



KALGOORLIE CONSOLIDATED GOLD MINES



ANNUAL NOISE MONITORING REPORT

*Environmental Protection (Fimiston Gold Mine
Noise Emissions) Approval 2016*

22 March 2016 – 21 March 2017

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1 PURPOSE OF DOCUMENT

Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) is required to submit an Annual Noise Monitoring Report (Report) to the CEO of the Department of Environment Regulation (DER) within one month from the end of the reporting year (21 March) in accordance with Condition 10 of the *Environmental Protection (Fimiston Gold Mine Noise Emissions) Approval 2016* (2016 Fimiston Noise Approval). The Report is required to include:

- (a) a summary of the noise and airblast levels recorded under clause 8 during the year; and
- (b) a summary of the progress of the implementation of the noise management plan submitted or revised under clause 9.

This is the first Report submitted by KCGM under the 2016 Fimiston Noise Approval (approved 22 March 2016) and covers the period 22 March 2016 to 21 March 2017. In accordance with the KCGM Noise and Vibration Monitoring and Management Plan (June 2016) (NVMMP) the data presented in the annual report will be for the twelve month period commencing 1 April 2016 in order to align with the quarterly reporting periods.



2 SUMMARY OF KCGM OPERATIONS

KCGM operates the Fimiston Open Pit, Mt Charlotte Underground Mine and the Fimiston and Gidji Processing Plants on behalf of joint venture owners; Barrick (Australia Pacific) Pty Limited (Barrick; 50%) and Newmont Asia Pacific Ltd (Newmont; 50%).

The Fimiston Operations and Mt Charlotte Underground Mine are located adjacent to the City of Kalgoorlie-Boulder approximately 600 km east of Perth, Western Australia, whilst the Gidji Processing Plant is located approximately 17 km north of Kalgoorlie-Boulder.

KCGM comprises many facets of mining and mineral processing including:

- Open pit mining (Fimiston);
- Waste rock disposal (Fimiston);
- Underground mining (Mt Charlotte);
- Mineral processing (Fimiston and Gidji);
- Tailings disposal (Fimiston and Gidji);
- Ultra-fine grinding (Fimiston and Gidji);
- Electrowinning and refining (Fimiston); and
- Exploration.

KCGM produces around 700,000 ounces of gold each year and has a gold reserve of approximately 7 million ounces. The estimated Life of Mine (LOM) for KCGM's operations will see mining continue until around 2025, and an extension of the mineral processing operations until around 2035 through the processing of low-grade stockpiles. On completion, the Fimiston Open Pit will measure 3.5 km in length, 1.5 km in width and up to 700 metres in depth.

3 NOISE MONITORING SUMMARY

In accordance with Condition 8 of the 2016 Fimiston Noise Approval, KCGM undertakes the following noise monitoring programmes:

- Continuous Environmental Noise Monitoring;
- Compliance Environmental Noise Monitoring; and
- Airblast Monitoring.

Each of these monitoring programmes are outlined in the NVMMP; approved by the DER on 19 September 2016 and the Office of the Environmental Protection Authority (OEPA) on the 01 November 2016.

3.1 CONTINUOUS ENVIRONMENTAL NOISE MONITORING

During the reporting period, continuous environmental noise monitoring was undertaken, as far as practicable, at Metal Exploration Premises (MEP) and Boulder Primary School (BPS) in accordance with Condition 8(1) of the 2016 Fimiston Noise Approval.

Results of the continuous environmental noise monitoring programme are provided in the Quarterly Noise and Blast Monitoring Report submitted to the OEPA. The quarterly report also contains the following:

- Information on any data loss; and
- Graphs of continuous noise levels recorded at the MEP and BPS monitoring sites.

To avoid duplication of data, the Report does not include the detailed results as previously submitted in the quarterly reports, but provides a summary of the noise levels recorded at MEP and BPS during the period 1 April 2016 to 31 March 2017.

