GLEBE ISLAND

COMPLIANCE NOISE MONITORING SUMMARY - MV SUMMIT

JUNE 2019

4 June 2019

SPOKE ACOUSTICS

GLEBE ISLAND

COMPLIANCE NOISE MONITORING SUMMARY
MV SUMMIT

JUNE 2019

PREPARED FOR

PORT AUTHORITY OF NEW SOUTH WALES

PREPARED BY

SPOKE ACOUSTICS PTY LTD

T +61 405 461821 E simon.kean@spokeacoustics.com.au

ABN 14 619 506 491

TABLE OF CONTENTS

1 INTRODUCTION

Spoke Acoustics Pty Ltd was engaged by the Port Authority of NSW to undertake noise measurements during the visit of the MV Summit to Glebe Island in June 2019. These noise measurements were completed to fulfil Clause M4.1 of the Environment Protection Licence (Licence number 13008) that was issued by the NSW EPA for the unloading of salt at Glebe Island. This report outlines the noise monitoring results as required by Clause R3.5 of the Licence.

Measurements were conducted between 8:30pm and 12:00am on the night of 3 June 2019. Salt was not being unloaded at these times.

Figure 1 MV Summit at Glebe Island 1

2 BACKGROUND AND SITE DESCRIPTION

Under the Licence vessels may unload salt at Glebe Island into trucks to transport off site. The unloading of salt occurs over several days and to protect the amenity of local residents the Licence sets noise criteria for the evening and night time periods.

The MV Summit was berthed port side to Glebe Island with the stern 70m from the end of the berth. The length of the vessel is 180m. Major noise sources identified by Spoke Acoustics were fan vents located approximately 15m above the water line and engine or generator exhausts at approximately 25m above the waterline. At the time of inspection the draught was approximately 8.5m.

Salt is unloaded at Glebe Island across the water from residential medium and high rise buildings located at Jackson's Landing with the worst affected receivers located between 160m and 180m away from the vessel. Other potentially affected receivers are located in Glebe and Balmain at distances of 550m and 640m respectively (see Figure 2). Residences at Glebe comprise of mostly terrace townhouses. Balmain residences comprise of apartment buildings and individual dwellings.

Figure 2 Monitoring locations

Source: Nearmap

3 EPA ENVIRONMENT PROTECTION LICENCE

The noise limits in the licence from Section L2 of the Licence are reproduced in Table 1.

Table 1 EPL Noise Limits

Location	Day		Evening		Night		
	$L_{Aeq\ (15minute)}$	$L_{Aeq\ (period)}$	$L_{Aeq\ (15minute)}$	$L_{Aeq\ (period)}$	$L_{Aeq\ (15minute)}$	$L_{Aeq\ (period)}$	$L_{Aeq\ (1minute)}$
Balmain	Not applicable	Not applicable	53	50	48	45	56
Glebe	Not applicable	Not applicable	53	50	48	45	60
Pyrmont	Not applicable	Not applicable	53	50	48	45	61

4 EQUIPMENT

Attended measurements were conducted using a Class 1 NTi XL2 sound level meter (serial number A2A12135E0) with current NATA calibration. Field calibration checks were also completed before and

after the measurement with a Pulsar type 105 acoustic calibrator (serial number 81326). No drift in calibration was detected during the measurement period. The calibrator also has a current NATA calibration certificate.

5 METHODOLOGY

All noise measurements were completed at a location representative of the ground floor of each residence and in accordance with the Licence requirements. Two requirements of the Licence are that measurements are completed in accordance with Australian Standard AS 2659 and the NSW Industrial Noise Policy.

Noise levels were only measured during the evening and night time periods as the Licence does not set limits for the daytime. During the evening and night time periods the vessel was not unloading salt. At the times of measurement the main noise sources were the ventilation fans and an onboard auxiliary generator used to provide electricity to the vessel.

The duration of each measurement was sufficient to be representative of the noise emission from the vessel in the time periods defined by the Licence noise limits. Where the vessel was audible and measurable the measurement was paused to exclude transient sources of extraneous noise from the decibel reading.

