



CAMDEN GAS PROJECT

EMAI Wells (EM23 – EM36) Noise Monitoring Program

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Figure 1 Location of EMAI Wells and Sensitive Receivers

1. Introduction

1.1 Overview

AGL Gas Production (Camden) Pty Ltd is proposing to construct and operate 14 coal seam gas wells at the Elizabeth Macarthur Agricultural Institute (EMAI) site located to the west of Menangle (referred to as the EMAI project).

The purpose of the project is to extract the coal seam methane resource located in the underground coal seams of the Sydney Basin. The project includes the construction of gas gathering systems, water transport lines and access roads.

The Minister for Planning approved the Project Application for the EMAI Project on 9 December 2006.

As part of the Conditions of Consent for the Project Approval, Schedule 3 Environmental Performance Conditions Condition 6 requires the preparation and implementation of a Noise Monitoring Program (NMP) for the Project.

1.2 Legislative and Regulatory Requirements

1.2.1 Legislative Requirements

Legislation relating to the management of noise includes:

- Protection of the Environment Operations Act 1997 (POEO Act),
- Protection of the Environment Operations (General) Regulation 1998, and
- Protection of the Environment Operations (Noise Control) Regulation 2000.

1.2.2 Development Consent Conditions

The Conditions of Consent for the EMAI Project specify the requirement for a NMP for the project. The condition is as follows:

Noise Monitoring Program

6. The Proponent shall prepare and implement a Noise Monitoring Program for the construction and operation of the project to the satisfaction of the Director-General. The Program shall be submitted to the Director-General prior to construction commencing and shall include a noise monitoring protocol for evaluating compliance with the construction noise goals and the operational noise impact assessment criteria in this approval.

1.3 Relationship with Other Environmental Documentation

A Construction Noise Management Plan (CNMP) has been prepared for the EMAI Project. This CNMP indicates a number of generic management measures which will be used to minimise the effect of noise in the surrounding area. The CNMP also discusses noise monitoring procedures, auditing and reporting requirements and community consultation.

An Environmental Assessment titled "*Environmental Assessment – Camden Gas Project Joint Venture Stage 2 Drilling Program, Elizabeth Macarthur Agricultural Institute Wells (EM23-EM36)*" was prepared for the project and submitted to the Department of Planning in July 2006 by AGL. An Addendum to Original Construction Noise Assessment (SIS Drilling) (Wilkinson Murray, 21 September 2006) was also supplied the Department of Planning.

1.4 Consultation, Revision and Amendment

1.4.1 NMP Preparation and Consultation

The NMP was prepared by AGL, and Wilkinson Murray Pty Ltd (noise & vibration consultants) were engaged as expert consultants to review this NMP.

This NMP has been provided to the Department of Planning (DoP) for review.

1.4.2 Revision and Amendment

If the text or body of this NMP is required to be updated at any stage during construction of the EMAI project, a revised copy of the NMP will be forwarded to DoP for information.

2. Construction Phase Monitoring

2.1 Objectives

The objective of the noise monitoring program is to provide monitoring information and advice to ensure that noise emission from the site is appropriately managed.

2.2 Monitoring Overview

Unless otherwise noted, noise monitoring will occur at appropriate locations approximately 200 metres from the well site in the direction of the closest residential receiver. Monitoring between the well site and the receiver will allow greater flexibility and avoid unnecessary disruption to local landholders. If noise levels at 200 metres exceed target noise goals additional monitoring will be undertaken at the closest residential receiver to demonstrate compliance.

Monitoring will consist of attended monitoring carried out in accordance with *AS1055: Acoustics – Measurement and Description of Environmental Noise* and the NSW Department of Environmental and Conservation (DEC) *Industrial Noise Policy*.

In addition, meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

2.3 Construction Noise Goals

Table 1 details the construction noise targets for the potentially affected residences in the vicinity of the project area. These targets are consistent with Condition 2 of the Planning Approval.

Table 1 Construction Noise Criteria

L _{A10} Noise Criterion (dBA)		
Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
54	39	35

Environmental Noise Management, Noise Guide for Local Government (DEC Ref.2004/59) indicates that to protect against sleep disturbance, the L_{A1} noise level external to the facade of any residence from any construction event should not exceed the background noise level by more than 15dBA.

Therefore, the L_{A1} sleep disturbance operational noise criterion external to residential facades for the potentially affected residences nearby is 45dBA.

2.4 Noise Monitoring for Daytime Activities

Monitoring Activity No.1

Frequency: When earthworks occur within approximately 750 metres of a residential receiver, noise monitoring shall be carried out within three days of excavation works starting. Noise monitoring would be required at wells EM 23, EM 25, EM 26 and EM 29.

Locations: 200 metres from the well in the direction of the closest residential receiver. If noise levels at 200 metres exceed target noise goals additional monitoring will be undertaken at the closest residential receiver to demonstrate compliance.

Interval: The monitoring interval shall be a 15 minute period.

Parameters: Parameters to be recorded includes L_{Amax} , $L_{A1, 1min}$, $L_{Aeq, 15min}$ and $L_{A90, 15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

- Location, data and time;
- Instrument, calibration status and calibration level before and after measurements;
- Parameters measured and their results;
- Weather conditions; and
- Sound levels from specific identifiable sources.

Monitoring Activity No.2

Frequency: When drilling occurs within approximately 750 metres of a residential receiver noise monitoring shall be carried out within three days of drilling starting. Noise monitoring would be required at wells EM 23, EM 25, EM 26 and EM 29.

Locations: 200 metres from the well in the direction of the closest residential receiver. If noise levels at 200 metres exceed target noise goals additional monitoring will be undertaken at the closest residential receiver to demonstrate compliance.