The noise generated from the Fimiston Operations is considered to be very constant and stable. The average noise levels are summarised for day (0700 to 1900 hours), evening (1900 to 2200 hours) and night (2200 to 0700 hours) periods in Figure 1 (BPS) and Figure 2 (MEP). Noise data from BPS is recorded as L_{10} , L_{50} and L_{90} , and noise data from MEP is recorded as L_{eq} due to different configurations of the sound level meters. Noise levels are consistent with previous years.

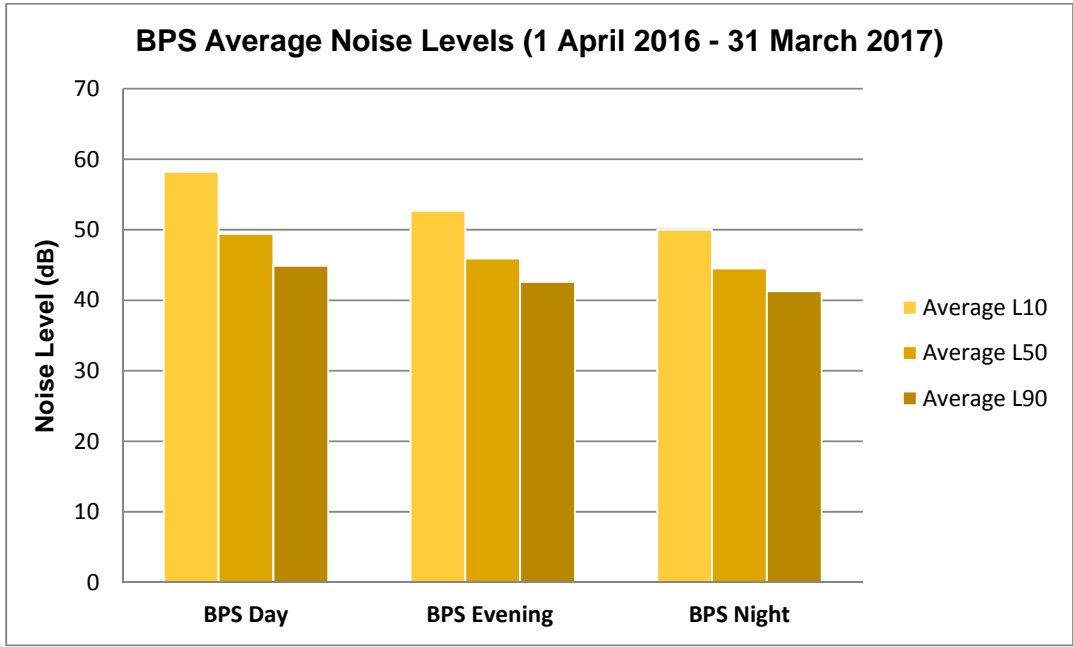


Figure 1: BPS Noise Level Summary

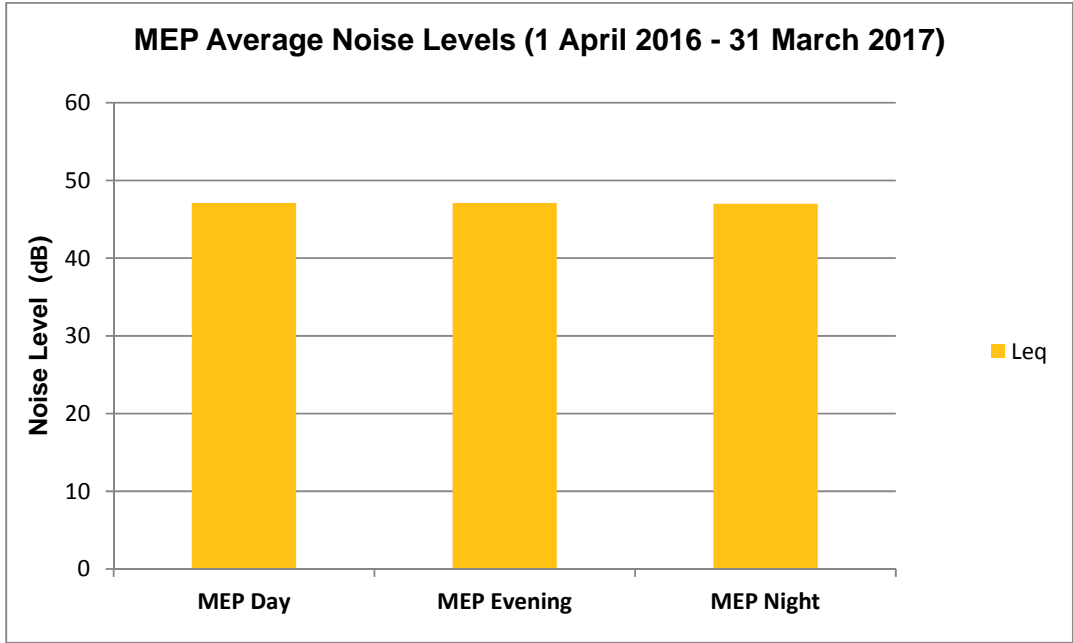


Figure 2: MEP Noise Level Summary

3.2 QUARTERLY COMPLIANCE ENVIRONMENTAL NOISE MONITORING

Approved noise levels for KCGM's Fimiston Operations are stipulated in Condition 4 of the 2016 Fimiston Noise Approval. During the reporting period, quarterly compliance noise monitoring was undertaken at each of the five reference locations (Figure 3) in accordance with Condition 8(2) of the 2016 Fimiston Noise Approval.

The approved noise levels also take into account a Weather Influencing Factor (WIF); data from the weather monitoring equipment at KCGM's weather station MEX (Figure 3) is used to determine the WIF based on measured weather conditions prevailing at the time the noise is received.

During the reporting period, the measured levels at all locations complied with the approved noise levels for the night time period. A summary of the measured noise levels and the approved noise levels by location are shown in Figures 4, 5, 6, and 7.

Results of the quarterly compliance noise monitoring programme are provided in the Quarterly Noise and Blast Monitoring Report submitted to the OEPA and is provided on KCGM's website (www.superpit.com.au).



