



Rasp Mine
Monthly Environmental Monitoring Report
March 2023



INTRODUCTION

Broken Hill Operations Pty Ltd (BHOP) [a wholly owned subsidiary of CBH Resources Limited (CBH)] owns and operates the Rasp Mine (the Mine), which is located centrally within the City of Broken Hill on Consolidated Mine Lease 7 (CML7).

Mining has been undertaken within CML7 since 1885. The existing operations at the Rasp Mine include underground mining operations, a processing plant producing zinc and lead concentrates and a rail siding for concentrate dispatch. These operations are undertaken in accordance with Project Approval 07_0018 granted 31 January 2011, under Part3A of the Environmental Planning and Assessment Act 1979 (EP&A Act).

As the holder of an Environmental Protection Licence, 12559, BHOP is required, under Section 66(6) of the NSW *Protection of the Environment Operations Act 1997*, to publish pollution monitoring data. In addition BHOP is required to publish data in accordance with its Project Approval 07_0018 Schedule 4 Condition 9. These documents can be found on the Rasp Mine web site.

TABLE OF CONTENTS

1	AIR QUALITY	3
1.1	HIGH VOLUME AIR SAMPLERS	3
1.2	TAPERED ELEMENT OSCILLATING MICROBALANCE SAMPLING (TEOM).....	9
1.3	DUST DEPOSITION SAMPLING	13
1.4	VENTILATION OUTLETS AND BAG HOUSE MONITORING	15
2	NOISE.....	16
2.1	BLASTING (VIBRATION AND OVERPRESSURE)	16
2.2	NOISE	17
3	WATER	18
3.1	GROUNDWATER.....	18
3.2	SURFACE WATER SAMPLE RECORD	18
4	WEATHER DATA	20
5	DATA LOG	22
6	CORRECTION LOG.....	22



1 Air Quality

The following pollutants as listed in the Project Approval (DA 07_0018 MOD6 March 2022) are required to be monitored in EPL 12559:

Long Term Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Total solid particles (TSP)	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	25 µg/m ³

Short Term Criterion for Particulate Matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Long Term Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Project Contribution	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

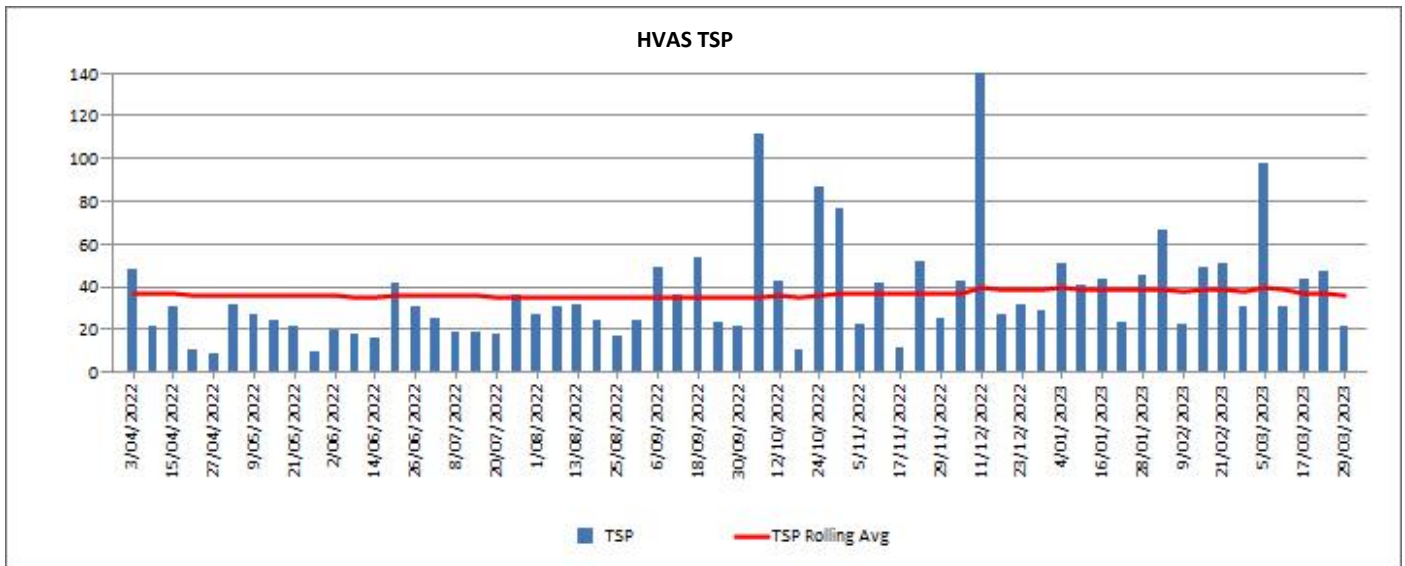
1.1 High Volume Air Samplers

There are four high volume air samplers used to measure ambient air quality at the Rasp Mine – HVAS (EPL10) and HVAS1 (EPL11) are located at the Silver Tank, central and to the south of the mine lease, and HVAS2 (EPL12) and HVAS3 (EPL57) are located adjacent to and north of Blackwood Pit. A map indicating these locations can be found on the Rasp Mine web site. HVAS and HVAS3 sample for total suspended particulates (TSP) and lead dust, and HVAS1 and HVAS2 sample for particulate matter less than 10 microns (PM₁₀) and lead dust.

HVAS (EPL10) - Silver Tank (On Site) Results for March 2023

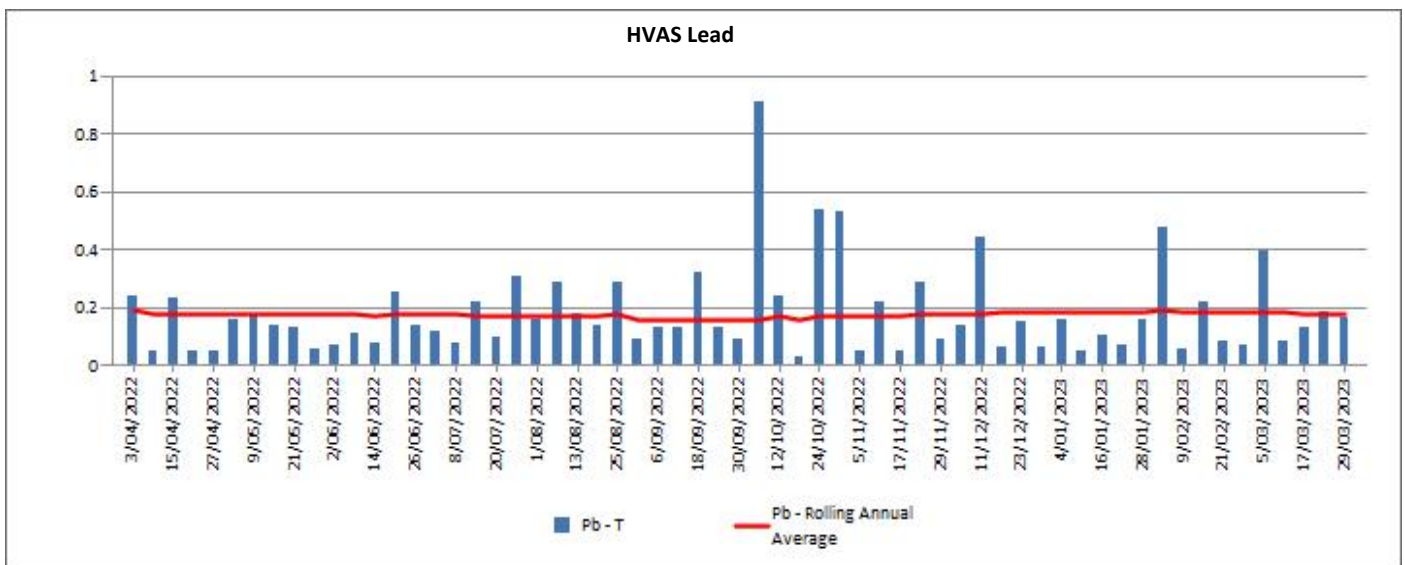
DATE	TSP (µg/m ³)	Lead (µg/m ³)
05-March-23	97.3	0.40
11-March-23	30.5	0.09
17-March-23	43.6	0.13
23-March-23	47.1	0.19
29-March-23	21.2	0.17

HVAS (EPL10) is located on the southern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.



