SAINT ELMO MINE

ANNUAL AIR QUALITY MONITORING REPORT

1 April 2023– 31 December 2024

Reference: SEP-RPT-EV-00002

Date	Description	Originator	Reviewer	Approver
03/03/2025	Version 1	L. Crawford	K. Fish	A. Napier

The information contained in this document is solely for the use by Multicom and approved contractors for the purpose for which it has been prepared and Multicom undertakes no duty to or accepts any responsibility to any third party who may rely upon this document. All rights reserved. No section or element of this document may be removed from this document, reproduced, electronically stored or transmitted in any form without the written permission of Multicom.

Contents

List of Tables

List of Figures

1 EXECUTIVE SUMMARY

The Annual Air Quality Monitoring Report for the Saint Elmo Mine, covering the period from 1 April 2023 to 31 December 2024, provides a comprehensive overview of air quality in accordance with the Environmental Authority (EA) Permit P-EA-100119386, Schedule B. The monitoring system employed included a Partisol 2025di-Sequential Air Sampler (Partisol), HIVOL High Volume Air Sampler (HIVOL), Radiello Passive Sampler (Radiello), and Dust Deposition Gauges (DDGs) to track pollutants such as total suspended particulates (TSP), particulate matter (PM10 and PM2.5), vanadium (V), sulphur dioxide (SO_2), and dust deposition. Data collection adhered to the Multicom Resources Air Quality Management Plan (AQMP).

Despite no mining activities and an unoccupied nearby homestead during the reporting period, the monitoring revealed occasional air quality exceedances. Exceedances were recorded primarily for HIVOL and DDGs, driven by wildlife contamination, local bushfires, dry conditions, and strong winds, rather than mining operations. The monitoring equipment faced challenges, including network dropouts, technical malfunctions, and wildlife interference, which occasionally disrupted data accuracy. Parts supply delays due to the mine's remote location further impacted operations. Notably, the Partisol machine was decommissioned several times due to frequent malfunctions.

Key findings include:

- Particulate Matter (PM10, PM2.5): Remained within EA limits, with two exceedances in PM10 and PM2.5 due to cattle dust and environmental factors.
- Vanadium (V): Remained with EA limits, with only one exceedance which was likely due to natural variations or sample contamination.
- TSP: A single exceedance in November 2024 occurred due to regional bushfires, while other readings stayed within acceptable levels.
- Sulphur Dioxide (SO_2): No exceedances; levels remained within acceptable limits.
- Dust Deposition: Levels generally complied with the EA's limit, with occasional spikes due to natural factors, such as local farming and dry conditions.

- Operational issues included Partisol and HIVOL equipment failures, and limited data capture from Radiello samplers. These challenges were largely mitigated through corrective actions like machine rentals and repairs. Weather conditions significantly impacted particulate levels, with dry periods and minimal vegetation exacerbating dust and particulate matter deposition.

The report highlights the need to review and potentially adjust the dust deposition criteria to better align with background environmental levels, as the current limits do not fully account for the natural factors influencing air quality. Despite these challenges, air quality overall was largely compliant with EA standards. The findings underscore the importance of ongoing monitoring and adaptation of management strategies to maintain compliance and mitigate the impact of environmental air pollution at the Saint Elmo Mine.

2 INTRODUCTION

Multicom Resources is dedicated to maintaining high environmental standards, particularly in air quality management. As part of the Air Quality Management Plan (AQMP), this report is designed to assess our compliance with the conditions specified in Schedule B of our Environmental Authority (EA) P-EA-100119386 and to provide a comprehensive overview of our air quality monitoring efforts in 2023 and 2024. Multicom Resources is committed to ensuring that the release of contaminants to air does not cause environmental harm unless authorised by the EA.

It is important to note that all environmental data collected during this reporting period is representative of background environmental levels, as no mining activities have occurred. This ensures that our findings reflect natural conditions without the influence of mining operations.

The Annual Air Quality Monitoring Report includes detailed data analysis on air quality parameters, an evaluation of monitoring results, plus a summary of exceedances or missed sampling events, causing deviations from regulatory standards. By systematically analysing this information, we aim to ensure that our operations not only comply with regulatory requirements but also contribute positively to the environment.

3 METHODOLOGY

To effectively monitor environmental background levels of dust deposition and particulate matter in ambient air, Multicom Resources employs four distinct sampling methods for real-time monitoring:

1. **Partisol 2500i Dichotomous Sequential Air Sampler (Partisol)**
    - Parameters Monitored: PM10, Vanadium & PM2.5.
    - Sampling Frequency: Continuous sampling.
2. **HIVOL 3000 High Volume Air Sampler (HIVOL)**
    - Parameters Monitored: Total Suspended Particulates (TSP).
    - Sampling Frequency: Samples taken every 6 days.
3. **Radiello Diffusive Sampler (Radiello)**
    - Parameters Monitored: Sulphur Dioxide (SO_2).
    - Sampling Frequency: Continuous passive sampling.
4. **Dust Deposition Gauges (DDG)**
    - Parameters Monitored: Dust deposition.
    - Sampling Frequency: Continuous sampling.

These devices were installed in April 2023 to establish a robust baseline for air quality monitoring. Based on the current conditions of the EA, the construction of eleven-point source release to air will be necessary to address the objectives related to stationary source emissions in accordance with EA conditions. However, this condition has not been triggered at the time of this report as the RDP has not yet been commissioned.

Additionally, weather station data has been included in this report to provide context for air quality monitoring results. The weather station monitors wind speed and direction, precipitation (rainfall), ambient temperature and humidity. This data is crucial for understanding how meteorological conditions may influence the dispersion of pollutants and overall air quality in the area.

To ensure data accuracy and reliability, independently certified annual calibration for the two active samplers was conducted prior to installation in April 2023 and during the reporting period on March 12, 2024. This calibration process is essential for maintaining the integrity of our monitoring efforts and ensuring compliance with environmental standards.

4 CURRENT REPORTING PERIOD

This report presents the air quality data for the period of:

- 1 April 2023 – 31 December 2024

It should be noted that there was no mining activity during this period.

5 LOCATION

The Saint Elmo mine is located on rural, agricultural land. The predominant existing land use within the mine site and surrounding area is cattle grazing with several homesteads interspersed on the surrounding properties.

Immediately to the south of the mining boundary is the Flinders Highway. The Offsite Water Storage Facility (OWSF) and associated infrastructure are located near the Flinders River north-east of the mine. The pipeline from the OWSF to the Mine Infrastructure Area (MIA) on Saint Elmo Station is located along Punchbowl Road. The township of Julia Creek is located approximately 15 kilometres from the western boundary of the mining lease and consequently very unlikely to be impacted by any noise generated from the mine.

The current air quality Monitoring devices used are shown in **Figure 1-4** and the receiving environment monitoring locations are identified in **Table 1**.

Figure 1 - Partisol 2500i Dichotomous Sequential Air Sampler

Figure 2 - HIVOL 3000 High Volume Air Sampler

Figure 3 - Radiello Diffusive Sampler

Figure 4 – Five Dust Deposition Gauges

Table 1 - Monitoring Locations

Monitoring Location	Latitude / Longitude (GDA 94 MGA Zone 54)	Location Description
PARTISOL HIVOL RADIELLO	590203, 7722982	Saint Elmo homestead
DDG1	590440, 7722966	General downwind direction of Saint Elmo and Argyle homesteads
DDG2	589396, 7733165	General downwind direction of Burwood homestead
DDG3	592200, 7731258	General downwind direction of Burwood homestead[1]
DDG4	590203, 7722982	Saint Elmo homestead[2]
DDG5	597371, 7723069	Upwind when wind blowing toward Saint Elmo homestead

The nearest existing sensitive receptors to the mining lease are summarised in **Table 2** with the closest receptor (A) being the currently uninhabited Saint Elmo Homestead. The homestead is located approximately 270 meters west of the mining lease boundary and is the position at which most of the air quality equipment has been installed. All five sensitive receptors listed are residences. The geographic location of these receptors is shown in **Figure 5** and **Figure 6**.

