ENDEAVOR OPERATIONS PTY LTD

ENDEAVOR MINE

FEBRUARY 2019 MONTHLY ENVIRONMENTAL REPORT

Name of Operation	Endeavor Mine
Name of Licensee	Endeavor Operations Pty Ltd
Environmental Protection Licence	No: 1301
Reporting Period Start Date	1 February 2019
Reporting End Date	28 February 2019
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Contents

1 INTRODUCTION

We at Endeavor Mine conduct systematic and periodic environmental monitoring to substantiate the effectiveness of our environmental controls which are in place to protect the environment, the health of our workers, our neighbours and the greater community. Welcome to the February 2019 Environmental Monitoring Report. This report has also been produced to satisfy our reporting obligations under the Protection of the Environment Operations Act 1997 (POEO Act), Mine Operational Plan (MOP) and EP Licence 1301 which requires for Endeavor Mine to publish or make pollution monitoring data available to members of the public. The report provides a summary of monthly environmental monitoring results for February 2019.

Endeavor Mine's environmental monitoring program includes the monitoring of contaminants to air, surface water and ground water at locations within or beyond mine site boundary. The program also involves the monitoring of noise (when required), the management of hazardous and non-hazardous waste, the deposition of tailings and reporting of resources such as raw water usage. All monitoring is conducted in accordance with regulatory requirements and the EOPL Annual Environmental Monitoring Plan. Samples are collected and handled in accordance and compliance with regulatory requirements and taken to laboratories accredited by the National Association of Testing Authorities (NATA) for analysis. The Report also compares the results against established internal and external targets and provides critical discussion on environmental issues and sustainability initiatives during the monitoring period.

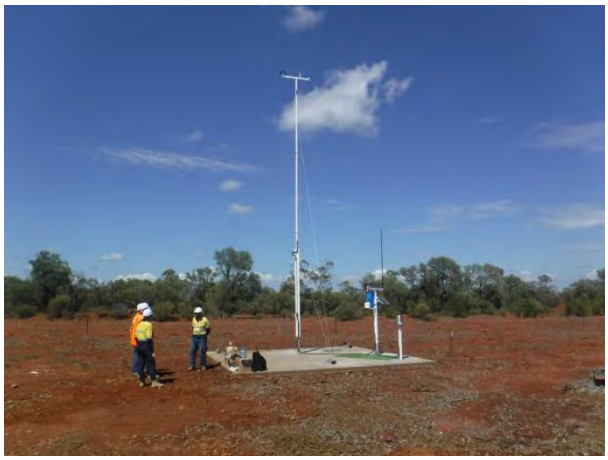
1 Meteorology

The following section presents historical and current weather data for Cobar and the surrounding Shire. Endeavor has installed on site a high quality weather station to enable more accurate on site data to be downloaded and reported. The December Report was the first use of data collected from site. This includes a change in format on how we present the data.

1.1 Air Temperature, Relative Humidity and Barometric Pressure

History

Cobar has a semi-arid climate with hot summers and cool to mild winters. Winter nights can be quite cold. Average monthly maximum temperatures tend to range from 13C to 20C in winter to between 28C to 39C in summer. Average monthly minimum temperatures range from 2C to 8C in winter to 14C to 24C in summer. The humidity in Cobar is low. During the summer the average relative humidity is about 30% in the afternoon and about 50% at 9am. In winter it is about 45% at 3pm, whilst it is about 75% at 9am.



1.1.1 Air Temperature, Relative Humidity and Barometric Pressure: Data and Discussion

The average air temperature for the Endeavor Mine for February 2019 was 27.93°C with a Maximum Temperature of 41.1°C. Figure 1.1 shows the data in a daily graphical representation of averages for Air Temperature, Relative Humidity and Barometric Pressure. Figure 1.2 shows the Daily Maximum Air Temperature for February 2019. Groundwater monitoring was to be undertaken during January 2019 but was delayed until February to allow collection to be done in safe conditions although temperatures remained in the mid to high 30's temperatures.

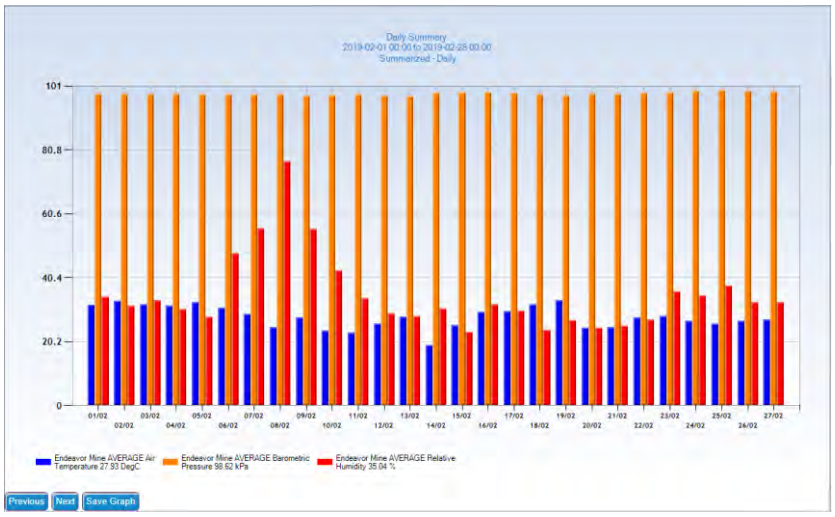


Figure 1.1: Monthly Temperature, Humidity and Barometric Pressure for February 2019

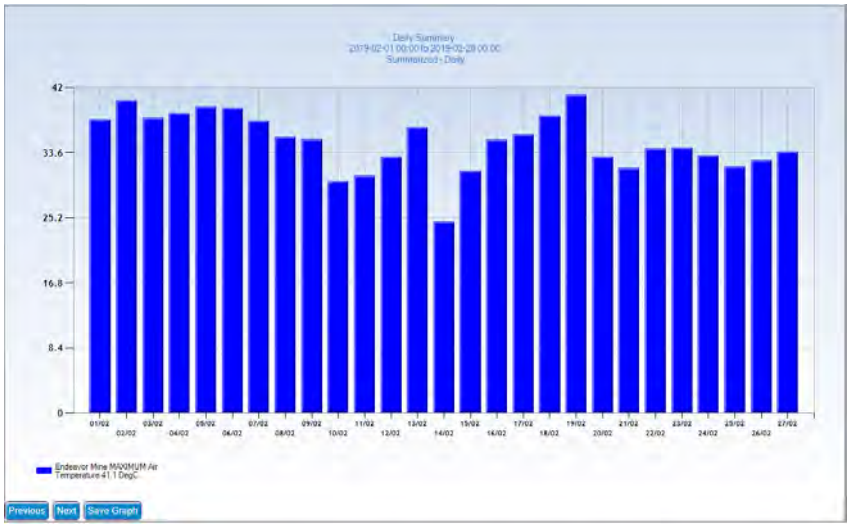


Figure 1.2: Daily Maximum Air Temperature for February 2019

1.2 Wet Bulb Temperature

*The **wet-bulb temperature** is the steady-state temperature reached by a small amount of liquid evaporating into a large amount of unsaturated gas-vapour mixture. Humans and many mammals have an internal body temperature of approximately 98.6 degrees Fahrenheit (37 Degrees Celsius) and cannot tolerate a wet-bulb temp's above 35 Degrees Celsius for longer than six hours.*

Humans cool themselves through their skin. Internal heat can dissipate when the external temperature is cooler than internal body temperature. But when the external wet-bulb temperature is 35 degrees or above, the body can't cool itself and begins to experience hyperthermia.

Extended hyperthermia is associated with ill health and eventually death. The Endeavor Weather Station has the measurement for Wet Bulb Temperature for surface conditions. Use the scale to the right as a scale as a guide for exposure and water intake.

Heat Stress Category (WBGT)	Moderate Work		Hard Work	
	Work/Rest Cycle	Water Intake Per Hour	Work/Rest Cycle	Water Intake Per Hour
White ≤76.9°F (≤24.9°C)	60/15 MINUTES	300 ml (1/3 qt)	40/20 MINUTES	500 ml (1/2 qt)
Green 77-81.9°F (25-27.7°C)	60/15 MINUTES	750 ml (3/4 qt)	40/20 MINUTES	1000 ml (1 qt)
Yellow 82-84.9°F (27.8-29.4°C)	40/20 MINUTES	1000 ml (1 qt)	30/30 MINUTES	1000 ml (1 qt)
Red 85-88.9°F (29.5-31.6°C)	30/30 MINUTES	1000 ml (1 qt)	Exercise is forbidden. Very high risk for heat casualties.	
Black ≥89°F (≥31.7°C)	Exercise is forbidden. Very high risk for heat casualties.			