TSP dust results at HVAS for the month of March were higher than previous months. The highest TSP result for March was $97.3 \mu\text{g}/\text{m}^3$ on 5 March when winds were predominantly from the NW, it is likely that dust generated on this day was a result of MOD6 project works in Little Kintore Pit. Water carts apply water to site roads daily and work areas as required, and dust suppressant is applied to free areas and unsealed roads. The annual rolling average for TSP at this location is $36.1 \mu\text{g}/\text{m}^3$ at the end of March, below the average at the beginning of April 2022 which was $37.05 \mu\text{g}/\text{m}^3$.

The annual rolling average for TSP is determined using data with extreme dust events included.



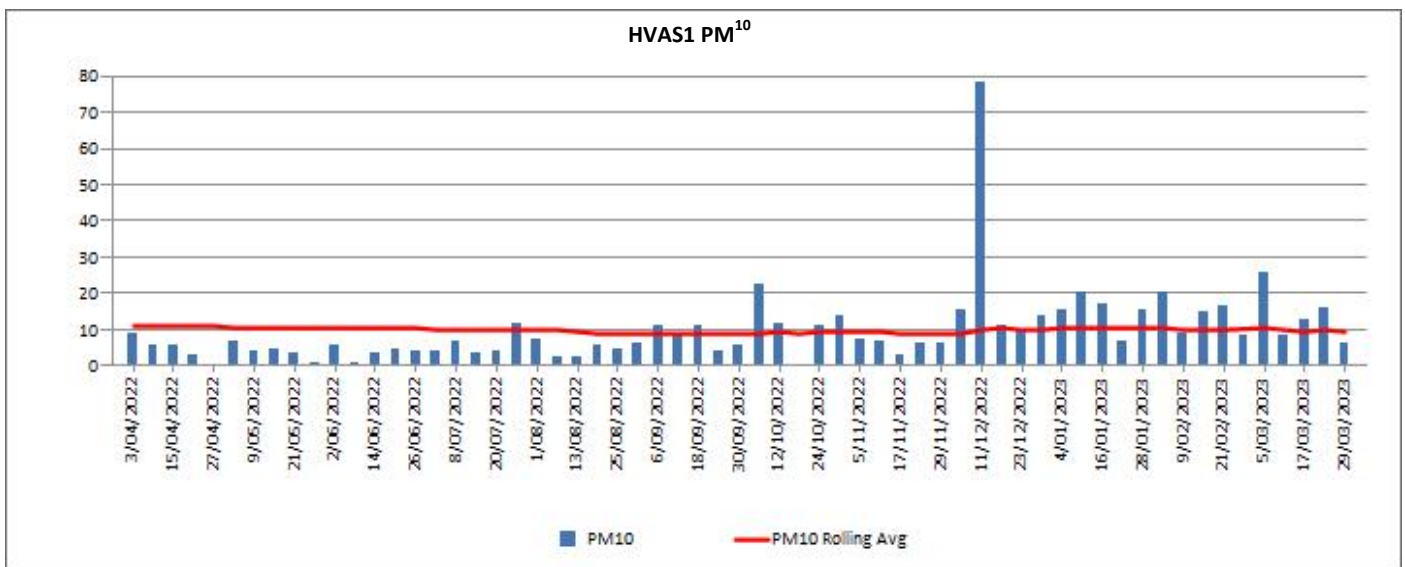
TSP Lead dust results at HVAS for the month of March were consistent with results seen in previous months. The highest TSP Lead level for March was $0.40 \mu\text{g}/\text{m}^3$ on 5 March when winds were predominately from the NW. It is likely that the TSP Lead sampled on 5 March has been generated as a result of MOD6 project works in Little Kintore Pit. Water carts apply water to site roads daily and work areas as required, and dust suppressant is applied to free areas and unsealed roads. The rolling annual average for TSP Lead in March 2023 was $0.18 \mu\text{g}/\text{m}^3$ lower than the rolling annual average of $0.19 \mu\text{g}/\text{m}^3$ for TSP Lead in April 2022.



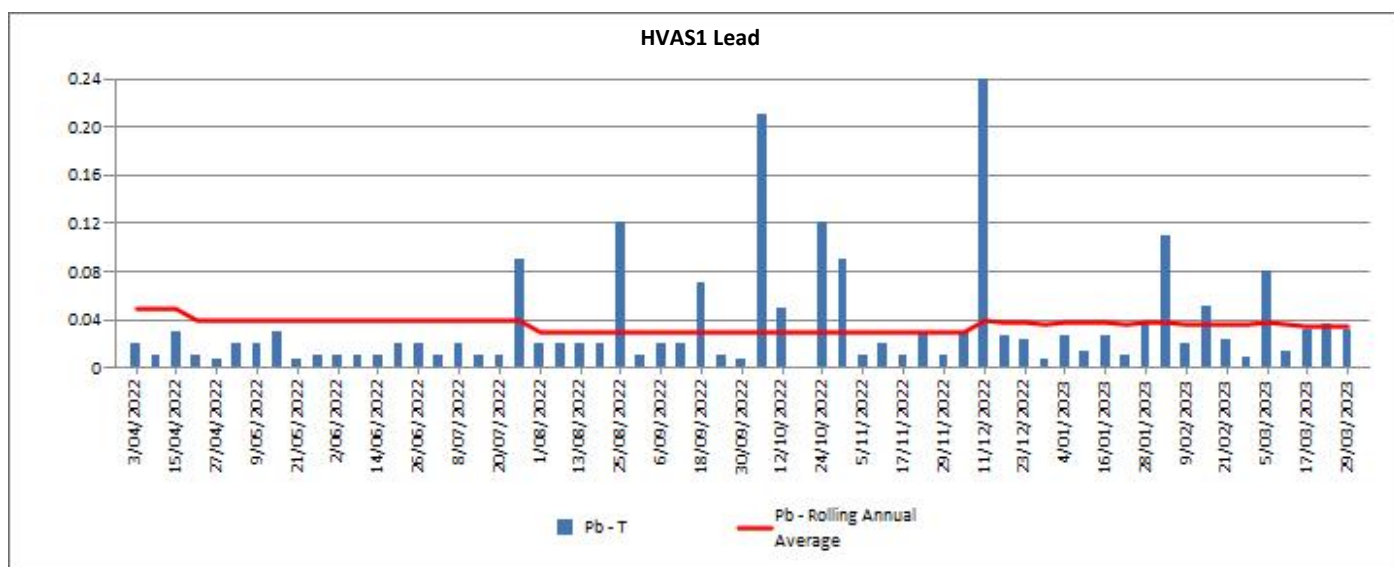
HVAS1 (EPL11) - Silver Tank (On Site) Results for March 2023

DATE	PM ₁₀ (µg/m ³)	PM ₁₀ Lead (µg/m ³)
05-March-23	25.5	0.08
11-March-23	8.5	0.01
17-March-23	12.5	0.03
23-March-23	16.1	0.04
29-March-23	6.4	0.03

HVAS1 (EPL11) is located on the southern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.



PM₁₀ dust results at HVAS1 for month of March were consistent with previous months. The highest PM₁₀ dust level for March was 25.5 µg/m³ on 5 March when winds were predominantly from the NW, suggesting dust has been generated by MOD6 project activities in Little Kintore Pit. Water carts apply water to site roads daily and work areas as needed, and dust suppressant is applied to free areas and unsealed roads. The annual rolling average for PM₁₀ dust at this location is 9.65 µg/m³ at the end of March 2023, lower than the annual rolling average at the beginning of April 2022 which was 11.2 µg/m³. External and extreme dust events are recorded in measurements.



PM₁₀ Lead dust results at HVAS1 in the month of March were consistent with previous months. The highest Lead PM₁₀ result for March was 0.08 µg/m³ on 5 March when winds were predominantly from the NW, suggesting contribution from MOD6 project works in Little Kintore Pit. Water carts apply water to site roads daily and work areas as needed, and dust suppressant is applied to free areas and unsealed roads. The rolling annual average for PM₁₀ Lead in March was 0.03 µg/m³, down from 0.05 µg/m³ in April 2022.

