

Rasp Mine
Monthly Environmental Monitoring Report
September 2020



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.

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1 Air Quality

The following criteria as listed in the Project Approval (DA 07_0018 MOD7 July 2019) apply to air quality monitoring:

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

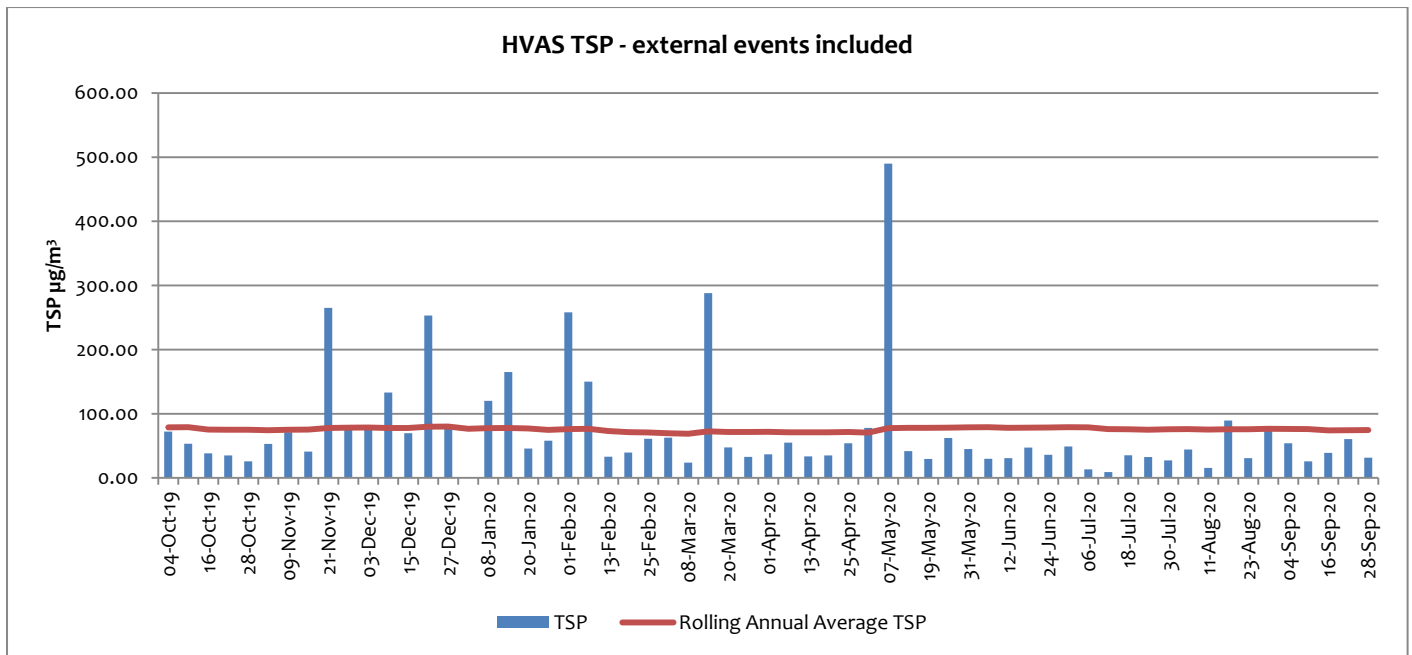
There are four high volume air samplers used to measure ambient air quality at the Rasp Mine – HVAS (EPL10) and HVAS1 (EPL11) are located at the Silver Tank, central and to the south of the mine lease, and HVAS2 (EPL12) and HVAS3 (EPL57) are located adjacent to and north of Blackwood Pit. A map indicating 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 September

| DATE | TSP (µg/m ³) | Lead (µg/m ³) |
|------------|-----------------------------|------------------------------|
| 4-09-2020 | 54.10 | 0.28 |
| 10-09-2020 | 25.80 | 0.12 |
| 16-09-2020 | 39.10 | 0.38 |
| 22-09-2020 | 60.40 | 0.33 |
| 28-09-2020 | 31.60 | 0.15 |

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.

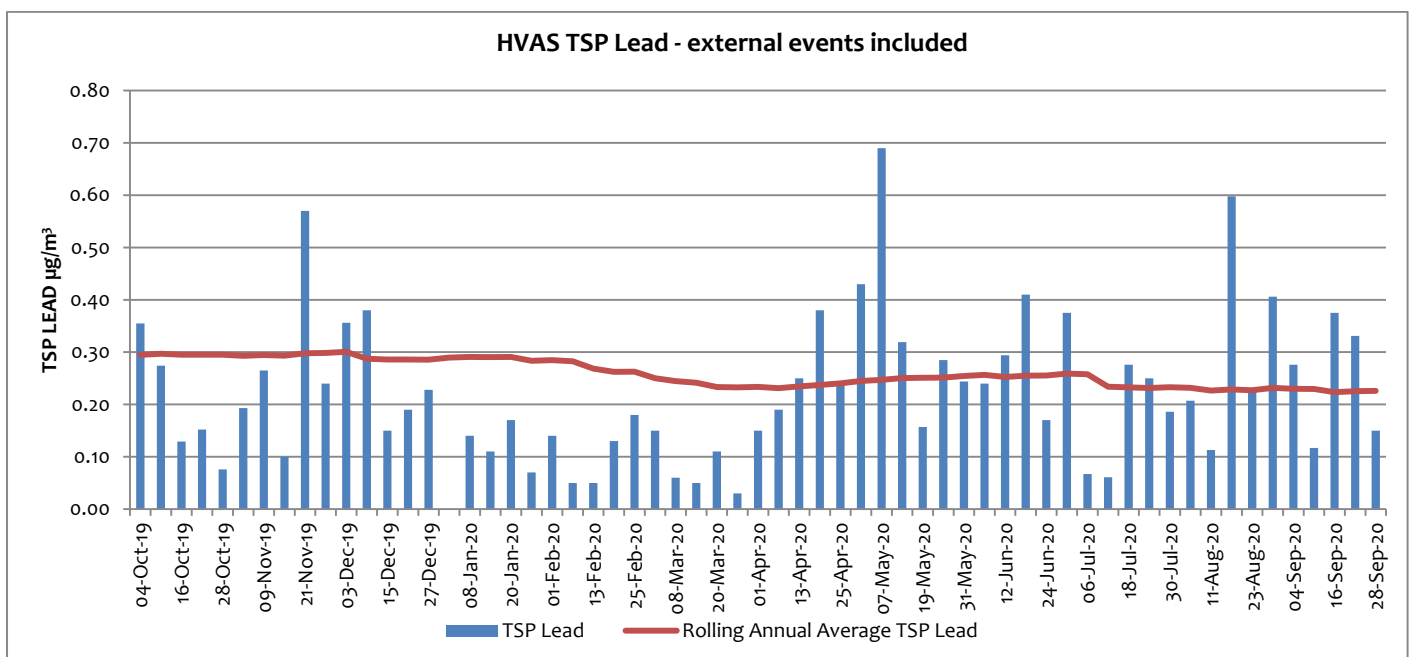
There were elevated TSP levels on 4 and 22 September. Heavy winds came from multiple directions on each of these dates so contribution from site activities is difficult to determine. The annual rolling average for TSP at this location is 74.49 µg/m³ at the end of September.



