



Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: Quarter 3 2024

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 19 November 2024

**Approved by: Julie Thomas
Environmental Superintendent**



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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.

The SCMP has 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				
July 2024	0	0	0	566
August 2024	0	0	0	223
September 2024	0	0	0	323
Open Cut 2				
July 2024	0	0	0	0
August 2024	0	0	0	0
September 2024	0	0	0	0

* - during reporting period

** - at end of reporting period

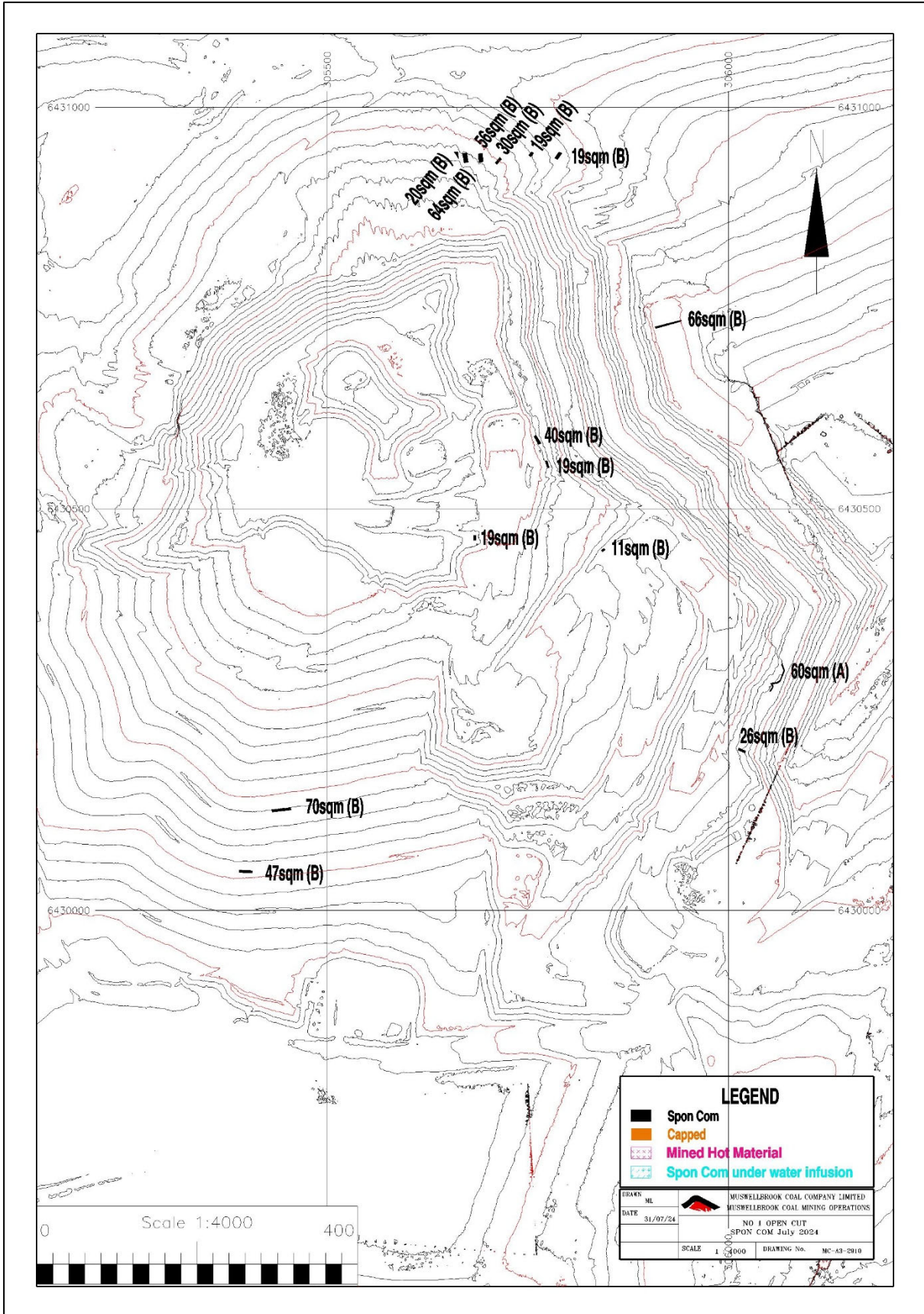


Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – July 2024

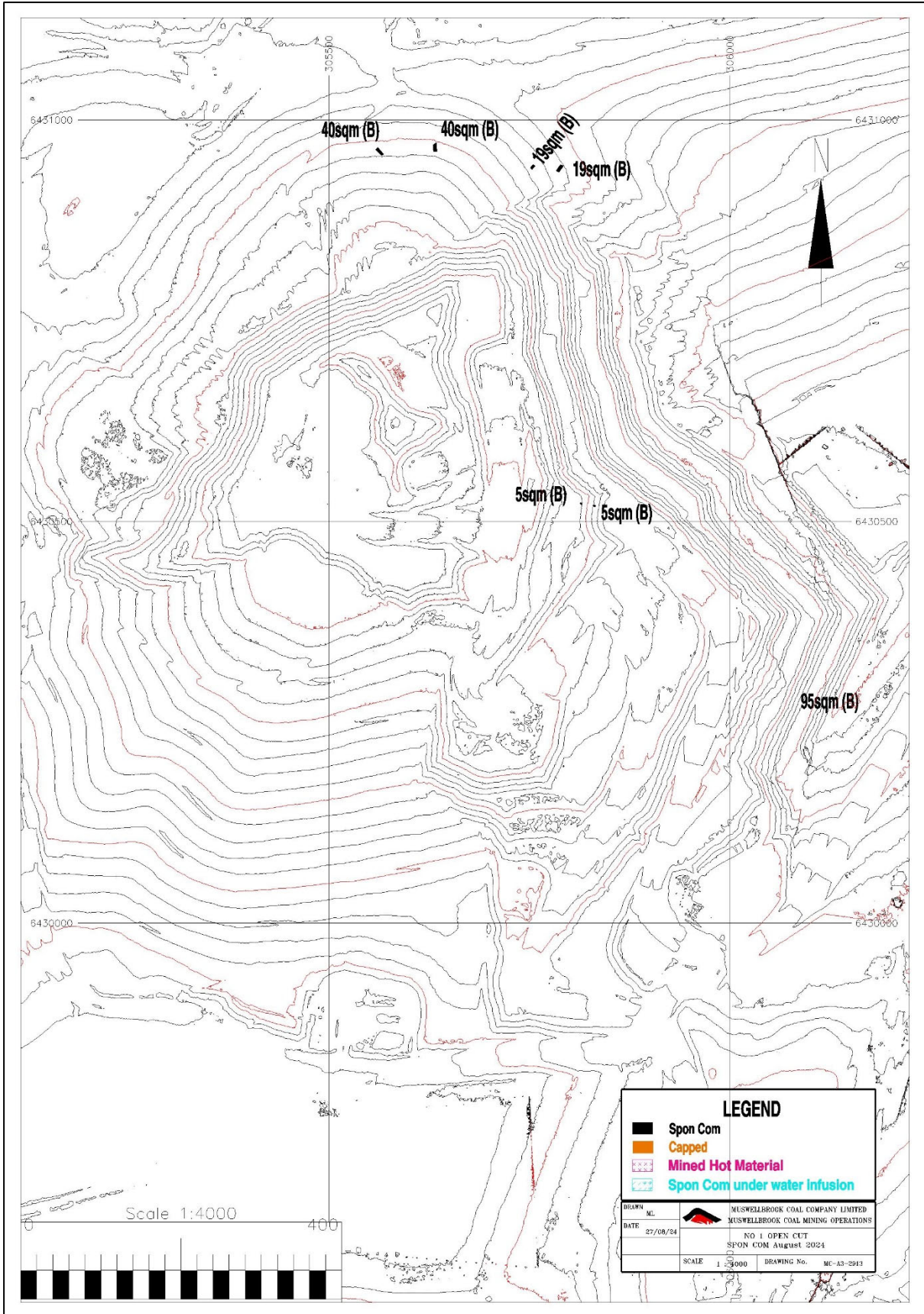


Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – August 2024

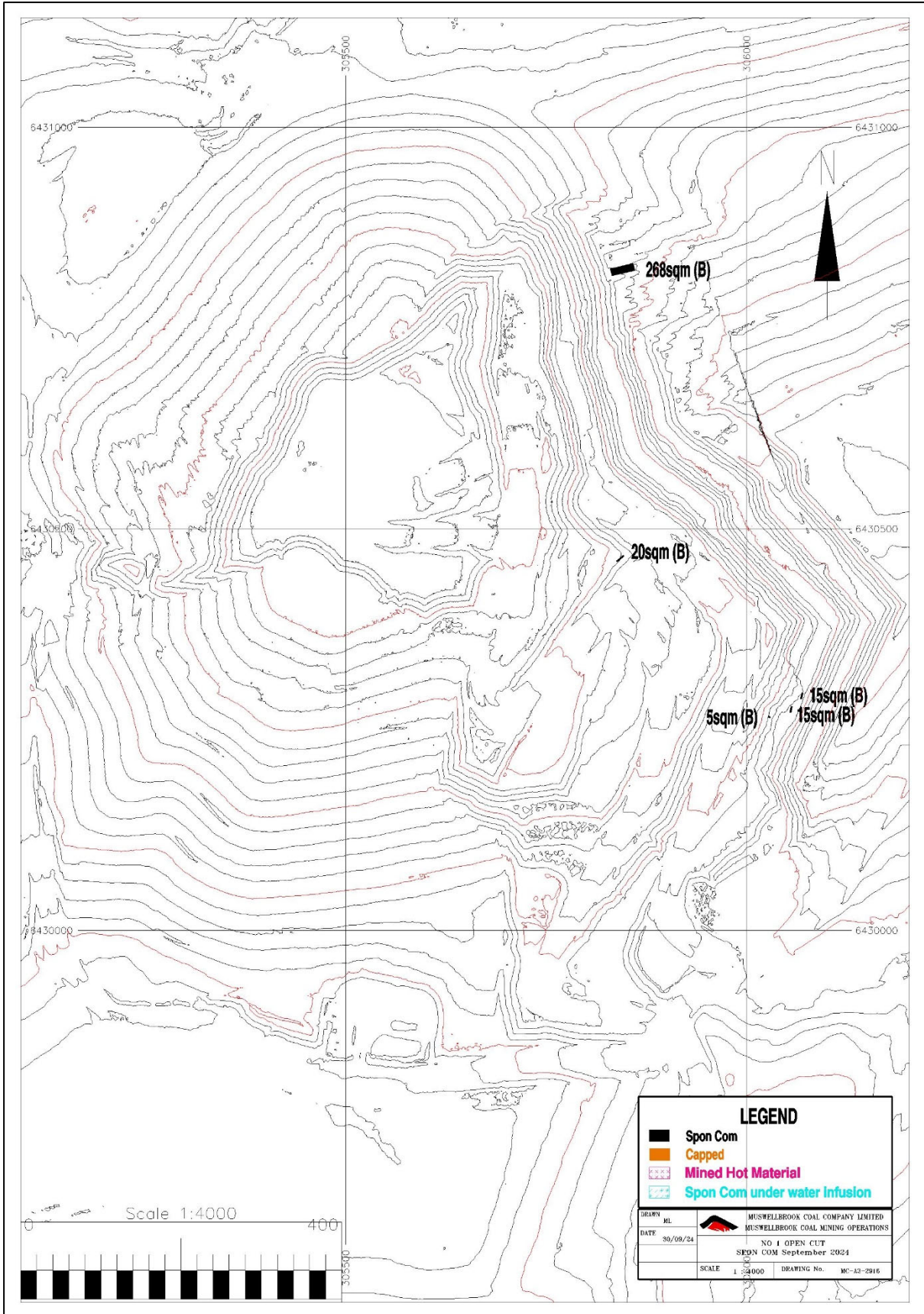


Figure 3: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – September 2024

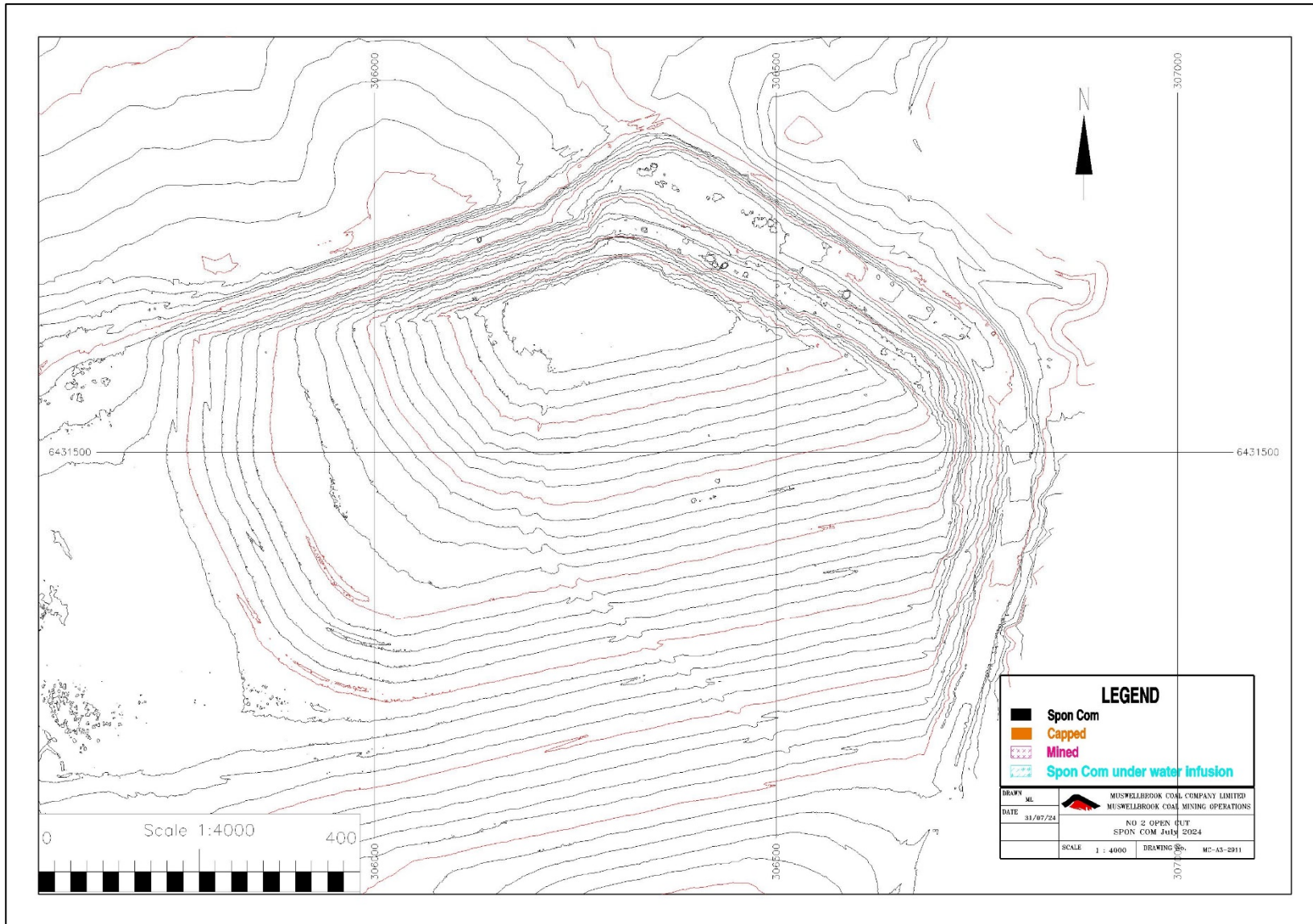


Figure 4: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – July 2024