1.2.1 Wet Bulb Temperature: Data and Discussion

Nevertheless, the data demonstrates a Maximum, Minimum and Average Wet Bulb temperature (Figure 1.3). All maximum measurements remained under the 27^0 threshold and show surface Wet Bulb work conditions to be generally safe. However due to the result of high levels of solar radiation, precautionary warnings were communicated to all personnel to avoid strenuous activity during the hotter parts of the day and rehydration should be observed.

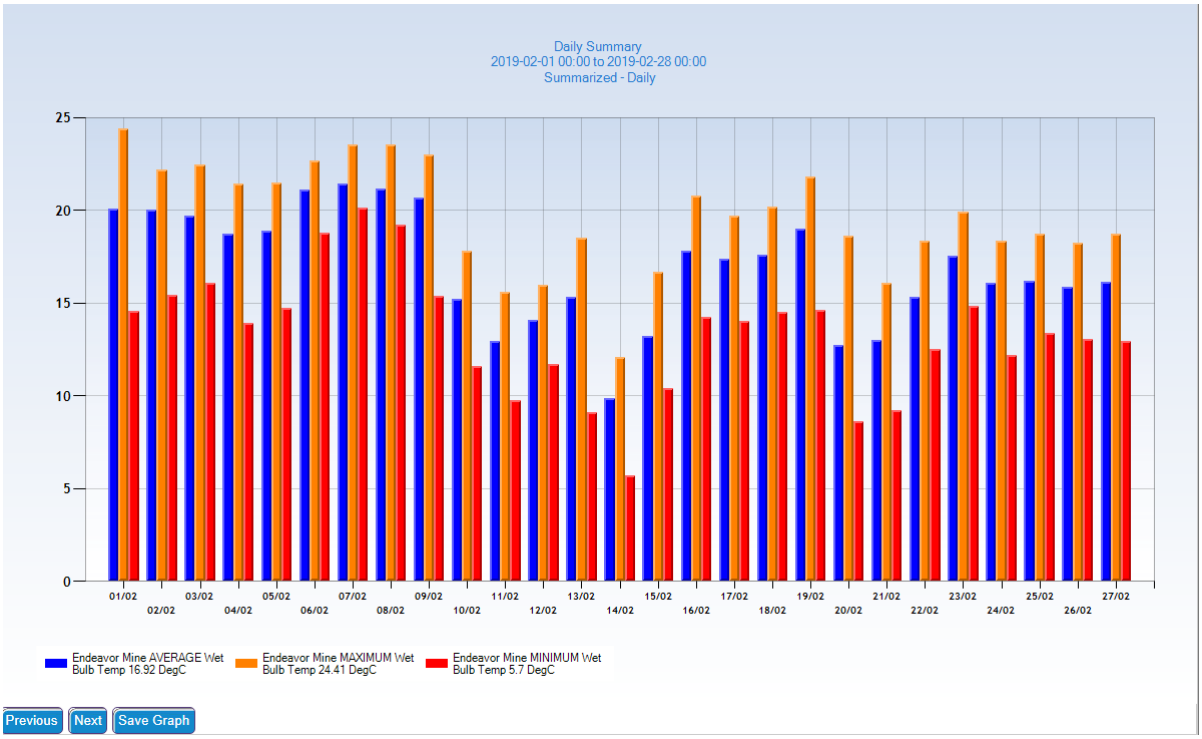


Figure 1.3: Daily Max, Min and Ave Wet Bulb Temperature Levels for February 2019

1.3 Black Globe Temperature

Black Globe Temperature is the temperature measured at a perfectly non-reflective black surface placed directly in the line of thermal radiation. Usually applied to the measurement of solar radiation temperatures at the earth's surface, to allow engineers and scientists to design equipment for exposure to high levels of solar radiation and heating, typically in desert climates such as the Middle East, the Sahara Desert, the Gobi Desert and Australia. Black Globe Temperature is also used to calculate Thermal Work Limits

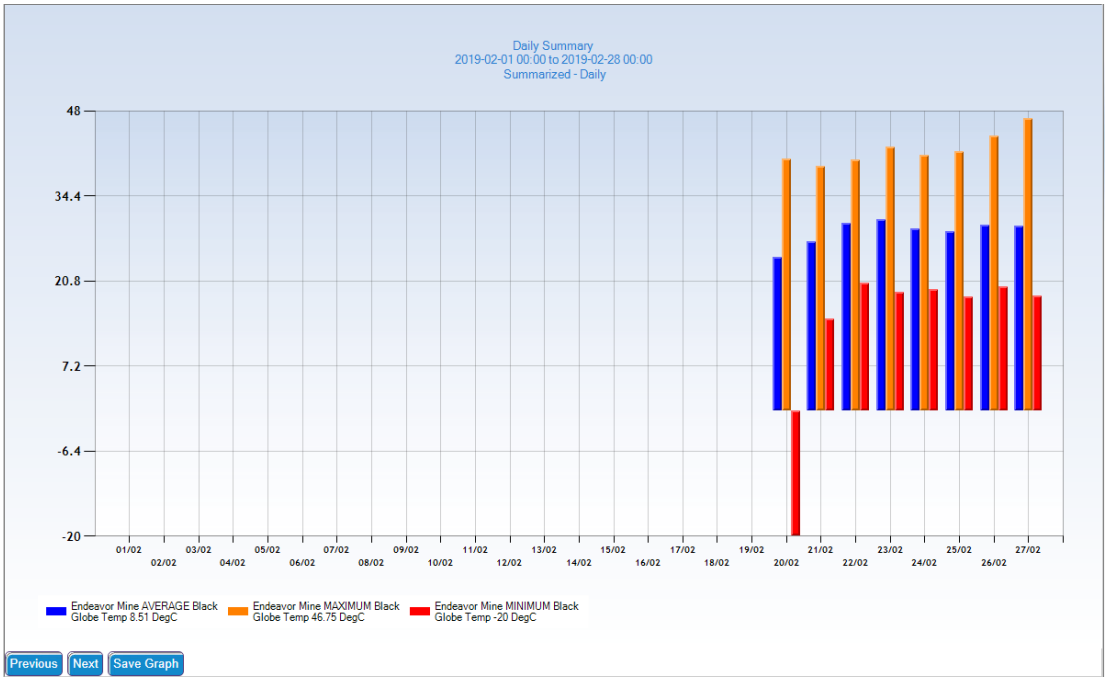


Figure 1.4: Min, Max and Ave Black Globe Temperature for February 2019

As shown in Figure 1.4, the measurement of Black Globe Temperatures commenced on the 19th of February once the sensors were installed at the weather station. The negative result as shown for the 20th appears to be an abnormality. All other days appear to be within normal range.

1.4 Thermal Work Limit

TWL is calculated using five environmental parameters – dry bulb, wet bulb and globe temperatures, with the addition of wind speed and atmospheric pressure. It also accommodates for clothing factors to arrive at a prediction of a safe maximum continuously sustainable metabolic rate (W/m2) for the conditions. TWL has been widely adopted and implemented in Australia's underground mining industry, resulting in a reduction in heat illness and lost production.

Thermal Work Limit - Working Zones
Control Interventions, Rest-Work and Rehydration Schedules

Working Zones	Interventions	Rehydration Schedule (per hr)	Work-rest Schedule (minutes)
Low Risk Unrestricted Zone TWL: 140 - 220 +	**No limits on self-paced work**# for educated, hydrated workers.	Light Work 600 ml - 1 Litre / hr	Safe for **all** continuous **self-paced work**#
Medium Risk Cautionary Zone TWL: 115 – 140	**Cautionary zone indicates situations in which environmental conditions require additional precautions.** • Practicable Engineering control measures to reduce heat stress should be implemented e.g. provide shade, improve ventilation etc. • Working alone to be avoided • No unacclimatised person to work* • Ensure adequate fluid intakes appropriate for type of work	Light Work 1 -1.2 Litres / hr	Safe for continuous **self-paced light work**#
		Heavy Work > 1.2 Litres / hr *	**Continuous paced work** 45 work - 15 rest
High Risk Zone TWL: < 115	• **Strict Work/Rest cycling required** • No person to work alone • No unacclimatised person to work* • High Risk induction required emphasising hydration and identifying signs of heat strain • Provide personal water bottle (2 litre capacity) on-site at all times	All Work >1.2 Litres / hr *	Light work# 45 work – 15 rest
			Heavy work#: 20 work - 40 rest

