ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period:	**December 2020**
Authority Holder:	**Muswellbrook Coal Company Limited**
Report Date:	**25 January 2021**
Approved by:	**Brooke York** **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.

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
01/12/20	S23	OC1	-	-	
02/12/20	-	OC1	S22	S22	
03/12/20	-	OC1	-	S25	
04/12/20	-	OC1	-	-	
05/12/20	-	OC1	-	-	Wet Weather
06/12/20	-	OC1	-	-	Wet Weather
07/12/20	-	OC1	-	-	
08/12/20	-	OC1	-	-	
09/12/20	S22	OC1	S22	S22	

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
10/12/20	-	S22	S22	S22	
11/12/20	S22	OC1	-	-	
12/12/20	S22	OC1	-	S22	
13/12/20	S22	OC1	-	S22	Wet Weather
14/12/20	S22	S22	-	S22	
15/12/20	OC1	-	-	-	Wet Weather
16/12/20	-	OC1	-	-	Wet Weather
17/12/20	-	OC1	-	-	Wet Weather
18/12/20	-	OC1	-	S22	Wet Weather
19/12/20	-	OC1	-	S22	Wet Weather
20/12/20	-	OC1	S22	S22	Wet Weather
21/12/20	-	OC1	S22	-	Wet Weather
22/12/20	-	OC1	S22	-	Wet Weather
23/12/20	S22	OC1	S22	-	Wet Weather
24/12/20	-	-	-	-	
25/12/20	-	-	-	-	
26/12/20	-	-	-	-	Wet Weather
27/12/20	-	-	-	-	Wet Weather
28/12/20	-	OC1	-	-	Wet Weather
29/12/20	S22	OC1	-	-	Wet Weather
30/12/20	S22	OC1	-	-	Wet Weather
31/12/20	S22	-	-	-	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	0* 62* 22*	Mining Capping Infusion	2,810** 10,965** 3,280**
Open Cut 2	N/A	0*	None Required	0**
SUMMARY				
Total Area Affected		84*		
Total Area Controlled		17,055**		

* - at end of reporting period

** - during reporting period

No spontaneous combustion outbreaks were observed in Open Cut 2 throughout December 2020. Therefore, no active controls were implemented in Open Cut 2.

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. However, there were two occasions in the reporting period where H_2S was above the odour threshold and an alarm was received. These alarms were received on 21st December 2020 at 10:30pm and 27th December 2020 at 4:24am both from Nisbet (Site 9).

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 – December (%)	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	96.4	91.7
		1 hour	95.4	90.5
		24 hours	100.0	94.2
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	96.3	95.9
		1 hour	95.6	94.9
		24 hours	100.0	99.2
Point 15, Nisbet	Sulphur Dioxide	1 hour	95.0	**88.9**
		24 hours	100.0	92.6
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	95.3	95.0
		24 hours	100.0	99.5

Data capture for all monitoring sites was 90% or higher during December 2020. However, the data capture 12-month rolling average for sulphur dioxide at Nisbet (Site 15) remained less than 90% due to the previous outages in February and May 2020.

