



ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: Quarter 1 2024

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 14 May 2024

**Approved by: Julie Thomas
Environmental Superintendent**



Table of Contents

1.0 INTRODUCTION.....	1
2.0 SPONTANEOUS COMBUSTION MANAGEMENT MEASURES.....	1
3.0 GAS MONITORING RESULTS	9
4.0 RESPONSE TO ELEVATED GAS LEVELS.....	20
5.0 CORRELATION BETWEEN MANAGEMENT ACTIVITIES AND GAS LEVELS	22
6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS	22

List of Tables

Table 1: Classification of Spontaneous Combustion Outbreaks	2
Table 2: Summary of Spontaneous Combustion	2
Table 3: Data Capture Rates.....	9
Table 4: Actions Taken in Response to Elevated Gas Levels.....	20

List of Figures

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – January 2024.....	3
Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – February 2024...	4
Figure 3: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – March 2024.....	5
Figure 4: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – January 2024.....	6
Figure 5: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – February 2024...	7
Figure 6: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – March 2024.....	8
Figure 7: Hydrogen Sulphide 30 Minute Results	11
Figure 8: Sulphur Dioxide 1 Hour Results	13
Figure 9: Hydrogen Sulphide 1 Hour Results	15
Figure 10: Sulphur Dioxide 24 Hour Results	17
Figure 11: Hydrogen Sulphide 24 Hour Results	19

1.0 INTRODUCTION

The coal seams mined by the Muswellbrook Coal Company (MCC) were the Greta Coal Measures. These measures had a history of spontaneous combustion. Spontaneous combustion was a long-term issue at MCC since the first operation commenced in 1907.

A Spontaneous Combustion Management Plan (SCMP) has been prepared according to the specific requirements of the Development Consent. The main objective of the SCMP is to minimise the occurrence of spontaneous combustion and manage the effect by identification, control, removal, mitigation and prevention in the following areas:

- Existing open cut and underground workings,
- Drilling and blasting,
- Mining of overburden,
- Mining of coal,
- Emplacement of overburden,
- Emplacement of washery reject, and
- Coal stockpiles.

Following the completion of mining at the end of 2022, the SCMP was updated in April 2023 to reflect this change of activity on site. The SCMP has subsequently been updated to reflect changes to development consent conditions that were approved in February 2024. MCC are still waiting on Muswellbrook Shire Council (MSC) to approve these changes.

The Environment Protection Authority (EPA) require MCC to provide reports on spontaneous combustion management and monitoring quarterly. This report identifies:

- Spontaneous combustion management during the reporting period,
- Gas monitoring results,
- Number of complaints relating to spontaneous combustion,
- Response to hydrogen sulphide levels above the odour threshold, and
- Correlation between spontaneous combustion on site with gas results and complaints received.

2.0 SPONTANEOUS COMBUSTION MANAGEMENT MEASURES

Spontaneous combustion management measures for the reporting period included water carts assisting with cooling down hot spots and capping of spontaneous combustion outbreaks. Open Cut mining operations ceased at MCC in November 2022, so the reporting of spontaneous combustion management measures has changed and there is no longer a daily report prepared.

The classification system for spontaneous combustion outbreaks is provided in **Table 1**. A summary of the areas affected by spontaneous combustion and the areas controlled and treated during the reporting period is provided in **Table 2**. The locations of these areas can be seen in **Figure 1** to **Figure 6**. As part of the final rehabilitation at MCC, bulk shaping activities have commenced in Open Cut 1 and these activities have included the dozer push of carbonaceous materials. As a result of this work the area affected by spontaneous



combustion has increased. As the bulk shaping activities continue and inert material is placed over this carbonaceous material, this area will decrease.

Table 1: Classification of Spontaneous Combustion Outbreaks

Classification	Description
A	Open flame
B	Visible steam or smoke
C	Other physical evidence of spontaneous combustion (e.g. cracks, coal tars, sulphur crusting, etc)

* - classification revised in November 2019

Table 2: Summary of Spontaneous Combustion

Month	Areas Capped (m ²)*	Areas Mined (m ²)*	Area Under Water Infusion (m ²)*	Area Without Active Control (m ²)**
Open Cut 1				
January 2024	0	0	0	50,291
February 2024	0	0	0	39,875
March 2024	0	0	0	352
Open Cut 2				
January 2024	0	0	0	0
February 2024	0	0	0	0
March 2024	0	0	0	0