Where the vessel was not audible or measurable, calculations were completed to estimate the noise levels from the vessel. These estimates were based on measurements undertaken at Glebe Island within 80m of the vessel. The estimates were calculated by extrapolating the measurements undertaken within 80m of the vessel to the locations where the vessel could not be measured due to extraneous noise.

Measurements were completed between periods with adverse wind and heavy rain.

6 MEASUREMENT RESULTS

The following tables outline the measured noise levels with Spoke's subjective description of the audible environment.

Noise levels from the vessel were only clearly audible near residential receivers in the southern end of Jackson's Landing. The residences at this end near 2 Bowman Street were the worst affected by noise from the vessel across all compliance locations. The noise levels near 2 Bowman Street were also affected by traffic on ANZAC Bridge.

Noise levels at Balmain were affected by other vessels and traffic on ANZAC Bridge.

Noise levels in Glebe were controlled by noise from ANZAC Bridge.

Table 2 Evening noise levels

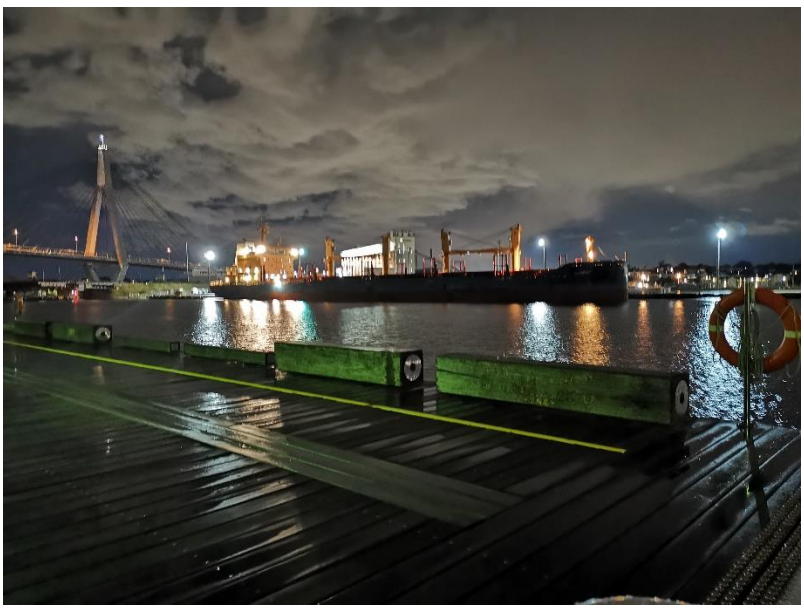
Location	Time	L_{Aeq}	L_{Amin}	Comments
Pyrmont - Jackson's Landing				
2 Bowman St	8:41pm	59	55	The MV Summit was noisiest near apartments at 2 Bowman St. Based on an inspection adjacent to the vessel on Glebe Island and the observations near 2 Bowman St this appears to be due to fans venting on the port and starboard sides near the funnel.
34 Refinery Dr	8:55pm	54	49	ANZAC Bridge dominated noise levels towards the northern end of Pyrmont and the vessel was not directly measurable.
Glebe – Leichardt St	9:21pm	53	51	Ambient noise dominated by ANZAC Bridge traffic and the water. MV Summit not audible.
Balmain – Reynolds St	9:44pm	51	50	Ambient noise dominated by unloading at Glebe Island berth 8 plus ANZAC Bridge Traffic.

Table 3 Night time noise levels

Location	Time	L_{Aeq}	L_{Amin}	L_{A1}	Comments
Pyrmont - Jackson's Landing					
2 Bowman St	10:31pm	58	55	None noted	The MV Summit was noisiest near apartments at 2 Bowman St. Based on an inspection adjacent to the vessel on Glebe Island and the observations near 2 Bowman St, this appears to be due to fans venting on the port and starboard sides near the funnel.
34 Refinery Dr	10:44pm	51	47	None noted	ANZAC Bridge dominated noise levels towards the northern end of Pyrmont and the vessel was not directly measurable.
Glebe – Leichardt St	11:10pm	53	51	None noted	Ambient noise dominated by ANZAC Bridge Traffic and water noise. MV Summit not audible.
Balmain – Reynolds St	11:34pm	49	46	None noted	Ambient dominated by unloading at Glebe Island berth 8 plus ANZAC Bridge Traffic. MV Summit occasionally just audible but not measurable.