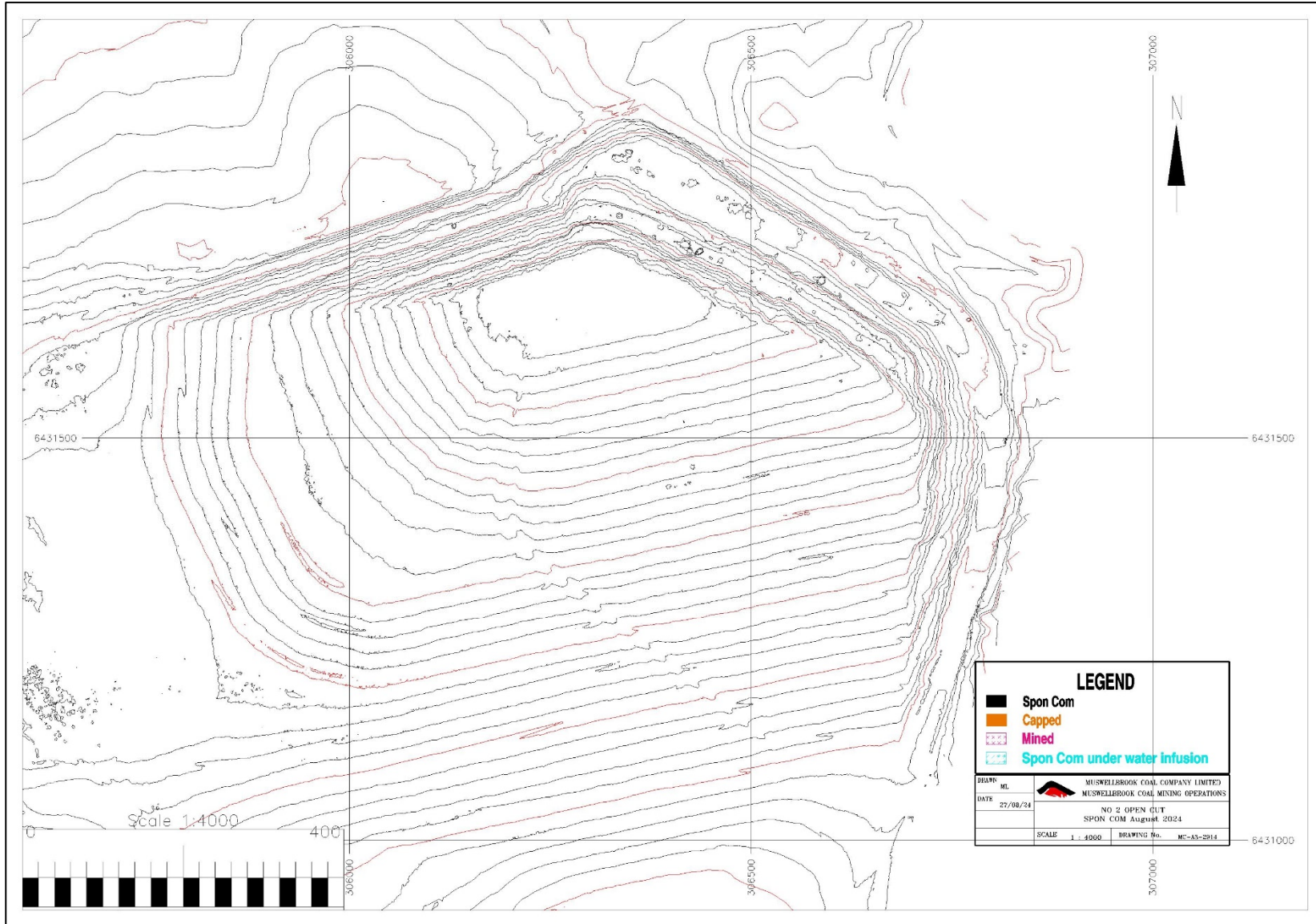


Figure 5: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – August 2024

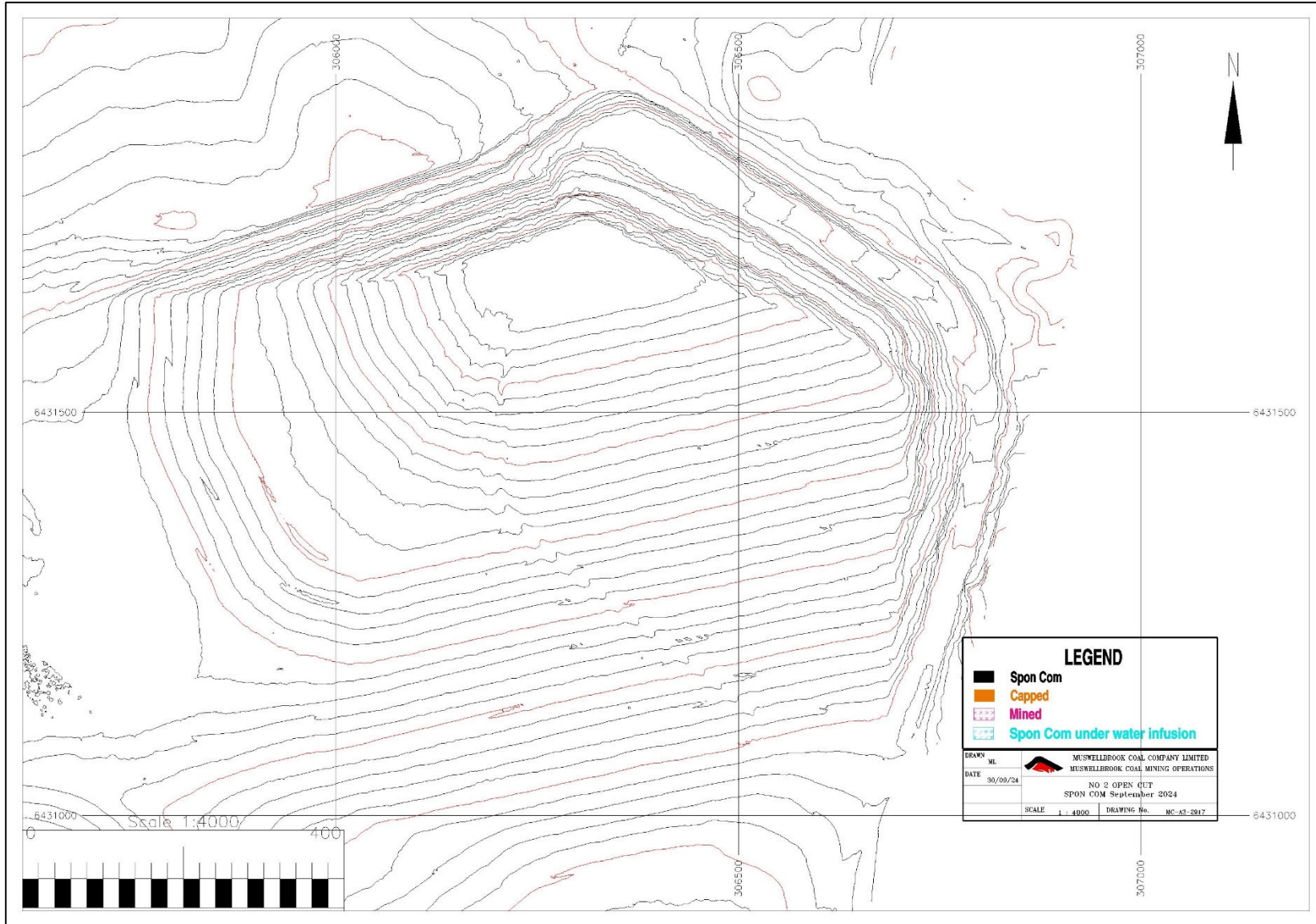


Figure 6: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – September 2024

3.0 GAS MONITORING RESULTS

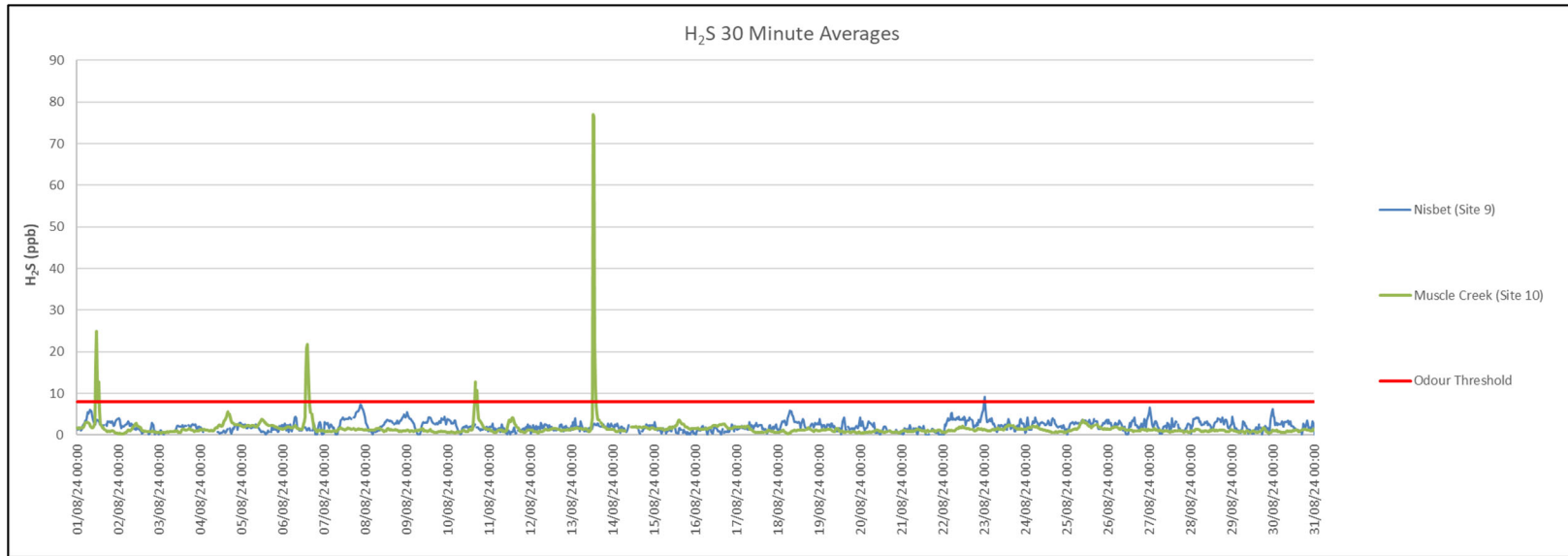
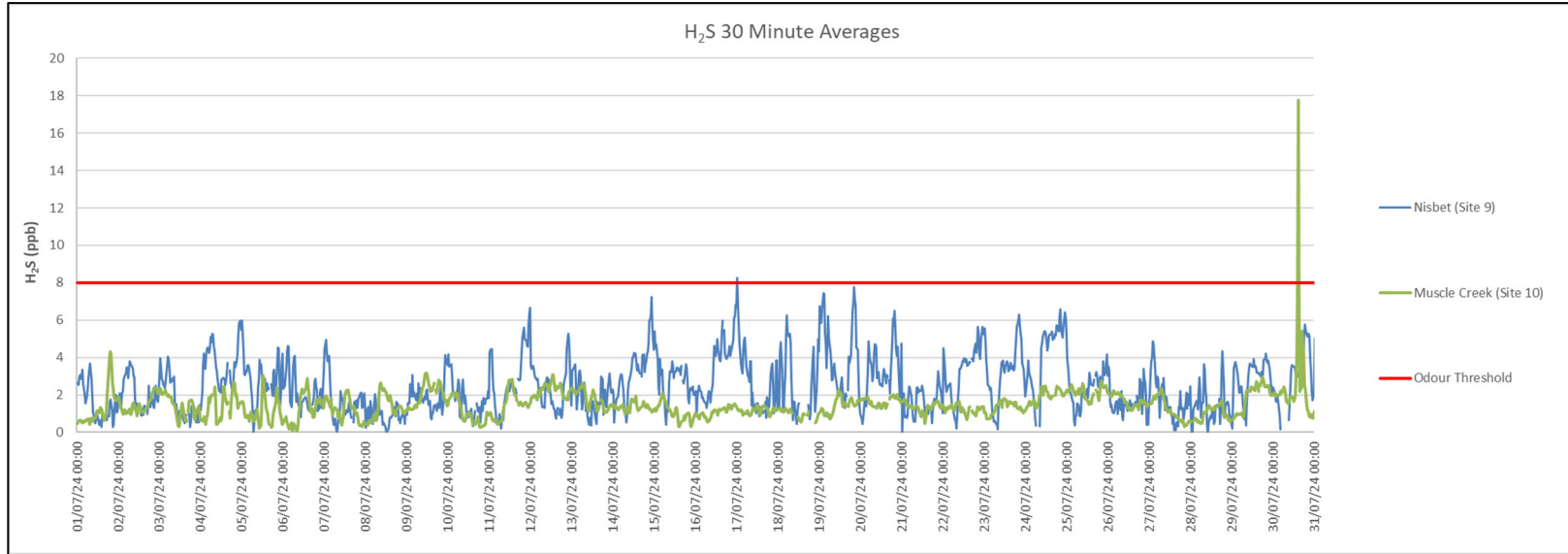
The gas monitoring results are displayed graphically in **Figure 7** to **Figure 11**. As noted in these graphs, there were no results above the health impact assessment criteria for the reporting period. In February 2024, MCC received a modification to the consent and as part of this modification the 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 September 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	76.9
		1 hour	75.1
		24 hours	78.1
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	87.7
		1 hour	85.7
		24 hours	88.5
Point 15, Nisbet	Sulphur Dioxide	1 hour	77.6
		24 hours	78.4
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	87.1
		24 hours	90.1

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.



