



Supplementary Management Plan

Gunnedah Basin Operations PEL 452

Warah 1

Document Approvals

Date: 16 October 2009	Prepared by:	Ann Stewart	Principal Advisor NSW Compliance
Date: 25 January 2010	Reviewed by:	Trent Williams	Environmental Advisor
Date:	Approved by:		

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1 Introduction

On 26 February 2007 a Review of Environmental Factors for PEL 452 was prepared by Upstream Petroleum Pty. Ltd. for the then titleholder of PEL 452 being Gunnedah Gas Pty Ltd. On 26 March 2007 Gunnedah Gas Pty Ltd received an approval from Department of Industry and Investment (DII) to undertake work in PEL 452 in accordance with the approved Review of Environmental Factors (REF).

Santos QNT Pty Ltd (Santos) became the registered titleholder of PEL 452 on 19 August 2009, when a transfer of interests in this title was endorsed by DII, affecting a transfer from Gunnedah Gas Pty Ltd to Santos, from which date Santos became the titleholder of PEL 452. Santos is continuing the exploration programme outlined in the approved REF (approval dated 26 March 2007) within the Gunnedah Basin. The exploration program being undertaken in PEL 452 is primarily corehole drilling.

1.1 Purpose

The purpose of this Supplementary Management Plan is to outline the potential impacts associated with changing the drilling programme and operating times of Warah 1, assess the likely risk and where required provide appropriate mitigation strategies to minimise any impacts.