Figure 3: Compliance Noise Monitoring and Weather Station Locations

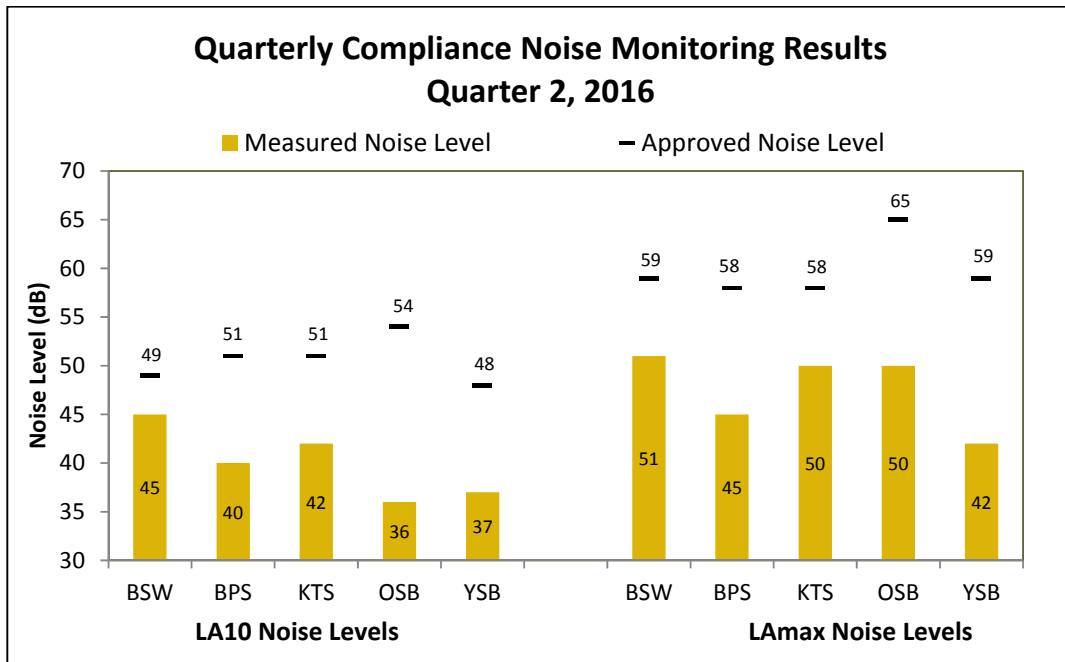


Figure 4: Compliance Noise Monitoring Q2 2016

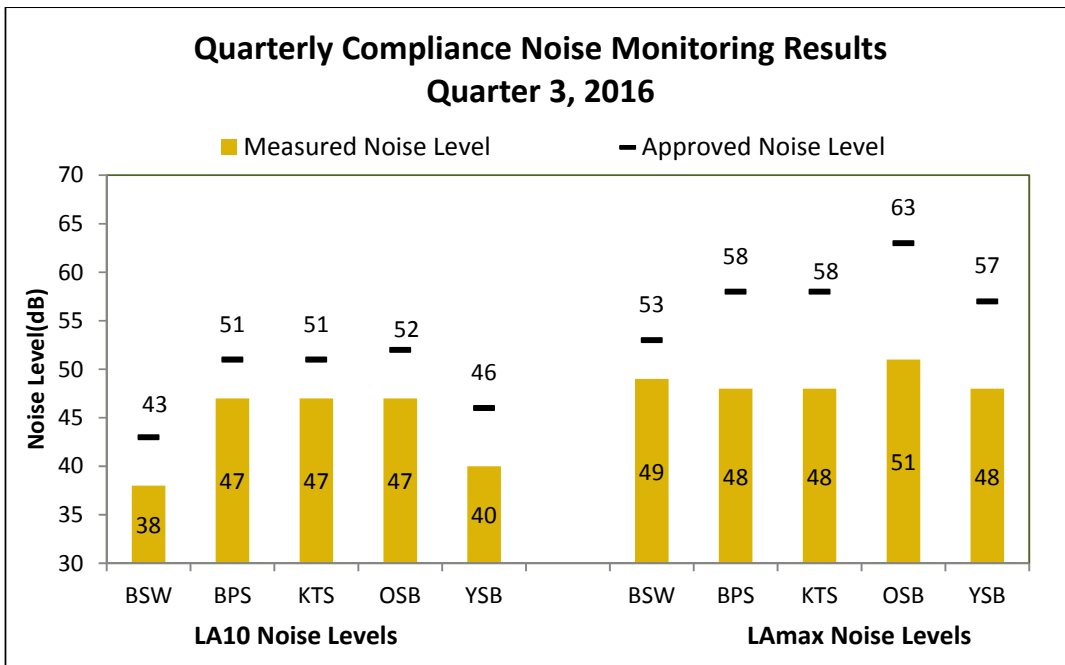


Figure 5: Compliance Noise Monitoring Q3 2016

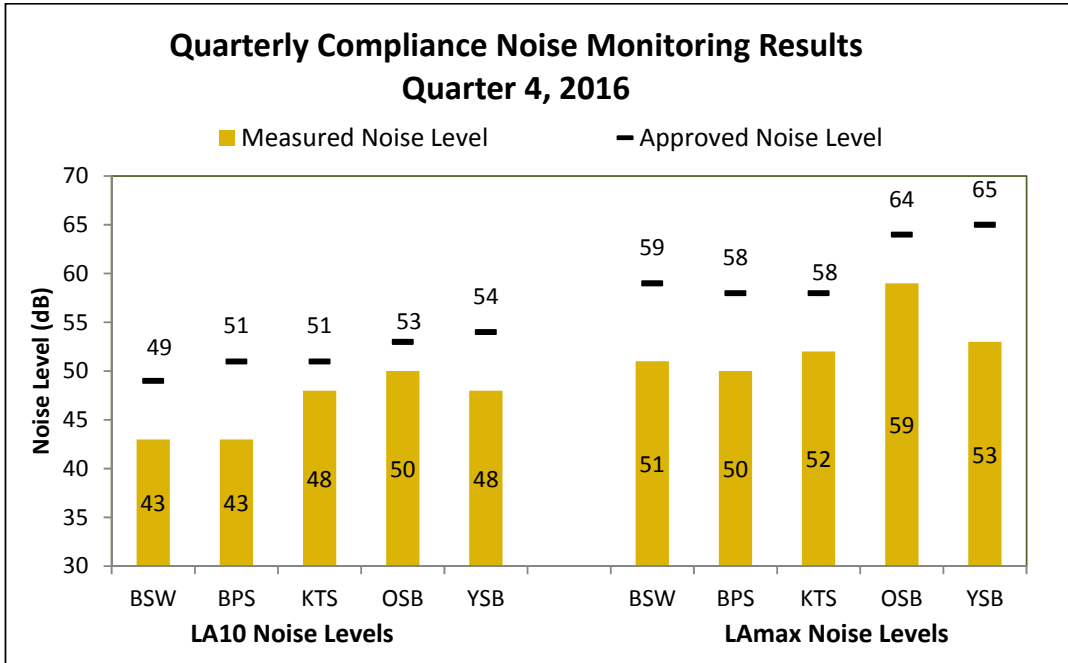


Figure 6: Compliance Noise Monitoring Q4 2016

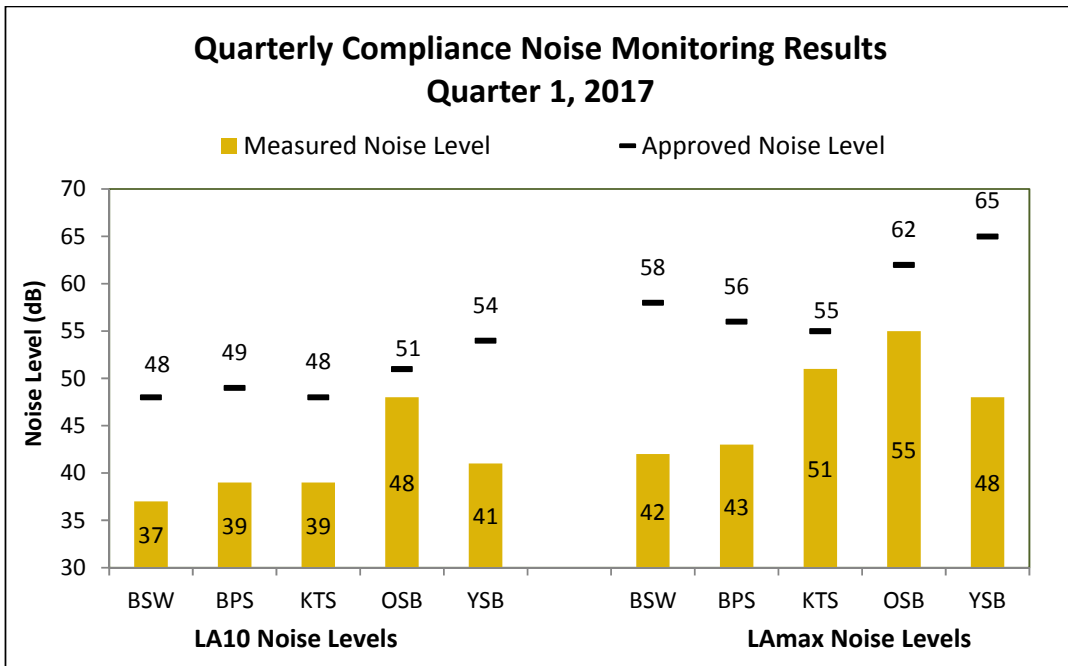


Figure 7: Compliance Noise Monitoring Q1 2017

3.3 AIRBLAST MONITORING

Approved airblast levels for KCGM's Fimiston Operations are stipulated in Condition 4 of the 2016 Fimiston Noise Approval. During the reporting period, airblast levels received at each blast monitoring station (Figure 8) were recorded in accordance with Condition 8(3) of the 2016 Fimiston Noise Approval.



