

**KALGOORLIE CONSOLIDATED GOLD MINES PTY LTD**

**FIMISTON GOLD MINE**

**COMPLIANCE NOISE MONITORING LOCATION  
OUTRAM STREET, BOULDER**

SEPTEMBER 2023

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FOR

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PTY LTD**

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## 1.0 INTRODUCTION

Herring Storer Acoustics have been commissioned by Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) to undertake an acoustic assessment of noise emissions from the proposed expansion of the Fimiston Open Pit to the south and west of the existing operations.

Noise levels for the proposed expansion have been assessed against the criteria prescribed by the *Environmental Protection (Noise) Regulations 1997*. Under regulation 17(7) of the *Environmental Protection (Noise) Regulations 1997*, approval<sup>1</sup> has been granted to KCGM to allow the level of noise emitted from the Fimiston Gold Mine to exceed this standard as prescribed under Regulation 7(1)(a).

The currently implemented *Environmental Protection (Fimiston Gold Mine Noise Emissions) Approval 2016* identifies approved noise monitoring locations, referred to as *Compliance Noise Monitoring Locations*. These locations are used as points for which reference noise levels of the KCGM operation noise are measured.

As a part of the acoustic assessment for the expansion of the Fimiston South Project, (Ref 30901-3-23033-02), it was identified that one of the Regulation 17 compliance noise monitoring locations, Outram Street Boulder (OSB) will be encompassed by the footprint of the mining project with the assessment concluding that further investigation into an alternative location will be part of the approval process.

This study forms the basis of that investigation, providing an alternative compliance noise monitoring location for OSB.

## 2.0 ACOUSTIC CRITERIA

The KCGM operations operate under a Regulation 17 adjustment in Assigned Noise Levels. First approved in 2009 with additional amendments to maintain representation of changing mining activities. The current implemented approval was gazetted on 22<sup>nd</sup> March 2016.

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Under Regulation 17(7) of the *Environmental Protection (Noise) Regulations 1997*, approval has been granted to KCGM to allow the level of noise emitted from the Fimiston Gold Mine to exceed this standard as prescribed under Regulation 7(1)(a). The level of noise emitted from the Fimiston Gold Mine when received at a location set out in Table 1 is not to exceed the corresponding  $L_{A10}$  and  $L_{Amax}$  approved levels for that location and time of day, where;

$L_{A10}$  approved level means an approved level which, measured as a  $L_{A\text{ Slow}}$  value, is not to be exceeded for more than 10% of the representative assessment period;

$L_{Amax}$  approved level means an approved level which, measured as a  $L_{A\text{ Slow}}$  value, is not to be exceeded at any time;

$L_{A\text{ Slow}}$  means reading in decibels (dB) obtained using the "A" frequency weighting and "Slow" time response setting.

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<sup>1</sup> Environmental Protection (Fimiston Gold Mine Noise Emissions) Approval 2016. Gazetted 22 March 2016.

**TABLE 2.1: APPROVED NOISE LEVELS**

Location	Time of Day	Approved Level (dB)	
		L <sub>A10</sub>	L <sub>Amax</sub>
OSB	0700 - 1900 hours (Day)	52 + WIF	65 + WIF
	1900 - 2200 hours (Evening)	49 + WIF	60 + WIF
	2200 - 0700 hours (Night)	49 + WIF	60 + WIF

Note: WIF is the weather influencing factor.

For the purpose calculating the L<sub>A10</sub> or L<sub>Amax</sub> approved noise level, the WIF to be added to the figures are shown in Table 1, with the weather influencing factor (WIF) as set out in Table 2. The WIF relates to the weather conditions prevailing at the time the noise is received. The following table has been taken from *Environmental Protection (Fimiston Gold Mine Noise Emissions) Approval 2016*.

**TABLE 2.2 – WEATHER INFLUENCING FACTORS FOR DIFFERENT WEATHER CONDITIONS (2009)**

Wind Direction	Wind Speed (km/h)	Location / Weather Influencing Factor (dB)
		OSB
Calm	< 2	5
Northerly	≥ 2	5
North Easterly	≥ 2	4
Easterly	≥ 2	4
South Easterly	≥ 2	3
Southerly	≥ 2	2
South Westerly	≥ 2	2
Westerly	2 - 7	3
Westerly	> 7	3
North Westerly	2 - 7	4
North Westerly	> 7	3

For the purpose of assessing under Regulation 9(3) if noise emission from the Fimiston Gold Mine when received at a location is to be taken to be free of the characteristics referred to in Regulation 7(1)(b), the adjustment in Regulation 9(3) Table 2 column 1 where tonality is present is varied to 0 dB.

