

Licensee	Perilya Broken Hill Limited (PBHL)
Address	Argent St, Broken Hill, NSW 2880
Environmental Protection Licence	2683 (North Mine and Potosi Operations)
Link to Environmental Protection Licence	http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=31559&SYSUID=1&LICID=2683
Reporting period	December 2017
Date report published on website	

Environmental Protection Licence 2683

Dust Monitoring

Perilya Broken Hill Limited (PBHL) has eleven (11) dust monitoring points located around the North Mine and Potosi Operation (Figure 1). Licence point 20 is located on a private residence on Hall Street. A summary of Environmental Protection Licence (EPL) 2683 conditions is shown in Table 1.

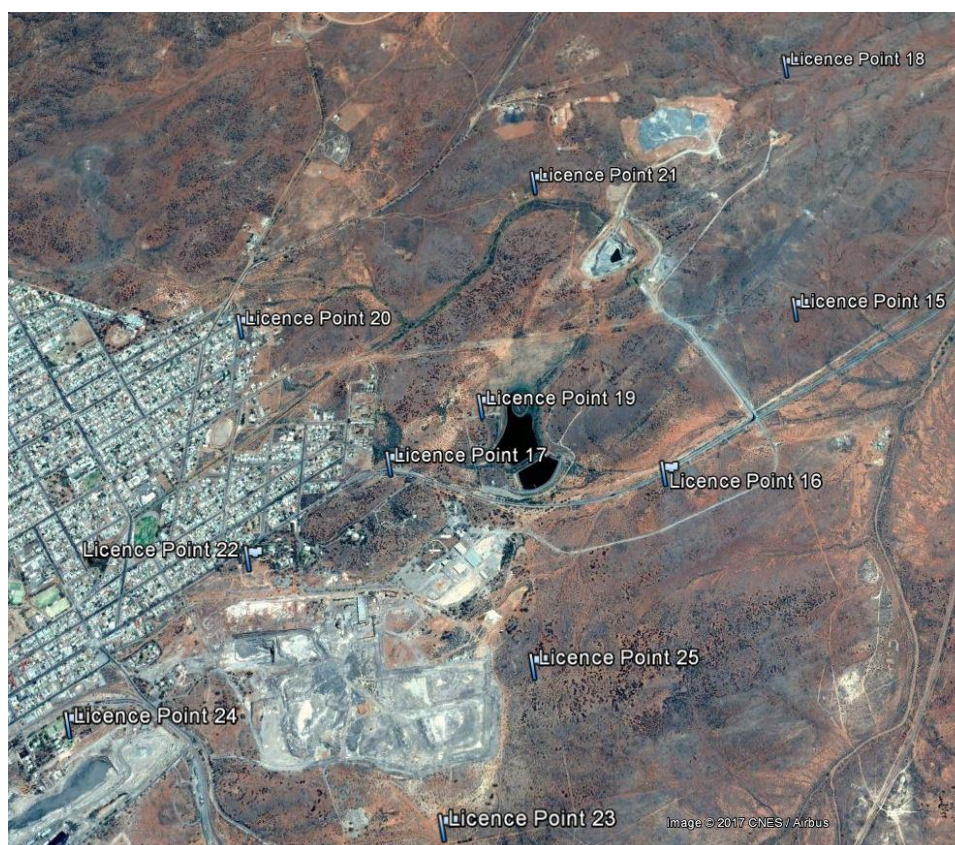


Figure 1. Location of the dust monitoring points associated with EPL 2683.

Table 1. Summary of EPL 2683 conditions for dust monitoring points.

Dust Monitoring Points: EPL 2683 Conditions	
Condition	Licence Requirement
Licence Point	15,16,17,18,19,20,21,22,23,24,25
Pollutant/s	Particulates -deposited matter
	Total Lead
Unit of measure	Grams per square meter per month (g/m ² /month)
Sampling Method	AM-19
Monitoring frequency	Every 30 days ± two (2) days
Data Reporting	Monthly

Dust Monitoring Point Results

December 2017 particulates – deposited matter and total lead results are presented in Table 2. Results of laboratory analyses were received by Perilya on 29/12/2017.