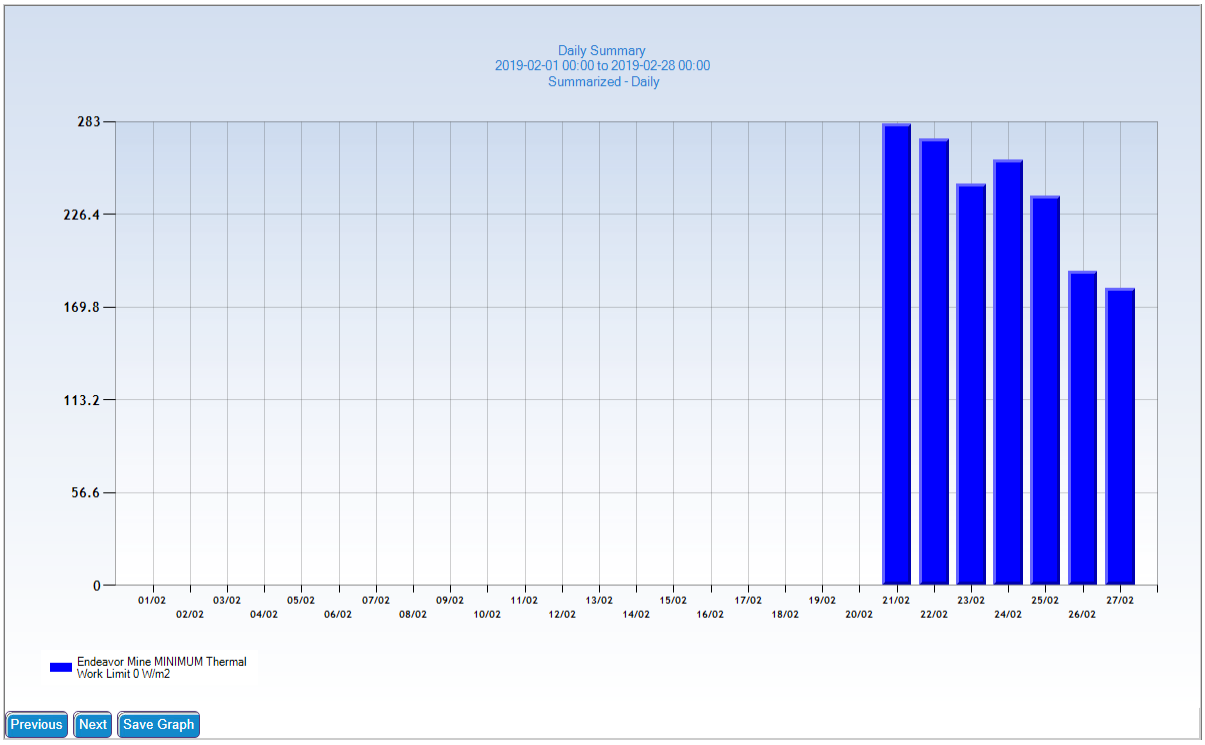


Figure 1.5: Thermal Work Limits Levels for February 2019

The lower the reading the more risk to human health. As shown in Figure 1.4, the measurement of Thermal Work Limits commenced on the 19th of February once the sensors were installed at the weather station. Levels were within acceptable levels.

1.5 Rainfall

History

On average, rainfall in the Cobar region tends to be uniformly distributed throughout the year, with a median annual rainfall of 390-400mm. The average monthly rainfall is 33mm. The rainfall is however extremely variable, and this is particularly so in late summer and early spring when the highest observed falls have been in excess of 200mm in any one month. This results in the average monthly rainfall being greatly in excess of the median monthly rainfall for some months. In February, February and December, for example, the average rainfall is more than double the median rainfall.

1.5.1 Rainfall: Data and Discussion

There was 34.2 mm of rainfall at Endeavor Mine during February 2019 (Table 1.1). Year to Date (YTD) is shown in Table 1.2. Maximum daily rain was recorded on the 8th of February with 13.4mm.

Table 1.1: Rain Gauge Total for February 2019

Weather Station	Date	TOTAL Rain Gauge - mm
Endeavor Mine	2019-02-01	1
Endeavor Mine	2019-02-02	0
Endeavor Mine	2019-02-03	0
Endeavor Mine	2019-02-04	0
Endeavor Mine	2019-02-05	0
Endeavor Mine	2019-02-06	9.4
Endeavor Mine	2019-02-07	10.2
Endeavor Mine	2019-02-08	13.4
Endeavor Mine	2019-02-09	0.2
Endeavor Mine	2019-02-10	0
Endeavor Mine	2019-02-11	0
Endeavor Mine	2019-02-12	0
Endeavor Mine	2019-02-13	0
Endeavor Mine	2019-02-14	0
Endeavor Mine	2019-02-15	0
Endeavor Mine	2019-02-16	0
Endeavor Mine	2019-02-17	0
Endeavor Mine	2019-02-18	0
Endeavor Mine	2019-02-19	0
Endeavor Mine	2019-02-20	0
Endeavor Mine	2019-02-21	0
Endeavor Mine	2019-02-22	0
Endeavor Mine	2019-02-23	0
Endeavor Mine	2019-02-24	0
Endeavor Mine	2019-02-25	0
Endeavor Mine	2019-02-26	0
Endeavor Mine	2019-02-27	0

Table 1.2 and Figure 1.6 show the daily and total rainfall for February 2019 and YTD. YTD for 2019 as of February 28, 2019 was 53.2mm compared to 2018 of 6.4mm.

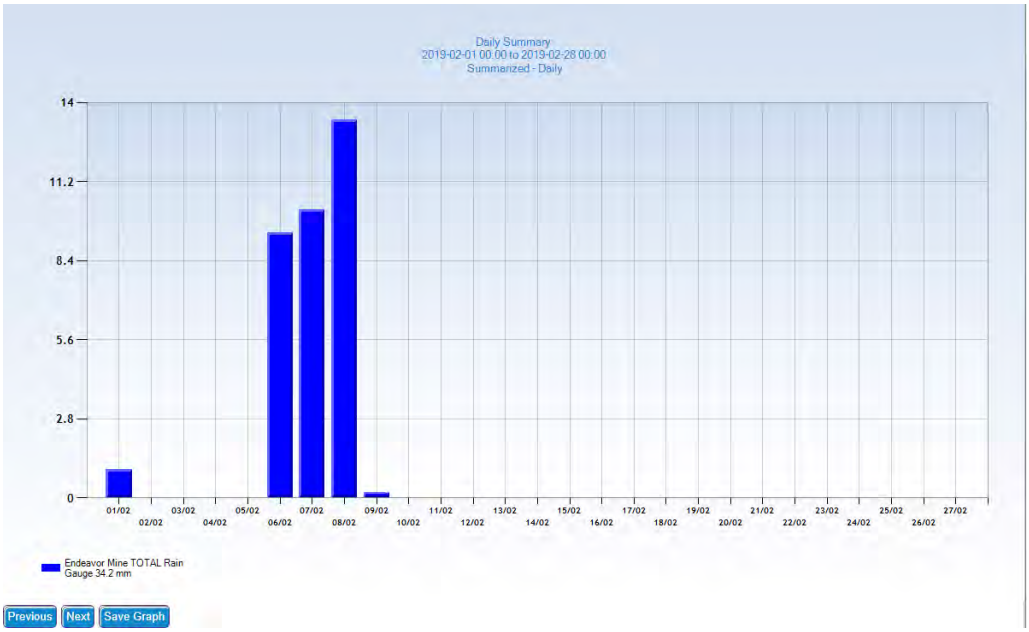


Figure 1.6: Rain Gauge Total for February 2019

Table 1.2: YTD Rainfall for Cobar, NSW (01/01/2019 to 31/01/2019)

Jan 2019	Feb 2019	March 2019	April 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	YTD
19 mm	34.2mm	0mm	0mm	0mm	0mm	0mm	0mm	0mm	0mm	0mm	53.2 mm

1.6 Wind

History

Wind can play a critical role in a site's environmental performance, particularly with dust deposition and noise depending on wind direction. Wind direction is reported by the direction from which it originates. For example, a northerly wind blows from the north to the south. Wind direction is usually reported in cardinal directions or in azimuth degrees. Wind direction is measured in degrees clockwise from due north. The predominant wind direction for the Cobar region is East or North East, but will come from the North occasionally West during the hotter periods. Forecasts of wind speed and direction are the average of these gusts and lulls, measured over a 10-minute period at a height of 10 metres above sea level. Peak Wind is defined as, "The highest wind speed observed at the station" during a given 24-hour period of time". This is a measurement of a burst or a gust of wind that one feels over a very short period of time. In the case of the peak wind, the very short period of time is usually three seconds.

Common	Degree
N	350, 360, 010
N/NE	20, 30
NE	40, 50
E/NE	60, 70
E	80, 90, 100
E/SE	110, 120
SE	130, 140
S/SE	150, 160
S	170, 180, 190
S/SW	200, 210
SW	220, 230
W/SW	240, 250
W	260, 270, 280
W/NW	290, 300
NW	310, 320
N/NW	330, 340

1.6.1 Wind Speed and Wind Gusts: Data and Discussion

As shown in Table 1.3 and Figure 1.7, the average wind speed for February 2019 was 9.99km/h with a maximum speed of 35.7 km/h and a maximum wind gust of 54.4 km/h.

