

MEETING MINUTES

21 November, 2013

Minutes: Santos Community Committee -Narrabri Shire
Wednesday, 21 November 2013
Narrabri Bowling Club

Attendance: David Ross (Chair), Tony Pickard, John Tough, Victoria Hamilton, Ian Duffy, Annie Alexander (Santos), Annie Moody (Santos), Ken Flower, Ron Campey, Terry Hynch, Michael Guest, Josh Gilroy (Santos), Glenn Toogood (Santos)

Apologies: Brendan Warnock, Jon Maree Baker

	Discussion	Action/By Whom
1. Welcome and introductions	The chair opened the meeting at: 5.32pm Chair welcomed committee. Introduced Santos Representatives: Josh Gilroy and Glenn Toogood Introduced new Independent Secretary: Shayne Miller	
2. Previous meeting's minutes	No comments were given on the previous minutes. No comments were given regarding actions from the previous minutes. Chair confirmed with the Committee that minutes from the last meeting were reflected as was discussed and accepted. Santos gave a brief overview of the progress to the Formalisation of the CCC. The application is with the Minister-see News release. The Committee was advised that an EIS will be presented next year on Santos' future development in the Pilliga region.	
3. Monitoring of local air quality Presented by Josh Gilroy	<i>Pilot study to establish CH₄ and CO₂ baseline levels, Gunnedah Basin NSW</i> (See Appendix 1 for presentation) – Josh outlined his position as the Social Environmental Studies Coordinator with Santos and	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<p>his previous position based in Queensland within Government; he has transferred skills to be used whilst working with Santos</p> <ul style="list-style-type: none"> – Commented on the reports about methane monitoring in The Courier this year in reference to the results of a Southern Cross University study on monitoring methane gases; – A presentation was given showing the equipment used and how it is placed within and around the vehicle used in testing – There are logistical challenges using Picarro Analyser, the tool used to measure methane gas concentration; a bank of batteries and ongoing cleaning is required to maintain integrity and accuracy of the readings – Whilst samples can be taken when driving via a plastic tube outside the vehicle with a continuous pump inside the vehicle, the real innovation is accuracy and it's robustness; less than one part per billion of methane can be recorded and readings can be taken each second – The analyser is constantly picking up information as the vehicle is driving around – The pilot also includes spending time in a single location to watch the variations over time; – Weather station data is also recorded as part of the testing – Santos aims to trial different setups to have meteorological equipment located on the vehicle whilst moving, with the ability to register wind speed direction whilst driving (looking for devices to do this) – the next step is to set it up on the vehicle and get it working – Every data point monitored has a GPS reference – Partnering with the University of Adelaide; the cost is \$125,000 per device with additional funding provided by Santos for additional devices and testing – Measuring methane and carbon dioxide – Samples were previously taken into a stainless steel canister and sent off to a lab with testing of single methane concentration for this instance – Methane concentration moves through the atmosphere so it can be challenging in the previous sampling process – Advantage of using the Picarro Analyser is its accuracy 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<p><u>Presentation Comments</u></p> <ul style="list-style-type: none"> – Page 4: Cavity ring-down spectrometer – inside the box is a cavity with a laser shone, continuously pumping air through the cavity. The laser reflects off the mirrors inside the cavity. It is on for a set period of time and builds up then shuts down with the beam bouncing around inside the cavity for approximately 100,000 times every second (it travels about 20km). The box is measuring how the light decays by the concentration of methane in the cavity. It is a significant advancement in technology. The cavity requires careful maintenance and attention. – Page 5: Methane concentrations – Local Councils measuring levels exceeding 50,000 parts per million (ppm). Methane is a safety concern not a health concern. Testing devices are manufactured on this basis. Prior to this technology, testing was done on the concentration of methane in the soil. From this, it was found that the methane concentration in the atmosphere and soils has a link to coal seam gas. – Page 6: Pilot – get information before extensive industry development occurs and before moving into the production phase. – Page 7: Pilot includes looking at different seasonal conditions. Santos is trying to get a good understanding of the characteristics of different areas and landscapes. in the region – Page8: next steps; every data point to have meteorological references through the use of a GPS <p>QUESTIONS AND ANSWERS</p> <ul style="list-style-type: none"> – Q. Concerns were raised regarding how the system gets air in and out (equipment may not have had a pump like a simple flow-through system). <ul style="list-style-type: none"> ○ A. The intake is pointed backwards and the filter is included on the end of the intake to stop particles getting in. It blows the gas through it. ○ A. There are challenges regarding the level below which devices do not need to measure. Santos is looking for the most sensitive bottom end device they can find and use to obtain accurate readings. 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<ul style="list-style-type: none"> – Q. When you do your monitoring, do you do it around all existing infrastructure in the Pilliga and all sites? – A. Yes, but monitoring has not been not done when the flare is burning. – Q. Why are you testing in Tamworth? – A. It is an area different to anything else in the region, a town like no other town and it is used as a base for the Liverpool Plains and Gunnedah Basin. Testing has been done at Gunnedah but not in Moree. The most extensive work has been done in PEL 238. No testing has been done in Armidale. – Q. Research suggests that data must be collected in a zig-zag fashion. Is this the way data is collected under the Pilot? – A. Santos uses every road available to them in the Pilliga. ‘Tara’ was used as an example, regardless of which way it was driven. There is a need to have a fixed point for measuring methane at a point. We want to test the same locations at different times at the same point to build understanding of methane omissions. The plan for testing is done 6 weeks in advance. Tamworth testing was completed in winter during the coldest week, with sampling taken at night in 2-3 degree temperatures with no wind. This was a perfect source of accumulation. But no, it does not require zig-zagged sampling. – Q. Measuring VOCs (volatile organic compounds)? – A. They will be assessed as required under our EPA License. There is a variety of equipment required for VOCs to be monitored in NSW. – Q. If the technical work is based in Adelaide and intellectual property is owned by the university, who’s funding the pilot? – A. Santos – Report will be something to potentially be published – Response to Tara and Southern University work is about getting better information and to do more specific studies – Q. Are there health issues related to methane? 