

Noise Management Sub Plan

Rev 03
Revised June 2019

Dewhurst Gas Exploration Project

Environmental Sub-Plan – Noise Management Sub Plan

1.1 Background

This Noise Management Plan (NMP) is one of the Environmental Sub-Plans under the Project Environmental Management Plan (PEMP) for the Dewhurst Gas Exploration Pilot Wells Program and the Exploration Pilot Expansion Project (the Project).

This NMP addresses mitigation measures and monitoring and reporting requirements. Residential Locations are shown below and detailed in Figure 1, Appendix 1:

<i>Location</i>	<i>Easting</i>	<i>Southing</i>
Residence 1	149° 44° 36"	30° 34° 55"
Residence 2	149° 44° 31"	30° 34° 42"
Residence 3	149° 45° 05"	30° 34° 20"
Residence 4 & ML1	149° 41° 38"	30° 36° 26"
ML2	149° 41° 59"	30° 38° 54"
ML3 (to the north of the Project Area)	149° 41° 07"	30° 21° 49"
ML4 (to the north of the Project Area)	149° 41° 07.47"	30° 22° 06"

1.2 Key Statutory Requirements

1.2.1 General

- *Protection of the Environment Operations Act 1997* (NSW)
- New South Wales Industrial Noise Policy (EPA,2000)
- Interim Construction Noise Guideline (ICNG) (DECC, 2009)
- New South Wales Road Noise Policy (DECCW, 2011)
- Assessing Vibration: a technical guideline (DEC, 2006)

1.2.2 Project Specific

- Relevant Approvals:
 - Department of Primary Industries (DPI) Project Approval for production pilots covering wells 13 to 18H – 21 July 2009 (DPI-PA)
 - Department of Trade and Investment (DT&I) Development Approval for pilot wells 26-29 under Minister for Resources and Energy – 16/8/2013 (MRE-DA).¹
 - Department of Planning and Environment (DPE) Approval – 18 July 2014 (SSD-6038).
 - NSW Forests Occupation Permit (OP).
- Renewal Petroleum Exploration Licence 238 (PEL 238).
- Environment Protection Licence 20350 (EPL 20350).

¹ Note the operational conditions of consent and REF statement of commitments under this approval are addressed within the approved Project Environmental Management Plan (PEMP). This PEMP forms part of the SMS process for the Project.

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

- Review of Environmental Factors (REF (3/13)).
- Review of Environmental Factors - Statement of Commitments (REF – SoC (3/13)).

1.2.3 Santos Safety Management System (SMS)

This NMP has been developed in accordance with relevant legislative and regulatory requirements and conditions in **Santos Management System (SMS)**, including:

- SMS-MS1-ST13 Environmental Hazards Control Procedure
- SMS-MS1-ST11 Occupational Exposure Management Procedure
- EHSMS 14 Monitoring, Measurement and Reporting (including Appendix A Environmental Monitoring Overview).

1.3 Objectives

Objectives relating to the Noise Management Plan are described below:

- Minimise noisy activities and manage community expectations concerning noise emissions;
- Compliance with Environmental Protection Licence 20350 noise limits and relevant guidelines (i.e. Interim Construction Noise Guideline (DECC, 2009);
- To address the Review of Environmental Factors (REF) Mitigation Strategy (Chapter 2.8 of the REF, March, 2013);
- Compliance with relevant regulatory requirements.
- Compliance with the Minister's Conditions of Approval.
- Prevent adverse noise impacts on the amenity of local communities and environment.

1.4 Performance Indicators

Performance indicators/targets relating to this Noise Management Plan are outlined below:

- Zero complaints received from landowners or government agencies concerning noise disturbance.
- Zero noise incidents from construction and operational activities.

1.5 Predicted Impacts

With the proposed mitigation measures in place, it is unlikely that the Project would increase the magnitude of noise in the Project Area. Construction activities are likely to generate noise, particularly during the drilling and cementing activities that may occur up to 24 hours per day, seven days a week. Drilling is only expected to take approximately 40 days.

