

14 October 2020

Ref: 171356/29076

Muswellbrook Coal Company Limited  
PO Box 123  
Muswellbrook NSW 2333

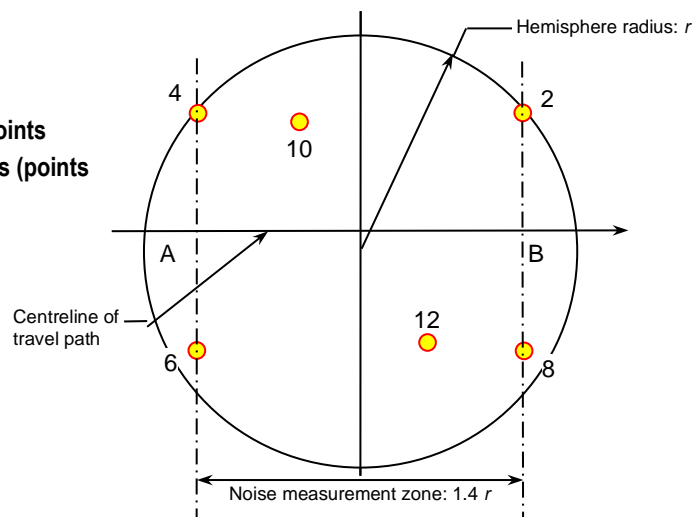
## RE: PLANT NOISE TEST RESULTS – SEPTEMBER 2020

This letter report presents the results of plant noise testing conducted for the Muswellbrook Coal Company (MCC) on 16<sup>th</sup> September, 2020 as required in Section 4.2 of the MCC Noise Management Plan (November 2017).

### MONITORING PROCEDURES

Dynamic testing was conducted using a modified version of ISO 6395:2008<sup>1</sup> that utilises two microphones to capture the same data as the four ground level points in the standard. The layout of the machinery path of motion and measurement points in the Standard are shown in **Figure 1**. When applied to dump trucks in motion, the forward measurement path is from point A to point B and then from B to A so that the microphones positions record both the left and right side of the vehicle.

**Figure 1. Measurement points for ISO 6395 dynamic tests (points 10 and 12 omitted).**



Measurement points 2 and 4 (6 and 8) were combined into a single point and the measurement zone extended to approximately  $2.8 r$  to allow for an approach distance of  $1.4 r$  to represent the measurement at point 2 (4) and a departure distance of  $1.4 r$  to represent the measurement at point 6 (8). For measurements of dozer 1439 the engine revs were held at approximately 1850 rpm.

<sup>1</sup> Pennington, N. *Theoretical justification for modifying homologation standard ISO 6395:2008(E) to suit the working mine site*. *Acoust. Aust.* **45**, 77-84 (2017).

## RESULTS

Calculated sound power levels (Lw, dB(A)) are presented in Table 1 below, with the test procedure (Stationary, dynamic or operational) noted along with the previously calculated sound power levels. All values are rounded to the nearest whole number with the method uncertainty error as defined in Annex N of ISO 6395.

Noise emissions were measured with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements. NATA calibration certificates for the measurement equipment are attached to this report.

<b>TABLE 1</b>				
<b>Sound Power Levels, Lw dB(A)</b>				
<b>16 September, 2020</b>				
<b>Equipment</b>	<b>Action/Mode</b>	<b>Test condition</b>	<b>Lw (Prev)<sup>1</sup></b>	<b>Lw, (2020)</b>
Excavator no. 209	Dynamic (rotation)	Stationary (operation)	116 ± 1	116 ± 1
Excavator no. 212	Dynamic (rotation)	Stationary (operation)	116 ± 1	117 ± 1
Water Cart 1117	Dynamic (forward)	Travel on incline	117 ± 1	117 ± 1
Water Cart 1218	Dynamic (forward)	Travel on incline	118 ± 1	117 ± 1
Haul truck 1237	Dynamic (forward)	Travel on incline	119 ± 1	118 ± 1
Haul truck 1238	Dynamic (forward)	Travel on incline	119 ± 1	117 ± 1
Haul truck 1239	Dynamic (forward)	Travel on incline	117 ± 1	116 ± 1
Dozer 1439	Dynamic fwd/rev <sup>2</sup>	Tracking on flat	122 ± 1	120 ± 1
Grader 1548	Dynamic (forward)	Travel on incline	112 ± 1	108 ± 1
CAT Loader no. 323	Dynamic (fwd / rev)	Travel on flat	112 ± 1	112 ± 1

<sup>1</sup> Most recent measurement from previous years.

