

Appendix 8

Acoustic Assessment

(Total No. of pages including blank pages = 10)

(Note: A colour version of this Appendix is available on the Project CD)

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11 May 2015

Ref: 09522/5486

Mr Mitchell Bland

R.W. Corkery & Co. Pty. Limited

62 Hill St

Orange NSW 2800

RE: MOD 3 ACOUSTIC ASSESSMENT – DARGUES GOLD MINE

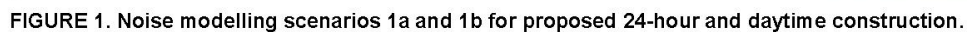
This letter report presents the results of noise modelling conducted to determine the noise impact implications of minor differences between the site layout as modelled by Spectrum Acoustics in April 2014 for Modification 2, and the proposed revised layout. This letter has been prepared to accompany an application to modify Project Approval MP 10_0054 (MOD 3). The proposed layout is fully described in the *Environmental Assessment* prepared to support that application.

The proposed modifications include the following

- Storage of waste rock in the proposed Eastern Waste Rock Emplacement.
- Construction of a haul road directly from the box cut to the Tailings Storage Facility and Eastern Waste Rock Emplacement.
- Processing of gold concentrate on site to produce gold bar through the use of a proposed carbon-in-leach processing plant, including the use of cyanide to leach the gold.
- Extension of the life of the Project and the amount of ore to be extracted.
- Construction of a range of infrastructure that would be ancillary to the above.
- A range of minor adjustments to the conditions of MP 10_0054 to further clarify the intent of the conditions.

NOISE MODELLING PROCEDURE

Noise scenario diagrams based on the existing site layout and proposed site establishment and operational noise sources were provided for computer modelling of noise emissions are shown in **Figures 1 and 2**. The revised daytime and 24-hour site establishment scenarios were modelled in point-calculation mode to give noise levels at representative residential receivers and the revised operation scenario was also modelled in point calculation mode to the same representative receivers. Modelling was based on the same Environmental Noise Model (ENM) as has been used by Spectrum Acoustics for all previous noise modelling for the Dargues Reef project. A full description of that methodology is provided in Dargues Reef Gold Project, Noise and Vibration Assessment (Spectrum Acoustics, 2010).