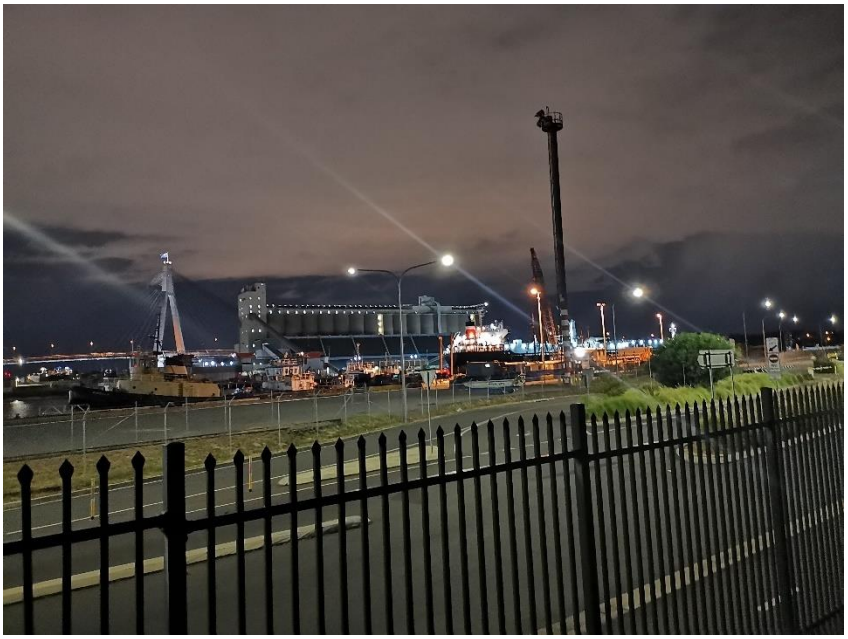
It may appear counterintuitive that noise levels from ANZAC Bridge dominated noise levels from the vessel to the north of Pyrmont as this location is further from the Bridge than the southern end of Pyrmont. However this is a result of the vessel not emitting noise levels equally in all directions. On the night of 3 June the vessel was emitting significantly more noise in the direction of 2 Bowman Street than in the direction of receivers further north.

Figure 3 View of ANZAC Bridge and the MV Summit from in front of the residences at 34 Refinery Dr to the north of Pyrmont



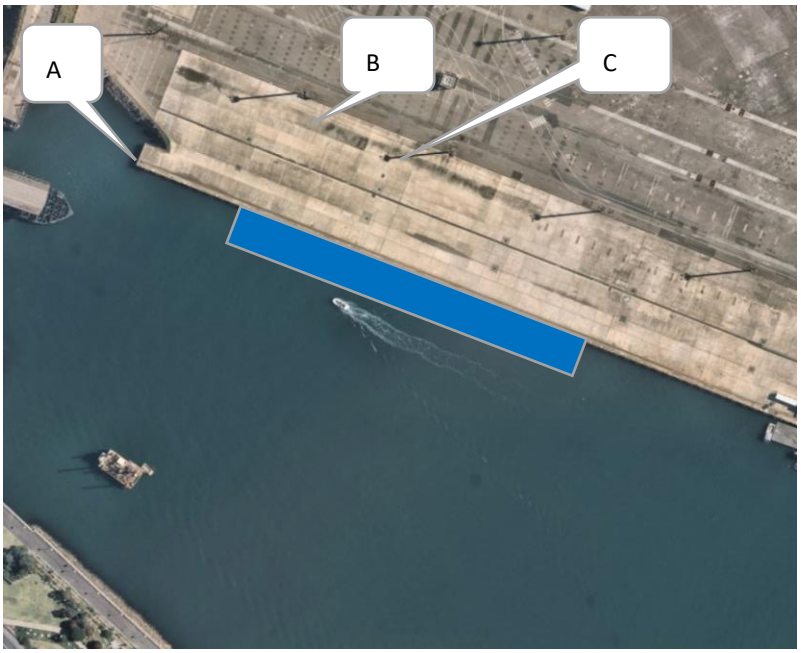
Noise levels in Balmain near Reynolds Street were controlled by noise from ANZAC Bridge and the Wyuna unloading at Glebe Island 8.

