fluid generally consists of water and small volumes of additives, such as Potassium chloride (muriate of potash, which is used in the agricultural industry) and biodegradable biocide (for bacterial control). Drill fluid is predominantly removed from the drill cuttings through use of technology such as centrifuges prior to the cuttings being placed in a trench. The fluid portion is removed from site.

Prior to a decision to apply drill cuttings to land, the cuttings are tested to ensure they are safe (i.e. non-toxic) for application to the soil and for the surrounding land use. If approved for application, the tested cuttings are applied to land in accordance with a certified plan to ensure that they do not have a negative impact to the environment.

26. During construction, as you are laying pipe, are you effectively creating levee banks on the boundaries of properties? How is that legally allowed?

Pipeline construction contractors work to an Erosion and Sediment Control Plan which is approved by Arrow environmental specialists. The plan details how to leave breaks in topsoil or spoil windrows to enable the flow of water across ROWs.

The plan details how and where to use cross berms, sediment fencing or coir logs to control the overland flow of water and prevent erosion and sediment transport from the ROW to undisturbed areas.

27. Have you ever had to fix a pipeline?

Only when damaged by accidental excavation. There are strict quality control measures in place, and the final strength and leak test verifies that the pipeline has the integrity to be put into service.

28. Do you silt the pipeline?

The pipeline is padded with fine screened material (particle size less than 20mm). This is done on the sides of the pipe and up to 150mm above the top of the pipe.

29. Is the pipeline exclusion zone the same during testing and in operation mode?

No, the exclusion zone is a one-off zone during pressure testing at night. During operation there is no exclusion zone.

Session:	Grassdale
Date:	26/08/2021
Time:	1:00pm-4:00pm (AEST)
Venue:	St Ruth Hall
Arrow Energy presenters:	Gary Lees – Land Liaison Manager Michael Watts – Well Operations Field Superintendent Brent Lichtwark – Project Lead Pipelines Zeb Dawson – AWP Land Team Lead Simon Gossmann – Groundwater Manager Richard McLean – Principal Land Liaison Officer Brydie Hedges – Community Manager
Facilitator:	Michelle Zaunbrecher – Acting Vice President, External Relations and Tenure Management

1. Will LiDAR be conducted bi-annually?

Yes, Arrow has committed to collecting LiDAR twice a year over cultivated areas near our wells and where there InSAR covers less than 50% of a given property.

2. Does the baseline package for subsidence cover all properties affected and what sort of baseline data is supplied?

The baseline surface elevation information is provided for properties where Arrow has surface or subsurface infrastructure. OGIA is currently reviewing the content of these reports and the methodology use to derive the information presented.

3. Can you give a 100% guarantee that there will be no effect on the Horrane Fault?

From the studies conducted, Arrow is confident that the fault is sealing however, you should refer to OGIA if you need more information. Our data is provided to OGIA, and they have undertaken their own fault seal analysis and modelling of the potential impacts.

4. How many times do you 'drill' to 'make good' a bore?

Make Good Agreements are negotiated between Arrow and the owner of a groundwater bore which is assessed to be impaired by CSG extraction of groundwater. In that event the parties may negotiate a variety of outcomes dependent on the needs of the bore owner, the capacity of the impaired bore and the expected timing of any impairment. Make good measures may include monitoring of the bore to confirm predict impacts have eventuated, financial compensation or drilling of a replacement bore by Arrow.

An agreement which involved Arrow drilling a replacement bore may include terms requiring Arrow to ensure the bore produced a certain quantity and quality of water, depending on the quality and quantity of water produced by the existing bore (which was assessed being impaired) as well as any water licenses or regulations applicable to the bore. In those circumstances it would be up to Arrow to ensure it met the obligations of the Make Good Agreement.

5. With a Make Good Agreement, what if the new bore does not supply the same quantity of water?

As above, this depends on the make good measures included in the Make Good Agreement. An agreement which involved Arrow drilling a replacement bore may include terms requiring Arrow to ensure the bore produced a certain quantity and quality of water, depending on the quality and quantity of water produced by the existing bore (which was assessed being impaired) as well as any water licenses or regulations applicable to the bore. In those circumstances it would be up to Arrow to ensure it met the obligations of the Make Good Agreement.

6. Have you done monitoring of the rivers in the area for gas bubbles?

Arrow has not conducted any baseline studies of gas bubbling through the Condamine river. The problem where bubbling has occurred is unique to the area where Walloon Coal Measures are shallower and the hydrocarbons have been produced from shallower coal seams.

To mitigate this scenario, Arrow has implemented a vertical standoff distance of 150m from the ground level in its production wells. The shallower coal seams will be behind two layers of cemented casing string, for added well integrity.