Dargues Gold Mine Noise Modelling – Mod 3

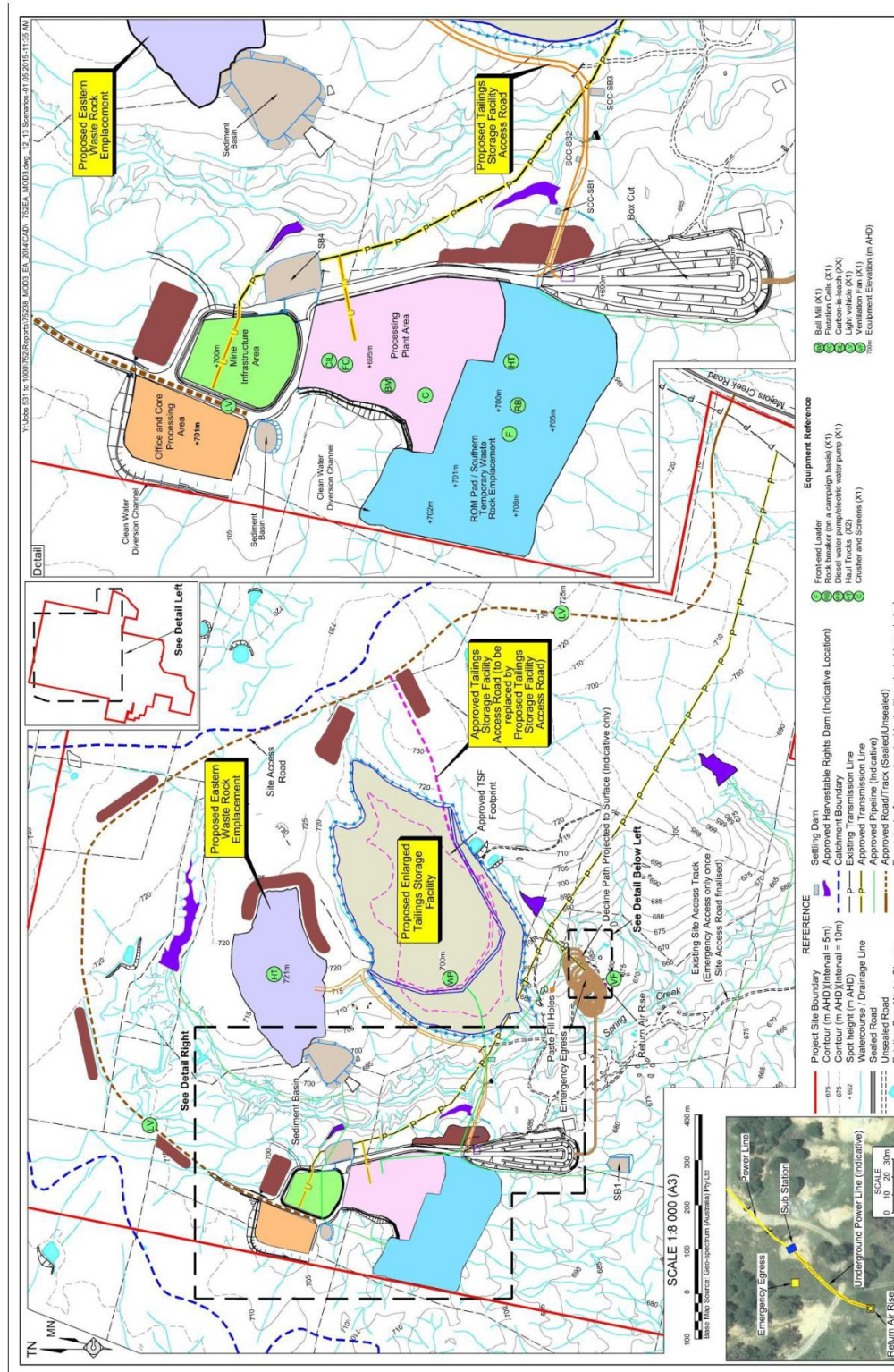


FIGURE 2. Noise modelling for proposed 24-hour operations.



Dargues Gold Mine Noise Modelling – Mod 3

As with our previous July 2013 and April 2014 modelling, a 4°C/100m temperature inversion was modelled as the worst case for the operational and 24-hour (night time) site establishment scenarios. This is in keeping with the noise modelling in the original 2010 EA and the discussion therein.

NOISE SOURCES

Noise sources and modelled sound power levels are shown in Table 1. Preliminary modelling for the 2010 EA noise assessment showed excessive noise levels at some receivers from the crushing and screening plant and some other sources, when modelled with no attenuation. These sources would require acoustic treatment as follows:

- Crushing and grinding plant – contain within shed engineered to achieve minimum 12 dB noise reduction (nominally $R_w + C_{tr} = 15$);
- Ventilation fan – to be placed at least 10m below ground level rather than at the surface; and
- ROM pad – waste rock noise bunds 5m high along the southern and western edges.

These noise controls have been included in all model results conducted for the project.

Table 1
Noise Source Sound Power Levels, L_w

Noise Source	$L_w, dB(A)$	
Construction noise sources	L_{A10}	
Building fabrication at surface facilities	106	
Front end loader (FEL)	112	
Dozer (D9)	114	
Excavator	114	
Topsoil scraper	114	
Haul truck	115	
Drill	113	
Operational noise sources	$L_{Aeq(15min)}$	L_{Amax}
Front end loader (CAT 950H)	107	114
Crushing plant ¹	109	112
Breaker (used 5 minutes per hour)	101	113
Ventilation fan ²	94	--
Haul truck	102	116
Flotation cell	105	105
Ball mill (rubber lined)	105	108
Carbon in Leach (CIL) plant (22 electric motors) ³	103	--
Water pump	98	98
Semi-trailer	98	103

¹ Enclosed in shed. Unattenuated sound power level is 122 dB(A).

² Located at least 10m below ground level.

³ Details of electric motors/pumps provided by DRA Australia.