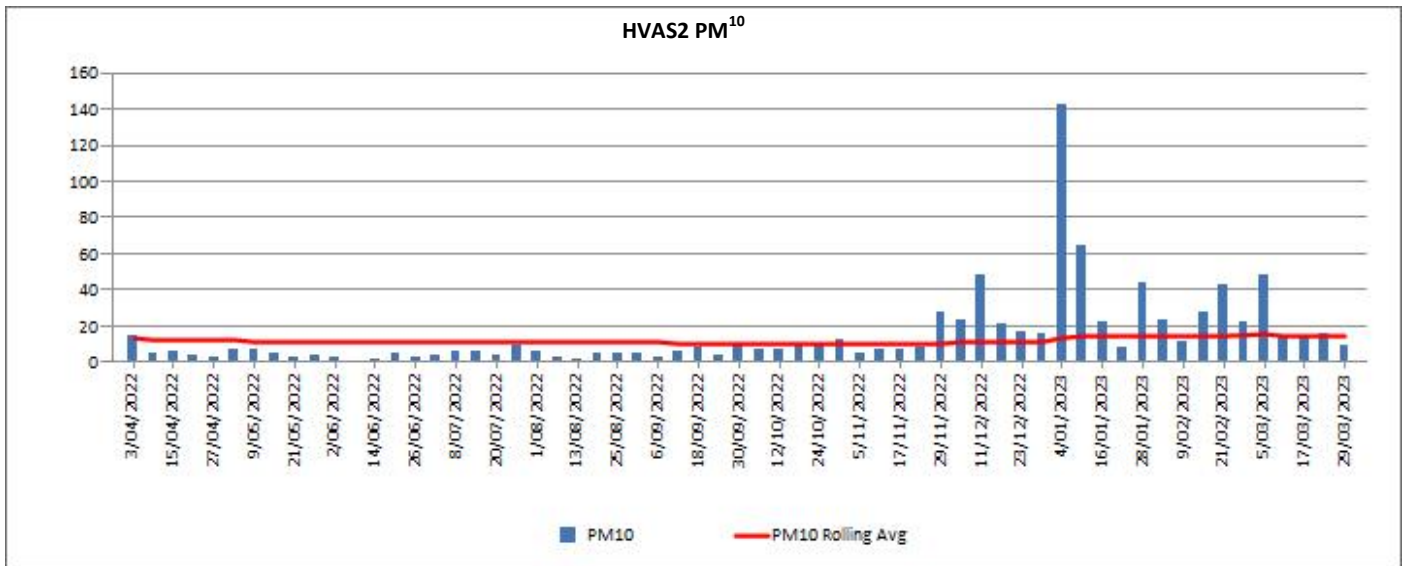
HVAS 2 (EPL12) - Blackwood Pit (On Site) Results for March 2023

DATE	PM ₁₀ (µg/m ³)	PM ₁₀ Lead (µg/m ³)
05-March-23	48.2	0.31
11-March-23	13.5	0.04
17-March-23	14.7	0.06
23-March-23	15.7	0.03
29-March-23	8.8	0.07

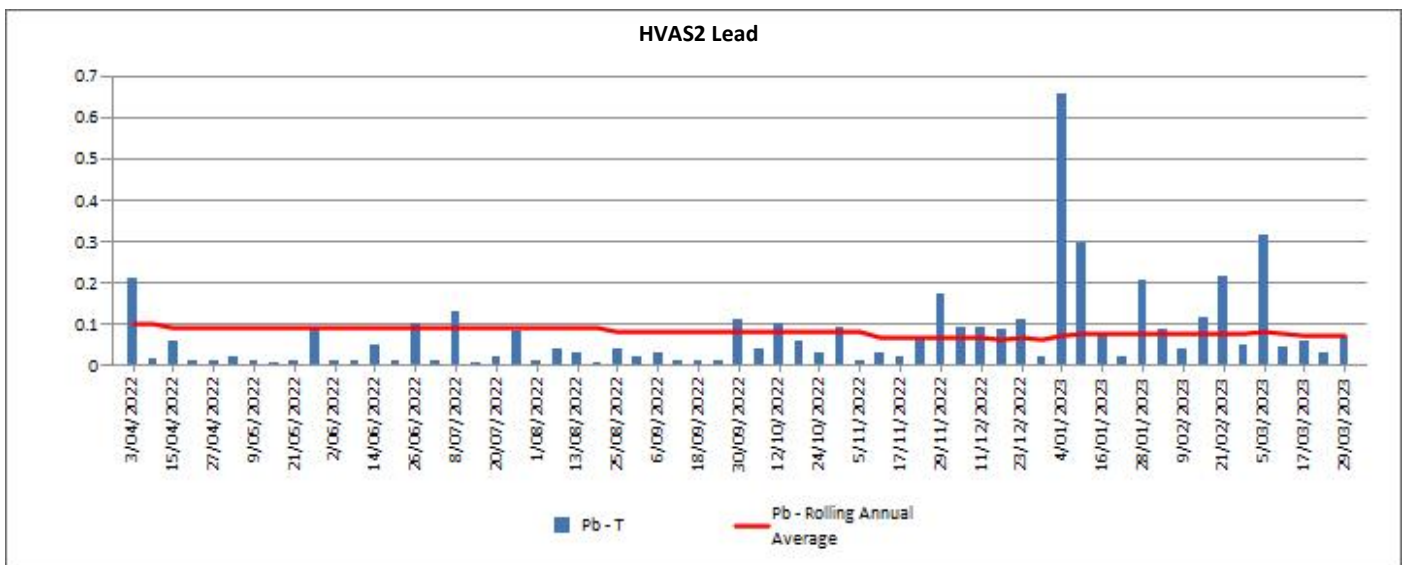
HVAS2 (EPL12) is located on the northern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.

In March PM₁₀ levels at HVAS2 were low compared with previous months. The highest recorded PM₁₀ dust reading for March was 48.2 µg/m³ on the 5 March when winds were from the NW suggesting contribution from off-site sources. The surface of Blackwoods TSF2 is treated with dust suppressant and the TSF spray system is under construction. The annual rolling average for PM₁₀ dust at this location is 14.4 µg/m³ at the end of March 2023, up from 12.95 µg/m³ in April 2022. A TSF spray system is to be installed after MOD10 approved works preparing the TSF for dry stacking operations and will improve dust control on the TSF surface.

The annual rolling average for PM₁₀ dust is determined using data with extreme dust events included.



PM₁₀ lead levels in March were consistent compared with previous months. The highest recorded PM₁₀ Lead dust reading for March was 0.31 µg/m³ on the 5 March when winds were from the NW suggesting a contribution of Lead dust from an off-site source. A TSF spray system is to be installed after MOD10 approved works preparing the TSF for dry stacking operations and will improve dust control on the TSF surface. The rolling annual average for PM₁₀ Lead in March 2023 was 0.07 µg/m³ down from 0.10 µg/m³ in April 2022.





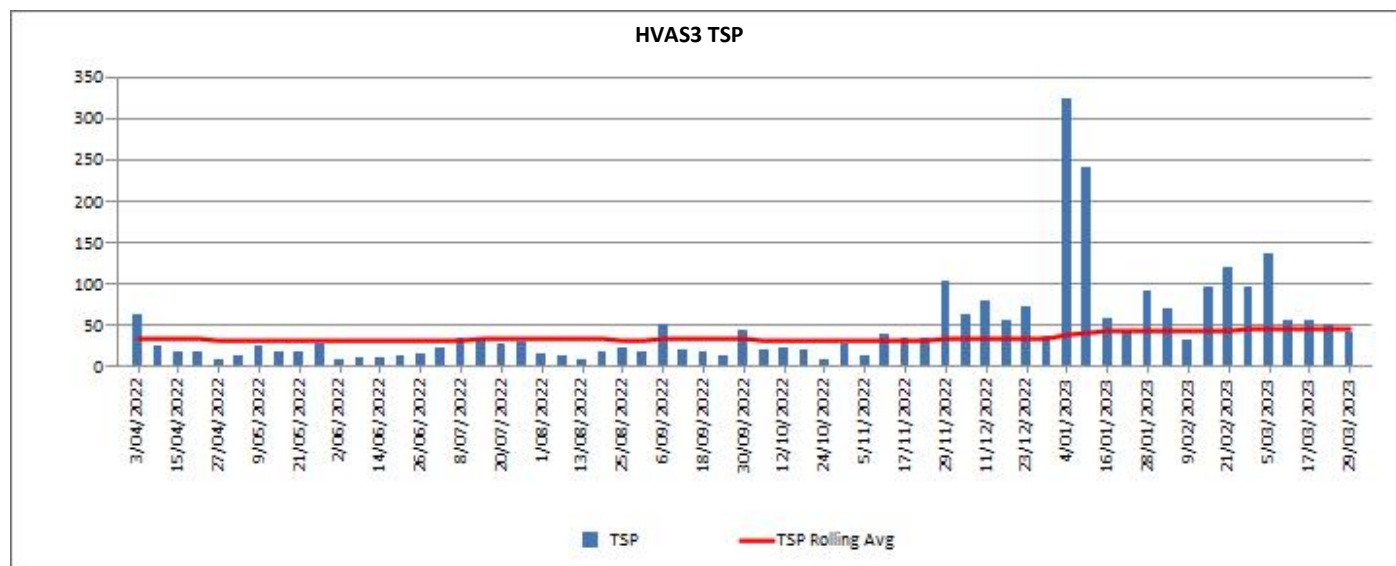
HVAS 3 (EPL57) - Blackwood Pit (On Site) Results for March 2023