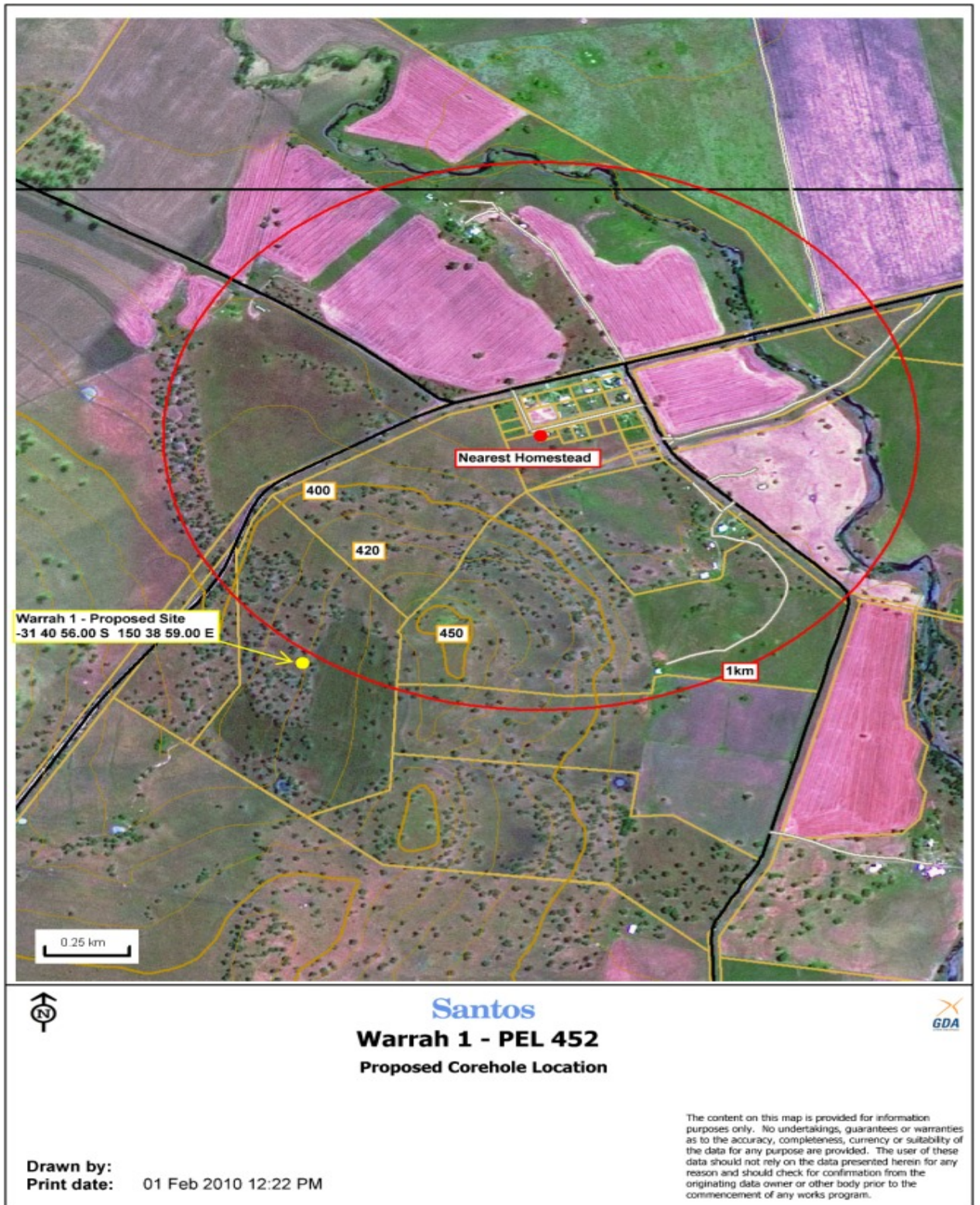


Figure 1: Location of Warah 1

2 Proposed Activity

Activities to be undertaken in the drilling of Warah No 1 are open corehole drilling, running casing and cementing, and geophysical logging.

All of the above activities apart from access to the site are confined to the drill pad.

Initial site preparation and rehabilitation of the drill pad will be undertaken during daylight hours as per normal drilling operations.

Drill Rig

Santos has contracted McDermott Rig 33 to undertake the work program for this phase of the Gunnedah Basin exploration project. Rig 33 is a truck mounted UDR 1200-21 hydraulic rig.

McDermott Rig 33 is considered a smaller, quieter rig than those used in other petroleum operations and has very similar noise emission levels to Santos' other NSW rigs (McDermott 29 and Mitchell Drilling Rig 105) (Heggies 2009b).

3 Landholder Consultation

The landholders for Warah 1 have been contacted and a signed Access and Compensation Agreement will be executed prior to any activities commencing.

Santos encourages open dialogue between the landholder, neighbours and the Santos Drilling Rig Representative during operations on site to address any issues that might arise.

4 Change in Activity

Santos seeks approval for the following changes in activities:

- The proposed activity will only include core drilling
- Depth of the well drilled will exceed 1000m
- The time expected on site will increase from 10 days to anywhere from 35 days to 60 days
- Hours of operation will change from Monday to Friday 7am to 6pm and 8am to 1pm on Saturdays to 6am to 6pm 7 days a week

Under the 26th March 2007 approved REF the following activities were listed:

- Section 3.1.1 states the drill depth of 400-900 metres.
- Section 3.2 states that complete drilling of the well will be up to 10 days.
- Section 3.3 states that core hole drilling techniques will be used.
- Section 5.5.2 states that hours of operation will be Monday to Friday 7am to 6pm and 8am to 1pm on Saturdays.

5 Proposed location

The below photographs present the location proposed for the Warah 1 lease location.



Photograph 1: Looking south from the proposed lease site.