Table 2. December 2017 dust monitoring point results.

Licence Point	Particulates – deposited matter (g/m ² /month)	Total Lead (g/m ² /month)
15	1.3	0.063
16	3.1	0.033
17	0.4	0.110
18	0.5	0.033
19	2.3	0.110
20	2.3	0.029
21	2.2	0.040
22	4.2	0.067
23	2.5	0.110
24	4.5	0.340
25	1.8	0.066

Ambient Air Monitoring

EPL 2683 requires two (2) ambient air monitoring sites, one located at the Potosi Operations and the other at the North Mine (Figure 2). PBHL currently uses high volume air samplers (HVAS) for the ambient air monitoring program. The HVAS operate (sample) for 24 hours every six (6) days.



Figure 2. Locations of the ambient air monitoring points associated with EPL 2683.

Table 3 provides a summary of EPL 2683 conditions.

Table 3. Summary of EPL 2683 conditions for ambient air monitoring points.

Ambient Air Monitoring Points: EPL 2683 Conditions	
Condition	Licence Requirement
Licence Point	26 and 27
Pollutant/s	Total Suspended Particles
	Total Lead
Unit of measure	Micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
Sampling Method	AS 3580.9.15:2014
	AS/NZS 3580.9.3:2015
Monitoring frequency	Every six days for 24 hours
Data Reporting	Every 6 days

HVAS Results

Total suspended particulate (TSP) and total lead results are presented in Table 4. Monthly averages for TSP and total lead for the previous 12 months are shown in Figure 3 and Figure 4 respectively. The final set of results for December's ambient air monitoring, were received on 23-01-2018.

Table 4. December 2017 HVAS total lead and TSP results.

Licence Point	Pollutant	No. times measured in the month	Min. Value	Mean Value	Median Value	Max. Value
26	TSP ($\mu\text{g}/\text{m}^3$)	6	20.0	99.3	67.5	288.0
	Total Lead ($\mu\text{g}/\text{m}^3$)	6	0.080	0.282	0.260	0.500
27	TSP ($\mu\text{g}/\text{m}^3$)	6	31.00	99.8	55.000	250.0
	Total Lead ($\mu\text{g}/\text{m}^3$)	6	0.091	0.462	0.315	1.400

Results above industry standards reflect seasonal climatic conditions and offsite factors. Recent construction and land clearing activities in the vicinity of the HVAS have also affected results.

Annual monthly average TSP (previous 12 months)