The rolling annual average for TSP to September 2020 is below the long term annual average criteria of $90 \mu\text{g}/\text{m}^3$. The annual rolling average for TSP is determined using data with extreme dust events included.

Dust is controlled on site using the application of dust suppressant on free (unused) areas and side tracks, and from the frequent watering of haul roads.

There were elevated TSP Lead levels on 16 and 22 September when the predominant wind directions were from the NE and West, respectively. Heavy winds came from multiple directions on each of these dates so contribution from site activities is difficult to determine. The rolling annual average for TSP Lead at 28 September was $0.23 \mu\text{g}/\text{m}^3$.



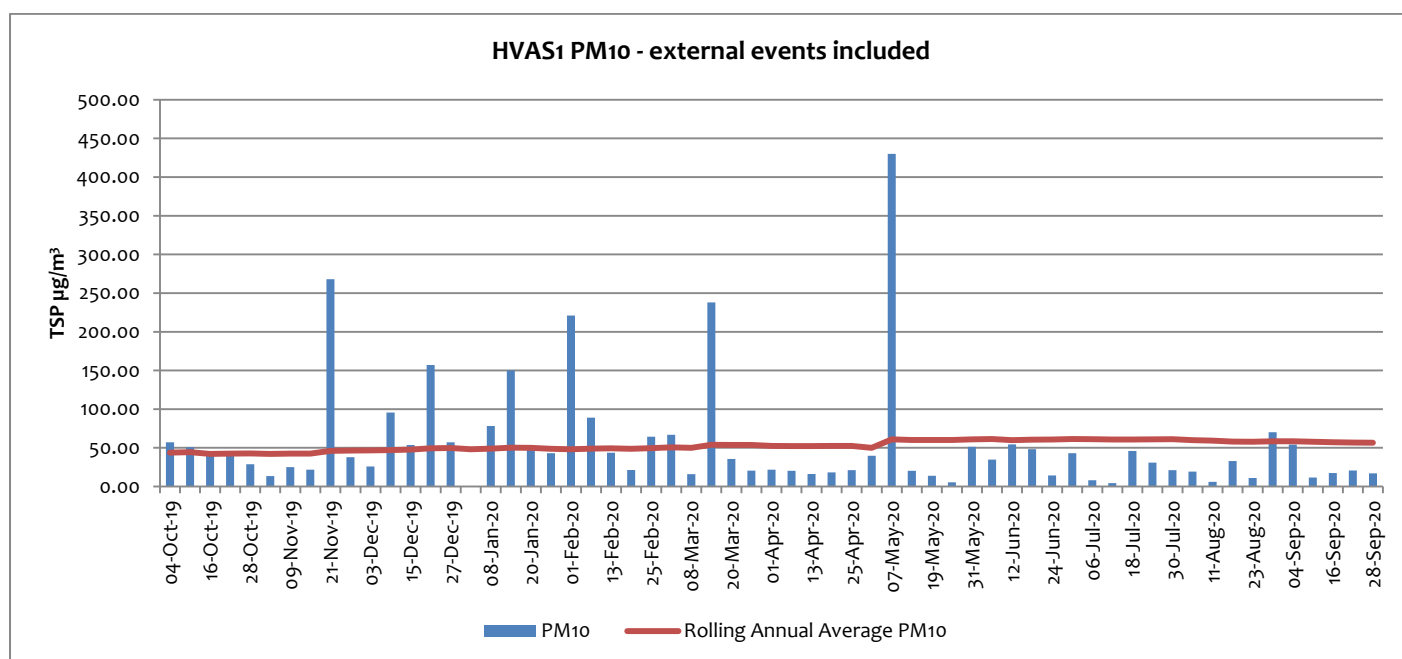


HVAS1 (EPL11) - Silver Tank (On Site) Results for September

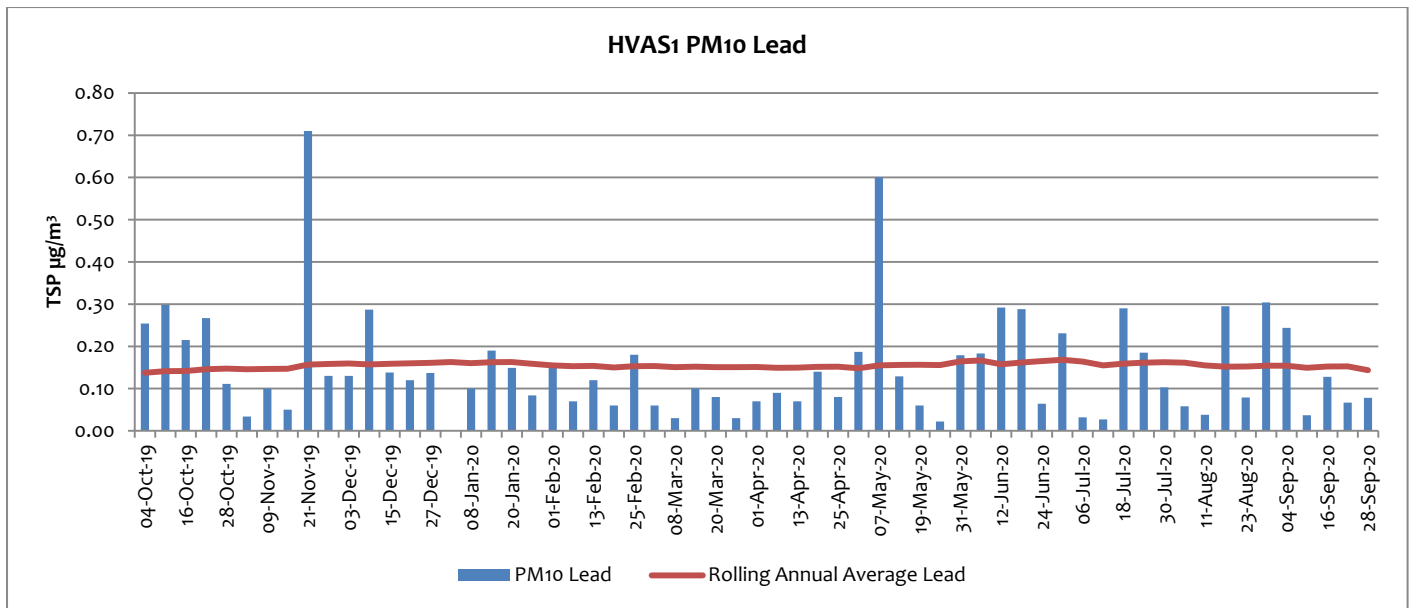
| DATE | PM ₁₀ (µg/m ³) | PM ₁₀ Lead (µg/m ³) |
|------------|--|---|
| 4-09-2020 | 54.20 | 0.24 |
| 10-09-2020 | 11.70 | 0.04 |
| 16-09-2020 | 17.50 | 0.13 |
| 22-09-2020 | 20.70 | 0.07 |
| 28-09-2020 | 16.90 | 0.08 |

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.

There were elevated PM₁₀ levels on 4 September when the predominant wind direction was from the West. Site road traffic is the likely source of dust from this direction although water carts frequently apply water to regularly used surface roads. The annual rolling average for PM₁₀ at this location is 56.6 µg/m³ at September 2020. While the annual rolling average for PM₁₀ at this location exceeds the long term criteria of 25 µg/m³, the reported data may include dust levels influenced by extreme dust events, and external events or sources due to the variability of wind directions on any day.



There is no guideline for assessing PM₁₀ lead dust; the rolling annual average for PM₁₀ lead dust at this location over 12 months is 0.14 µg/m³ and is likely the result of drought conditions and windy weather transporting lead contaminated dust from the Broken Hill environs. There were elevated PM₁₀ lead dust levels of 0.13 µg/m³ on 16 September when the predominant wind direction was from the West.



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

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. HVAS2 has been decommissioned since June 2019 while Embankment 2 TSF2 construction works are undertaken. A real-time PM₁₀ monitor is in place adjacent to the HVAS2 location.

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

HVAS3 (EPL57) 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. 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. HVAS3 has been decommissioned since June 2019 while Embankment 2 TSF2 construction works are undertaken. A real-time PM₁₀ monitor is in place adjacent to the HVAS2 location.



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 operate continuously and sample for particulate matter less than 10 microns (PM₁₀) in size.

TEOM2 was decommissioned from 19 June 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.