Figure 4 Wyuna unloading at Glebe Island 8



Noise levels were measured within 80m (see Figure 5) of the MV Summit from Glebe Island during the night time period after 10pm (see Table 4). These measurements have been used to extrapolate for vessel noise levels at locations where the vessel was not measurable.

Figure 5 Measurement locations on Glebe Island near MV Summit



Source: Nearmap

Table 4 Night time noise levels on Glebe Island near the MV Summit

Location (distance)	L_{Aeq}	L_{Amin}	Comments
A - port side (77m)	66	63	Fan noise
B - port side (65m)	69	66	Fan noise
C - stern (70m)	63	61	Mostly generator noise

7 ANALYSIS

The measured or extrapolated noise levels have been evaluated against the noise limits in the evening and night time periods in Tables Table 5 to Table 8. The only exceedance of noise limits were in the southern end of Jackson's Landing, Pyrmont near 2 Bowman Street.

The exceedances occurred in both the evening and night time periods by up to 7dBA. During the measurements the noise level from the vessel was similar to the noise level from ANZAC Bridge. The contribution from the vessel had to be estimated using statistical data to extract it from the measured level which included traffic noise from ANZAC Bridge.

During the attended measurements the noise emission from the vessel was steady and there were no obvious sources of noise which could contribute to a sudden short noise event. Therefore no $L_{A(1minute)}$ noise events were recorded and on this basis the assessment shows the vessel complies with the $L_{A(1minute)}$ noise limits at all locations.

Table 5 Assessment of evening noise levels against $L_{Aeq(15minute)}$ intrusiveness noise limits

Location	Measured / Predicted Level, L_{Aeq} dBA	Noise Limit $L_{Aeq\ (15minute)}$ dBA	Exceedance of noise limit
Pyrmont - Jackson's Landing			
2 Bowman St	59 / 55	53	2dBA exceedance
34 Refinery Dr	54 / 45	53	No exceedance
Glebe – Leichardt St	53 / 45	53	No exceedance
Balmain – Reynolds St	51 / 45	53	No exceedance

Table 6 Assessment of evening noise levels against $L_{Aeq(4hour)}$ amenity noise limits

Location	Measured / Predicted Level, L_{Aeq} dBA	Noise Limit $L_{Aeq\ (4hour)}$ dBA	Exceedance of noise limit
Pyrmont - Jackson's Landing			
2 Bowman St	59 / 55	50	5dBA exceedance
34 Refinery Dr	54 / 45	50	No exceedance
Glebe – Leichardt St	53 / 45	50	No exceedance
Balmain – Reynolds St	51 / 45	50	No exceedance

Table 7 Assessment of night time noise levels against $L_{Aeq(15minute)}$ intrusiveness noise limits

Location	Measured / Predicted Level, L_{Aeq} dBA	Noise Limit $L_{Aeq\ (15minute)}$ dBA	Exceedance of noise limit
Pyrmont - Jackson's Landing			
2 Bowman St	58 / 55	48	7dBA exceedance
34 Refinery Dr	51 / 45	48	No exceedance
Glebe – Leichardt St	53 / 45	48	No exceedance
Balmain – Reynolds St	49 / 45	48	No exceedance

Table 8 Assessment of night time noise levels against $L_{Aeq(9hour)}$ amenity noise limits

Location	Measured / Predicted Level, L_{Aeq} dBA	Noise Limit $L_{Aeq\ (9hour)}$ dBA	Exceedance of noise limit
Pyrmont - Jackson's Landing			
2 Bowman St	58 / 55	45	10dBA exceedance
34 Refinery Dr	51 / 45	45	No exceedance
Glebe – Leichardt St	53 / 45	45	No exceedance
Balmain – Reynolds St	49 / 45	48	No exceedance

