**13 July 2022**

Ref: 171356/29812

Muswellbrook Coal Company Limited
PO Box 123
Muswellbrook NSW 2333

**RE: PLANT NOISE TEST RESULTS – JULY 2022**

This letter report presents the results of plant noise testing conducted for the Muswellbrook Coal Company (MCC) on 11th July, 2022 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[1] 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.

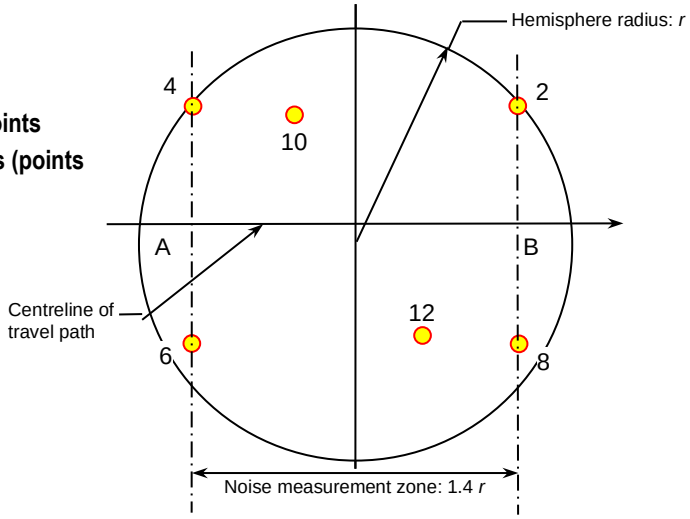


**Figure 1. Measurement points for ISO 6395 dynamic tests (points 10 and 12 omitted).**

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).

[1] 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 a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument 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.

**TABLE 1**
**Sound Power Levels, Lw dB(A)**
**July 2022**

| Equipment | Action/Mode | Test condition | Lw (2019) | Lw, dB(A) |
|---|---|---|---|---|
| Excavator no. 211 | Dynamic (rotation) | Stationary (operation) | 115 ± 1 | 117 ± 1 |
| Haul truck 1235 | Dynamic (forward) | Travel on incline (unladen) | 116 ± 1 | 116 ± 1 |
| Haul truck 1236 | Dynamic (forward) | Travel on incline (unladen) | 117 ± 1 | 116 ± 1 |
| Dozer 1437 | Dynamic fwd/rev[1] | Drive-by | 119 ± 1 | 117 ± 1 |
| Dozer 1451 | Dynamic fwd/rev[1] | Drive-by | 118 ± 1 | 118 ± 1 |
| Water Cart 1724 | Dynamic (forward) | Travel on flat | n/a | 117 ± 1 |

1. Arithmetic 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."

The results in Table 1 show that all plant items 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. Further targeted noise monitoring of individual plant measured during this survey is not warranted at this stage.

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**

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# CERTIFICATE OF CALIBRATION

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## CALIBRATION OF

| | | | |
|---|---|---|---|
| Sound Level Meter: | Brüel & Kjær Type 2250 | No: 3030460 | Id: - |
| Microphone: | Brüel & Kjær Type 4189 | No: 3318407 | |
| PreAmplifier: | Brüel & Kjær Type ZC-0032 | No: 31079 | |
| Calibrator: | None | | |
| Software version: | BZ7222 Version 4.7.6 | Pattern Approval: | - |
| Instruction manual: | BE1712-22 | | |

## CUSTOMER

Spectrum Acoustics Pty Limited
PO Box 374
2287 Wallsend
New South Wales, Australia

## CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C

Environment conditions: *See actual values in sections.*

## SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

## PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.3 - DB: 8.30) by using procedure B&K proc 2250, 4189 (IEC 61672:2013).

## RESULTS

Calibration Mode: **Calibration as received.**

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: 2021-12-10

Susanne Jørgensen
Calibration Technician

Date of issue: 2021-12-10

Erik Bruus
Approved Signatory