Dargues Gold Mine Noise Modelling – Mod 3

The CIL plant included in the current assessment was not included in our original 2010 assessment for the project EA. **Figure 2** presents the location of the modelled plant. The total site sound power level including all sources in Table 1 is 113.7 dB(A) excluding the CIL plant and 114.1 dB(A) including the CIL plant.

NOISE MONITORING RESULTS

Noise monitoring conducted by SLR during site preparation and construction works from 2012 – 2013 generally recorded no exceedances of the noise criteria, with the exception of the 12-13 March 2012 survey in which several exceedances were recorded at Receivers R27, R29 and R108 (**Figure 3**). The identified sources were scraper(s) and/or diesel engines associated with earthworks being conducted during the daytime only.

It is not possible to determine the exact location of the scrapers during the attended measurements. For the purposes of modelling construction noise modelling in the EA noise assessment, it was assumed that a scraper was located at the tailings storage facility (see **Figure 1**) as a typical location. It can only be assumed that construction works during March 2012 were taking place in locations more exposed to the receiver locations at which exceedances were recorded. Since the monitoring was conducted during site establishment activities, it is not possible to utilise historical noise monitoring results for accuracy testing of noise modelling of future operational activities.

NOISE MODELLING RESULTS

Point calculation results for the modified night time site establishment scenario are shown in **Table 2** for receivers previously identified as the potentially worst affected. Results from the original (2010) and remodelled (July 2013 and April 2014) scenarios are included for completeness. Results for the daytime site establishment scenario are shown in **Table 3**.

Table 2
Predicted Night time site establishment Noise Levels dB(A), $L_{eq}(15min)$

Residence	Original (EA) 2010	MOD 1 July 2013	MOD 2 April 2014	MOD 3 May 2015	Criterion dB(A), $L_{eq}(15min)$
R15	29	29	29	29	35
R27	30	30	30	30	35
R29	21	21	21	21	35
R30	27	27	27	27	35
R31	35	35	35	35	35
R32	31	31	31	31	35
R33	30	30	30	30	35
R107	33	33	33	33	35
R108	34	34	34	34	35