Table 1.3: Maximum and Average Wind Speed and Maximum Wind Gusts February 2019

Weather Station	Date	AVERAGE Wind Speed 10m - km/h	MAXIMUM Peak Wind Gust 10m - km/h	MAXIMUM Wind Speed 10m - km/h
Endeavor Mine	2019-02-01	10.4	30.8	24.6
Endeavor Mine	2019-02-02	9.3	36.7	22.5
Endeavor Mine	2019-02-03	9.4	36.7	26.1
Endeavor Mine	2019-02-04	7.5	31.9	22.3
Endeavor Mine	2019-02-05	6.4	34.3	20.4
Endeavor Mine	2019-02-06	8.7	35.5	27.5
Endeavor Mine	2019-02-07	9.1	43.8	30.7
Endeavor Mine	2019-02-08	8	45	31.1
Endeavor Mine	2019-02-09	8.3	45	28.2
Endeavor Mine	2019-02-10	12.1	37.9	27.4
Endeavor Mine	2019-02-11	6.7	26	19.6
Endeavor Mine	2019-02-12	6.9	35.5	25
Endeavor Mine	2019-02-13	17.8	54.4	35.7
Endeavor Mine	2019-02-14	11.2	41.4	26.2
Endeavor Mine	2019-02-15	11.9	39	27.4
Endeavor Mine	2019-02-16	10.4	33.1	21.7
Endeavor Mine	2019-02-17	7.2	28.4	21.6
Endeavor Mine	2019-02-18	6.1	23.7	18.6
Endeavor Mine	2019-02-19	12.1	37.9	28.9
Endeavor Mine	2019-02-20	11.5	35.5	27.2
Endeavor Mine	2019-02-21	12.6	35.5	28.1
Endeavor Mine	2019-02-22	14.4	43.8	30.5
Endeavor Mine	2019-02-23	13.1	49.7	31.3
Endeavor Mine	2019-02-24	12.5	39	26.9
Endeavor Mine	2019-02-25	13.2	36.7	26.3
Endeavor Mine	2019-02-26	7.7	33.1	22.7
Endeavor Mine	2019-02-27	5.3	24.9	18.5

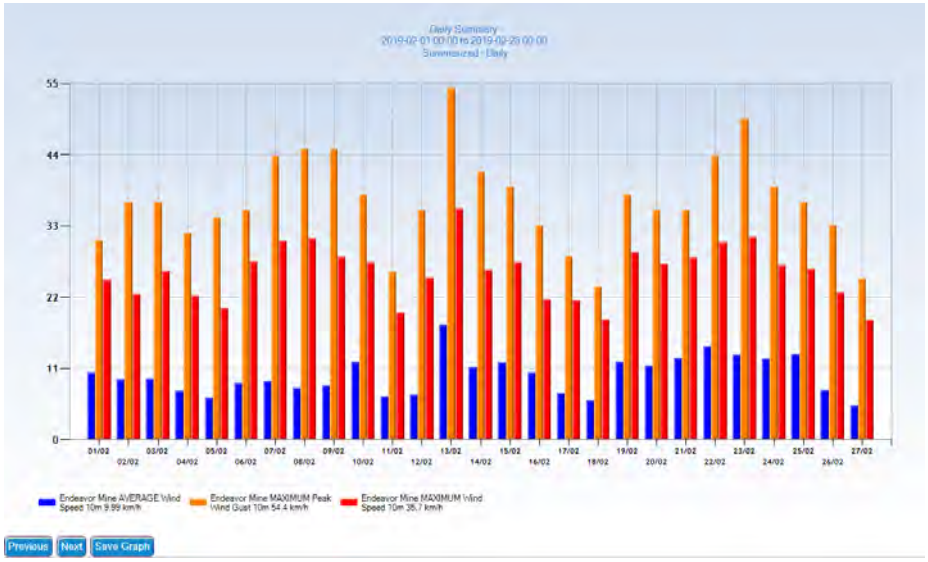


Figure 1.7: Average Wind Speed, Maximum Wind Speed and Maximum Wind Gusts for February 2019

1.6.2 Wind Direction: Data and Discussion

With increased air temperatures, wind patterns became more sporadic with the predominate wind coming from East (E) and South/South West (S/SW). Figure 1.8 illustrates the Wind Rose for the Endeavor Mine for February 2019.

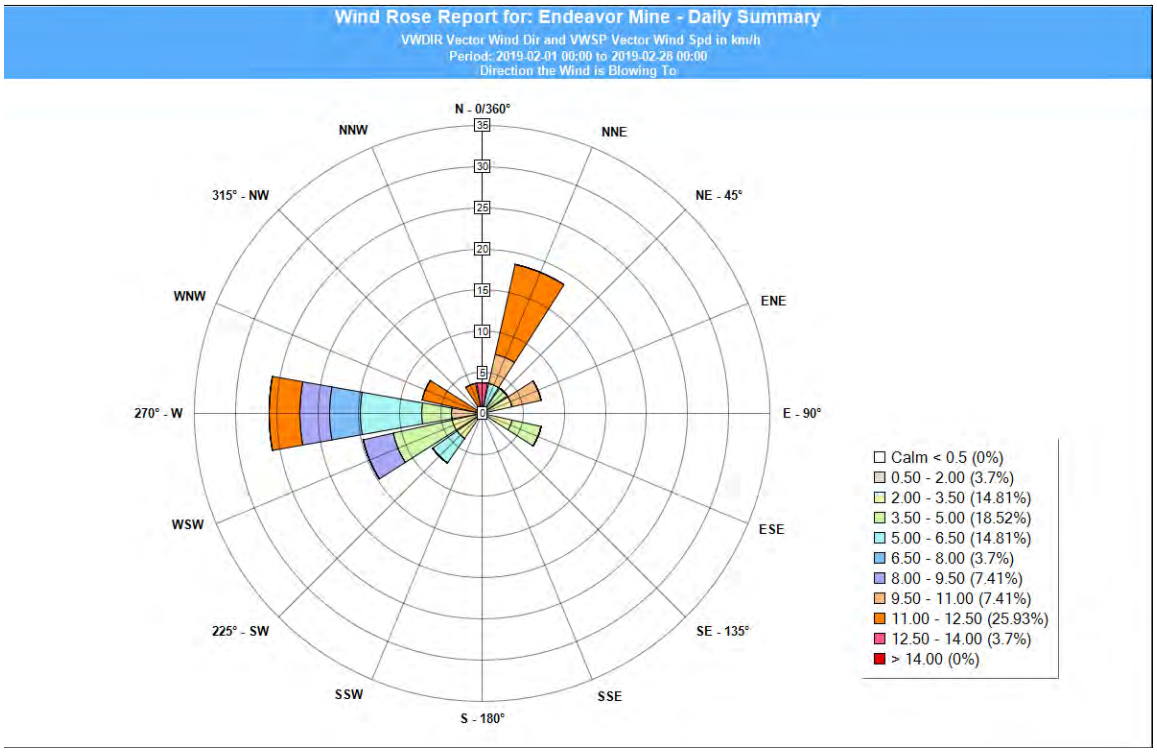
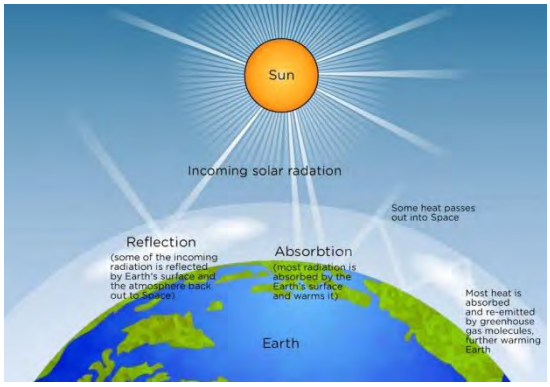


Figure 1.8: Wind Rose for the Endeavor Mine for February 2019

1.7 Solar Radiation

History

Solar radiation *is radiant energy emitted by the sun, particularly electromagnetic energy. About half of the* ***radiation*** *is in the visible short-wave part of the electromagnetic spectrum. The other half is mostly in the near-infrared part, with some in the ultraviolet part of the spectrum. The Sun releases an estimated 384.6 yotta watts of energy in the form of light and other forms of radiation. We are able to survive on Earth because the energy is spread over the area of a sphere with a radius of approximately 93,000,000 miles. At the Earth's surface, the energy density is reduced to approximately 1,000 W/m2 for a surface perpendicular to the Sun's rays at sea level on a clear day. There is well established evidence that exposure to ultraviolet radiation (UVR) from the sun can lead to skin cancer and eye damage. For best protection use a combination of sun protection measures.*



