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Santos Community Consultative Committee - Narrabri Shire Meeting

Wednesday 23rd July – 5:30 pm to 7:30 pm Narrabri Golf Club

1.	Welcome, apologies and introductions	5:30 - 5:35	All
2.	Previous meeting minutes	5:35 – 5:55	David Ross
3.	Navigating the Santos website	5:50 – 6.30	Leesa Selke/Annie Moody
4.	Leewood Phase 2 Review of Environmental Factors	6.30 – 7.10	Simon Griffiths
5.	 General Business Other business Dates for upcoming meetings Next meeting and issue to discuss 	7:10 – 7:30	All

Minutes: Santos Community Committee - Narrabri Shire

Wednesday, 23 July 2014 Narrabri Golf Club, Narrabri

Attendance: David Ross (Chair), Tahnee Laycock (Secretary), Annie Moody (Santos), Kym Bailey (Santos), Vesna Rendulic (Santos), Tony Pickard, Ron

Campey, John Tough, Victoria Hamilton, Ian Duffy, Brendan Warnock.

Apologies: Jon Maree Baker, Ken Flower, Terry Hynch.

	Discussion	Action/By Whom
Welcome, apologies and introductions	The chair opened the meeting at 5:38pm. Chair welcomed committee. Introduced Santos Representative: Kym Bailey.	
2. Leewood Phase Two – Review of environmental factors	Energy NSW – Leewood Project Update	
	Agenda:	
	Site overview	
	 Leewood Phase 1 – Update 	
	 Leewood Phase 2 – Proposed Activities 	
	Field Layout Overview	
	See Appendix 1	
	The Bibblewindi water is being pumped to Leewood. At the Leewood facility, produced	
	water and brine are being stored in the ponds where the cells are completed and two	

Discussion	Action/By Whom
that are still under construction. From there the gas pipe line transmits the gas through	
to the Wilga Park Power Station.	
Leewood Objectives and Strategy	
See Appendix 2	
Phase 1 is not about treating water but keeping the water in suitable storage containers	
until such time as we can implement Phase 2, which is water treatment and the	
beneficial use of that water. It is very early in the stages and Phase 3 is something down the track that will involve crystallisation plants for salt disposal.	
Produced water is the water that comes directly out of the well. Brine water is recycled	
back into the system after it goes through an RO unit. The brine that is currently in Cell 1	
at Leewood is legacy brine from Bibblewindi 3 and Cell 1 will store the 45 ML that is	
sitting at Tinsfield.	
Leewood Strategy – The Process	
See Appendix 3	
Phase 1: Pilot wells	
Water extracted during exploration pumped via underground flowlines from pilot wells	
to Leewood ponds.	
Phase 2: Leewood Ponds	
Water will be pumped from the ponds to the water treatment facility. See orange box on	
Appendix 2.	
Phase 2: Water treatment facility	
Phase 2: Water treatment facility Reverse osmosis will separate the fresh and brine (saline) water. The brine will then go to	
heverse osmosis will separate the fresh and brine (saline) water. The brine will then go to	

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Discussion	Action/By Whom
a brine treatment plant (transferred to brine treatment plant for concentration and	
further recovery of treated water) and then onto Phase 3 of crystallisation and removal	
of salts. The fresh water will move to a treated water facility (treated water transferred	
to temporary holding tank for testing before reuse) to be used for irrigation and other	
purposes (approx. 70% of water will be beneficially used after treatment). At this time centre pivot irrigation is what will be used.	
centre pivot irrigation is what will be used.	
Santos have had many discussions regarding other uses for the treated water and have	
had several proposals from groups such as the RFS to use some take off from the tank in	
the event that there is a fire in the area.	
Leewood Phase 1 - Progress	
See Appendix 4 Bibblewindi – 95% complete	
Pipeline to Leewood – 100% complete	
Leewood ponds – 80+% complete: 2 cells complete, 2 cells remaining.	
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Leewood Phase 2 - Proposal	
See Appendix 5	
Construction of Leewood Phase 2 will take about six to eight months and the	
Infrastructure will include:	
Water treatment plant, including a reverse osmosis and brine treatment plant;	
Associated pipework to transfer water and brine around the facility;	
Treated water storage tank; Treated water storage tank;	
Treated water irrigation system - Leewood;	
Monitoring systems in place	