7. Will Arrow be completing more water sampling or baseline assessments before completing further drilling?

Arrow must use best endeavours to undertake baseline assessments of water bores before production in a tenure commences (unless production in that tenure had already commenced when the *Water Act 2000* was amended to include the requirement to undertake baseline assessments). Arrow is required to prepare baseline assessment plans which describe the timetable under which Arrow must undertake those assessments. Arrow has contacted all landholders in the Springvale Grassdale area wide planning area to undertake baseline assessments.

Arrow is also required to install 3 new monitoring bores in the Springvale Grassdale area wide planning area. These 3 bores are scheduled for installation before the end of 2021 in accordance with OGIA's timeframes as outlined in the 2019 UWIR. Arrow currently monitors 8 existing groundwater monitoring bores in, or in close proximity to, the Springvale Grassdale area wide planning area and provides the results to OGIA.

8. Is there an option for those landholders who don't want Arrow's wells near them?

Arrow strongly believe that the multi-well pad and deviated wells model that Arrow developed in conjunction with its landholder forums is overwhelmingly positive for co-existence and minimises surface impacts on high-value agricultural land. It gives landholders much greater flexibility about the location of well pads.

Arrow will use the Area Wide Planning process to identify those landholders who do and do not wish to have infrastructure located on and below their properties. We will engage with, and listen to landholders, in order to better understand current operations and future plans for each property, so that Arrow can minimise or eliminate any impacts on the land or business as a result of our operations.

This may include adjusting the location of our gas infrastructure and continued dialogue with landholders, as plans mature.

Arrow will attempt create a field development plan that accommodates all landholder needs.

9. What is the distance between the top of Nandi-Springvale Part 2 and the bottom of Grassdale?
The distance is roughly 16kms.

10. Will there be infill wells in this area?

The nature of the country doesn't allow us to consider infill wells. An infill well refers to a well that is drilled on a new well pad in close proximity to existing or planned well infrastructure. This approach is costly and not in Arrow's best interest to include in its field development, and this is not being considered in Arrow's future Surat development. In the rare scenario where a well is not successful due to issues encountered during the drilling or operations, Arrow will plug and abandon it and re-drill a new hole close to the old one on the same well pad.

11. Can you confirm the total number of well pads in the area?

There are roughly 27 well pads currently planned in Nandi Springvale Part 2 and Grassdale.

12. How big is an 8 well pad exactly?

100m by 200m, with roughly 15 metres between each well head on the well pad.

13. Can a landholder farm up to the fence line of the well site?

Yes, landholders are encouraged to farm right up to the fence line of the well sites / infrastructure.

14. Are both WDRC and Private Roads looked after with dust suppression?

Yes

15. If a landholder accidentally digs up a pipeline or piece of infrastructure, is the landholder liable for the damage?

Typically no, they are not liable. They are only liable if they wilfully dig up or damage infrastructure. The depth and location of Arrow's infrastructure is included in a Conduct and Compensation Agreement (CCA) which should help prevent these accidents.

16. Do CCAs have to be confidential?

Arrow includes a standard confidentiality clause within the CCAs. However, within the clause there is an option for one party to obtain the other party's prior written consent to disclose the details of the agreement.

Arrow will reasonably consider these requests on a case-by-case basis.

You can also disclose the CCA without Arrow prior written consent for certain reasons (e.g. if provided to legal or financial advisers, to a potential purchaser of the land, and where required by law). This only applies to standard CCAs and pipeline easement agreements.

17. Can a landholder have a CCA confidentiality clause waived? Past, present and future.

As above.

18. During the drilling process, will the water be sucked out of the house bores?

The drilling process undertaken by Arrow will not impact landholder water bores. During the drilling process, groundwater is not extracted from the aquifers as the hole being drilled is kept full of drilling fluid. During construction the well is cased with steel and cement to isolate the well from the aquifers overlying the Walloon Coal Measures.

Coal seam gas extraction removes groundwater in order to reduce pressure and allow the gas to flow. For Arrow the primary target for water and gas extraction is the Walloon Coal Measures. If a water bore is found to be impaired by CSG extraction of groundwater, Arrow will follow the make good process outlined in the Water Act. This includes providing make good measures for the bore such as providing monetary compensation to the landholder which may be used, at the landholders discretion, to drill a replacement bore.

19. How deep is the initial casing in this area?

The casing can be between 120-150m down, or enough to cover all water zones. Then double steel double cement linings.

20. Do you use a standard depth for drilling and casing?

We have some test holes in the area which help inform Arrow of the casing and drilling depths, however every single well is looked at by a geologist.

