



**Muswellbrook Coal Company Limited**

**Spontaneous Combustion Report**

**For: Environmental Protection Licence 656**

**Reporting Period: Quarter 3 2023**

**Authority Holder: Muswellbrook Coal Company Limited**

**Report Date: 25 October 2023**

**Approved by: Julie Thomas  
Environmental Superintendent**



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## 1.0 INTRODUCTION

The coal seams mined by the Muswellbrook Coal Company (MCC) operations are the Greta Coal Measures. These measures have a history of spontaneous combustion. Spontaneous combustion has been 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. 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. 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
<b>A</b>	Open flame
<b>B</b>	Visible steam or smoke
<b>C</b>	Other physical evidence of spontaneous combustion (e.g. cracks, coal tars, sulphur crusting, etc)

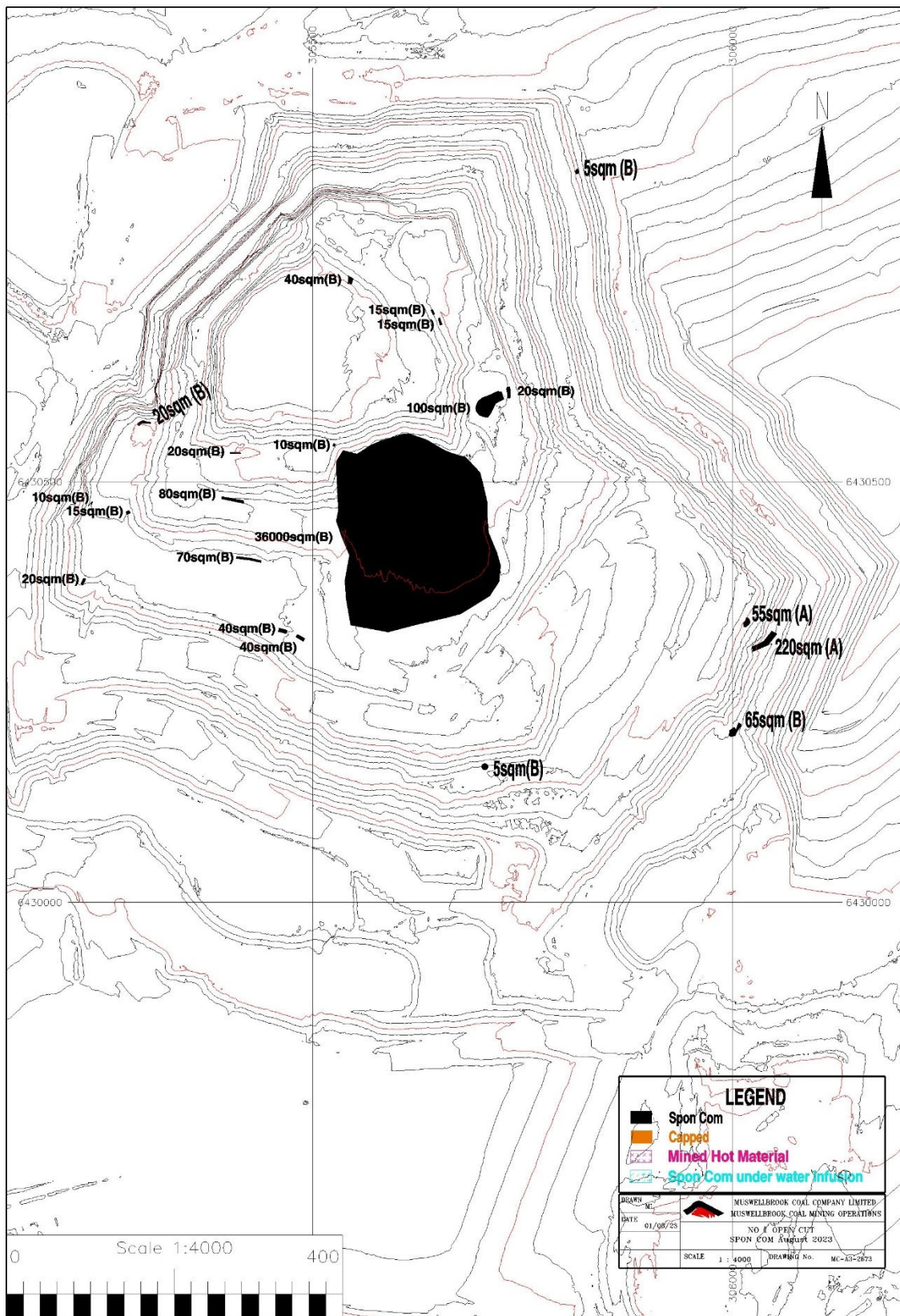
\* - classification revised in November 2019

**Table 2: Summary of Spontaneous Combustion**

Month	Areas Capped (m <sup>2</sup> )*	Areas Mined (m <sup>2</sup> )*	Area Under Water Infusion (m <sup>2</sup> )*	Area Without Active Control (m <sup>2</sup> **
<b>Open Cut 1</b>				
July 23	0	0	0	36,840
August 23	0	0	0	25,862
September 23	0	0	9,725	48,740
<b>Open Cut 2</b>				
July 23	0	0	0	0
August 23	0	0	0	0
September 23	0	0	0	0