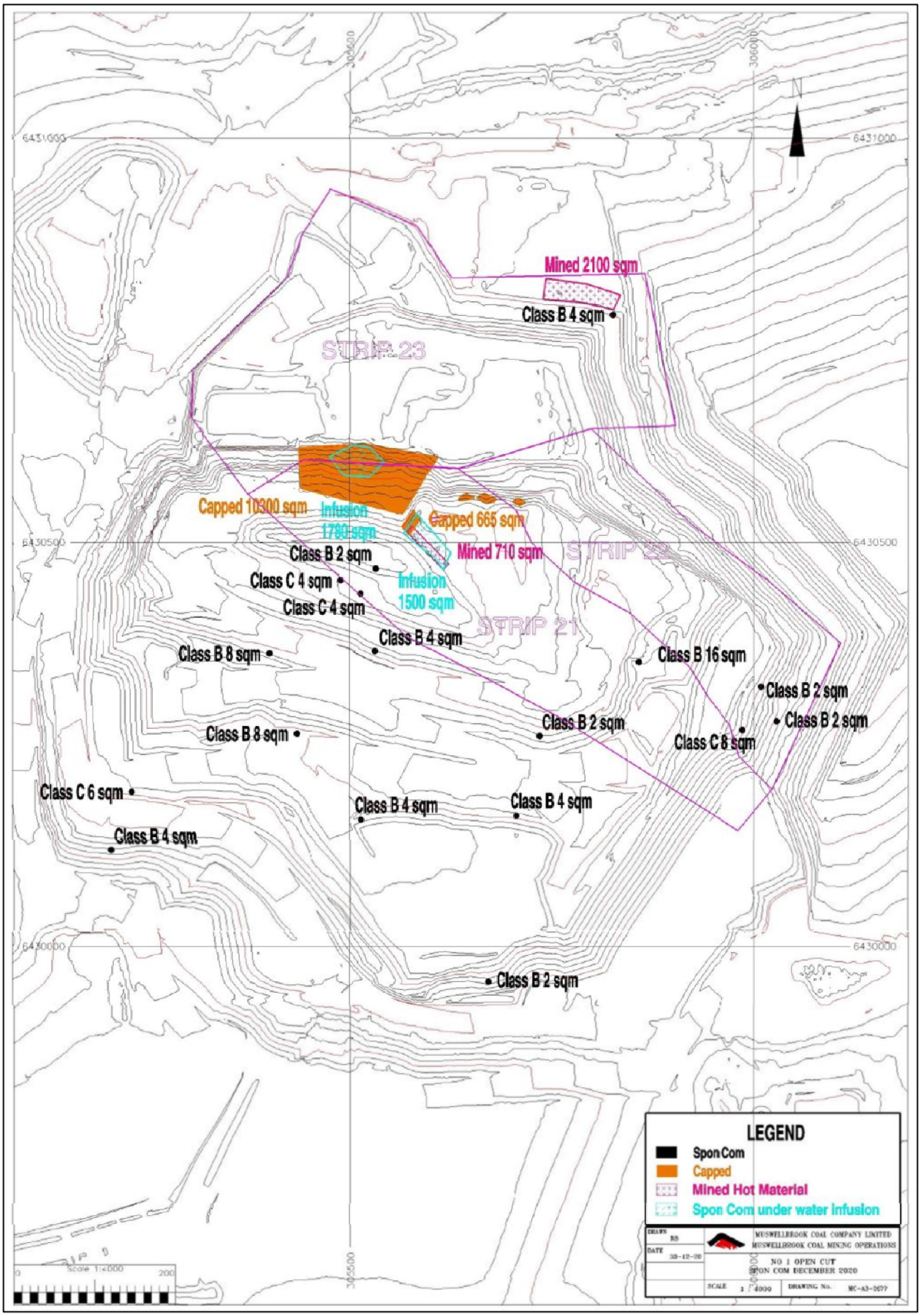

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