Discussion	Action/By Whom
<u>Leewood Phase 2 – Schedule</u>	
See Appendix 6	
Indicative staging of the works:	
- Access and preliminary civil works	
- Site office and administration buildings	
- Underground services for electricity and power	
- Surface facilities installed	
- Generator and fuel gas conditioning skids	
- Control centres and process units	
- Commissioning of facilities	
<u>Leewood Phase 2 – Assessment and Approval Process</u>	
See Appendix 7	
1 • Initial desktop investigations and scout	
2 • Detailed environmental surveys	
3 • Prepare REF with input from specialists	
4 • Submit REF to OCSG	
5 • OCSG and government agencies assess REF	
6 • Further information may be provided	
7 • If approved, OCSG advises (with conditions)	
The next stage for Santos in this process is lodging a REF to the Office of Coal Seam Gas.	
Q. Committee member: Is the RO plant going to be assembled on a concrete slab and fully bunded?	
A. Santos: No. The facilities that we use are 40 foot containers. There is bunding around	

Discussion	Action/By Whom
the area but the requirements for bunding are directly proportional to the storage area. There will be bunding to stop any separation of brine as an example. The filtration units and containers are fully contained standalone containers.	
Q. Committee member: If a leak occurs, where does the water go? A. Santos: If a leak occurred within those 40 foot containers, it is contained within that container. It has in-built water protection with water proof sides and a water proof floor. In the event that there is a leak, an automatic shutdown occurs. So what's contained inside that container is the maximum amount of spill that you could have, if it did leak outside the container.	
Q. Committee member: So rather than turning those bunches of cells off, you're going to shut the whole plant down? A. Santos: I don't have enough detail on that to know whether it will shut down a unit or shut down them all. I suspect just the one unit.	
Q. Committee member: How will you get the water out of the container, if need be? A. Santos: There are pumps associated with the insides of the container.	
Q. Committee member: Are they all water proof? A. Santos: I'll take that on notice.	Santos to respond to whether the pumps associated with the insides
Comment: I would really prefer if you did not refer to this RO plant as similar design to the Eastern Star Gas system that was at Bibblewindi. The Santos RO plant system proposed for Leewood will be quality built by Australia's leading builder of RO plants.	of the water containers are all water proof.

Discussion	Action/By Whom
Q. Committee member: Santos seems to have been pumping water from Bibblewindi Pond 3 for months, how long until the pond is empty? A. Santos: The pond is empty of water that has been transferred to Leewood, sediment remains and will be removed by the end of the year. There are four cells in Leewood. The two cells to the southern end are what we call brine and the two cells to the northern end will be produced water. So what we are doing now is operating the pilots and the water is being produced from there into a 5 ML tank at Bibblewindi and pumped from there into that Cell 2 at Leewood and that will fill up over a period of time.	
Q. Committee member: In regard to the over spill bank (see appendix 2), where does it go back to? A. Santos: Not drawn on appendix 2 diagram are two environmental spill and sediment control banks that the over spill banks feed into.	
Q. Committee member: Will just one centre pivot run irrigated water? A. Santos: At this stage, yes.	
Q. Committee member: Can you pump water and gas at the same time? A. Santos: No. It has to be either a gas line or a water line. That is a practice used elsewhere however it is not economical for Santos at this stage to do this.	
Q. Committee member: Is the power being fed back to the field generators at Leewood? A. Santos: At this point in time for Leewood Phase 2 there is no proposal to use any power other than what we generate ourselves.	
Q. Committee member: Where do you store the treated water?	