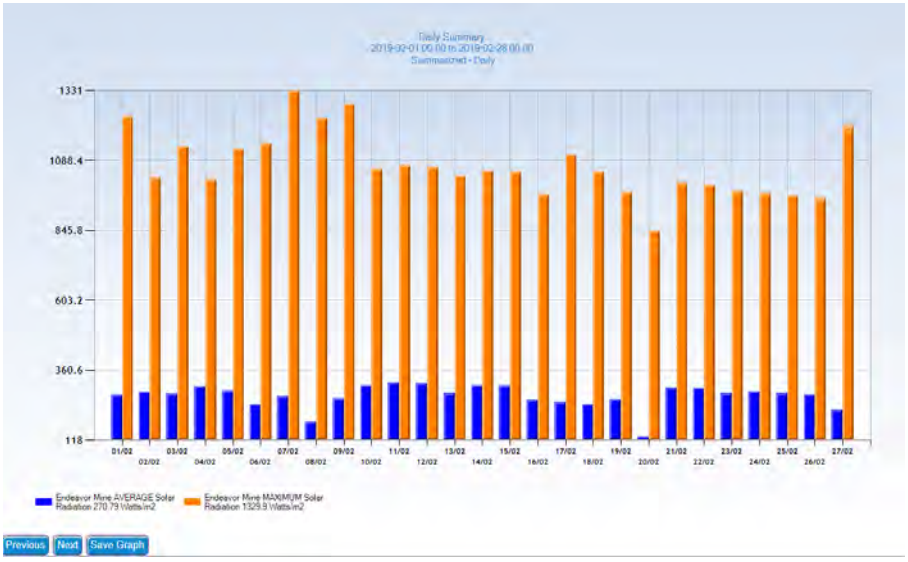


Figure 1.9: Daily Solar Radiation Levels (Ave and Max) February 2019

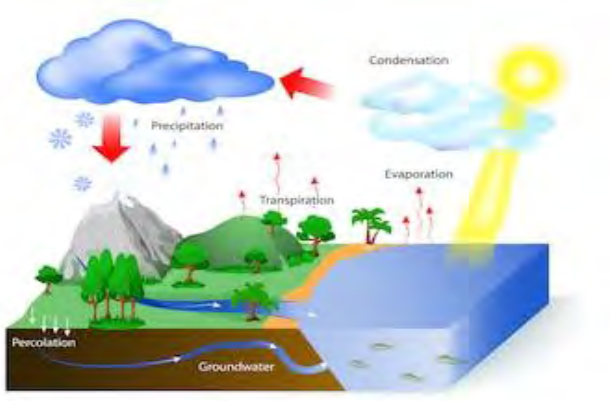
1.7.1 Solar Radiation: Data and Discussion

The Maximum Solar Radiation measurement was 1329.9 Watts/m^2 (Figure 1.9), which was lower than January but still making it a must for PPE and reducing direct exposure. The average for February 2019 was 270.79 Watts/m^2. As shown in Figure 1.9, most days were in exceedence of the 1000 Watts/m^2 level used as the norm.

1.8 Rate of Evaporation

The Measurement of Evaporation Rate *is defined as the amount of water which evaporates from an open pan called a Class A pan. The rate of evaporation depends on factors such as cloudiness, air temperature and wind speed. It is measured in millimetres of fluid evaporated per hour.*

The mean evaporation rate for the Endeavor Mine is 1953mm – 6 times the annual rainfall.



1.8.1 Rate of Evaporation: Data and Discussion

As shown in Table 1.4 and Figure 1.10, evaporation rates were lower than January as a result of lower temperatures, lower humidity and solar radiation levels. The Highest evaporation was

observed on the 13th of February with a rate of 9.09 mm. Evaporation is a critical tool in the management of tailings supernatant.

Table 1.4: Total Daily Evaporation Rates for February 2019

Weather Station	Date	TOTAL Daily Evaporation - mm
Endeavor Mine	2019-02-01	7.52
Endeavor Mine	2019-02-02	7.48
Endeavor Mine	2019-02-03	6.96
Endeavor Mine	2019-02-04	7.04
Endeavor Mine	2019-02-05	6.72
Endeavor Mine	2019-02-06	6.29
Endeavor Mine	2019-02-07	6.04
Endeavor Mine	2019-02-08	3.82
Endeavor Mine	2019-02-09	5.7
Endeavor Mine	2019-02-10	6.77
Endeavor Mine	2019-02-11	5.95
Endeavor Mine	2019-02-12	6.57
Endeavor Mine	2019-02-13	9.09
Endeavor Mine	2019-02-14	6.09
Endeavor Mine	2019-02-15	7.58
Endeavor Mine	2019-02-16	6.74
Endeavor Mine	2019-02-17	5.98
Endeavor Mine	2019-02-18	5.81
Endeavor Mine	2019-02-19	7.87
Endeavor Mine	2019-02-20	4.34
Endeavor Mine	2019-02-21	7.69
Endeavor Mine	2019-02-22	8.5
Endeavor Mine	2019-02-23	7.57
Endeavor Mine	2019-02-24	7.04
Endeavor Mine	2019-02-25	7.06
Endeavor Mine	2019-02-26	5.84
Endeavor Mine	2019-02-27	4.61

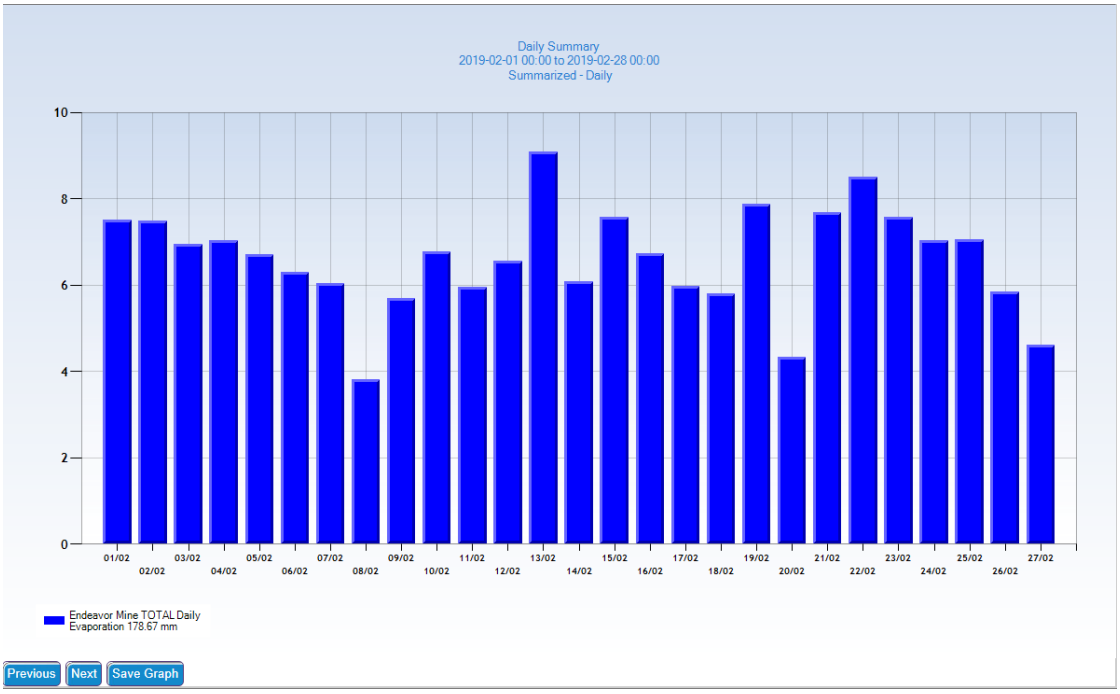


Figure 1.10: Daily Evaporation Rates for February 2019.

2 Monitoring Requirements

The Importance of Monitoring

Increasingly, mining companies are coming under pressure to improve their environmental, social and financial performance. The challenges stem from fluctuating stakeholder demands and shifting commodity prices. To many, keeping production costs down is a top priority to ensure profit margin are maintained. But it is much more than that.

Endeavor Mine has found by implementing more accurate and efficient environmental monitoring as part of their operational culture and practices, it has produced significant and positive impacts on overall performance. By truly understanding what is happening across the operation, more informed and sustainable decisions can be made about the business.

3 Dust Monitoring

Air quality aspects and impacts associated with site operations are managed in accordance with the Air Quality Management Plan (END-PLN-ENV-006) and the requirements detailed in NSW EP Licence 1301.

The Endeavor Mine is located 47km from the nearest town (Cobar) and 4.5km away from its nearest sensitive receptor (residential property). Therefore, dust deposition at these potential sensitive receptors is considered a low environmental risk.

Nevertheless, dust deposition on and beyond the boundary of the lease has the potential to cause environmental harm. Therefore Endeavor Mine manages airborne contaminants on site through the use of water sprays and a water trucks with depositional dust monitoring stations strategically located along the boundary of ML158/159/160/161 to measure performance.