\* - during reporting period

\*\* - at end of reporting period



**Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – July 2023**

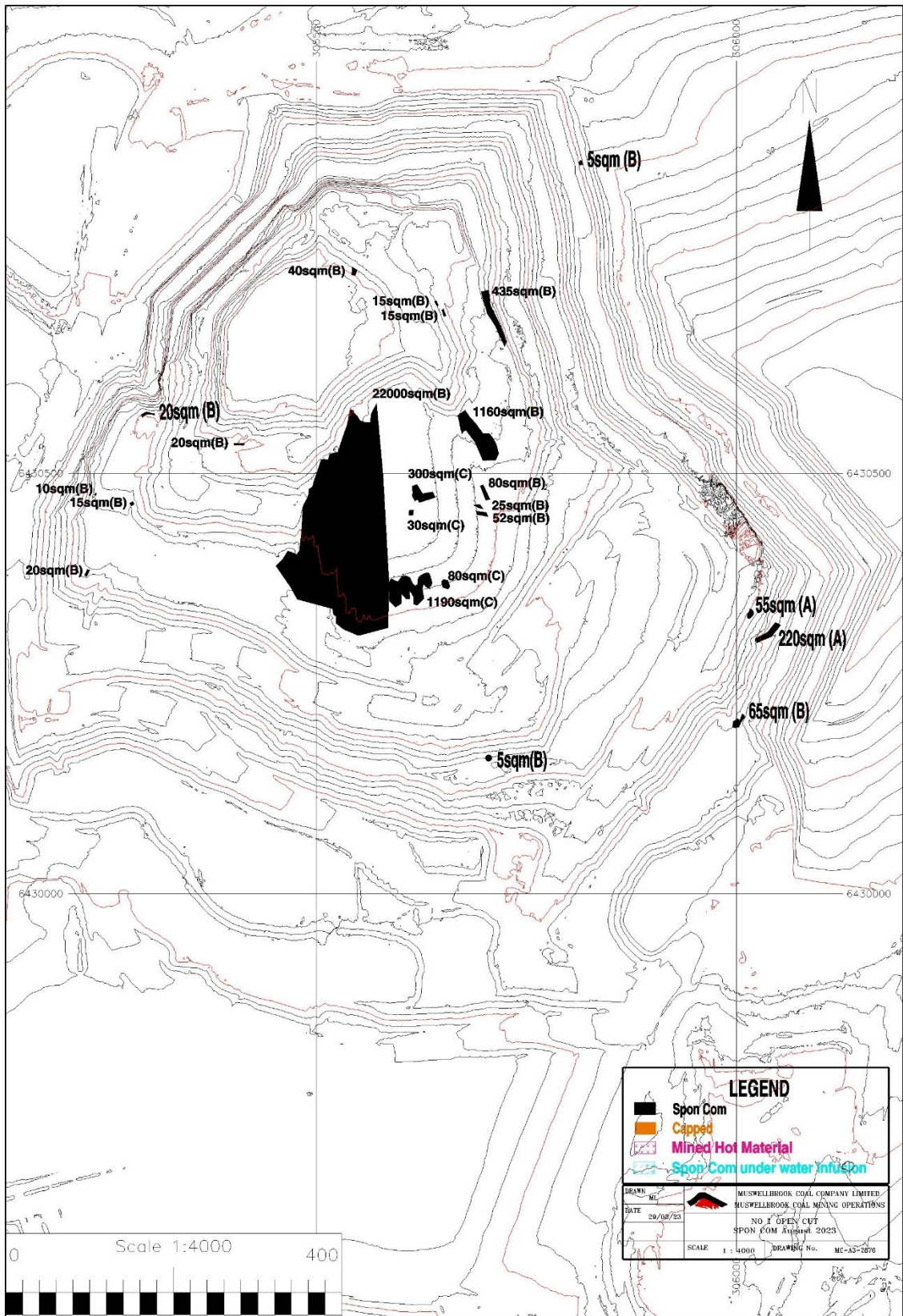


Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – August 2023