For construction activities associated with the Project there are no occupied residential receivers located within five kilometres of the sites. For drilling and operational works the closest receivers are at Dewhurst 13-18H. The predicted noise levels at the nearest residence during operation are likely to be just above the criteria for intrusive noise in all climatic scenarios, as well as sleep disturbance during windy conditions; however, soft ground conditions (trees, grass) that were not incorporated into the Environmental Impact Statement (RPS, 2013) noise modelling may reduce sound transmission from

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

construction, drilling and operational activities at the pilot wells.

Users of the forest, such as bushwalkers, picnickers and Forestry NSW staff may be affected by noise and vibration during the works. Drilling activities at Dewhurst 26-29 are unlikely to be audible at any residence during the day or night.

During operations noise will be limited to the occasional combustion of gas through a flare or vehicles visiting the sites, and pumping of water between the wells and gathering system. The flare control valve installed upstream of the flare will reduce the noise of flare operation.

Noise impacts from traffic generated by the Project during construction and operation are considered negligible to minor, and will meet the NSW Road Noise Policy (DECCW, 2011).

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

1.6 Mitigation Measures

MPRef.	Actions	Timing	Reference						
Construction Noise									
NMP-1	Construction Hours: a) 7.00am and 6.00pm Monday to Friday. b) 8.00am and 1.00pm Saturday. c) Not to be undertaken on Sundays or Public Holidays. Exceptions to standard construction hours: - Construction work that causes L Aeq(15 min) noise levels that are no more than 5dB above rating background level at any residence not subject to a private negotiated agreement, in accordance with the Interim Construction Noise Guideline (DESS, 2009). - The delivery of plant, equipment and materials which is required to be delivered outside of the standard construction hours by Police and / or other authorised authorities. Exceptions to the standard construction hours will be managed through Santos’ ‘Out of Hours Approval Form’ (refer to Appendix 2).	During Construction During Drilling	EPL (20350) Condition L4.1 & L4.2						
NMP-2	Table 1 Construction Noise Impact Assessment Criteria dB(A) <table><tr><th>Location</th><th>Standard Construction Hours LAeq (15 min)</th><th>Outside Standard Construction Hours LAeq (15 min)</th></tr><tr><td>Any residence on privately owned land</td><td>40 dB(A)</td><td>35 (dBA)</td></tr></table> Standard construction hours are 7 am to 6 pm Monday to Friday and 8 am to 1 pm Saturday. All construction works will comply with the requirements of the Interim Construction Noise Guideline (DECC, 2009).	Location	Standard Construction Hours LAeq (15 min)	Outside Standard Construction Hours LAeq (15 min)	Any residence on privately owned land	40 dB(A)	35 (dBA)	During Construction During Drilling	SSD-6028, Schedule 3, Condition 11 & 12 SSD-6038, SoC 61
Location	Standard Construction Hours LAeq (15 min)	Outside Standard Construction Hours LAeq (15 min)							
Any residence on privately owned land	40 dB(A)	35 (dBA)							