* - during reporting period

** - at end of reporting period

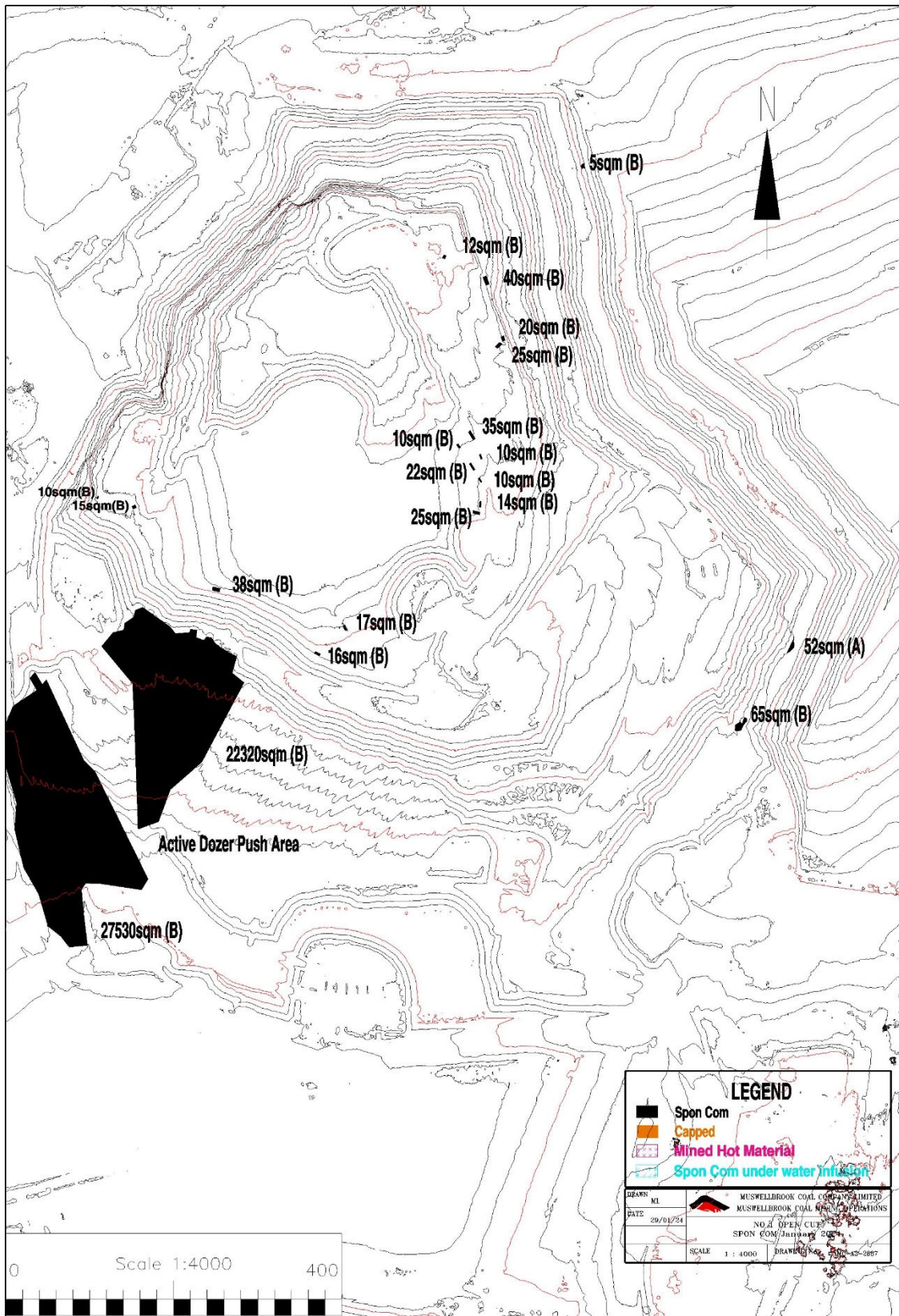


Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – January 2024

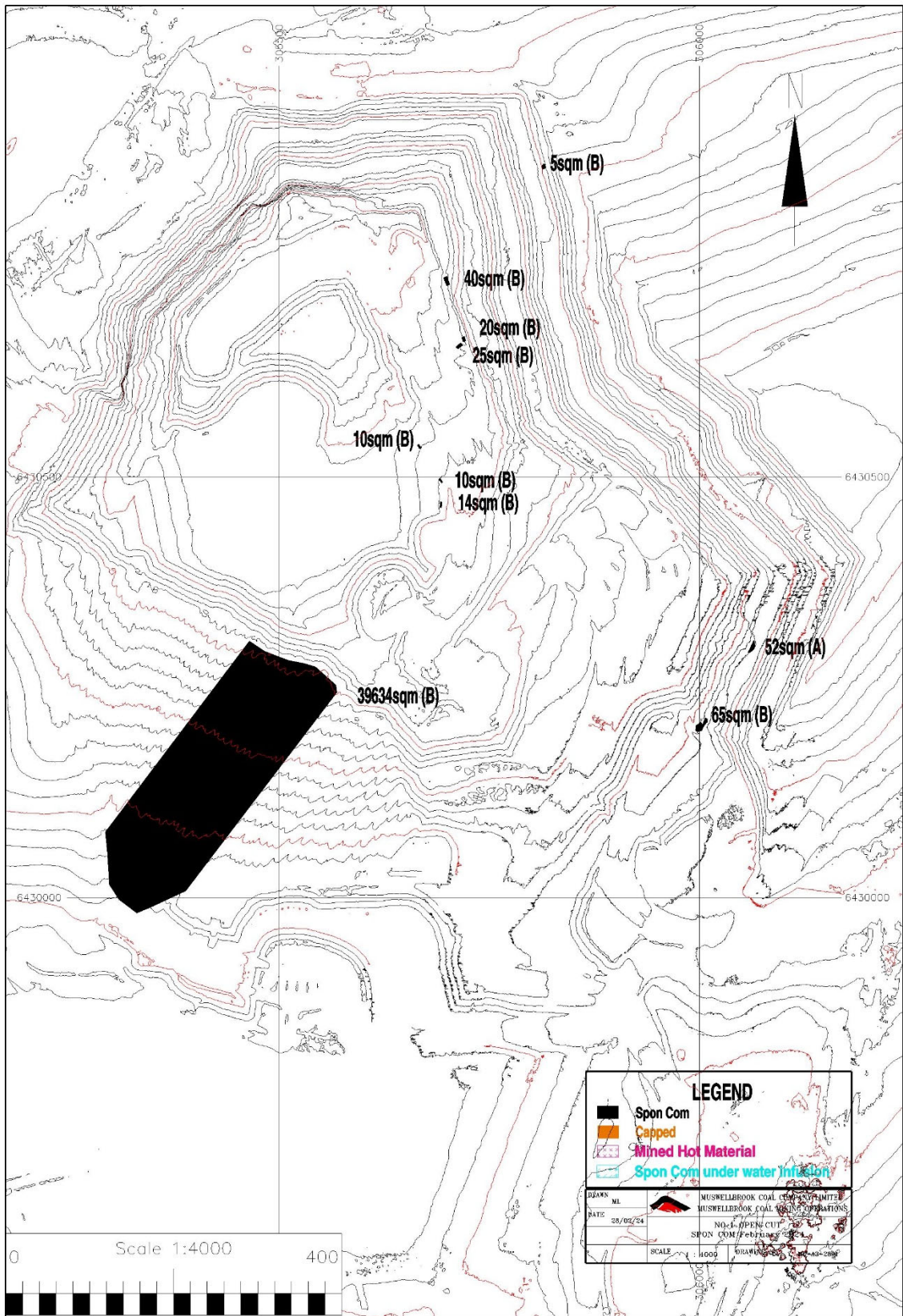


Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – February 2024

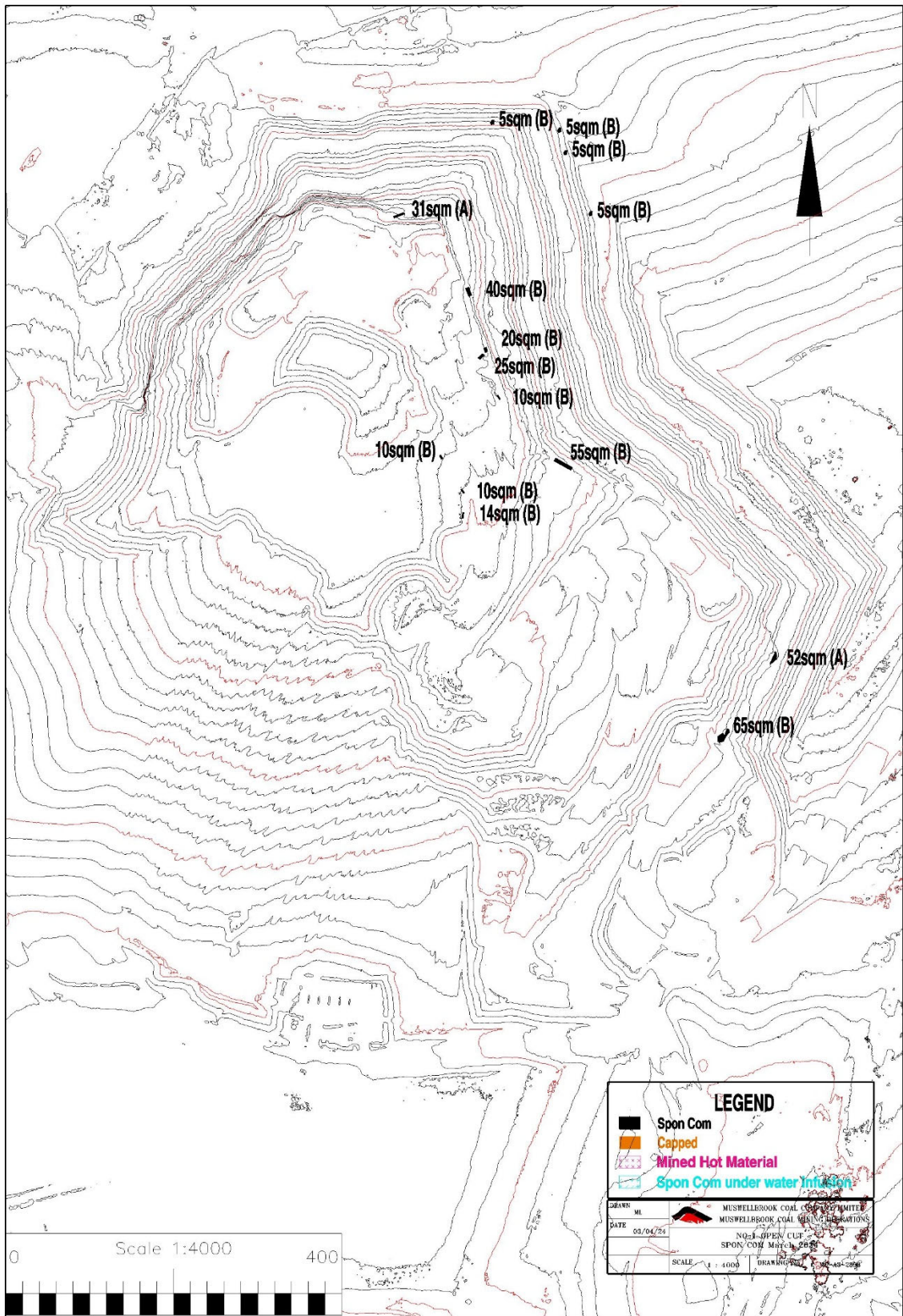


Figure 3: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – March 2024

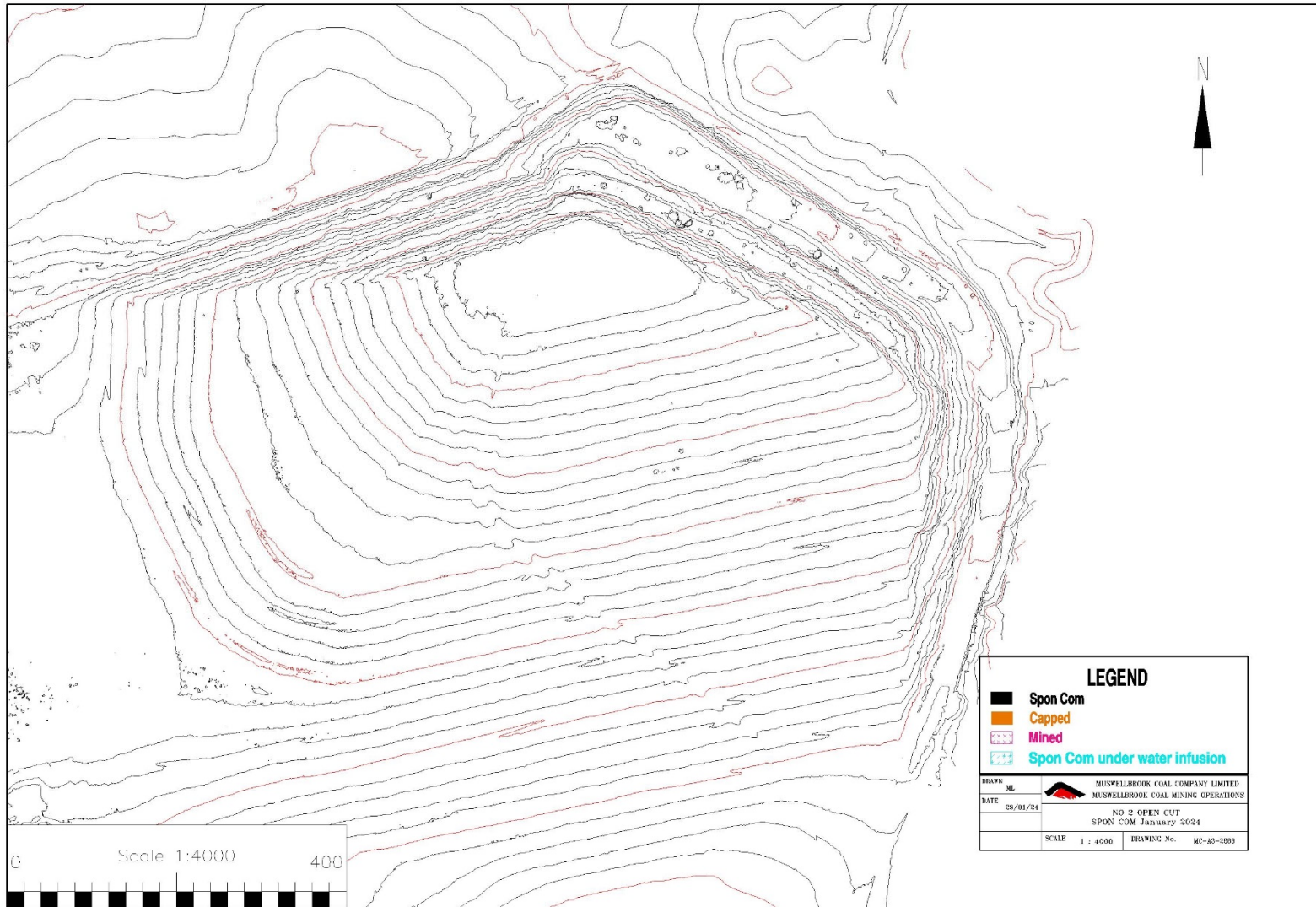


Figure 4: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – January 2024

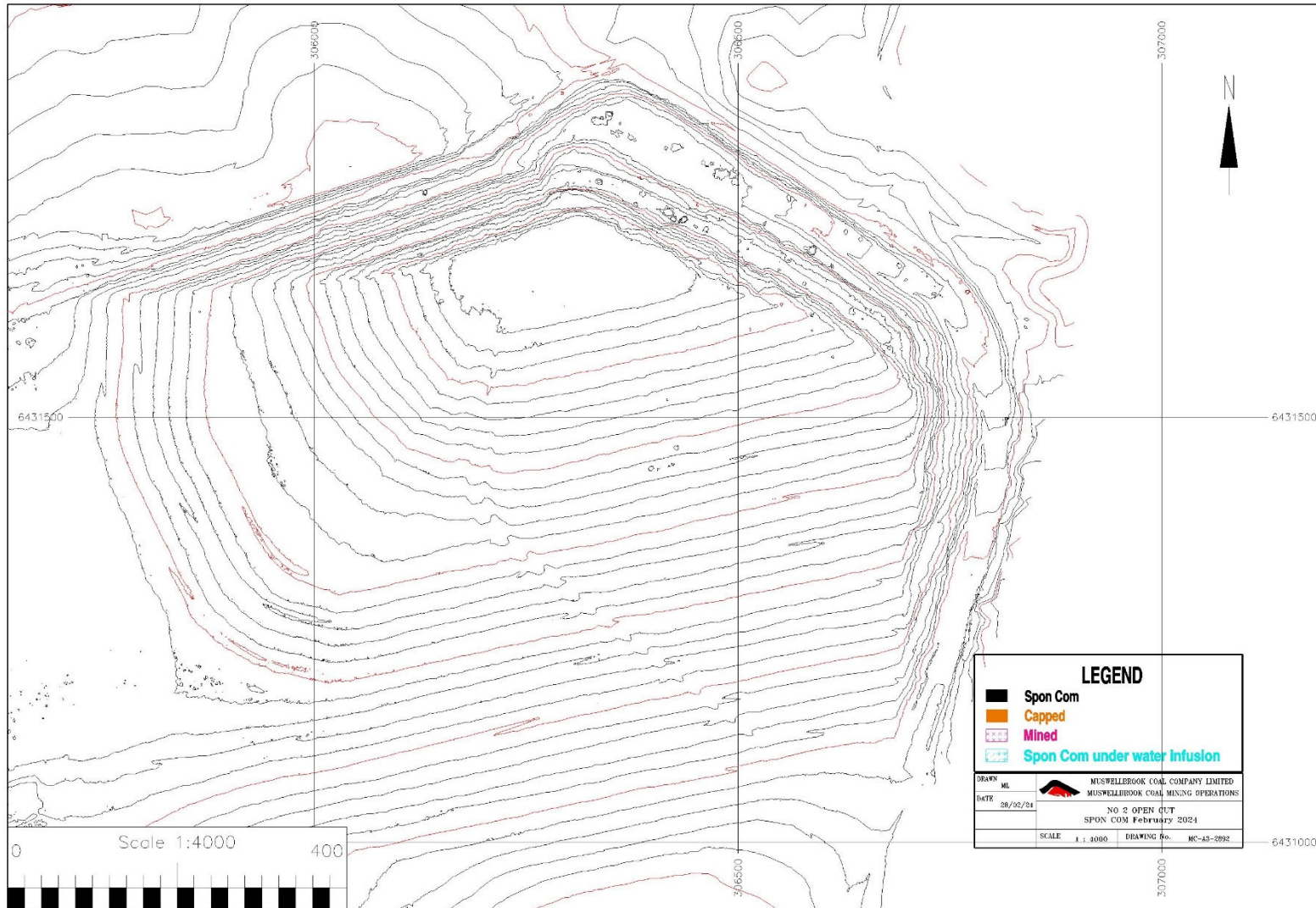


Figure 5: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – February 2024

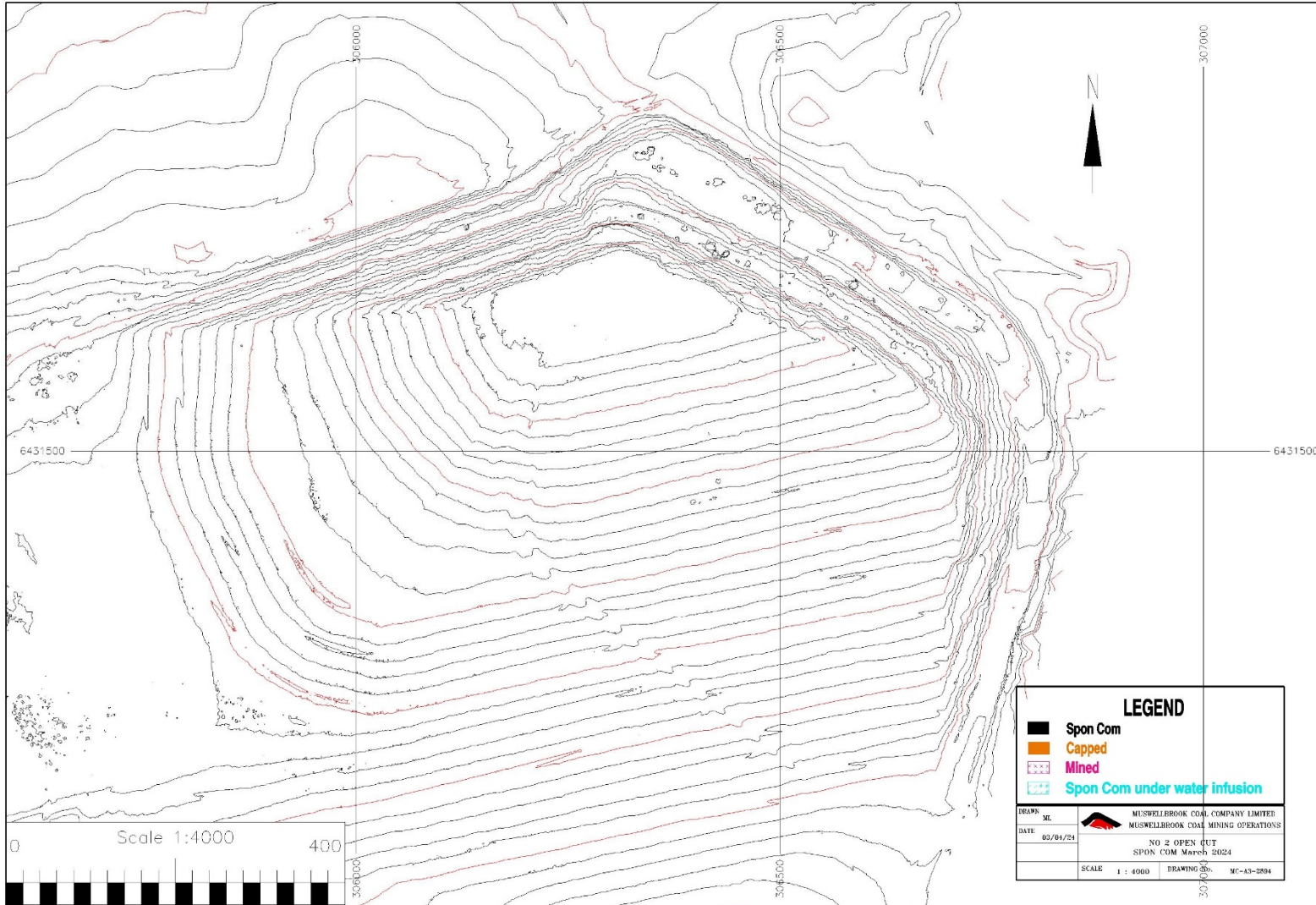