### 3.0 OSB CURRENT LOCATION (OUTRAM ST BOULDER)

Compliance environmental noise monitoring is undertaken each quarter by specialist noise consultants (Herring Storer Acoustics) to determine compliance against the noise level standards set in the KCGM Regulation 17 (2016 Approval). The measurement and assessment of noise levels at the five reference locations (as detailed in Figure 3.1) is undertaken in accordance with Part 3 of the *Environmental Protection (Noise) Regulations 1997*.

KCGM's compliance noise monitoring programme involves the:

- Measurement of noise levels (L<sub>A10</sub> and L<sub>Amax</sub>) at five reference locations set in the KCGM Regulation 17 Approval; and
- Review of weather monitoring data, i.e. wind speed and direction to determine the applicable WIF (Table 4.2).

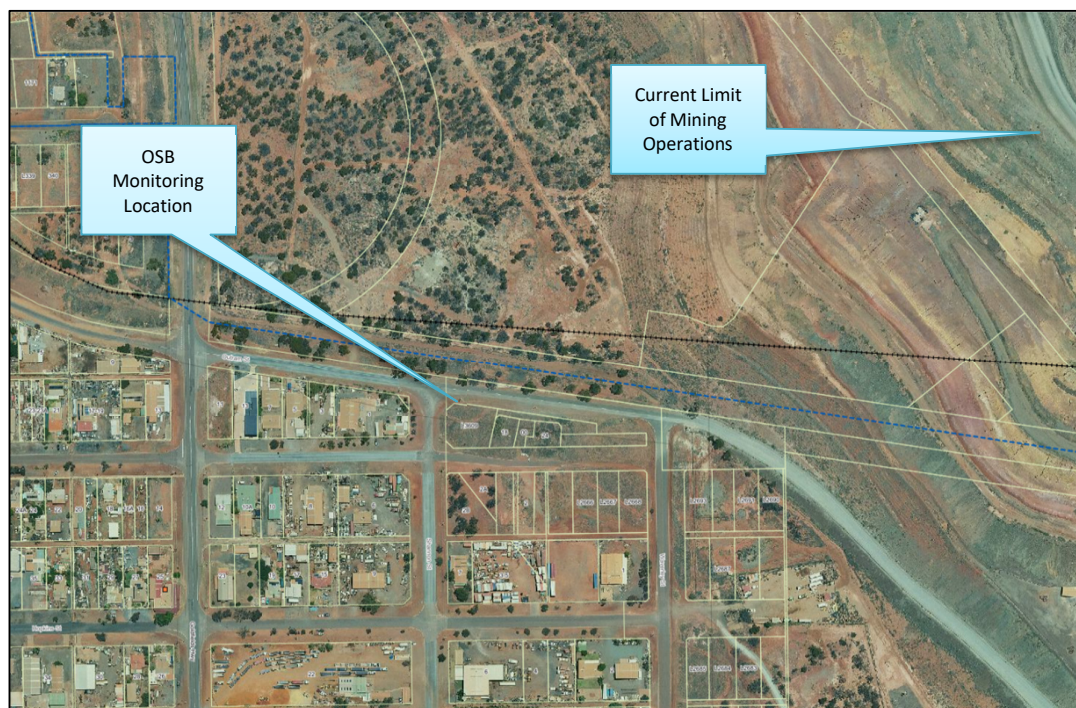
The five reference locations are shown as a location plan in Figure 3.1 and are summarised as follows:



**FIGURE 3.1 – COMPLIANCE NOISE MONITORING LOCATIONS**

The Outram Street Boulder (OSB) is any place at or adjacent to the intersection of Outram Street and Shannon Street, Boulder with Figure 3.2 detailing the location.

KCGM Coordinates for the current OSB location is X 18230.17 and Y 47764.85.