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

MPRef.	Actions	Timing	Reference				
NMP-3	Applicable Meteorological Conditions (Appendix 3 of PA SSD-6028) 1. The noise criteria in Table 1 will apply under all meteorological conditions except the following: a. average wind speed at microphone height exceeds 5 m/s; b. wind speeds greater than 3 m/s measured at 10 m above ground level; or c. temperature inversion conditions greater than 3°C/100 m or stability category F. Determination of Meteorological Conditions 1. Except for wind speed at microphone height, the data to be used for determining meteorological conditions will be recorded by the meteorological station located at Narrabri Airport. Compliance Monitoring (Appendix 3 of PA SSD-6028) 1. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent. 2. Unless otherwise agreed with the Secretary, this monitoring will be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy.	During Construction During Drilling	SSD-6028, Appendix 3, Noise Assessment				
Operational Noise							
NMP-4	The licence holder must carry out operations in accordance with the requirements of the Interim Construction Noise Guidelines (DECC, 2009), as amended or replaced from time to time. Unless otherwise approved by the Minister, the licence holder must ensure that: a) Noise levels during standard working hours do not exceed the Rating Background Level (RBL) +10dB at any residence or other sensitive receiver (as defined in the Interim Construction Noise Guidelines). b) Noise levels outside of standard working hours do not exceed the RBL +5dB	During Operations	PEL 238, Condition 19				
NMP-5	The noise limits identified in Condition 19 (PEL 238) will not apply where the licence holder has negotiated a written agreement with: a) The relevant landholder; or b) In the case of a prospecting operation that will result in an exceedance of the criteria at a dwelling or other sensitive receiver, the resident of that dwelling or occupier of the sensitive receiver; to allow different limits and the licence holder complies with those limits.	During Operations	PEL 238, Condition 20				
NMP-6	Table 2 Operation Noise Impact Assessment Criteria dB(A) <table><tr><th>Location</th><th>Operational Noise Criteria LAeq (15 min)</th></tr><tr><td>Any residence on privately owned land</td><td>35 dB(A)</td></tr></table> Noise generated by the Project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Meteorological conditions under which these criteria	Location	Operational Noise Criteria LAeq (15 min)	Any residence on privately owned land	35 dB(A)	During Operations	SSD-6028, Schedule 3, Condition 12 EPL (20350), Condition L3.1 & L3.2
Location	Operational Noise Criteria LAeq (15 min)						
Any residence on privately owned land	35 dB(A)						

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

MPRef.	Actions	Timing	Reference
	apply and the requirements for evaluating compliance with these criteria are provided below:		
NMP-7	Noise monitoring as required in Section 1.7 of this Plan will be LA _{eq(15minute)} attended noise monitoring and will follow the requirements set out in the EPL. Monitoring equipment will be situated: - on Santos' property boundary at a position that is 30m or less from the affected premises or dwelling; or - at the affected premise if the Santos' boundary is more than 30m from the dwelling, but not closer than 3m to the dwelling (based on residents approval); or - in a recorded position or positions which takes into account climatic conditions and as such is in a direct line between the residential dwelling or affected area and the noise source(s) associated with Santos' activities	During Operations	EPL (20350), Condition L3.3
NMP-8	A non-compliance of condition L3.2 will occur where noise generated from the premises in excess of the appropriate limit is measured: - At a location other than an area prescribed by condition L3.2: and or - At a point other than the most affected point at a location.	During Operations	EPL (20350), Condition L3.5
NMP-9	The noise limits set out in condition L3.2 apply under all meteorological conditions except for the following: - Wind speeds greater than 3 metres / sec at 10 metres above ground level. - Stability category F temperature inversion conditions and wind speeds greater than 2 metres / sec at 10 metres above ground level are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy - Stability category G temperature inversion conditions. Note the agreed meteorological station to be used for this data is the Narrabri Airport weather station	During Operations	EPL (20350), Condition L3.6
NMP-10	For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.	During Operations	EPL (20350), Condition L3.8
NMP-11	If during operation the residence located 500 m south of the Dewhurst 13-18H Pilot (RR4 – Refer to Figure 1) is re-occupied, monitoring will be undertaken to confirm operational noise levels at this location. If noise monitoring determines that levels are above noise criteria appropriate management and/or mitigation measures will be implemented.	During Operations	SSD-6038 SoC 62
Construction and Operational Noise			
NMP-12	Complaint Management: All complaints will be recorded in accordance with the Community Management Plan and the PEMP Section 3.5. - In the event of a noise complaint, the source of the noise will be investigated. Where necessary, Santos will offer to conduct noise monitoring from the proposed activity at the affected receiver. If it is determined that noise levels are unacceptable, further feasible and reasonable work practices or mitigation measures will be implemented. - In the event of a noise complaint, the effectiveness of noise mitigation measures will be assessed and additional feasible and reasonable measures will be implemented, where necessary.	As required	REF (3/13), S. 2.8.1.3 REF SoC 58
NMP-13	Where any exceedance of noise monitoring criteria and/or performance measures has occurred, Santos will:	As required	SSD-6038,