Figure 8: Fimiston Open Pit Blast Monitoring Sites

Results of the recorded airblast levels are provided in the Quarterly Noise and Blast Monitoring Report submitted to the OEPA. During the reporting period, the measured airblast levels at all locations complied with the approved noise levels. A summary of the measured airblast levels are shown in Figure 9.

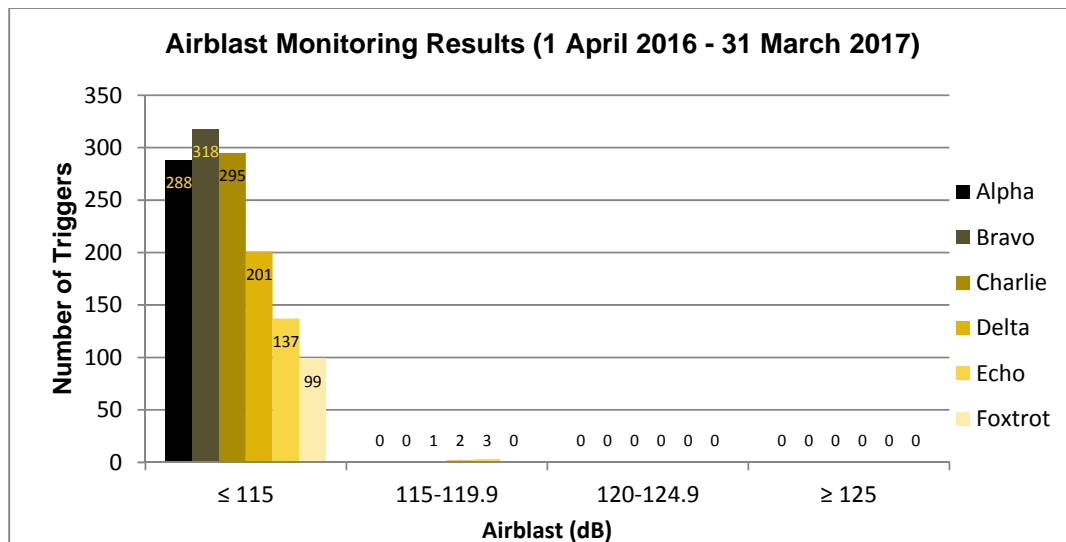


Figure 9: Summary of Fimiston Airblast Monitoring Results

4 NOISE MANAGEMENT PLAN IMPLEMENTATION SUMMARY

KCGM's NVMMP has been developed and implemented by KCGM in accordance with conditions set by the Minister for Environment since the early 1990's. The NVMMP is implemented to fulfil the requirements of Ministerial Statement No.782 *Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning*, and the 2016 Fimiston Noise Approval.

The objective of the NVMMP is to manage noise emissions from the Fimiston Operations to minimise potential impacts to the residents of the City of Kalgoorlie-Boulder. Through implementation of the NVMMP, KCGM commits to undertake all reasonable, practicable and safe measures to meet the relevant noise and vibration standards.

In accordance with Condition 9 of the 2016 Fimiston Noise Approval the NVMMP was updated during the reporting period following gazettal of the Environmental Protection (Fimiston Gold Mine Noise Emissions) Approval 2016 in March 2016. The revised the NVMMP (June 2016) was submitted to the DER and the OEPA on 22 June 2016, and was approved by the DER on 19 September 2016 and the OEPA on 1 November 2016.