21. From the test wells, what is the depth that will be drilled in this area?

The depth to the top Walloon Coals varies from as shallow as 75m in the north of Nandi/Springvale to as deep as 200m in the south of Grassdale road. However, Arrow's general practice is not to target coals shallower than ~150m. In those areas with shallow coals, only the coals in the section deeper than ~150m would be produced, with the shallower coals being sealed behind steel casing. The deepest coals in the area range from 450m in the north through to 600m in the south.

Arrow's model (or prediction) of coal depth is constrained by a number of exploration and appraisal wells (e.g. Tipton West-4 in the north, and Plainview-2/2A in the south), and a network of seismic lines acquired by Arrow in 2000 and 2016.

Some natural variation does occur in the depth of coal, thus during drilling the Arrow operations geologists monitor the geology being intersected by each well to ensure that only the target coals are being completed. This is achieved through a combination of wireline logging, rock property measurements taken while drilling, and direct observation of the drill cuttings being returned to surface.

22. How often do wells get 'worked over'?

The frequency of this maintenance will vary well by well, but has averaged once every two to three years.

23. What do you do on a workover?

We usually pull the rods and tubing, clean out the wellbore and replace them. Other maintenance and repair activities on downhole and wellhead equipment will be done at the same time as required.

24. With deviated drilling, if there is subsidence in the area, will that affect the casing? i.e. crack the casing due to the movement?

No, any expected subsidence is within the tolerance of the casing. The well is monitored for leaks throughout its lifetime to confirm integrity.

25. Is the Right of Way (RoW) a permanent exclusion?

No, the pipe is buried up to 900mm deep to allow the area to be cropped. 750mm is the minimum depth in the Australian Standards, however Arrow prefers 900mm in a cultivated area to allow for the weight of machinery used.

26. What is the noise profile of the generators on the well pads?

All well pads are designed to meet Arrow's relevant noise limits in our Environment Authority (EA). During the planning process, this is achieved by ensuring operational noise from well pads meet the most stringent noise level at sensitive receptors of 28 dBA $L_{A, eq - 15 mins}$, under worst case weather conditions and during the maximum operating load.

The dominant noise source from a single and multi-well pad is the operating gas generator set(s). It is usually the loudest early in the well life, as the well is initially 'dewatered' (water is pumped from the coal seam in order to reduce the pressure within the coal seam, allowing the gas to flow. The noise usually decreases over time, as less dewatering is required.

Where noise sensitive well pads are identified in planning, modifications to the well pad are introduced (at planning stage). This may include (but is not limited to):

- locating well pads and gensets at appropriate distances from sensitive receptors
- limiting generator load/water pumping rates during night time periods
- installing low noise canopies or other acoustic devices on the gensets.

27. If the noise limits of drilling exceeds Arrow's Environmental Authority, can Arrow still drill the well 24 hours if they don't have an Alternate Arrangement in place?

Arrow has management options in place to ensure noise levels are compliant with EA noise limits. Different rigs and rig activities generate different noise levels. In the event that a drill activity has been assessed unlikely to meet the night time EA limit and an alternative arrangement is not in place, this activity is scheduled to occur outside of night time hours. Drill rig activities that can achieve the night time noise limit are still permitted to occur.

28. What pressure does the gas flow at in the gas pipeline?

Operating pressures are in the range of 200-300 kPa. Gas pipelines are rated to 668 kPa. This is also known as the Maximum Allowable Operating Pressure.

29. What is a High Point Vent?

High Point Vent's (HPV's) release air from the water lines.

30. What is a Low Point Drain and where does the water drained go?

Low point drains (LPDs) collect condensed water at low geographical points in gas pipelines. The water is collected in a LPD and is pumped back into the nearby water pipeline.

31. Do you pick up rocks over the pipeline area after it has been constructed and rehabbed?

Yes large rocks are removed in cropping areas.

32. Is there pressure testing completed during the life of the pipeline? I.e. Is it an operational activity?

A strength and leak test is conducted after initial installation to prove the integrity of the pipeline. Once it passed this test it can be put into service. There is no requirement or need to re-test the pipeline again during the operational phase. Pipelines are tested to 1.25 x the maximum allowable operating pressure.

33. How loud are High Point Vents? And is it continuous?

HPV's are not typically very loud, and the noise is rarely continuous. It is typically a short release of air. The number of releases is highly variable depending on the terrain.

34. How often are there High Point Vents and Low Point Drains along a pipeline?

It depends on the terrain. Hilly areas need more HPVs and LPDs. Flat areas need less.