Figure 6: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – March 2024

3.0 GAS MONITORING RESULTS

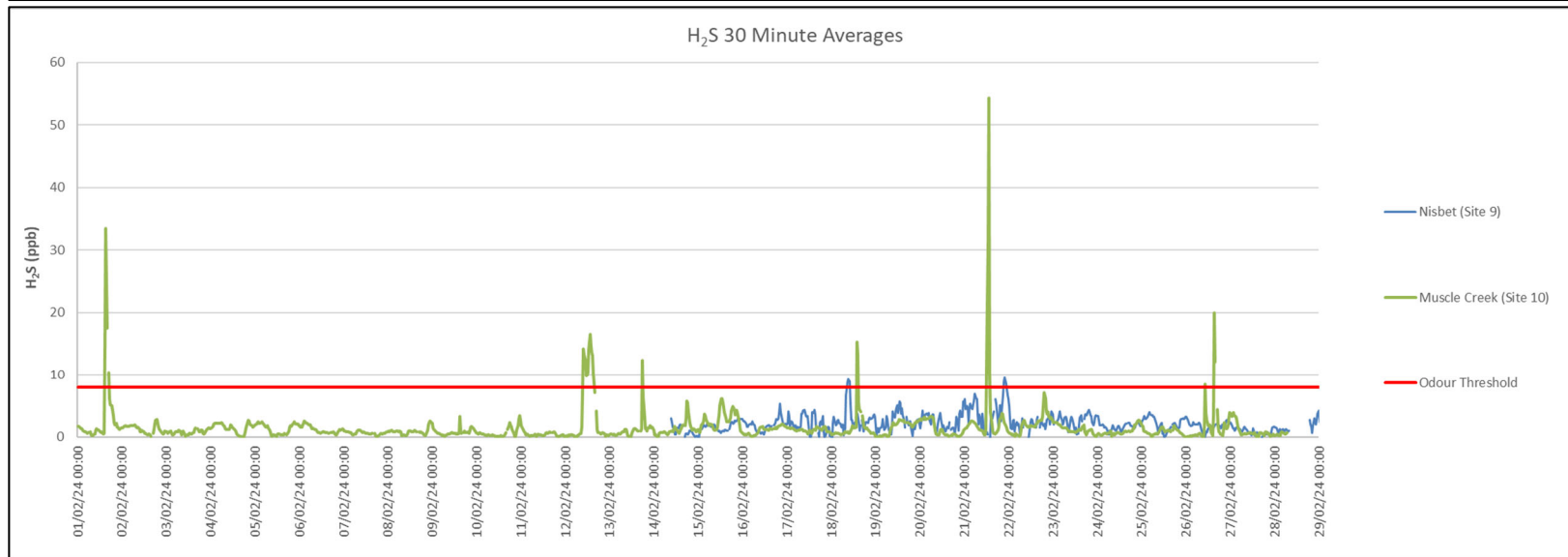
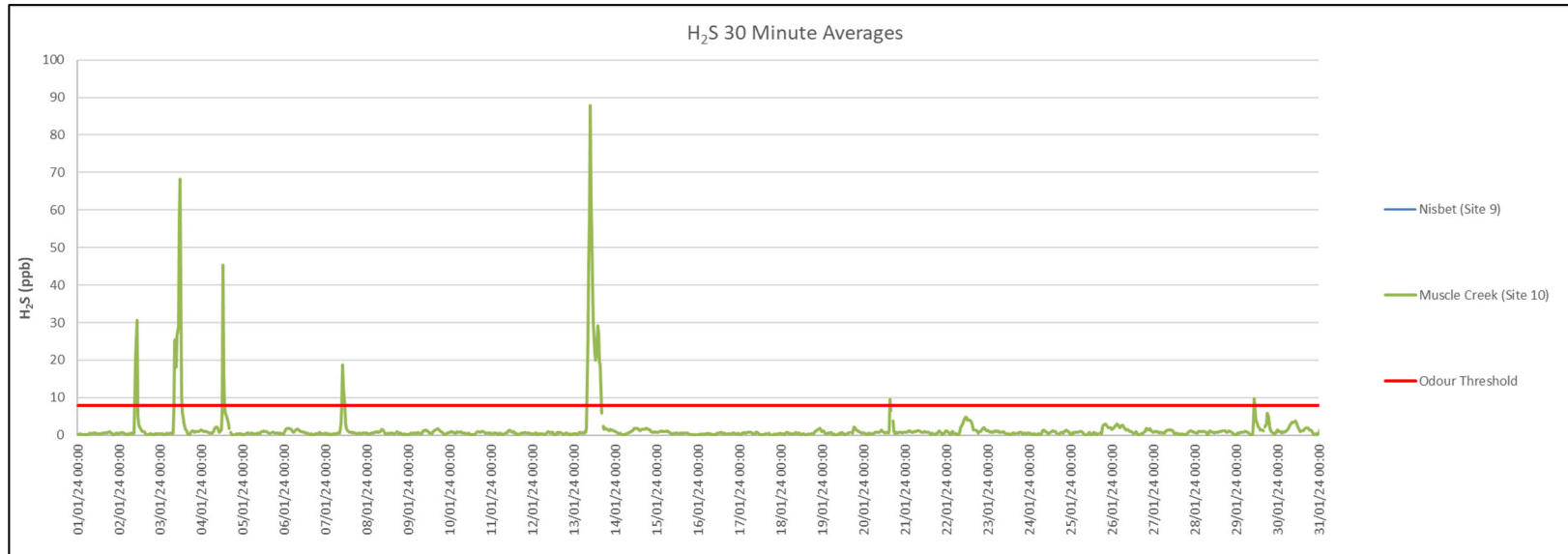
The gas monitoring results are displayed graphically in **Figure 7** to **Figure 11**. As noted in these graphs, there were no results above the health impact assessment criteria for the reporting period. In February 2024, MCC received a modification to the consent and as part of this modification the 1-hour and 24-hour sulphur dioxide criteria were changed. The updated criteria are now 100ppb for 1-hour and 20ppb for 24-hour. These changes are reflected in the figures below. The criteria for hydrogen sulphide have not changed.

The data capture rates for the last 12 months to the end of March 2024 are shown in **Table 3**.

Table 3: Data Capture Rates

Monitoring Location	Pollutant	Averaging Period	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	97.8
		1 hour	98.6
		24 hours	95.4
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	94.0
		1 hour	99.1
		24 hours	98.9
Point 15, Nisbet	Sulphur Dioxide	1 hour	76.1
		24 hours	74.4
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	77.0
		24 hours	93.8

Data was lost from Point 9 and Point 15 between December 2023 and February 2024 due to faulty equipment. This resulted in the 12-month rolling average dropping below 90%. This faulty equipment has been replaced.