The NVMMP covers the following aspects:

- Management plan Summary
- Overview of the Fimiston Operations and History of Fimiston Noise Approvals
- Noise Modelling and Verification
- Management Approach (environmental noise, blast vibration and airblast)
- Environmental Criteria and Monitoring Programmes
- Complaint Management
- Reporting Provisions
- Adaptive Management and Review
- Stakeholder Consultation

KCGM believes the NVMMP provides best practices and procedures to enable the Fimiston Operations to continue in a reasonable and practicable manner, while providing an acceptable noise environment for the residents of the City of Kalgoorlie-Boulder.

A summary of the progress of the implementation of the NVMMP is provided in Table 1, which lists the key activities undertaken with regards to KCGM's Management Approaches as outlined in the NVMMP.

Table 1: Summary of NVMMMP Implementation

MANAGEMENT APPROACH		PROGRESS OF IMPLEMENTATION
Mining Activities	Environmental Noise Bund	<ul style="list-style-type: none"> A key noise management feature at KCGM has been the establishment of the Environmental Noise Bund (ENB). Major changes to the pit design take into consideration the location of the ENB and potential noise impacts on the City of Kalgoorlie-Boulder. Noise modelling was undertaken during the reporting period with regards to a proposed modification to the Fimiston Open Pit which would require modification to a section of the existing ENB. The noise assessment showed that mining activities associated with the proposed modification would comply with the 2016 Fimiston Noise Approval. This project is in preliminary stages and regulatory approvals are pending. No modifications of the ENB were undertaken during the reporting period.
	Surface Activities	<ul style="list-style-type: none"> During the reporting period, waste rock dumping associated with the Southern Waste Rock Dump was undertaken during daytime only due to the proximity of dumping activities to nearby industrial/residential premises. Property owners were notified of the planned mining activities via letter drop prior to commencement. No issues or complaints were received in relation to this surface activity during the reporting period. Other surface activities (e.g. rock breaking) continue to be restricted to daytime only.
	Reversing Alarms	<ul style="list-style-type: none"> Broadband reversing alarms continue to be utilised on select mining equipment permanently located onsite. KCGM will continue to research the feasibility of mechanisms other than audible signals for use as reversing alarms on other equipment used at the Fimiston Operations.
	Mt Charlotte Waste Rock Conveyor	<ul style="list-style-type: none"> KCGM continues to manage noise emissions from the Mt Charlotte Waste Rock Conveyor via routine inspections and maintenance of the conveyor belt, the rollers and related infrastructure. One complaint was received in relation to this surface activity during the reporting period.
Haul Truck Noise	UWA Research Project	<ul style="list-style-type: none"> KCGM has implemented a Noise Amelioration Programme by means of co-funding a Research Project entitled “<i>Integrated Passive and Active Control of Humming noise from KCGM’s Haul Trucks</i>” put forward by the University of Western Australia (UWA). The project is aimed at achieving total sound power attenuation through development of a prototype engine enclosure as well as examining ways to reduce noise associated with the haul truck muffler.