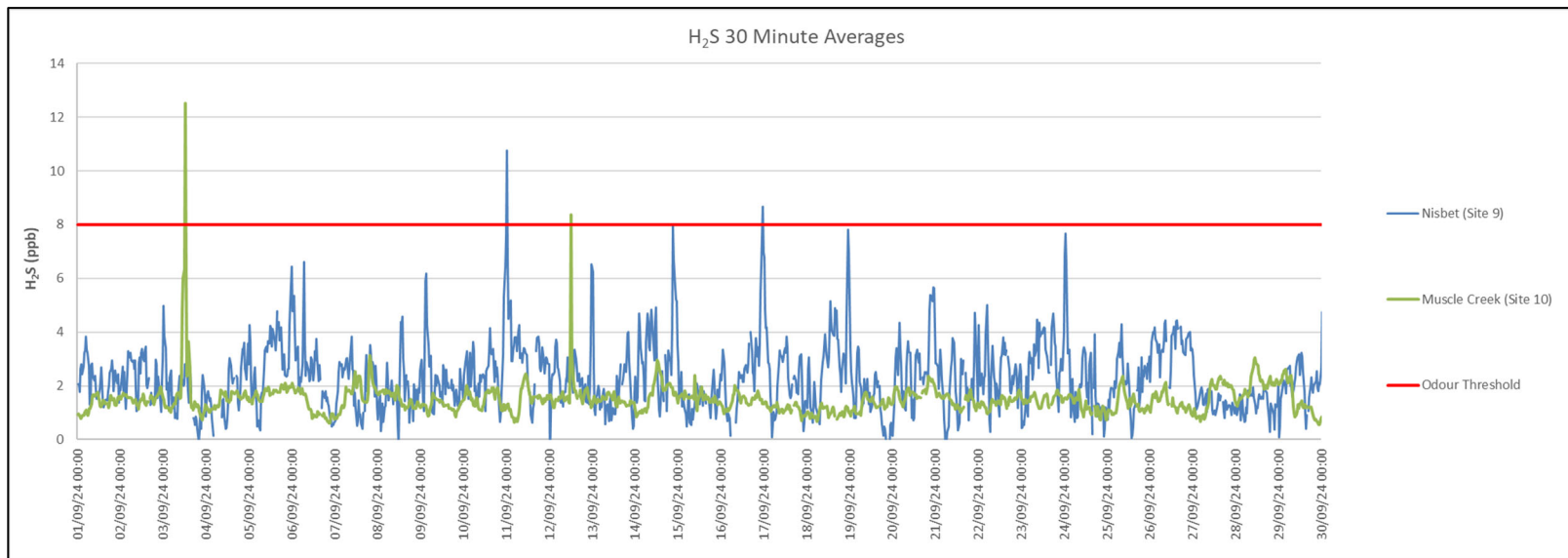
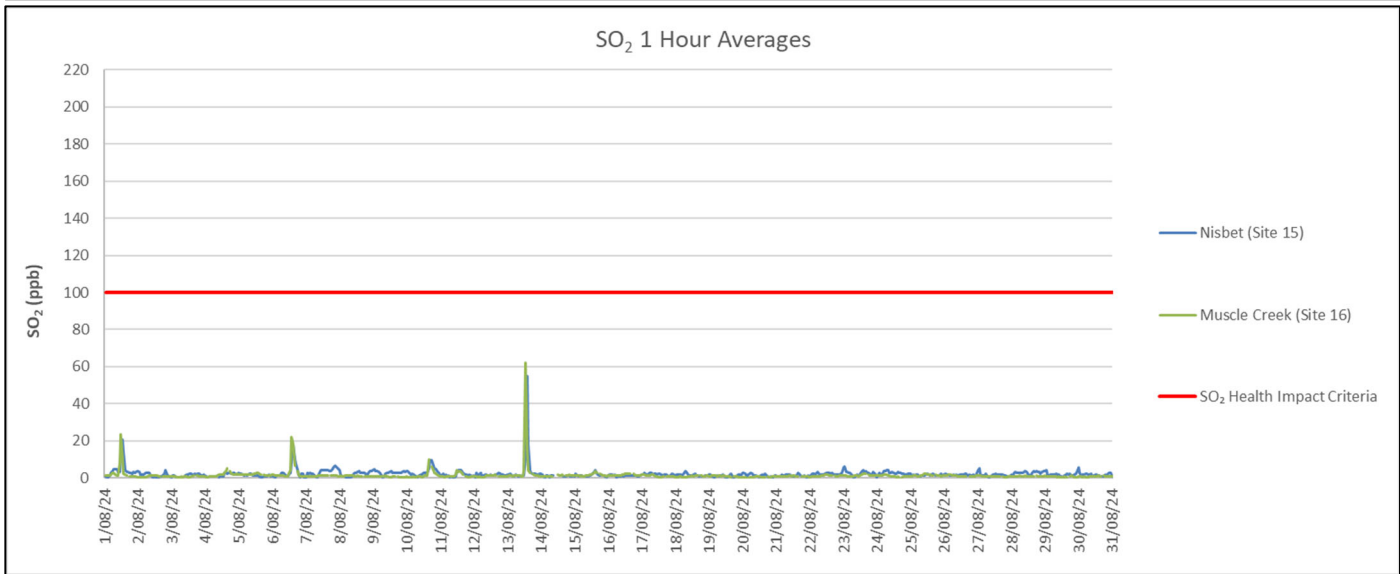
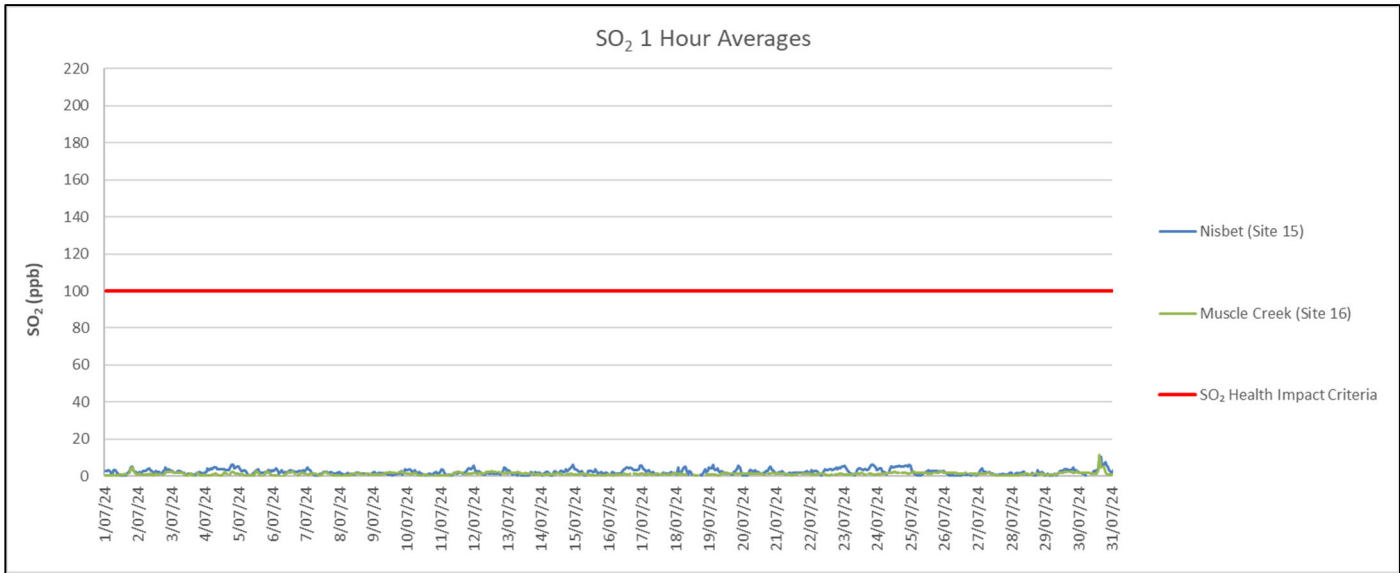