Based on the air quality assessment undertaken for the project, and considering the location of sensitive receptors, receptor A would be the most affected by air emissions from the mine, and receptor E the least affected. The main sources of the air emissions would be the release of dust due to the operation of mobile heavy machinery including wind erosion, dozers, ROM ore haul trucks, scrapers, and product trucks.

Table 2 - List of Sensitive Receptors with Coordinates

ID	Real Property Description	Approximate Distance and Direction from Site Boundary	Easting (m)	Northing (m)	Latitude (°)	Longitude (°)
A	Lot 13 EN89	270 m west	590175	7722971	-20.5901	141.8653
B	Lot 4 EN30	4.2 km west	584451	7724151	-20.5798	141.8104
C	Lot 4 MF16	6.8 km north	588714	7739955	-20.4369	141.8503
D	Lot 2 MF3	10 km north-east	598316	7739202	-20.4431	141.9424
E	Lot 11 EN105	6.2 km south-west	591181	7709990	-20.7074	141.8756

Figure 5 - Air Quality Monitoring Equipment Location at Saint Elmo Homestead

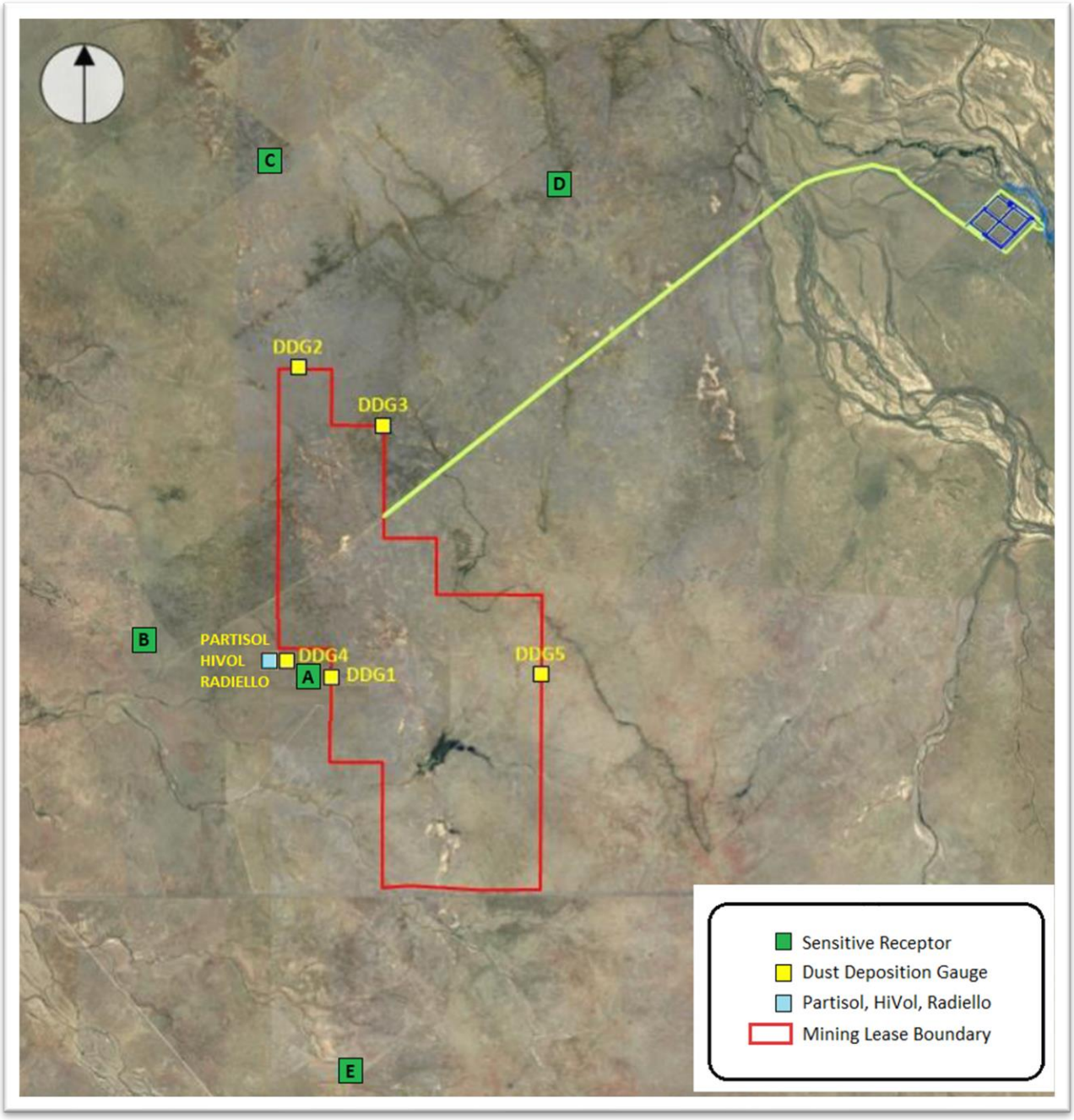


Figure 6 - Location of Sensitive Receptors and Air Quality Monitoring Devices

6 AIR QUALITY CRITERIA

The EA specifies relevant ambient air quality criteria in Error! Reference source not found. for nearby sensitive receptors. Relevant EA conditions for stationary sources have been provided in **Table 4** however, they are not applicable for the current reporting period as the equipment is not yet constructed. Further information can be obtained from the AQMP which identifies management and mitigation measures to be implemented as part of the Saint Elmo Project. These measures are in place to ensure impacts to environmental air quality levels resulting from mining activities comply with the conditions detailed in Schedule B of the EA.

Table 3 - Relevant Ambient Air Quality Criteria at the Sensitive Receptors

Air Quality Indicator	Limit Type	Averaging Time	Criteria
PM_{10}	Maximum	24 hours	50 µg/m^3
$PM_{2.5}$	Maximum	24 hours	25 µg/m^3
TSP	Maximum	1 year	90 µg/m^3
Sulphur dioxide	Maximum	1 year	57 µg/m^3
Vanadium (total in PM_{10} fraction	Maximum	24 hours	1.1 µg/m^3
Dust Deposition	Maximum	30 Days	120 mg/m2/day

Table 4 - Relevant EA Specifications for Stationary Sources

Source Description	Minimum Release Height (m)	Minimum Exit Gas Temperature (°C)	Minimum Efflux Velocity (m/s)
RP1 – stack serving vanadium rotary kiln	30	820	3.0
RP2 – stack serving leach scrubber	20	80	3.0
RP3 – stack serving AMV flash dryer and deammoniation kiln scrubber	20	50	3.0
RP4 – stack serving fusion furnace dust collector	20	420	3.0
RP5 – stack serving vanadium bagging plant dust collector	10	Ambient	3.0
RP6 – stack serving crude alum deammoniation kiln scrubber	10	80	3.0
RP7 – stack serving stage 2 alum deammoniation kiln scrubber	10	80	3.0
RP8 – stack serving HPA calciner	10	1200	3.0
RP9 – stack serving HPA bagging plant dust collector	10	Ambient	3.0
RP10 – stack serving boiler	20	160	11.9
RP11 – stack serving condenser	TBA to the Department prior to commencement of operation	TBA to the Department prior to commencement of operation	TBA to the Department prior to commencement of operation