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<ul style="list-style-type: none"> – A. It can affect your health in a confined space. The real issue is managing explosives. – Q. Have you found anything different around Tamworth? – A. There is a peak next to town and we can get good readings of the town’s microclimate at the lookout. You can see those things and get about the back of the range with geographic features dividing the atmosphere. This has been discovered through data collection. – Q. Beside a well, how many ppm before you can pick up and see? – A. We are unable to say but long before it would have to be 50,000 ppm above the point of the explosive level. Generally if we saw something coming out of the well then it could combust. – Q. Is there an opportunity to test around Yarrie Lake and the swamps around Tintsville? – A. Not around Yarrie Lake but there has been testing around Tintsville, which happens to have 3 wells around it. – Q. Have you been around the swamps near Wilga Park? – A. We are not going to talk about results today. – Q. Are they higher than anywhere else? Any swamps in the East Pilliga? – A. There is still a need to review the data. – Uni of Adelaide has designed the sampling regime for a really broad geographic coverage, broadly around the Pilliga, north, around the station and Tintsville and through the creek where all the roads are. – Q. How long is it between the sample and data coming back to be readable? – A. We are looking at the screen whilst driving around. The results are coming in at real time. – Takes about a month to come up with the analysis after a week of driving around. – Q. What’s the testing structure and when will it come back to the public? – A. The University will write up the results and it will be peer reviewed and then published. Academics have to review it before publication of the report/findings (explanation about the process of reporting the findings). – Q. Is it easily understood where the readings were taken? 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
<p>4. Narrabri Gas Project – Baseline Monitoring Activities, Narrabri Presented by Glenn Toogood</p>	<ul style="list-style-type: none"> – A. It will be mapped. – Basic overview of the recent baseline monitoring Santos is doing was provided. (See Appendix 2 for presentation/ hard copy distributed at the meeting). – Page 2: putting everyone back into the mindset of hydrogeological overview <ul style="list-style-type: none"> ○ Highlighted areas of the project 50m to 160m thick before hitting sandstone towards Wee Waa area; Pilliga sandstone is more unconfined and acts as an artesian aquifer. ○ What are the water resources we need to protect in this area? Controls required? 18,000 registered bores in the area makes it an important aspect to protect; southern recharge zone – less bores ; the water flow in alluvial aquifers is up to 100 m/sec. – There is a need to understand the effects on the chemistry in the area – 19 aquifer monitoring bores this year in Keelinbi bed; targeting Upper and Lower Pilliga sandstone; Piezo monitoring going in; the regions’ deepest ground monitoring bore of 1024 metres in Porcupine formation into the top of the watermark, Digby formation and Napperby formation; look at pressure readings in the coming weeks and how it compares in the models; calibrating models to make it more accurate. – NSW State Water provides good information about changes in the basin from 1980s onwards – available as independently verified source of information. – Eastern Star pilots - some historical reviews have been completed. – Page 3: current locations linked to be in monitoring activities – 8 new location – 3 separate monitoring bores; located in a range of places as per blue dots on map; Trying to determine what water is sitting in those seams further out both horizontally and vertically? – Page 4: understanding what surface water systems are and whether they are recharge or discharge springs. There is a need to know the upper reaches of the Upper Namoi system to understand what’s coming in; a lot of aerial review across PEL238 through Google Earth and now doing ground earthing work. – Page 5: an example of the device was provided. The structure was outlined of the device as 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<p>pictured - provides pressure readings and fluctuations, reading about every 30 seconds but really want readings every hour; want to get understanding of trends; expect to get fluctuations and seasonal variations; important to understand dynamic changes.</p> <ul style="list-style-type: none"> - Page 6: making data available for people to see; what are the readings? What's happening with the water tableland? To access you will simply click on to a location providing information on water level, pH, total dissolved solids (TDS) and electrical conductivity; www.santoswaterportal.com.au – can click on layers, locations; waiting on Office of Water for permission to publish data; will try and get the data on as quickly as possible subject to review; good source for community to look at; looking at GLNG symbol being removed from portal. - Santos has identified 15 Ground water dependent Ecosystems across PEL 238 - Dewhurst 8A completed Saturday 18-11-13. Pressure of water in coal seam is 1400 psi. - 680 wells to be drilled in the Pilliga, so Santos is collecting base line water data by putting down SAMBS and DAMBS to check water pressures and water quality. Water pressure equates to the amount of water draw-down or water head level <p>QUESTIONS AND ANSWERS</p> <ul style="list-style-type: none"> - Q. Have you tested for gases around the flares at Bibblewindi and Wilga Park? - A. We have driven around the sites. - Q. Have you tested for gases the flares at either site when going? - A. No - Q. Coal seam from the Whitehaven underground mine – where is it? - A. Referenced Page 2: targeting Blackjack with multiple little seams and then out to the Boggabri High. - Q. Is there any age dating of the water samples? - A. Carbon 12, 13 and 14 dating in each of these formations with the University of Newcastle. Attempting to get ages to better understand residency time of water, how long it's in the system and how long it takes to move; water may be up to 10,000 years of age; 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
	<p>limited by no age data due to no water produced from wells; will be capturing this to do carbon dating once well is turned on.</p> <ul style="list-style-type: none"> – Q. TDS (total dissolved solids) in actual samples – how often? – A. Live samples are tested in the laboratory. Measuring the dissolved contents within water, sum of all dissolved solids within water. No breakdown will need to be done as separate testing is required in accordance with the EPA License requirements. The timing will also be done in accordance with EPA License requirements. – Completed the location testing to communicate and give a guide to the community versus water elsewhere so as not to overload the system – There is a need to know what is coming out of the wells and centralised with monitoring devices. It is hooked up with live time monitoring devices of water levels; part of wells will centralise pipes insitu. Central pipelines are being placed to gain quality of formation water provided annually. Results will be published online in reports. – Q. Map page 6: will we be able to identify where the dots are? – A. Every dot should have coordinates and will have bore numbers. No landowner names or property locations will be included. You are able to scan and zoom into the locations. – Q. Pressure gauges and open hole wells are two variants –what is the level of analysis on open hole wells? – A. Water quality items will be included on website with testing including inorganics and organics, gases, bacteria sensing if required. It may include sulphate-reducing test on bacteria in the area; may look at eecoli testing; can pick up sulphate smells which would assist in providing further testing; doing baseline monitoring of 4 parts to 40 variables; if warranted we could explore more. – Q. What exactly are you testing for and the frequency you are testing bores for bacteria and analytic cross studies to make available? – A. There are very specific requirements on the EPA prescriptions of what needs to be tested for, and what needs to be analysed and assessed for. Once the EPA License is provided, a public list will be made available. Santos has the License from Office of Water to put a bore down and is awaiting EPA License. Under the 1912 Water Act, Santos can take water for 	

