ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: April 2022

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 20 May 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
01/04/22					
02/04/22					
03/04/22					
04/04/22		OC1		S25	
05/04/22		OC1		S25 StH Coal	
06/04/22		OC1		S25 StH Coal	
07/04/22		S25		S25 East	Wet Weather
08/04/22					Wet Weather
09/04/22					
10/04/22					

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
11/04/22		RL150 Dump, S24 & S25		S25	
12/04/22		OC1		S25 &RL150 Dump	
13/04/22	S24	OC1			
14/04/22		OC1			
15/04/22		S25, RL150 Dump & ROM			
16/04/22		ROM			
17/04/22		S24, RL150 Dump & ROM			
18/04/22		RL150 Dump & ROM	RL150 West side	RL150 Dump	
19/04/22					Wet Weather
20/04/22		OC1		S25	
21/04/22		OC1		S25	
22/04/22					Wet Weather
23/04/22					
24/04/22					
25/04/22					
26/04/22		OC1			
27/04/22		OC1			Wet Weather
28/04/22		OC1			Wet Weather
29/04/22		OC1			
30/04/22	S25	OC1		S25 StH Coal	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* 89* 20*	Mining Capping Infusion	0** 0** 4165**
Open Cut 2	N/A	40*	None Required	0**
SUMMARY				
Total Area Affected		153*		
Total Area Controlled		4278**		

* - at end of reporting period

** - during reporting period

The outbreak in Open Cut 2 is approximately 40 square metres. Steam is issuing from the area of rehabilitation which is fully vegetated. The vegetation impacted by the stream is yellowing. The area will be excavated to remove the impacted material and backfilled with inert material before being revegetated.

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	97.8	96.3
		1 hour	95.6	94.4
		24 hours	100.0	98.4
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	73.8	94.8
		1 hour	72.1	92.5
		24 hours	73.3	97.0
Point 15, Nisbet	Sulphur Dioxide	1 hour	95.6	94.5
		24 hours	100.0	98.4
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	71.9	92.7
		24 hours	73.3	97.3

Muscle Creek monitor had an equipment failure during April where a week's data was lost. The faulty unit was replaced and sent away for repairs.