**FIGURE 3.2 – OSB COMPLIANCE NOISE MONITORING LOCATION**

As can be seen in the above Figure, the current OSB monitoring location is approximately 500m from the nearest haul truck route and approximately 900m from the nearest active mining operation. Additionally, the location is approximately 300m from the top of the current KCGM Environmental Noise Bund.

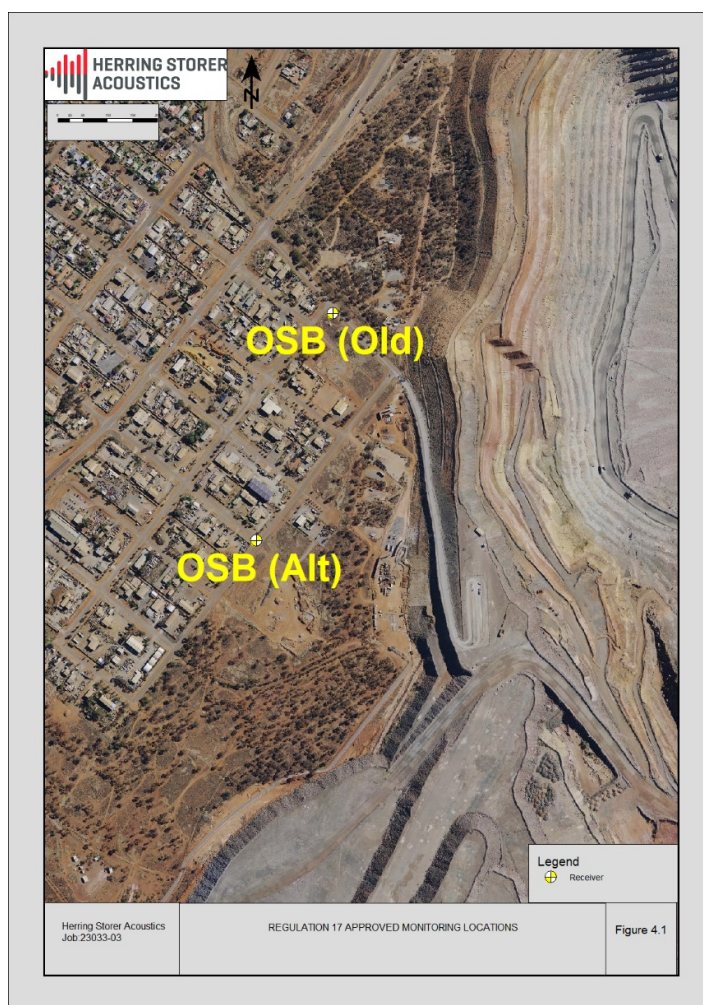
#### 4.0 OSB PROPOSED NEW LOCATION

The alternative location for the OSB Compliance Noise Monitoring Location has been based on analysis of the following:

1. Physical access to the location at all times.
2. Confirmation noise level measurements.
3. Predictive noise modelling for the location for all weather conditions as identified in Table 2.2 – weather influencing factors for different weather conditions.
4. Similar distances to mining operations and the environmental noise bund.
5. Similar predicted noise levels for the proposed Fimiston South Expansion project as to those currently received at the existing reference location.

Based on these factors, the alternative location has been chosen as the corner of Oroya and Waverley Street, with Figure 4.1 detailing the aerial map.

KCGM Coordinated for the proposed OSB location is X 18092.54 and Y 47298.08.



**FIGURE 4.1 – OSB PROPOSED COMPLIANCE NOISE MONITORING LOCATION**

## 5.0 MODELLING / FUTURE NOISE LEVELS

Noise immissions<sup>1</sup> at the proposed Regulation 17 compliance noise monitoring location (New OSB) due to noise associated with the proposed FS Project operations, were modelled utilising the DWER recognised computer modelling programme, SoundPlan with CONCAWE algorithms as per the acceptable methods detailed within the *DWER Guideline: Assessment of environmental noise emissions (Draft May 2021)*.

Methodology including equipment used and source locations etc are contained in the acoustic assessment 30901-3-23033-02 (April 2023; revised May 2023 in which a total of five scenarios were investigated). The scenario selected from this earlier study was a representative “snapshot” of the proposed operations, these being:

Scenario 5 - Mining Operations at -90RL

Mining at the -90 RL. Mining operations cutting a 10m bench through the FS Project length.