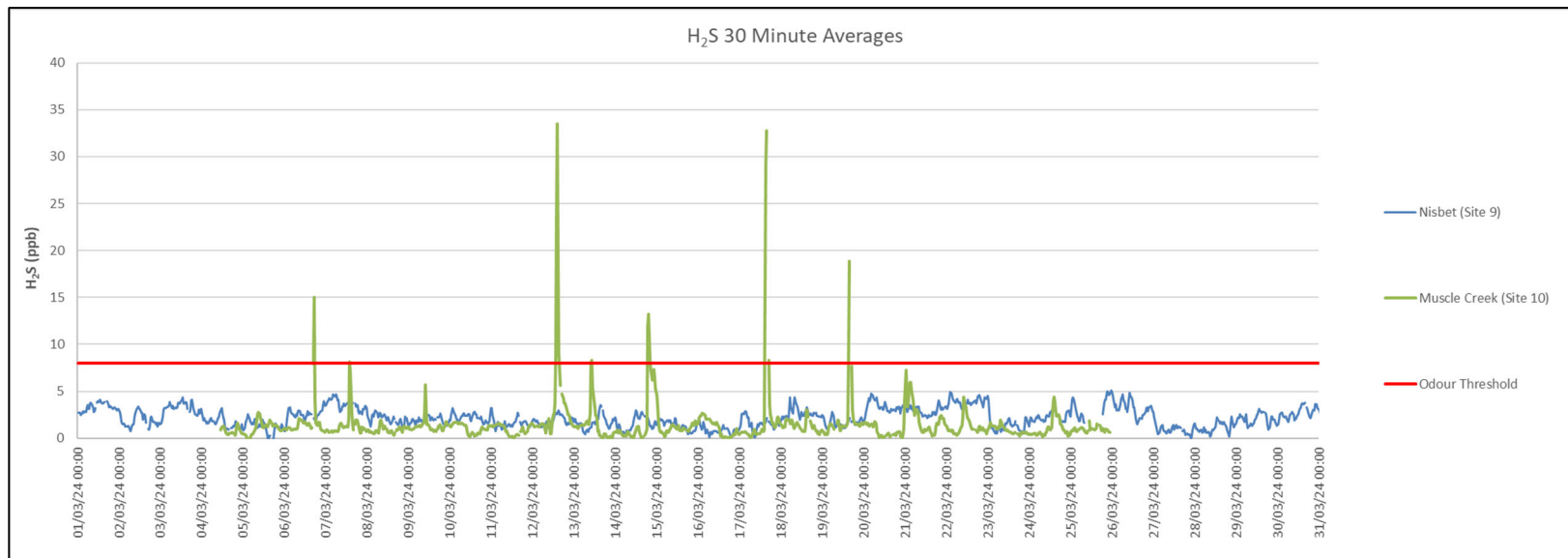
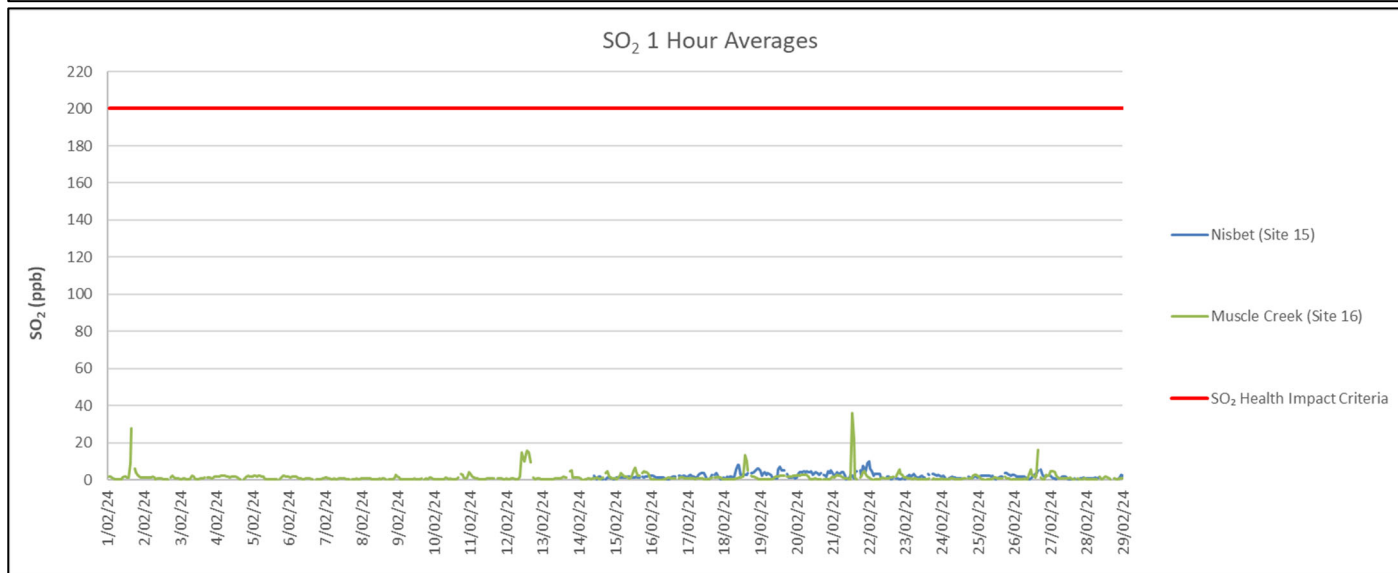
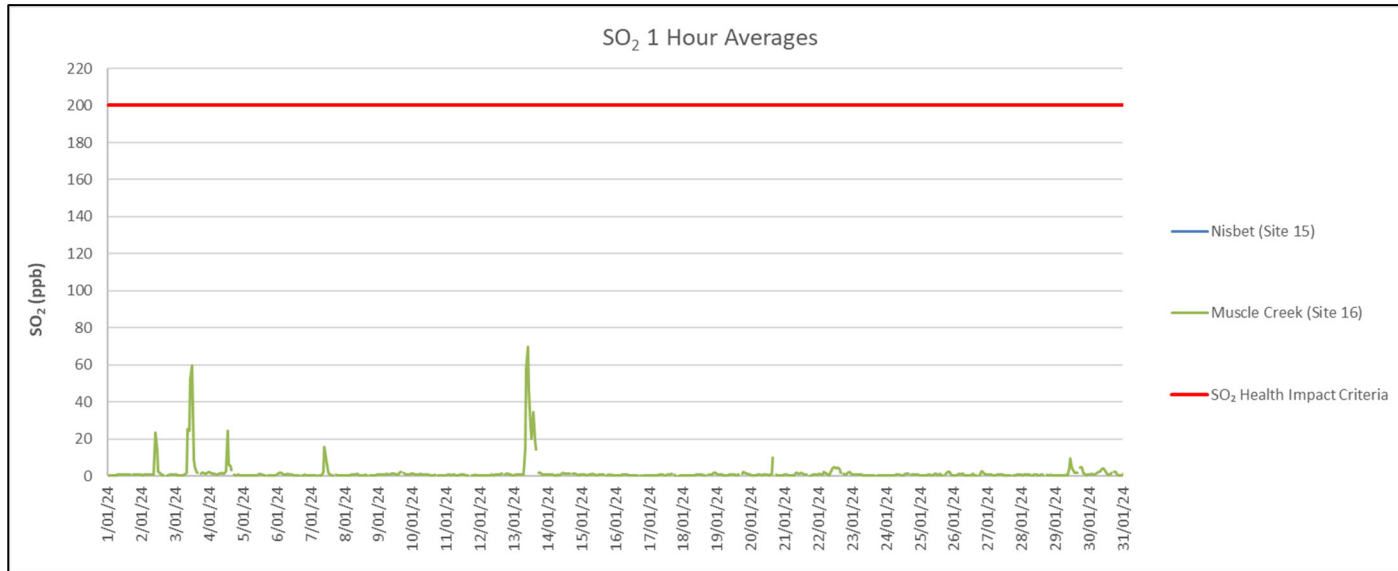