DATE	TSP ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
05-March-23	135	1.29
11-March-23	55.6	0.23
17-March-23	55.2	0.26
23-March-23	49.5	0.21
29-March-23	42.2	0.47

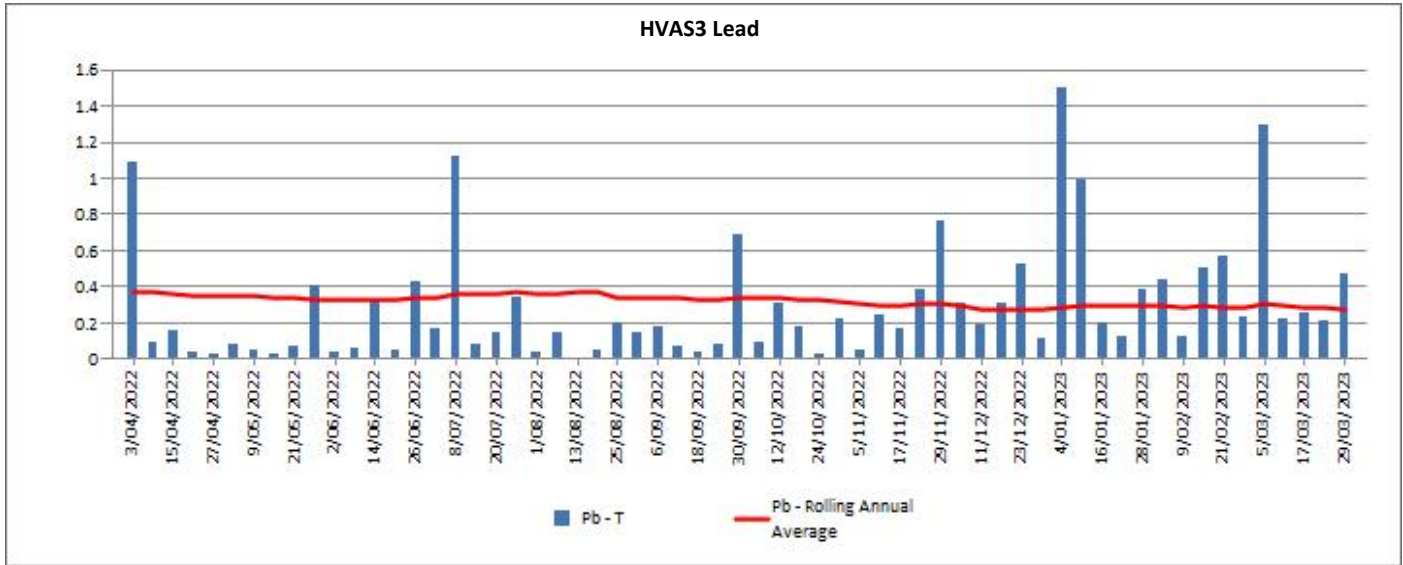
HVAS3 (EPL57) was included in EPL 12559 on 14 March 2019 to provide for monitoring of TSP Dust on the northern boundary of the site at Blackwoods Pit TSF2.

TSP levels at HVAS3 were highest on 5 March with a result of $135.00 \mu\text{g}/\text{m}^3$, when winds were from the NW, meaning that the dust source was likely from off-site. A TSF spray system is to be installed after MOD10 approved works preparing the TSF for dry stacking operations and will improve dust control on the TSF surface. The annual rolling average for TSP dust at this location is $45.46 \mu\text{g}/\text{m}^3$ at the end of March 2023, up from $34.4 \mu\text{g}/\text{m}^3$ in April 2022.

The annual rolling average for TSP is determined using data with extreme dust events included.



TSP Lead levels in March were consistent with previous months, with the highest result of $1.29 \mu\text{g}/\text{m}^3$ recorded on 5 March when winds were predominantly from the NW suggesting contribution from off-site. The rolling annual average for TSP Lead in March was $0.28 \mu\text{g}/\text{m}^3$, down from $0.37 \mu\text{g}/\text{m}^3$ in April 2022. A TSF spray system is to be installed after MOD10 approved works preparing the TSF for dry stacking operations and will improve dust control on the TSF surface.



1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

There are two Tapered Element Oscillating Microbalance (TEOM) sampling units used to measure ambient air quality at the Rasp Mine – TEOM1 (EPL13) is located off-site within the perimeter fence of Essential Water south of the mine lease, and TEOM2 (EPL14) is located on-site adjacent to Blackwood Pit to the north of the mine lease. A map indicating these locations can be found on the Rasp Mine web site. TEOM1 and TEOM2 are designed to operate continuously and sample for particulate matter less than 10 microns (PM₁₀) in size.

TEOM2 was temporarily decommissioned in 19 June 2019 due to Embankment 2 TSF2 construction works. The decommissioning is in accordance with dust management strategies agreed with the EPA which includes the operation of a real-time PM₁₀ monitor north of the construction works. Both Project Approval and Environment Protection Licence criteria exclude dust storms and other extraordinary events.

Project Approval 07_0018 criteria apply at TEOM1 and TEOM2, with two criteria listed for PM₁₀, a 24 hour average criteria of 50 ug/m³ and an annual average criteria of 25 ug/m³.

TEOM data is validated by third party consultants using Australian Standards and internal procedures, and is used to populate the table of TEOM monthly data provided below.



TEOM1 (EPL13) (Off Site) and TEOM2 (EPL14) (On Site) Validated Results for March 2023

Particulate Matter <10 Microns 24Hr Average				
Date	TEOM 1 ($\mu\text{g}/\text{m}^3$)	Compliant with 50 $\mu\text{g}/\text{m}^3$ 24hr average?	TEOM 2 ($\mu\text{g}/\text{m}^3$)	Compliant with 50 $\mu\text{g}/\text{m}^3$ 24hr average?
01-Mar-23	5.8	Y	12.3	Y
02-Mar-23	4.4	Y	6.3	Y
03-Mar-23	4.4	Y	5.9	Y
04-Mar-23	6	Y	2.4	Y
05-Mar-23	12.2	Y	19.9	Y
06-Mar-23	5	Y	2.7	Y
07-Mar-23	7.3	Y	1.4	Y
08-Mar-23	4.6	Y	1.3	Y
09-Mar-23	4.5	Y	2.5	Y
10-Mar-23	5.6	Y	0.4	Y
11-Mar-23	5.2	Y	0.8	Y
12-Mar-23	5.1	Y	2.5	Y
13-Mar-23	4.9	Y	2.4	Y
14-Mar-23	5.4	Y	2.2	Y
15-Mar-23	10.1	Y	ns	Y
16-Mar-23	6.4	Y	5.2	Y
17-Mar-23	5.5	Y	2.5	Y
18-Mar-23	8.2	Y	1.7	Y
19-Mar-23	9.7	Y	0.4	Y
20-Mar-23	9.5	Y	9.3	Y
21-Mar-23	15.9	Y	5.3	Y
22-Mar-23	9.5	Y	7.5	Y
23-Mar-23	7.8	Y	1.3	Y
24-Mar-23	8.5	Y	1.1	Y
25-Mar-23	8	Y	1.3	Y
26-Mar-23	4.7	Y	1.3	Y
27-Mar-23	12	Y	0.5	Y
28-Mar-23	5.2	Y	2.2	Y
29-Mar-23	ns		1	
30-Mar-23	ns		ns	
31-Mar-23	ns		ns	

PM₁₀ dust levels at both TEOM units were low in the month of March, with neither site recording a daily average over the limit of 50 $\mu\text{g}/\text{m}^3$.

The rolling annual average for PM₁₀ at TEOM1 with external dust events removed for the period April 2022 to March 2023 is 7.56 $\mu\text{g}/\text{m}^3$, down from 13.46 $\mu\text{g}/\text{m}^3$ at the beginning of the reporting period.