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

MPRef.	Actions	Timing	Reference
	- Take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur. - Implement remediation measures as directed by the Secretary.		Schedule 5, Condition 3
NMP-14	Noise impacts will be managed in accordance with the ICNG and OEH requirements. The management approach will include: - Consultation with potentially affected receivers - Monitoring of noise impacts - Implementation of feasible and reasonable work practices - Complaint management and response. - Forestry NSW and the next two nearest sensitive receivers will be notified of the proposed activity prior to commencing works including details of the timing and duration of noise generating activities (13H – 18H only). Where monitoring is required it will be undertaken in accordance with the ICNG (DECC June 2009). This includes the provision of: - The type of monitoring conducted (for example, at a particular project stage or following complaints) and a brief statement of the measurement method. - The noise conditions on the consent/licence. - Descriptions of the nearest affected sensitive receiver. - Plan / diagram showing the location of the monitoring and the noise generating works. - Description of the instrumentation used, including calibration requirements. - Name and position of monitoring personnel. - The weather conditions during monitoring. - The time(s) and duration(s) of monitoring, including dates – in the case of complaints. - A clear description of the activities taking place during the monitoring. - Noise limit consent conditions. Refer to Attended Noise Monitoring Form in Appendix 3	As required	REF (3/13), S.2.8.1.3 and S.2.8.1.4 SSD-6038 SoC 60
NMP-15	Plant and Equipment Management and Maintenance Source noise levels of the drilling rig will be confirmed prior to arriving on site to verify noise impacts and confirm the management approach using the Project Power-Source Monitoring Form in Appendix 3.	Prior to Drilling	REF SoC 60

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

<i>MPRef.</i>	<i>Actions</i>	<i>Timing</i>	<i>Reference</i>
NMP-16	- All plant will be properly maintained and operated according to manufacturers' recommendations in such a manner as to avoid causing excessive noise. This will include the use and maintenance of noise attenuation equipment such as silencers, mufflers and/or acoustic enclosures where practicable. - Site inductions and toolbox talks will address ways to use equipment to minimise noise and designated access routes for the Project. - Tool-boxing of staff to ensure they are aware of requirements for noise mitigation and working hours during the relevant phases of the Project. These will be undertaken at the start of each phase and as required during the Project. - Horn signals between drivers will be kept to a minimum.	At all times	REF SoC 10 SSD-6038 SoC 50

Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan

1.7 Monitoring and Inspection Requirements

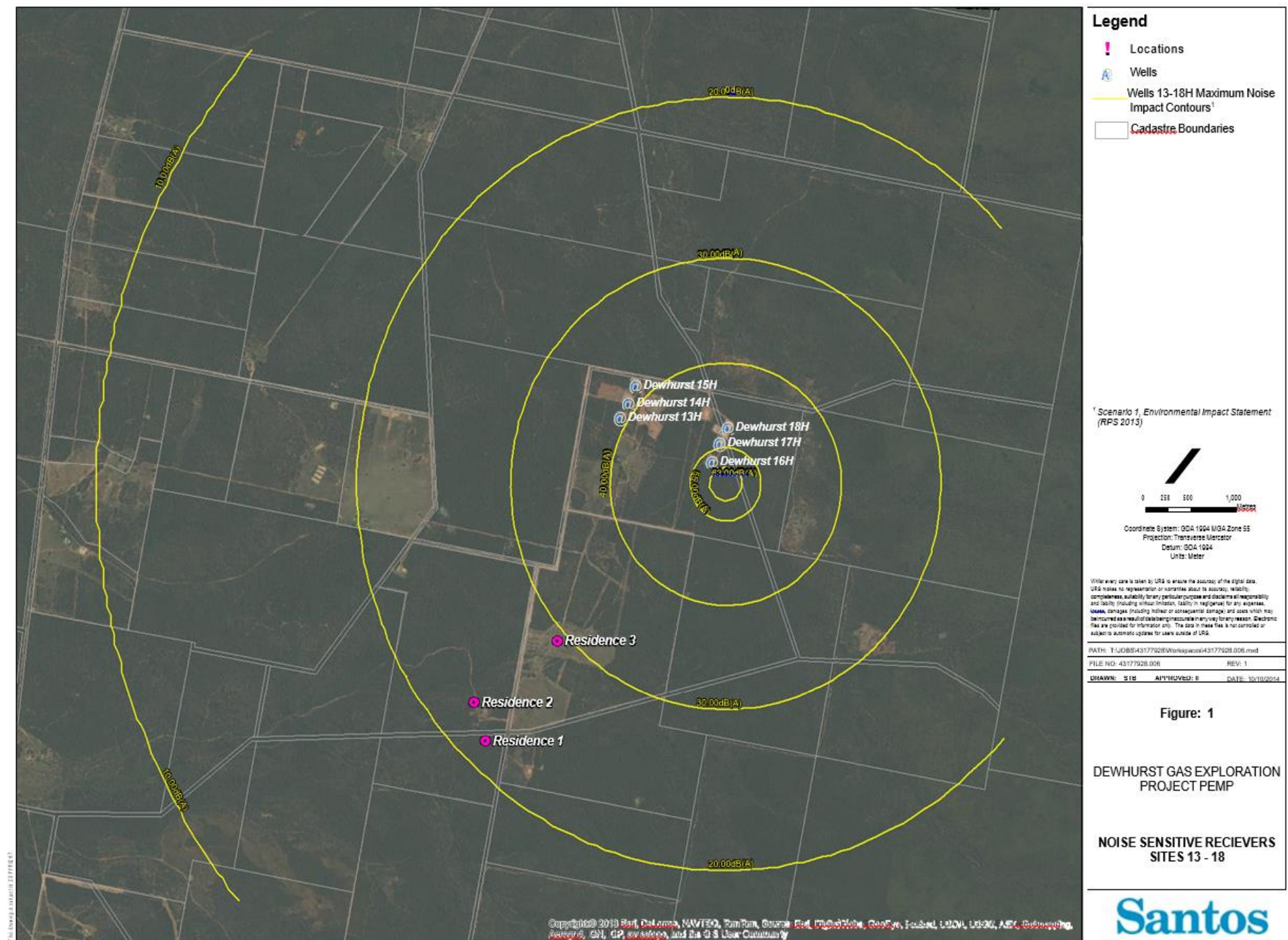
Aspect	Description	Frequency
Complaints - Monitoring	Attended noise monitoring ($L_{Aeq(15mins)}$) will be undertaken at sensitive receivers based on assessment of noise complaints	As Required
Out of Hours - Monitoring	Attended noise monitoring ($L_{Aeq(15mins)}$) will be undertaken at sensitive locations should construction works be required to be undertaken outside normal construction hours. The frequency of the noise monitoring will be determined to assess that the noise impacts are in accordance with NMP-1 and NMP-2. Appropriate actions will be undertaken should noise levels exceed the criteria for the Project.	As Required
General – Inspections	- Field Superintendent to assess potential noise issues during construction and drilling - Well Operator to undertake 'Well Runs' during operation to assess any potential noise issues. - Environmental Advisor inspection of activities to determine if all reasonable and feasible noise mitigation measures are in place	Daily during construction and drilling - In accordance with maintenance planning during operation 6 monthly during operation