Under the Licence, remedial action is required by Clause R3.5.3(v) where a complaint is received by the community. Some complaints were received by the Port Authority about noise emission. The vessel was contacted by the Port Authority on 4 June and action was undertaken by the vessel operator to reduce noise. Actions taken by the vessel were to cease operations of supply fans to the engine room and generator and to closely monitor the generator over night to prevent damage from overheating. These actions reduced noise levels by approximately 4dBA compared with the reported levels.

The complainants were offered noise monitoring at their residences in accordance with Clause O4.5.2. Any results of noise monitoring will be separately reported should this offer be taken up by the residents.

The Licence also requires graphical presentation of the noise data. These are provided below at the worst affected receivers which are located at Jackson's Landing, Pyrmont. The graphs illustrate the measured noise levels from the attended measurements, estimates of the ambient noise level without the vessel and vessel noise levels which may be compared with the criteria.

Figure 6 Assessment of evening noise levels against $L_{Aeq(15minute)}$ intrusiveness noise limits

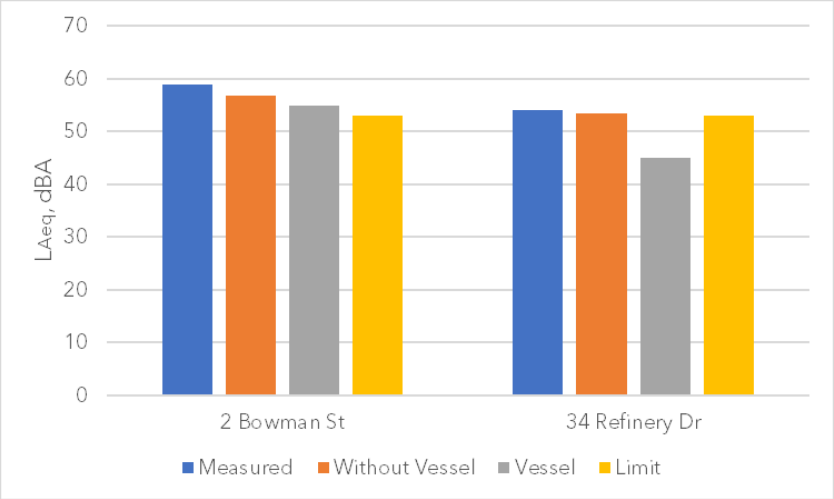


Figure 7 Assessment of evening noise levels against $L_{Aeq(4hour)}$ amenity noise limits

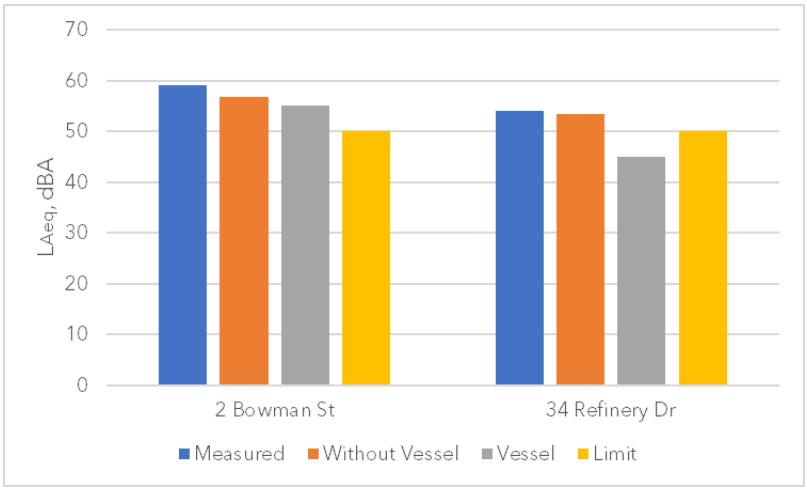


Figure 8 Assessment of night time noise levels against $L_{Aeq(15minute)}$ intrusiveness noise limits