MEETING MINUTES

21 November, 2013

	Discussion	Action/By Whom
<p>Other Business</p>	<p>testing up to one megalitre per hole. Currently Santos is doing pump tests on the aquifer systems themselves.</p> <ul style="list-style-type: none"> - Q. What is the amount of testing analysis? - A. It is the same suite as used on committee member's place: need to review the range of Coal Seam Gas Suite – inorganic, organics, gas; - Q. Why is Santos testing on shallow bores? - A. The primary purpose is to use as testing wells (19 this year at 8 different locations). - Q. Do you test and pump them first? - A. Yes, to clear the system out (purging the well) – allow fresh water to come in. <p>A member expressed his concern at the movement of equipment adjacent to his property without being provided with any notification. He noted that he had requested appropriate communication previously. This issue is now the focus of an official complaint and will be investigated as a result.</p> <p>A discussion was then held on what guarantee can be given that the works will not impact upon a particular individual's property. It was recommended by Santos for that individual to seek independent advice</p>	

Next Meeting Topics:

Economic issues associated with Santos' proposed activities in the region

Date of next meeting:

Wednesday 11th December 2013

MEETING MINUTES

21 November, 2013

Meeting Closed: 7.30pm

Appendix 1: Pilot study to establish CH₄ and CO₂ baseline levels, Gunnedah Basin NSW

Appendix 2: Narrabri Gas Project – Baseline Monitoring Activities, Narrabri

MEETING MINUTES

21 November, 2013

Attachment 1. Actions

Action Raised	Date Raised	Progress Made
Action for Santos to provide committee with full soil analysis including analysis of bacteria of the Leewood site next year when it is available. As well as providing regular soil checks to ensure no contamination is occurring.	11th December	Ongoing
Santos to give a process to try and resolve committee members issue with his bore	14 th May	Ongoing. CCC will be provided with copy of document when it is finalized
Santos to provide further details on the erosion management plan for the flow line project	18 th September.	CCC will be provided a copy of this once it is finalized.
Committee member would like clarification of the location as marked NAR7059_SUR_W.	18 th September	Santos looking into to see if they can provide the GPS location
Santos to send out upcoming presentation for future meetings 1 week in advanced.	16 th October	Actioned: Information provided by Santos
Action on all CCC to review the provided material (Narrabri Shire Economic Development Strategy and Groundwater monitoring and modeling plan) for next meeting.	16 th October	Actioned: Information provided by Santos
Santos will check the proximity of the seam they use to the Whitehaven coal mine and speak with a geologist to see if they can find out more information.	16 th October	Actioned: Information provided by Santos

Meeting Action Item Response

Reference:	131016_NCCC
Subject:	Meeting Action Items – October Meeting Narrabri CCC
Request date:	November 2013
Requested by:	David Ross Chair Narrabri CCC
Background Request:	<ol style="list-style-type: none"> 1. Committee member would like a more precise location of NAR7059_SUR_W GPS reference if available. 2. Santos to send out upcoming presentation for future meetings 1 week in advance. 3. Santos to provide more information about polymers. 4. Santos to provide further details on the erosion management plan for the flow line project. 5. Santos to provide further information on methane testing. Possibly get a presenter to come and speak at meeting. 6. Action for Santos to explore the option of formalising the committee. 7. Santos to raise with their Communications team that the Land Access Brochure has been noted at the CCC meeting to be unclear. 8. Action on all CCC to review the provided material (Narrabri Shire Economic Development Strategy and Groundwater monitoring and modelling plan) for next meeting. 9. Santos will check the proximity of the seam they use to the Whitehaven coal mine and speak with a geologist to see if they can find out more information. 10. Specialist to answer questions on aquifer monitoring research that is being conducted.
Response:	<p>Item 1 - <i>Committee member would like a more precise location of NAR7059_SUR_W GPS reference if available.</i></p> <ul style="list-style-type: none"> • Surface water site NAR7509 is the large lagoon east of the Newell Highway (almost roadside) and is found at GIS Coordinates (GDA94) Easting 747345 and Northing 6611073. • This site has been sampled 18 times over the past 2 years as part of our surface water baseline studies. • This SRB sample was taken once as SRBs are not part of normal surface water studies.
	<p>Item 2 - <i>Santos to send out upcoming presentation for future meetings 1 week in advance.</i></p>