Discussion	Action/By Whom
A. Santos: There is a holding tank to be built. Final design is not through yet but it is likely to be a 5 ML tank.	
Q. Committee member: So is the 5 ML to be continually emptied? A. Santos: Continuously cycled through. As you produce the treated water you use it in centre pivot irrigation.	
Q. Committee member: How can you continuously irrigate? A. Santos: You manage it. You have a production number coming and a production number coming out. When you use the tank you are actually lowering and raising.	
Q. Committee member: You're going to have someone there growing crops all the time or is the idea to get rid of the water? A. Santos: We will be growing crops. The amount of water used depends on how many crops we grow. We aren't going to grow something if we haven't got enough water to water it, nor are we going to continually irrigate.	
Q. Committee member: Have you got any allowance to put excess water into the creek? A. Santos: Not at the moment. We haven't asked. Our proposal is that we are going to irrigate using centre pivot irrigation.	
Q. Committee member: Do you know how many ML of treated water is expected to be produced per year in the existing project? A. Santos: I'll take that on notice.	Santos to respond to the how many ML of treated water is expected to be produced per year in the
Q. Committee member: Is there any condensate? A. Santos: No.	existing project.

Discussion	Action/By Whom
Q. Committee member: Treated water transferred to the temporarily holding tank for treating before being re-used. What is it being tested for? A. Santos: That it conforms to the specification and requirements of manufactured water and the Office of Coal Seam Gas.	
Q. Committee member: Are you going to try and bring down the pH level of that water back to the pH of the existing soils out there which is 5.6 or go higher? Will this extra acidic water over and above the rainfall have an accumulative impact on the pH of the aquifer waters in the area? A. Santos: I'll take that on notice.	Santos to respond to whether they are going to bring down the pH level of water back to the pH level of the existing soil.
Q. Committee member: Has the board signed off on the major expense of this RO plant? A. Santos: At this point in time we have funding allocated for the completion of all of the studies and early works that needs to be completed as part of the project. We are still waiting for final approval.	
Q. Committee member: Are you going to get this before lodging the REF? A. Santos: We can lodge a REF before we get our sign off internally. Quite often you're working in parallel with these things.	
Q. Committee member: Does Santos have environmental insurance as per the chief scientist report in case anything goes wrong and you alter the environmental balance out there? A. Santos: I'll take that on notice.	Santos to respond to whether they have environment insurance.

Discussion	Action/By Whom
Q. Committee member: What type of ground cover will you be irrigating? Native to Australia or imported? If imported grasses like in Queensland, what bio-security measures will be in place? A. Santos: We are looking at a range of crops including lucerne, native crops and grasses etc. Q. Committee member: We have spoken about salts etc. however what's your control for the bacteria? A. Santos: I'll take that on notice. Q. Committee member: Have you done a full study to ensure that any of the salts or metals remaining within the water once it's been finally treated and sprayed on the paddock are a food source for natural bacteria? A. Santos: I'll take that on notice; however we have completed a full water study for the area. Q. Committee member: When will number 3 pond at Bibblewindi be finally emptied and decommissioned? A. Santos: It's empty now of brine. What's left in the bottom is around 500mm of sand and there's layer on top of that sand that appears to be coal fines and brine water. The intention is to clean that out. We are under instruction to have this completed by the end of this year.	Santos to respond to what their control is for the bacteria? Santos to respond to the potential for irrigated water to affect bacterial levels

	Discussion	Action/By Whom
3. Previous meeting minutes	Santos to complete outstanding actions from previous months. Taken on notice and will be completed in the next couple of days.	
	Action for Santos to explore the option of formalising the committee – There has been a casual preliminary discussion with DRE (government) suggesting Narrabri Shire Council to take a stronger role in information getting out to the community. In that meeting, it was suggested that Santos and council have a look at the terms of reference at the Gloucester dialogue. This was completed and we are still waiting on DRE to make their decision.	
	Concerns were raised by committee members about a proposal put forward at Council that would increase the level of Council involvement but reduce the level of participation by the community. It was also noted that those members of the community earmarked for positions on the committee had not been contacted beforehand.	
	Santos responds that they had not been aware of the formulation of the proposed committee beforehand and had not been consulted prior to the meeting agenda item going to the Council meeting. It is reiterated that the existing committee will remain ongoing until such time as there is an alternative or if the government decides not to formalise the committee.	
4. Navigating the Santos website	http://www.santos.com/	
	The Santos website covers the entire Santos business including all the mainland states and also some of the Papua New Guinea, Asian Pacific information.	
	The 'Our Activities' tab covers all our business units can be found at http://www.santos.com/our-activities.aspx	