Figure 7: Hydrogen Sulphide 30 Minute Results



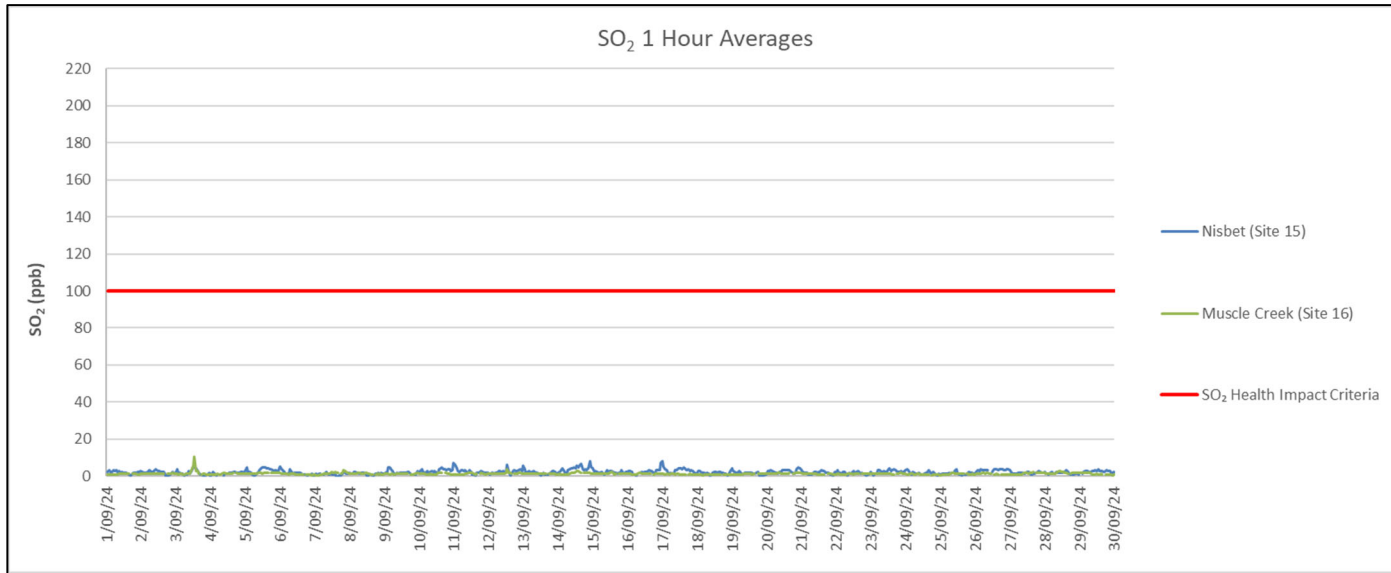
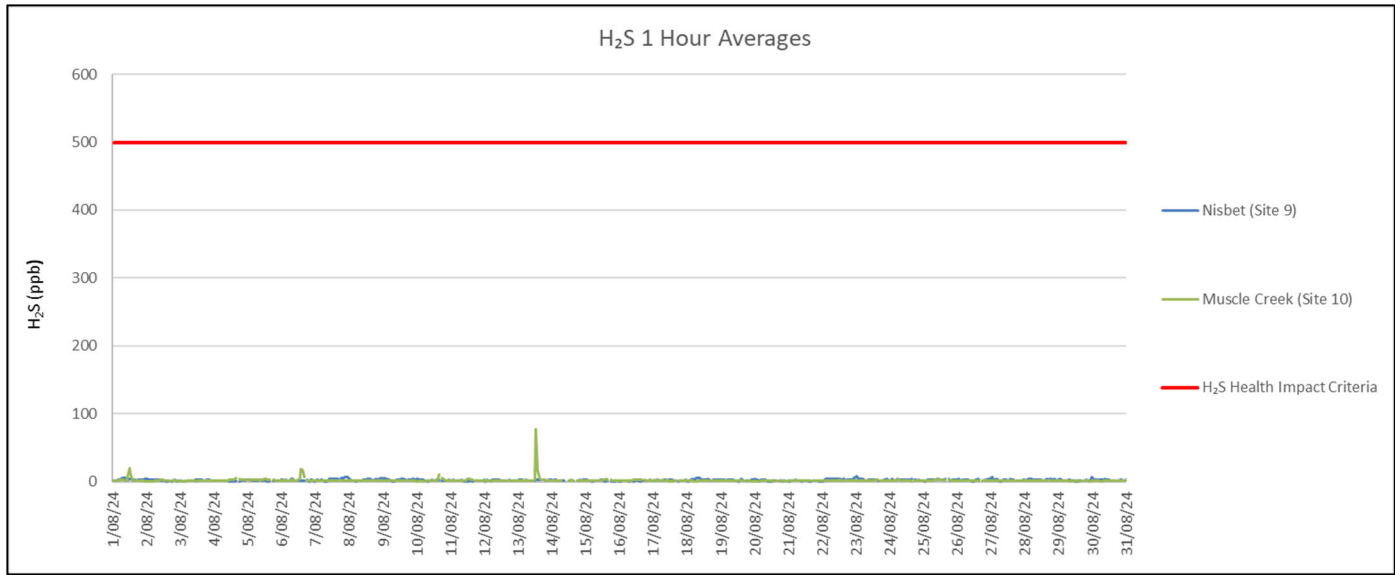
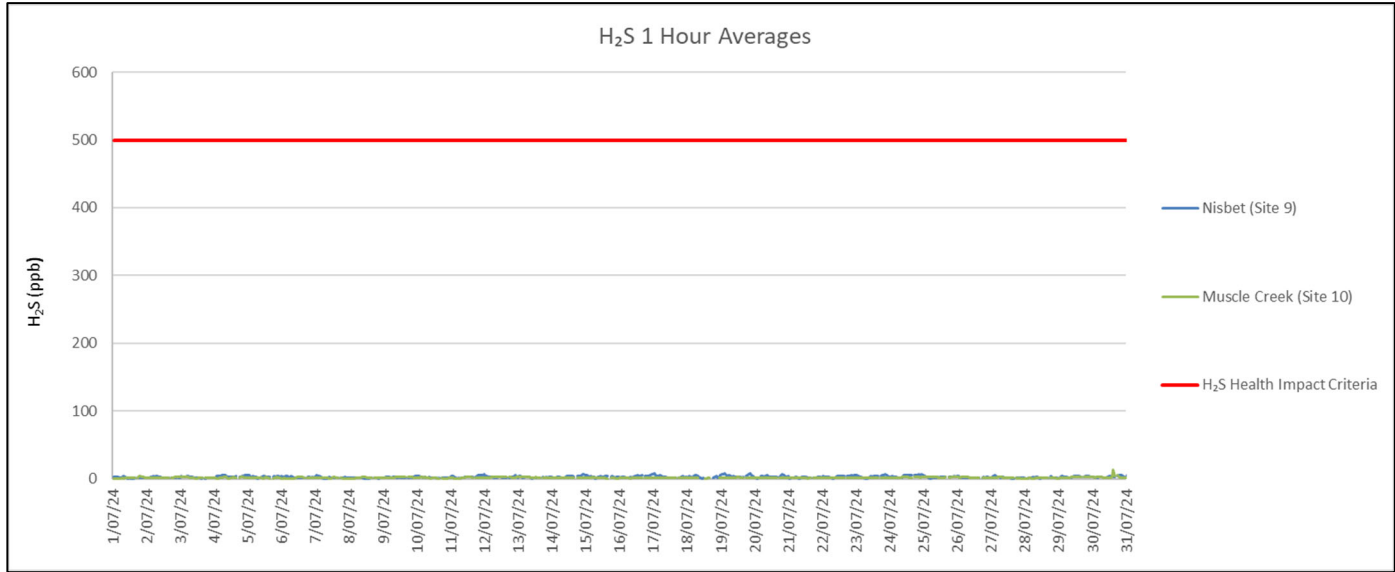