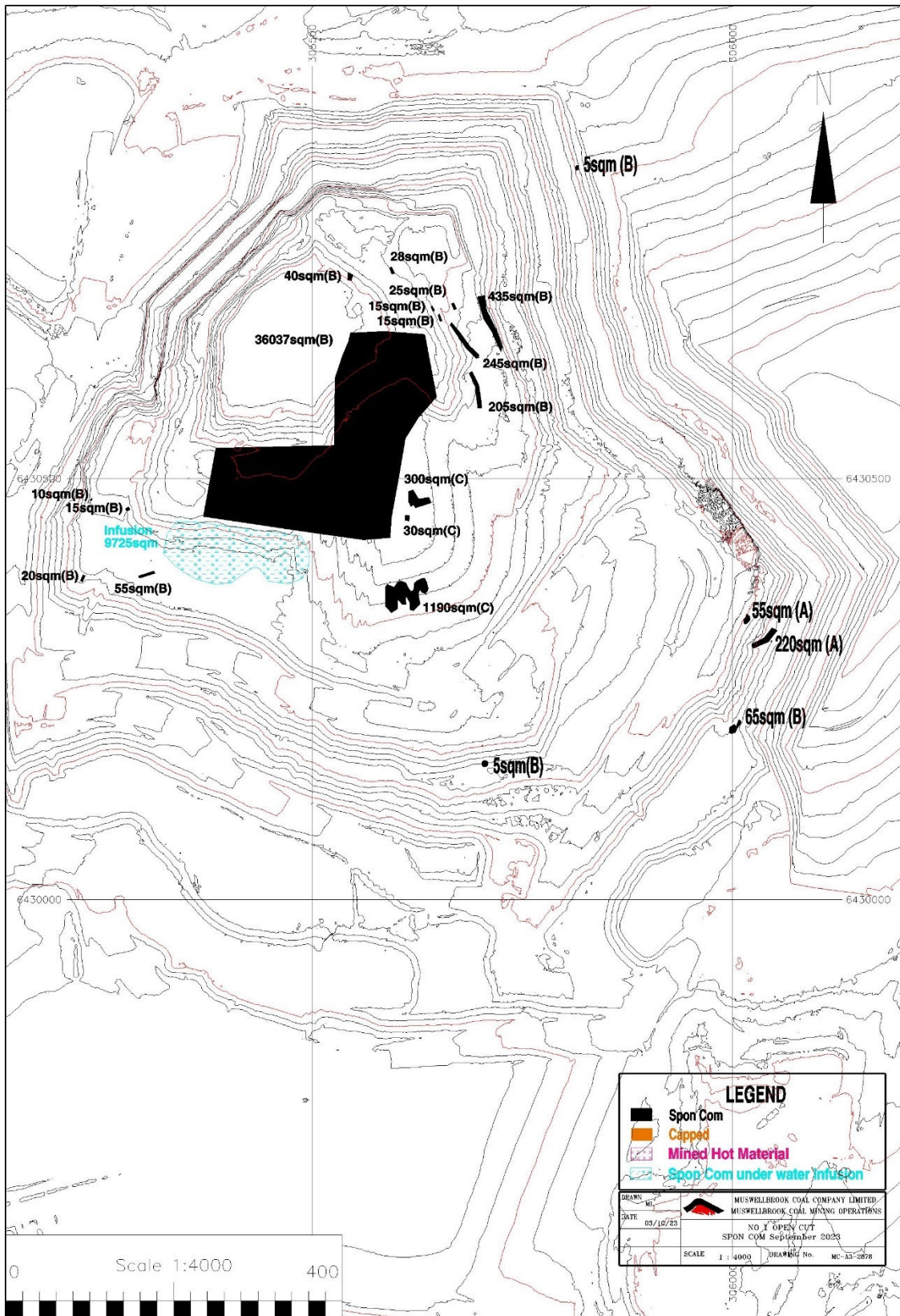


Figure 3: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – September 2023

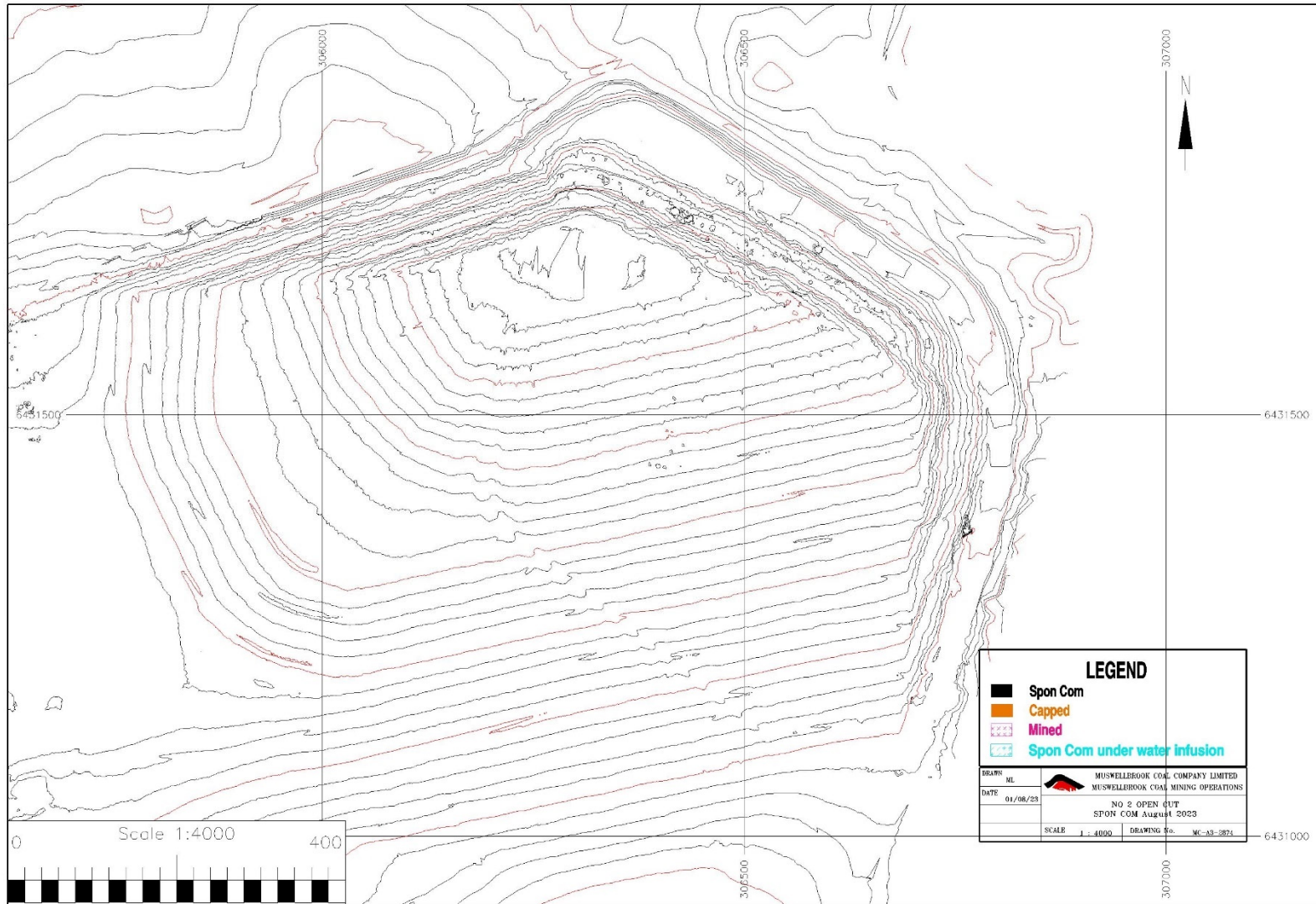
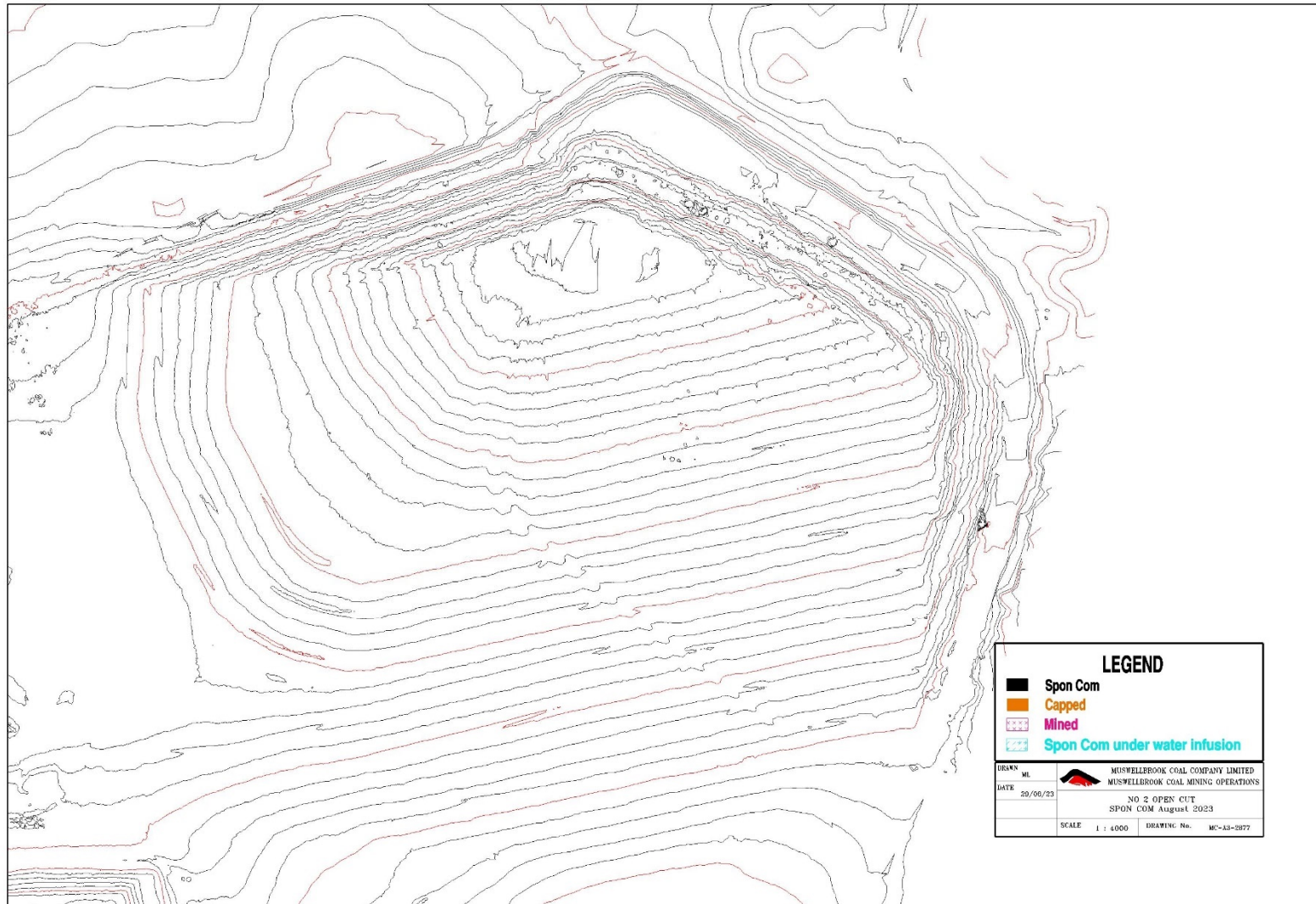