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Current well information can be found at http://www.santos.com/share-price-	
performance/current-well-information.aspx?year=2014	
Conversion calculator can be found at http://www.santos.com/conversion-calculator.acm	
<u>calculator.aspx</u>	
Quick access NSW information tab which is located on Santos home page (in the middle,	
top right hand corner) http://www.santos.com/our-activities/eastern-australia/new-south-wales.aspx	
The environment section including information on protecting biodiversity, water	
monitoring, monitoring emissions, Pilliga rehabilitation and environmental approvals can	
be found at http://www.santos.com/our-activities/eastern-australia/new-south-wales/environment.aspx	
The environmental approvals page includes:	
the regulatory bodies that are responsible for licenses and permitsREF's	
- copies of EIS's that have been lodged	
- relevant approval documents	
- development applications that have been to council	
Community/ Community Consultative Committee/Narrabri page includes all the minutes	
and attachments from August 2012 and can be found at http://www.santos.com/our-	
activities/eastern-australia/new-south-wales/community/community-consultative-	
<u>committee.aspx</u>	

Discussion	Action/By Whom
Headings highlighted in blue indicate that it will take you to more information.	
The water portal provides you with up to date results of our extensive surface and groundwater monitoring programs. It includes detailed results from over 100 water monitoring locations. You can also find useful information about Santos' water strategy and the project.	
Access to the Water Portal can be found through the following steps: 1. NSW tab on the homepage 2. Environment	
3. Water monitoring 4. Down the bottom of page is the link http://www.santoswaterportal.com.au/ 5. Narrabri http://www.santoswaterportal.com.au/water-monitoring-map.aspx?extent=16561000,-3600000,16787000,-3491000	
Q. Committee member: Was the Nyora bore as a shallow aquifer monitoring bore going through the Great Artesian Basin? A. Santos: I'll take that on notice.	
The DIGS database can be found at the Trade and Investment Resources and Energy website http://digsopen.minerals.nsw.gov.au/	
For example if you were looking to find out some information on Bibblewindi: 1. Type 'Bibblewindi' in Subject Terms/Keywords 2. 9 viewable reports will be found for viewing http://digsopen.minerals.nsw.gov.au/ 3. Once you click on the report you wish to look at, there are sometimes further	Santos to respond to whether Nyora bore as a

	Discussion	Action/By Whom
	documents at the bottom that are associated with your search.	shallow aquifer monitoring bore goes through the Great Artesian Basin?
5. General BusinessOther business	Q. Committee member: In your June meeting with the Narrabri Council, who did you meet with?	Great Artesian Basin.
	A. Santos: You can put the question to council as Santos did not facilitate the meeting	
	and were there as guests. The Narrabri Shire Council hosted the meeting and the request for the meeting came from DRE.	
	Q. Committee member: At the meeting in June, with DRE, Santos and Council, has Santos done a deal or anything else with the Narrabri Shire Council and local and federal governments for the CCC committee?	
	A. Santos: No.	
	Comment:	
	I was at the NSW Farmer's conference last week where Santos had a stand there. I spoke to an employee of Santos at the stand and I asked about the contaminated aquifers and she straight up said 'alleged' contaminated aquifers. What are Santos guidelines? It's not good enough for Santos to say "she doesn't really know". To me it's misleading the public.	
	Santos gave notification that they are intending to lodge another REF at some time in the next 4 weeks. The REF is in relation to the Dewhurst 32-37 fourspot pilot and a core hole. Two vertical and two deviated wells (multileveled).	
	Once approval has been given Santos will distribute the overview of the REF to the committee members through the Chairman, out of session. Any questions in relation to	
	the Leewood Phase 2 REF, Santos asks that committee members address them to Santos within a week of receiving notification so Santos can feed them into the REF document.	