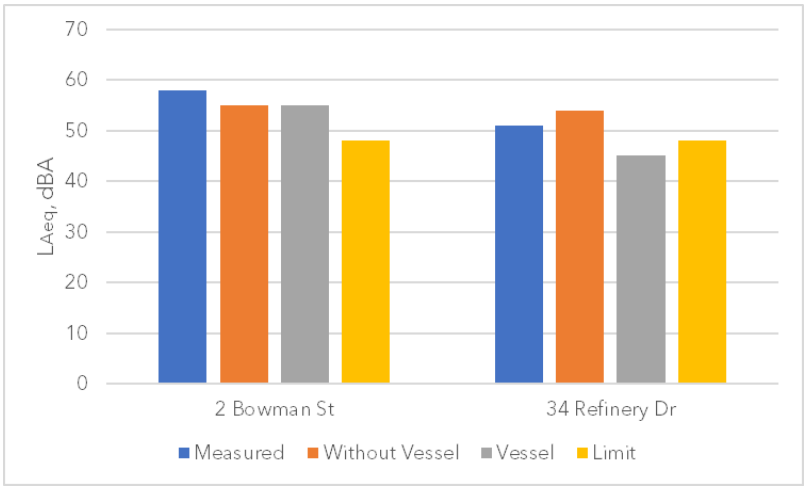
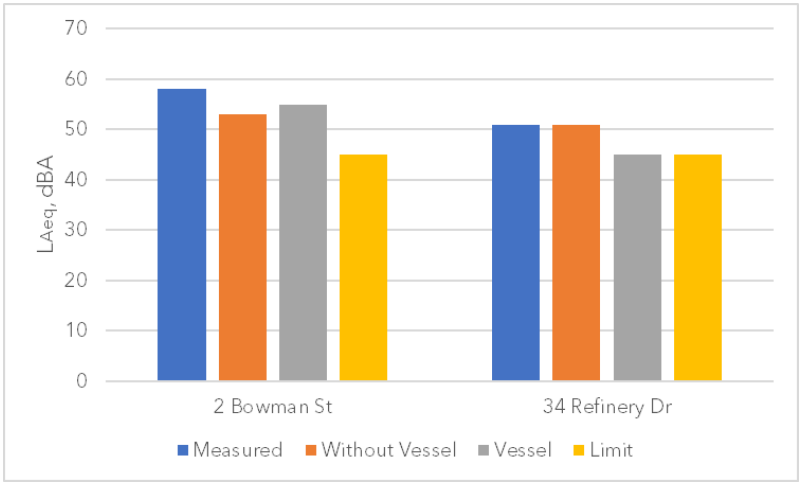


Figure 9 Assessment of night time noise levels against $L_{Aeq(9hour)}$ amenity noise limits



8 CONCLUSIONS

Spoke Acoustics completed noise measurements between 8:30pm and midnight from the evening of 3 June 2019 to evaluate the compliance of the MV Summit against noise limits set by Environment Protection Licence number 13008. Measurements were completed between periods of heavy rain and wind.

Noise levels from the vessel were clearly audible and measurable towards the southern end of Jackson's Landing, Pyrmont and not audible or measurable at other locations. These other locations include Jackson's Landing near 34 Refinery Drive, Leichardt Street, Glebe and Reynolds Street, Balmain. Noise levels from the MV Summit were not audible or measurable due to extraneous noise from other vessels and traffic on ANZAC Bridge.

Measurements were completed on Glebe Island in close proximity to the MV Summit to identify representative noise levels that may be extrapolated to locations where the vessels noise was not measurable.

Vessel noise levels from the MV Summit were found to comply with the Licence noise limits in all locations except for the southern end of Jackson's Landing, Pyrmont. In accordance with the Licence, the vessel was not unloading cargo in the evening and night time periods when noise levels exceeded the noise limits.