Figure 4: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – July 2023





**Figure 5: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – August 2023**

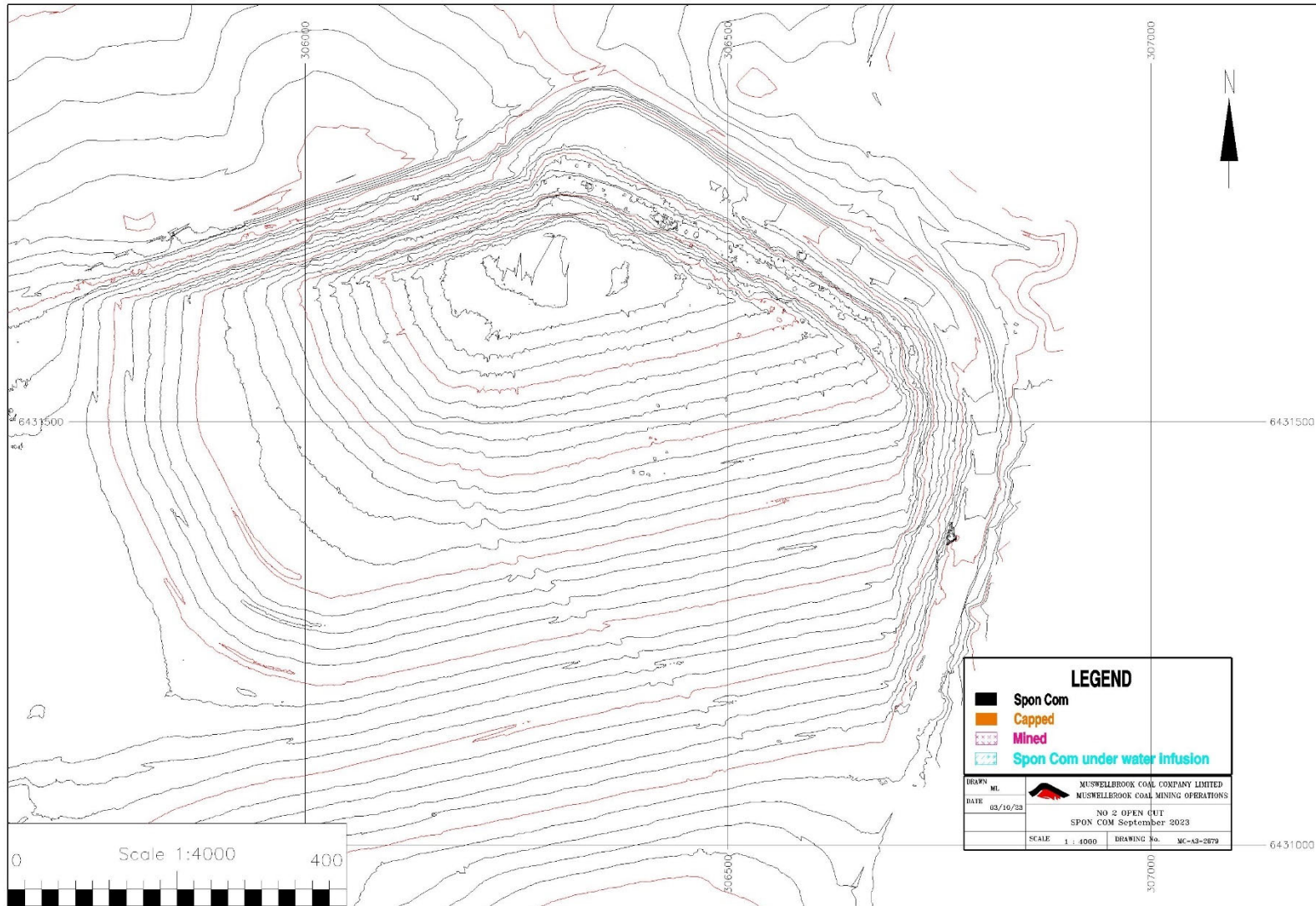


Figure 6: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – September 2023

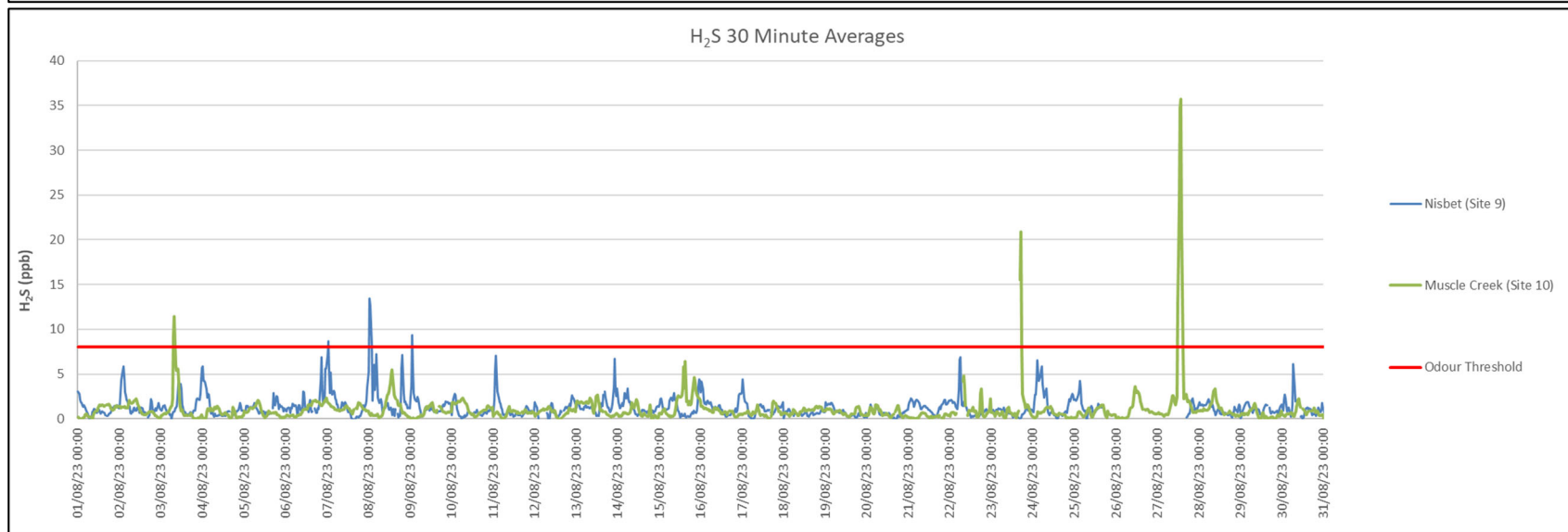
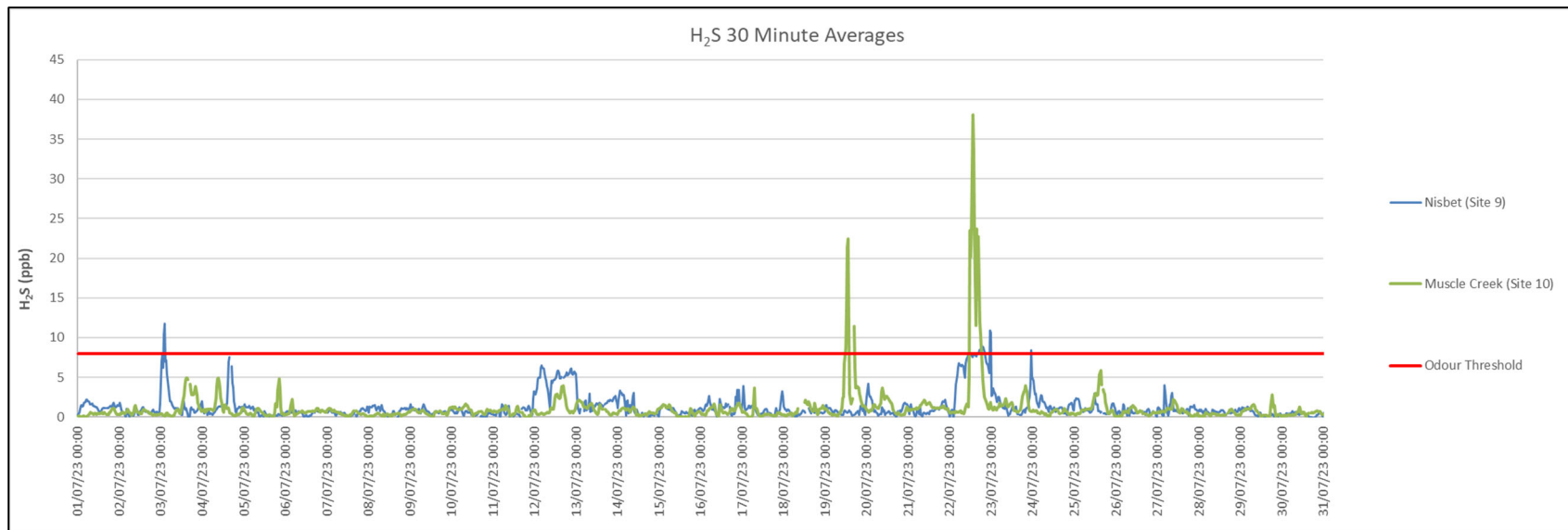
### 3.0 GAS MONITORING RESULTS

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.

The data capture rates for the last 12 months to the end of September 2023 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	99.1
		1 hour	99.2
		24 hours	97.0
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	97.3
		1 hour	99.1
		24 hours	99.2
Point 15, Nisbet	Sulphur Dioxide	1 hour	94.8
		24 hours	92.7
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	96.2
		24 hours	97.0