Figure 8: Sulphur Dioxide 1 Hour Results



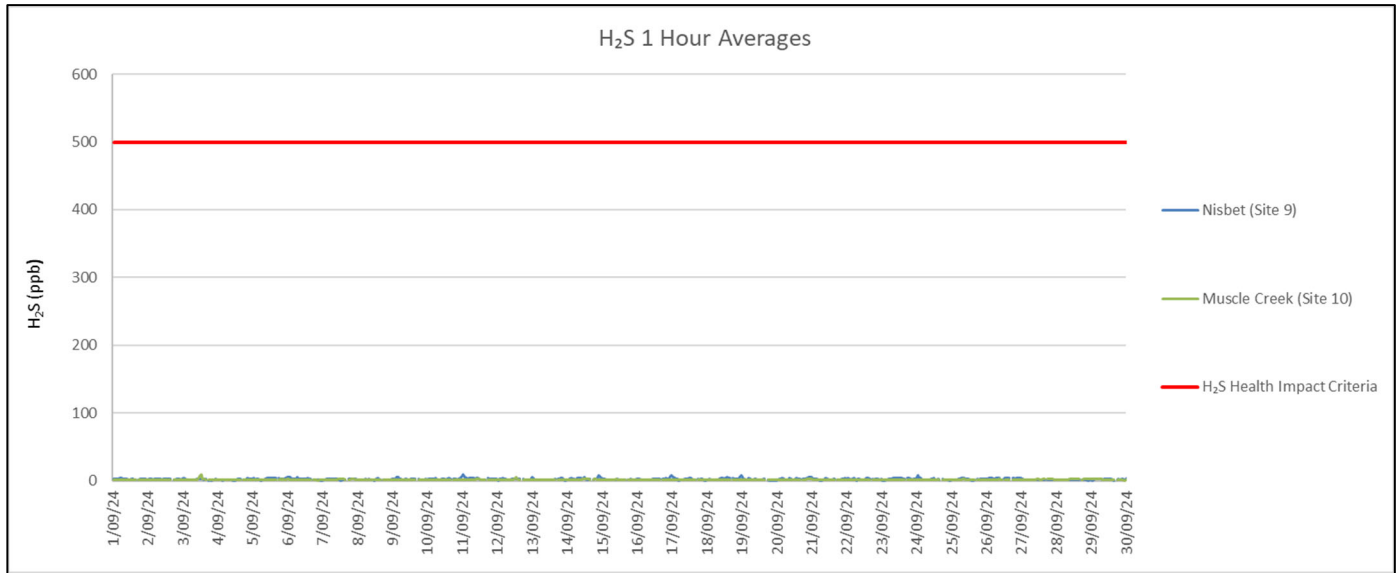
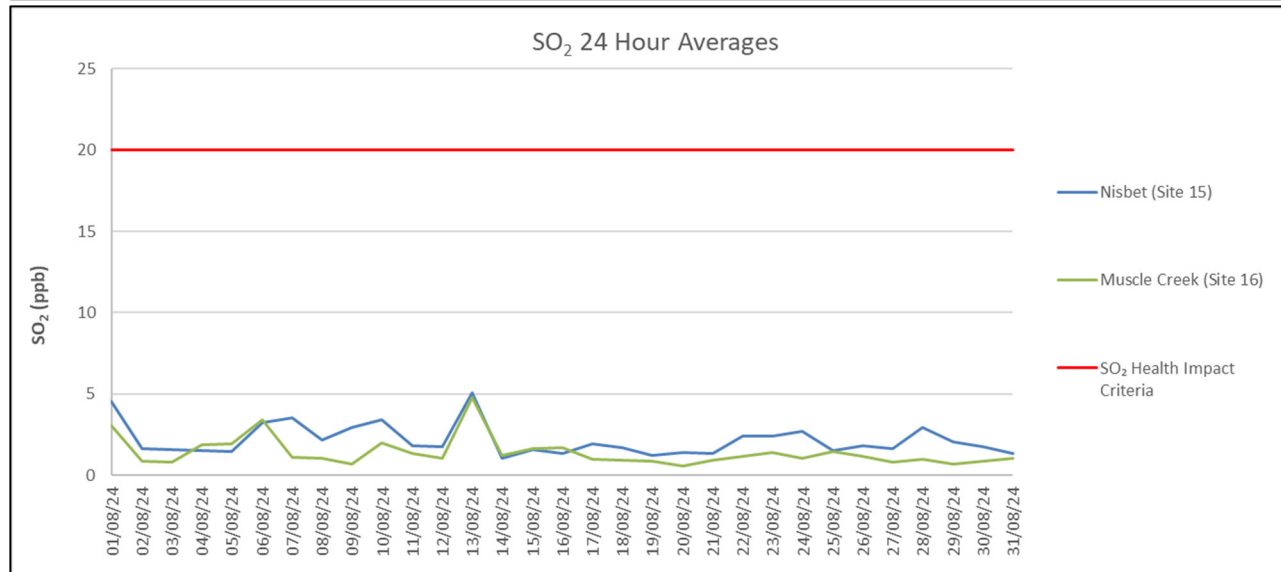
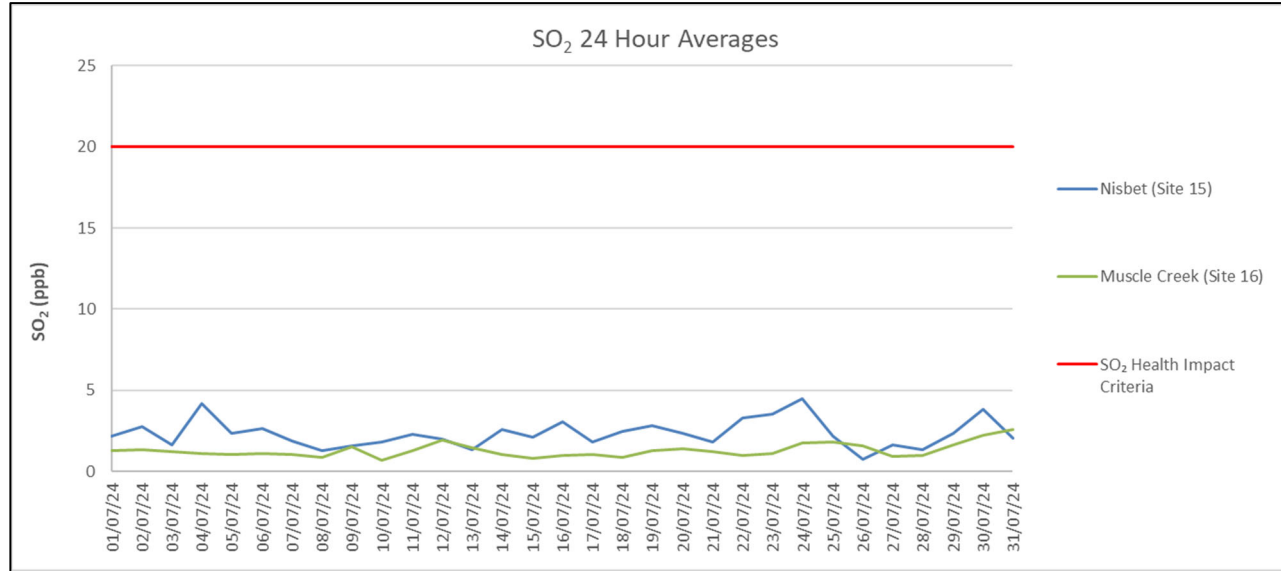