Interval: The monitoring interval shall be a 15 minute period.

Parameters: Parameters to be recorded includes L_{Amax} , $L_{A1, 1min}$, $L_{Aeq, 15min}$ and $L_{A90, 15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

- Location, data and time;
- Instrument, calibration status and calibration level before and after measurements;
- Parameters measured and their results;
- Weather conditions; and
- Sound levels from specific identifiable sources.

Monitoring Activity No.3

Frequency: When fracing operations occur within approximately 1000 metres of a residential receiver noise monitoring shall be carried out during the fracing operation. Noise monitoring would be required for the following wells EM 23, EM 24, EM 25, EM 26, EM 27, EM 28, EM 29 and EM 35.

Locations: 200 metres from the well in the direction of the closest residential receiver. If noise levels at 200 metres exceed target noise goals additional monitoring will be undertaken at the closest residential receiver to demonstrate compliance.

Interval: The monitoring interval shall be a 15 minute period.

Parameters: Parameters to be recorded includes L_{Amax} , $L_{A1, 1min}$, $L_{Aeq, 15min}$ and $L_{A90, 15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

- Location, data and time;
- Instrument, calibration status and calibration level before and after measurements;
- Parameters measured and their results;
- Weather conditions; and
- Sound levels from specific identifiable sources.

2.5 Noise Monitoring for Nighttime Activities

Monitoring Activity No.1

Frequency: Within the first three days of night time construction at EM 32 and EM 34, attended noise monitoring shall occur.

Locations: **EM32:** Due to the distance from the well site to identified receivers, monitoring should be carried at two locations approximately 750 metres from the well site.

EM34: Monitoring should be carried out at the two closest residential receivers (i.e. South Camden Residential Area and Belgenny Homestead).

Interval: The monitoring interval shall be a 15 minute period at each residential location.

Parameters: Parameters to be recorded includes L_{Amax} , $L_{A1, 1min}$, $L_{Aeq, 15min}$ and $L_{A90, 15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

- Location, data and time;
- Instrument, calibration status and calibration level before and after measurements;
- Parameters measured and their results;
- Weather conditions; and
- Sound levels from specific identifiable sources.



Figure 1 – Location of EMAI Wells and Sensitive Receivers.

2.6 Compliance with Construction Noise Goals

The reporting of any exceedances of noise goals is specified in the Project Approval (06_0138) Schedule 4 Condition 2 *Incident Reporting*. The conditions states:

Within 7 days of detecting an exceedance of the goals/limits/performance criteria in this approval or an incident causing (or threatening to cause) material harm to the environment; the Proponent shall report the exceedance/incident to the Department (and any relevant agency). The report shall:

(a) describe the date, time, and nature of the exceedance/incident;

- (b) identify the cause (or likely cause) of the exceedance/incident;*
- (c) describe what action has been taken to date; and*
- (d) describe the proposed measures to address the exceedance/incident.*

3. Operation Phase Monitoring

3.1 Objectives

The objective of the noise monitoring program is to provide monitoring information and advice to ensure that noise emissions from the well site operations are appropriately managed.

3.2 Monitoring Overview

Noise monitoring will be carried out at each well head to ensure that noise emissions resulting from the operation of the well are consistent with the Operational Noise Levels used in the EMAI Project EA to assess noise impacts against the relevant operational noise criteria for the Project.

Monitoring will consist of attended monitoring carried out in accordance with *AS1055: Acoustics – Measurement and Description of Environmental Noise* and the NSW Department of Environmental and Conservation (DEC) *Industrial Noise Policy*.

In addition, meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

3.3 Operational Noise Goals

Table 2 summarises the sound power levels (SWL) used in the EA to carry out the operational noise impact assessment.

Table 2 Noise from Gas Well Operation

Well Identification No.	Well Type	SWL (dBA)
EM19	Free-Flow	81 ¹ (or 56dBA at 7 m)
RP11	Pump-operated	81 (or 56dBA at 7 m) on the quieter side / 93 or 68dBA at 7 m on noisier side

Note: 1. Well EM19 was highly productive during the time of measurement.

A sound power level of 81dBA was considered to be conservative due to the variation in production which results over the life of a gas well. A pump operated well was found to be 12 dBA louder around part of the enclosure based on the plant layout employed. As noted in the EA, if a pump is required at a well careful consideration will be given to the plant layout so as to minimise any potential noise impacts on surrounding receivers.

3.4 Noise Monitoring Activities

Monitoring Activity No.1

Frequency: Monitoring should be carried out within the first week of production and again after three months for each well or sooner if the well status changes.

Locations: At 7 metres from the gas well.

Interval: The monitoring interval shall be a 15 minute period.

Parameters: Parameters to be recorded includes $L_{Aeq, 15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

- Location, data and time;
- Instrument, calibration status and calibration level before and after measurements;
- Parameters measured and their results;
- Weather conditions; and
- Sound levels from specific identifiable sources.

3.5 Compliance with Operational Noise Criteria

If either set of monitoring data (first week and three months) exceed the operational noise level as described in Section 3.3, mitigation measures should be installed at the well head and further three-monthly monitoring carried out until the criteria is met.

The reporting of any exceedances of noise goals is specified in the Project Approval (06_0138) Schedule 4 Condition 2 *Incident Reporting*. The conditions states:

Within 7 days of detecting an exceedance of the goals/limits/performance criteria in this approval or an incident causing (or threatening to cause) material harm to the environment; the Proponent shall report the exceedance/incident to the Department (and any relevant agency). The report shall:

- describe the date, time, and nature of the exceedance/incident;*
- identify the cause (or likely cause) of the exceedance/incident;*
- describe what action has been taken to date; and*
- describe the proposed measures to address the exceedance/incident.*