ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: May 2022

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 4 July 2022

Approved by: Brooke York
Environmental Advisor

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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.

The Environment Protection Authority (EPA) require MCC to provide reports on spontaneous combustion management and monitoring on a monthly basis. 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

The daily spontaneous combustion management measures for the reporting period are shown in **Table 1**.

Table 1: Spontaneous Combustion Management Measures

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
01/05/22		OC1			Wet Weather
02/05/22		OC1			
03/05/22					
04/05/22		OC1			
05/05/22		OC1			Wet Weather
06/05/22				S25, ROM & RL150	
07/05/22		OC1		S25 and ROM	
08/05/22		S25, ROM & RL150		S25, ROM & RL150	

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
09/05/22		S25, ROM & RL150		S25	
10/05/22		OC1			
11/05/22		OC1			
12/05/22		OC1		Dozer pushing hot material	Wet Weather
13/05/22	S24 & S25	OC1			Wet Weather
14/05/22	S24	OC1			
15/05/22	S24 & S25	OC1		S25	
16/05/22	S24	S25 & ROM	RL150	S25 South	
17/05/22	S24	OC1		RL150	
18/05/22	S24	OC1			
19/05/22	S24	S23 & S24			
20/05/22	S24	OC1			
21/05/22	S25	OC1		S25	
22/05/22	S24 & S25	OC1			Wet Weather
23/05/22	S24	OC1		S25	
24/05/22	S24	OC1	RL150	S25	
25/05/22	S24	OC1	RL150		
26/05/22	S24	OC1			
27/05/22	S24	ROM			
28/05/22	S24				Wet Weather
29/05/22	S24	OC1			
30/05/22	S24 & S25	OC1			Wet Weather
31/05/22		OC1			Wet Weather

The classification system for spontaneous combustion outbreaks is provided in **Table 2**. A summary of the areas affected by spontaneous combustion and the areas controlled and treated during the reporting period is provided in **Table 3**. The locations of these areas can be seen in **Figure 1** to **Figure 2**.

Table 2: 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 3: Summary of Spontaneous Combustion

Site Map Location	Classification (A-C)	Affected Area Without Active Control *(m^2)*	Active Controls Completed	Area Controlled *(m^2)*
Open Cut 1	A B C	4* 92* 20*	Mining Capping Infusion	0** 0** 5275**
Open Cut 2	N/A	0*	Excavated and replaced	40**
SUMMARY				
Total Area Affected		116*		
Total Area Controlled		5439**		

* - at end of reporting period

** - during reporting period

The outbreak in Open Cut 2 of approximately 40 square metres has had the impacted material removed and backfilled with inert material.

3.0 GAS MONITORING RESULTS

The gas monitoring results are displayed graphically in **Figure 3** to **Figure 7.** 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 reporting period and the last 12 months are shown in **Table 4**.

Table 4: Data Capture Rates

Monitoring Location	Pollutant	Averaging Period	Data Capture – April (%)	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	96.1	96.3
		1 hour	94.1	94.4
		24 hours	100.0	98.6
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	97.3	94.8
		1 hour	95.2	92.5
		24 hours	100.0	97.0
Point 15, Nisbet	Sulphur Dioxide	1 hour	95.4	94.5
		24 hours	100.0	98.4
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	95.3	92.7
		24 hours	100.0	97.3

Data capture for all monitoring sites was 90% or higher during May 2022.