Evening noise levels at the southern end of Jackson's Landing, Pyrmont were found to exceed $L_{Aeq(15minute)}$ intrusiveness and $L_{Aeq(4hour)}$ amenity noise limits by 2dBA and 5dBA respectively. During the night time period the $L_{Aeq(15minute)}$ intrusiveness and $L_{Aeq(9hour)}$ amenity noise limits were exceeded at the southern end of Jackson's Landing, Pyrmont by 7dBA and 10dBA respectively. Note that the noise levels from the vessel during these times could not be directly measured and had to be extracted using statistical processing to exclude traffic noise from ANZAC Bridge. Noise levels from the vessel during the measurements was similar to noise from ANZAC Bridge.

Noise complaints were received from some residents. These residents were offered noise monitoring at their residence in accordance with the Licence.

GLOSSARY

TERM	DESCRIPTION
Representative noise level	A representative noise level is the typical noise level from a vessel during it's visit and excludes short term events which may be louder. The typical noise level from a vessel occurs from a combination of ventilation, air conditioning systems and onboard power generators. Higher short term noise levels may occur during arrival/departure or due to a change in an operational procedure. These are not representative of the longer term noise exposure from the vessel while in port. Where they are unreasonable they may be addressed by amending the vessel's procedures.
dBA	The term dBA is an abbreviation which indicates the noise levels have been expressed in decibels (dB) using an A-weighting filter which approximates how the human ear perceives the loudness of complex noise sources with both low frequency (chugging of engines), medium (fans and engine exhaust flow) and higher frequency aspects.
Environment Protection Licence (EPL)	The NSW Environment Protection Authority may issue an EPL relating to operations that are outlined in the NSW Protection of the Environment Operations Act. The EPL may provide noise limits for assessment and detail operational actions that must undertaken when the licenced activity occurs.
L_{Aeq}	In general, noise levels in any location vary continuously and any sound level meter will show this changing decibel level on the display. To make sense of the range in noise levels that may occur within a standard time period, various statistics are used in acoustics. The simplest are the L_{A90}, L_{A50} and L_{A10} descriptors. The number in each of these descriptors indicates the percentage of time that noise levels exceed the indicated value. For example an L_{A90} is the noise level that was exceeded 90% of the time, and L_{A50} is the noise level that was exceeded 50% of the time (also the median) and L_{A10} is the noise level that was exceeded 10% of the time. The L_{Aeq} is more complex to derive from changing noise levels and is an averaging process. The averaging process results in a single equivalent number for the measurement period that has the same total sound energy as the changing noise levels over the time period.
Adverse wind and rain	Conditions are described as adverse when noise levels from wind or rain are high enough to influence noise measurement. Adverse noise may result from direct noise generation on the microphone or from wind and rain impacting other items such as the ground, pavements, structures, vegetation etc.
Noise logger	A noise logger is an automated sound level meter which repeatedly saves noise statistics for defined noise sampling periods. In NSW statistics are usually obtained for every 15 minute period each day starting at midnight.
Class 1	Sound level meters are available with different levels of accuracy. A class 1 instrument is a high precision instrument suitable for acoustic measurement of noise levels at the White Bay Cruise Terminal. To achieve a Class 1 rating the meter must comply with Standard IEC61672. Most meters that are available through retail electronics stores (including smartphone apps with claimed calibration curves) are not accurate or stable enough to achieve a class rating.

GLOSSARY

TERM	DESCRIPTION
	Testing by Spoke Acoustics has found that noise levels measured using smartphone apps may commonly be wrong by 8dBA or more.
NATA calibration certificate	The sound level meter must have a current calibration certificate issued by a National Association of Testing Authorities (NATA) accredited laboratory for noise measurements to be valid in Australia. The certificate confirms that the meter is in good working order and complies with Standard IEC61672 and others as relevant.
Field calibration	A field calibration is conducted with a hand held acoustic calibrator and confirms the meter is working correctly and also permits minor adjustments to account for significant changes in temperature and atmospheric pressure.
Acoustic calibrator	An acoustic calibrator is used to conduct a field calibration. For the calibration to be valid the calibrator must have a current calibration certificate issued by a National Association of Testing Authorities (NATA) accredited laboratory.