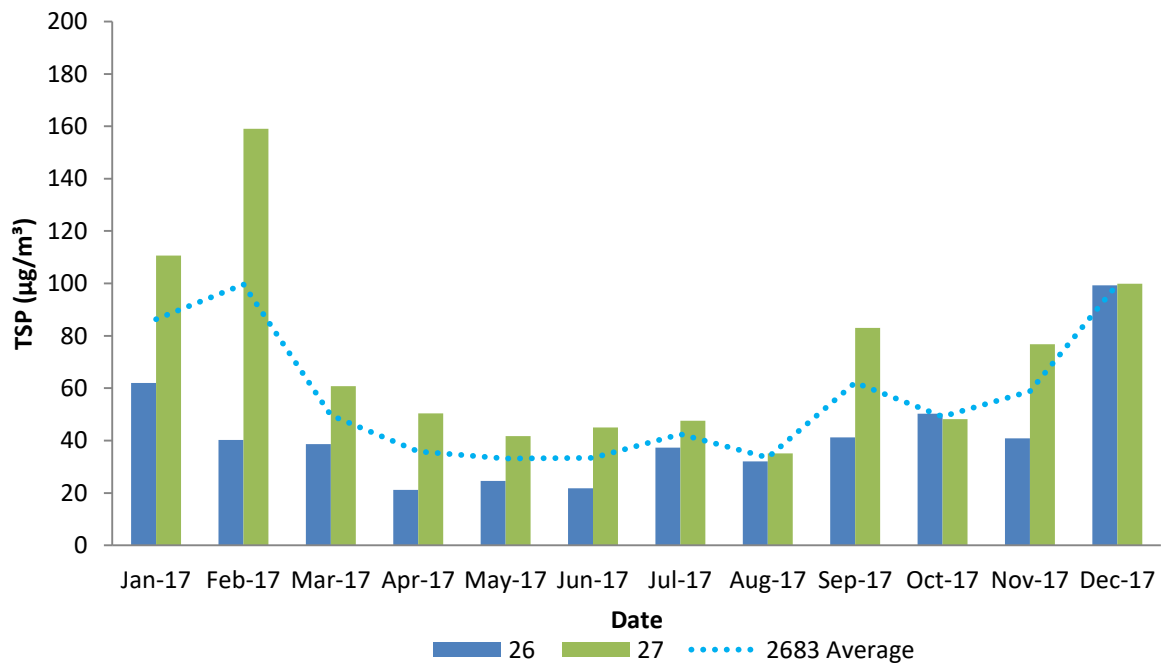


Figure 3. Average TSP results for the 12 months up to and including December 2017.

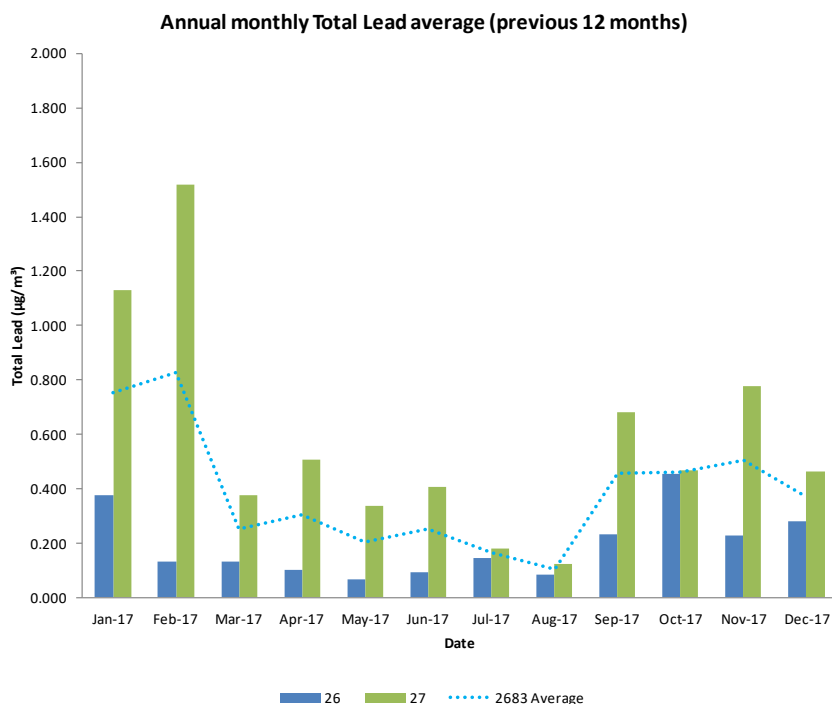


Figure 4. Average total lead results for the 12 months up to and including December 2017.

Noise Monitoring

North Mine is currently operating under an approved interim exploration MOP, no noise monitoring is conducted at this site.

PBHL’s Potosi Operation is currently being actively mined and noise monitoring is conducted at this site. A summary of the EPL requirements for noise monitoring is shown in Table 5.

Table 5. A summary of the EPL 2683 conditions for noise monitoring.