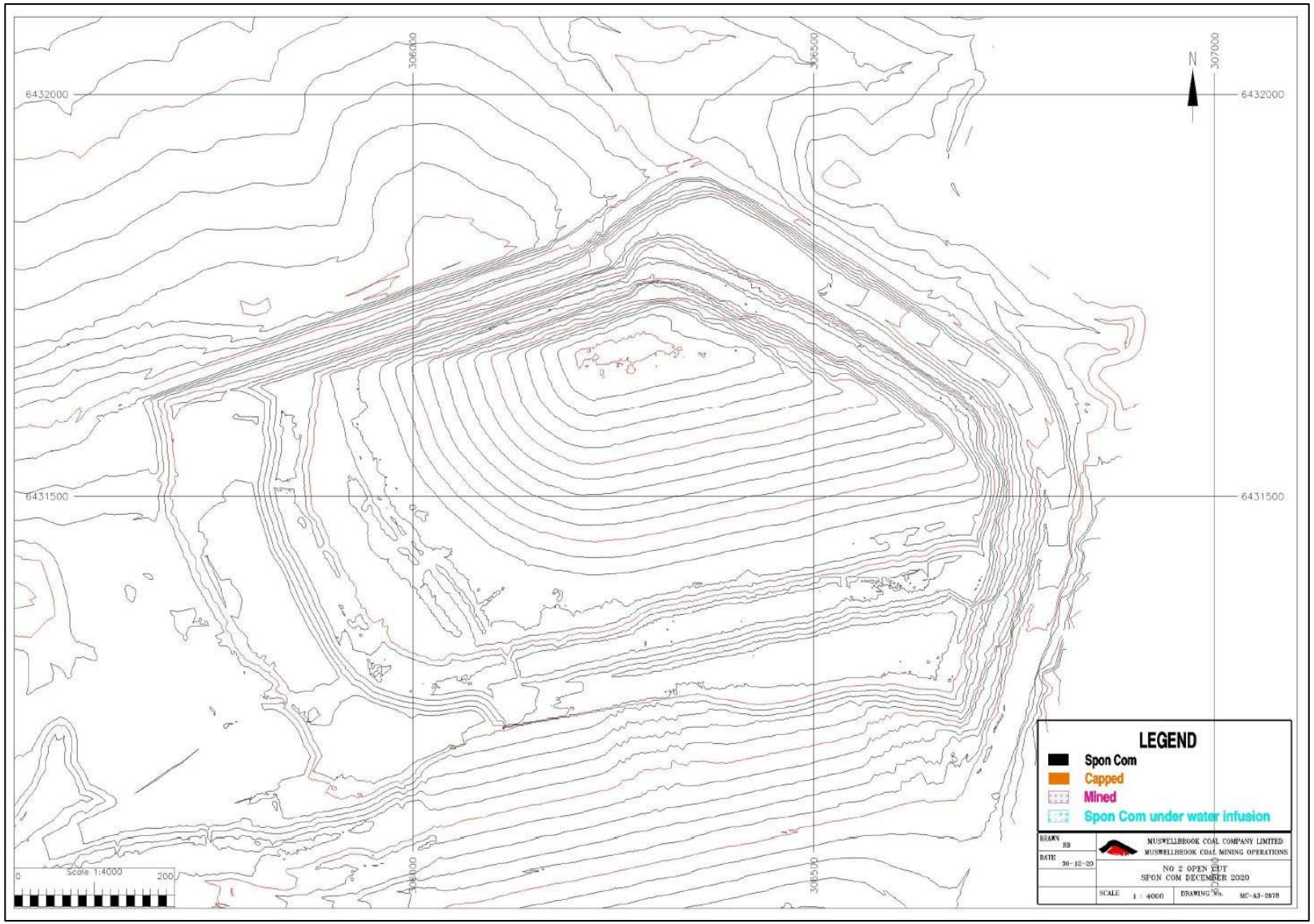

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

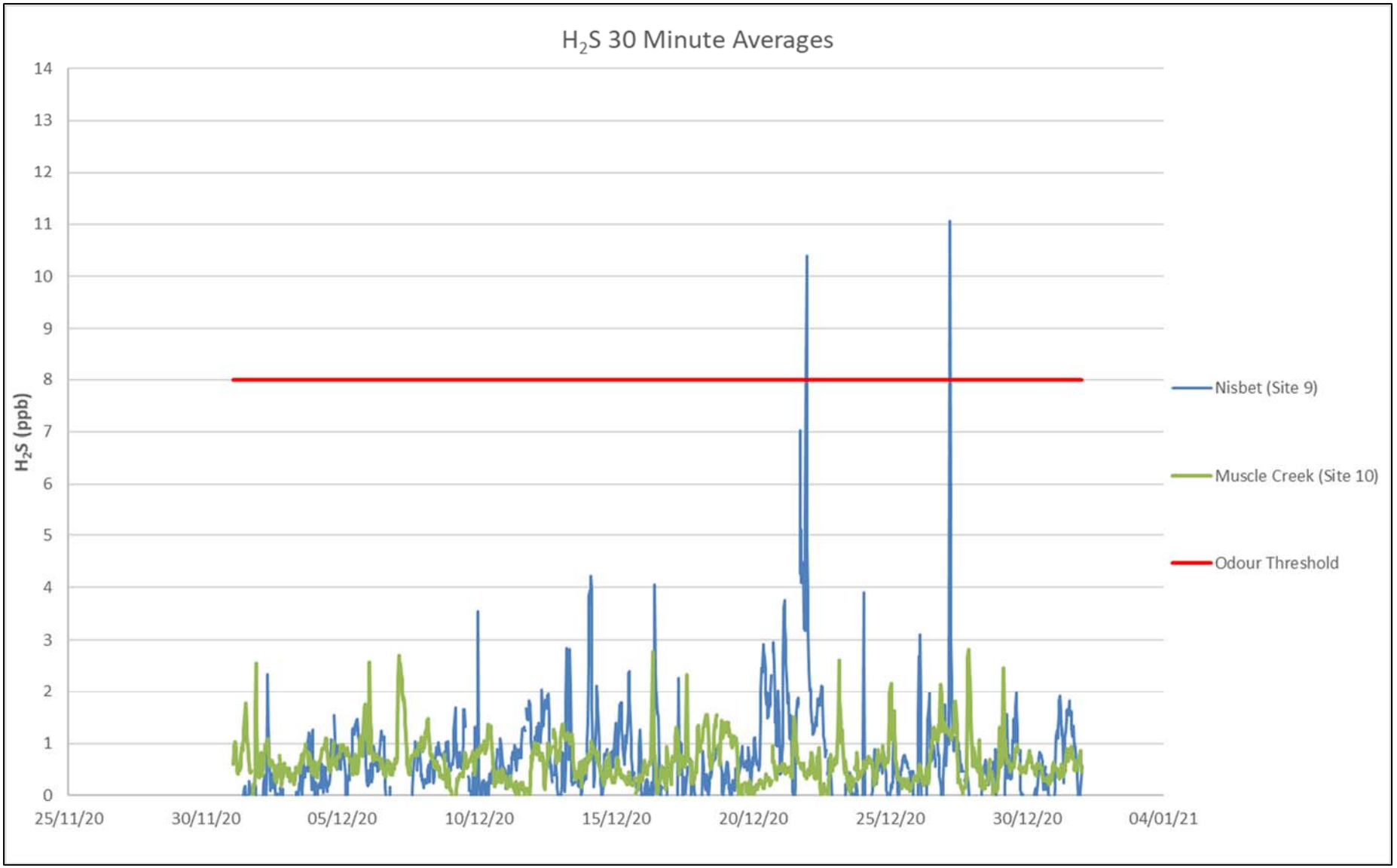

