

8 March 2016

WM Project Number: 06159-WM  
Our Ref: AGL080316RH  
Email: aclifton@agl.com.au

Aaron Clifton  
AGL Upstream Investments Pty Ltd  
Lot 35, Medhurst Road  
MENANGLE NSW 2568

Dear Aaron

**Re: Operational Noise Monitoring of Well Sites SF17 and SF20**

### **Introduction**

Wilkinson Murray was commissioned to conduct operational noise monitoring of well sites Spring Farm 17 (SF17) and Spring Farm 20 (SF20). Measurements were conducted at the potentially most affected residential receivers in different directions to assess compliance. This letter report summarises the results of the measurements conducted during the day, evening and night time on Wednesday, 2 March 2016.

Both well sites were free flowing during the measurements. At SF17, all three (3) wells (SF01, SF02 and SF03) were producing. At SF20, three wells (SF05, SF07 and SF08) were producing. During the day (before 6.00pm), a workover rig and ancillary equipment were also operating at well SF09.

It is important to note that civil works associated with the construction of Liz Kernohan Drive and Spring Farm residential estate to the east of Richardson Road was taking place during daytime hours (before 6.00pm).

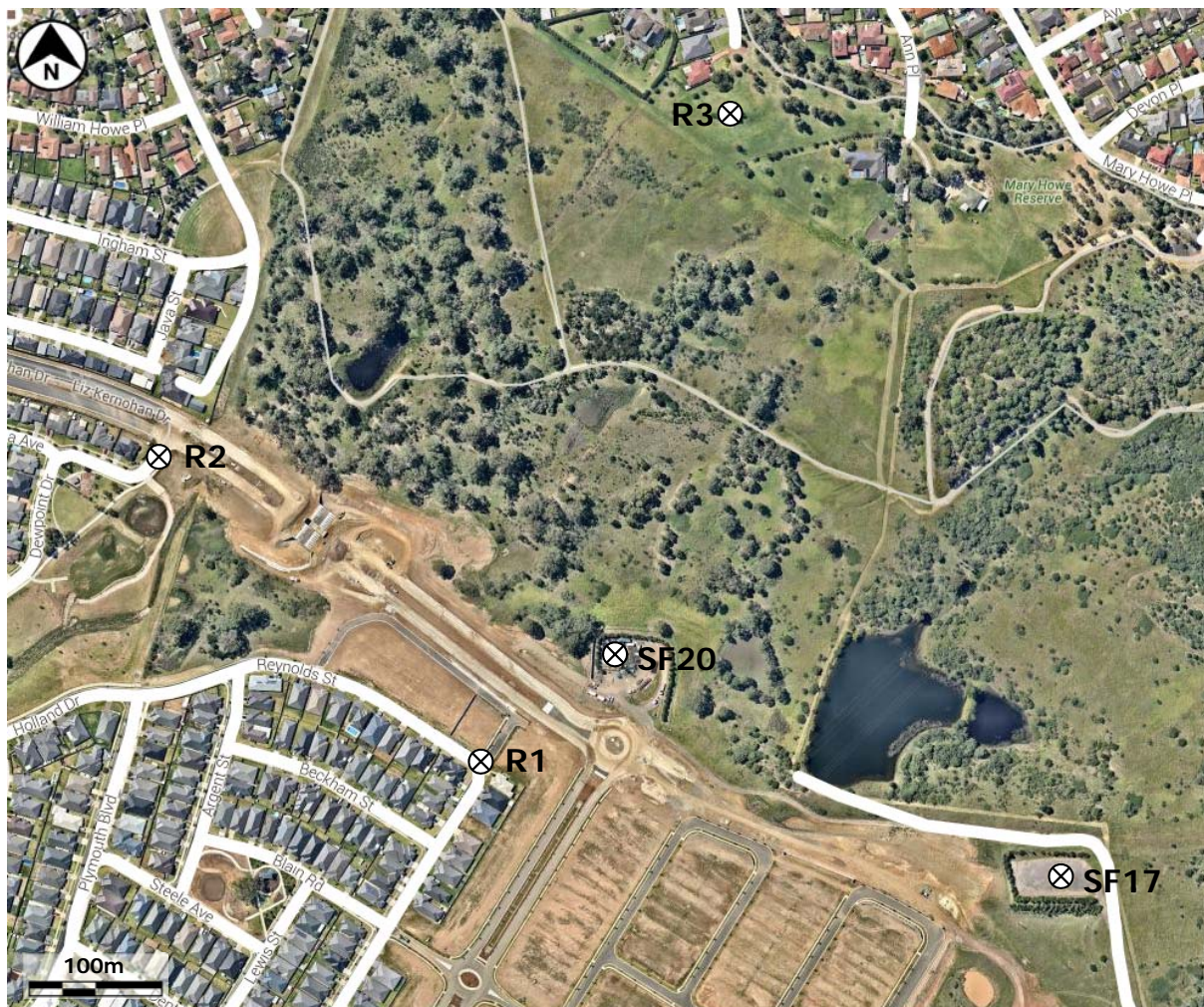
### **Measurement Locations**

Measurements conducted at the potentially most affected residential receivers surrounding the well sites are described as follows:

- R1 Corner of Holland Drive and Reynolds Street (representing the easternmost point of Landcom's Spring Farm Eastern Village residential development area currently in construction)
- R2 67 Dewpoint Drive (existing house located directly west of the well sites)
- R3 15 Jane Court (existing house located to the north of the well sites)

Figure 1 shows the measurement locations and both well sites.