	<ul style="list-style-type: none"> Noted. November presentation is included as Attachment 1.
	<p>Item 3 - Santos to provide more information about polymers</p> <ul style="list-style-type: none"> Polymers are biodegradable compounds used to aid the drilling of bore holes. They are a standard component of drilling fluids used for oil and natural gas wells and also for the drilling of water wells. Drilling fluids provide hydrostatic pressure to prevent formation fluids from entering the well bore, keep the drill bit cool and clean during drilling. Polymers within the drilling fluid assist to carry cuttings to the surface and to increase the viscosity (thickness) of the drilling fluid. The drilling fluid is selected for each particular drilling job based on the geological formation of the well and to limit corrosion of drilling equipment. Santos does not intend using any toxic chemicals with potassium-sulphate being the main component of drilling fluids. Potassium sulphate is a non-flammable white crystalline salt which is soluble in water. The chemical is commonly used in fertilizers as it provides potassium to the soil. A list of the chemicals which may be used for drilling of a well is detailed in each REF which is available from the DRE website.
	<p>Item 4 - Santos to provide further details on the erosion management plan for the flow line project</p> <ul style="list-style-type: none"> Awaiting copyright release from contractor but will send copy of the Soil and Water Management Plan for the flowlines as Attachment 2 when release granted.
	<p>Item 5 - Santos to provide further information on methane testing. Possibly get a presenter to come and speak at meeting.</p> <ul style="list-style-type: none"> Complete. Methane testing presentation scheduled for November 2013 meeting. Josh Gilroy, Social and Environmental Studies Coordinator, Santos Environment and Water team will be presenting.
	<p>Item 6 - Action for Santos to explore the option of formalising the committee.</p> <ul style="list-style-type: none"> Complete. A request has been made to the delegate through the Department of Resources and Energy to formalise the Santos Narrabri Community Consultative Committee.
	<p>Item 7 - Santos to raise with their Communications team that the Land Access Brochure has been noted at the CCC meeting to be unclear.</p> <ul style="list-style-type: none"> Complete. Communications have revised the brochure and it is currently in the approval stages for printing and expected to be ready for release by January 2014.
	<p>Item 8 - Action on all CCC to review the provided material (Narrabri Shire Economic Development Strategy and Groundwater monitoring and modelling plan) for next meeting.</p>

	<ul style="list-style-type: none"> • Noted.
	<p>Item 9 - Santos will check the proximity of the seam they use to the Whitehaven coal mine and speak with a geologist to see if they can find out more information.</p> <ul style="list-style-type: none"> • The diagrams at Attachment 3 show the areas being mined for coal and Santos' petroleum exploration licence areas. • The diagram in Figure 3A shows Santos permits in blue and the coal permits in red. • The Whitehaven (Narrabri Coal Mine) lies within PEL 238 (at the end of the yellow seismic line in Figure 3B) and is a long-wall underground mine mining the Hoskissons coal seam at depths of 160-350m which contains high concentrations of carbon dioxide, 90%. • The Maules Creek coal seam is considered too deep and thin for mining in the Whitehaven Narrabri coal mine lease area. • Santos is targeting the Maules Creek coal seam including the Bohena seam in PEL 238 and PAL 2, generally at depths of 600-900m. • Santos has a stated intent to target the Hoskissons seam near the Bohena wells in PAL 2 at depths of 500-600m, this is a lesser target compared to the Maules Creek coals. • The seismic line shows the structure, depth and geology of the area as does the cross section of the Whitehaven Narrabri Coal project in Figure 3C.
	<p>Item 10 - Specialist to answer questions on aquifer monitoring research that is being conducted.</p> <ul style="list-style-type: none"> • Glenn Toogood, Team Leader Water can provide a technical overview of the aquifer monitoring program at a future meeting.
Briefing Officer:	Annie Moody Team Leader, Community and Land
Date:	12/11/2013

QUESTIONS FOR SANTOS FROM THE GENERAL COMMUNITY

Presented to SANTOS at the Narrabri SANTOS Community Consultative Committee Meeting

Wednesday 18th September 2013 1730-1930hrs Narrabri Shire Council Rooms.

It is requested that printed answers be supplied by SANTOS to each individual question, thank you.

- 1) Will the results of all the baseline air quality data be made available to the general public and all details of when, where, methods of collection and air speed /direction at time of collection, be included. We are requesting they are made available to the public and also requesting we will be directed by SANTOS as to what government department the results will be sent and when.
- 2) What legal protection does any individual privately owned business entity including farming and grazing or individual land owner living on a 'lifestyle block' have, in regard to the loss or contamination/depletion of their underground stock and domestic or irrigation water, due to that owner believing the cause may be from a operational(in any form) csg business. How do you prove damage, where does the onus of proof rest and how is it possible to prove damage in your ie SANTOS view?
- 3) Has or is Mr. Sam Crafter of SANTOS moving from the district to live elsewhere? Is this an acknowledgement that his style of community engagement has failed? What will SANTOS do to re-establish trust in the community?
- 4) Is SANTOS supporting the establishment of a HIA in the region to set baseline health levels? If so will they write to the Deputy Premier to include this in the SRLUP ?
- 5) What commitments has SANTOS given to the Federal Coalition about csg reservation of the Pilliga for NSW ? Are they enforceable?
- 6) How will SANTOS stop aquifer drawdown and gas leakage in the tri-stacked Dewhurst wells when SANTOS informed the NSW Chief Scientist Professor Mary O'Kane that they had difficulty in sealing the tri-lateral junctions?
- 7) Does SANTOS remain faithful to their statement that "they would not force their way onto any landholder who does not want them"?
- 8) Can SANTOS explain the above statement they have made in relation to the State and Federal Governments position on procurement of unconventional coal seam gas on private land?