Figure 3: Hydrogen Sulphide 30 Minute Results

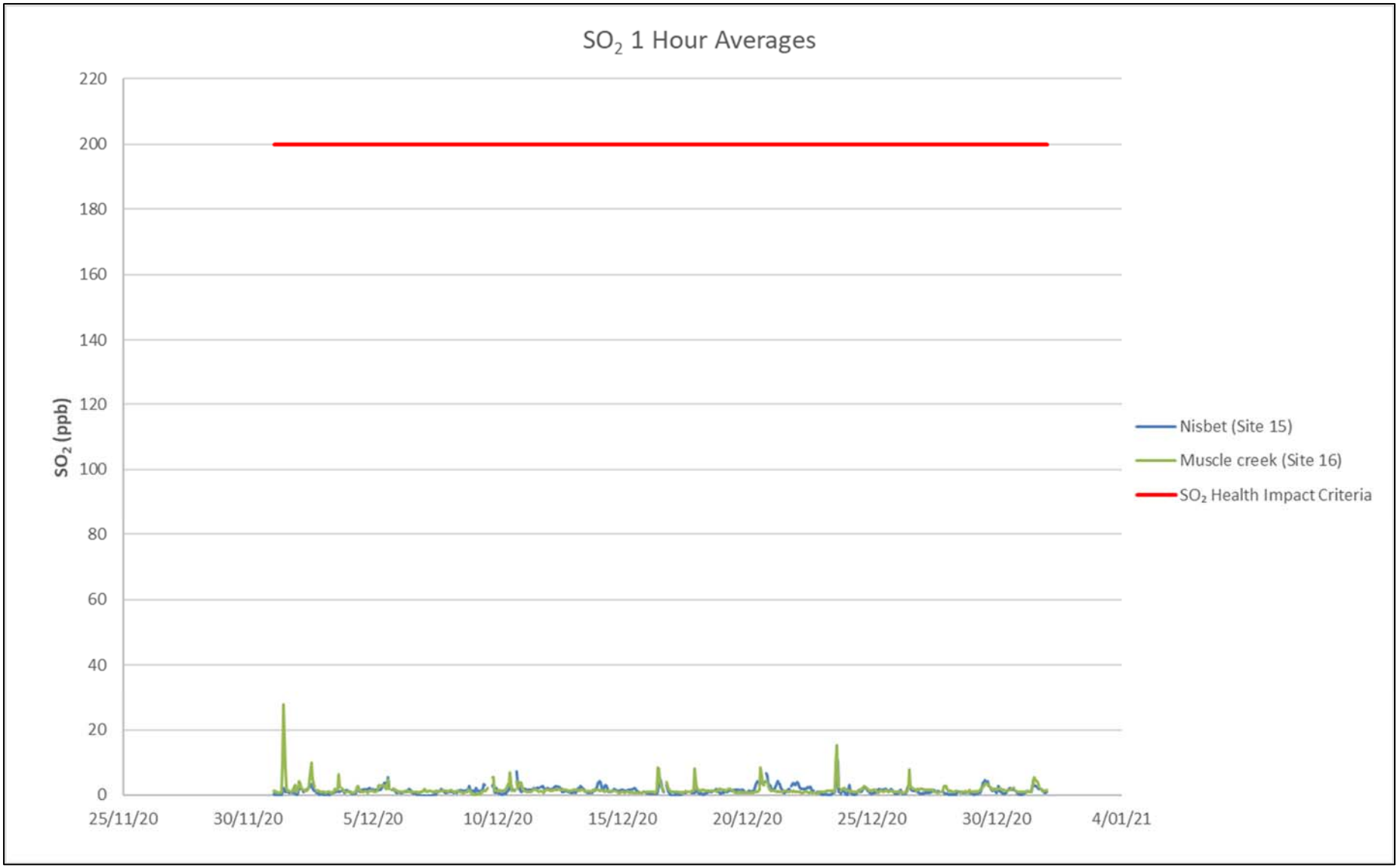