**Figure 1 Measurement Locations & Well Sites**



**Operational Noise Criteria**

The Minister’s Conditions of Approval (PA06\_0291) for the Project state Project-specific operational noise criteria as shown in Table 1.

**Table 1 Project-Specific Operational Noise Criteria**

Well Site	L <sub>Aeq,15min</sub> (dBA)		
	Day (7.00am – 6.00pm)	Evening (6.00pm – 10.00pm)	Night (10.00pm – 7.00am)
SF17 & SF20	43	41	36

## Monitoring Procedure

Noise monitoring was conducted during the three (3) time periods defined in Table 1 in order to assess compliance for the day, evening and night time periods.

Daytime, evening and night measurements were carried out on Wednesday, 2 March 2016.

The measurements were made using a B&K Type 2236 Sound Level Meter. The sound level meter holds a current NATA calibration certificate (Calibration Certificate valid for 2 years is attached to this letter).

The reported measurements were conducted in suitable meteorological conditions (wind speeds below 5m/s and no rain). Wind speed and direction was determined using a hand-held digital anemometer Digitech QM1642. Cloud cover was observed to be 0-5%.

## Results of Attended Noise Measurements

Table 2 summarises the measurement results.

**Table 2 Measurement Results at Residential Receivers**

Period	Measurement Start Time	Location	Comments	Estimated $L_{Aeq,15min}$ due to Well Sites (dBA)	$L_{Aeq,15min}$ Noise Criteria (dBA)		
					Day	Eve	Night
Day	3.44pm	R1	Distant traffic hum audible most of the time, 40-42dBA. Civil works audible most of the time, 40-42dBA. SF20 workover generator audible most of the time, 41-43dBA. Metal clanging noise and hand tools associated with workover activities audible very briefly, 46-50dBA. SF17 well site inaudible at all times.	42dBA	43	-	-
	4.08pm	R2	Measurement dominated by civil works, 40-54dBA. Well sites inaudible at all times.	<30dBA	43	-	-
	4.38pm	R3	Measurement dominated by distant traffic, 38-44dBA, and insect noise, 35-40dBA. Well sites inaudible at all times.	<30dBA	43	-	-
Evening	6.53pm	R2	Measurement dominated by distant traffic, 37-42dBA, and bird noise, 45-50dBA. Well sites inaudible at all times.	<30dBA	-	41	-

Period	Measurement Start Time	Location	Comments	Estimated L <sub>Aeq,15min</sub> due to Well Sites (dBA)	L <sub>Aeq,15min</sub> Noise Criteria (dBA)		
					Day	Eve	Night
	7.19pm	R3	Measurement dominated by distant traffic, 40-41dBA, and bird noise, 40-43dBA. Well sites inaudible at all times.	<30dBA	-	41	-
	7.46pm	R1	Measurement dominated by distant traffic, 37-38dBA. Well sites inaudible at all times.	<30dBA	-	41	-
	10.00pm	R2	Measurement dominated by cicadas, 44-47dBA. Well sites inaudible at all times.	<34dBA	-	-	36
Night	10.23pm	R3	Measurement dominated by distant traffic, 34-37dBA, and insect noise, 36-38dBA. Well sites inaudible at all times.	<30dBA	-	-	36
	10.50pm	R1	Measurement dominated by cicadas, 40-53dBA. Well sites inaudible at all times.	<30dBA	-	-	36

## Conclusion

On the basis of the attended measurements conducted at the potentially most affected residential receivers in different directions, noise levels generated by well sites SF17 and SF20 are found to comply with the relevant operational noise criteria during the day, evening and night time periods.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

**WILKINSON MURRAY**



**Roman Haverkamp**

Senior Engineer

**Note**

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**Quality Assurance**

We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.

**AAAC**

This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.





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Accredited Laboratory Number 1301

# CALIBRATION CERTIFICATE

Certificate No: CAU1400292

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**CUSTOMER:** Wilkinson Murray Pty Ltd  
123 Willoughby Road  
Crows Nest NSW 2065

**Manufacturer:** Brüel & Kjær  
**Sound Level Meter:** 2236 **Serial Number:** 2173783  
**Microphone:** 4188 **Serial Number:** 2157590

### CALIBRATION CONDITIONS:

Preconditioning: 12 hours at 23 °C  
Environment conditions: Air temperature: 23.8 °C ± 3°C  
Air pressure: 101.8 kPa ± 3.0 kPa  
Relative Humidity: 34.7 %RH ± 25 %RH

**SPECIFICATIONS:** The Sound Level Meter has been calibrated in accordance with the requirements as specified in AS 1259.1 and AS 1259.2.

**PROCEDURE:** The measurements have been performed with the assistance of:  
Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 using procedure B&K proc 2236-4188-009

**RESULTS:** The reported expanded uncertainty is bidirectional and is based on the standard uncertainty multiplied by a coverage factor  $k=2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Accredited Laboratory No: 1301 accredited for compliance with ISO/IEC 17025.  
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Date of Calibration: 03/11/2014

Certificate Issued: 04/11/2014

Approved signatory: \_\_\_\_\_

*Jan Rasmussen*  
Jan Rasmussen