7 PARTISOL: PM10, VANADIUM & PM2.5 MONITORING RESULTS

The data collected from the Saint Elmo Partisol Machine provides annual averages for PM10, Vanadium, and PM2.5 (**Table 5**). Monitoring is scheduled to be conducted continuously in accordance with EA requirements, which specify that the 24 hour average concentrations must not exceed: 50 µg/m^3 for PM10, 1.1 µg/m^3 for Vanadium and 25µg/m^3 for PM2.5. Annual PM10, Vanadium, and PM2.5 levels remained below the required limits overall, however two individual 24-hour samples returned with exceedances (**Table 6**). The exceedance on 4 July 2024 was caused by cattle dust contamination, which occurred when cattle broke through the air quality fencing (**Figure 7**). The second exceedance on 24 September 2024 was unclear but the absence of significant weather events or mining activities during this time suggests that the exceedance may have been caused natural environmental conditions.

Throughout the reporting periods, data capture consistently remained below 50%. Although the machine experienced several malfunctions leading to its decommissioning, all data gaps have been addressed, and the percentage of data captured each year is provided (**Table 7**). The machine is checked weekly, but due to its offsite location and the absence of permanent staff at the homestead, many data gaps occurred. From April to July, data capture was limited due to the lack of trained personnel onsite to facilitate sampling. During this period, two separate rental machines were used, one for sampling PM10 and Vanadium, and the other for PM2.5. In August, a new dichotomous Partisol machine replaced the rental devices, consolidating the three samples into one machine. However, the new machine arrived damaged due to a circuit board issue during transit, which delayed sampling. Once the repairs were completed, a new staff member received basic training on the device, and more consistent sampling was able to begin.

The remote location of the Saint Elmo Mine poses additional operational challenges. In October 2023, wildlife damage to above-ground wiring disrupted the power supply, requiring substantial upgrades to the homestead's electrical system. While data losses from filter jams or operational errors were infrequent, they caused minor gaps in the annual reporting periods. In some instances, replacement parts did not arrive in time, preventing continuous sampling. Power fluctuations due to weather conditions also impacted sampling continuity. Wildlife interference, including ants and native bush rats (Rattus Villosissimus), further worsened data gaps by obstructing tubes, restricting airflow, and damaging wiring, leading to electrical failures (**Figure 8 and 9**). In March 2024, an electrical failure required a technician to be flown in, but the issue couldn't be repaired onsite, and the machine was sent back for repairs, resulting in several weeks of missing data. The supplier could have provided a replacement, but it would have arrived just days before our machine was due back. Considering the cost and time required for staff to set up and return the machine, it was deemed not worth it. Additionally, in November and December 2024, a significant period of data loss occurred due to a pump malfunction, further exacerbated by delays in obtaining specialty replacement parts. The difficulty in sourcing specialized components and arranging repairs was compounded by a shortage of trained technicians in the area. The limited availability of resources has led to extended periods of machine decommissioning, contributing to data gaps and operational inefficiencies.

Table 5 - Partisol Results Summary (PM10, Vanadium, PM2.5)

Year	Parameter	Annual Average (ug/m3)	Data Capture %	Exceedances
2023	PM10	14.48	44.26%	0
	Vanadium	0.40	47.98%	0
	PM2.5	7.52	44.26%	0
2024	PM10	11.02	48.09%	0
	Vanadium	0.41	47.95%	1
	PM2.5	5.80	48.09%	1

Table 6 - Partisol Exceedances

Limit PM10 50mg/m3/day | Limit PM2.5 25mg/m3/day | Limit Vanadium 1.1mg/m3/day					
Year	**Parameter**	**Start Date**	**End Date**	**Value mg/m3/day**	**Explanation**
2024	Vanadium	4/07/2024	5/07/2024	1.28	Possible cattle contamination
	PM2.5	24/09/2024	25/09/2024	27.20	Natural Environmental Conditions

Table 7 - Partisol Data Gaps

Year	Parameter	Start Date	End Date	Explanation
2023	PM10 & Vanadium	15/04/2023	8/05/2023	No Samples were taken between these dates
	PM10, Vanadium & PM2.5	9/05/2023	10/05/2023	No Samples were taken between these dates
	PM10, Vanadium & PM2.5	25/05/2023	22/06/2023	No Samples were taken between these dates
	PM2.5	23/06/2023	10/07/2023	No Samples were taken between these dates
	PM10 & Vanadium & PM2.5	11/07/2023	6/09/2023	No Samples were taken between these dates
	PM10 & Vanadium & PM2.5	5/10/2023	6/10/2023	No Samples were taken between these dates
	PM10 & Vanadium & PM2.5	24/10/2023	1/11/2023	Power Upgrades
	PM10 & Vanadium & PM2.5	15/11/2023	16/11/2023	Filter Jam
	PM10 & Vanadium & PM2.5	19/11/2023	24/11/2023	Replacement filters did not arrive
	PM10 & Vanadium & PM2.5	28/11/2023	29/11/2023	Filter Jam
	PM10 & Vanadium & PM2.5	27/12/2023	29/12/2023	Power Failures
2024	PM10 & Vanadium & PM2.5	23/01/2024	24/01/2024	Filter Jam
	PM10 & Vanadium & PM2.5	25/01/2024	26/01/2024	Ants in Machine
	PM10 & Vanadium & PM2.5	27/01/2024	9/02/2024	Machine Faullt
	PM10 & Vanadium & PM2.5	9/02/2024	10/02/2024	Ants in Machine
	PM10 & Vanadium & PM2.5	17/02/2024	12/03/2024	Machine Fault - Filter Jam
	PM10 & Vanadium & PM2.5	13/03/2024	27/04/2024	Machine sent for repairs
	PM10 & Vanadium & PM2.5	25/05/2024	29/05/2024	Filter Jam
	PM10 & Vanadium & PM2.5	10/06/2024	19/06/2024	Samples expelled from machine and contaminated
	PM10 & Vanadium & PM2.5	7/07/2024	9/07/2024	Piston Error - hoses disconnected
	PM10 & Vanadium & PM2.5	23/07/2024	20/08/2024	Power Failure - Rats shortcircuited powerbox
	PM10 & Vanadium & PM2.5	15/10/2024	16/10/2024	No Samples were taken between these dates
	PM10 & Vanadium & PM2.5	4/11/2024	11/12/2024	Pump Failure - Awaiting replacement parts
	PM10 & Vanadium & PM2.5	12/12/2024	31/12/2024	Leake Detected - Awaiting new seals and o'rings

Figure 7 – Cattle faeces and broken fencing observed within AQ area (July 2024).

Figure 8 - Ants in Partisol (January 2024).

Figure 9 - Rat Damage to Saint Elmo Homestead Power Supply (July 2024).