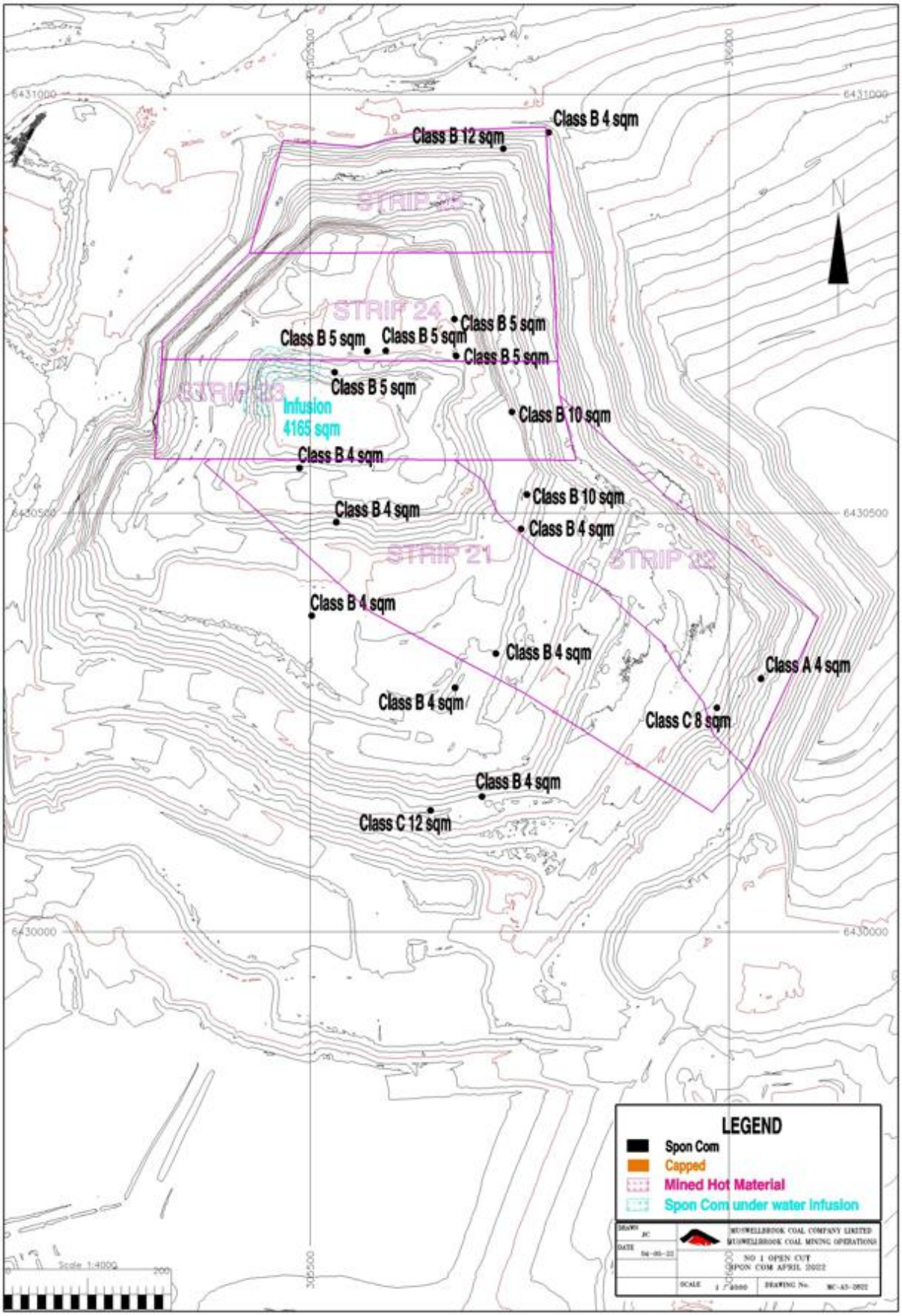

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

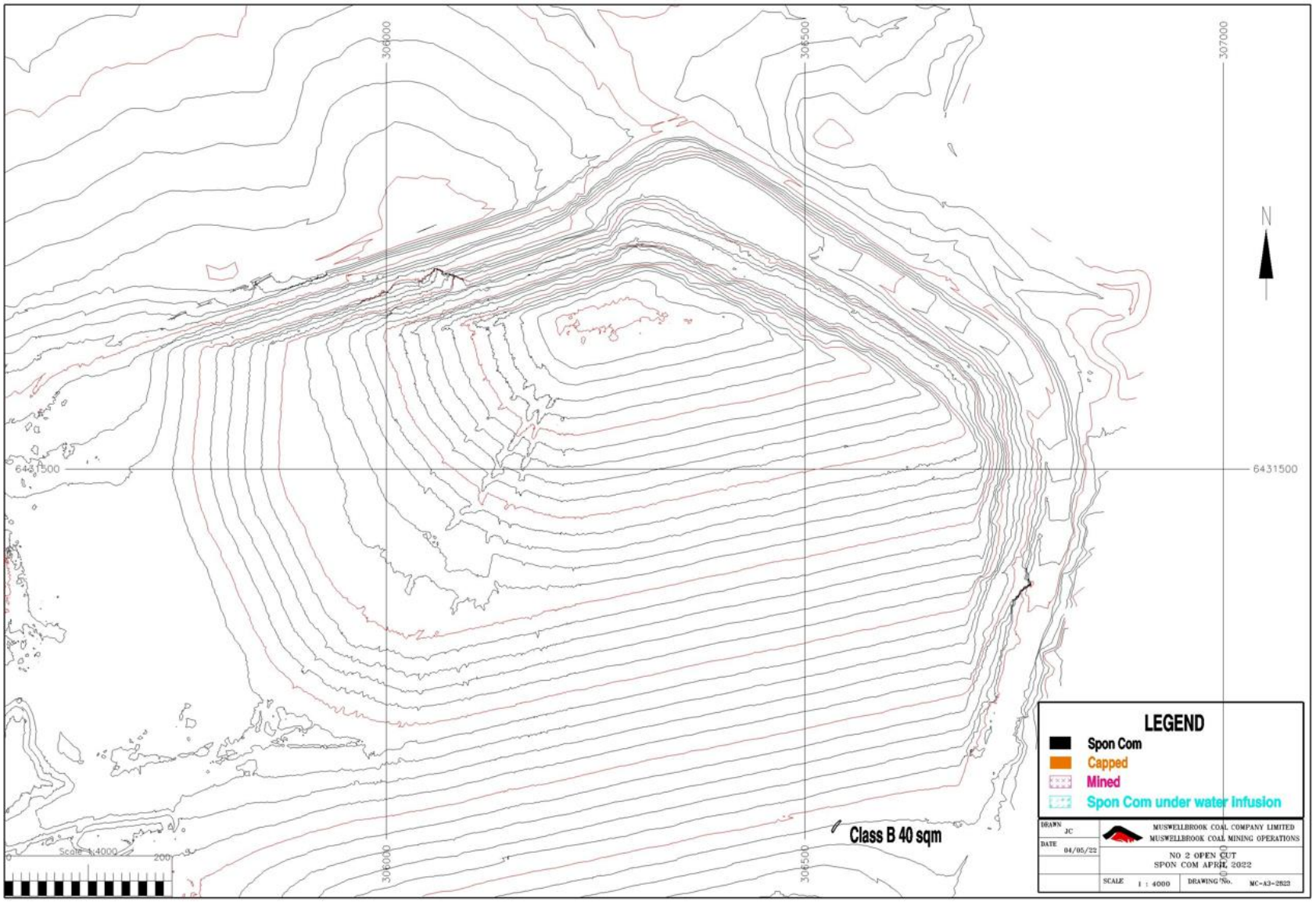

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

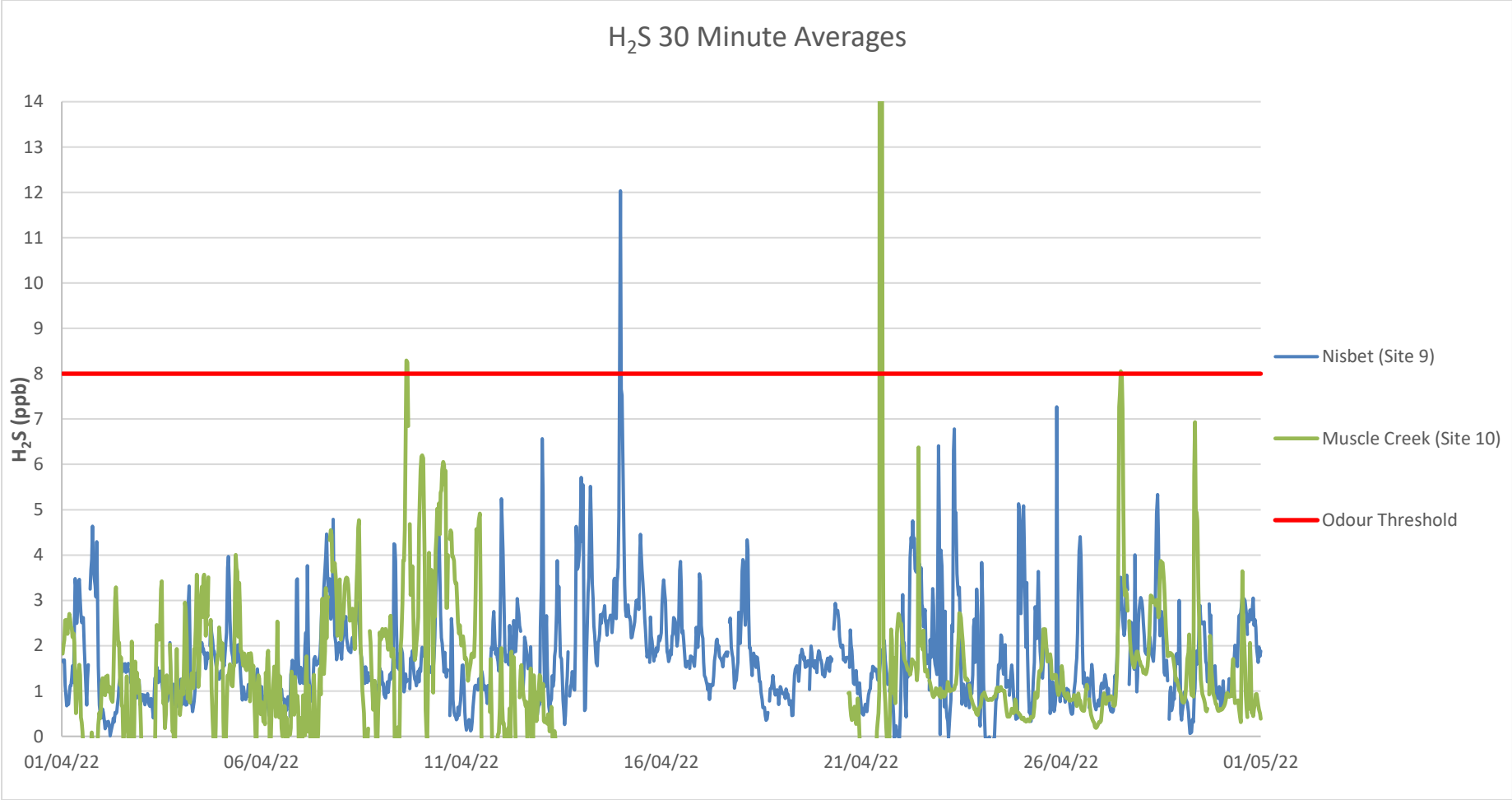

Figure 3: Hydrogen Sulphide 30 Minute Results

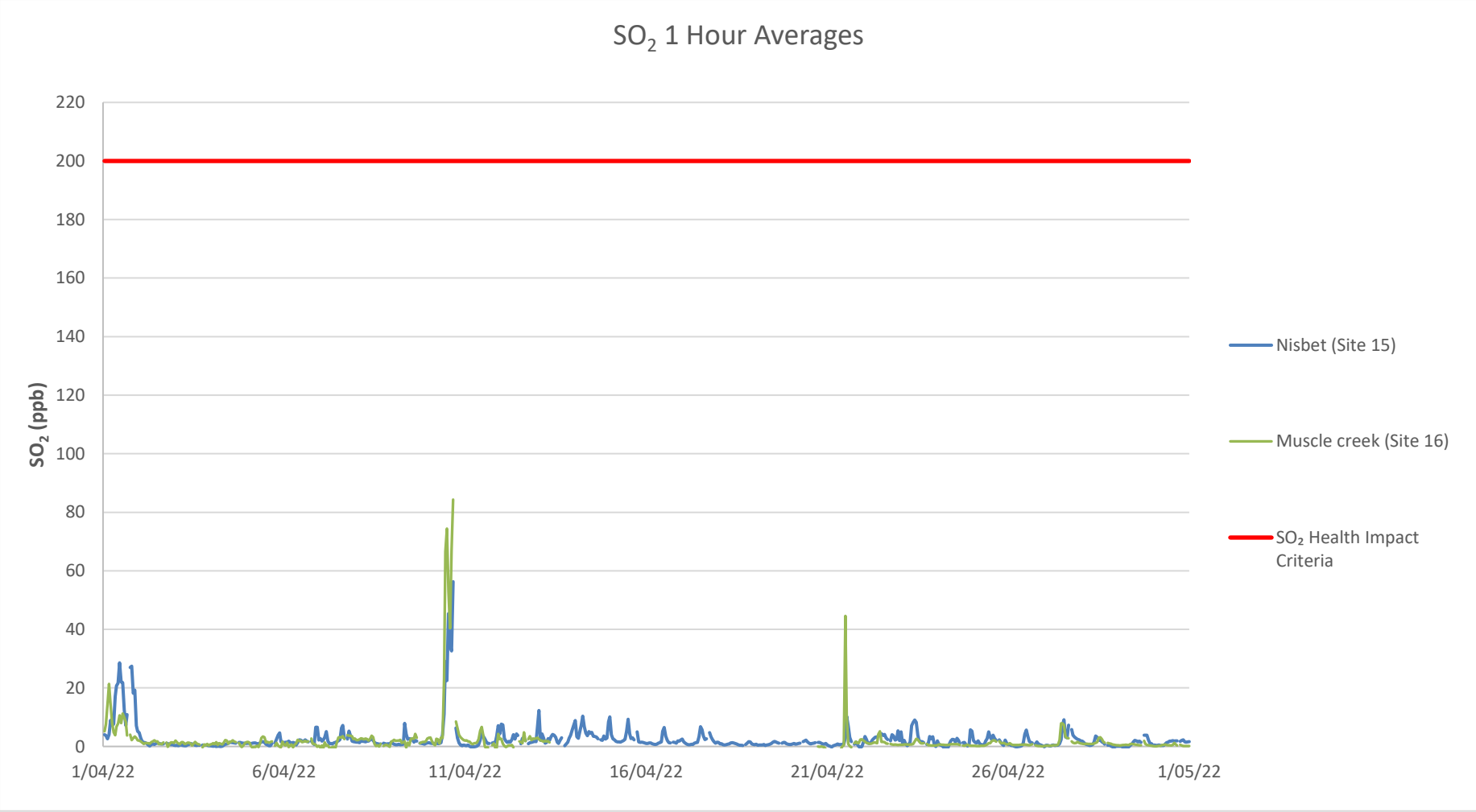

Figure 4: Sulphur Dioxide 1 Hour Results

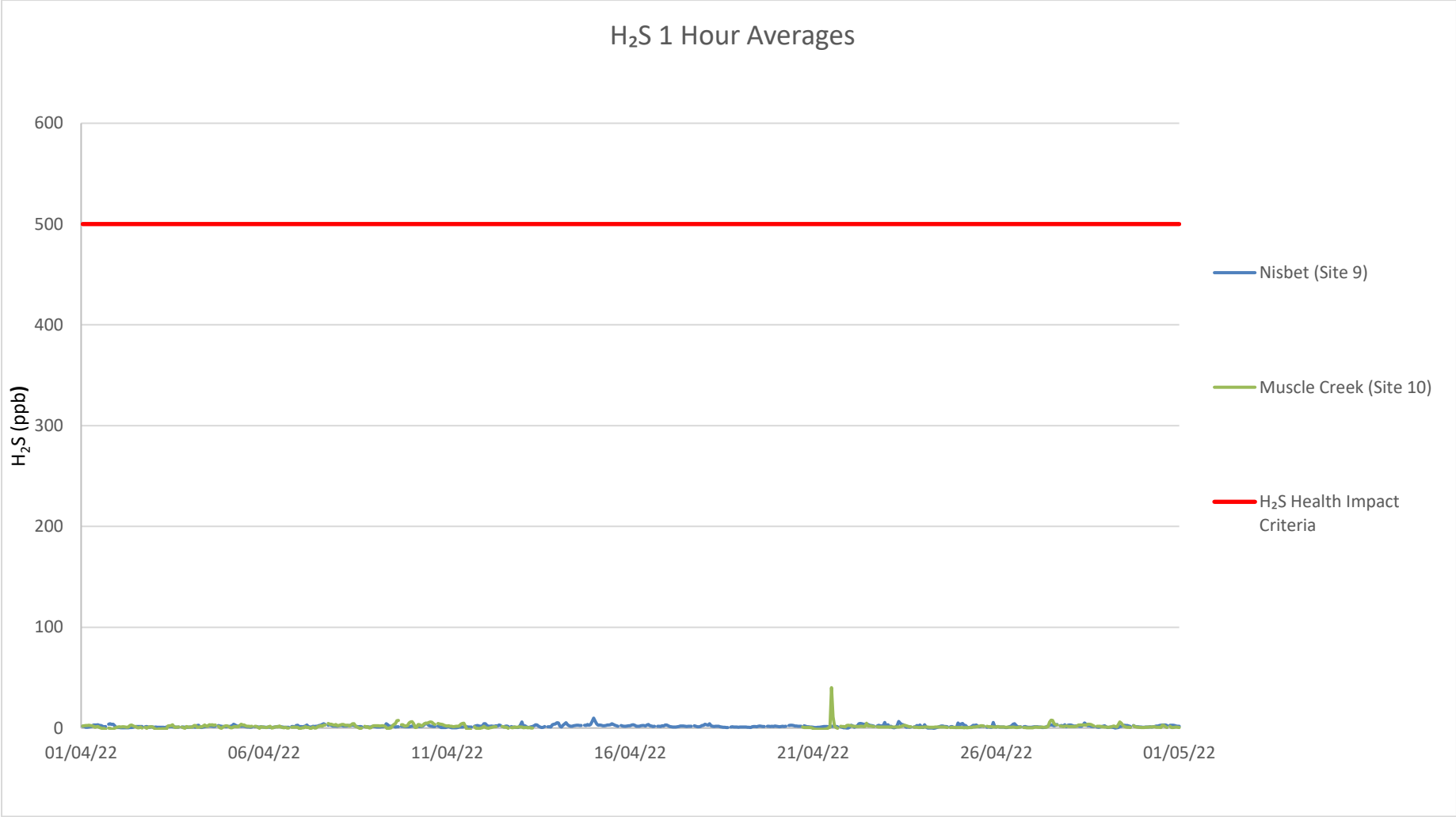