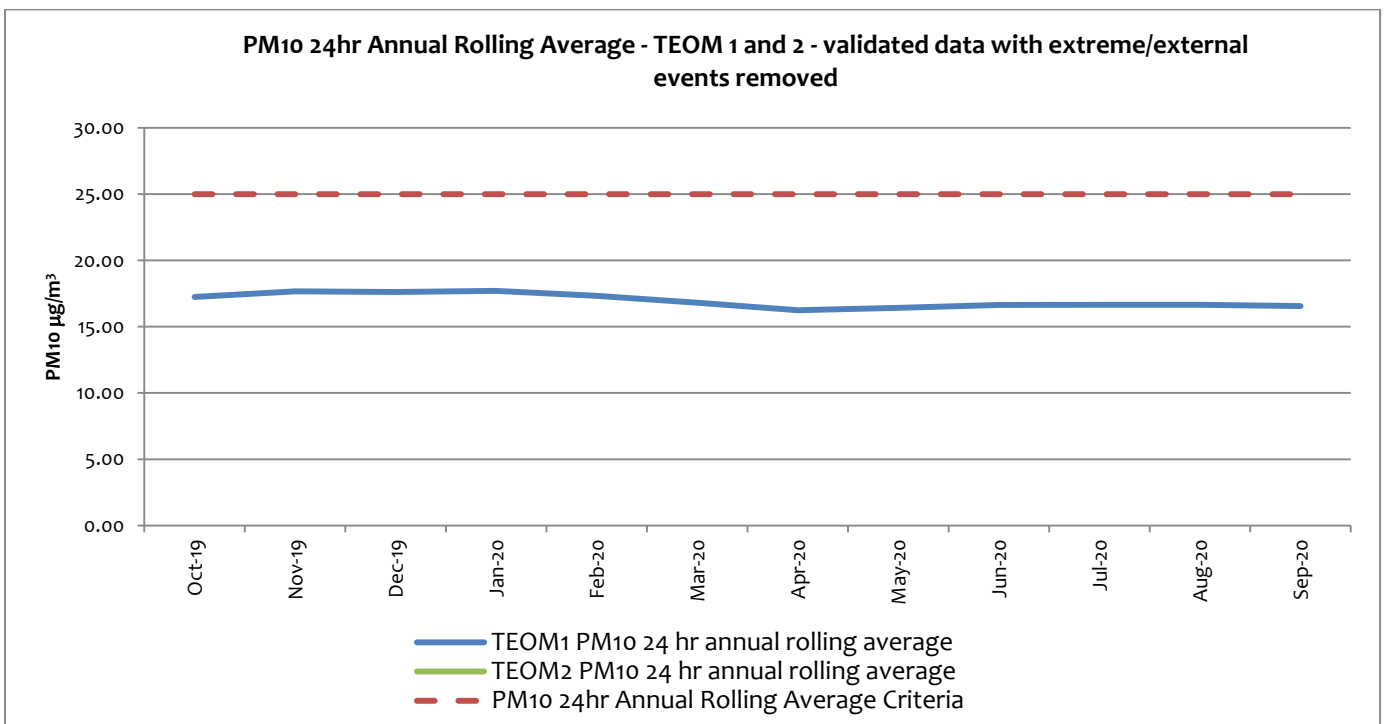
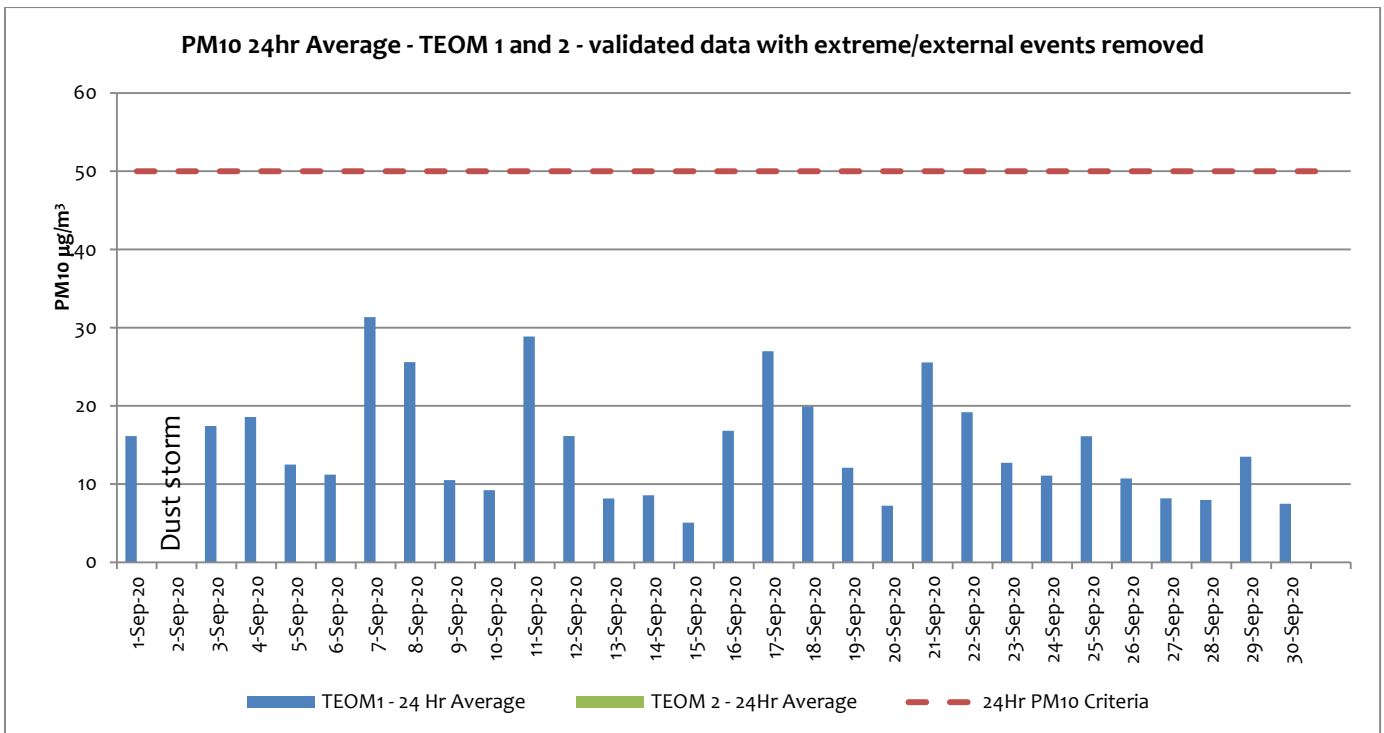
TEOM1 (EPL13) (Off Site) and TEOM2 (EPL14) (On Site) Validated Results for September

| 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-Sep-20 | 10.8 | Y | NS | Y |
| 02-Sep-20 | 9.7 | Y | NS | Y |
| 03-Sep-20 | 11.6 | Y | NS | Y |
| 04-Sep-20 | 11.6 | Y | NS | Y |
| 05-Sep-20 | 7.3 | Y | NS | Y |
| 06-Sep-20 | 21.4 | Y | NS | Y |
| 07-Sep-20 | 2.1 | Y | NS | Y |
| 08-Sep-20 | 3.8 | Y | NS | Y |
| 09-Sep-20 | 4.4 | Y | NS | Y |
| 10-Sep-20 | 5.3 | Y | NS | Y |
| 11-Sep-20 | 7.4 | Y | NS | Y |
| 12-Sep-20 | 10.3 | Y | NS | Y |
| 13-Sep-20 | 8.3 | Y | NS | Y |
| 14-Sep-20 | 5.8 | Y | NS | Y |
| 15-Sep-20 | 5.8 | Y | NS | Y |
| 16-Sep-20 | 6.0 | Y | NS | Y |
| 17-Sep-20 | 11.4 | Y | NS | Y |
| 18-Sep-20 | 22.7 | Y | NS | Y |
| 19-Sep-20 | 16.4 | Y | NS | Y |
| 20-Sep-20 | 9.5 | Y | NS | Y |
| 21-Sep-20 | 21.4 | Y | NS | Y |
| 22-Sep-20 | 15.5 | Y | NS | Y |
| 23-Sep-20 | 8.8 | Y | NS | Y |
| 24-Sep-20 | 7.0 | Y | NS | Y |
| 25-Sep-20 | 6.2 | Y | NS | Y |
| 26-Sep-20 | 7.7 | Y | NS | Y |
| 27-Sep-20 | 7.1 | Y | NS | Y |
| 28-Sep-20 | 8.5 | Y | NS | Y |
| 29-Sep-20 | 13.2 | Y | NS | Y |
| 30-Sep-20 | 34.6 | Y | NS | Y |

NS¹ – no sample collected due to temporary decommissioning of TEOM unit.