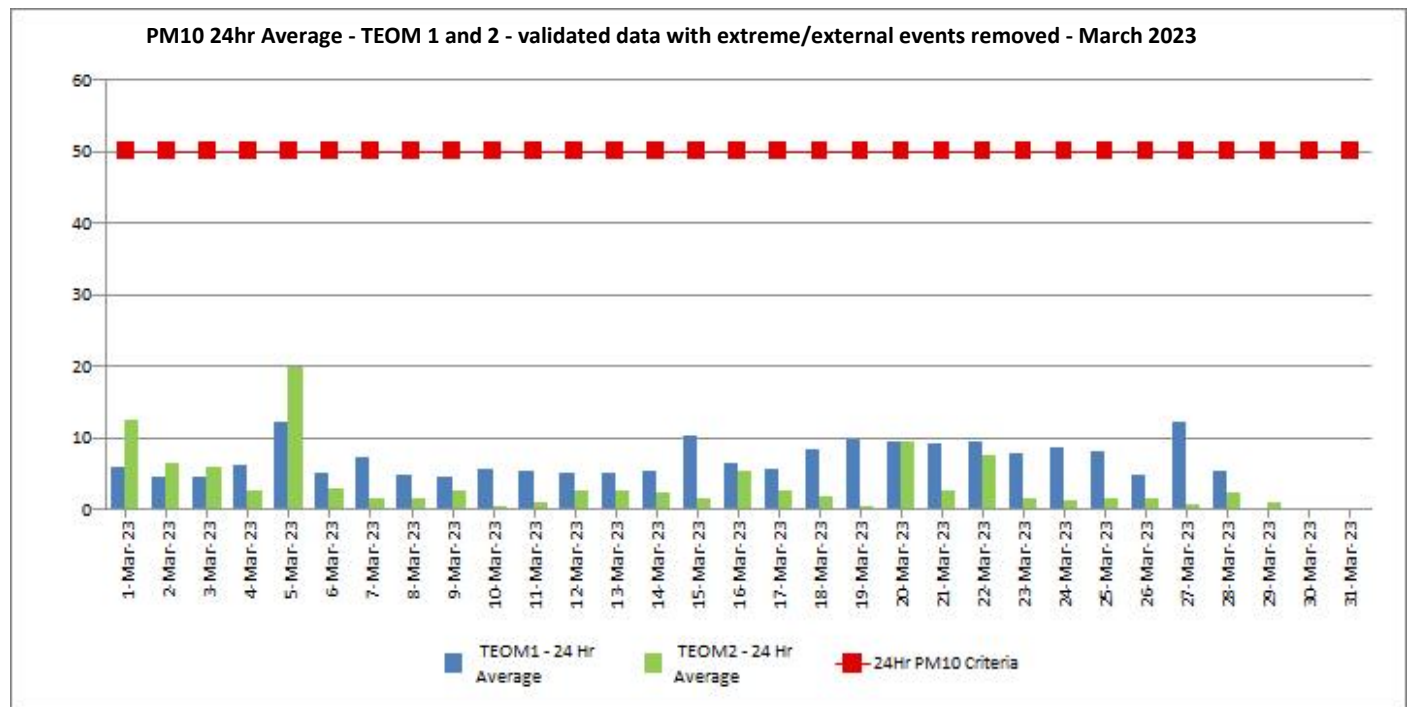
The rolling annual average for PM₁₀ at TEOM2 with external dust events removed for the period April 2022 to March 2023 is 6.69 $\mu\text{g}/\text{m}^3$, below the rolling annual average of 13.98 $\mu\text{g}/\text{m}^3$ at the beginning of the reporting period.

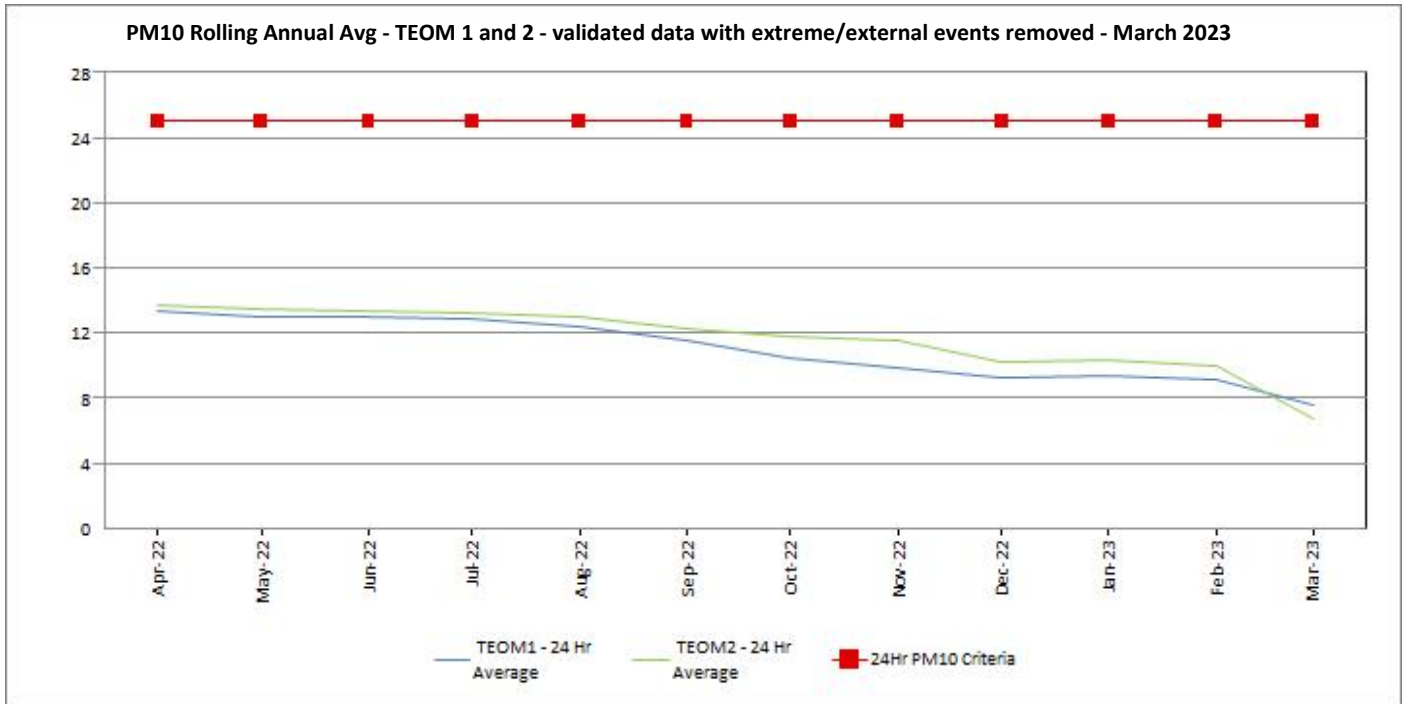


The PM₁₀ 24-hour rolling annual average for both TEOM sites remain below the annual average criteria of 25 ug/m³.

Power loss on the night of 14 March 2023, which wasn't restored until 7am on 15 March 2023 resulted in a lack of data capture and a non-compliance for monitoring on this day.

Decommissioning of rental TEOM units and installation of BHO owned TEOMs was conducted at TEOM1 on 29 March 2023 and TEOM2 on 30 March 2023. This installation event was followed by a period of zero testing and calibration. A portable PM₁₀ monitor was employed at each TEOM location during replacement and calibration to monitor dust levels.







