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| <b>Reference:</b>    | March 2015 CCC Meeting_001   |
| <b>Subject:</b>      | Tony Pickard Photographs   |
| <b>Request date:</b> | 20 March 2015 (Narrabri CCC Secretariat)   |
| <b>Requested by:</b> | Tony Pickard<br>Member<br>Representing: People for the Plains  |
| <b>Question:</b>     | Mr Pickard submitted a number of photographs of well infrastructure and ponds as per <b>Attachment 1</b> .   |
| <b>Response:</b>     | <p>The rehabilitation of well sites in PEL 238 has been discussed at three previous Santos Narrabri Community Committee meetings, with Mr Pickard in attendance at all of these meetings (refer to minutes at the links below).</p> <p>Presentations (links below) by Santos to the Committee provided specific detail on the rehabilitation of well sites with technical staff in attendance to answer questions from Committee members. At all three meetings Santos responded to questions at the meeting; took questions on notice for a later response; or when required responded to further questions tabled after the meeting by members.</p> <p>All questions were answered at the time by Santos to the satisfaction of the Chair and Committee members. This information is publicly available as meeting minutes and presentations are available on the Santos website (see links below).</p> <p><b><u>Photographs of well surface facilities and ponds</u></b></p> <p>Photographs of well surface facilities and ponds submitted by Mr Pickard to the Santos Narrabri Community Consultative Committee in March 2015 were taken in 2011 or 2012, prior to any of the three previous presentations to the Committee (November 2012, February 2013 and June 2014). Mr Pickard's questions in relation to rehabilitation of well sites were addressed at previous meetings as per minutes and presentations detailed below.</p> <p>Information on status of wells is publicly available from the NSW Division of Resources and Energy which has published a Coal Seam Gas Locations map that has a comprehensive listing of wells drilled for the purposes of exploring for, or extracting, natural gas from coal seams. The map has information about the history of the well including the date it was drilled, its current status (whether it is active, has been plugged and abandoned or is currently suspended). Further information and a link to the map is available from <a href="http://www.resourcesandenergy.nsw.gov.au/landholders-and-community/coal-seam-gas">http://www.resourcesandenergy.nsw.gov.au/landholders-and-community/coal-seam-gas</a></p> |

### Photographs of “Old Oil Well”



The photographs labelled “Old Oil Well” are not of an old oil well. This item is unrelated to gas exploration and appraisal activities in the Narrabri area by either Santos or previous exploration licence holders.

The photographs are of a component of the Sydney University Giant Air-shower Recorder (SUGAR) array. The liquid scintillation detectors consist of what presents as a 44 gallon drum half buried in the ground. The shaft of the liquid scintillation detector may reach up to 5 metres below the ground, before opening into a wider chamber underneath.

The SUGAR array was established by the University of Sydney’s School of Physics in the Pilliga Forest, and operated between 1968 and 1979. The array consisted of 54 stations dotted around the Pilliga Forest, with each station consisting of pairs of large liquid scintillation detectors (pits filled with fluid) separated by 50 metres.

The entire Sydney University Giant Air-shower Recorder covered an area of 100 km<sup>2</sup> (Sydney University Physics Department 2008) although the precise locations of the stations throughout the Pilliga are not available.

The SUGAR project was developed to measure showers resulting from cosmic ray particles of the highest known energy. Each station operated in an autonomous manner with solar power units and received their timing information via radio receivers (Brownlee et al 1968: 68). At this stage it is unknown how many of these stations remain in situ in the area.

Photograph of another SUGAR Pit within the Narrabri area for reference:



**SUGAR Pit A. When the lid was removed, the structure revealed a tunnel of approximately five metres deep which opened into a cavity at the bottom.**

Source: <http://www.physics.usyd.edu.au/hienergy/index.php/SUGAR>  
and

*Leewood – Produced Water & Brine Management Ponds Review of Environmental Factors (Appendix 6, 426 – 611)*

[http://www.santos.com/library/NSW\\_CSG\\_REF\\_Leewood\\_Full.pdf](http://www.santos.com/library/NSW_CSG_REF_Leewood_Full.pdf)