Figure 7: Hydrogen Sulphide 30 Minute Results



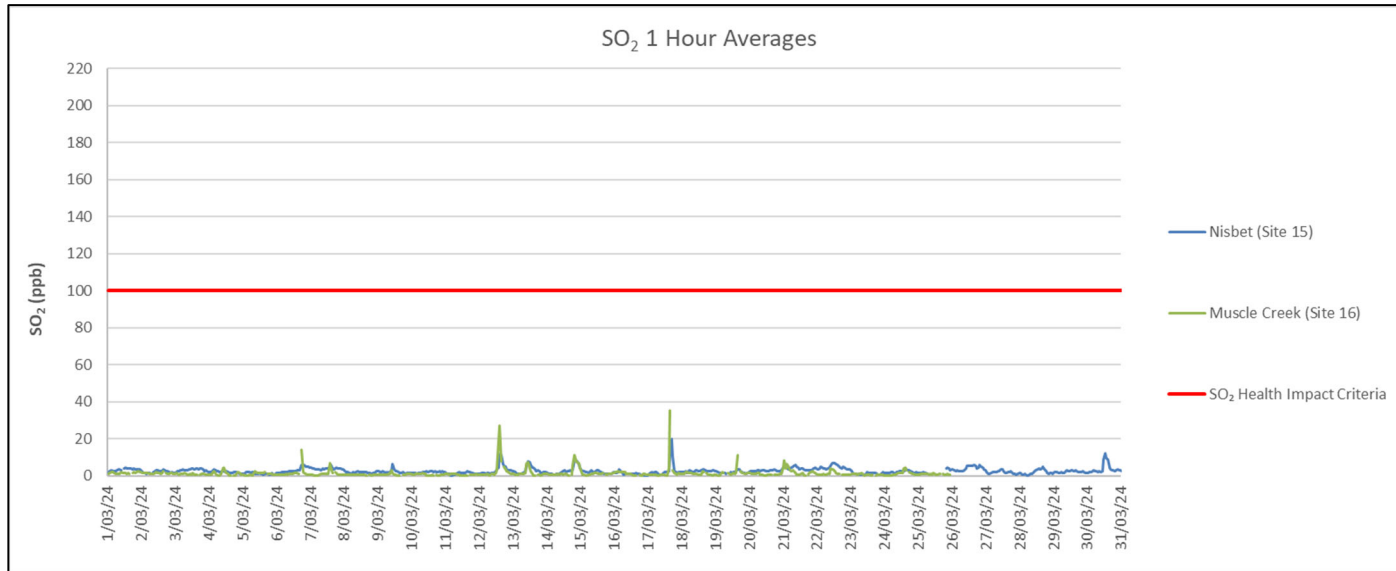
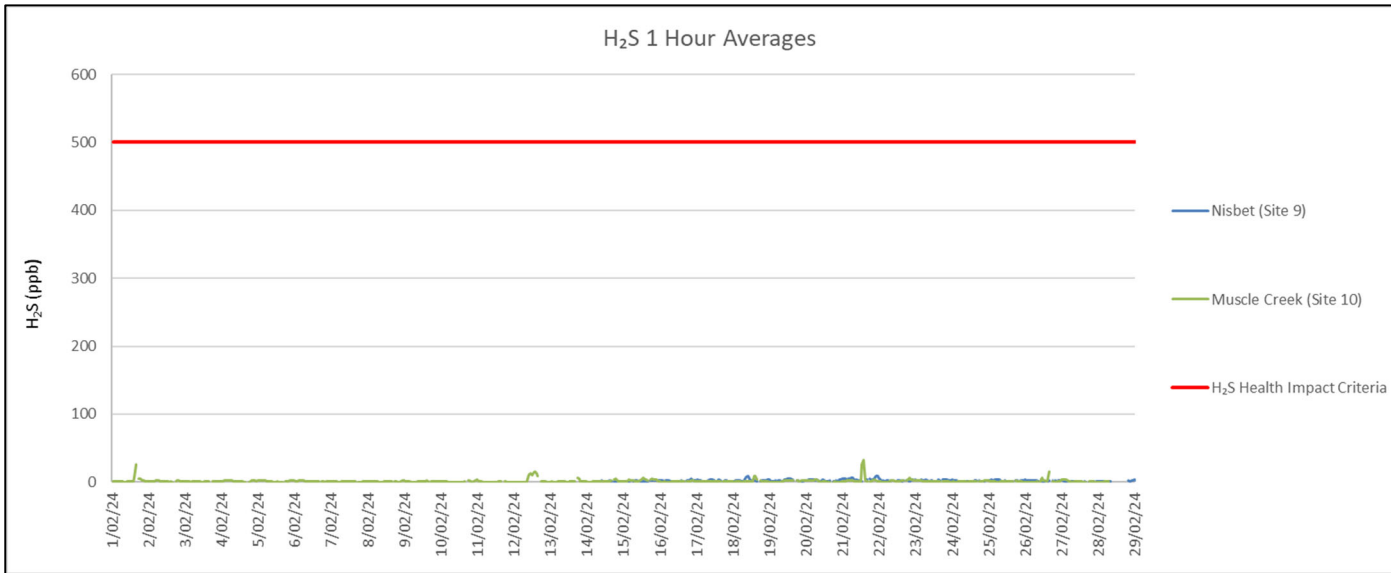
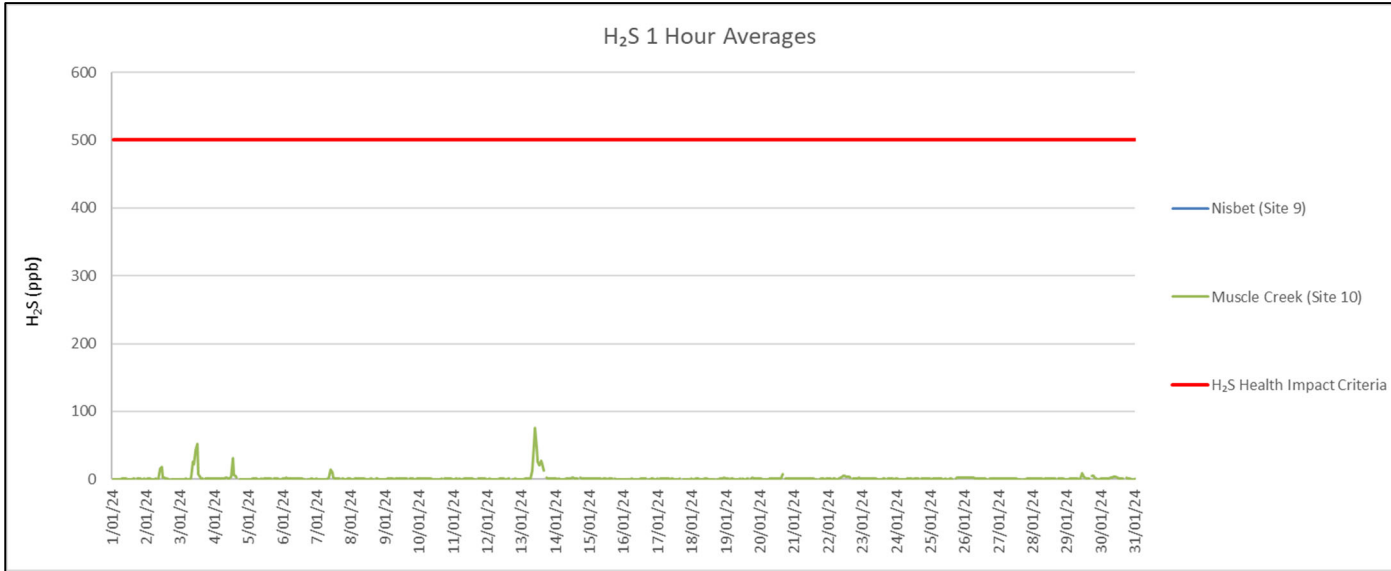