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MEETING MINUTES 23 July, 2014

Discussion	Action/By Whom
If the committee would like a presentation on this at the next CCC meeting Santos can arrange that.	

Next Meeting Topics: Water Portal

Date of next meeting: 11th August 2014

Meeting Closed: 7:48pm

Appendix 1: Field Layout Overview

Appendix 2: Leewood Objectives and Strategy Appendix 3: Leewood Strategy – The Process Appendix 4: Leewood Phase 1 - Progress Appendix 5: Leewood Phase 2 - Proposal Appendix 6: Leewood Phase 2 – Schedule

Appendix 7: Leewood Phase 2 – Assessment and Approval Process

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MEETING MINUTES 23 July, 2014

Attachment 1: Actions

Action Raised	Date Raised	Progress Made
Action for Santos to explore the option of formalising the committee.	18 th June 2013	Ongoing waiting on response from Government
Santos to respond to questions raised regarding recent aquifer contamination and associated questions within 10 days.	12 th April 2014	Ongoing
Santos to respond to question raised regarding CCC chance to comment on the transportation of water from the exploration phase to production phase.	14 th May 2014	
Santos to respond to questions raised in Appendix 1 and 2 regarding the Produced Water Management Plan Document and & also Tintsfield Water Management Plan.	14 th May 2014	Ongoing
Santos to respond to whether they can provide a copy of the Bibblewindi Hydrological Assessment.	14 th May 2014	Ongoing
Santos to provide the most recent data on water quality concentrations across Narrabri Gas Development.	14 th May 2014	Ongoing
Santos to provide explanation as to how they are going to ensure, in the forest and other areas, that erosion doesn't happen down the disturbed earth corridor, where the gas lines are put including slopes, creeks and gullies.	11 th June 2014	
In relation to the change to the minutes the Chair and Secretary will look over previous meeting and respond accordingly.	11 th June 2014	
Santos to respond to whether the pipelines are compacted.	11 th June 2014	
Santos to respond to why the irrigation method to flush the salts was used and approved.	11 th June 2014	
Santos to provide a copy of the natural and unnatural uranium levels from the produced water spill at Bohena.	11 th June 2014	
Santos to provide why and what soils two people out on Moore's Rd were testing.	11 th June 2014	

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Santos to provide an analysis of how the 3,000 tonnes of solid waste was transported to Newcastle.	11 th June 2014
Santos to provide a soil analysis of the soil that was contaminated at the Bibblewindi treatment facility.	11 th June 2014
Santos to respond to whether the pumps associated with the insides of the water containers are all water proof.	23 rd July 2014
Santos to respond to the how many ML of treated water is expected to be produced per year in the existing project.	23 rd July 2014
Santos to respond to whether they are going to bring down the pH level of water back to the pH level of the existing soil.	f 23 rd July 2014
Santos to respond to whether they environment insurance.	23 rd July 2014
Santos to respond to what their control is for the bacteria?	23 rd July 2014
Santos to respond to whether Nyora bore as a shallow aquifer monitoring bore goes through the Great Artesian Basin.	23 rd July 2014



Narrabri CCC

Meeting Action Item Response

Reference:	20140723_NCCC
Subject:	Meeting Action Items – July Meeting
	Narrabri CCC
Request	23 July 2014
date:	
Requested	David Ross
by:	Chair
	Narrabri CCC
Response:	 Item 1 – Santos to respond to whether the pumps associated with the insides of the water containers [for proposed Reverse Osmosis plant at Leewood] are waterproof. All areas within the Reverse Osmosis (RO) plant that may leak are contained within a bunded area. This includes tanks containing processed
	 Leaks are prevented by comprehensive control and alarms systems. These systems monitor and account for the volume of water pumped and processed from the ponds, throughout the RO process and back to the treated water and brine ponds. If any discrepancy is detected the plant will automatically shut down and an alarm is sent to the plant operator. Due to the type of telemetric control system that would be in place, it is unlikely that a container would fill with water. If a leak were to occur within a container, the leak will be internally contained; drained via a drain line; directed to the nearest waste sump; and pumped back to the ponds. Each unit operating in the plant can be shut down individually or the entire plant can also be shut down. The leak from the old ESG plant that was located at the Bibblewindi site was from a failed flow distribution manifold, not within the actual process containers. In the new facility being proposed for Leewood, all manifolds will be designed from different material than what was used by ESG and will have an integrated control monitoring system that will immediately shut down in the event of loss of pressure (i.e. from a leak).
	Item 2 – Santos to respond to how many ML of treated water is expected to be produced per year in the existing project
	Approximately 300ML per year or approximately 1ML/d.