CONTINUED ON NEXT PAGE

- 9) What is SANTOS water management plan? , In light of the community requiring and deserving of a straight succinct answer to the below reference. Can SANTOS please set the record as to:

The community deserves a straight answer, on the record, about their plans to treat and dispose of water from their 36 planned coal seam gas pilot production wells in the Pilliga region that are currently sitting in the NSW Government's approval process.

The have a formal referral to the Federal Government that includes a water resources assessment report that specifically describes water being trucked daily from the Leewood Ponds to a licenced waste facility in Sydney.

It says, "Produced water from the pond will be transported by road tankers to an appropriately licensed facility for treatment, reuse and/or disposal. An average of 35 truckloads per day are estimated to be required to transport produced water from Leewood Produced Water Facility to an appropriately licensed facility in the Sydney metropolitan area."

However, in late August 2013, Santos is now stating to the Narrabri Courier:

"In the second stage of the project, a water treatment facility will be built to treat the water to a high standard, suitable for human consumption. The water will be variously re-injected into the aquifers, used for irrigation and be available to farmers."

Santos staff have also said there will be no trucking at the recent Ag Quip, and despite their Water Resources Assessment, a Santos rep told an AAP journalist in July 2013 that "We have no immediate plans to truck water."

- 10) Can SANTOS clarify what written permission they have been granted by any State or Federal government department with regard to the media item recently appearing in the media and all conditions upon the granting. As below:

SMH 18/09/2013

The NSW government said it had approved the drilling by Santos of eight exploration coal seam gas wells in one of the biggest remaining temperate woodlands in eastern Australia, provided "strict" environmental conditions are met.

Santos won approval to drill two sets of four wells in the Pilliga Forest in north-west NSW in August with details only made public in recent days.

The company also secured approval for stage one of its water management project.

Environmental groups, such as the Wilderness Society, queried how the same arm of the government taking Santos to court on Friday over the spill in mid-2011 of waste water from

the nearby Bibblewindi water treatment works could also give the nod for further drilling in the area.

A spokesperson for NSW Trade & Investment said the wells and water management project had been approved on August 16 "subject to strict environmental reporting and monitoring conditions".

"Before Santos can produce water from these wells they are required to lodge and have approved a produced water management plan," the spokesperson said.

The company will need approval to transfer water via flow lines to its Leewood facility outside the Pilliga Forest before the wells can start producing water, she said.

Naomi Hogan, a campaign manager for The Wilderness Society, said a longer-term plan was necessary since Santos' Leewood ponds now operate solely as evaporation sites.

"They have no clear plan for how they will handle the water when it gets to the ponds," Ms Hogan said, adding the water was often contaminated with heavy metals and salts. Any water management plan should be "on the public record" and be a "long-term scientifically researched outcome," which is not yet the case, she said.

A spokesman for Santos said the company would abide by the conditions set by the state government.

The aim is to begin drilling in the final quarter of 2013, assuming the company obtains state approval and also a separate nod from the incoming federal government under the existing environment rules, the spokesman said. "It is also worth pointing out that there has been extensive groundwater modelling done that shows the proposed exploration program will have no significant impact on the groundwater source in the region," a spokesman for Santos said.

The NSW Environmental Protection Authority, meanwhile, said it had yet to complete investigation of a possible leaking at the large pond at Bibblewindi earlier this year.

- 11) What geological studies including tracer studies between potable aquifers and the proposed drill sites (to determine interconnectivity) in the Pilliga (just announced) have been carried out to date? Where may we access this data? Have tracer studies been conducted by SANTOS or any commissioned by SANTOS or any entity, recently or in the past, if yes, where can we view the results?

Thankyou, for and on behalf of the greater general public including the Narrabri SANTOS CCC.