Figure 4: Sulphur Dioxide 1 Hour Results

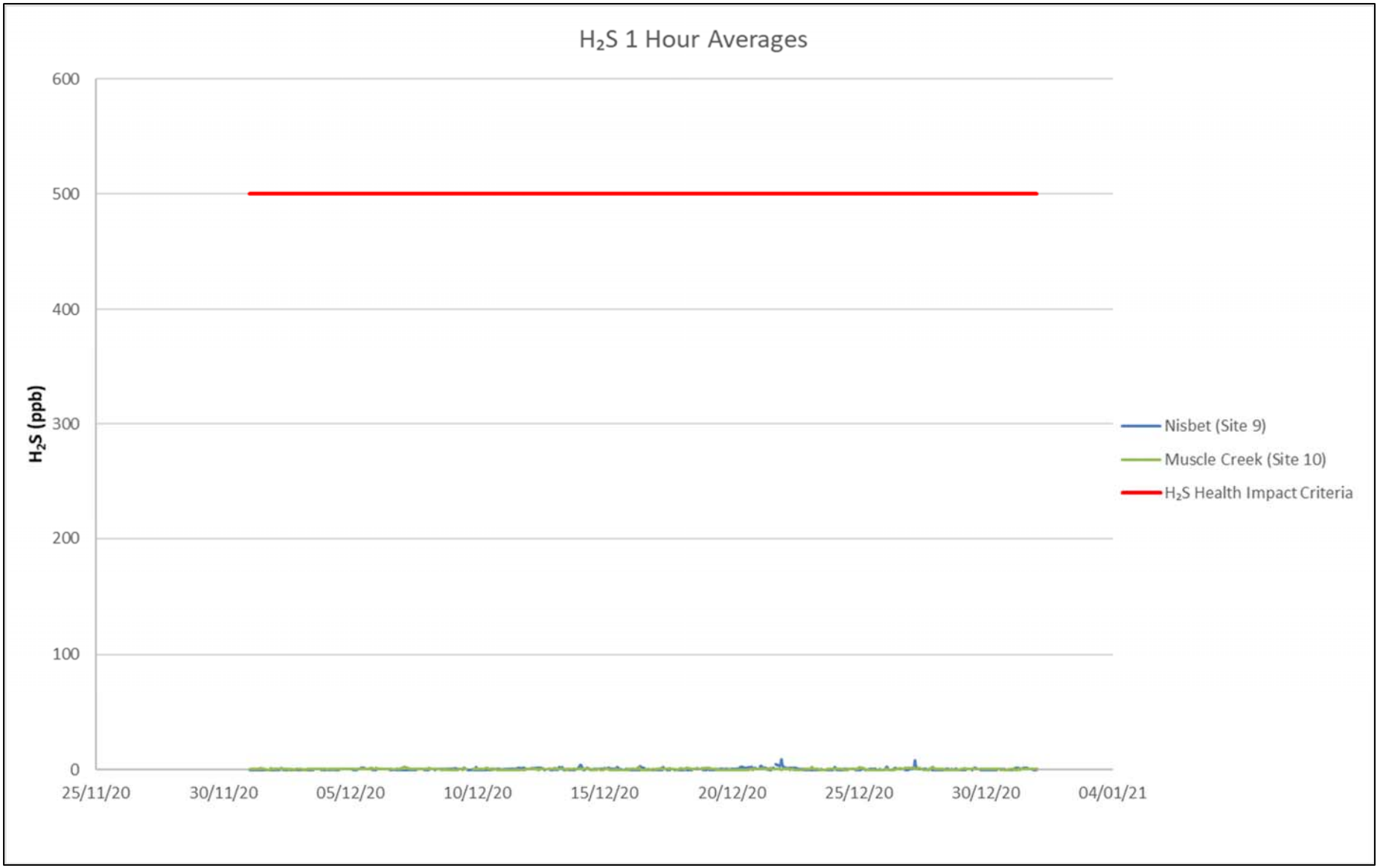

Figure 5: Hydrogen