8 HIVOL: TOTAL SUSPENDED PARTICULATE MONITORING RESULTS

The Saint Elmo HIVOL data presents annual average TSP levels (**Table 8**). Monitoring is conducted every six days in accordance with the AQMP. The EA specifies that the annual average TSP concentration must not exceed 90 mg/m³. Data capture throughout the reporting periods was below 70%, primarily due to the remote location of the Saint Elmo Mine, which posed significant operational challenges. With no mining or construction activities taking place during this period, the TSP annual levels remained below the required limits. However, one monthly TSP limit was exceeded in November 2024, due to widespread bushfires across the region (**Table 9** and **Figure 10**).

Table 10 provides a detailed explanation of all data gap occurrences. In the early part of 2023, the absence of a designated, trained staff member to handle sampling led to sporadic and infrequent data collection. Additionally, adverse weather conditions at times limited site access, and frequent power failures were an ongoing issue. These challenges were exacerbated by the outdated wiring in the homestead, which required substantial upgrades to maintain a reliable power supply. Native wildlife also contributed to sampling difficulties. Frogs frequently inhabited the HIVOL filters contaminating samples (**Figure 11**), while native rats caused power failures by chewing on electrical wiring (**Figure 9**). Furthermore, a mechanical malfunction occurred, requiring the replacement of the flow sensor. in late 2024, one final data gap occurred when a package containing four samples sent for analysis was lost in transit and has not yet been recovered.

Table 8 - HIVOL Summary

Year	TSP Annual Average ug/m3	Data Capture %	Exceedances
2023	23.67	67%	0
2024	29.87	69%	1

Table 9 - HIVOL Exceedances

TSP Limit 90mg/m3/day			
Start Date	**End Date**	**Value mg/m3/day**	**Explanation**
5/11/2024	6/11/2024	110.82	Bushfires during this period

Table 10 - HIVOL Data Gaps

Start Date	End Date	Explanation
17/05/2023	18/05/2023	Sample Run Missed
23/05/2023	24/05/2023	Sample Run Missed
29/05/2023	30/05/2023	Sample Run Missed
4/06/2023	5/06/2023	Sample Run Missed
10/06/2023	11/06/2023	Sample Run Missed
28/06/2023	29/06/2023	Sample Run Missed
4/07/2023	5/07/2023	Sample Run Missed
16/07/2023	17/07/2023	Sample Run Missed
28/07/2023	29/07/2023	Sample Run Missed
3/08/2023	4/08/2023	Sample Run Missed
9/08/2023	10/08/2023	Sample Run Missed
15/08/2023	16/08/2023	Sample Run Missed
4/11/2023	5/11/2023	Sample Run Missed
28/12/2023	29/12/2023	Wet Weather - No Site Access
3/01/2024	4/01/2024	Wet Weather - No Site Access
15/01/2024	16/01/2024	Contaminated Sample - Frogs
14/02/2024	15/02/2024	Contaminated Sample - Frogs
20/02/2024	21/02/2024	Power failure, Contaminated Sample - Frogs
21/03/2024	22/03/2024	Contaminated Sample - Frogs
14/05/2024	15/05/2024	Major Blockage or Motor Drive Error
20/05/2024	21/05/2024	Awaiting New Flow Sensor
19/07/2024	20/07/2024	Power Failure - Rats destroyed power
31/07/2024	1/08/2024	Power Failure - Rats destroyed power
31/07/2024	1/08/2024	Power Failure - Rats destroyed power
12/08/2024	13/08/2024	Power Failure - Rats destroyed power
18/08/2024	19/08/2024	Power Failure - Rats destroyed power
24/08/2024	25/08/2024	Power Failure - Rats destroyed power
17/10/2024	18/10/2024	Brittle and torn from heat - No analysis available
22/11/2024	23/11/2024	Hivol filters were lost in transit
28/11/2024	29/11/2024	Hivol filters were lost in transit
4/12/2024	5/12/2024	Hivol filters were lost in transit
10/12/2024	11/12/2024	Hivol filters were lost in transit

Figure 10 - HIVOL exceedance following bushfire (November 2024).

Figure 11 - Frogs Contaminated Samples

9 RADIELLO: SULPHUR DIOXIDE MONITORING RESULTS

Radiello diffusive samplers have been utilized to monitor sulphur dioxide (SO_2) concentrations at the Saint Elmo homestead. Monitoring occurs every 14 days, in line with Environmental Authority (EA) requirements, which stipulate that the annual average SO_2 concentration must not exceed 57 mg/m³. The annual averages for SO_2 are summarized in **Table 11**. No exceedances have occurred during this reporting period, ensuring full compliance with the conditions outlined in the EA.

The Radiello device was installed on 14 April 2023. The data capture rate for 2023 was 76.43%, while in 2024 it increased to 80.87%. **Table 12** provides details of all data gaps, which have been attributed to several factors such as, cattle breaching the fencing, leading to sample destruction (**Figure 12**), and native fat-tailed rats (Rattus Villosissimus) damaging some samples, rendering them unsuitable for analysis (**Figure 13**). Additionally, extreme weather conditions caused the degradation of plastic casings and holders, resulting in the tubes falling and compromising sample integrity. A delay in receiving Radiello cartridges due to backorder status, compounded by the lack of alternative suppliers within Australia, led to a 40-day disruption, significantly affecting data collection.

.

Table 11 - Annual Average for Radiello

Year	Monitoring Device	S02 ug/m3/annual average	Data Capture %	Exceedances
2023	Radiello	0.05	76.43%	0
2024	Radiello	0.09	80.87%	0

Table 12 - Data Gaps for Radiello

Start Date	End Date	Explanation
22/06/2023	21/07/2023	Damaged, not analysed. PN529
22/07/2023	21/08/2023	Damaged, not analysed. IZ598
20/02/2024	1/03/2024	No available filters- backorder a 5-6 week wait
2/03/2024	15/03/2024	No available filters- backorder a 5-6 week wait
16/03/2024	31/03/2024	No available filters- backorder a 5-6 week wait
1/04/2024	15/04/2024	No available filters- backorder a 5-6 week wait
6/08/2024	19/08/2024	Cattle in Paddock - Destroyed Sample

Figure 12 - Radiello Cattle Damage (August 2024)

Figure 13 - Radiello Rat Damage (May 2024)

10 DDG: DUST DEPOSITION MONITORING RESULTS

A total of five Dust Deposition Gauges (DDGs) have been installed on the boundary of the mining lease to monitor dust deposition levels in accordance with the EA requirements, which stipulate that the annual average must not exceed 120mg/m^2. The annual averages for all DDGs have been assessed (Error! Reference source not found.**13**) and while they generally comply with these conditions, one sample was found to exceed the limit and significantly affect annual averages. An individual sample from DDG2 in 2024, recorded an abnormally high-level of 1100 mg/m^2/day over 23 days; however, this sample is considered invalid as the gauge was knocked over by cattle and filled with soil (**Figure** 14**14**). Upon disregarding this erroneous sample, the revised annual average for DDG2 is calculated to be 70.4 mg/m^2 (which previously was 140.65 mg/m^2), which falls within the acceptable limits. Consequently, with the problematic data excluded, all DDGs are compliant with the EA's standards.

Further individual sample exceedances are detailed in

Table **14,** as no mining activities are currently taking place, these exceedances have been attributed to environmental background levels. It is important to note that factors such as dry conditions, wind movement, and the presence of cattle in the paddocks all contribute to the elevated dust deposition levels. Notably, DDG1 is situated near a cattle watering point, where cattle are frequently present, which explains the higher dust deposition levels observed in that location. The first two DDG's (DDG4 and DDG5) were installed on 14 April 2023, while the remaining DDG's (DDG1, DDG2, and DDG3) were installed on 11 May 2024. During this period, some data loss has occurred primarily due to site access issues and broken samples (Error! Reference source not found.**15**).