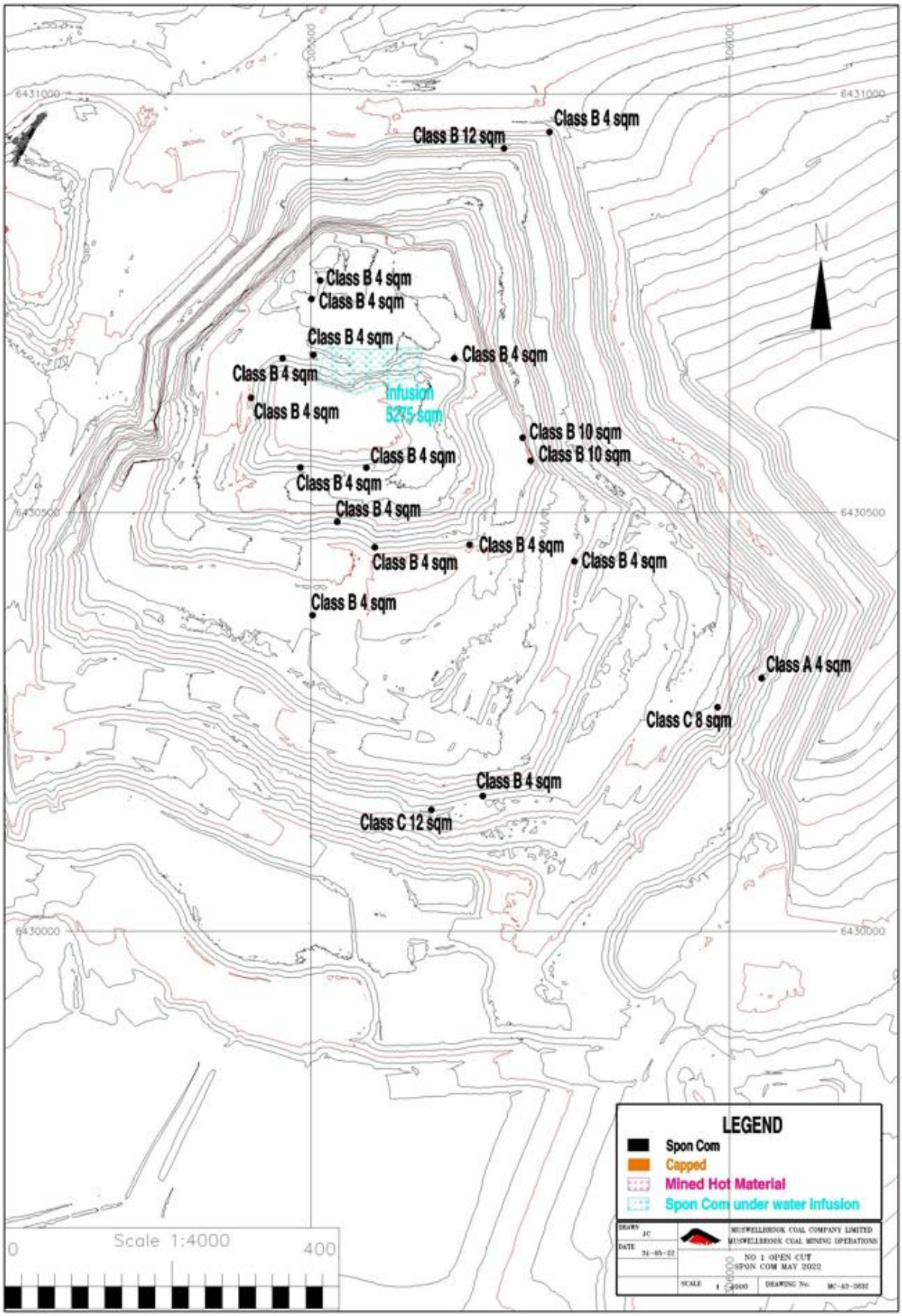

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

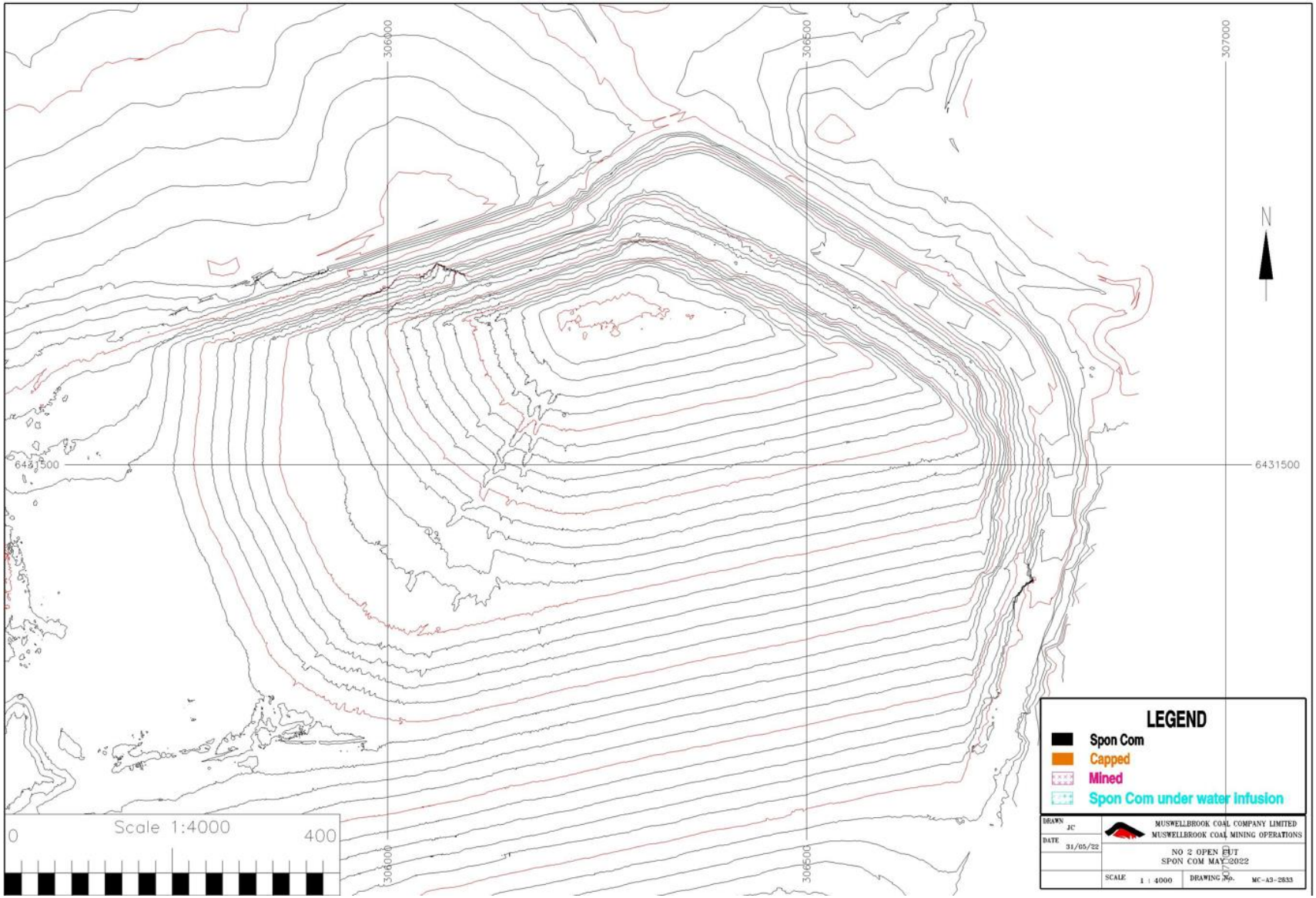

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

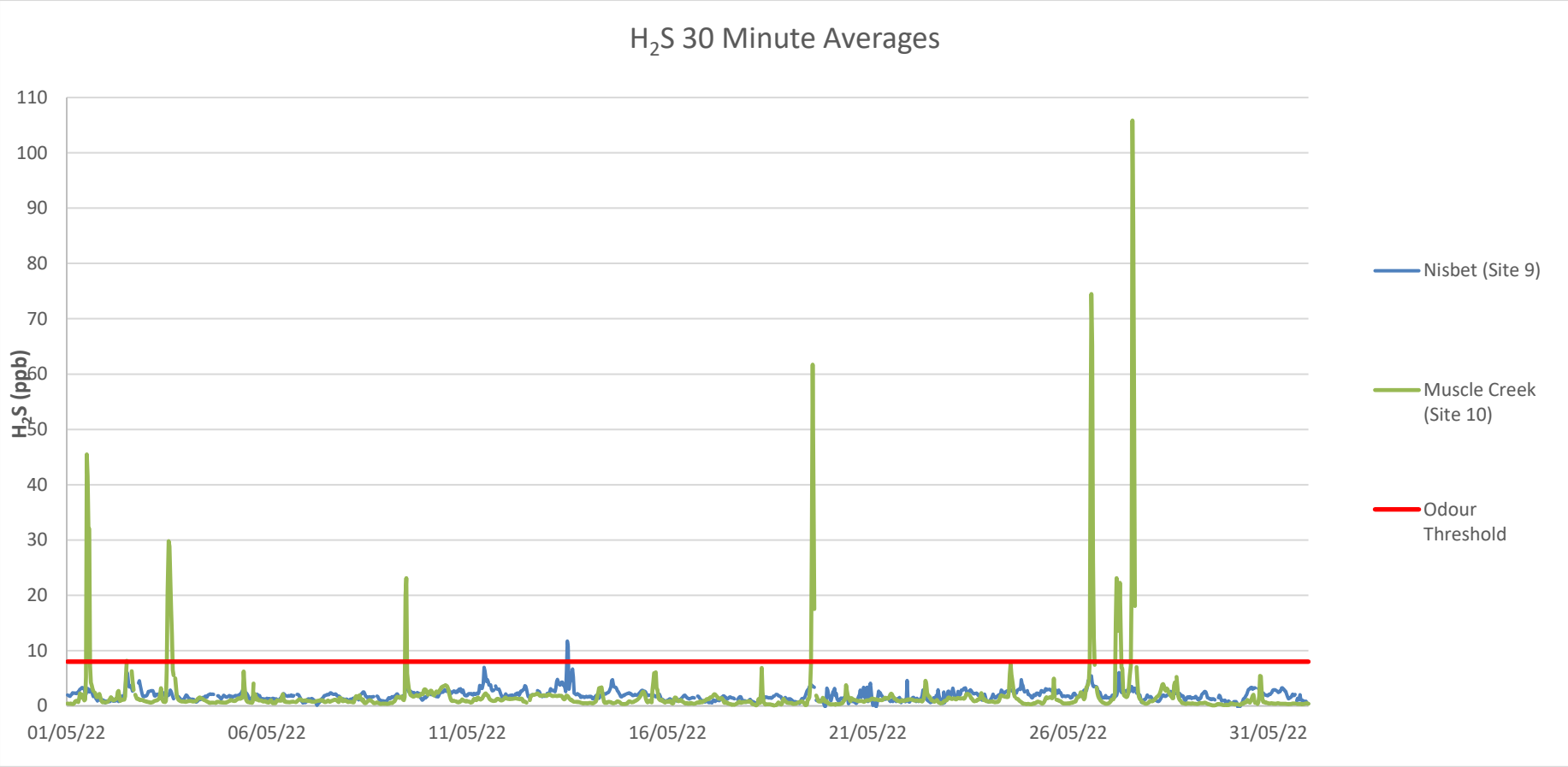

Figure 3: Hydrogen Sulphide 30 Minute Results

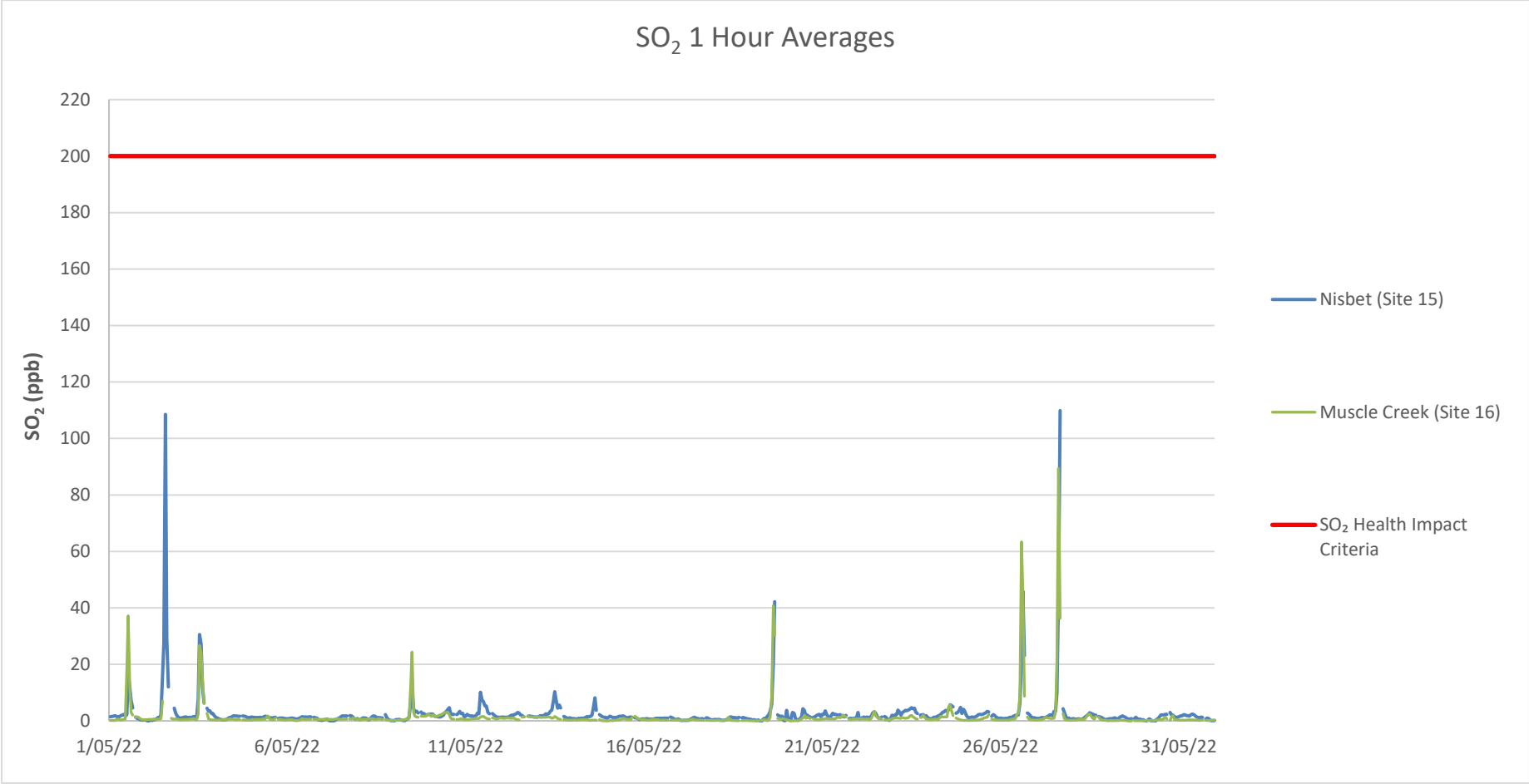