3.1 Dust Monitoring Methodology and Limits

The Endeavor Mine Dust Monitoring Program measures dust deposition rates on a monthly basis at the main mining lease boundary (4 locations) and at a background location located 11km from the

operating mine site (DDG 5). EP Licence 1301 does not set limits for dust deposition. The results are however assessed against the recommended limits outlined in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW 2005*. This guidance document recommends that the deposition rate for total insoluble matter when expressed as a 12 month rolling average should not exceed 4 g/m^2/month and that site activities should not generate dust emissions which result in a dust deposition rate greater than 2 g/m^2/month above background levels. Table 3.1 describes the Pollutant, Units of Measure, Monitoring Frequency and Method of Sampling.

Table 3.1: Endeavor Mine Air Monitoring Requirements

Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 4

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 5

Pollutant	Units of measure	Frequency	Sampling Method

3.2 Monitoring Locations

As shown in the satellite image (Figure 3.1), there are 5 dust monitoring locations on the boundary of the lease, with one located 11kms from the site at the turnoff to the Mine site near the Louth Road. This station was positioned to establish background levels.

Figure 3.1: Endeavor Mine Dust Monitoring Locations

3.3 Dust Monitoring Data and Discussion

Table 3.2 shows the results of Monitoring for February 2019.

Table 3.2: Dust Monitoring Results for February 2019

Monitoring Location			DG1	DG2	DG3	DG4	DG5
Date / Sample Collected			**12/02/2018**	**12/02/2018**	**12/02/2018**	**12/02/2018**	**12/02/2018**
Dissolved Metals by ICP-MS		**Unit**					
Lead (Dissolved)	7439-92-1	mg/L	0.001	0.001	0.001	0.002	<0.001
Total Soluble Matter		g/mÂ².month	0.2	0.4	0.2	0.3	0.5
Total Insoluble Matter		g/mÂ².month	2.8	3.3	2.4	2.8	2.9

Table 3.2 shows the results for Soluble Matter (TSM) and Insoluble Matter (TIM) and Lead (Pb). Results for TIM were low and did not exceed the limit of 4 g/m^2/month as set in the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW 2005*. TSM were lower than the previous month result. Pb levels were again well within established guidelines. Insoluble levels were also lower suspected to be as a result of lower winds speeds and gusts and increased rain activity. This is also indicated in the upstream result (DDG5)

4 Groundwater Monitoring

Deep and Shallow Aquifers

Deep regional groundwater flows to the south west, conforming to the structural dip of the underlying sedimentary rocks. Groundwater inflow into the mine is observed at a depth range of between 60 to 80 m below ground surface. A shallow, perched aquifer occurs is found in the vicinity of the Central Tailings Discharge CTD between approximately 0.5 to 13 m below ground surface. This aquifer is recharged by rainfall and seepage water from the operational TSF via a permeable gravelly soil layer in the area.

A review of groundwater characteristics undertaken by consultants Environmental Earth Sciences (EES) in 2013 indicates there is no interface between the shallow perched water and the deep regional aquifer.

Ground Water Quality

Groundwater quality at the mine is generally poor due to the high salinity. The water has been sampled by NSW Water Conservation and Irrigation for the original Environmental Impact Statement (EIS) could be considered "brackish" and was found to have an electrical conductivity (EC) of 26,000 µS/cm (sea water is approximately 30,000 us/cm). Further, it was noted that the water was not suitable for stock, domestic or farm use. Potential contamination of the groundwater would be of low risk due to the naturally poor quality of the water.

4.1 Monitoring Locations

Endeavor Mine's groundwater monitoring locations are concentrated around the perimeter of the Central Tailings Discharge (CTD) and the Sector 5 Tailings Storage Facility (CTF), while surface water monitoring locations are focused on water storages that could potentially discharge to environment during a major rain or storm event. Table 4.1 describes the monitoring stations where Figure 2 shows the locations of the piezometers. Depending on availability of water or flow, unfortunately on some occasions, piezometers cannot be monitored as a result of being dry.

Table 4.1: Table 5: EPA Monitoring Stations

8	Discharge to tailings dam	Discharge to tailings dam	End of tailings line pipe that discharges"Sector Five" tailing dam as shown on map titled"Sector 5-tailing facility"and submitted to the DEC in document BTF 9027.
9	Groundwater monitoring Point		Piezometer labelled as "BH02" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
10	Groundwater Monitoring Point		Piezometer labelled as "BH02B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
11	Groundwater Monitoring Point		Piezometer labelled as "BH03" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
12	Groundwater Monitoring Point		Piezometer labelled as "BH06" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
13	Groundwater Monitoring Point		Piezometer labelled as "BH08A" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
14	Groundwater Monitoring Point		Piezometer labelled as "BH09" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
15	Groundwater Monitoring Point		Piezometer labelled as "BH10" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
16	Groundwater Monitoring Point		Piezometer labelled as "BH10B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
17	Groundwater Monitoring Point		Piezometer labelled as "BH12B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
18	Groundwater Monitoring Point		Piezometer labelled as "BH14" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).

Table 4.1: Table 5: EPA Monitoring Stations		
19	Groundwater Monitoring Point	Piezometer labelled as "BH15" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
20	Groundwater Monitoring Point	Piezometer labelled as "BH16" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
25	Groundwater Monitoring	Piezometer labelled as "BH13" on map titled "Statutory Groundwater Monitoring Locations" recieved by the EPA on 12/12/14.

Figure 4.1: : Location of the Piezometer Monitoring Locations

4.2 Groundwater Monitoring: Data and Discussion

Table 4.2: Groundwater Monitoring Results: February 2019												
Date of Sampling		**6/02/19**	**6/02/19**	**6/02/19**	**6/02/19**	**6/02/19**	**7/02/19**	**7/02/19**	**7/02/19**	**7/02/19**	**8/02/19**	**8/02/19**
Monitoring Locations		EPA 9	EPA 10	EPA 12	EPA 13	EPA 14	EPA 15	EPA 16	EPA 17	EPA 18	EPA 19	EPA 20
Analyte Grouping/Analyte	**Units**											
Standing Water Levels	Metres	3.13	3.45	2.98	5.34	3.36	8.17	5.48	8.67	4.65	7.31	3.32
pH Value	pH Unit	7.7	7.54	6.39	7.87	7.54	7.76	7.45	7.71	6.99	7.94	7.27
Electrical Conductivity @ 25Â°C	ÂµS/cm	15500	17100	17500	27200	18700	27200	19100	25400	16500	22300	19400
Total Dissolved Solids	mg/L	18300	16500	18300	16200	19200	23400	17900	19100	17400	22100	17100
Total Alkalinity as CaCO3	mg/L	941	987	115	933	778	878	748	813	633	915	187
Sulfate as SO4	mg/L	5310	5520	8690	4220	5980	6140	6370	4050	5740	6930	3420
Chloride	mg/L	2620	3180	2450	6950	2850	5250	3090	6310	2720	4150	5270
Calcium	mg/L	632	566	567	767	542	359	544	611	534	546	760
Magnesium	mg/L	945	1023	14`0	938	1420	649	1405	800	1420	1670	648
Sodium	mg/L	1630	2150	1750	4100	2290	5100	2440	3670	1590	2960	2770
Potassium	mg/L	107	112	92	148	236	225	185	217	134	158	87
Aluminium	mg/L	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 4.2: Groundwater Monitoring Results: February 2019											
Date of Sampling		**6/02/19**	**6/02/19**	**6/02/19**	**6/02/19**	**6/02/19**	**7/02/19**	**7/02/19**	**7/02/19**	**7/02/19**	**8/02/19**	**8/02/19**
Monitoring Locations		EPA 9	EPA 10	EPA 12	EPA 13	EPA 14	EPA 15	EPA 16	EPA 17	EPA 18	EPA 19	EPA 20
Analyte Grouping/Analyte	**Units**											
Arsenic	mg/L	0.084	0.064	2.22	0.004	0.011	0.019	0.008	0.006	0.008	0.005	0.003
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0041	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Copper	mg/L	<0.001	0.002	<0.001	0.005	0.001	0.004	0.002	0.002	0.003	0.002	<0.001
Lead	mg/L	<0.001	0.003	<0.001	0.002	0.083	0.081	<0.001	<0.001	0.006	0.02	<0.001
Manganese	mg/L	10.1	4.88	9.43	5.81	5.02	0.105	2.99	0.064	0.54	0.063	23.4
Nickel	mg/L	0.007	0.031	0.109	0.009	0.049	0.005	0.018	0.007	0.009	0.008	0.04
Selenium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.019	0.026	0.17	0.048	0.083	1.96	0.023	0.027	0.037	0.059	0.526
Iron	mg/L	2.61	<0.05	445	0.16	0.53	0.15	0.83	<0.05	<0.05	0.05	22.5
Mercury	mg/L	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0002	0.0001	<0.0001
Total Cyanide	mg/L	<0.004	<0.004	0.017	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

4.3 Monitoring Results Discussion

As shown in Table 4.2, sampling took place over three days as a result of reducing exposure to the heat and conditions. Samples were refrigerated daily until transported to the Laboratory for Analysis. Results were confident with previous quarterly results.