Table 13 - Annual Average for Dust Deposition

Year	Monitoring Location	Total Solids mg/m2/annual average	Data Capture (days per year)	Data Capture %	Exceedances
2023	DDG1	98.54	367.0	100%	3
	DDG2	70.51	367	100%	1
	DDG3	36.28	305.0	83%	1
	DDG4	42.83	367.0	100%	0
	DDG5	97.30	339.0	93%	1
2024	DDG1	72.26	367	100%	3
	DDG2	140.56	367.0	100%	2
	DDG3	77.46	305.0	83%	2
	DDG4	51.89	367.0	100%	1
	DDG5	54.52	339	93%	0

Figure 14 - DDG2 knocked over (15 April 2024)

Table 14 - Exceedances for DD

DD Limit 120mg/m2/day				
Monitoring Location	Start Date	End Date	Value mg/m2/day	Explanation
DDG5	14/04/2023	10/05/2023	344.44	Environmental dust, no mining occurring
DDG1	11/05/2023	30/05/2023	215.00	Environmental dust, no mining occurring
DDG1	31/05/2023	22/06/2023	160.87	Environmental dust, no mining occurring
DDG1	18/11/2023	18/12/2023	180.65	Environmental dust, no mining occurring
DDG2	18/11/2023	18/12/2023	174.19	Environmental dust, no mining occurring
DDG3	18/11/2023	18/12/2023	164.52	Environmental dust, no mining occurring
DDG1	24/01/2024	15/02/2024	134.78	Environmental dust, no mining occurring
DDG2	24/01/2024	15/02/2024	1100.00	Disregard: Bottle knocked over filled with soil
DDG3	24/01/2024	15/02/2024	191.30	Environmental dust, no mining occurring
DDG4	24/01/2024	15/02/2024	173.91	Environmental dust, no mining occurring
DDG1	16/02/2024	20/03/2024	150.00	Environmental dust, no mining occurring
DDG2	09/05/2024	10/06/2024	184.85	Bugs/nest and organics in sample
DDG1	6/11/2024	10/12/2024	180.00	Environmental dust, no mining occurring
DDG3	11/12/2024	31/12/2024	282.35	Environmental dust, no mining occurring

Table 15 - Data Gaps for Dust Deposition

Monitoring Location	Start Date	End Date	Explanation
DDG1	1/04/2023	13/04/2023	DDG'S not yet installed
DDG2	1/04/2023	13/04/2023	DDG'S not yet installed
DDG3	1/04/2023	13/04/2023	DDG'S not yet installed
DDG4	1/04/2023	13/04/2023	DDG'S not yet installed
DDG5	1/04/2023	13/04/2023	DDG'S not yet installed
DDG1	14/04/2023	10/05/2023	DDG'S not yet installed
DDG2	14/04/2023	10/05/2023	DDG'S not yet installed
DDG3	14/04/2023	10/05/2023	DDG'S not yet installed
DDG5	31/05/2023	22/06/2023	Samples not collected
DDG4	23/06/2023	22/08/2023	Samples not collected
DDG2	23/06/2023	15/09/2023	Sample not analysed, broken in transit
DDG2	16/09/2023	20/10/2023	Sample not analysed, broken in transit
DDG2	20/12/2023	23/01/2024	Weather conditions made roads inaccessible
DDG3	21/12/2023	23/01/2024	Weather conditions made roads inaccessible
DDG5	23/12/2023	23/01/2024	Weather conditions made roads inaccessible
DDG3	16/02/2024	20/03/2024	Glass funnel broke into bottle, not analysed
DDG3	21/03/2024	31/03/2024	Broken glass in bottle, not analysed

11 METEOROLOGICAL DATA

Weather patterns significantly influence particulate matter in the air, either mitigating or exacerbating air pollution levels. During the monitoring period, weather conditions followed typical seasonal trends apart from some winter rain in July 2023. Julia Creek, located in a semi-arid climate zone, experiences hot, humid summers and dry, warm winters. Low precipitation combined with hot, windy days increases the amount of particulate matter in the air. On the other hand, high levels of precipitation help cleanse the air, and reduced wind speeds lower the concentration of particulate matter. For the purposes of this report, data has been compiled from the Saint Elmo Weather Station. The following information outlines the average of the highest daily average (HDA) and lowest daily averages (LDA) for:

- Temperature
- Precipitation
- Humidity
- Wind Speed and Direction

All data covers the period from April 1, 2023, to December 31, 2024.

Julia Creek seasons will be classified as the following, with the wet and dry seasons falling in between these periods:

- Summer (December - February)
- Autumn (March - May)
- Winter (June - August)
- Spring (September - November)

- Wet Season (December - March)
- Dry Season (April - November)

Temperature:
Julia Creek experiences significant temperature fluctuations, ranging from 0°C to 45°C. The coolest temperatures are typically recorded in July (winter) while the warmest occur in December and January (summer). High temperatures, especially in the summer months, contribute to dry, dusty conditions, which increase particulate matter in the air. Throughout 2023, St Elmo Mine recorded a temperature high of 35.6 in December 2023 and a low of 9.3 in July (**Figure 15**). In 2024, St Elmo Mine recorded a temperature high of 34.5 in December 2024 and a low of 10.1 in July (**Figure 16**).

Precipitation:
Rainfall levels are typically highest in late summer, during the wet season, with January often receiving the heaviest precipitation. Winter months are drier, with significantly reduced rainfall. Rainfall has a "cleaning" effect on the air, washing away pollutants such as particulate matter, sulphur dioxide, and nitrogen, leading to decreased concentrations of these pollutants. Precipitation during the 2023 reporting period was highest during April. The months of May, June and September had no rainfall (**Figure 17**). Precipitation between January 2024 to December 2024 consisted of high rainfall throughout January and low to no rainfall from July to October (**Figure 18**). Both reporting periods followed expected rainfall patterns for the Julia Creek area.

Humidity:
Julia Creek humidity levels are highest in the summer months during the wet season, peaking in February when atmospheric moisture is most prevalent. The lowest humidity levels are typically observed in mid-spring, with September and October being the driest months. Humidity reduces air circulation, meaning pollutants and other particulates are trapped in the air. Humidity throughout the 2023 reporting period was high in July following rainfall recorded for that month and low during October (**Figure 19**) this coincided with the dry season. Humidity during the 2024 season followed very similar trends with high humidity experienced through January to March and low throughout September and October (**Figure 20**).

Wind Speed and Direction:
Wind patterns in Julia Creek are shaped by the local topography and weather systems. The town experiences dominant easterly to south easterly winds, which offer cooling relief during the summer months. However, wind speeds can fluctuate, and gusty conditions are often observed. Thunderstorms disperse pollutants, while lower wind speeds may result in pollutant accumulation. Wind direction can also transport pollutants from nearby sources, such as bushfires or dust from nearby mustering events. Wind speeds during the monitoring period ranged from 0 m/s to 7 m/s, with prevailing winds typically heading south or southeast (**Figure 21 & 22**).

Calibration:
Independent calibrations were performed before the equipment purchase in April 2023. Routine calibrations and regular maintenance were carried out throughout the year to maintain data accuracy. The only calibration issues identified were related to rain gauge calculations, and ongoing discussions with the supplier have been held to improve the accuracy of data recording through the rain gauge. The data presented in this report is accurate to the best of our knowledge.