1.8 Reporting Requirements

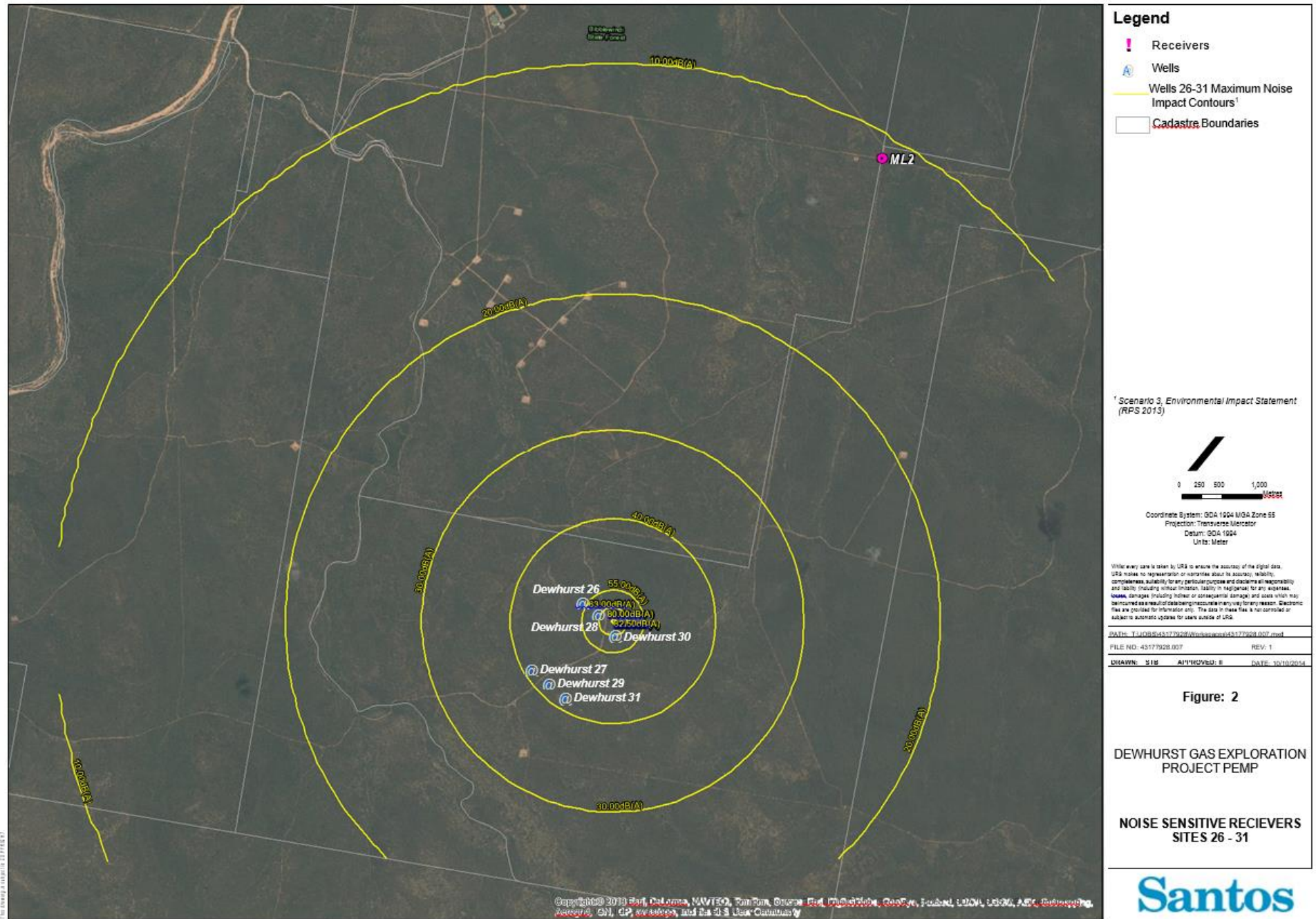
Description	Timing	Reference
Noise monitoring exceedances against criteria specified in the EPL (20350) will be reported in the Annual Return.	At the end of reporting period	EPL (20350), Condition 6
Where any exceedance of noise monitoring criteria and/or performance measures has occurred, Santos will, at the earliest opportunity: Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and to the satisfaction of the Secretary.	As required	PA SSD-6038, Schedule 5, Condition 3
- Santos will immediately notify all relevant agencies of any incident* that has caused, or threatens to cause, material harm to the environment. - Within 7 days of the date of the incident, Santos will provide all relevant agencies with a detailed report on the incident, and such further reports as may be requested. <i>*Note: An incident is defined as: A set of circumstances that:</i> - Causes or threatens to cause material harm to the environment; and/or - Breaches or exceeds the limits or performance measures/criteria in this consent.	As required	PA SSD-6038, Schedule 5, Condition 6 PEL 238, Condition 54(a), (b), (c) & (d)

Dewhurst Gas Exploration Project
Environmental Sub-Plan – Noise Management Sub Plan