Noise EPL 2683 Conditions	
Condition	Licence Requirement
Pollutant	Noise
Unit of measure	Decibels (dB)
Limits	
Monday to Friday - 0700 hours (h) to 1800 h	An *Leq (15 minute) of 40 decibels (A weighted)
Monday to Friday - 1800 h to 2200 h	An Leq (15 minute) of 39 decibels (A weighted)
All other times	An Leq (15 minute) of 35 decibels (A weighted)

*Leq is the equivalent continuous noise level – the level equivalent to the energy average of noise levels emitted by the premises over the stated measurement period (Source: Environmental Protection Licence 2683).

The location of Potosi noise monitoring is shown in Figure 5.



Figure 5. The location of the noise monitoring associated with EPL 2683.

Noise results

Rather than undertaking noise monitoring on a monthly or quarterly basis, Perilya has opted to conduct noise monitoring for its Potosi Operations on a more frequent basis. This monitoring consists of one (1) 15-minute interval each week conducted between 0730 hours and 1900 hours. Actual time that the monitoring commences is selected at random within the designated hours of the monitoring time period.

During the monitoring interval, noise identified by the operator as coming from the Potosi Operation is noted. Results of noise monitoring for the month of December 2017 are provided in Table 6.

Table 6. A summary of the noise monitoring results for the month of December 2017.

Date Noise Monitoring Undertaken	Time (24 hour)	LAeq (15 min) (dB)	Non-mine noise		Potosi Operations (mine contribution)		
			Observed sources*	Duration (min)	Observed Mine Source	Duration (min)	Adj. LAeq (dB)
5/12/2017	10:30-10:45	44.7	Various	15	Nil	nil	N/A
11/12/2017	11:00-11:15	38.6	Various	15	Rockbreaker	3.00	N/A
20/12/2017	14:15-14:30	54.2	Various	15	Nil	nil	N/A
28/12/2017	10:30-10:45	38.9	Various	15	Nil	nil	N/A

* Typically, 'various' includes commonly occurring non-mine noise such as wind interference, birds, overflying aircraft, vehicles and motorbikes.

Blasting

North Mine is currently operating under an approved interim exploration MOP, blast vibration and overpressure monitoring are conducted at this site. The North Mine blast monitors used to undertake this monitoring are located on residential properties adjacent to the North Mine. Location of these monitors are shown in Figure 6 and labeled as 'North

56' and 'Junction'. Potosi Operations currently are under active mining, overpressure is monitored at this site. The Potosi blast monitor used to undertake this monitoring is located on site and adjacent to the Potosi Pit. Location of this monitor is shown in Figure 6 and labeled as 'Potosi' in this figure.