Air Quality Considerations:
Most air quality exceedances are expected to occur during the dry summer months, characterized by hot temperatures and high winds. Air quality exceedances, excluding contamination events, are outlined below with a focus on the potential impact of meteorological factors. For the data analysis, exceedances will be factored in but will also include higher-level samples that do not exceed the EA limits, providing comparison of air quality and weather data.

PM10
The air quality data for PM10 in both 2023 and 2024 indicated no exceedances, suggesting that the particulate matter levels remained within acceptable limits. The highest recorded concentrations of PM10 occurred in November 2023 (34.73 µg/m³) and September 2024 (33.39 µg/m³), but these elevated levels did not coincide with any significant meteorological events such as high winds, unusual temperatures, or precipitation. This suggests that the variations in PM10 levels were likely due to natural environmental factors rather than weather-driven phenomena. The absence of any unusual weather conditions points to environmental background variations as the primary influence on PM10 levels during these periods.

PM2.5

For PM2.5, there was only one exceedance in September 2024 (27.2 µg/m³ in), which was attributed to cattle dust near the equipment, illustrating a localized source of pollution rather than widespread air quality issues. The highest recorded levels of PM2.5 in 2023 was in November (22.24 µg/m³) and 2024 was in July 2023 (23.86 µg/m³)**.** Both occurred without significant weather events that could explain concentrations, indicating that the elevated concentrations were more likely a result of natural environmental background conditions rather than extreme weather or pollution sources.

Vanadium

The exceedance in July 2024 (1.28 µg/m³) was likely due to a contaminated sample or natural environmental variation. The highest recorded concentration of Vanadium in 2023 was in December (0.78 µg/m³) and in 2024 was January (1.00 µg/m³) these events did not coincide with any significant weather conditions, suggesting that natural variations or background pollution sources were responsible for the elevated levels. The Vanadium data, therefore, reflects typical background levels with no significant meteorological or environmental events to explain the recorded concentrations.

TSP

The only exceedance occurred in November2024 (110.82 µg/m³), which was linked to nearby bushfires. TSP concentrations fluctuated in both years in response to environmental factors. In 2023, the highest TSP levels were recorded in October (52.99 µg/m³), following several dry months with little rainfall, which likely contributed to increased particulate matter. Conversely, the lowest TSP levels occurred in April, when the highest rainfall of the year was recorded, suggesting that precipitation helped reduce suspended particles. In 2024, the highest TSP concentrations were recorded in November (71.7 µg/m³) during dry conditions, coinciding with bushfires on neighbouring properties, highlighting the influence of environmental conditions such as weather patterns and local events like bushfires on particulate matter levels.

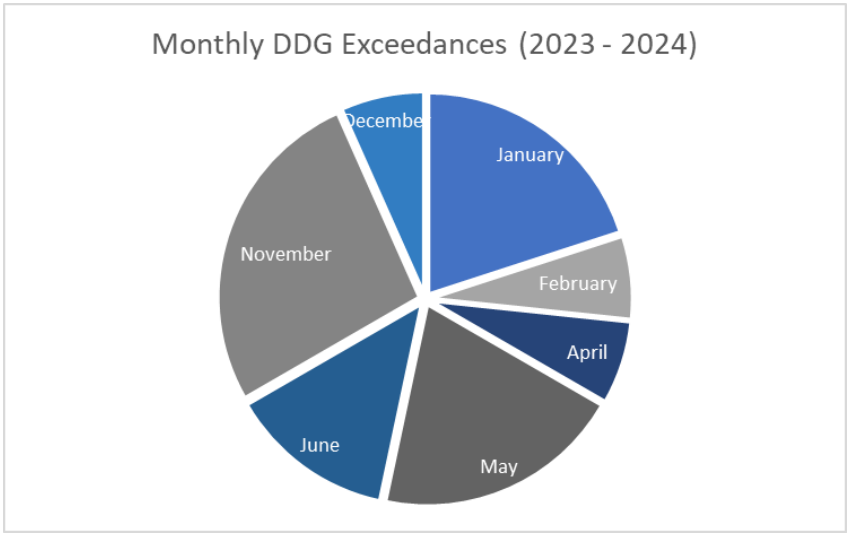
SO_2

Sulphur dioxide levels remained consistently low without exceedances in both 2023 and 2024, indicating that air quality for SO_2 was largely unaffected by significant pollution sources. The highest recorded levels of SO_2 both in 2023 (3.09ug/m³) and 2024 (3.14ug/m³) occurred in April at the beginning of the dry season. The relatively low and stable concentrations point to minimal industrial or natural SO_2 emissions in the region, with no major weather events influencing the data. The absence of exceedances and significant weather factors reflects good air quality with respect to SO_2 during both years.

Dust Deposition

Several exceedances in dust deposition were recorded in both 2023 and 2024, with a higher frequency occurring in November 2023 and January 2024 (Figure 15). While weather conditions varied across the reporting periods, the data suggests that the fluctuations in dust deposition most often occurred when weather events such as higher temperatures, lack of precipitation and higher wind speeds were combined with local events such as heavy grazing, lack of ground cover and other farming activities. These factors contributed to the presence of more natural dust in the environment.

Figure 15 –Monthly DDG Exceedances for 2023 and 2024



The Highest Non-Exceedance Limits for 2023 and 2024 are listed below:

- The highest concentration of DDD1 recorded in 2023 was 83.3 µg/m2 in January
- The highest concentration of DDG2 recorded in 2023 was 33.3 µg/m2 in June
- The highest concentration of DDG3 recorded in 2023 was 17.9 µg/m2 in November
- The highest concentration of DDG4 recorded in 2023 was 87.1 µg/m2 in December
- The highest concentration of DDG5 recorded in 2023 was 90.0 µg/m2 in May
- The highest concentration of DDG1 recorded in 2024 was 85.7 µg/m2 in December
- The highest concentration of DDG2 recorded in 2024 was 120.0 µg/m2 in November
- The highest concentration of DDG3recorded in 2024 was 65.7 µg/m2 in November
- The highest concentration of DDG4 recorded in 2024 was 111.4 µg/m2 in November
- The highest concentration of DDG5 recorded in 2024 was 114.3 µg/m2 in December

The data trends for non-exceedance levels indicate that dry conditions and local activities (farm work) during these periods, saw more frequent dust deposition spikes. The highest recorded dust deposition for each group in 2023 occurred in different months, with notable peaks in November and December. However, DDG1 reached 83.3 µg/m² in January, while DDG5 reached 90.0 µg/m² in May, these figures suggest variability in dust deposition over the course of the year. Similar trends continued in 2024, with particularly high levels of dust deposition recorded in November and December. DDG2 reached 120.0 µg/m² in November, and DDG5 recorded 114.3 µg/m² in December. These spikes at the end of the year are likely reflective of natural environmental variations, such as higher temperatures and less vegetation cover during these periods, contributing to increased dust levels.