Figure 8: Sulphur Dioxide 1 Hour Results



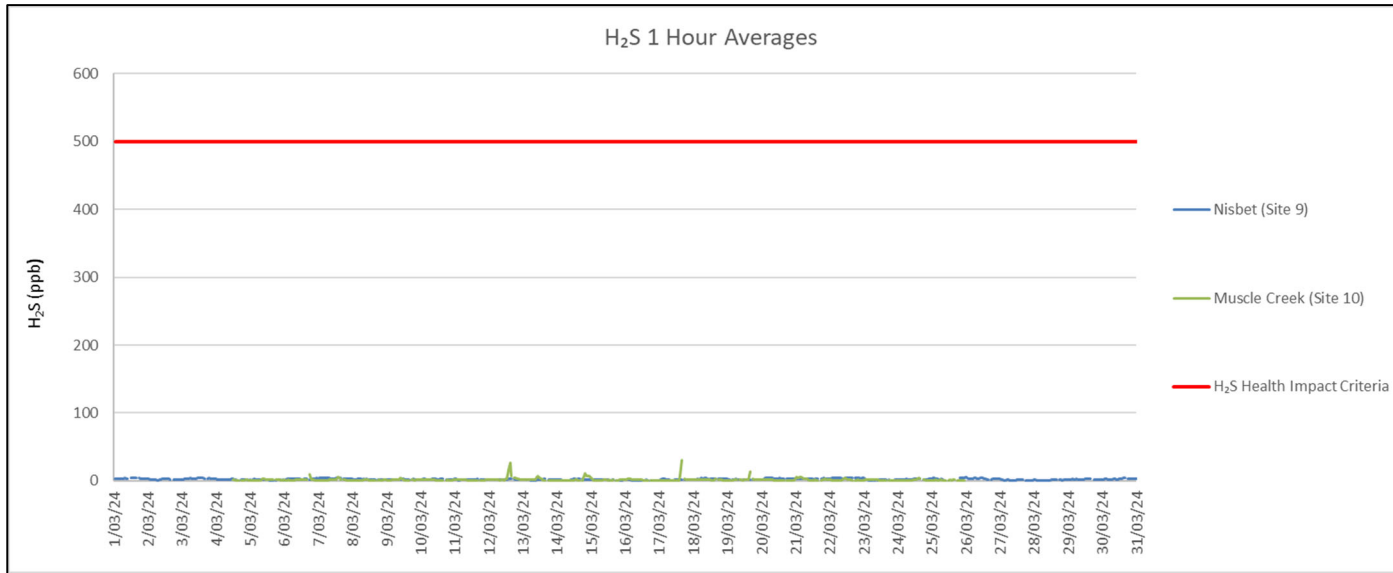
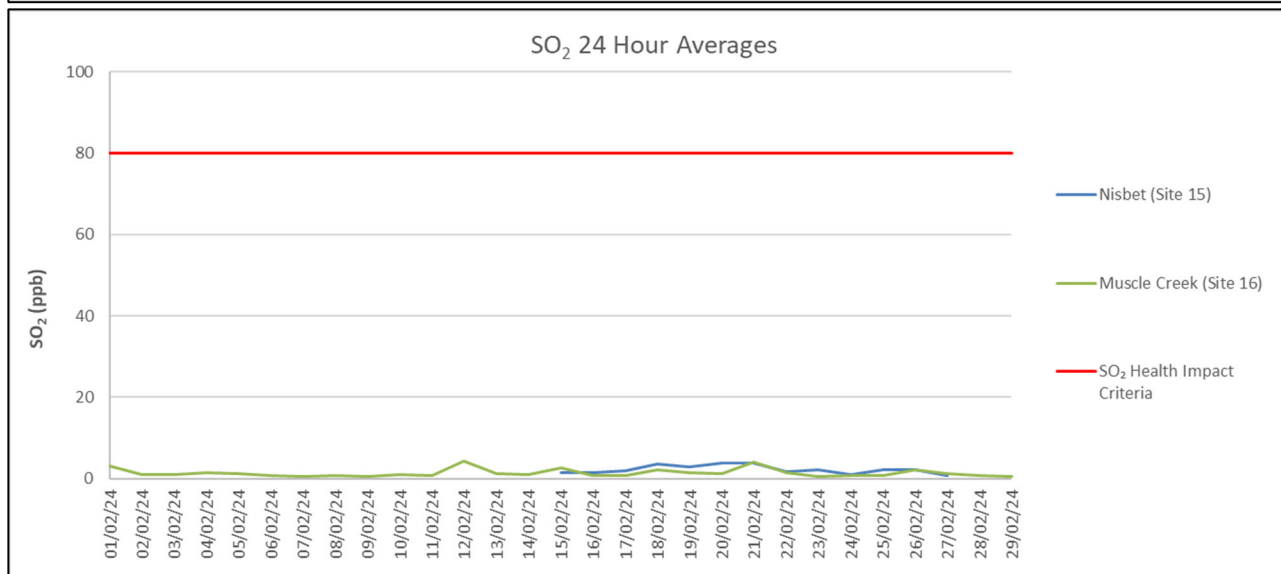
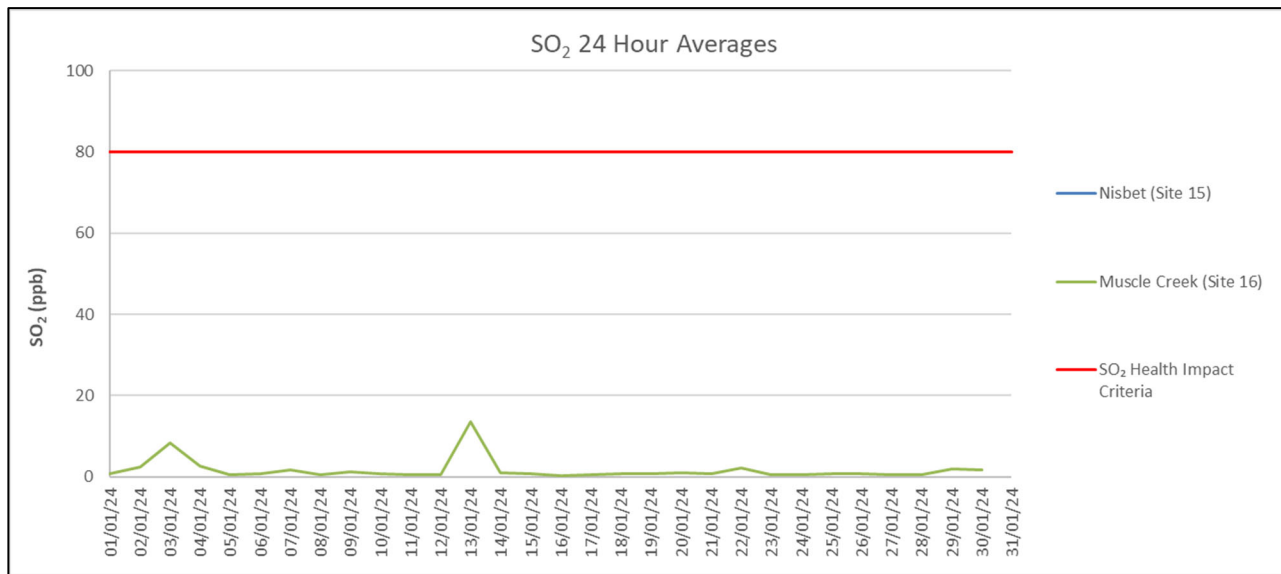


Figure 9: Hydrogen Sulphide 1 Hour Results



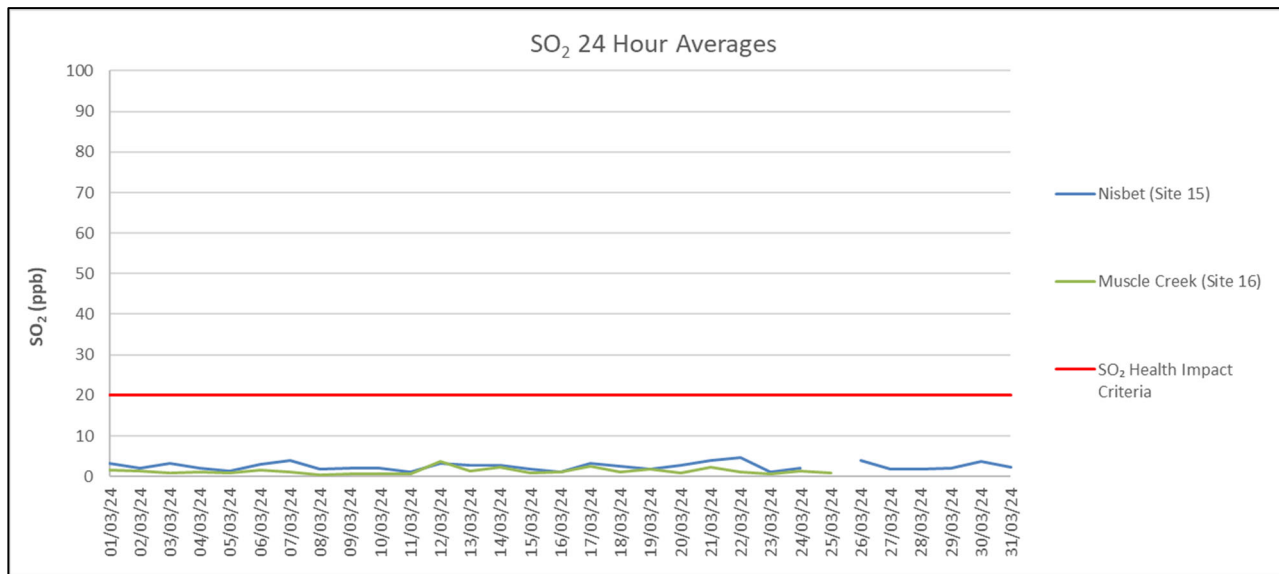
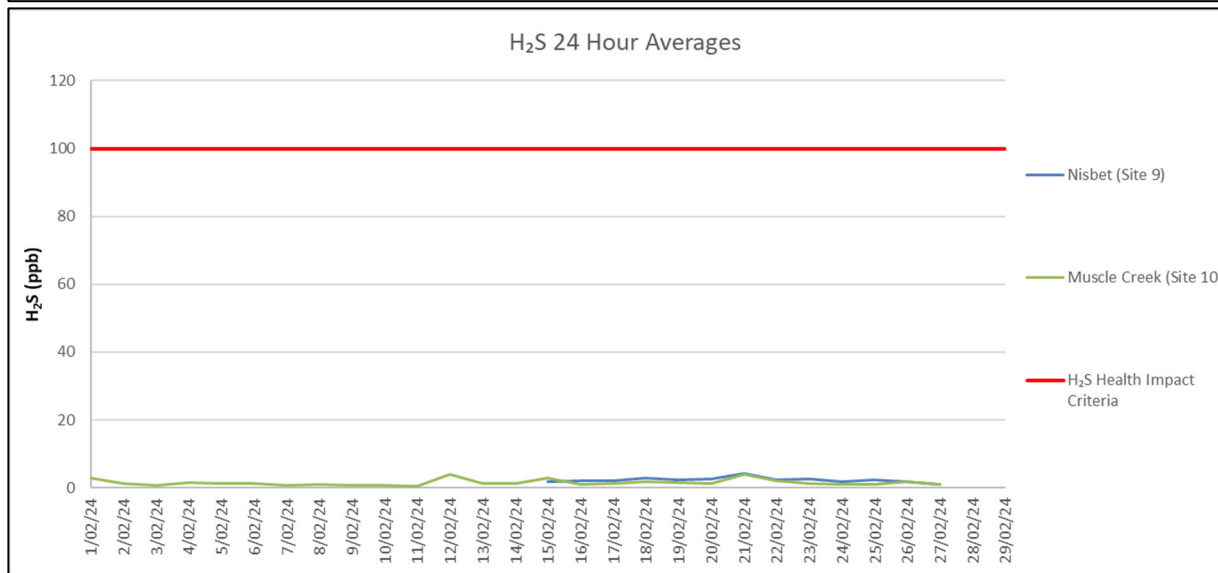
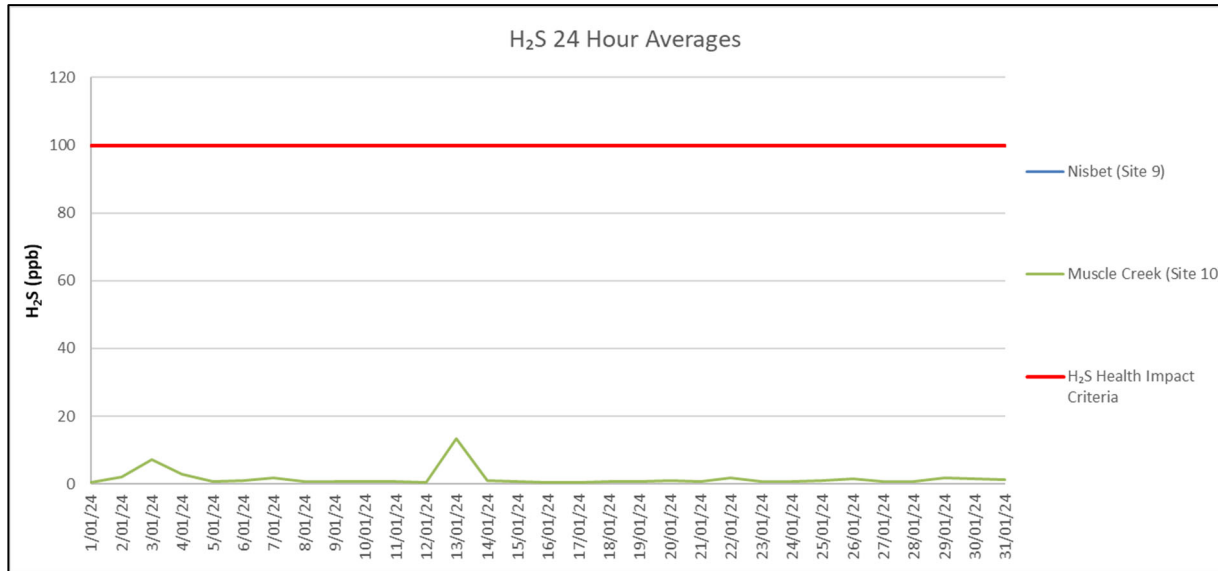