Attachment 3

Figure 3A

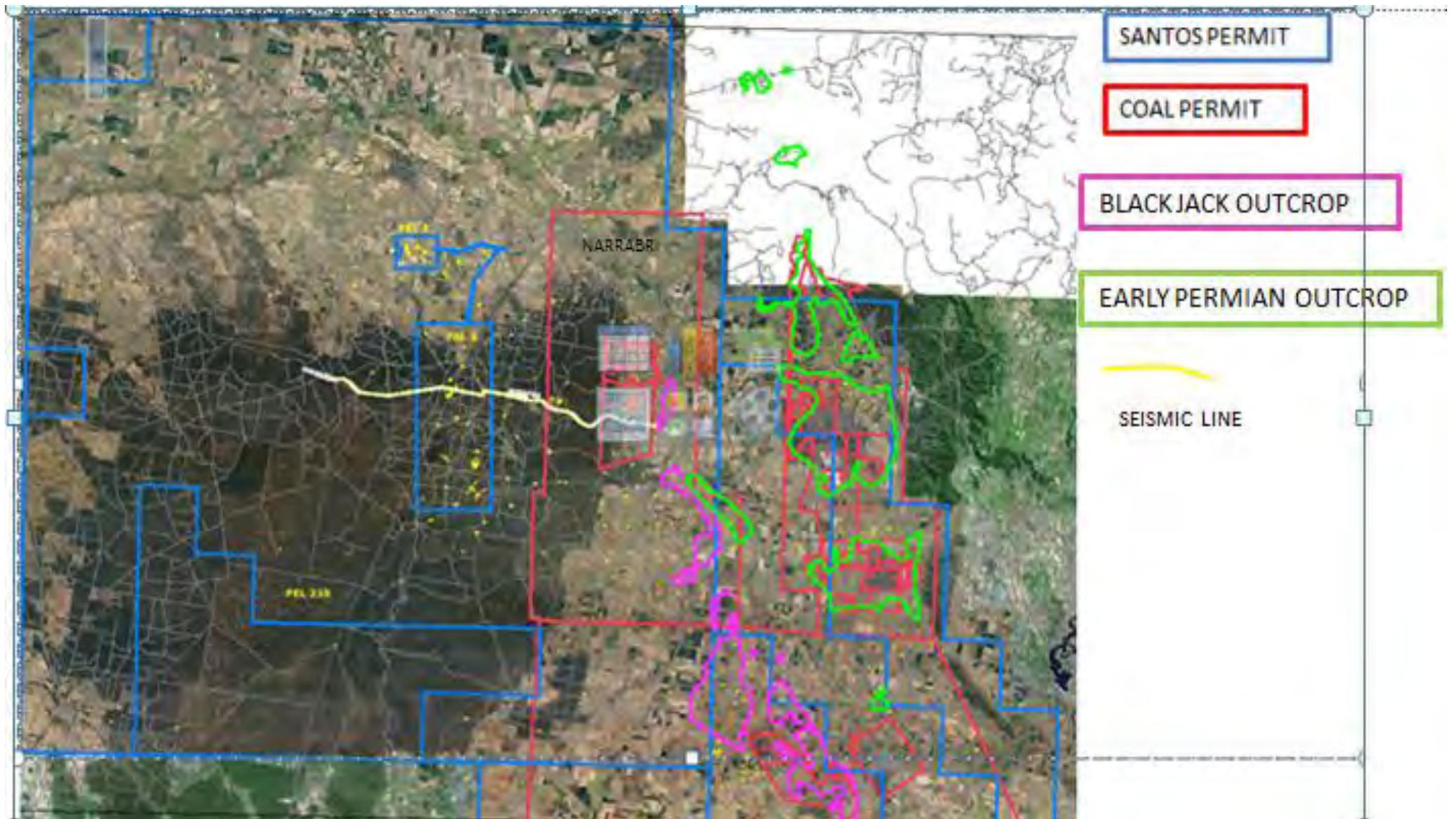


Figure 3B

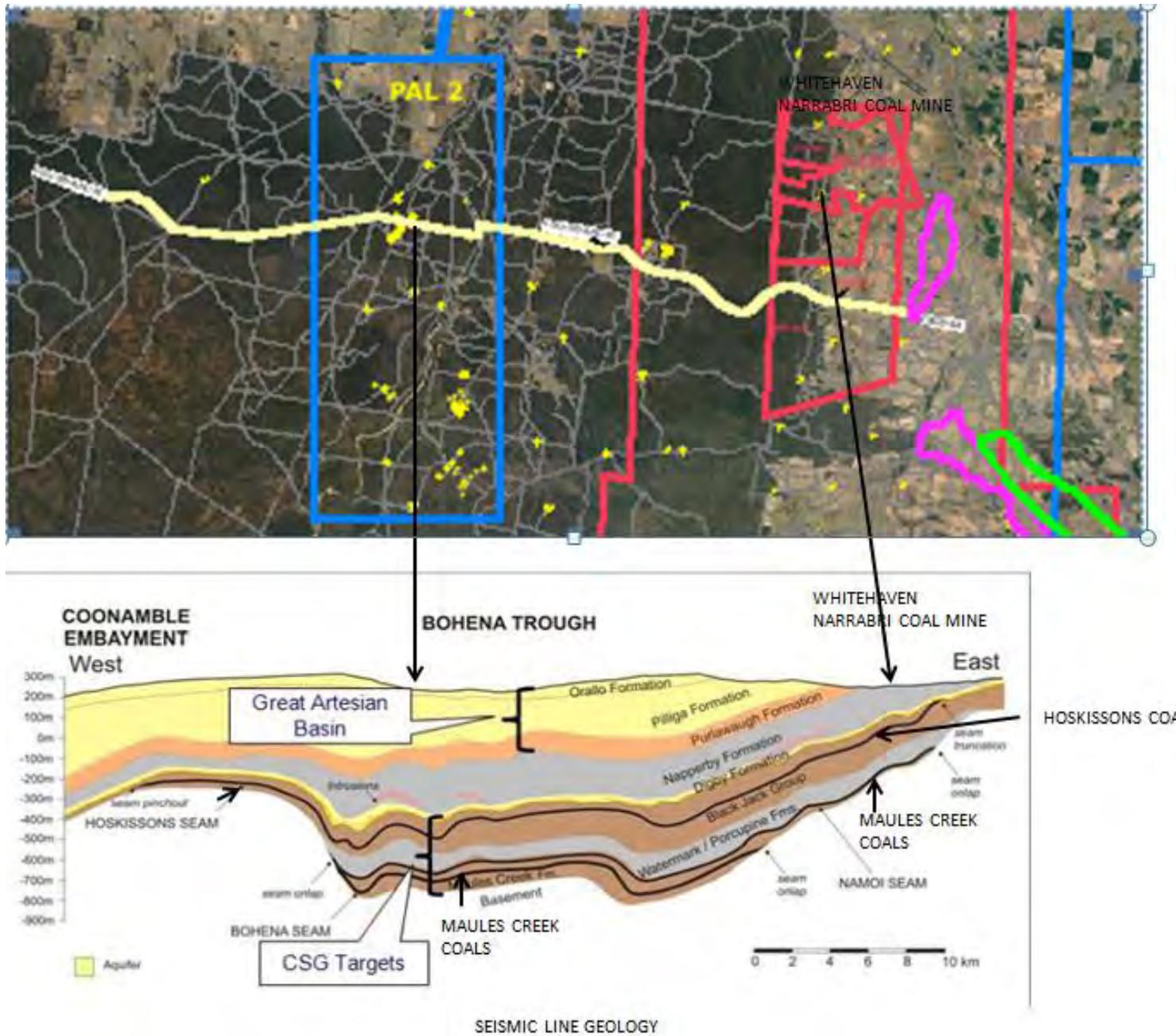