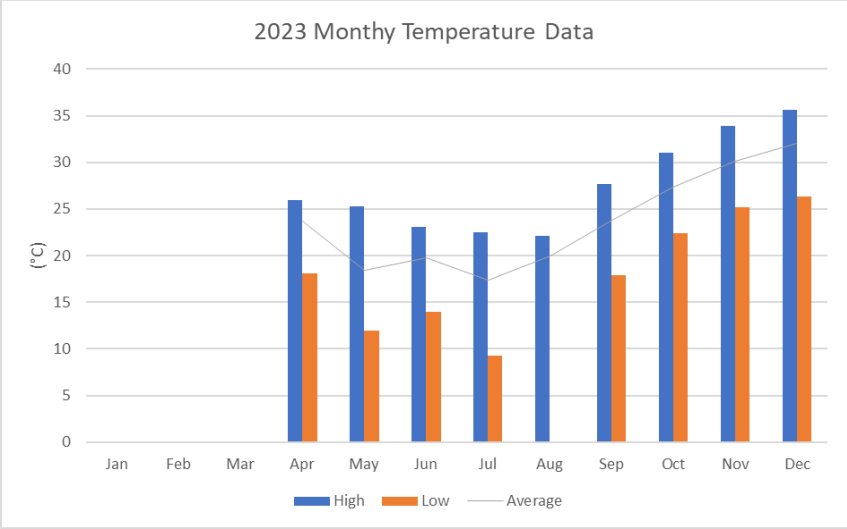


Figure 16 - 2023 Monthly Temperature Data

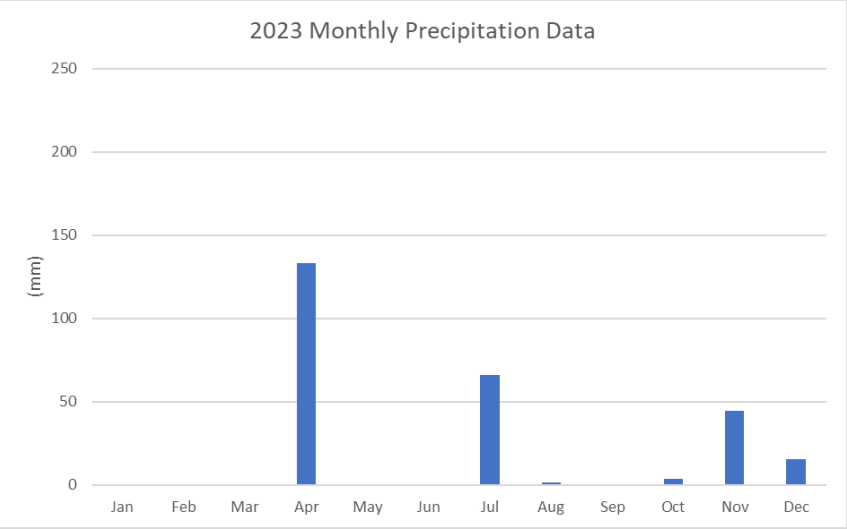


Figure 18 - 2023 Monthly Precipitation Data

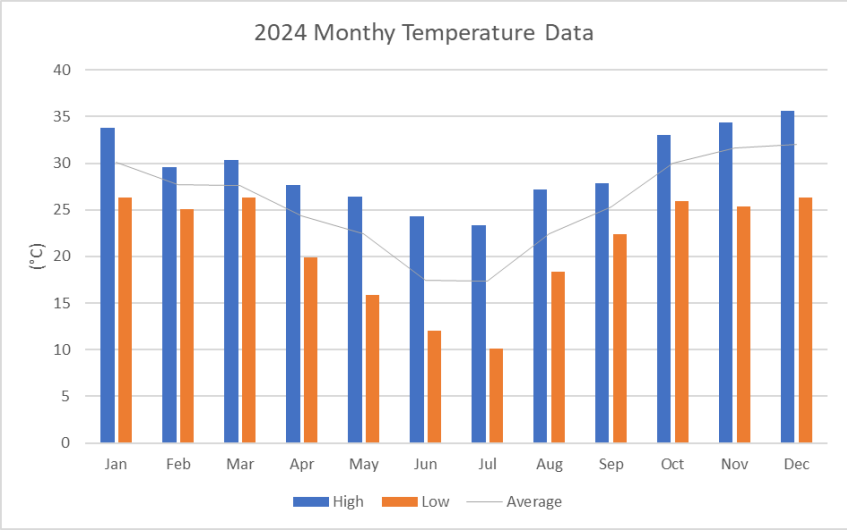


Figure 17 - 2024 Monthly Temperature Data

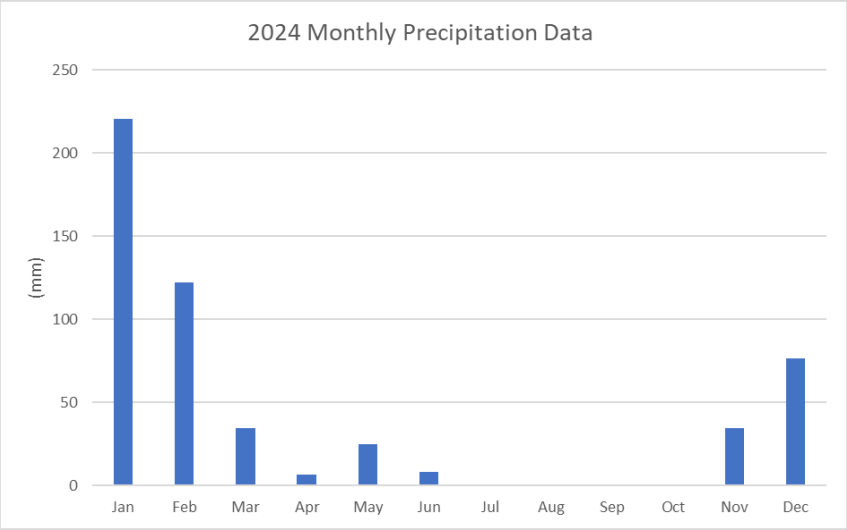


Figure 19 - 2024 Monthly Precipitation Data

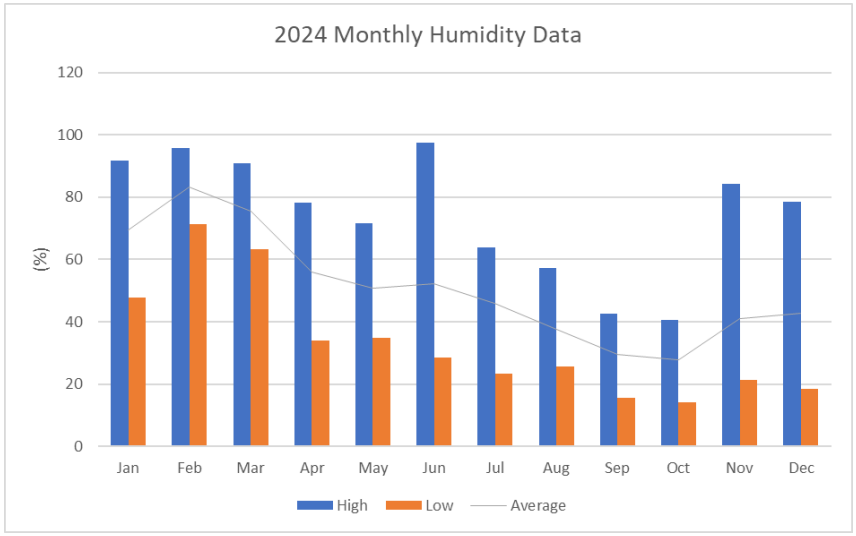


Figure 20 - 2024 2023 Monthly Humidity Data

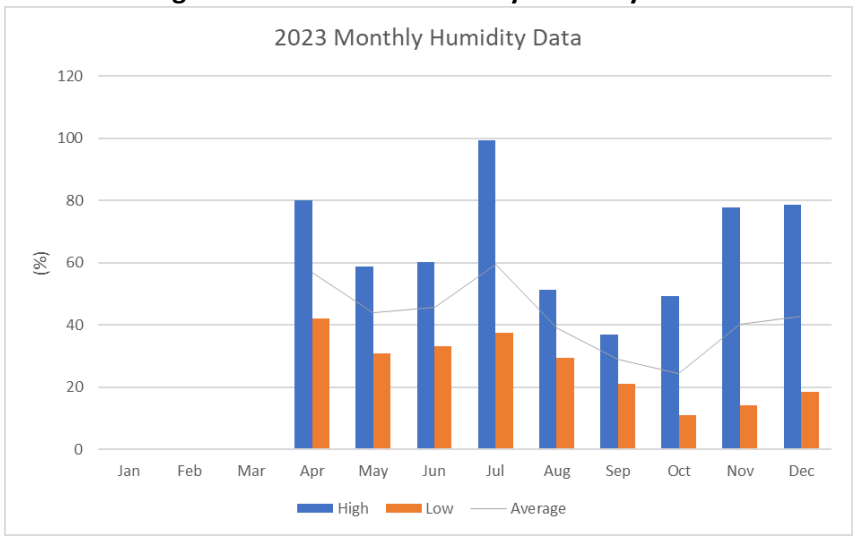


Figure 21 - 2023 Monthly Humidity Data

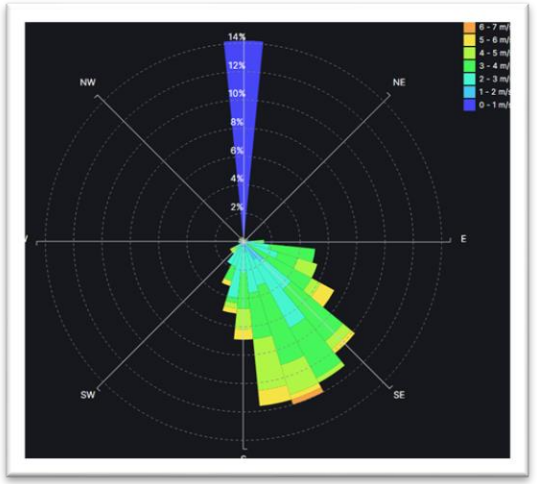


Figure 22 - 2023 Annual Wind Direction/Speed

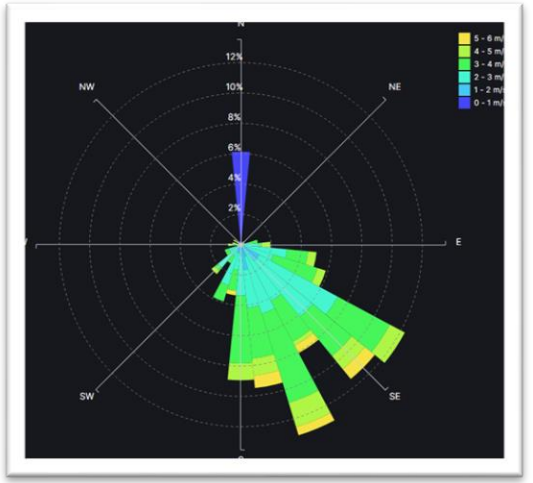


Figure 23 - 2024 Annual Wind Direction/Speed

Table 16 – Meteorological Data Gaps

Data Gaps		
Start Date	**End Date**	**Explanation**
12/05/2023	12/05/2023	Intermittent network failures.
20/05/2023	20/05/2023	Intermittent network failures.
25/05/2023	27/05/2023	Intermittent network failures.
2/07/2023	2/07/2023	Intermittent network failures.
19/07/2023	19/07/2023	Intermittent network failures.
1/08/2023	1/08/2023	Intermittent network failures.
8/08/2023	8/08/2023	Intermittent network failures.
10/08/2023	12/08/2023	Intermittent network failures.
17/08/2023	18/08/2023	Intermittent network failures.
25/08/2023	25/08/2023	Intermittent network failures.
6/09/2023	6/09/2023	Intermittent network failures.
13/09/2023	13/09/2023	Intermittent network failures.
15/09/2023	16/09/2023	Intermittent network failures.
22/09/2023	22/09/2023	Intermittent network failures.
27/09/2023	27/09/2023	Intermittent network failures.
1/10/2023	3/10/2023	Loose cable.
8/02/2024	9/02/2024	Ants in equipment.
21/06/2024	24/06/2024	Intermittent network failures.
27/06/2024	27/06/2024	Intermittent network failures.
4/07/2024	4/07/2024	Infestation of native fat tailed rats damaging cables and equipment.
9/07/2024	9/07/2024	Infestation of native fat tailed rats damaging cables and equipment.
11/07/2024	11/07/2024	Infestation of native fat tailed rats damaging cables and equipment.
19/11/2024	27/11/2024	Hardware changeover which caused initial data upload issues.

12 COMPLAINTS

No air quality complaints were received during this reporting period.

13 CONCLUSION