	Item 3 - Santos to respond to whether they are going to bring down the pH level of water back to the pH level of the existing soil
	 A comprehensive assessment of the Leewood soil profile has been undertaken by specialist irrigation consultant and a water balance model developed. The soil will be amended with gypsum and fertilizer to manage the pH conditions and ensure the soil health is enhanced and maintained.
	Item 4 – Santos to respond to what their control is for the bacteria
	 The RO process is very effective at removing bacteria from water. RO removes salt at an ion level which has a particle size anywhere from 0.0001 microns and 0.001 microns. Bacteria particle size is generally 0.5 microns to 10 microns and hence the process is very effective at removing this particle size. The treated water meets irrigation guidelines that apply to NSW. There is not expected to be any increased bacterial growth due to application of the treated water.
	Item 5 – Santos to respond to whether Nyora bore as a shallow aquifer monitoring bore goes through the Great Artesian Basin
	The Nyora Shallow Aquifer Monitoring Bore (SAMB) specifically targets the Great Artesian Basin towards the western part of the Project Area to ensure we have comprehensive baseline groundwater monitoring data.
Briefing	Annie Moody
Officer:	Team Leader, Community and Land
Date:	6 August 2014

Santos Activities Update – July 2014



SANTOS UPDATE - July 2014

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:

 There are no plug and abandon activities planned for July

Workovers:

- The workover program is continuing with work being undertaken at the Bibblewindi East pilot wells during July
- The workover program for the Bibblewindi West pilot wells has been completed
- The workover rig is used to install and/or maintain pumps on existing wells

Drilling of exploration core holes:

 There are no core hole activities planned for July

Pilot wells:

- There are no pilot well drilling activities planned for July
- Tintsfield pilot is on-line with the Bibblewindi East and West pilot off-line for the workover program

Leewood:

- The transfer of water from Bibblewindi pond 3 to Leewood has been completed
- Installation of the liner to pond 1 has been completed
- Installation of the liner to pond 2 is continuing
- The Review of Environmental Factors (REF) for Leewood Phase 2 is being prepared
- The proposed activity involves the construction of treatment facilities for produced water and brine at Leewood
- Community consultation activities for Leewood Phase 2 will be undertaken when the scope of the project is finalised

Other work:

- Wilga Park Power Station remains off-line as pilot wells are not flowing gas whilst workover program is undertaken
- Cultural Heritage surveys are being undertaken within PEL238 to inform the preparation of the Environmental Impact Statement for the Narrabri Gas Project.

Site visits:

 Community site visits are held on the third Thursday of each month. If you are interested in attending a site visit or would like more information, please call Annie Alexander on 6792 9035 or email Energy.NSW@santos.com

Community:

- The Narrabri Chamber of Commerce is hosting information sessions for its local members on Santos' Narrabri Gas Project
- Santos has sponsored the Narrabri Clay Target Club annual shoot
- Santos has sponsored the University of NSW School of Petroleum Engineering Students' Chapter Annual Awards 2014
- The Santos Narrabri Blue Boars sponsor day is in Gunnedah on Saturday 19 July with Narrabri Blue Boars playing Gunnedah Red Devils
- The next meeting of the Santos Community Committee on CSG for the Narrabri Shire will be held on Wednesday 23 July

Other:

- The Planning Assessment Commission (PAC) held public hearings in Narrabri on June 19 as part of the assessment process for Santos' Bibblewindi and Dewhurst Gas Exploration Pilot Expansion.
- Information on the assessment process and submissions are available from the PAC website at http://www.pac.nsw.gov.au/