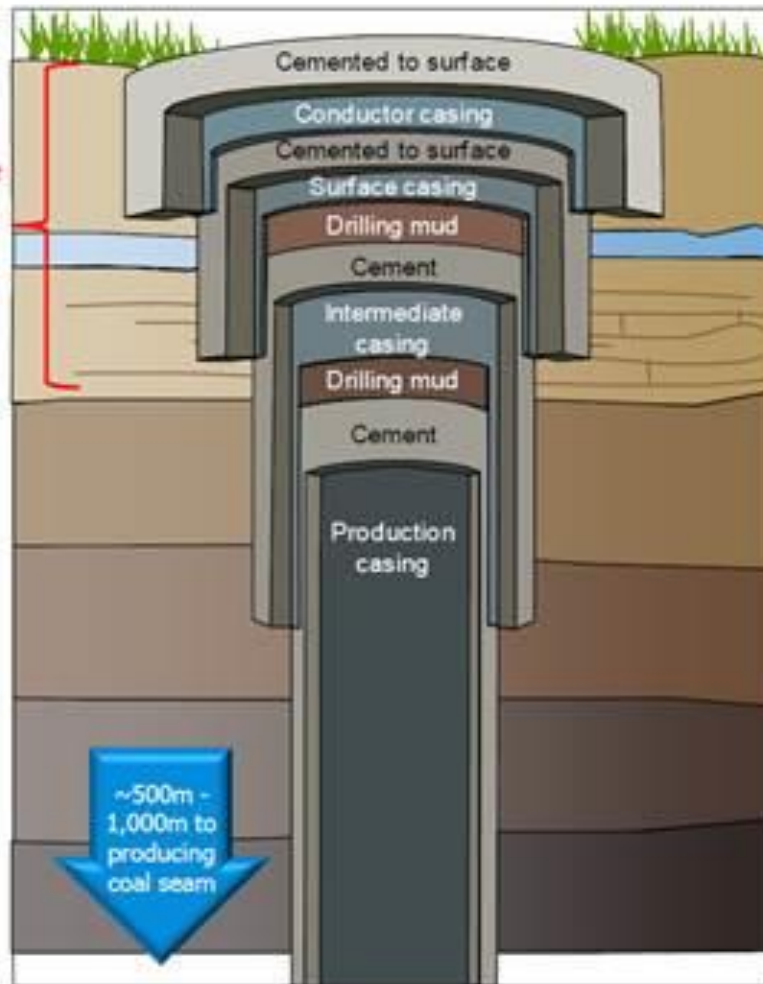
### **Conductor Casing**

#### **Summary of Issue**

- Mr Pickard raised a point about casing not aligned centrally to the conductor casing.

#### **Background Information**

- Conductor casing is installed on the drill pad in preparation for the drilling rig, with casing usually installed to 6 – 12 metre depth depending on the type of soil at the pad site, type of rig being used for drilling, etc.
- The conductor casing is the widest in diameter and serves as a support during drilling operations, to flow back returns during drilling and cementing of the surface casing, and to prevent collapse of the loose soil from the surface. Conductor casing is usually from 14" to 30" in diameter. The conductor casing is usually installed to a depth of between 6 and 12 metres.
- Spacers are used to ensure that well casing for the surface casing, intermediate casing and production casing is centralised prior to the casing being cemented. Diagram below illustrates the different casing types.



- Well Completion Reports for all wells are submitted to the Regulator in accord with PEL 238 Licence Conditions under the *Petroleum (Onshore) Act 1991*

#### **Conclusion**

- The alignment of the surface casing to the conductor casing does not compromise well integrity.
- The conductor casing is used for surface preparation, and extends only a short distance in preparation for a stable drilling support and to stabilise surface soil.
- Spacers ensure surface/intermediate/production casing is centralised prior to cementing casing.

#### **Previous Santos Narrabri Community Committee Meeting Minutes Presentations on Rehabilitation – PEL 238**

**11 June 2014**

Minutes:

[http://www.santos.com/library/20140611\\_CCC%20June%202014%20meeting%20minutes\\_Final-and-appendices.pdf](http://www.santos.com/library/20140611_CCC%20June%202014%20meeting%20minutes_Final-and-appendices.pdf)

Presentation:

[http://www.santos.com/library/SantosCCC\\_narrabri\\_14Nov12\\_minutes.pdf](http://www.santos.com/library/SantosCCC_narrabri_14Nov12_minutes.pdf)

**12 February 2013**

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|              | <p>Minutes:<br/> <a href="http://www.santos.com/library/SantosCCC_Narrabri_12Feb_presentation.pdf">http://www.santos.com/library/SantosCCC_Narrabri_12Feb_presentation.pdf</a><br/> Presentation:<br/> <a href="http://www.santos.com/library/SantosCCC_Narrabri_12Feb_presentation.pdf">http://www.santos.com/library/SantosCCC_Narrabri_12Feb_presentation.pdf</a></p> <p><b>14 November 2012</b><br/> Minutes:<br/> <a href="http://www.santos.com/library/SantosCCC_narrabri_14Nov12_minutes.pdf">http://www.santos.com/library/SantosCCC_narrabri_14Nov12_minutes.pdf</a><br/> Presentation:<br/> <a href="http://www.santos.com/library/SantosCCC_Narrabri_minutes_14Nov2012.pdf">http://www.santos.com/library/SantosCCC_Narrabri_minutes_14Nov2012.pdf</a></p> <p>Minutes of all previous Santos Narrabri Community Committee meetings are available on the Santos website at <a href="http://www.santos.com/our-activities/eastern-australia/new-south-wales/community/community-consultative-committee.aspx">http://www.santos.com/our-activities/eastern-australia/new-south-wales/community/community-consultative-committee.aspx</a></p> |
| <b>Date:</b> | 23/3/2015   |