Brackish Groundwater

As previously mentioned in this report, the groundwater quality in the vicinity of the Endeavor Mine is naturally poor. pH is elevated, high EC and contains elevated TDS, Cl, Mg which is consistent with elevated elements consistent with seawater. It could be considered brackish and unsafe to drink or use for agricultural or stock use. Although quantitative definitions of this term vary, it is generally understood that brackish groundwater is water that has greater dissolved-solids content than occurs in freshwater, but not as much as seawater (35,000 milligrams per litre). As shown in Table 6, this is the case for the groundwater at Endeavor. It is considered be brackish if the source has dissolved-solids concentration between 1,000 and 10,000 milligrams per liter (mg/L). The term "saline" commonly refers to any water having dissolved-solids concentration greater than 1,000 mg/L and includes the brackish concentration range.

Seepage

Based on the results shown in Table 6, there appears to be no evidence of leachate in groundwater from both the CTD and the Sector 5 TSF. As shown in the meteorological data, the region has received very little to no rainfall during 2018.

Groundwater levels around Sector 5 could not be measured due to the lack of water or flow. Based on a review of pH, EC and the absence of high levels of dissolved metals, there appears to no signs of any environmental harm caused at both storage facilities and show and no signs of leaching into either the shallow or deep aquifers. It is expected that during the next quarter, that rainfall in the region may provide improved recharge of the aquifers and further monitoring opportunities will provide more representative samples.

No Groundwater Piezometers were sampled during February. Although sampling was planned, but due to extreme temperatures during this period, it was decided to abandon sampling until February 2019. This sampling will act as the 4th Quarter 2018.

5 Surface Water

History

Surface water is categorised in two the following categories:

Clean Water: *Water that has not been degraded by contact with mine operations and is of a suitable quality for release to the off lease receiving environment. Clean water includes: Raw Water, Potable Water, and Clean Stormwater. However in an arid and water starved environment like the Cobar Shire, water is reused and recycled at every opportunity.*

Contaminated Water: *Water containing potential contaminants or pollutants and not fit for discharge, water that has had contact mining and ore processing operations. Contaminated water includes: Process Water, Tailings Supernatant, Mine Water, and Contaminated Stormwater.*

5.1 Monitoring Methodology

Although not part of the legislative commitments, Endeavor monitors surface waters on the lease as part of its internal and operational commitment. The site does not release any water directly into the environment. It operates with a closed circuit. However Endeavor remains vigilant in understanding the risks associated of impacted surface water. The main surface water monitoring point is the Evaporation Pond which is measured monthly (Volumes and pH) and biannually along with all other site dams for pH, electrical conductivity (EC), total dissolved solids (TDS), Cations (Ca, Mg, Na, K, ionic balance), Anions (SO4, Cl, alkalinity, flouride), Cyanide (total) and dissolved metals (As, Cd, Cr, Cu, Pb, Ni, Mn, Zn, Al, Fe, Se, Hg). Water in the Supergene Pit and Pontoon Dam could not be sampled due to a lack of water and unsafe access to any surface water.

5.2 Monitoring Locations

Figure 5.1 shows the location of the surface water dams on site that are monitored for water quality bi-annually.

Figure 5.1: The Endeavor Mine: Main Water Storages

5.3 Surface Water: Data and Discussion

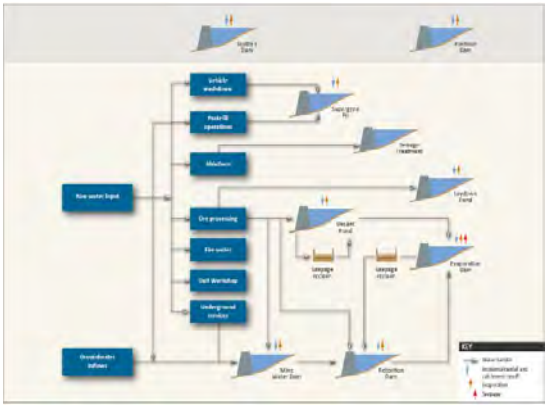
Due to the drought and low rainfall, it is difficult to access most of the dams with the exception of the Retention Dam. Access to the water's edge was hazardous. If rain occurs during March and it is safe, samples will be collected.

6 Raw Water Usage

History

The Cobar Water Board supplies raw water to the Endeavor Mine via a pipeline along the rail corridor. This water is sourced from Burrendong Dam (right) via a system of open channels, weirs and pipelines. Endeavor Mine currently holds a high security license for 1,280 Ml per annum, with average usage being 58,000KL per month. Supply of this water is controlled by the Cobar Water Board. The licensed volume of water is generally sufficient to support mining operations. If required, an above allocation water purchase can be made through the CWB depending on the level of drought and/or water restrictions placed on the area.

Raw water is reticulated across site for use as make up water for the Retention Dam (process water) and for "clean water" uses such as vehicle and equipment wash down and dust suppression. Raw water is initially stored in 5ML holding tank from where it is distributed to either: the raw water system, the potable water treatment plant or the fire water reticulation system.



6.1 Monitoring Methodology

Joint readings by personnel from Endeavor Mine Environmental Department and the Cobar Shire Council are conducted monthly.

6.2 Raw Water: Data and Discussion

Table 6.1 shows water usage year to date usage as well as usage for February 2019. Less water was used during February compared to later months in 2018. This is due to a reduction in production at the mine, paste fill and milling operations.

Table 6.1: Raw Water Use for February 2019

Date	YTD (KL)	Usage (KL) for February 2019
06/02/2019	159477	73235

7 Noise Management

Environmental Noise is the propagation of noise with harmful impact on the activity of human or animal life. According to the WHO, sound levels less than 70dB are not damaging to living organisms, regardless of how long or consistent the exposure. Exposure for more than 8 hours to constant noise beyond 85dB is deemed hazardous. A "Nuisance" noise is a noteworthy and unreasonable amount of sound from neighbouring properties or premises.

Endeavor Operations has never received a noise complaint from its neighbours. The closest sensitive receptor (neighbouring property) is Poon Boon Station, which is located 4.5 kms away from operations and has never reported a complaint for noise, dust, vibration or visual amenity. The predominant wind direction is from the east to north-east, therefore; the greatest potential noise risk is for 'Bundella', 11.8 km from the mine. Again, no complaints have been registered.

7.1 Noise and Vibration Assessment

If a noise complaint is registered, Endeavor Mine will identify the acoustic values where a potential source is emanating as well as determine background levels at the nearest sensitive receptor (nearest Property).

Acoustic values to be measured and considered include:

- Health and biodiversity of ecosystems;
- Human health and wellbeing, including ensuring a suitable acoustic environment for individuals to sleep, study or learn, and be involved in recreation, including relaxation and conversation; and
- The amenity of the community.

The noise and vibration assessment will involve the identification of a baseline noise environment, modelling of potential noise sources and assessment of potential impacts associated with the operation. Any impact assessment will be based on likely sources including indicative operating equipment.

7.1.1 Neighbours (Sensitive Receptor)

A sensitive receptor is considered to be a location in the vicinity of the operation, where noise December affect the amenity of the land use.

7.1.2 Noise Management Plan

Based on the results of the assessment, a noise management plan is in place to address how plan activities will be carried out, according to best practice noise management principles.

Best-practice noise management principles include:

- Noise impact assessments and emission calculations;
- Administration of activities;
- Stakeholder engagement;
- Adoption of noise attenuating technologies for plant and equipment (if practicable);
- Minimising background creep; and
- Containing and minimising variable noise;

7.2 Monitoring Locations

Potential Monitoring locations will include neighbouring properties. shows the location of the neighbouring properties.