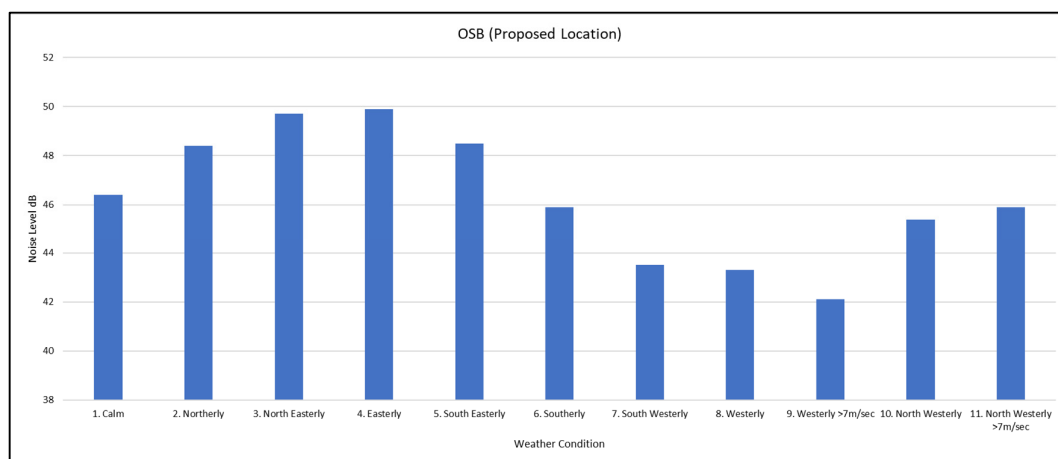
To correlate the predicted noise levels to the Regulation 17 assigned noise level criteria, the above operating scenario was calculated using the same weather conditions as those stipulated in Table 2.2. It is noted that the investigation as to the proposed noise levels for various mining operations stages was concluded in the previous study (April 2023; revised May

2023). The purpose of this predictive noise modelling was to assess the new location (OSB Alt) to ensure noise levels stipulated in the Regulation 17 criteria, including the weather influencing factors will remain the same as for the proposed operations as they are for the current operation and reference point.

The resultant predictive modelling is as shown in Table 5.1 and as a graph in Figure 5.1:

**TABLE 5.1 – WEATHER INFLUENCING FACTORS FOR DIFFERENT WEATHER CONDITIONS**

Wind Direction	Wind Speed (km/h)	Predicted Noise Levels dB(A)
		OSB
Calm	< 2	46
Northerly	≥ 2	48
North Easterly	≥ 2	50
Easterly	≥ 2	50
South Easterly	≥ 2	49
Southerly	≥ 2	46
South Westerly	≥ 2	44
Westerly	2 - 7	43
Westerly	> 7	42
North Westerly	2 - 7	45
North Westerly	> 7	46



## 6.0 ASSESSMENT

Predictive modelling of noise propagation indicates that the variation between the upwind and down wind conditions is slightly higher i.e., a variation of 8 dB(A) when compared to the weather influencing factors in the Regulation 17 assigned noise level criteria.

Generally, the greater variation is attributable to the noise source location being in a closer proximity to the receiver location, whereas at further distances to the mine there is a greater spread of noise sources for which are less impacted by a single wind direction.

The current OSB monitoring location has base noise level of 49 dB(A) at night and 52 dB(A) during the day (plus WIF). Predictive noise modelling for the proposed alternative location shows that the same base criteria value of 49 and 52 dB(A) would be applicable to adopt. Whilst the WIF for the current OSB location is slightly lower than the predicted noise level

variation for different conditions, the overall noise modelling conducted for the FS Project shows that dependant on the stage of operations, the same compliance levels would be achieved.

Therefore, as there is a good correlation between the current and proposed OSB Compliance Noise Monitoring Location the new OSB (alternative) location can be adopted into the Regulation 17 and the same Regulation 17 assigned noise level criteria compliance can be maintained for the proposed Fimiston South Expansion Project.

The information contained in this study relates to the OSB location only. For the other four regulatory monitoring locations, there would be no change in location or assigned level being sought in the Regulation 17 renewal process.