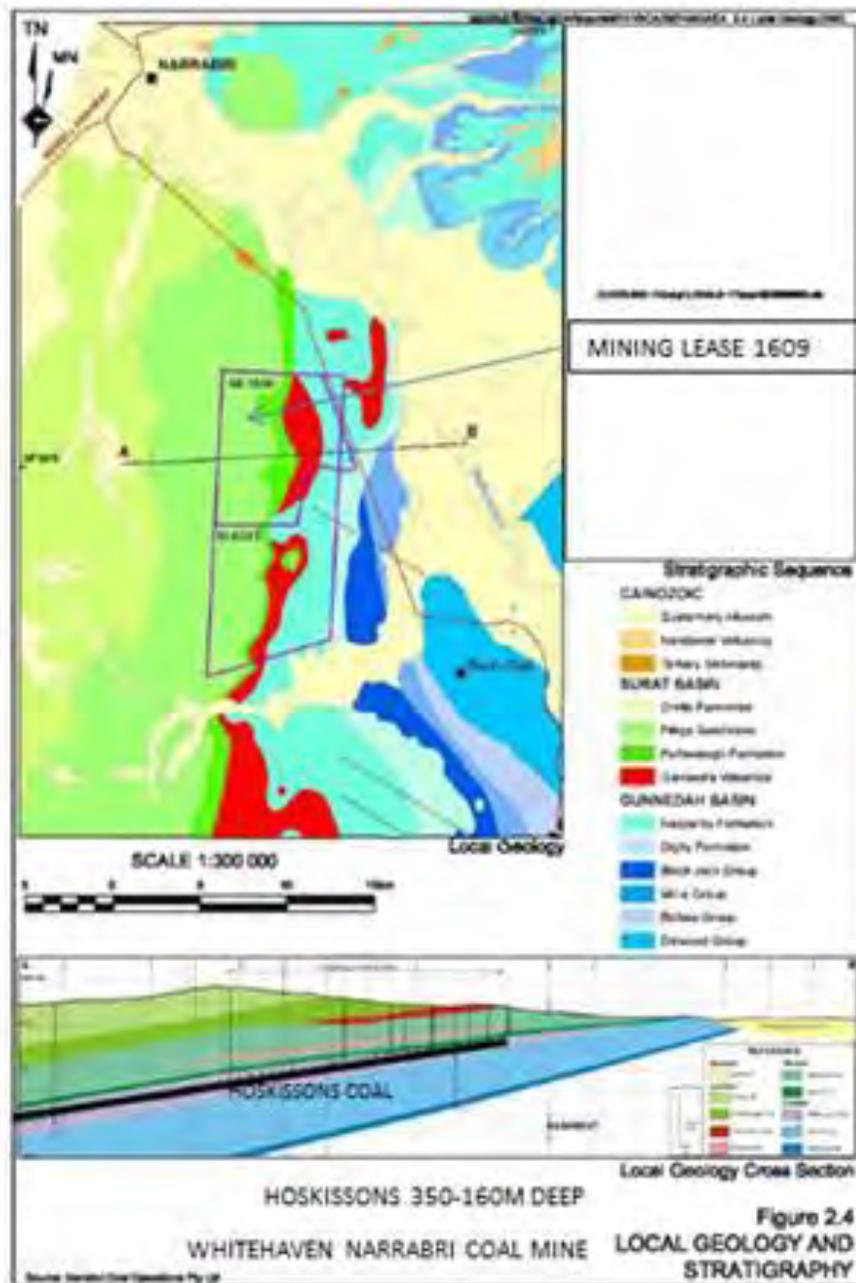
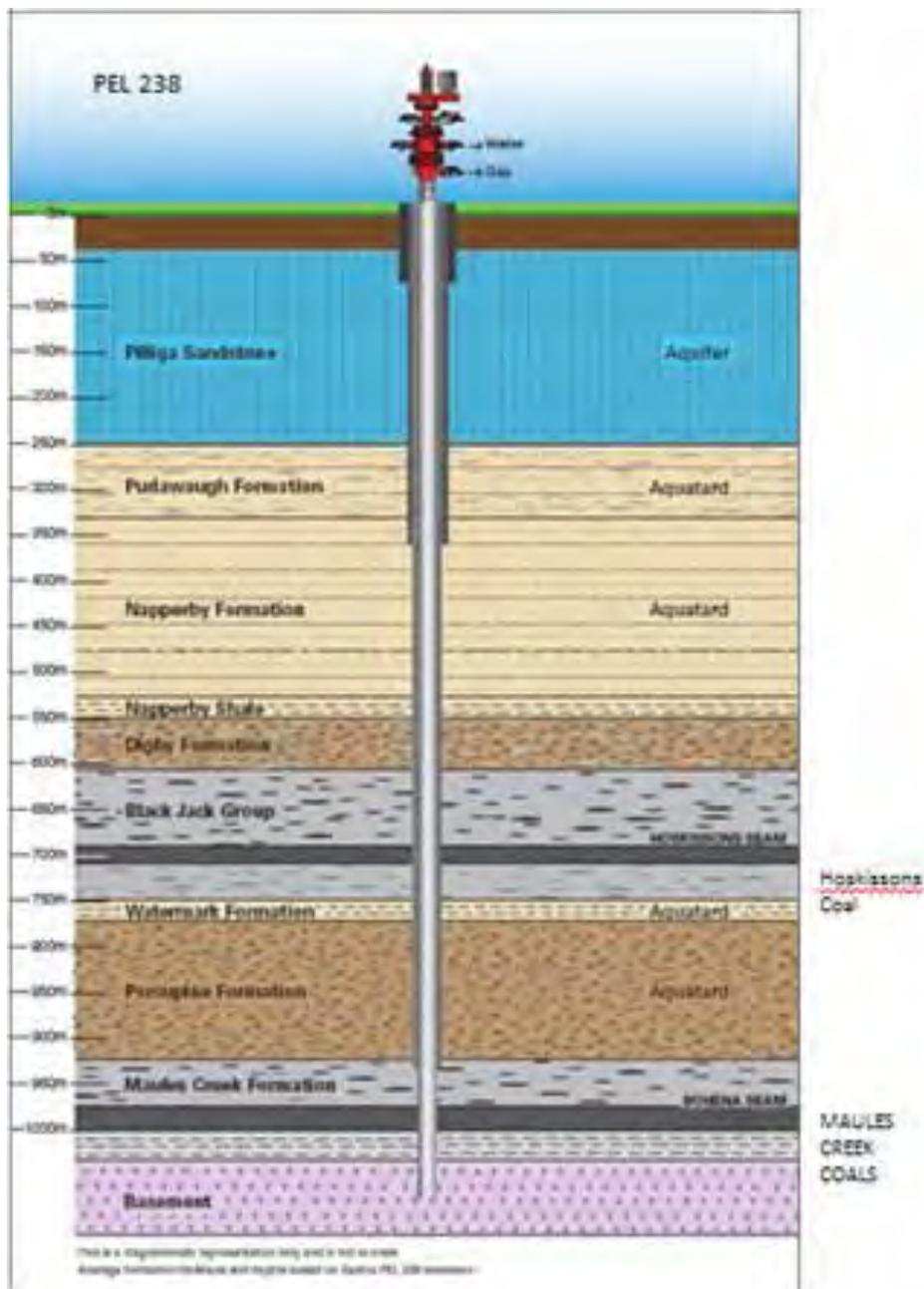