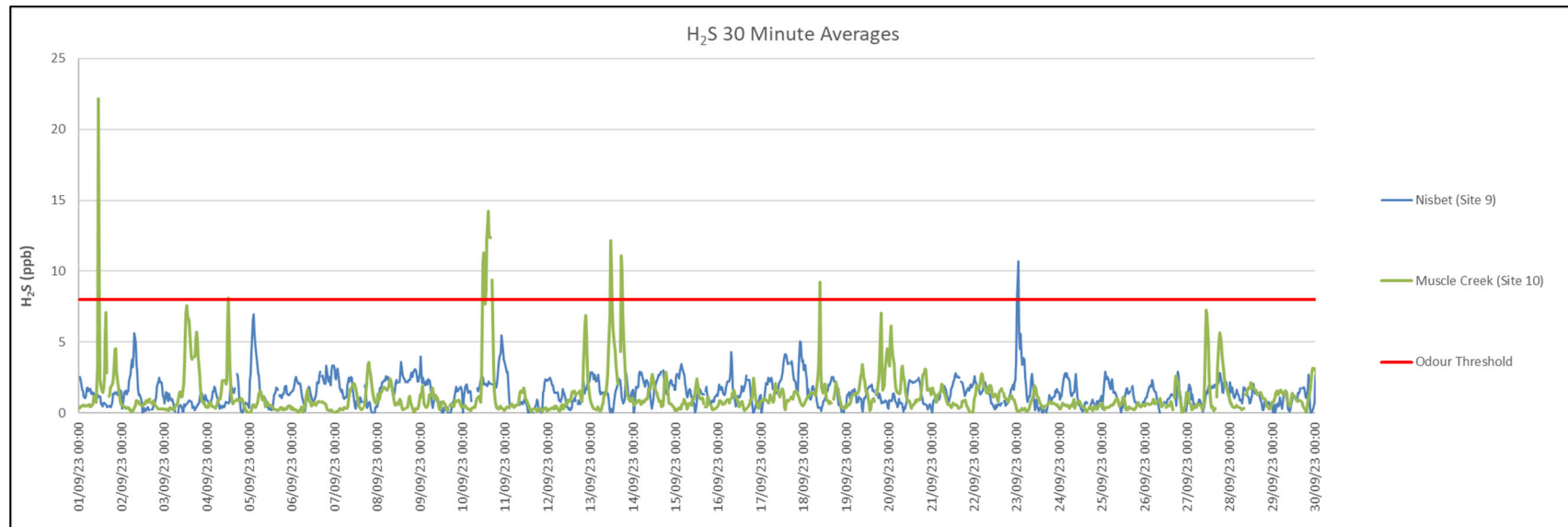
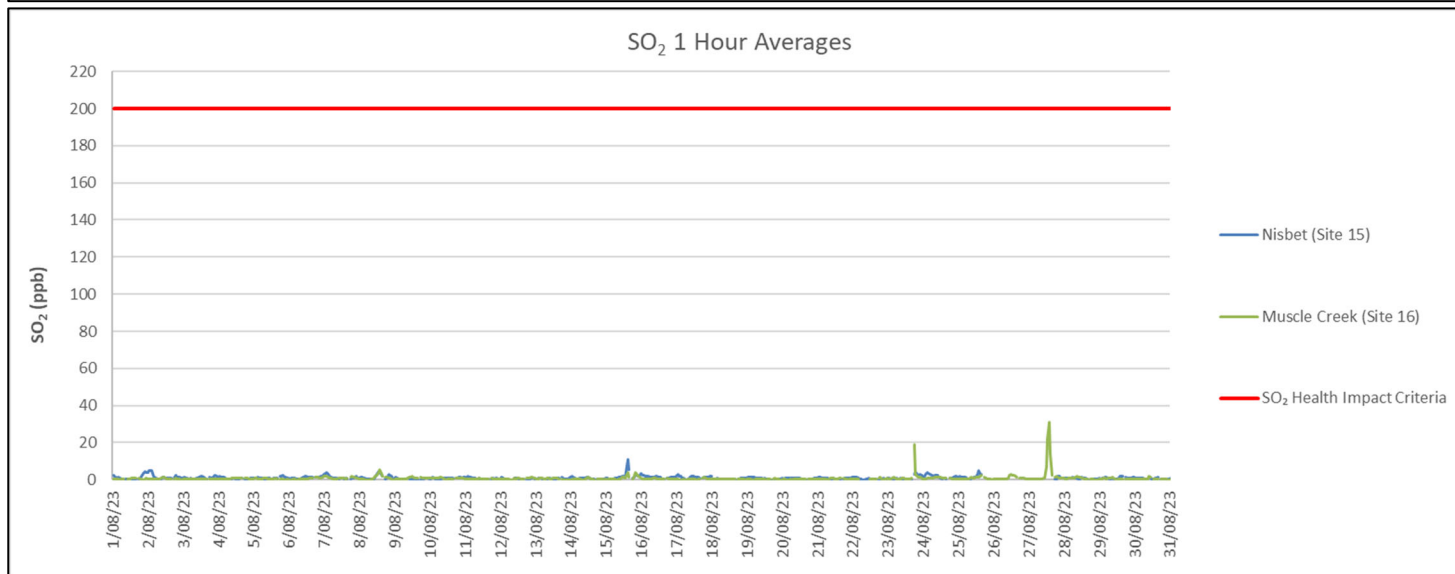
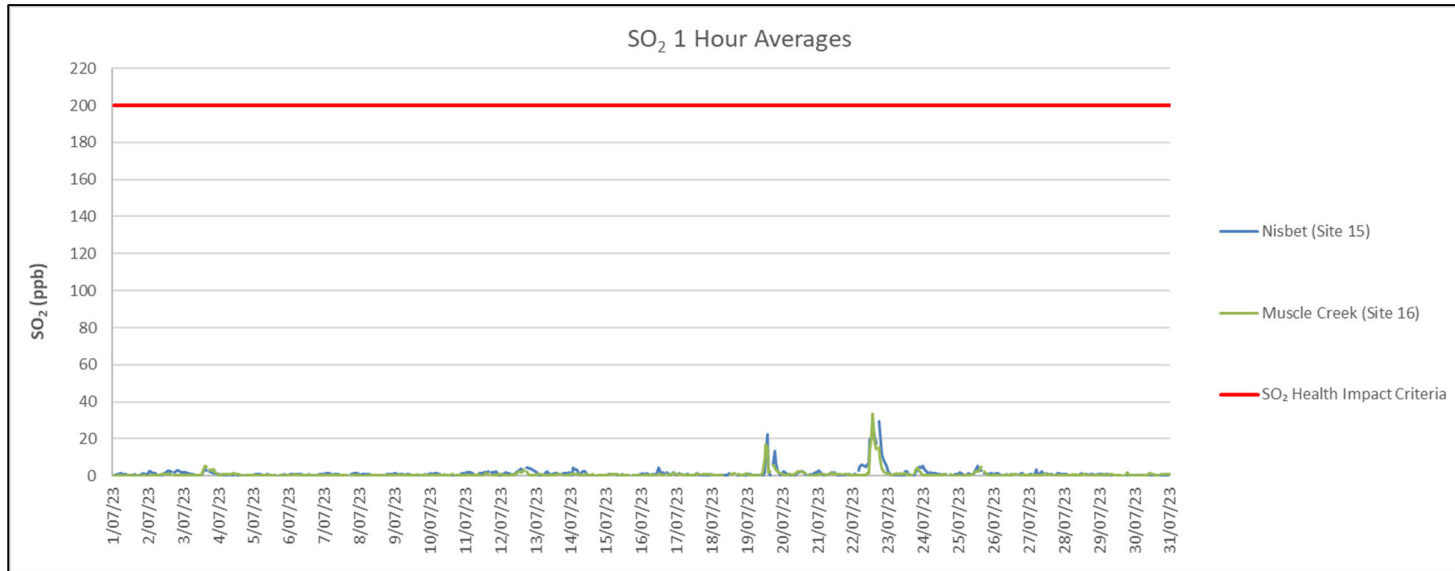