There was a dust storm in Broken Hill for much of the day on 2 September and the 24-hour average level for the day has been calculated without the levels recorded during the dust storm.

The PM₁₀ 24-hour rolling annual average for data with external elevated dust events removed at September 2020 is 16.5 $\mu\text{g}/\text{m}^3$ for TEOM1. The PM₁₀ 24-hour rolling annual average for both TEOM sites remain below the annual average criteria of 25 $\mu\text{g}/\text{m}^3$.





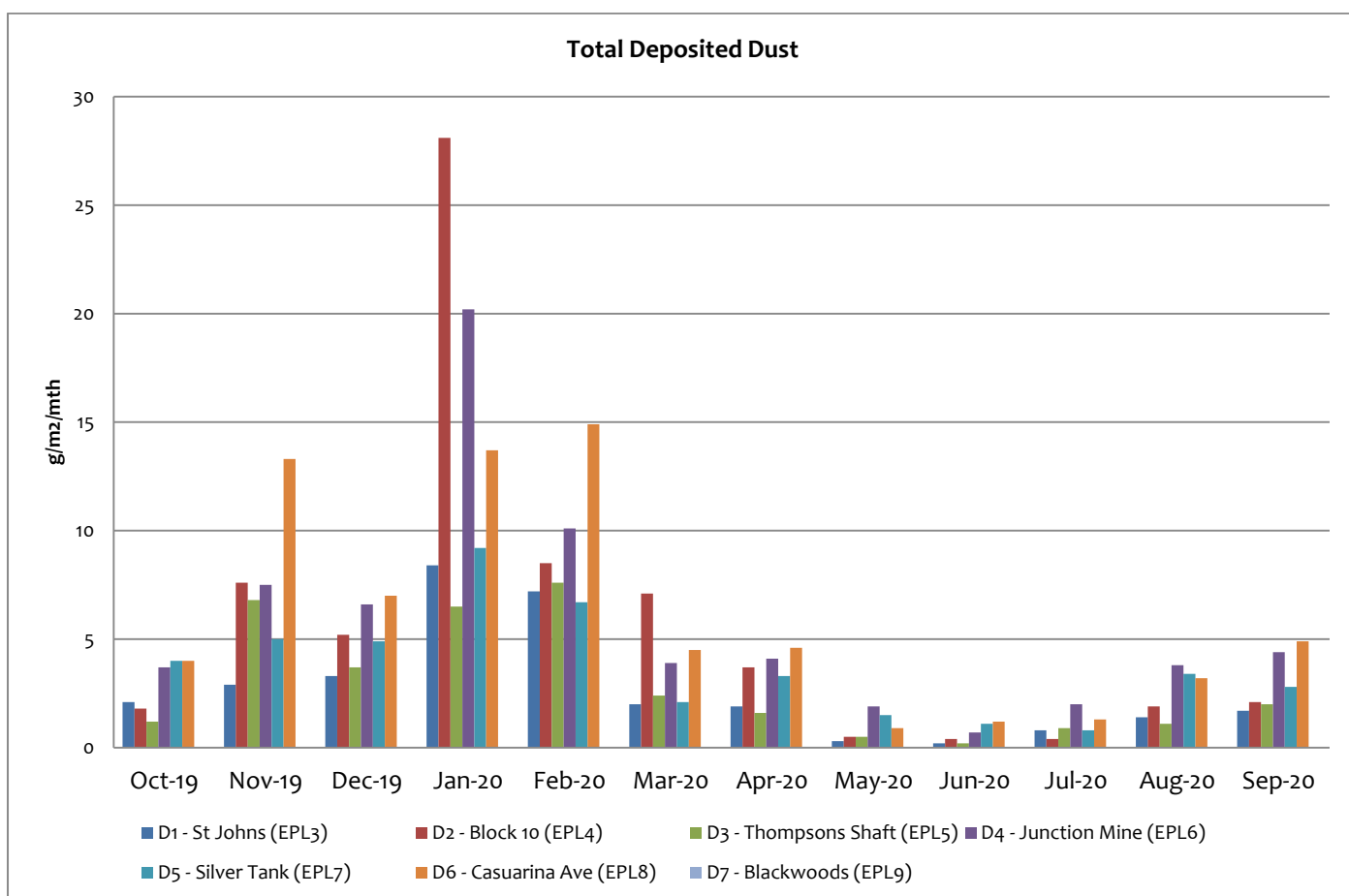
1.3 Dust Deposition Sampling

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. DDG7 has been decommissioned since June 2019 due to works on TSF Embankment 2.

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

| Total Deposited Dust (g/m ² /Month) | | | | | | | |
|--|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|
| Sample Period | D1 (off site) | D2 (on site) | D3 (on site) | D4 (on site) | D5 (on site) | D6 (off site) | D7 (on site) |
| September 2020 | 1.7 | 2.1 | 2.0 | 4.4 | 2.8 | 4.9 | NS |
| Background (2010) | 4.0 | 3.1 | 4.3 | 5.7 | - ¹ | 5.8 | - ¹ |
| Compliant? | Y | N/A | N/A | N/A | N/A | Y | N/A |