Dargues Gold Mine Noise Modelling – Mod 3

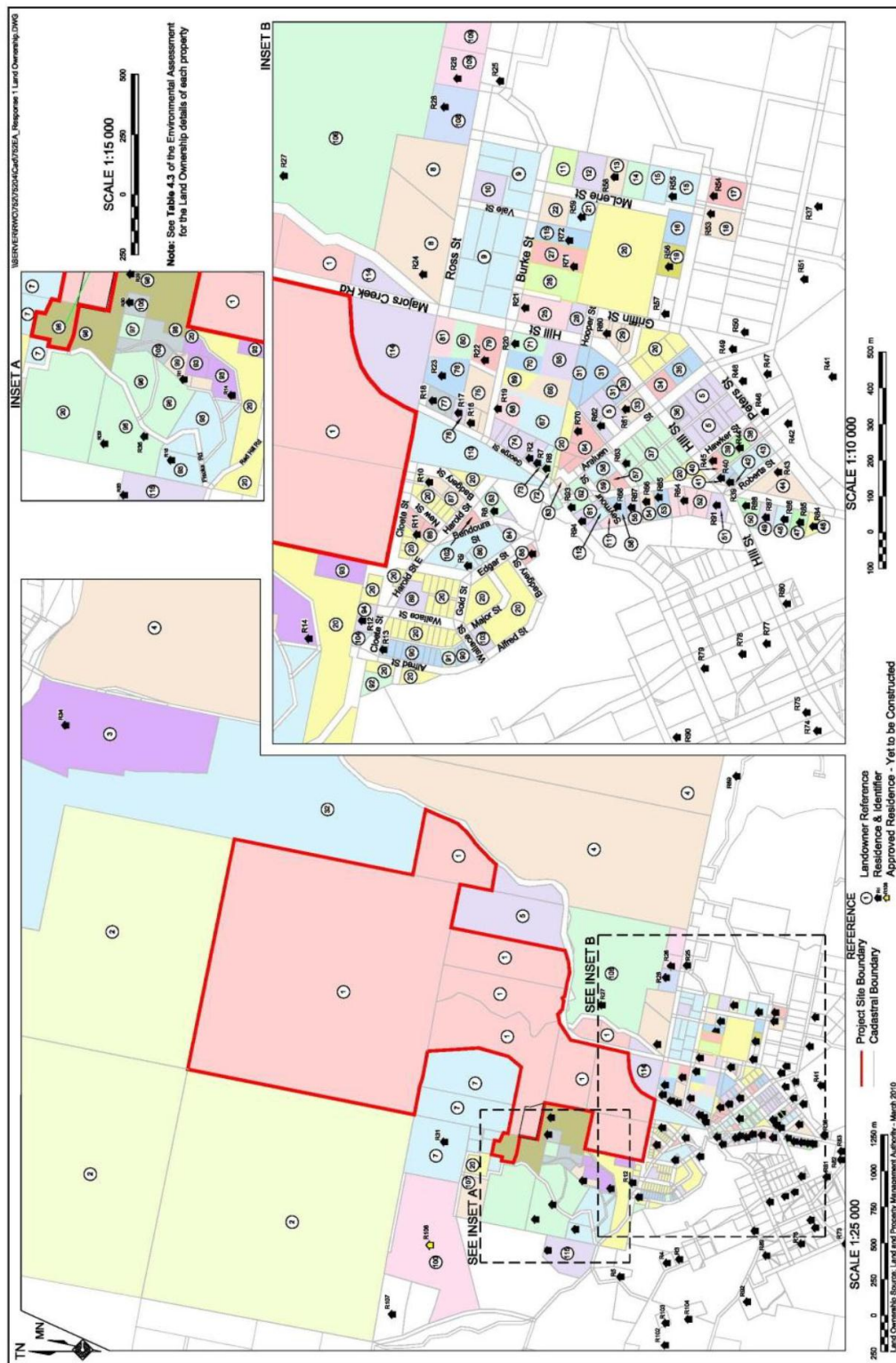


FIGURE 3. Residential receivers.



Table 3
Predicted Daytime site establishment Noise Levels dB(A), L_{eq}(15min)

Residence	Original (EA) 2010	MOD1 July 2013	MOD2 April 2014	MOD 3 May 2015	Criterion dB(A), L _{eq} (15min)
R15	32	32	32	32	35
R27	34	34	34	34	35
R29	26	26	26	26	35
R30	30	30	30	30	35
R31	35	35	35	35	35
R32	33	33	32	33	35
R33	32	32	32	34	35
R107	32	32	31	33	35
R108	32	32	32	33	35

The noise levels in Tables 2 and 3 are virtually identical to previous results, differing by no greater than 1dB, and are compliant with the noise criterion. Predicted operational noise levels are summarised in **Table 4**.

Table 4
Predicted Operational Noise Levels dB(A), L_{eq}(15min)

Residence	Original (EA) 2010	MOD1 July 2013	MOD2 April 2014	MOD 3 May 2015	Criterion dB(A), L _{eq} (15min)
R15	33	32	32	32	35
R27	31	31	31	31	35
R29	23	25	25	25	35
R30	25	26	26	26	35
R31	31	31	31	32	35
R32	31	28	28	28	35
R33	30	29	29	29	35
R107	33	30	30	30	35
R108	31	33	33	33	35

The noise levels in Table 4 are virtually identical to previous results, differing by only 1 dB at Receiver 31, and are compliant with the noise criterion.

In summary, noise modelling of the revised site establishment and operational noise scenarios has found negligible changes in predicted noise levels compared with the original scenarios modelled in the EA and for the July 2013 and April 2014 modifications, and that noise levels under the revised scenarios remain below the noise criterion at all receivers.

Accordingly, we advise that a full Noise and Vibration Impact Assessment (NVIA) is not required and this report may be included with EA documentation for the proposal.





Dargues Gold Mine Noise Modelling – Mod 3

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

A handwritten signature in black ink, appearing to be "N. Pennington", written over a faint, stylized wave graphic.

Neil Pennington

B.Sc., B.Math. (Hons), MAAS, MASA
Acoustical Consultant