Figure 7: Hydrogen Sulphide 30 Minute Results



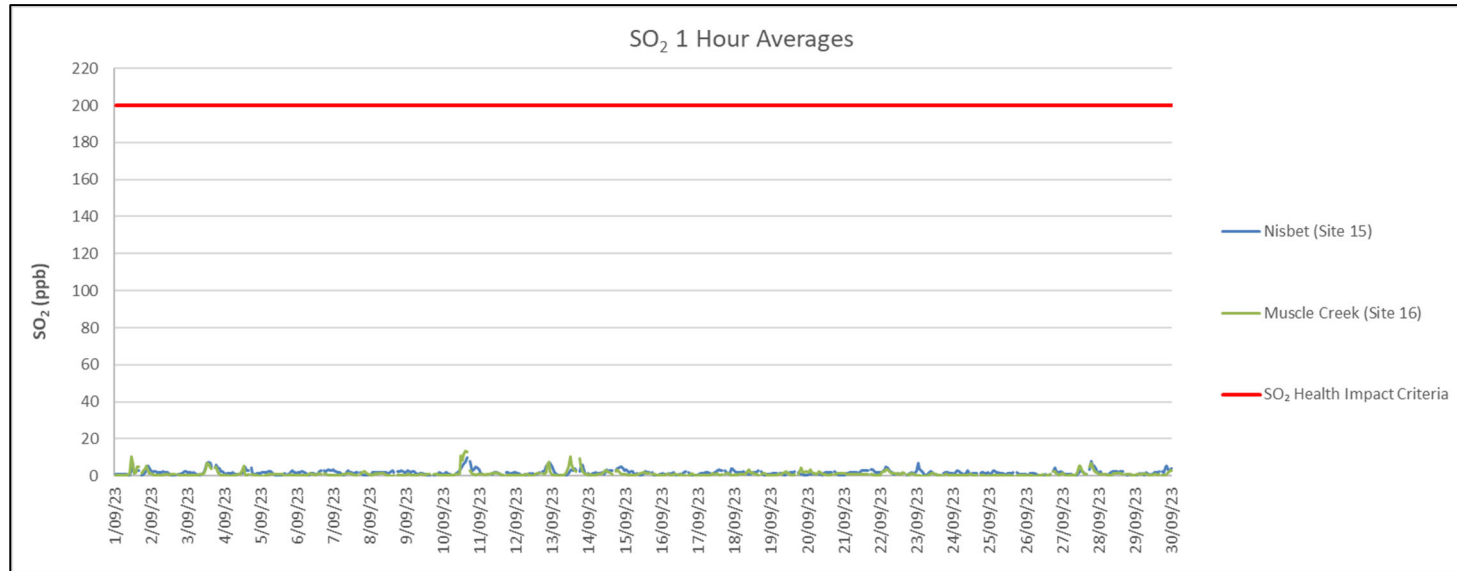
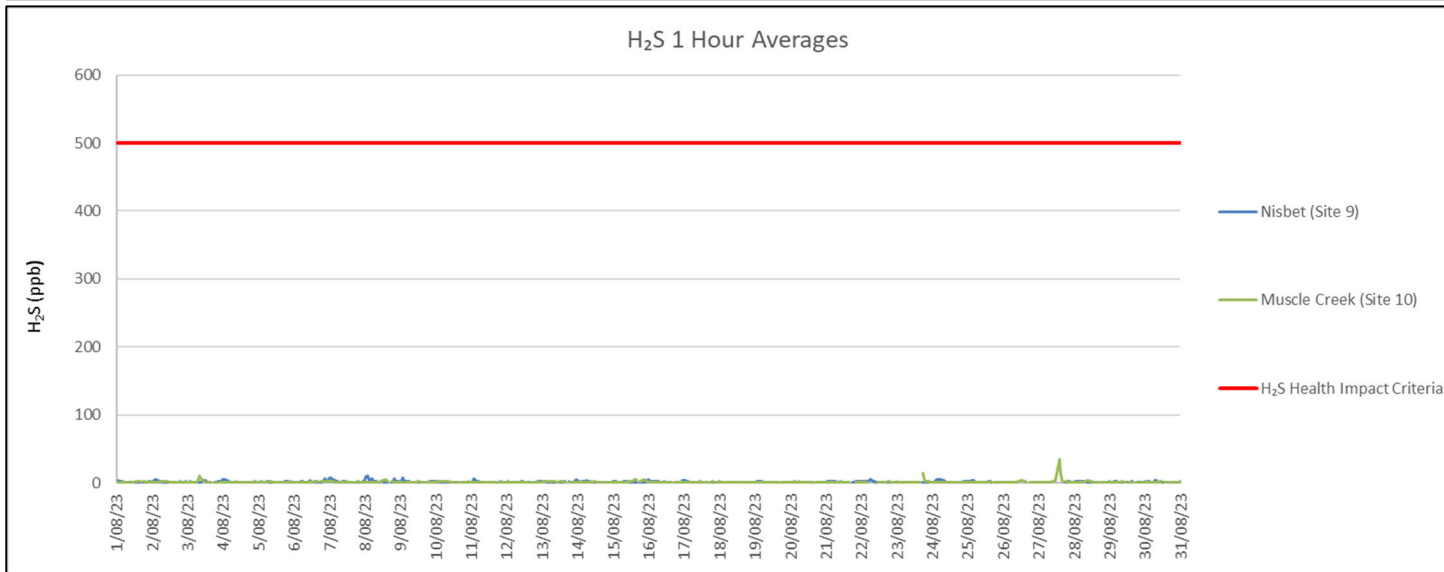
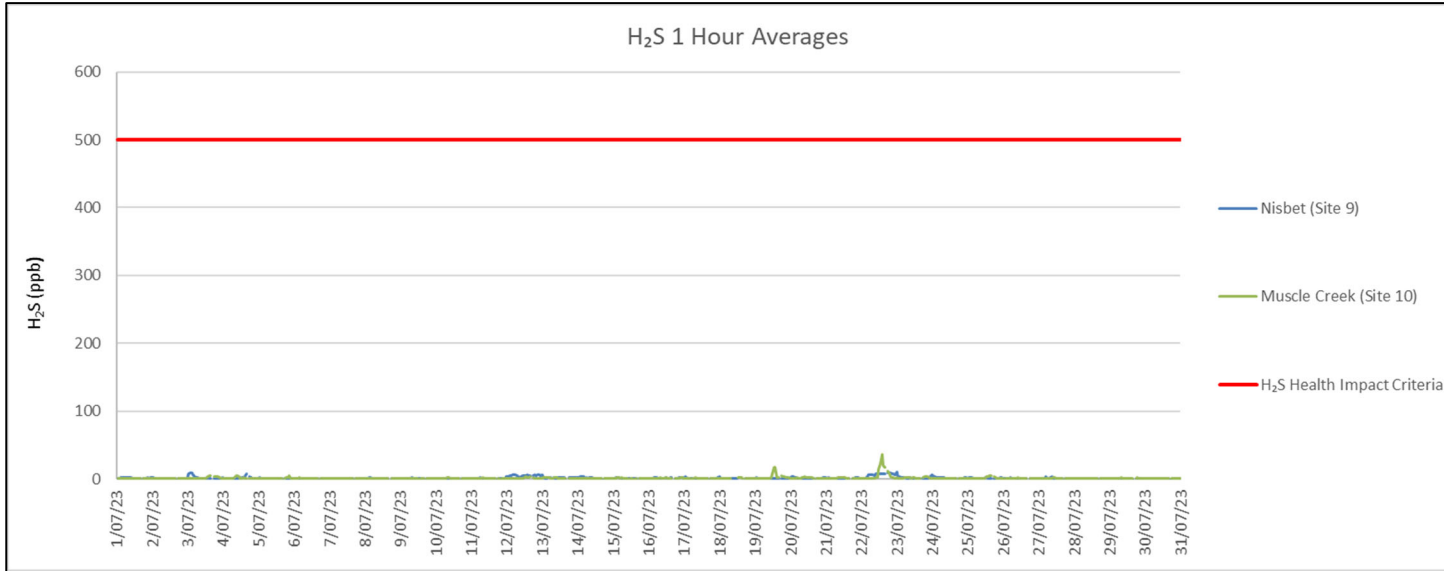