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



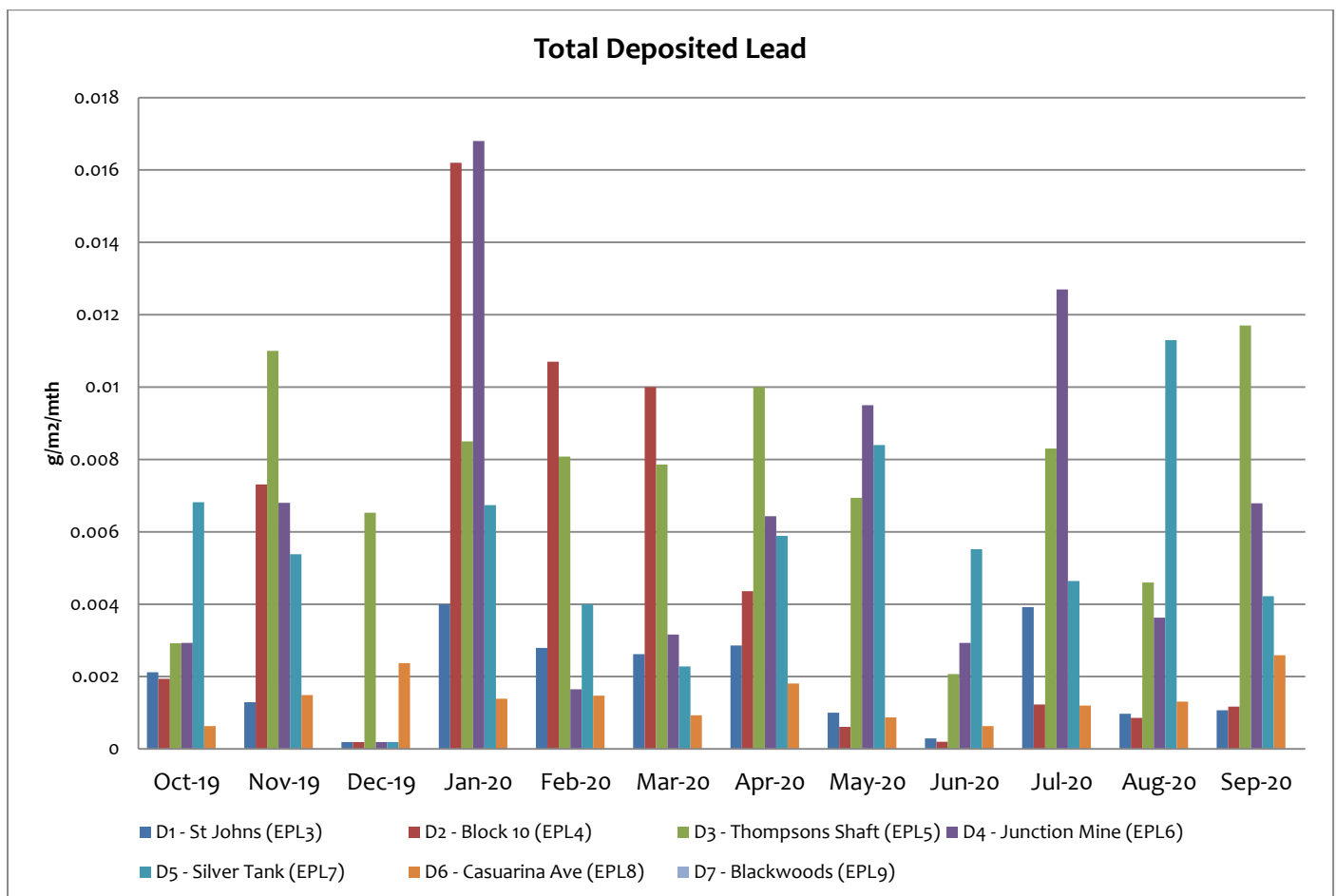
The dust levels recorded in Dust Gauges in September were elevated compared to previous months which is due to high winds and a dust storms which is to be expected at this time of year. The wind directions for September were highly variable as shown in the Wind Rose in Section 4. The highest dust levels were recorded in the D4 Junction Mine and D6 Casuarina Avenue gauges. The D6 Casuarina Avenue gauge is a control site reflecting regional dust



levels and community activity. Dust results at D4 Junction Mine in September were below the 2010 background levels and likely from a number of sources such as local traffic and nearby properties.

| Total Deposited Lead (g/m ² /Month) | | | | | | | |
|--|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|
| Sample Period | D1 (off Site) | D2 (on site) | D3 (on site) | D4 (on site) | D5 (on site) | D6 (off Site) | D7 (on site) |
| September 2020 | 0.00107 | 0.00117 | 0.0117 | 0.007 | 0.00422 | 0.00259 | NS |
| 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 September were highest in the D3 Thompsons Shaft and D4 Junction Mine gauges. The wind directions for September were highly variable but mainly from the South and West. Increased vehicle traffic at the Junction Mine and activities around the Rail Loadout area may account for increased dust and Lead levels at these location. Lead levels recorded at D3 Thompsons Shaft and D4 Junction Mine were higher than 2010 background levels.

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.



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 | 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 September

Monitoring of the Primary Bent Shaft (EPL1) and the Crusher Baghouse (EPL2) emissions is conducted on a quarterly basis and was last conducted on 16 June 2020. The next round of monitoring is expected to be conducted in November due to border closure and limitations on site access for contractors due to COVID-19 control measures. The measured results from this monitoring event were below the licence criteria.



2 Noise

2.1 Blasting (Vibration and Overpressure)

There are 6 vibration monitors at various locations to measure for vibration and overpressure from blast firings. These include V1 to V5 which are located off-site and V6 which is located on-site near Shaft 4. 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 September

Total Blasts:

- 0 production blasts occurred before 6.45 am or after 7.15 pm
- The number of Production blasts averaged 3.62 per week over the previous calendar year
- The number of Development blasts averaged 33.46 per week over the previous calendar year

Western Mineralisation and Main Lodes (excluding Block 7):

- 0 Blasts 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 = 4.8%

Block 7:

- 0 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 = 0%

The percentage of production blasts over 5 mm/sec in the Western Mineralisation and Main Lodes for the 12-month period is below the licence limit of 5%.

The percentage of production blasts over 3 mm/sec in Block 7 for the 12-month period is below the licence limit of 5%. There have been two production blasts in Block 7 in the previous 12 months and vibration from both blasts was below 3mm/s at compliance monitors.

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 last conducted in October 2019.

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 January. No limits are applied in the EPL to the results from groundwater monitoring.

EC results were lower than normal for Shaft 7 and Kintore in September and the trend will be monitored for ongoing variance. Rainfall in September is not the likely reason as EC levels were also lower than normal in August.

A drop in EC levels in GW11 is consistent with long-term levels and likely the result of increasing tailings levels in TSF2 sealing any shafts and cracks in the pit wall that would normally allow tailings waters to leach to the water table monitored by GW11.