Appendix 1: Figures



Dewhurst Gas Exploration Project Environmental Sub-Plan – Noise Management Sub Plan



This page is deliberately blank

**Dewhurst Gas Exploration Project
Environmental Sub-Plan – Noise Management Sub Plan**

Appendix 2: Out of Hours Approval Notification Form

Out of Hours Approval Notification Form



Project:	Dewhurst Gas Exploration Project	No:	
Company:		Date	

Reason for After Hours Work

Agreed reason for after hours work (Tick as Appropriate)	
☐	1. Construction work does not cause L Aeq(15 min) noise levels that are more than 5dB above rating background level at any residence.
☐	2. Works exceed criteria 1 but form part of a private negotiated agreement, in accordance with the Interim Construction Noise Guideline (DESS, 2009).
☐	3. The delivery of plant, equipment and materials which is required to be delivered outside of the standard construction hours by Police and/or other authorised authorities
☐	4. Emergency work to avoid loss of life, damage to property and/or environmental harm. (Approval can be documented retrospectively).
☐	

Scope of Work

Description of Proposed After Hours Works Required (include plant equipment to be used and attach a map of location)

Location Description of After Hours Work:	
Proposed After Hours Times	
Date of Proposed After Hours Work:	

Out of Hours Approval Notification Form



Noise Mitigation Measures

Approved by:	
Signature:	Date:

Monitoring Requirement

Approved by:	
Signature:	Date:

EPA and Secretary of Department of Planning and Environment (OPTIONAL)

Name:		Address:	
Signature:			
Name:		Address:	
Signature:			

Dewhurst Gas Exploration Project
Environmental Sub-Plan – Noise Management Sub Plan

Appendix 3: Noise Monitoring Forms

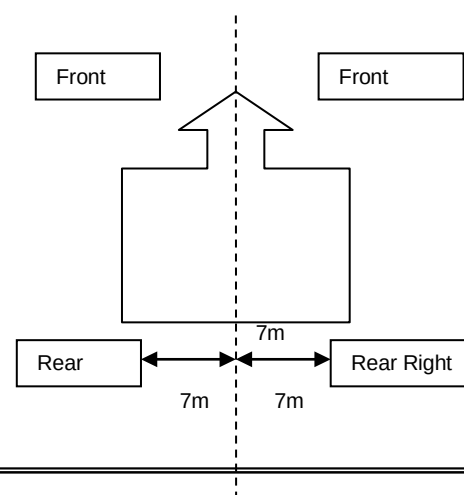
EQUIPMENT NOISE LEVEL REPORT

Project:	Dewhurst Exploration Project	No:	ENLR –
Equipment Owner:		Date:	

Equipment Description		
Equipment Model & Serial Number:		
Test Conducted By:		
Date & Time of Test:		
Location of Test Site		
Meteorological Conditions:		

Instrumentation & Test Procedure	
Sound Level Meter	
Calibrator	
Calibration Date	
Test Procedure	Guided by AS 2012.1 – 1990 Stationary Test Condition (Exterior Noise)

Equipment Noise Levels (dBA)					
	FL	FR	RL	RR	Cab Inside
L _{Amax}					
L _{Aeq}					
L _{A10}					
L _{A90}					



Comments / Notes
All measurements taken for 15 secs at 1.5m high
No reflective planes for a distance of m
Equipment revved to an approximated average by the driver of rpm

Project:		No:	NMER –
----------	--	-----	--------

Equipment Description	
Equipment Model & Serial Number:	
Test Conducted By:	
Date & Time of Test:	
Location of Test Site	
Meteorological Conditions: (Narrabri Airport)	Wind speeds (gnd level): Wind speeds (10M): Temperature: Temperature Inversion Conditions

Instrumentation & Test Procedure	
Sound Level Meter	
Calibrator	
Calibration Date	
Test Procedure	Guided by AS 2012.1 – 1990 Stationary Test Condition (Exterior Noise)

Noise Levels (dBA)			
Time			
Measurement Duration			
L _{A01}			
L _{A10}			
L _{A50}			
L _{A90}			

Site Diagram

Comments / Notes