The Annual Air Quality Monitoring Report for the period from 1 April 2023 to 31 December 2024, demonstrates that air quality monitoring at the Saint Elmo Mine effectively adhered to relevant environmental standards. No mining or construction activities took place during the reporting period, and the nearest homestead remained unoccupied, limiting the potential for air quality impacts from operations. Exceedances, particularly in Dust Deposition Gauges (DDGs), were largely attributed to natural sources such as bushfires, wildlife contamination, and environmental dust. These factors, rather than mining activities, contributed to the recorded exceedances, suggesting that the current dust deposition thresholds may not fully account for the consistently high natural dust levels in the area.

Data gaps during the monitoring period were caused by equipment issues, including network failures, technical malfunctions, wildlife interference, and wet weather conditions that impacted the accessibility of monitoring sites. Additionally, some samples were lost or damaged in transit. Despite these challenges, the monitoring results generally complied with the Environmental Authority (EA) conditions, and no air quality complaints were received, indicating that the air quality management measures were effective in minimizing potential impacts.

Overall, the Saint Elmo Mine met the air quality requirements set forth by the EA. Although there were some isolated exceedances due to environmental factors like cattle dust and bushfires, air quality remained within acceptable limits for the most part. The operational challenges and data gaps did not significantly hinder the assessment of air quality. Weather conditions, particularly dry and windy periods, played a major role in influencing particulate levels and dust deposition. Moving forward, ongoing monitoring will be essential to address operational challenges, improve data consistency, and ensure continued compliance with air quality standards while minimizing the impact of environmental air particulates from the mine.

14 APPENDIX A - GLOSSARY

Parameter or Term	Description
AQ	Air Quality
AQMP	Air Quality Management Plan
DDG	Dust Deposition Gauge
EA	Environmental Authority
g/Nm^3	Grams per normal cubic metre
km/h	Kilometers per hour
mg/m^2	Milligrams per square metre
mg/m^3	Milligrams per cubic metre
mg/Nm^3	Milligrams per normal cubic metre
MIA	Mine Infrastructure Area
mm	Millimetres
m/s	Metres per second
OWSF	Offsite Water Storage Facility
PM_{10}	Particulates suspended in air with aerodynamic diameter less than 10 microns
$PM_{2.5}$	Particulates suspended in air with aerodynamic diameter less than 2.5 microns
SO_2	Sulphur Dioxide
TSP	Total particulates suspended in air
µg/m^3	Micrograms per cubic metre
µg/m^2	Micrograms per square metre
%OL	Percentage Over Limit
%	Percentage