Figure 10: Sulphur Dioxide 24 Hour Results



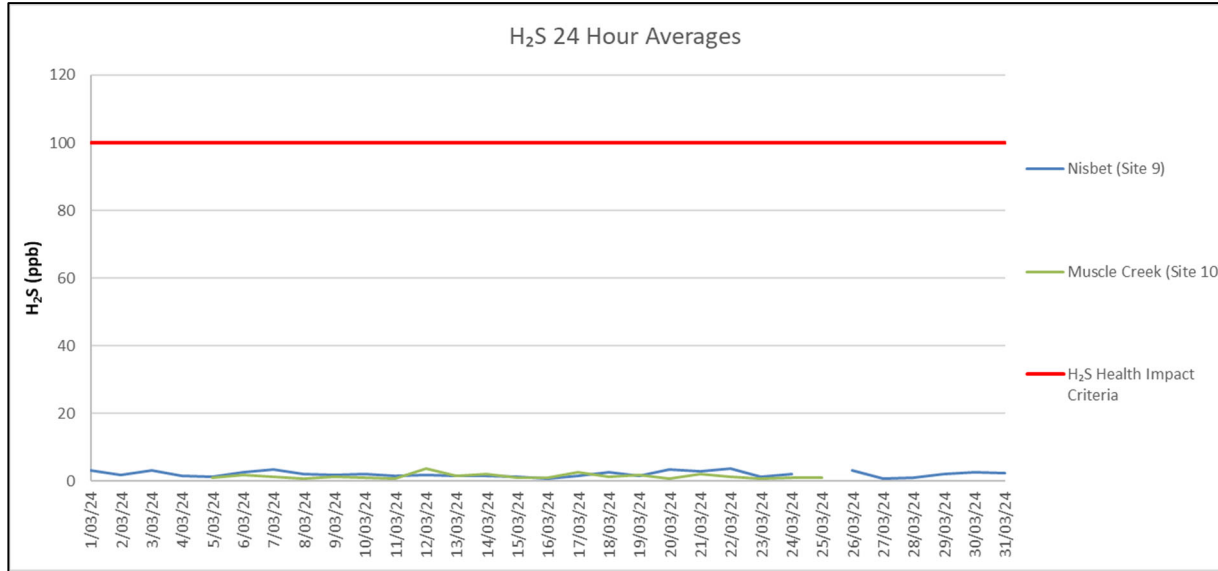


Figure 11: Hydrogen Sulphide 24 Hour Results



4.0 RESPONSE TO ELEVATED GAS LEVELS

When MCC receive an alarm that the hydrogen sulphide levels at the gas monitors are above the odour threshold of 8ppb, a review of operations and gas sources in the local area is undertaken. The responses to any alarms received during the reporting period are shown in **Table 4**. When the majority of alarms were received (95%), the wind was not blowing from the mine towards the monitor, indicating that MCC were most likely not the source of the elevated gas at the monitor.

Table 4: Actions Taken in Response to Elevated Gas Levels

Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
02/01/24 10:25am	Muscle Creek	Wind – 2.4m/s from the SE. Wind was not blowing from the operation to the monitor.	Minimal odour observed in pit.	Class A
03/01/24 09:05am	Muscle Creek	Wind – 1.2m/s from the ESE. Wind was not blowing from the operation to the monitor.	Minimal odour observed in pit. Nil visual issues.	Class A
04/01/24 01:05pm	Muscle Creek	Wind – 2.6m/s from the SE. Wind was not blowing from the operation to the monitor.	Minimal odour observed in pit. Nil visual issues.	Class A
07/01/24 10:25am	Muscle Creek	Wind – 2.0m/s from the S. Wind was not blowing from the operation to the monitor.	No activity occurring on site due to weekend.	Nil Classification
13/01/24 08:45am	Muscle Creek	Wind – 1.6m/s from the S. Wind was not blowing from the operation to the monitor.	No activity occurring on site due to weekend.	Nil Classification
20/01/24 04:35pm	Muscle Creek	Wind – 1.2m/s from the NW.	No activity occurring on site due to weekend.	Class A
29/01/24 12:25pm	Muscle Creek	Wind – 1.7m/s from the WNW. Wind was not blowing from the operation to the monitor.	General haze over the valley with some odour observed in pit.	Class A
01/02/24 03:55pm	Muscle Creek	Wind – 1.8m/s from the SE. Wind was not blowing from the operation to the monitor.	No odour detected in pit.	Class A
12/02/24 10:35am	Muscle Creek	Wind – 1.4m/s from the W. Wind was not blowing from the operation to the monitor.	Some odour early morning, increased visible steam/gas in pit.	Class A



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
13/02/24 06:55pm	Muscle Creek	Wind – 3.7m/s from the SE. Wind was not blowing from the operation to the monitor.	No management of spontaneous combustion at time of alarm.	Nil classification
18/02/24 02:55pm	Muscle Creek	Wind – 2.6m/s from the SE. Wind was not blowing from the operation to the monitor.	No activity occurring on site due to weekend.	Class A
21/02/24 01:15pm	Muscle Creek	Wind – 2.8m/s from the ESE. Wind was not blowing from the operation to the monitor.	Light cloud, small odour in pit, minimal haze.	Class B
26/02/24 11:25am	Muscle Creek	Wind – 1.7m/s from the ENE. Wind was not blowing from the operation to the monitor.	Water cart being used to cool down hot spots.	Combination of Class A and Class B
06/03/24 06:15pm	Muscle Creek	Wind – 2.3m/s from the E. Wind was not blowing from the operation to the monitor.	Water cart being used to cool down hot spots.	Combination of Class A and Class B
07/03/24 02:55pm	Muscle Creek	Wind – 3.2m/s from the SE. Wind was not blowing from the operation to the monitor.	No information available	No classification
12/03/24 02:25pm	Muscle Creek	Wind – 2.2m/s from the ESE. Wind was not blowing from the operation to the monitor.	Water cart being used to cool down hot spots.	Combination of Class A and Class B
13/03/24 11:00am	Muscle Creek	Wind – 2.5m/s from the SSE. Wind was not blowing from the operation to the monitor.	Water cart being used to cool down hot spots.	Combination of Class A and Class B
14/03/24 07:45pm	Muscle Creek	Wind – 7.3m/s from the SE. Wind was not blowing from the operation to the monitor.	No odour detected at monitor.	Class A
17/03/24 03:55pm	Muscle Creek	Wind – 3.2m/s from the SE. Wind was not blowing from the operation to the monitor.	No activity occurring on site due to weekend.	Combination of Class A and Class B
19/03/24 04:35pm	Muscle Creek	Wind – 3.2m/s from the SE. Wind was not blowing from the operation to the monitor.	Water cart being used to cool down hot spots.	Combination of Class A and Class B



5.0 CORRELATION BETWEEN MANAGEMENT ACTIVITIES AND GAS LEVELS

A review of the correlation between spontaneous combustion management activities and gas levels has been undertaken. This review found that gas levels during the reporting period were generally low.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There have been no complaints received during the reporting period in relation to odour.