Figure 4: Sulphur Dioxide 1 Hour Results

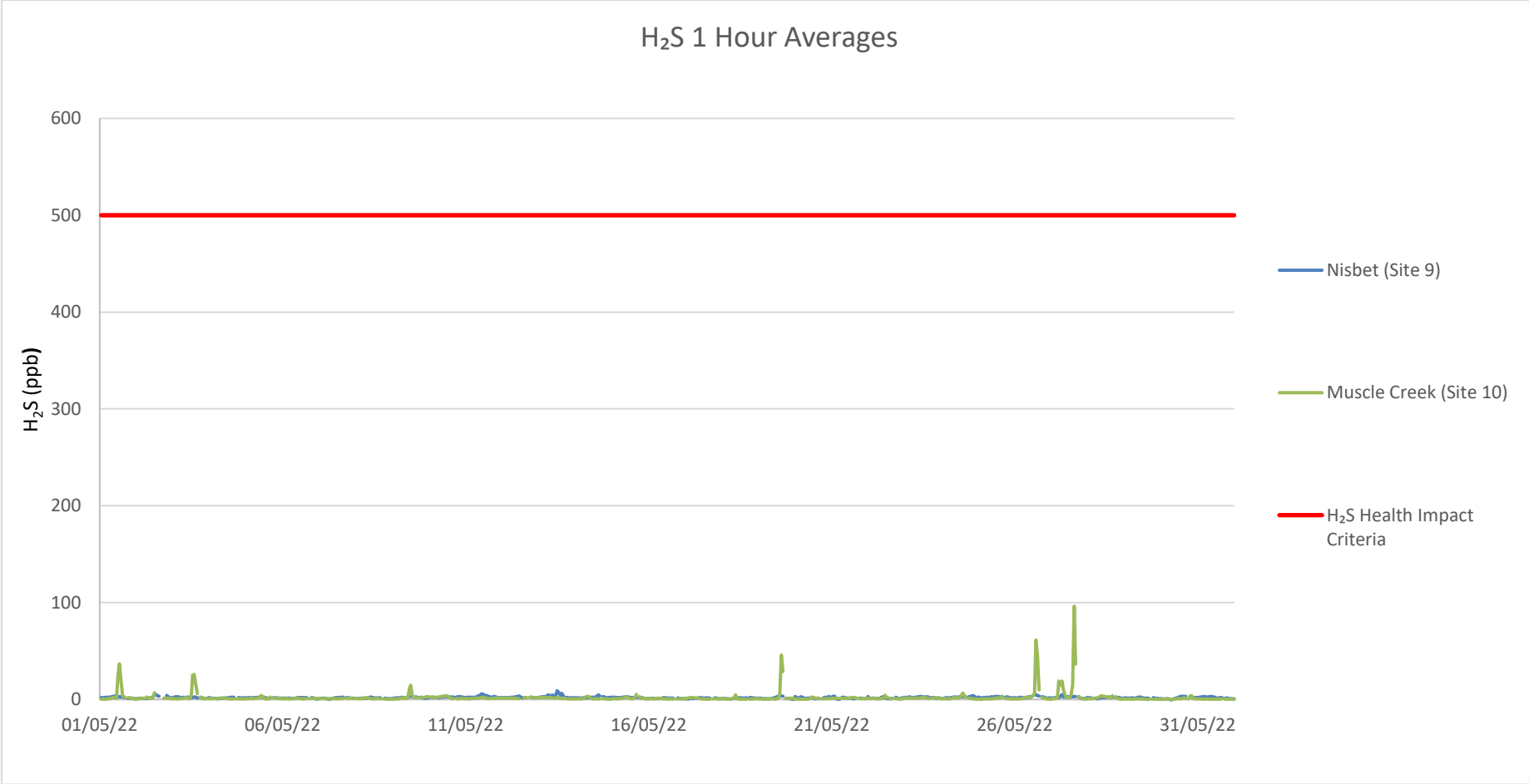

Figure 5: Hydrogen Sulphide 1 Hour Results

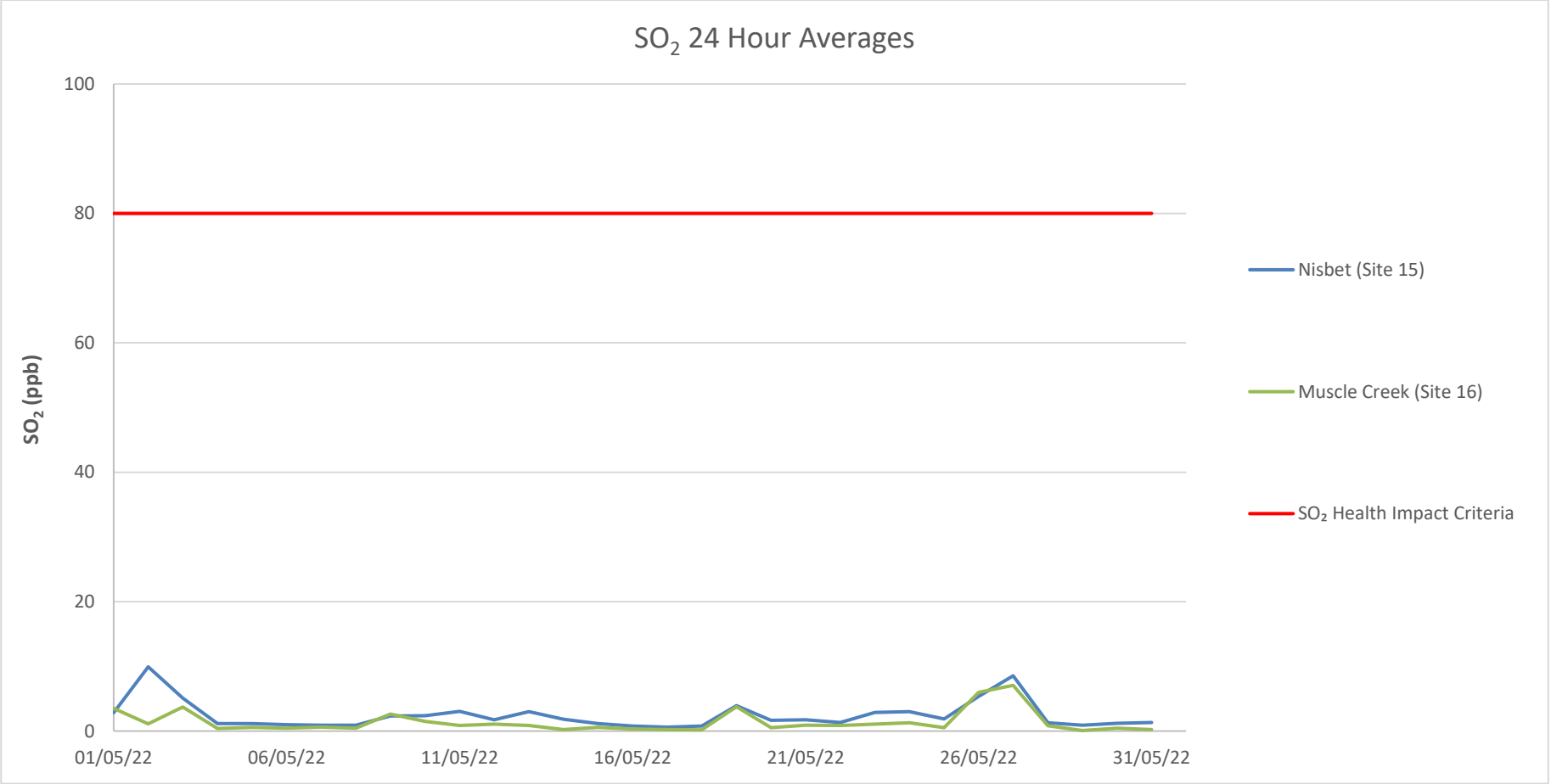

Figure 6: Sulphur Dioxide 24 Hour Results

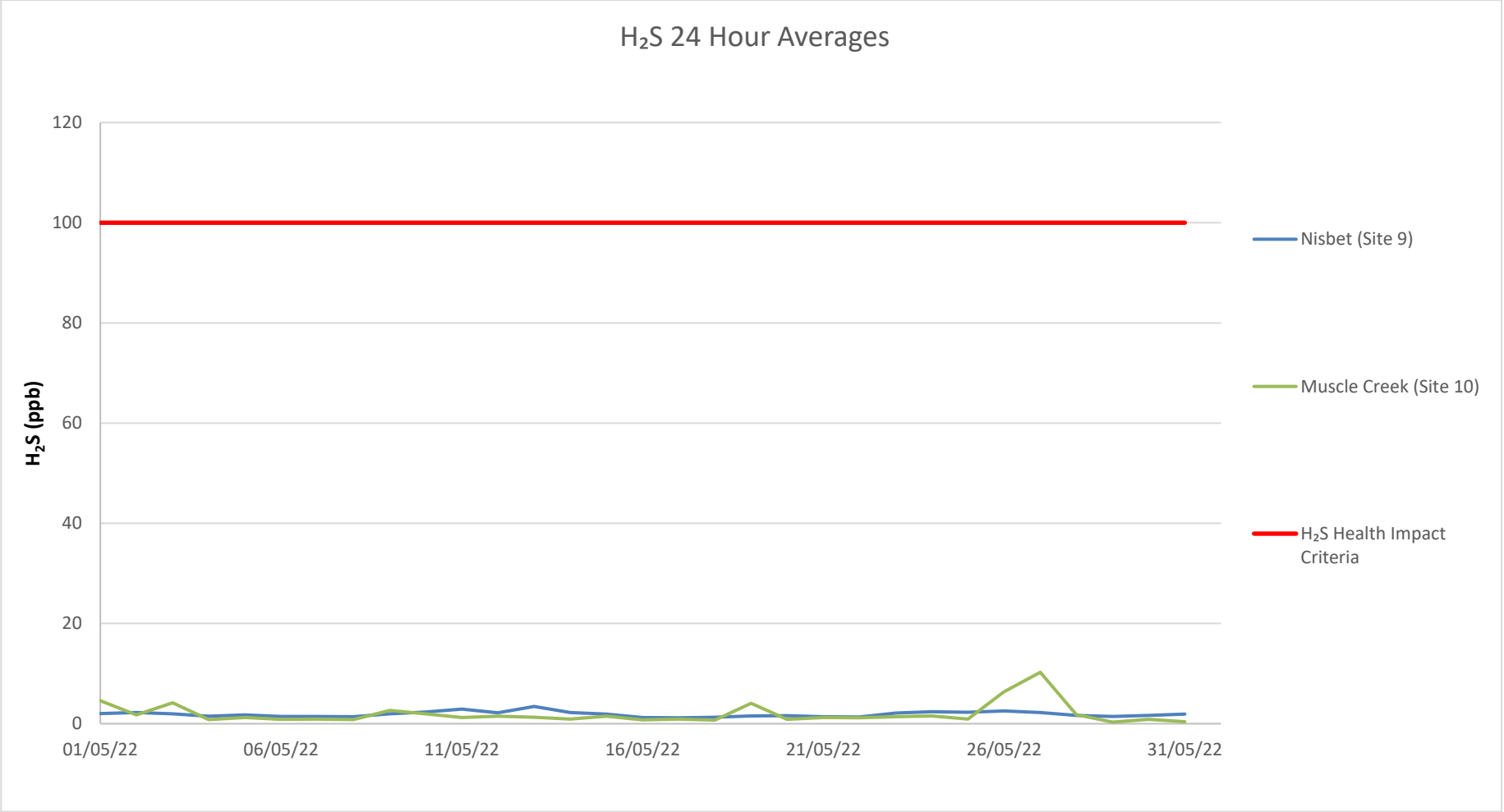

Figure 7: Hydrogen Sulphide 24 Hour Results

