

NOISE LEVEL CERTIFICATE

WHITE BAY 4
February 2020

MEASURED NOISE LEVEL SUMMARY

The representative vessel noise levels in February 2020 complied with the 58dBA reference level outlined in the White Bay Cruise Terminal (WBCT) Noise Impact Mitigation Strategy (NIMS). The noise levels for February are presented in the table.

During the period from 1 February to 29 February 2020 there six cruise ship visits to White Bay 4 (WB4). Each vessel visited once only.

Table – Representative noise levels from WB4

Vessel Name	Representative L _{Aeq} noise level (dBA)	Arrival Time	Departure Time	Complies with 58dBA reference level
Europa	45	5/02/2020 7:08	6/02/2020 17:53	Y
Explorer Dream	53	10/02/2020 6:44	10/02/2020 19:08	Y
Albatros	54	17/02/2020 7:42	18/02/2020 18:07	Y
Azamara Journey	48	22/02/2020 9:31	22/02/2020 18:05	Y
Explorer Dream	54	23/02/2020 6:11	23/02/2020 19:01	Y
The World	45	24/02/2020 6:16	25/02/2020 23:55	Y

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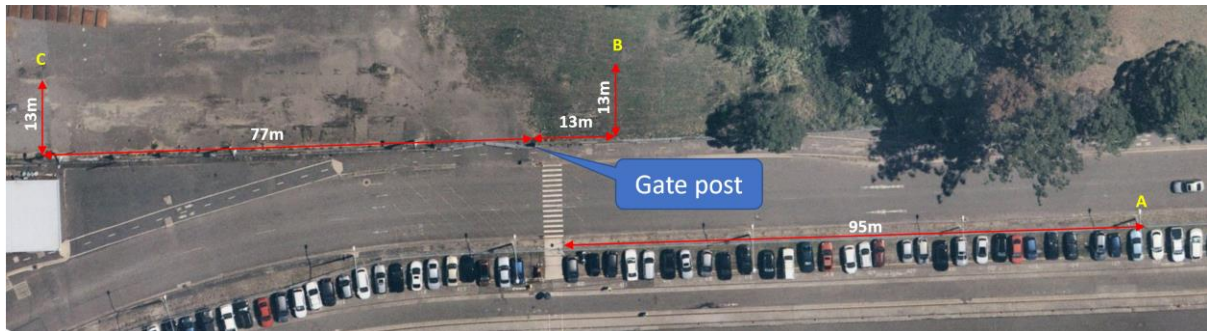
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METHODOLOGY AND MEASUREMENT LOCATION

Measurements were undertaken for WB4 using three automated noise loggers. These were positioned in locations A, B and C as indicated in the figure which provide equivalent data for WB4 to noise loggers positioned on Grafton St for WBCT.

Loggers B and C were tampered with on multiple occasions in February which led to rain driven water ingress. This caused significant damage to the equipment. Measurements were supplemented with attended measurements between February 10 and February 22.

Figure – Measurement locations at White Bay 4



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MEASUREMENT EQUIPMENT

The automated measurements were completed using Class 1 Svantek 977 sound level meters with current National Association of Testing Authorities, Australia (NATA) calibration certificates. Field calibration was completed monthly with a Pulsar type 105 acoustic calibrator. The calibrator has a current NATA calibration certificate. No significant change in calibration level was detected.

The attended measurements were completed with a Class 1 NTi XL2 sound level meter with a current National Association of Testing Authorities, Australia (NATA) calibration certificate. Field calibration was also completed before and after the noise measurement with a Pulsar type 105 acoustic calibrator. The calibrator has a current NATA calibration certificate. The pre and post field calibration confirmed there was no significant change in calibration over the measurement period and that results are representative.

ADDITIONAL OBSERVATIONS

Of note is that the Albatros has successfully reduced noise by 6dBA compared to last cruise season. Last cruise season the vessel exceeded the NIMS reference level by 2dBA. This visit the vessel was 4dBA less than the NIMS reference level. This improvement has seen them improve their rank from one of the noisiest vessels to just below the median noise level.

All noise levels from the vessels at WB4 complied with the NIMS reference noise level of 58dBA.

Yours faithfully



Dr Simon Kean
Director

GLOSSARY

TERM	DESCRIPTION
Representative noise level	<p>A representative noise level is the typical noise level from a vessel during its visit and excludes short term events which may be louder.</p> <p>The typical noise level from a vessel occurs from a combination of ventilation, air conditioning systems and onboard power generators.</p> <p>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.</p>
dBA	<p>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.</p>
58dBA reference level	<p>The approval for the White Bay Cruise Terminal called for the use of feasible and reasonable noise mitigation to manage potential noise impacts. In response the Port Authority of NSW has developed a Noise Impact Mitigation Strategy which considers potential noise impacts for typical vessels with noise levels up to 58dBA.</p> <p>Based on the approach in the Noise Impact Mitigation Strategy, 58dBA has become the baseline or reference level against which all vessels are assessed.</p> <p>Representative noise levels of 58dBA and lower from a vessel are deemed acceptable as the Noise Impact Mitigation Strategy has approaches to manage these noise levels by mitigating houses.</p> <p>Representative noise levels above 58dBA are deemed unacceptable and the vessel operations are reviewed under the Port Authority's three strikes policy.</p>
L_{Aeq}	<p>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.</p> <p>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.</p> <p>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.</p>

GLOSSARY

TERM	DESCRIPTION
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. 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.