Figure 8: Sulphur Dioxide 1 Hour Results





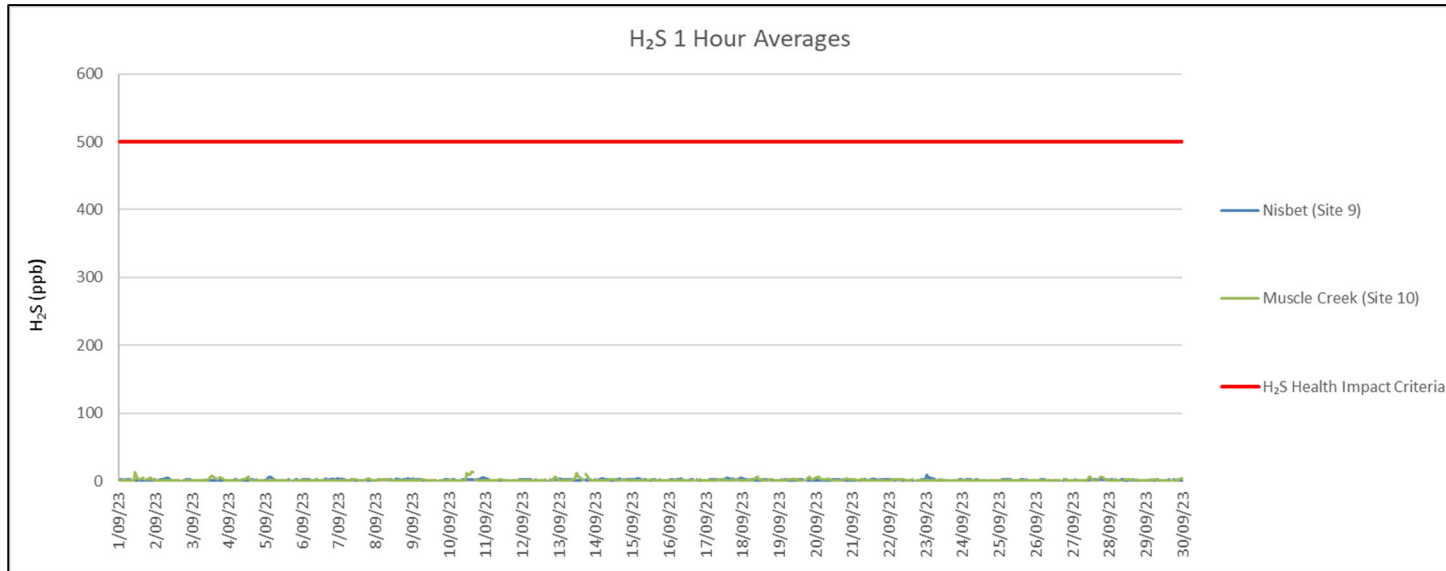
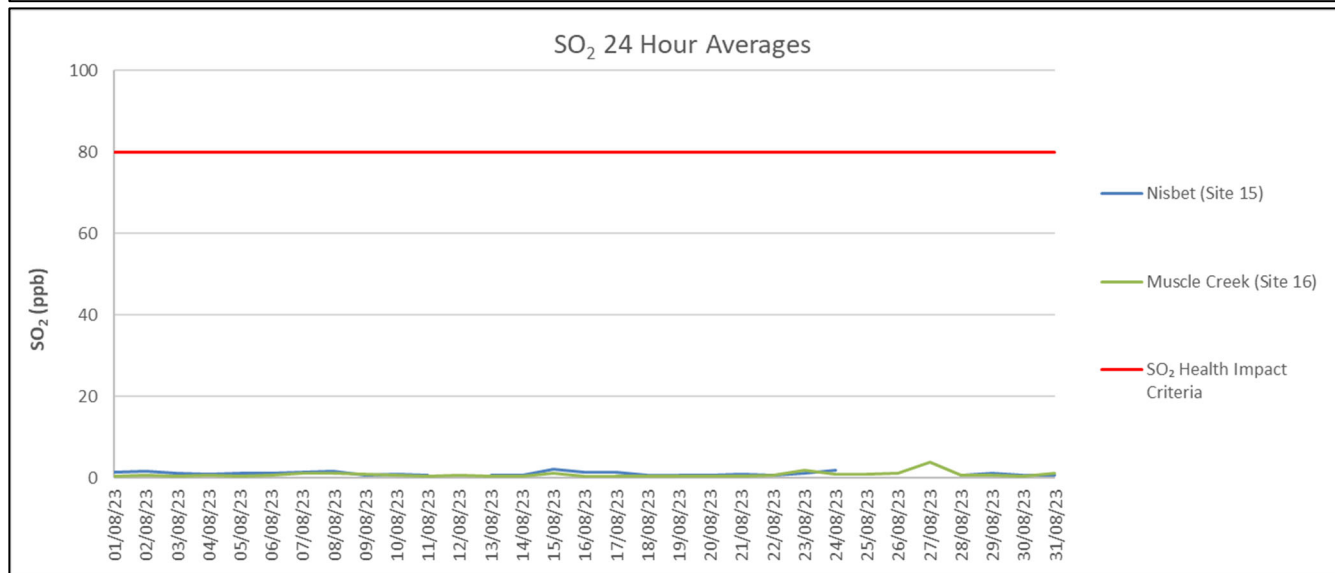
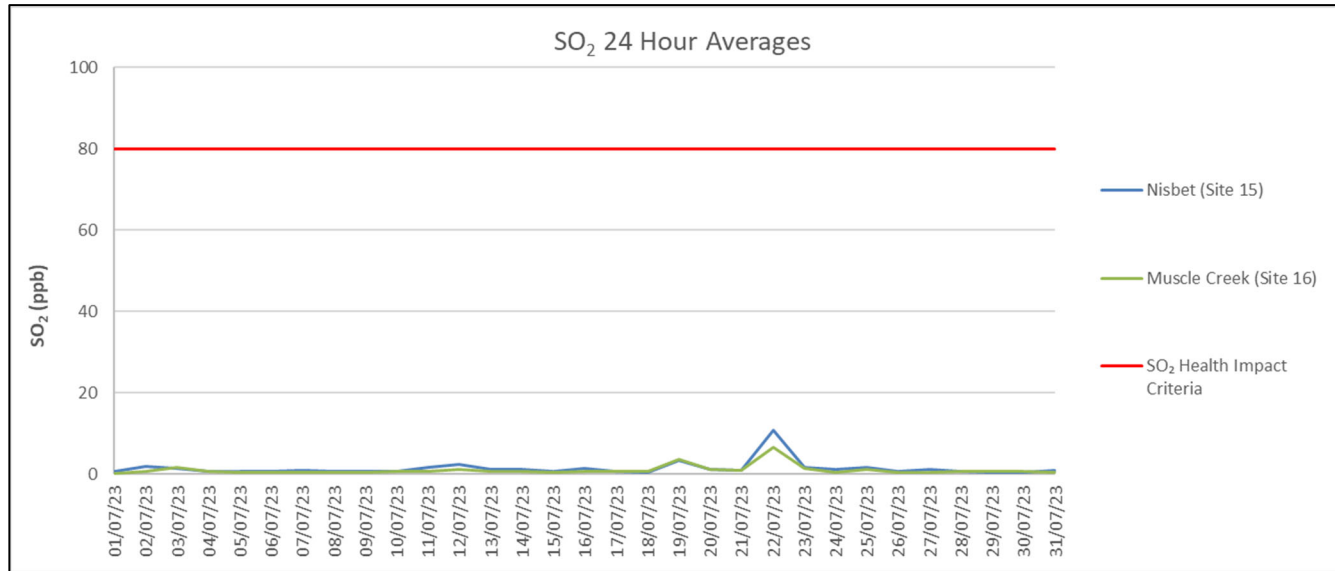