Figure 3C



SANTOS UPDATE – November 2013

Proposed upcoming work program – Narrabri Area

Time frames are indicative as schedules are dependent on factors such as approval times, weather and rig availability.

Decommissioning of wells:

- No plug and abandon activities planned for November

Workovers:

- No plug and abandon activities planned for November

Drilling of exploration core holes:

- Drilling of core hole at Dewhurst 8A is ongoing and will be completed November 2013. When the core material has been extracted, the hole will be fitted with aquifer monitoring equipment to provide baseline deep groundwater information and the core hole sealed.

Pilot wells:

- Installation of pilot wells at Dewhurst 22-25 scheduled to commence November 2013.

Other work:

- Construction of the Leewood water storage facility site is progressing:
 - Testing of the ponds' embankment layers is continuing
 - Liners for the storage ponds are due to arrive this month
 - Traffic management continues on the Newell Highway and Old Mill Road
 - The upgrade of boundary fencing is well underway
- Construction work is continuing on the Bibblewindi facility upgrade, installation of a 5ML water tank will commence this month
- Upgrades to the Narrabri Operations Centre are underway. Site work has commenced on the Fluid Treatment Facility and the cement bulk storage plant with both expected to be operational by the end of this month
- Vent stack on Tintfield site to be removed and rehabilitation to occur mid-November.
- Construction of a new flare stack within Wilga Park Power Station property site to begin mid-November.
- Site preparation for Dewhurst 26-29 to commence late November 2013.
- Installation of shallow aquifer monitoring bore Bohena 14 scheduled for early November 2013.

- Installation of deep aquifer monitoring bore Dewhurst 8A ongoing and will be completed November 2013.
- Dewhurst Northern and Southern Flowline on-ground works ongoing through November 2013.
- Ecological surveys – ongoing for current program through November 2013.

Pilliga rehabilitation:

- Irrigation is continuing as part of the rehabilitation of the Bohena and Bibblewindi sites in the Pilliga.

Site visits:

- Two community site visits to the Pilliga will be held this month on 10 and 21 November.

Community:

- Vesna Rendulic has joined our Community Engagement team in Narrabri in the role of Senior Adviser, Community Relations. Vesna joins us with over 15 years experience in community engagement across Australia, with prior roles at Ernest Henry Mining, QER, Shell, BHP and Woodside.
- Liz Tomlinson has joined our Land Access team on contract to assist with landholder engagement in the Narrabri Gas Project area. Liz is a local grazier and has extensive experience working with landholders in previous roles as a Rural Financial Counsellor and as State President for NSW Women in Agriculture and Executive Councillor with NSW Farmers.
- Narrabri Chamber of Commerce breakfast on 7 November 2013.

Other:

- Santos is seeking consent for the Dewhurst Gas Exploration Pilot Expansion and has submitted a development application and environmental impact statement (EIS) assessing the potential impacts of the proposed development to the NSW Department of Planning and Infrastructure on 30 October 2013.
- The proposed activity will occur at two pilot sites:
 - the existing Dewhurst 13-18H Pilot, located on freehold land approximately 25 kilometres south of Narrabri
 - the proposed Dewhurst 26-31 Pilot, located in the Pilliga East State Forest, approximately 44 kilometres south of Narrabri.
- The EIS will be on public exhibition from 7 November 2013 and will be available for review on the Department of Planning and Infrastructure's website: <http://majorprojects.planning.nsw.gov.au> and submissions on the proposed activity can also be made through the website. Copies are also available to view at Santos office at 125 Maitland Street, Narrabri and the Narrabri Shire Council.