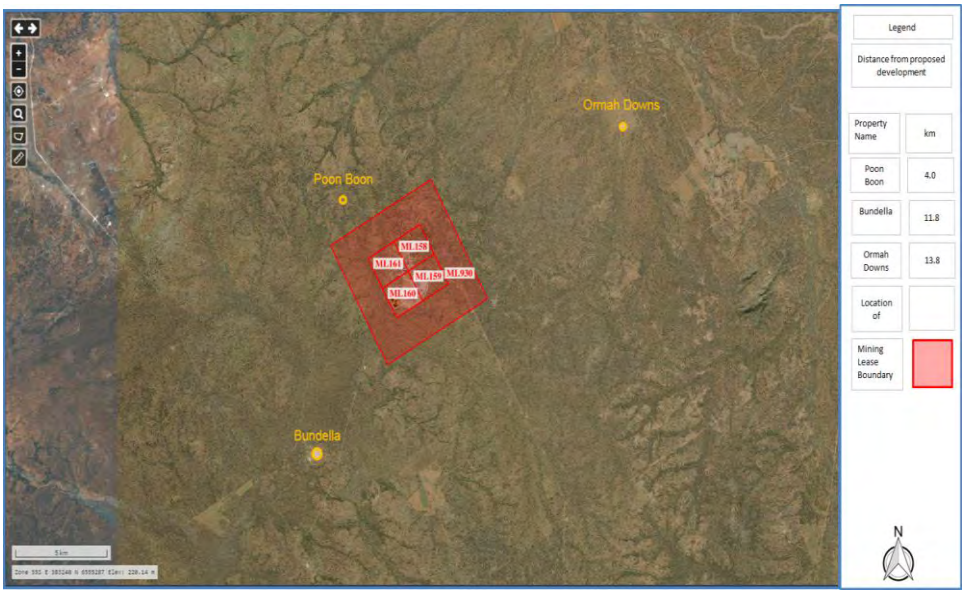


Figure 7.1: Closest Neighbours to Endeavor Mine

7.3 Noise Monitoring: Data and Discussion

No noise complaints were registered during February 2019. The Noise Management Action Plan was not activated. Year to date, Endeavor Mine has received no complaints regarding noise or any other nuisance issue.

8 Waste Management

Endeavor Mine has developed and implemented a Waste Management Plan to provide a framework for managing process and non-process wastes, both liquid and solid, excluding waste rock, overburden and tailings. Detailed internal procedures are used to support both the operation and maintenance of the waste. The primary objectives are to:

- ***Reduce potential health and environmental risks associated with waste generation and disposal;***
- ***Promote the efficient use and conservation of resources, reduce the need for waste treatment facilities and reduce the requirement for raw materials;***
- ***Minimise the use of hazardous materials and seek safer alternative materials where possible; and***
- ***Comply with statutory requirements, specifically the conditions set out in Environmental Protection Licence 1301 and site Mining Leases and other statutory requirements.***

As stated in EP1301, Endeavor Mine "*must not cause, permit or allow any waste to be received at the premises, except the wastes expressly meeting the definition as stated in its License*". Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the Table 8.1. Any waste received at Endeavor Mine is subject to the limits or conditions.

Code	Waste	Description	Activity	Other Limits
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005	As specified in each particular resource recovery exemption	NA
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA

Table 8.1: Requirements for the Storage and Handling of Waste under EP 1301.

8.1 Waste Management: Data and Discussion

During February 2019, EOPL undertook a scrap steel reduction program removing over 300t of Scrap Steel. The funds accumulated from the sale of the scrap, funded a massive reduction in trackable waste from site (hydrocarbons, batteries, e-waste).

9 Tailings Deposition

History

Tailings (also known as tails or residue) are the material left over after the process of separating the valuable fraction from the uneconomic fraction (waste) of the ore. Tailings are distinct from overburden or waste rock or other material that overlies an ore or mineral body and is displaced during mining without being processed.

The volumes of tailings can be large and require an engineered storage and capacity to safely house them, Depending on the nature of the ore or the type of extraction process, tailings can have the potential to harm the environment unless they are deposited and managed correctly.

The reporting of monthly tailings deposition is a legislative requirement as part of EP 1301.

9.1 Tailings Deposition: Data and Discussion

Table 9.1 shows the volumes of tailings deposited for February 2019. All tailings were deposited in the CTD TSF. Tailings were deposited in Sector 3.

Table 9.1: Tailings Deposition for February 2019

	Environment Protection Licence Monitoring Point 7		Environment Protection Licence Monitoring Point 8		
	Volume of tailings deposited (m^3)	Mass of tailing solids deposited (DMT)	Volume of tailings deposited (KL)	Mass of tailing solids deposited (DMT)	Mass of tailing solids deposited (DMT) YTD
February 2019	**20394**	**22750**	**0**	**0**	**57,979**

10 Tailings Dam Surveillance

Endeavor Mine undertake daily and weekly surveillance of the CTD TSF for signs of anomalies to tailings deposition, the freeboard, interception trenches, slope stability and erosion. During February 2019, there were no visible signs of leaching, seepage or cracks in the external embankment of the CTD TSF. Introduction of the central discharge platform (Eyebolt) has allowed for a more even distribution of slurry and more even beaching of tails. Standing water levels are measured for the presence of water in and around walls as well quarterly groundwater sampling and analysis.

Monthly Tailings Dam management Meetings are held to discuss any issues arising from inspections as well as discuss current and future works and projects. Minutes are kept and provided to Regulatory Authorities on request.

10.1 Discussion

There were no visible signs of seepage in the interception trench at all sections of outside of the external embankment during February. A series of Piezometers have been installed along the perimeter of the external embankment. All of the “Lift” Piezometers monitor for signs of moisture using a standing water level gauge. No water was detected during the monitoring of the Lift Piezometers. The following is minuted in the monthly Tailings Dam meeting records.

11 Waste Rock Management

History

The primary and most prevalent waste generated by many operations is waste rock or overburden. Waste Rock consists of the rock and target minerals in concentrations too low for economic recovery. This is generally not the case for an underground mine like Endeavor. In most cases, the rock is disposed of underground to backfill voids.

EOPL has been diligently working to maximise its mineral resource to extend its current mine life beyond 2023. This exploration program is critical to the future of Endeavor Mine's shareholders, employees, contractors, the township of Cobar and all those who provide direct and indirect support to the operations. Exploration drilling has indicated that the mine ore body is available at depth and requires further investigative drilling for confirmation. For this to occur, an extension to the mine decline (main access pathway) is required to access this potential ore body. As a result, waste rock is produced. But due to the volumes involved, there is a need to temporarily stockpile the waste rock on the surface. Currently the storage of waste rock is allowed in specified locations above ground and is currently approved under the MOP 2017-2020. Due to the quality of this waste rock, much of it may have a beneficial use in the long term or post mining land use.

11.1 Waste Rock Storage: Data and Discussion.

The storage of waste rock is within the catchment of the Sector 5 TSF. The material is placed on oversized tails and was assessed for geotechnical stability. The bottom up building approach is being applied in the construction which allows for the base batter of 5 metres and any change in volume will impact the top bench, which can be easily reshaped (Figure 11.1). Due to the nature of the tailings base, a layered approach was used as recommended by Golder Associates Pty. Ltd.

Figure 11.1: The EOPL Waste Rock Construction Strategy.

This involves the footprint being covered with a 1 Metre “pioneer” layer or pad. This provides an even coverage and place less point pressure on the in situ tails. Once in place, the next 1.5m encapsulation batter will be constructed to create the second level of the batter around the perimeter to encase any problematic material identified. This material will be encapsulated and capped using the 1.5metre 3rd level. The upper level will be compacted using heavy machinery prior to the laying of the pioneer pad for Bench 2.

The initial placement of rock was done using a method of paddock dumping, spreading and compacting to create a 1 metre impervious barrier or “Pioneer” layer (Figure 11.2). This is Layer 1. The material will be pushed to the south and south east (Figure 11.3). The edge of the dump is designed to end 2 meters inside the fence line. Drainage and windrows will be constructed on the outer edge and will be designed to run water back into an exterior toe drain, reporting back to Pit 1. Once the layer covers the designed footprint, the next layer (Layer 2) will follow the process. It is expected that the finalisation of the waste rock placement will be in the 3rd quarter 2019.

Figure 11.2: Pioneer Layer Paddock dumping locations

Figure 11.3: Waste rock placement plan

12 Rehabilitation and Research

As the majority of the site will remain active for the life of the mine, only limited progressive rehabilitation is possible.

However extensive planning and research into the rehabilitation of facilities such as the tailings dams are planned.

There are several significant projects being explored:

- *High Density Hard Pan Capping; and*
- *Sustainable Development in Post Mining Land Use (PMLU); and*
- *Investigation into Pb speciation and Pb tolerant species.*

Endeavor Mine are currently in discussion with industry experts to look at collaborative research into sustainable final and post mining landforms.

12.1 Discussion

In first quarter 2019, Endeavor Mine will commence phase 1 of a program looking at the development for a final land form solution for the Central Tailings Discharge Tailings Storage Facility (CTD TSF) and the Sector 5 TSF. This will involve in house trials at the Centre for Sustainable Mining at the University of Queensland.

13 Complaints Hotline

Endeavor Mine has established a complaints hotline for members of the Public to voice any concerns they December have with Endeavor Mine activities. The phone number to call is (02) 68306475 or email on enquiries@endeavor.com.au. The number can be called 24 hours a day / 7 days a week. Endeavor will investigate any complaint and take immediate action if the complaint is validated.