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 September

| 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) | 6.63 | 9700 | 13400 | 3 | 4540 | 1690 | 493 | 268 | 1670 | 4.63 | 1.37 | 349 | 1260 | <0.05 |
| Kintore Pit (EPL54) | 6.46 | 9560 | 13700 | 4 | 4480 | 1680 | 493 | 275 | 1690 | 4.65 | 2.31 | 346 | 1250 | <0.05 |

Groundwater Bores (EPL37 - EPL52) Results for September

| 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) | | | | | | | | | | | | | | |
| GW02 (EPL38) | | | | | | | | | | | | | | |
| GW03 (EPL39) | 5.39 | 14700 | 12600 | <1 | 4300 | 2910 | 489 | 337 | 2120 | 0.972 | 2.47 | 247 | 203 | <0.05 |



| 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) |
|--------------|------------|--------------------------|------------|--|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| GW04 (EPL40) | 6.49 | 13900 | 11700 | 200 | 4270 | 2650 | 491 | 457 | 2100 | 0.125 | 0.001 | 62.1 | 28.1 | <0.05 |
| GW05 (EPL41) | 5.69 | 16000 | 15300 | 93 | 5920 | 2690 | 450 | 594 | 2430 | 0.72 | 0.222 | 319 | 257 | <0.05 |
| GW06 (EPL42) | 5.82 | 13800 | 12600 | 61 | 4600 | 2640 | 464 | 433 | 2010 | 0.832 | 0.11 | 256 | 165 | <0.05 |
| GW07 (EPL43) | 6.92 | 12100 | 11100 | 39 | 4090 | 1850 | 469 | 296 | 1700 | 2.04 | 0.111 | 232 | 258 | <0.05 |
| GW08 (EPL44) | 5.59 | 14000 | 13900 | 34 | 4780 | 2730 | 472 | 331 | 1940 | 1.2 | 1.21 | 531 | 558 | <0.05 |
| GW09 (EPL45) | 6.12 | 11600 | 10500 | 72 | 4110 | 1780 | 545 | 505 | 1400 | 1.45 | 0.007 | 105 | 154 | <0.05 |
| GW10 (EPL46) | 6.46 | 13900 | 11700 | 315 | 4040 | 2780 | 508 | 502 | 2060 | 0.135 | <0.001 | 3.99 | 18.4 | <0.05 |
| GW11 (EPL47) | 6.56 | 5860 | 4930 | 92 | 2400 | 643 | 328 | 187 | 736 | 0.0829 | 0.037 | 31.4 | 43.1 | <0.05 |
| GW12 (EPL48) | 5.68 | 13100 | 12200 | 80 | 4790 | 1760 | 416 | 543 | 1970 | 1.43 | 0.003 | 80.5 | 155 | <0.05 |
| 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. Sampling is expected to be undertaken in October (highest rainfall month as recorded by Bureau of Meteorology) and April.

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 September

| 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) |
|----------------------------|------|-------------------------------------|---------------|---|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| S9B-2 (EPL 33) | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| S31-1 (EPL 29) | 5.93 | 2460 | 3110 | <1 | 1600 | 44 | 172 | 25 | 58 | 4.83 | 1.64 | 146 | 533 | <0.05 |
| S1A (EPL 32) | 6.83 | 386 | 374 | 17 | 150 | 20 | 43 | 6 | 18 | 0.0796 | 0.581 | 3.5 | 11.3 | <0.05 |
| Upstream (EPL 35) | 6.68 | 646 | 500 | 45 | 211 | 42 | 72 | 11 | 45 | 0.0103 | 0.014 | 0.322 | 1.6 | <0.05 |
| Downstream (EPL 36) | 7.43 | 303 | 262 | 64 | 30 | 38 | 17 | 4 | 43 | 0.0001 | <0.001 | <0.001 | 0.008 | <0.05 |
| S49 (EPL 31) | 6.31 | 537 | 444 | 6 | 244 | 6 | 59 | 6 | 9 | 537 | 444 | 6 | 244 | 6 |
| Horwood Dam (EPL 34) | 6.38 | 6260 | 6510 | 6 | 3010 | 1190 | 375 | 212 | 1020 | 3.49 | 2.07 | 130 | 166 | <0.05 |

On 18 and 19 September, 31.3 mm of rain fell and samples were collected from surface water structures on 20 and 21 September. No standing water was available for sampling from the S9B-2 (EPL 33) sediment pond.

The results were consistent with those of past samples.



4 Weather Data

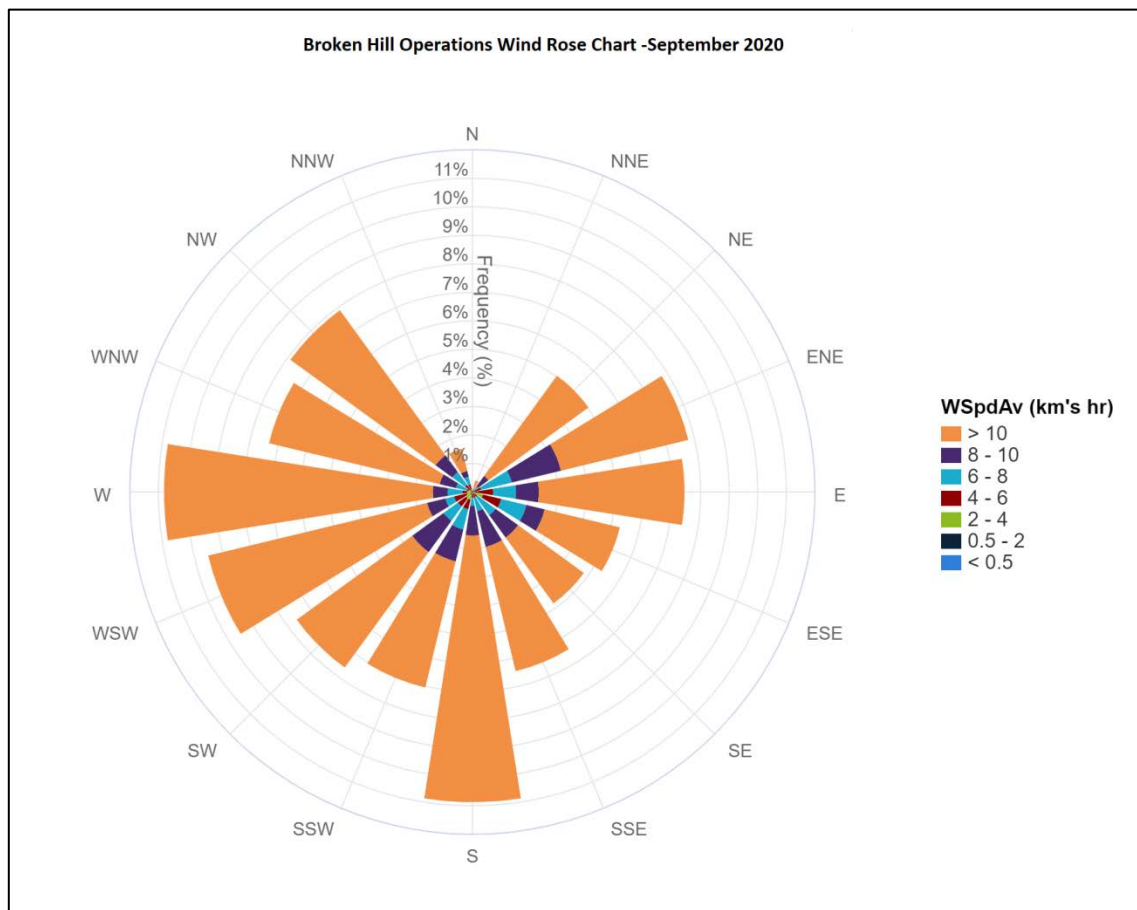
The weather station continuously monitors the following parameters as per Point 55 of the Environmental Protection Licence.