Figure 5: Hydrogen Sulphide 1 Hour Results

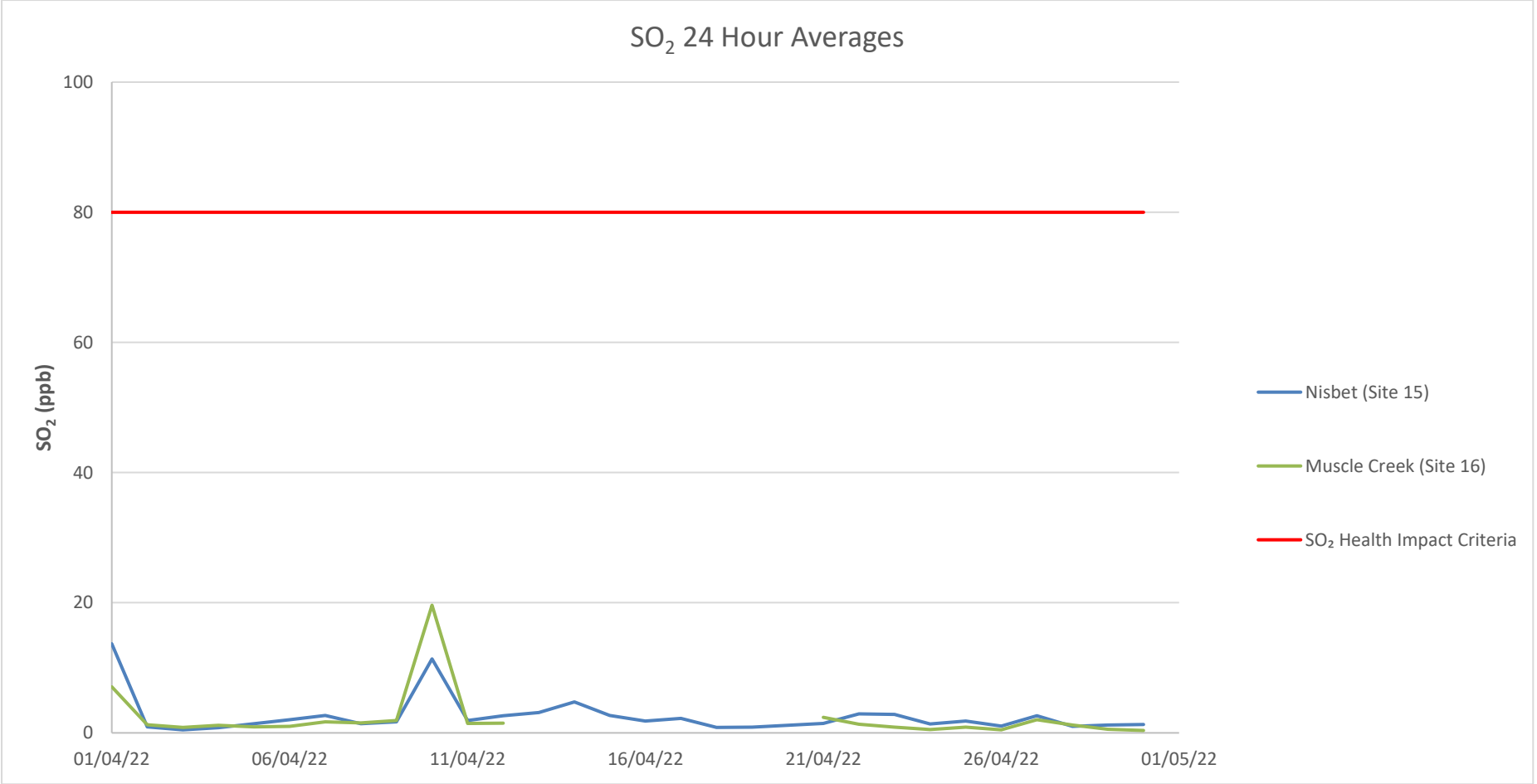

Figure 6: Sulphur Dioxide 24 Hour Results

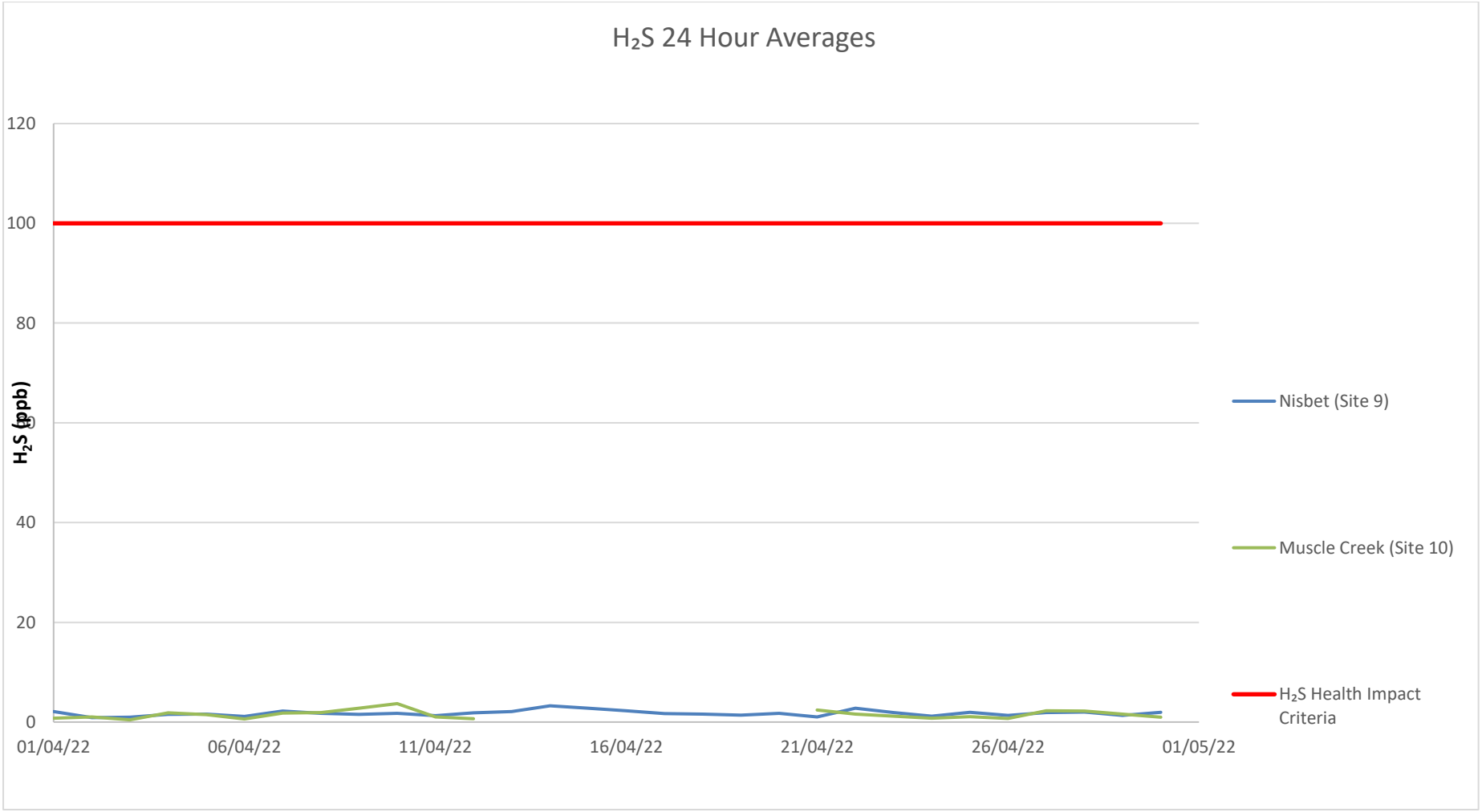

Figure 7: Hydrogen Sulphide 24 Hour Results

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 four alarms during April, occurring on Saturday 9th at 3:00pm, Thursday 14th at 11:30pm, Thursday 21st at 11:30am and Wednesday 27th at 11:30am. For each of the alarms, investigations were carried out.