<sup>2</sup> Geometric average of results for first and second gears.

Section 4.2 of the site Noise Management Plan (NMP, November 2017) states: “MCC conducts a survey of significant noise sources to determine the noise levels from the equipment. This survey will be completed so that all significant noise generating equipment is surveyed over a 3 year period. The results of this monitoring will be compared to previous results and if there is an increase of more than 2dB an investigation into the changes will be conducted to identify if any further mitigation on the equipment is required. As part of this investigation the attended noise monitoring results and complaints history will be considered.”

All items in Table 1 satisfy this requirement with respect to the most recently conducted measurements.

In summary, we advise that MCC mobile plant sound power levels do not exceed the previously measured levels by more than 2 dB.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please do not hesitate to contact the undersigned.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:



**Ross Hodge MAAS**  
Acoustical Consultant

Review:



**Neil Pennington MAAS**  
Acoustical Consultant



Australian Calibration Laboratory  
 Suite 2, 6-10 Talavera Road, North Ryde NSW 2113, Australia  
 Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301



**CERTIFICATE OF CALIBRATION**

Certificate No: CAU1901071

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**CALIBRATION OF:**

Sound Level Meter:	Brüel & Kjær	2250	No: 2747794
Microphone:	Brüel & Kjær	4189	No: 2733511
Preamplifier:	Brüel & Kjær	ZC-0032	No: 15339
Supplied Calibrator:	Brüel & Kjær	None	No: N/A
Software version:	BZ7224 Version 4.6.0	Pattern Approval:	PTB
Instruction manual:	BE1712-22	Identification:	N/A

**CUSTOMER:**

Spectrum Acoustics Pty Ltd  
 30 Veronica Street  
 Cardiff NSW 2285

**CALIBRATION CONDITIONS:**

Preconditioning: 4 hours at 23 °C  
 Environment conditions: *see actual values in Environmental conditions sections*

**SPECIFICATIONS:**

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

**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 (version 8.0 - DB: 8.00) and test procedure 2250-4189.

**RESULTS:**

	Initial calibration		Calibration prior to repair/adjustment
X	Calibration without repair/adjustment		Calibration after repair/adjustment

The reported expanded uncertainty 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.

Date of Calibration: 05/11/2019


Certificate issued: 05/11/2019

Sajeeb Tharayil  
 Calibration Technician

Craig Patrick  
 Approved signatory


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**Brüel & Kjær**

Australian Calibration Laboratory  
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Accredited for compliance with ISO/IEC 17025 - Calibration, Laboratory No. 1301



**NATA**  
NATIONAL METROLOGY  
ACCREDITATION

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**CERTIFICATE OF CALIBRATION**

Certificate No: CAU2000092

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**CALIBRATION OF:**

Sound Level Meter:	Brüel & Kjær	2250	No: 2653961
Microphone:	Brüel & Kjær	4189	No: 3087490
Preamplifier:	Brüel & Kjær	ZC-0032	No: 25104
Supplied Calibrator:	None	None	No: N/A
Software version:	BZ7222 Version 4.7.5	Pattern Approval:	PTB
Instruction manual:	BE1712-22	Identification:	N/A

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**CUSTOMER:**

Spectrum Acoustics Pty Ltd  
30 Veronica Street  
Cardiff NSW 2285

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Environment conditions: see actual values in *Environmental conditions* sections

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**RESULTS:**


Initial calibration		Calibration prior to repair/adjustment
Calibration without repair/adjustment	X	Calibration after repair/adjustment

The reported expanded uncertainty 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  $\pm A - 4/0.2$  from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

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Date of Calibration: 30/01/2020

Certificate issued: 30/01/2020



Sajid Thariyil  
Approved Signatory

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