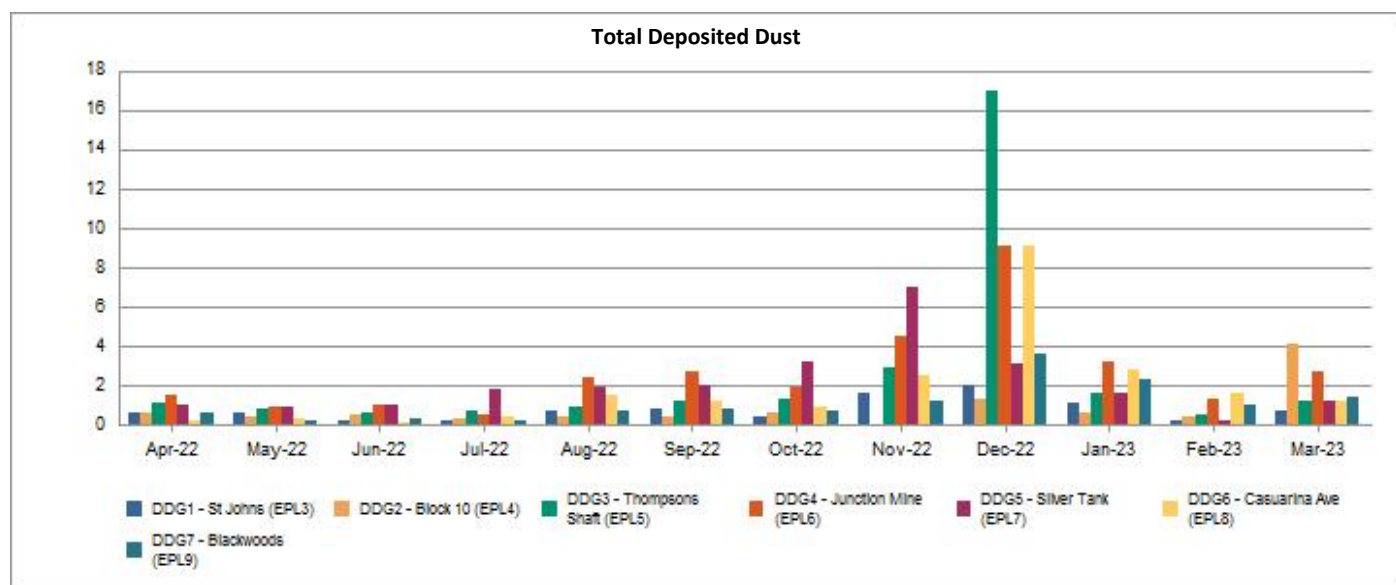
1.3 Dust Deposition Sampling

There are seven dust deposition gauges to measure ambient air quality at the Rasp Mine – D1 to D7. D1 and D6 are located off-site, D1 near the St Johns training facility north of the Rasp Mine and D6 in Casuarina Avenue south of the Rasp Mine. D2 to D5 and D7 are located on the mine lease in various locations. A map indicating these locations can be found on the Rasp Mine web site. Dust samples are collected monthly and analysed for total deposited dust and deposited lead dust.

Dust Deposition Gauges D1 (EPL3) to D7 (EPL9) – Results for March 2023

Total Deposited Dust (g/m ² /Month)							
Sample Period	D1 (off site)	D2 (off site)	D3 (on site)	D4 (off site)	D5 (on site)	D6 (off site)	D7 (on site)
March 2023	0.7	4.1	1.2	2.7	1.2	1.2	1.4
Annual Rolling Average	0.76	0.88	2.48	2.64	2.08	1.82	1.08
Background (2010)	- ¹	3.1	4.3	5.7	- ¹	5.8	- ¹

Note: "¹" = background not available, N/A = not applicable as dust deposition unit is located on site, NS = No sample



The dust levels recorded in Dust Gauges in March 2023 were lower than previous months. The highest dust levels were recorded in the D2 Block 10 gauge. The predominant wind direction for March was from the South as shown in the Wind Rose in Section 4. This result is likely caused by yard works in the Essential Water Compound in which the dust gauge is situated.

Dust Deposition Gauges that are located off-site must adhere to criteria for annually averaged deposited dust of 4 g/m²/month. All off-site Dust Deposition Gauges were compliant in the reporting period.

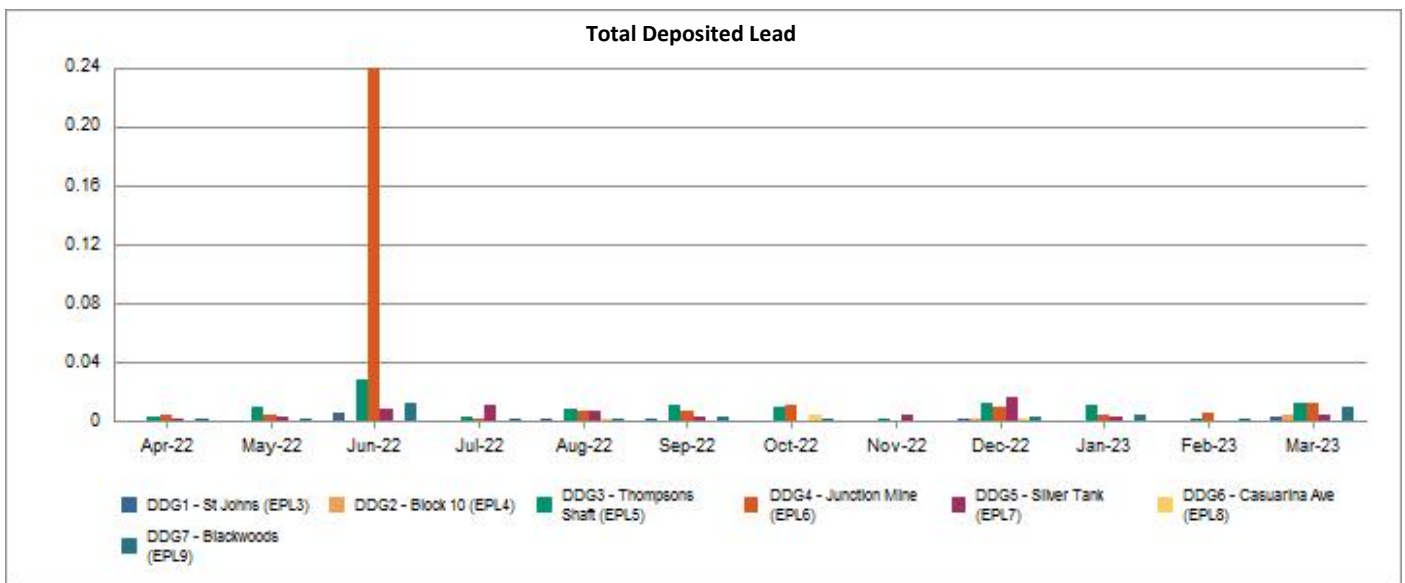


Total Deposited Lead (g/m²/Month)

Sample Period	D1 (off Site)	D2 (on site)	D3 (on site)	D4 (on site)	D5 (on site)	D6 (off Site)	D7 (on site)
March 2023	0.0034	0.0047	0.0126	0.0128	0.004	0.0008	0.0099
Background (2010)	0.0034	0.005	0.005	0.006	- ¹	0.004	- ¹

Note: "¹"= background not available, NS = No sample

There are no guidelines for deposited lead dust. Lead results in March 2023 were highest in the D4 Junction Mine gauge. The prominent wind direction for the month of March was from the South, suggesting result is likely due to increased activity in the rail yard. Dust suppressant is applied to unsealed areas of the site and roads are frequently watered using water carts in an attempt to control dust emissions. The waste dump adjacent to the rail loadout is treated with dust suppressant to limit dust lift-off from the waste dump surface.





1.4 Ventilation Outlets and Bag House Monitoring

There are two locations to measure pollutants from exhausts or stacks; these include the Primary Ventilation Shaft, measuring pollutants from underground firings, and the Baghouse Stack at the crusher measuring dust. Each are located on site; the Primary Ventilation Shaft is located centrally and to the north of the mine lease and the Primary Crusher Baghouse Stack is located within the area of the processing plant to the east of the lease. Shaft 6 (EPL56) was removed as a monitoring location with the variation of EPL12559 in March 2019 as it became an intake rather than an exhaust in April 2018. A map indicating these locations can be found on the Rasp Mine web site. Samples are collected quarterly and analysed for a number parameters listed in below. Reference to the item required in the Rasp Mine Environment Protection Licence (EPL) is provided below. Emissions monitoring is conducted quarterly.

The following criteria apply:

Primary Ventilation Shaft (EPL1)

	Unit	Criteria
Nitrogen Oxides	mg/m ³	350
Volatile Organic Compounds	mg/m ³	40

Primary Ventilation Shaft (EPL1) and Crusher Baghouse (EPL2)

	Unit	Criteria
Total Suspended particles (TSP)	mg/m ³	20
Type 1 and Type 2 ¹	mg/m ³	1

Note 1: "Type 1 substance" means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements.

"Type 2 substance" means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements.

Primary Vent Shaft (EPL1) and Crusher Baghouse (EPL2) Results for March 2023

Monitoring was conducted at the Primary Vent Shaft (EPL1) and the Crusher Baghouse (EPL2) on 28 February 2023. The monitoring results for the Primary Vent Shaft and the Crusher Baghouse from this monitoring event were below the licence criteria.