Figure 9: Hydrogen Sulphide 1 Hour Results



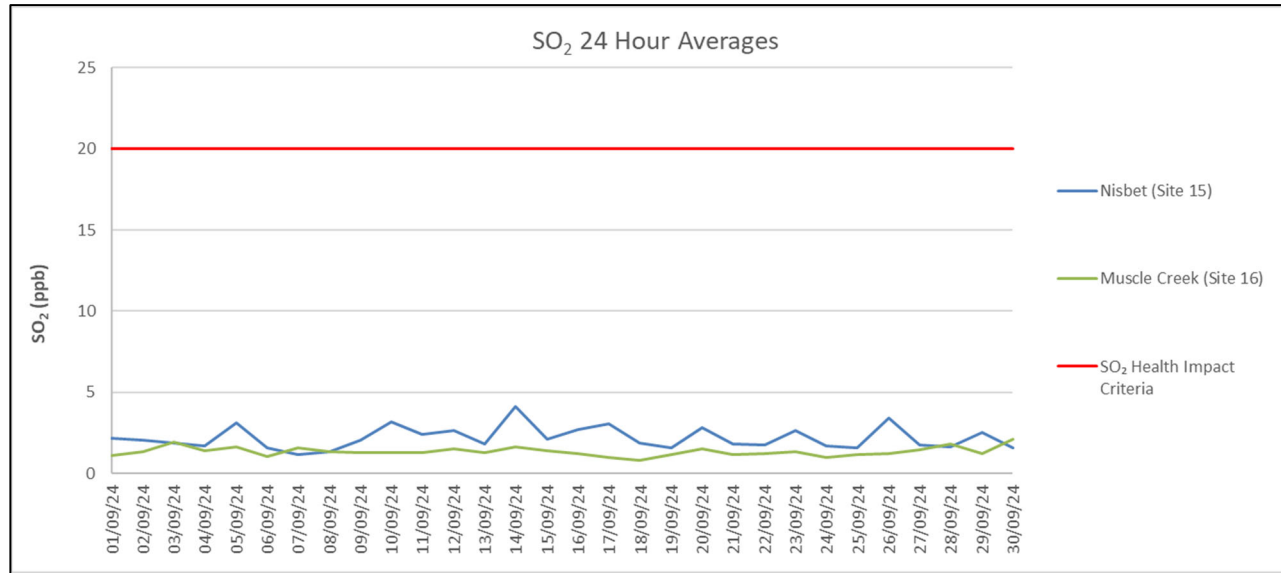
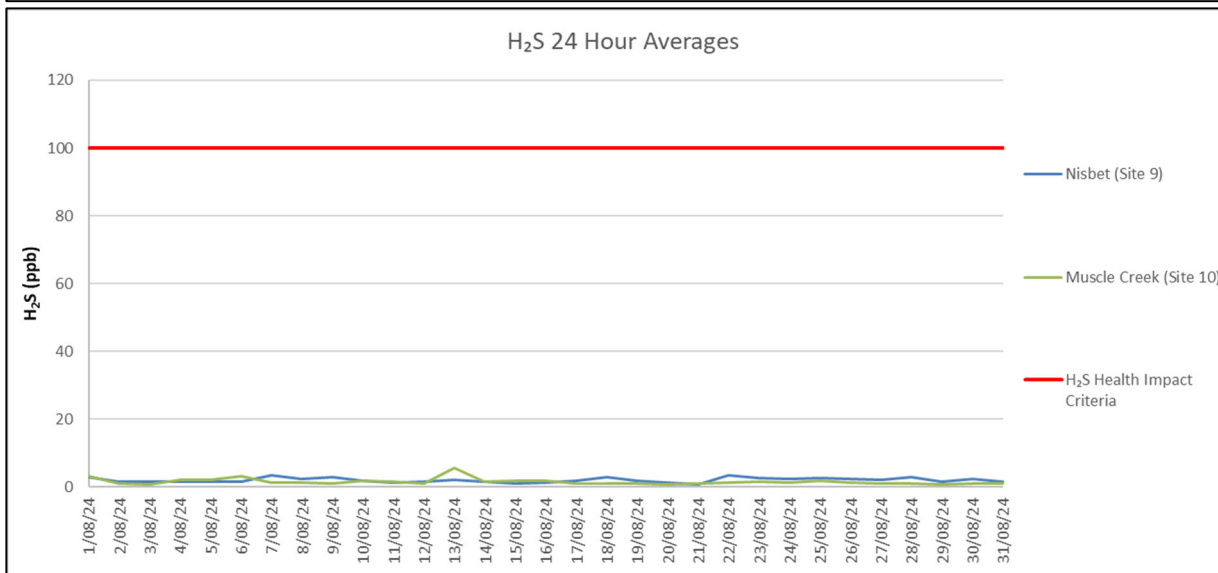
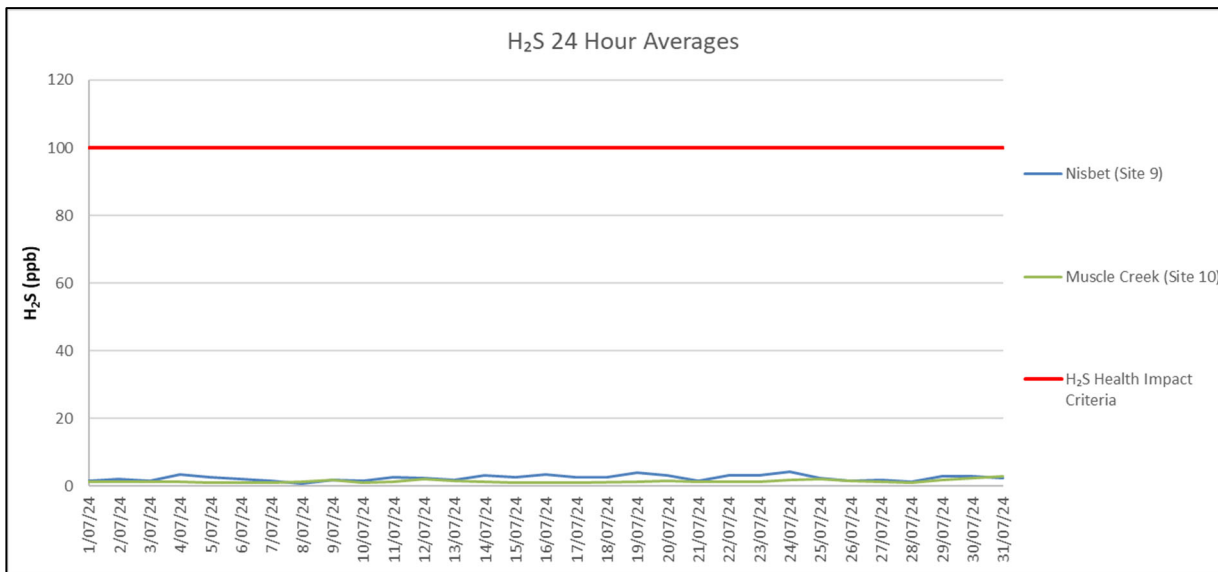


Figure 10: Sulphur Dioxide 24 Hour Results



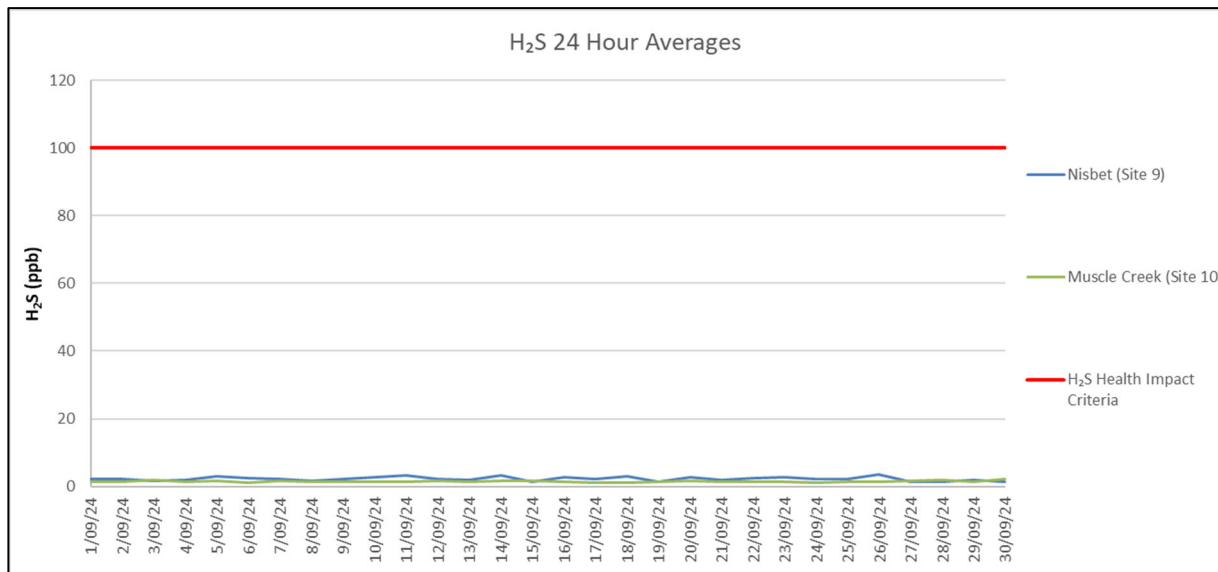


Figure 11: Hydrogen Sulphide 24 Hour Results

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 alarms were received, 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. The validity of the alarm process was reviewed in September 2024, and due to a very high proportion of alarms occurring when wind was not blowing from the operation to the monitor plus the progress of rehabilitation activities removing spontaneous combustion areas, it was decided the alarms were no longer required and they have been turned off.

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
30/07/24 01:55pm	Muscle Creek	Wind – 2.0m/s from the S. Wind was not blowing from the operation to the monitor.	Nil odour observed towards monitor	Class A
31/07/24 10:40am	Muscle Creek	Wind – 1.2m/s from the SE. Wind was not blowing from the operation to the monitor.	Nil odour observed towards monitor	Class A
01/08/24 10:55am	Muscle Creek	Wind – 1.4m/s from the W. Wind was not blowing from the operation to the monitor.	No odour detected on access road	Class A and Class B
06/08/24 01:30pm	Muscle Creek	Wind – 1.8m/s from the SSW. Wind was not blowing from the operation to the monitor.	No odour detected	Class A and Class B
10/08/24 03:00pm	Muscle Creek	Wind – 3.1m/s from the SE. Wind was not blowing from the operation to the monitor.	No odour detected	Class A
13/08/24 12:15pm	Muscle Creek	Wind – 1.4m/s from the SE. Wind was not blowing from the operation to the monitor.	No odour detected	Class A and Class C
03/09/24 12:15pm	Muscle Creek	Wind – 1.7m/s from the ESE. Wind was not blowing from the operation to the monitor.	No odour detected at mine entrance	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.