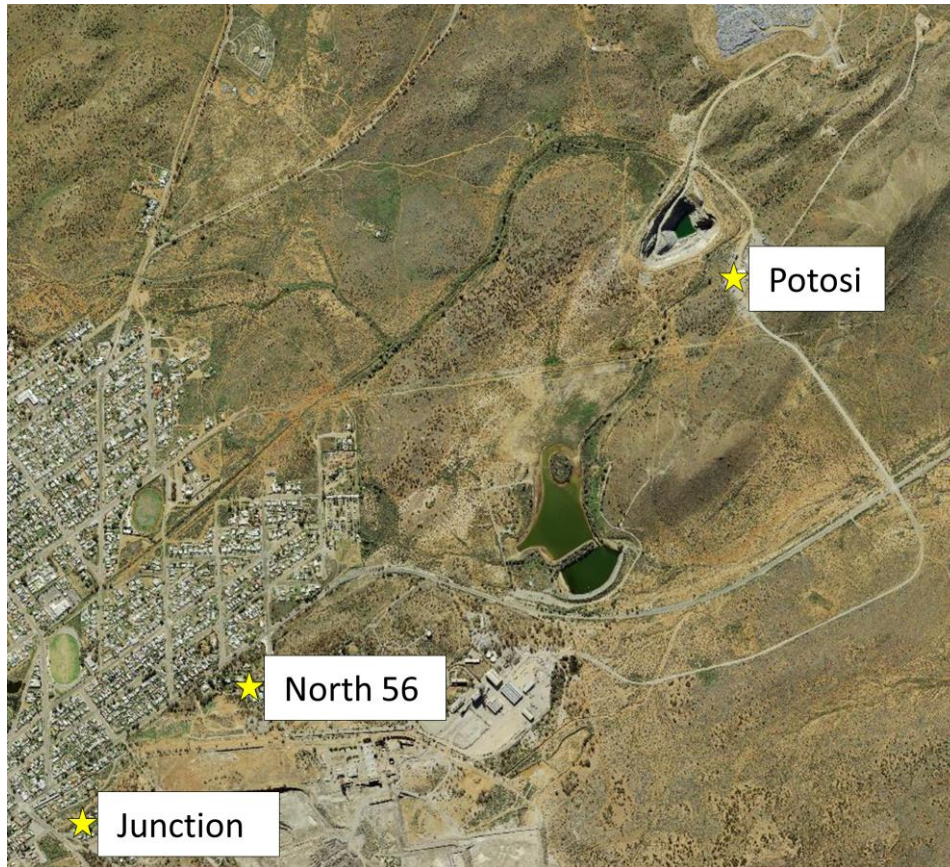


Figure 6. Location of the blast monitors associated with EPL 2683.

A summary of License conditions for blasting is provided in Table 7.

Table 7. Summary of EPL 2683 conditions for blasting.

Blasting EPL 2683 Conditions	
Condition	Licence Requirement
Licence Points	56 North Mine, 48 Junction Circle (North Mine is in care and maintenance), Potosi
Pollutant/s	Ground Vibration
	Overpressure
Unit of measure	Millimetres per second (mm/s), Decibels (dB)
Sampling method	AS 2187.2-2006
Monitoring frequency	All blasts
Data Reporting	All blasts
Date results received	Immediately following each blast
Limits	
Ground Vibration – 95% of blasts	Five (5) millimetres per second (mm/s)
Ground Vibration – Upper limit	Ten (10) millimetres per second (mm/s)
Overpressure – 95% of blasts (not including Potosi) between 0700 h -1900 h	115 decibels (dB)
Overpressure – upper limit (not including Potosi) between 0700 h -1900 h	120 decibels (dB)
Overpressure – upper limit (not including Potosi) between 1900 h -0700 h	95 decibels (dB)
Overpressure - 95% of blasts (Potosi) between 0700 h – 1900 h	130 decibels (dB)
Overpressure – upper limit (Potosi) between 0700 h – 1900 h	135 decibels (dB)
Overpressure – upper limit (Potosi) between 1900 h – 0700 h	110 decibels (dB)

Blasting Results

A total of 23 blasts were conducted at Potosi and a total of 46 blasts were conducted at North Mine during December 2017 (Table 8).

Table 8. December 2017 blast vibration for EPL 2683.

Licence Point	Parameter	No. times measured in the month	Minimum Value	Mean Value	Median Value	Maximum Value
Potosi	Overpressure	23	80.1	90.1	90.7	107.3
North 56	Overpressure	46	48	80	77	104
Junction Circle	Overpressure	43	73	84	81	102
North 56	Ground Vibration (mm/s)	46	0.060	0.160	0.140	0.430
Junction Circle	Ground Vibration (mm/s)	43	0.080	0.204	0.170	0.600

Perilya has advised previously that blast overpressure data from all of its operations routinely exceeds to 90dB limits relevant to EPA licenses and the NSW Industrial Noise Policy, and that this is not a result of overpressure events from blasting.

During daylight hours across the entire year, wind speeds in the Broken Hill area are in excess of 3m/sec. This threshold is referenced in all Perilya EPA licenses and in the NSW Industrial Noise Policy as being contra-indicated to the determination of accurate ambient noise pressure levels.

It is also significant that over-pressure is not a useful indicator of impacts on sensitive receptors from underground mining activities (as compared to open pit mining), as any pressure gradients are rapidly attenuated in the underground environment.

Complaints

No complaints were received under EPL 2683 during December 2017.