For the alarm on Saturday 9th, operations were mining hot material in Strip 25. Upon receiving the alarm, the OCE relocated the excavator off the hot material and used watercarts to supress the dust. This alarm occurred at the Muscle Creek monitor to the south of the mine with the wind coming from the south east direction at 4.6m/s.

The alarm on Thursday 14th occurred at 11:30pm at the Nisbert monitor, wind direction was from the south east at 2.5m/s. Operations had watercarts being used for hot spot cooling and the OCE was monitoring the ROM stockpile for any self-heating outbreaks.

The alarm on Thursday 21st occurred at 11:30am at the Muscle Creek monitor with the wind coming from the south east at 3.3m/s. At the time of the alarm operations were removing hot coal from Strip 25.

On Wednesday 27th it was raining at the time of the alarm (Muscle Creek monitor at 11:30am, wind direction southerly at 1.3m/s), earlier in the morning watercarts had been hot spot cooling in Strips 24 & 25 until 9:30am when the rain started.

For each of the alarms, the elevated result returned to low levels after a brief period. Three of the four alarms occurred at times when the monitor triggering the alarm was upwind of the mine.

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 four odour complaints received during the reporting period. None of the four complaints coincided with the four alarms which occurred during April. The complaints were received on Thursday 14th at 10:54am via an email from the EPA where an anonymous complainant called the EPA for an incident on Tuesday 12th at 9:15am; Monday 18th at 8:40am via the environmental hotline; Tuesday 19th at 4:30am where the complainant called the OCE directly; and then Thursday 28th at 11:28am an anonymous resident had called the EPA.

A review of the gas data for the times these complaints were received shows that the 30 minute and 1-hour gas levels were <3.7 ppb for hydrogen sulphide and <4.4 ppb for sulphur dioxide and at both monitoring locations during the times of these complaints.