2 Noise

2.1 Blasting (Vibration and Overpressure)

There are five compliance vibration monitors at various locations measuring for vibration and overpressure from blast firings. These include V1 to V5 which are located on-site and off-site. A map indicating these locations can be found on the Rasp Mine web site. In addition, there are a number of roving monitors which may be used to monitor vibration and overpressure at particular locations as required. Monitors operate continuously and are automatically triggered to record when a blast occurs. The following conditions apply as listed in the PA 07_0018 and EPL 12559:

Blasting Criteria (Western Mineralisation and Main Lodes excluding Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance (for production and development blasts)
Residence on privately owned land (7am-7pm)	115	5	5% of the total number of blasts over a 12-month period ¹
(7am-7pm)	120	10	0%
(7pm-10pm)	105	-	-
(10pm-7am)	95	-	-
Public Infrastructure	-	100	0%

Note 1: Does not apply until completion of Pollution Reduction Program on the EPL at the end of 2018. Applies to EPL criteria in the period for the Annual Return 3 Nov to 2 Nov the following year and to DPE criteria in the reporting period 1 Jul to 30 Jun each year.

Blasting Criteria (Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance (for production and development blasts)
Residence on privately owned land (7am-7pm)	115	3 (interim)	5% of the total number of blasts over a 12-month period ¹
(7am-7pm)	120	10	0%
(7pm-10pm)	105	-	-
(10pm-7am)	95	-	-
Broken Hill Bowling Club, Italio (Bocce) Club, Heritage Items within CML7	-	50	0%
Perilya Southern Operations	-	100	0%
Public Infrastructure	-	100	0%

Note 1: Applies to EPL criteria in the period for the Annual Return 3 Nov to 2 Nov the following year and to DPE criteria in the reporting period 1 Jul to 30 Jun each year.

In addition the following conditions also apply:

- Production blasts may occur between 6.45 am and 7.15 pm on any day
- 1 production blast per day, with 6 per week averaged over a calendar year
- 6 development blasts per day, with 42 per week averaged over a calendar year



Blasting Data Summary Results for March 2023 (annual period)

Total Blasts:

- 0 production blasts occurred before 6.45 am or after 7.15 pm
- The number of Production blasts averaged 1.9 per week over the previous calendar year
- The number of Development blasts averaged 23.23 per week over the previous calendar year

Western Mineralisation and Main Lodes (excluding Block 7):

- 0 Blast recorded >5 mm/s
- 0 Blasts recorded >10 mm/s
- 0 development blasts recorded an over pressure level over 95 dBL (10pm to 7am)
- 0 development blasts recorded an over pressure level over 105 dBL (7pm to 10pm)
- 0 Blasts recorded an over pressure level over 115dBL (7am to 7pm)
- 0 Blasts recorded an over pressure level over or 120 dBL at any time
- Percentage of development blasts over 5 mm/sec for the annual period = 0%
- Percentage of production blasts over 5 mm/sec for the annual period = 0%

Block 7:

- 1 Blasts recorded >3 mm/s
- 0 Blasts recorded >10 mm/s
- 0 Blasts recorded >50 mm/s at V6
- 0 development blasts recorded an over pressure level over 95 dBL (10pm to 7am)
- 0 development blasts recorded an over pressure level over 105 dBL (7pm to 10pm)
- 0 Blasts recorded an over pressure level over 115 dBL (7am to 7pm)
- 0 Blasts recorded an over pressure level over or 120 dBL at any time
- Percentage of development blasts over 3mm/sec for the annual period = 0%
- Percentage of production blasts over 3mm/sec for the annual period =100%

The have been no production blasts in the Western Mineralisation and Main Lodes producing vibration at monitors over 5 mm/sec for the 12-month period.

There has been one production blasts in Block 7 for the 12-month period and this blast produced vibration at one monitor of over 3 mm/sec.

2.2 Noise

Noise monitoring is undertaken as per the NSW Noise Policy for Industry at a frequency of once per annum. Annual noise monitoring was conducted during two consecutive night-time periods from 27 to 29 October 2022.

The monitoring assessment found that site LAeq, 15min noise contributions satisfied the relevant limits during the measurements at all assessment locations.



3 Water

3.1 Groundwater

There are eighteen sampling locations for groundwater. GW01 (EPL37) to GW16 (EPL52) are piezometers installed at various locations around the mine site and are sampled quarterly. There are also two sampling locations for water pumped from underground mining, Shaft 7 (EPL53) and Kintore Pit (EPL54), which are sampled monthly. A map indicating these locations can be found on the Rasp Mine web site. Groundwater monitoring is scheduled for completion in March, June, September and December. No limits are applied in the EPL to the results from groundwater monitoring. Groundwater monitoring results have remained stable for all locations and all parameters except for GW07 which has returned elevated Lead results in the last two quarterly sampling events. GW07 is at the base of TSF1 and elevated Lead results have not been detected in bores further from this point such as GW08, GW09 and GW10.

Groundwater Monitoring Requirements

EPA Identification Number	Frequency	Parameters to be analysed
Shaft 7 EPL53	Monthly	alkalinity (calcium carbonate (CaCO ₃)), cadmium (Cd), calcium (Ca), chloride (Cl), electrical conductivity (EC), iron (Fe), lead Pb), magnesium (Mg), manganese (Mn), pH, sodium (Na), sulphate (SO ₄), total dissolved solids (TDS) and zinc (Zn)
Kintore Pit (U/G dewatering) EPL54	Monthly	
Piezometers EPL37 (GW01) to EPL52 (GW16)	Quarterly	

Shaft 7 (EPL53) and Kintore Pit (EPL54) Results for March 2023

Sample Point	pH	EC (µS/cm ²)	TDS (mg/l)	Alkalinity (CaCO ₃) (mg/l)	SO ₄ (mg/l)	Cl (mg/l)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	Cd (mg/l)	Pb (mg/l)	Mn (mg/l)	Zn (mg/l)	Fe (mg/l)
Shaft 7 (EPL53)	5.85	12000	12900	7	5300	1520	487	271	1600	2.81	1.90	324	1020	<0.05
Kintore Pit (EPL54)	5.90	12200	12800	5410	1590	499	292	1640	2.73	2.04	336	987	<0.05	5410

Groundwater Bores (EPL37 - EPL52) Results for March 2023

Sample Point	pH	EC (µS/cm ²)	TDS (mg/l)	Alkalinity (CaCO ₃) (mg/l)	SO ₄ (mg/l)	Cl (mg/l)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	Cd (mg/l)	Pb (mg/l)	Mn (mg/l)	Zn (mg/l)	Fe (mg/l)
GW01 (EPL37)	6.13	8620	7770	12	4460	819	263	355	1170	0.181	0.060	225	174	<0.05
GW02 (EPL38)	Bore Dry													
GW03 (EPL39)	6.09	14100	12500	<1	5140	2980	502	332	2120	0.717	3.46	365	285	4.17
GW04 (EPL40)	6.34	13900	11400	299	4840	2650	519	516	2260	0.0404	0.168	21.3	13.0	<0.05
GW05 (EPL41)	5.90	13400	11500	48	4950	2590	472	354	1910	1.59	0.942	255	225	<0.05
GW06 (EPL42)	5.83	13800	12200	59	5460	2720	481	441	2110	1.19	0.095	305	194	<0.05
GW07 (EPL43)	5.98	12200	10800	30	5280	1940	471	312	1790	2.47	1.33	320	298	<0.05



Sample Point	pH	EC ($\mu\text{S}/\text{cm}^2$)	TDS (mg/l)	Alkalinity (CaCO_3) (mg/l)	SO ₄ (mg/l)	Cl (mg/l)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	Cd (mg/l)	Pb (mg/l)	Mn (mg/l)	Zn (mg/l)	Fe (mg/l)
GW08 (EPL44)	6.14	9140	8360	15	4120	1380	466	188	1110	1.76	0.343	292	432	<0.05
GW09 (EPL45)	6.2	10400	8520	177	3850	1780	555	403	1350	0.520	0.006	40.7	53.6	<0.05
GW10 (EPL46)	6.03	14900	12600	120	4980	3190	518	487	2330	3.35	0.002	150	270	<0.05
GW11 (EPL47)	6.24	4020	3250	29	1820	452	238	92	435	1.50	0.597	18.3	61.2	<0.05
GW12 (EPL48)	Insufficient sample													
GW13 (EPL49)	Bore Dry													
GW14 (EPL50)	Bore Dry													
GW15 (EPL51)	Bore Dry													
GW16 (EPL52)	Bore Dry													

3.2 Surface Water Sample Record

There are seven sampling locations for surface water, these include surface water basins located on the mine lease to capture and retain rainfall and two locations up and down stream of an ephemeral creek located south of the mine lease boundary. A map indicating these locations can be found on the Rasp Mine web site. Based on historical data, sampling is most likely to be undertaken in October (highest rainfall month as recorded by Bureau of Meteorology) and April.