		<ul style="list-style-type: none"> • During reporting period, UWA have been developing and testing a redesign of the exhaust muffler. Laboratory test results have indicated improved noise distribution (broadband) and reduced tonality. A second muffler has been purchased to undertake the redesign works so that subsequent field testing can be undertaken. • On 24 November 2016, Professor Jie Pan and Hongmei Sun visited the Fimiston Westrac workshop in order to obtain accurate measurements of the engine enclosure and to consult with onsite fitters to ensure that their proposed engine enclosure designs would be acceptable. A presentation outlining the work the UWA team have undertaken regarding the passive and active noise control system for the haul truck engine enclosure was also presented to key stakeholders. This work is ongoing with further calculations and development of a prototype enclosure currently underway, with final field testing to commence in 2017. • KCGM will continue to support this noise amelioration project for the duration of the ARC linkage grant and its associated agreements in order to eliminate tonality, modulation and impulsiveness in noise emissions from mining operations.
Resource Definition Drilling		<ul style="list-style-type: none"> • KCGM's resource definition drilling programmes often occur in close proximity to the City of Kalgoorlie-Boulder. A desktop noise assessment is undertaken for each drilling programme prior to commencement to verify compliance with the <i>Environmental Protection (Noise) Regulations 1997</i>. • During the reporting period, several desktop assessments were undertaken for proposed drilling programmes on the western side of the ENB which were in close proximity to industrial premises in Boulder. The assessments indicated that the proposed 24/7 drilling operations would comply with the <i>Environmental Protection (Noise) Regulations 1997</i>. • Sea containers were utilised to manage noise emissions at some drill hole locations. • Property owners were notified of the planned drilling activities via letter drop prior to commencement. • No issues or complaints were received in relation to KCGM's resource definition drilling activities during the reporting period.
Blast Vibration and Airblast	Blasting Times	<ul style="list-style-type: none"> • KCGM only detonated explosives on the premises between the hours of 0700 hours and 1800 hours. • All reasonable effort was taken to avoid blasting on Sundays. • No issues or complaints were received in relation to blasting times during the reporting period.
	Blast Design and Modelling	<ul style="list-style-type: none"> • Each blast is carefully designed to meet internal design criteria and takes into account external factors which may potentially increase the vibration and/or airblast levels. • No issues or complaints were received in relation to airblast as a result of blasting activities during the reporting period.

5 PUBLIC COMPLAINTS

KCGM's Public Interaction Line (PIL) was established in 1993 and is available 24 hours (08 9022 1100) for anyone to contact KCGM for a wide range of issues including emergencies, complaints, inquiries and feedback. KCGM has implemented a Complaints and Grievance Management Procedure to manage the actions taken to resolve complaints. Complaint Management is outlined in the NVMMP.

During the reporting period one noise complaint was received regarding noise associated with the Mt Charlotte Waste Rock Conveyor. Figure 10 below shows a summary of noise complaints received by KCGM since 2009 (per calendar year) with respect to activities managed under the NVMMP.

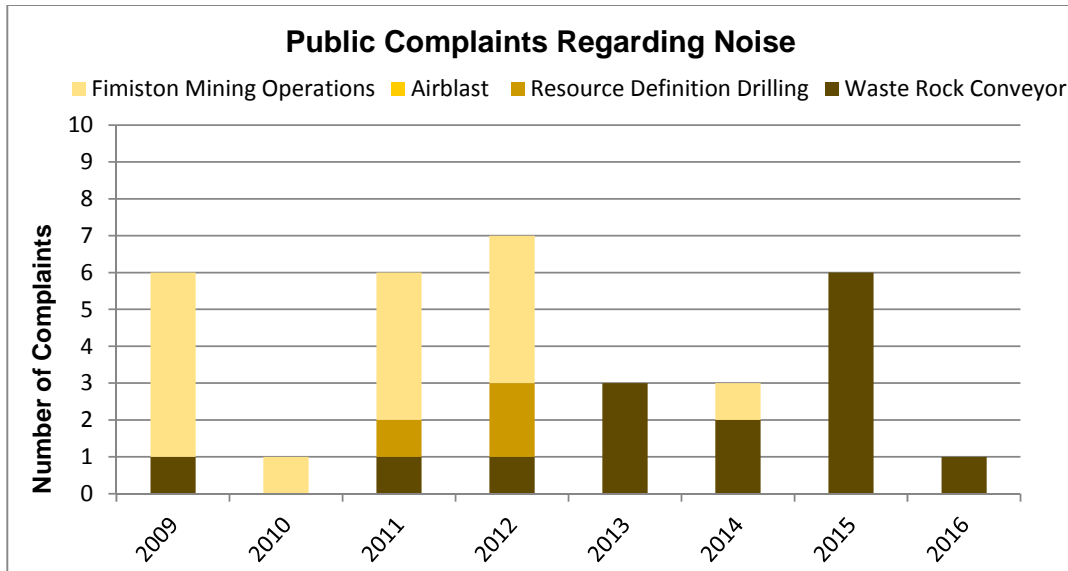


Figure 10: Summary of Noise Complaints since 2009