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 windrose provided below indicates the main wind directions for the month of September were from the South and West.





Weather Data Summary for September

| Date | Temperature @ 10m (°C) | | Wind Speed @ 10m (km/hr) | | Predominant Wind Direction @ 10m | | Rainfall (mm) |
|-----------|---------------------------|------|-----------------------------|------|-------------------------------------|--------|------------------|
| | Min | Max | Min | Max | Cardinal | Degree | Total |
| 01-Sep-20 | 7.2 | 18.8 | 4.0 | 31.7 | SE | 135 | 0.00 |
| 02-Sep-20 | 15.7 | 27.0 | 3.3 | 48.4 | SSW | 203 | 0.00 |
| 03-Sep-20 | 12.7 | 21.8 | 4.7 | 20.4 | South | 180 | 0.00 |
| 04-Sep-20 | 10.6 | 19.2 | 1.9 | 26.5 | West | 268 | 0.00 |
| 05-Sep-20 | 13.1 | 20.4 | 0.8 | 17.5 | SSW | 200 | 0.00 |
| 06-Sep-20 | 13.3 | 23.1 | 5.4 | 21.1 | NNE | 26 | 0.00 |
| 07-Sep-20 | 13.8 | 25.6 | 7.8 | 32.7 | NNE | 22 | 0.00 |
| 08-Sep-20 | 15.4 | 30.3 | 5.5 | 34.2 | South | 181 | 0.00 |
| 09-Sep-20 | 11.7 | 16.9 | 4.6 | 28.0 | SSE | 158 | 0.00 |
| 10-Sep-20 | 10.4 | 22.8 | 4.8 | 23.7 | ESE | 113 | 0.00 |
| 11-Sep-20 | 13.8 | 23.0 | 5.1 | 39.6 | NE | 44 | 0.00 |
| 12-Sep-20 | 14.6 | 25.3 | 7.7 | 38.9 | South | 181 | 0.00 |
| 13-Sep-20 | 12.1 | 21.0 | 7.1 | 30.7 | SSE | 162 | 0.00 |
| 14-Sep-20 | 8.6 | 19.3 | 9.7 | 30.6 | SSE | 158 | 0.00 |
| 15-Sep-20 | 8.5 | 21.1 | 2.5 | 22.8 | ESE | 113 | 0.00 |
| 16-Sep-20 | 15.8 | 27.4 | 3.9 | 29.4 | NE | 45 | 0.00 |
| 17-Sep-20 | 19.9 | 30.0 | 3.0 | 34.2 | SSW | 201 | 0.00 |
| 18-Sep-20 | 17.6 | 28.5 | 3.0 | 32.1 | ENE | 70 | 1.90 |
| 19-Sep-20 | 12.3 | 17.9 | 3.4 | 60.2 | NE | 44 | 29.40 |
| 20-Sep-20 | 14.1 | 23.0 | 5.6 | 32.8 | SE | 136 | 0.00 |
| 21-Sep-20 | 13.1 | 20.7 | 5.9 | 27.2 | WNW | 294 | 0.00 |
| 22-Sep-20 | 11.2 | 17.9 | 5.2 | 38.9 | West | 271 | 0.00 |
| 23-Sep-20 | 9.3 | 16.8 | 6.2 | 33.1 | WSW | 246 | 0.00 |
| 24-Sep-20 | 8.0 | 15.2 | 1.5 | 33.4 | NW | 312 | 0.00 |
| 25-Sep-20 | 6.0 | 12.0 | 8.0 | 39.5 | WSW | 245 | 0.40 |
| 26-Sep-20 | 5.2 | 14.1 | 4.1 | 22.6 | SSW | 204 | 0.00 |
| 27-Sep-20 | 6.3 | 15.4 | 4.1 | 14.7 | SE | 137 | 0.00 |
| 28-Sep-20 | 9.1 | 18.4 | 5.2 | 23.3 | ENE | 66 | 0.00 |
| 29-Sep-20 | 11.9 | 21.4 | 5.4 | 28.4 | NE | 45 | 2.40 |
| 30-Sep-20 | 12.5 | 20.2 | 1.7 | 26.3 | West | 265 | 0.00 |



5 Data Log

| Sample | Result Received |
|----------------------------------|-----------------|
| Hi Volume Samples | 26-10-2020 |
| TEOM | 28-10-2020 |
| Dust Deposition | 2-11-2020 |
| Vents & Bag House | 24-07-2020 |
| Water | 15-10-2020 |
| Blast vibration and overpressure | 1-10-2020 |
| Weather | 1-10-2020 |
| Date posted to web site | 20-11-2020 |

6 Correction Log

No corrections.