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. There were nine alarms during May, occurring on Sunday 1st at 12:00pm, Monday 2nd at 12:00pm, Tuesday 3rd at 12:30pm, Monday 9th at 11:00am, Friday 13th at 12:00pm, Thursday 19th at 2:30pm, Thursday 26th at 1:30pm, and Friday 27th at 4:30am and 2:00pm.

On the 1st it was raining, and no operations were occurring. On the 2nd and 3rd watercarts were cooling hot spots but there was nothing abnormal occurring at site. On the 9th hot material was being removed. For the alarms on the 13th, 19th, 26th and 27th there was a water infusion program occurring cooling hot spots.

For each of the alarms, the elevated result were sharp spikes and returned to low levels after a brief period.

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 spontaneous combustion management activities were occurring and gas levels during the reporting period were generally low. All possible management controls for spontaneous combustion were being undertaken at the time of the elevated gas levels and operations were modified where possible to reduce the spontaneous combustion emissions.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There were no odour complaints received during the reporting period. There was one visual complaint on 23 May at 9:14am where the complainant asked when the mine was closing and when the spontaneous combustion will stop. The complaint did not coincide with any of the alarms.

A review of the gas data for the time of this complaint shows that the 30 minute and 1-hour gas levels were <3.2 ppb for hydrogen sulphide and <3.8 ppb for sulphur dioxide and at both monitoring locations.