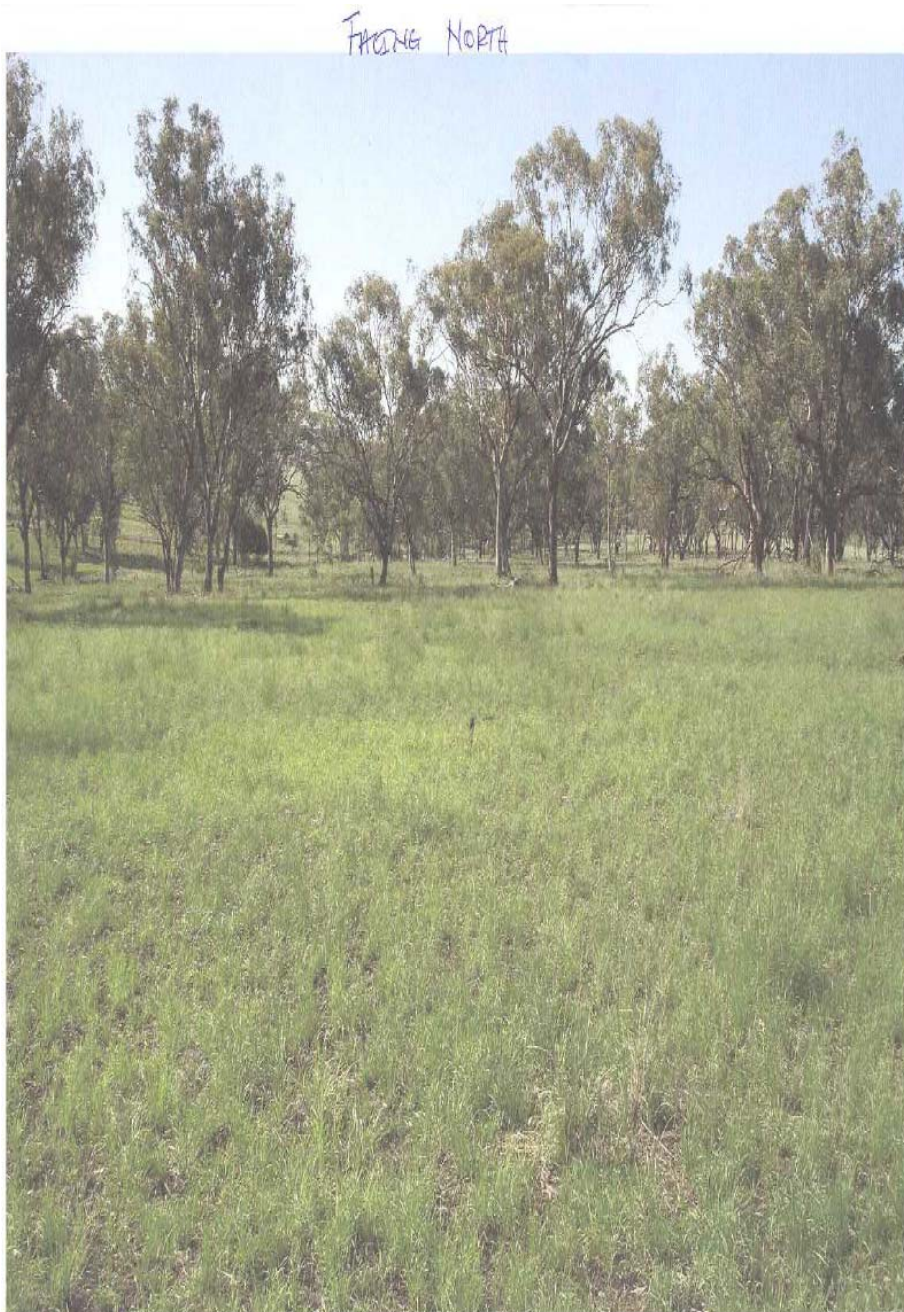


Photograph 2: Looking west from the proposed lease site.

FACING EAST



Photograph 3: Looking east from the proposed lease site.



Photograph 4: Looking north from the proposed lease site.

6 Potential Impacts and Management Controls

The single potential difference in environmental impacts associated with drilling Warah 1 to those described in the February 2007 REF, has been assessed as noise.

The management controls and the performance management indicators are outlined below in Table 1. The focus of environmental management will be to firstly avoid where possible, then minimise and mitigate any impacts. All activities will be planned in consultation with landholders so that potential impacts (e.g. lighting, noise, weeds) are avoided and/or controlled.

6.1 Risk Assessment

The Santos Risk Matrix was used to determine the risk rating for each of the environmental elements identified as potentially being impacted. The risk ratings were determined prior to applying mitigation strategies and safeguards and then after considering measures to reduced risk. The unmitigated risk rating and residual risk ratings are both provided and ranged from a 1-3, which means that the risk identified can be managed through routine monitoring and procedures. The table below outlines the risks associated with the change in activity, which has been identified as noise emissions.

Table 1: Aspect, Potential Impacts, Unmitigated Risk Rating (UMRR), Management Controls, Residual Risk Rating (RRR), Performance Indicator and Records

Aspect	Potential Impacts	UMRR	Management Controls	RRR	Performance Indicator	Records
Noise	Activities to be undertaken include drilling, running casing and cementing, and geophysical logging.	2	To manage noise and minimise impacts the following management strategies/controls will be implemented: Landholder notification will be given prior to commencement of drilling. Equipment will be maintained so that noise levels remain constant. Complaints will be responded to in a timely manner. Site located more than 1km from closest sensitive receptor.	1	All noise complaints will be recorded in the Complaints Register. Amicable resolution of complaints Where noise disturbance cannot be avoided, Santos will investigate alternative arrangements to suit the landholder.	Maintenance carried out on equipment is to be recorded. All complaints made and any subsequent action is to be recorded within the Complaints Register.