Figure 9: Hydrogen Sulphide 1 Hour Results



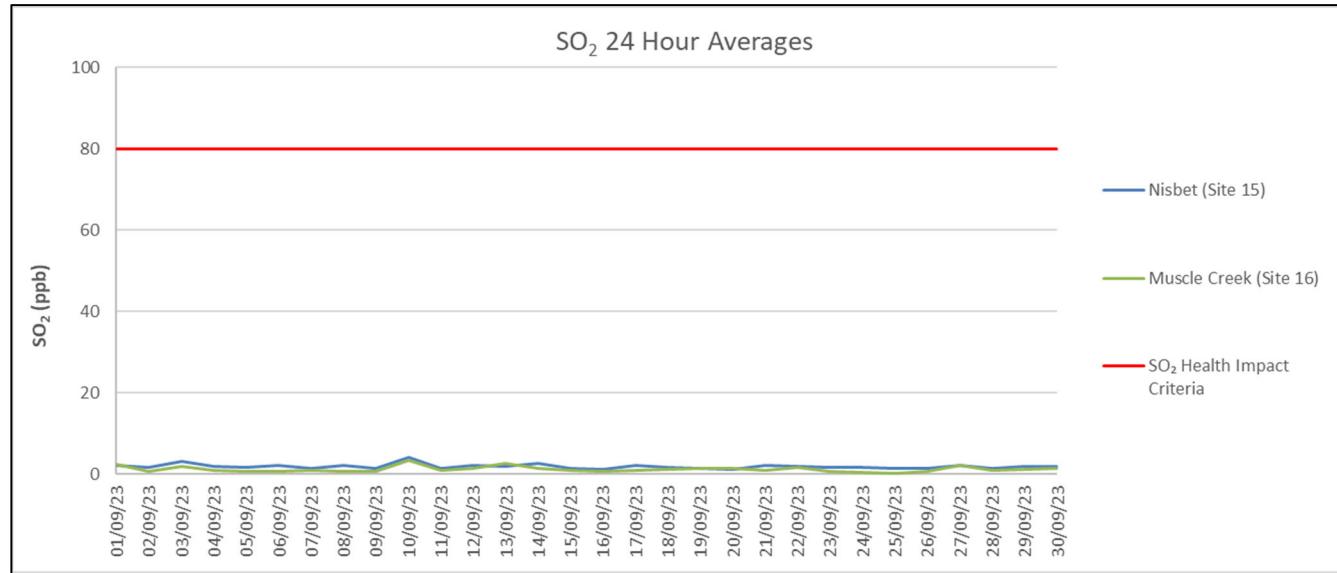
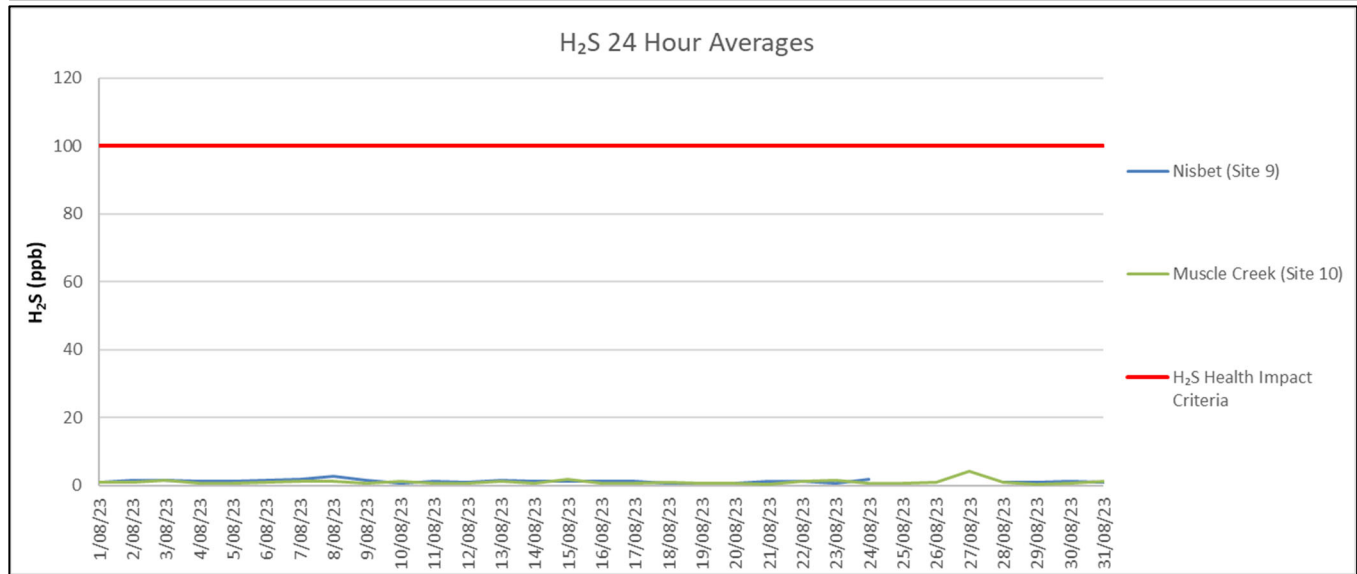
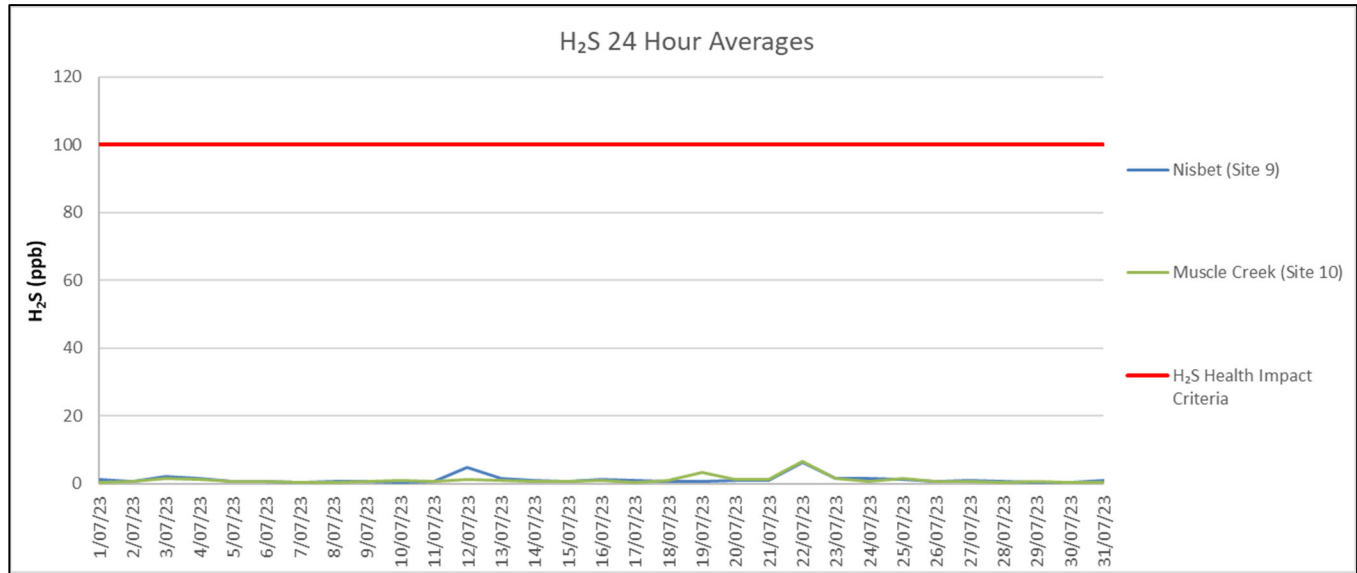


Figure 10: Sulphur Dioxide 24 Hour Results



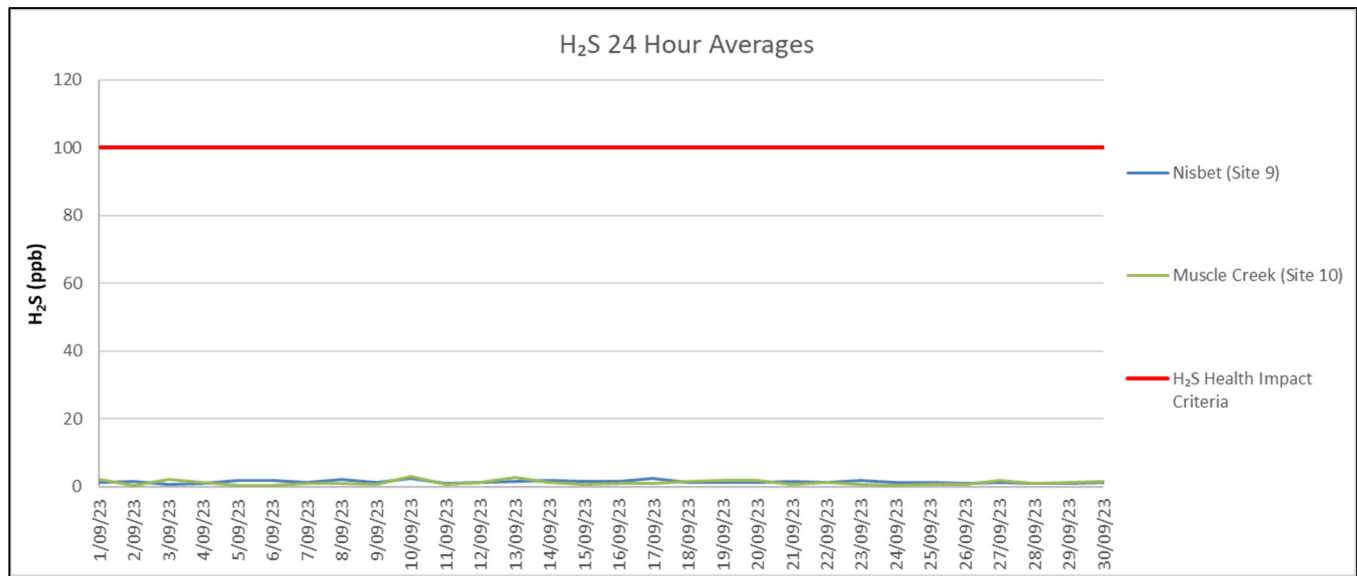


Figure 11: Hydrogen Sulphide 24 Hour Results



#### 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 (~67%), 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
03/07/23 12:35am	Nisbet	Wind – 1.6m/s from the SSE.	No activities occurring on site – no action required	Combination of Class A, B and C
04/07/23 03:45pm	Nisbet	Wind – 0.5m/s from the SSE.	No activities occurring on site – no action required	Combination of Class A, B and C
19/07/23 11:45am	Muscle Creek	Wind – 2.0m/s from the SW. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
22/07/23 11:15am	Nisbet	Wind – 1.9m/s from the NNW. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
22/07/23 11:45am	Muscle Creek	Wind – 1.8/s from the WNW. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
23/07/23 11:15pm	Nisbet	Wind – 1.6m/s from the SSW. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
03/08/23 07:25am	Muscle Creek	Wind – 0.9m/s from the E. Wind was not blowing from the mine towards the monitor.	Active watering of dozer push areas was being undertaken at time of alarm. No further action required.	Combination of Class A, B and C
07/08/23 12:45am	Nisbet	Wind – 1.5m/s from the SSE.	No activities occurring on site – no action required	Combination of Class A, B and C
08/08/23 12:45am	Nisbet	Wind – 2.1m/s from the SE.	Water infusion was in place at time of alarm. No further action required.	Combination of Class A, B and C



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
22/08/23 06:05am	Nisbet	Wind – 1.9m/s from the NNW. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
23/08/23 04:55pm	Muscle Creek	Wind – 1.4m/s from the S. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C
27/08/23 11:55am	Muscle Creek	Wind – 1.6m/s from the S. Wind was not blowing from the mine towards the monitor.	Minimal activities occurring on site – no action required	Combination of Class A, B and C

## 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.