Results for most locations were consistent with previous samples except for S34 Horwood Dam which returned reduced values for Lead, Sodium, Magnesium, TDS and Electrical Conductivity, which was likely due to the surface rainfall runoff transferred to the dam from surface storages.

Surface Water Monitoring Requirements

Description	Frequency	Parameters to be Analysed
Federation Way Culvert EPL29/S31-1	2 x per year, six months apart	cadmium (Cd), chloride (Cl), electrical conductivity (EC), lead Pb), manganese (Mn), pH, sodium (Na), sulphate (SO ₄), total dissolved solids (TDS) and zinc (Zn)
Ryan Street Dam EPL31/S49	2 x per year, six months apart	
Adjacent Olive Grove EPL32/S1A	2 x per year, six months apart	
Adjacent Bowls Club EPL33 /S9-B2	2 x per year, six months apart	
Horwood Dam EPL34/S34	2 x per year, six months apart	
Upstream Bonanza St EPL35	2 x per year, six months apart	
Downstream Sydney Rd EPL36	2 x per year, six months apart	

Surface Water Monitoring Results for March 2023

No surface water analysis was conducted in March, due to lack of rainfall.



4 Weather Data

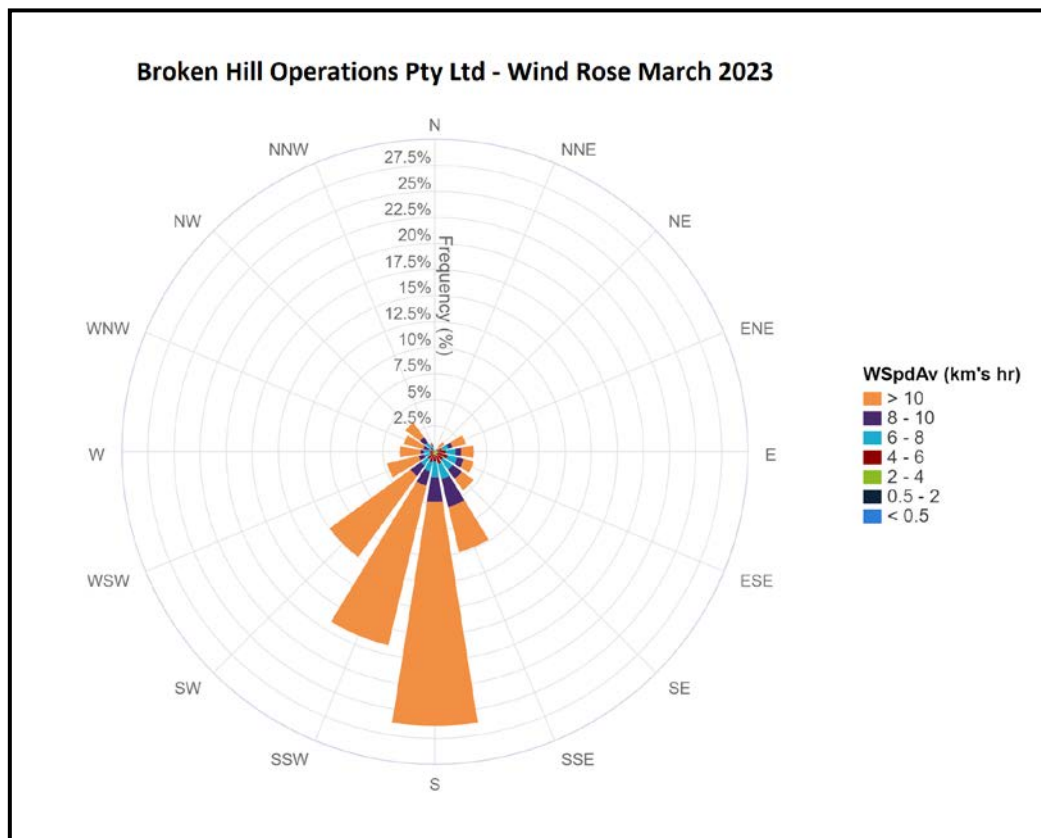
The weather station continuously monitors the following parameters as per Point 55 of the Environmental Protection Licence.

The following parameters are required to be recorded each month as listed in the EPL 12559:

Rasp Mine Weather Station (EPL55) Monitoring Requirements

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	15 minutes	Continuous
Wind Direction at 10 metres	AM-4	degrees in a clockwise direction from True North	15 minutes	Continuous
Wind Speed at 10 metres	AM-4	metres per second	15 minutes	Continuous
Rainfall	AM-4	millimetres	1 hour	Continuous
Sigma theta	AM-2 & AM-4	degrees	15 minutes	Continuous

The wind rose provided below indicates that the prominent wind direction for the month of March was from the South.





Weather Data Summary for March 2023

Date	Temperature @ 10m (°C)		Wind Speed @ 10m (km/hr)		Predominant Wind Direction @ 10m		Rainfall (mm)
	Min	Max	Min	Max	Cardinal	Degree	Total
01-Mar-2023	13.1	24	9.4	30.3	S	172.87	0.00
02-Mar-2023	13.8	26.4	4.7	27.3	S	173.56	0.00
03-Mar-2023	16.9	27.1	5.3	27.3	S	166.53	0.00
04-Mar-2023	24	32.1	0.4	14	SSW	183.66	0.00
05-Mar-2023	15.5	35	3.7	33	WSW	225.45	0.004
06-Mar-2023	14.9	27.7	2.8	25.9	SW	224.18	0.00
07-Mar-2023	13.6	26.3	2.7	24.9	WSW	229.57	0.00
08-Mar-2023	12.2	24.3	9.6	27.8	SSW	198.37	0.00
09-Mar-2023	14.9	22	2.6	24.5	SSE	142.40	0.00
10-Mar-2023	18.6	27.1	2.7	17.4	ESE	108.83	0.00
11-Mar-2023	14.9	29.6	1.7	32.9	S	170.71	0.00
12-Mar-2023	12.7	25.3	7.8	32.8	SSW	181.92	0.00
13-Mar-2023	19.6	25.9	1.1	26.3	S	164.56	0.00
14-Mar-2023	22.7	29.6	2.5	17.6	SSE	138.88	0.002
15-Mar-2023	22.6	34.2	2.7	24.2	WSW	246.1	0.005
16-Mar-2023	18.4	36	2.3	28.7	SSW	191.35	0.00
17-Mar-2023	24.8	33.3	1.7	33.7	S	171.33	0.00
18-Mar-2023	19.8	39.1	1	30.8	SW	208.55	0.00
19-Mar-2023	19	38	1.3	33.1	S	173.86	0.03
20-Mar-2023	16.7	26.7	6.1	39.1	S	162.88	1.5
21-Mar-2023	18.4	25.8	4.4	21.4	SE	124.03	0.00
22-Mar-2023	22.7	33.7	1.3	16.3	S	170.32	0.00
23-Mar-2023	14.7	32.3	5.2	23.1	SW	207.04	0.00
24-Mar-2023	13.9	29.1	5.2	28.9	SSW	195	0.00
25-Mar-2023	16	24.9	4.6	25	SSE	150.59	0.00
26-Mar-2023	21.4	26.4	4.1	21.2	ESE	103.92	0.2
27-Mar-2023	17.4	29.7	1.5	17	S	179.28	0.3
28-Mar-2023	15.6	26.9	2	23.2	SW	210.34	0.00
29-Mar-2023	10.2	22.4	7.4	28.5	SSW	197.28	0.00
30-Mar-2023	13.6	20.3	0.5	21	S	161.47	0.00
31-Mar-2023	12.3	20.3	0.8	25.6	S	173.82	0.00

Rainfall of 2.01mm fell in March 2023.



5 Data Log

Sample	Result Received
Hi Volume Samples	12-05-2023
TEOM	22-05-2023
Dust Deposition	03-05-2023
Vents & Bag House	30-03-2022
Noise	5-12-2022
Water	24-04-2023
Blast vibration and overpressure	03-04-2023
Weather	21-04-2023
Date posted to web site	9-06-2023

6 Correction Log

No corrections.