7 Clause 228 Checklist

Clause 228 of the EP&A Regulation states that for the purpose of Part 5 of the EP&A Act the following factors are required to be taken into account concerning the impact of an activity on the environment. These factors are considered below.

Factor	Positive/Negative Impact
<p><i>Any environmental impact on the community</i></p> <p>Minor short term impacts such as noise would be experienced. Safeguards proposed in Section 6 and the PEL 452 REF would minimise these impacts.</p>	Short term negative.
<p><i>Any transformation of a locality</i></p> <p>There would be localised and non-permanent impact on the immediate vicinity of the hole for the duration of the program. Safeguards proposed in Section 6 and the PEL 452 REF would minimise these impacts.</p>	Short term negative
<p><i>Any environmental impact on the ecosystems of the locality</i></p> <p>The area of proposed activities is disturbed, no environmental impacts of the ecosystems of the locality would occur as a result of the project.</p>	Nil
<p><i>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality</i></p> <p>During construction there may be a reduction in these values due to affecting visual amenity. Given the short term nature of activities and the safeguards/mitigation in Section 6 and the PEL 452 REF the reduction is considered negligible.</p>	Nil
<p><i>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations</i></p> <p>No locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations occur near the proposal area.</p>	Nil
<p><i>Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)</i></p> <p>The proposal would not impact on the habitat of protected fauna.</p>	Nil
<p><i>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air</i></p> <p>The proposal would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Nil
<p><i>Any long-term effects on the environment</i></p> <p>The proposal would have no long-term effects on the environment</p>	Nil

Factor	Positive/Negative Impact
<p><i>Any degradation of the quality of the environment</i></p> <p>There is potential for minor short term environmental degradation due to noise impacts. Safeguards proposed in Section 6 and the PEL 452 REF would minimise these impacts.</p>	Minor short term negative
<p><i>Any risk to the safety of the environment</i></p> <p>The proposal may result in short term potential risks to the safety of the environment due to potential accidents and spills. The likelihood of incidents occurring would be reduced through the application of Santos's EHSMS Standards and mitigation proposed in Section 4 and the PEL 452 REF.</p>	Minor short term negative
<p><i>Any reduction in the range of beneficial uses of the environment</i></p> <p>The footprint of activities for the proposal would not result in any reduction in the range of beneficial use of the environment.</p>	Nil
<p><i>Any pollution of the environment</i></p> <p>There is minor potential for short term negative impacts during activities. However mitigation documented in Section 6 and the PEL 456 REF would minimise the potential for impacts.</p> <p>CSG is seen as a transitional fuel in the aim for a carbon neutral energy source. The potential to secure CSG reserves has long term positives.</p>	<p>Short term negatives</p> <p>Long term positives</p>
<p><i>Any environmental problems associated with the disposal of waste</i></p> <p>Drill cuttings would be essentially inert and any drilling fluid conditions would be biodegradable or similarly inert and would be allowed to dry onsite and disposed of in drilling sumps. Any other waste generated by the activities will be collect and removed from site for disposal at approved landfill sites. Given the short term of the propose activity waste production will be minimal.</p> <p>Water produced will be temporarily stored in on site pits and transported to an appropriate licensed facility.</p>	Nil
<p><i>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply</i></p> <p>Resources required for the proposal are not in limited supply in the area.</p>	Nil

8 Conclusion

To support the change in Warah 1 operational activity Santos has assessed the potential new risks that may occur and developed strategies to mitigate potential impacts.

The impacts associated with the change in location have not significantly changed from those described in the DPI approved March 2007 REF for PEL 452.

Santos will continue to engage all possible best practices to ensure reasonable comfort to landholders in the area.

9 References

Heggies 2009a, *Santos Drill Rig Lighting Assessment*. A report prepared by Heggies Pty Ltd for URS and Santos.

Heggies 2009b, *Santos Drill Rig Noise Assessment*. A report prepared by Heggies Pty Ltd for URS and Santos.