Sulphide 1 Hour Results

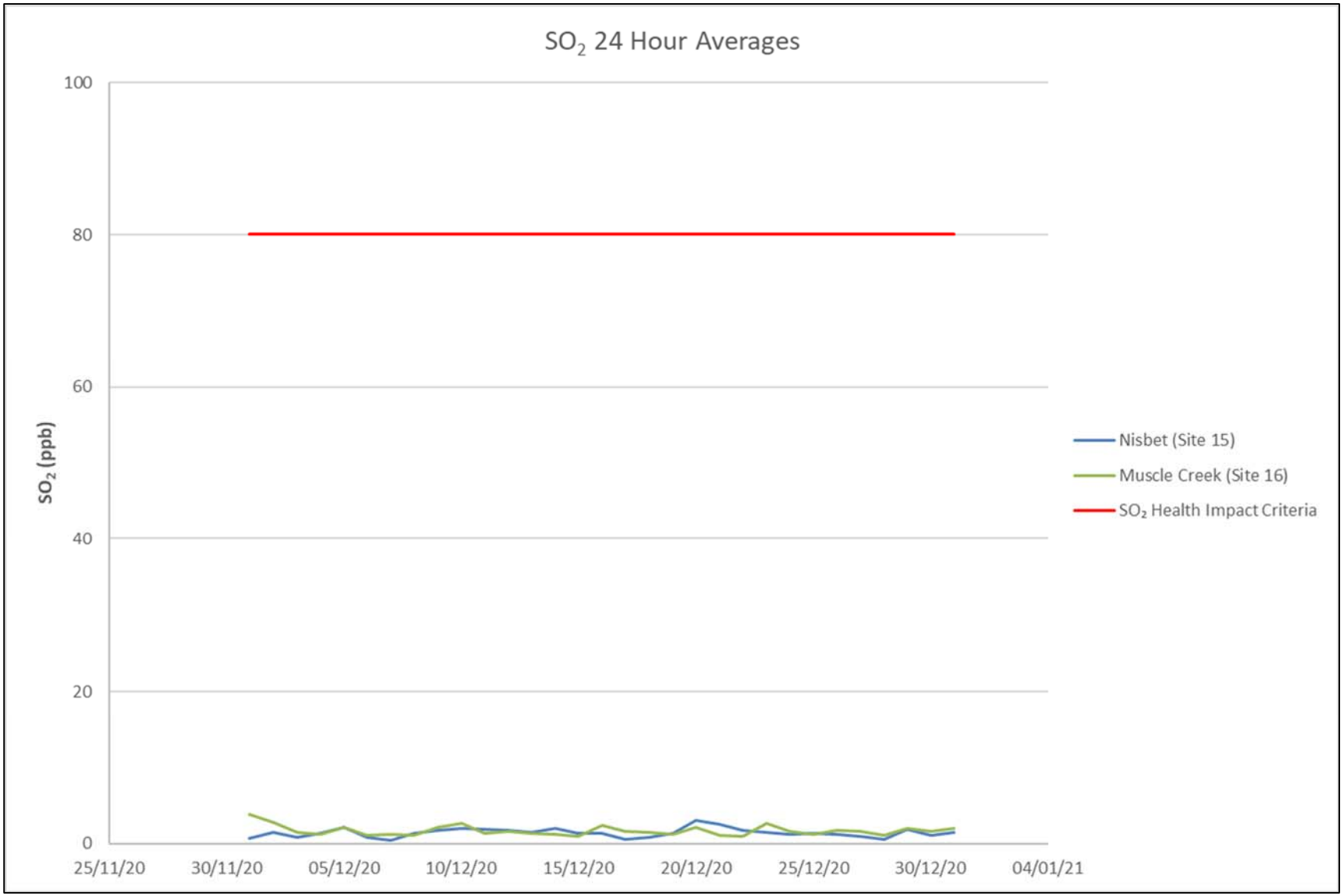

Figure 6: Sulphur Dioxide 24 Hour Results

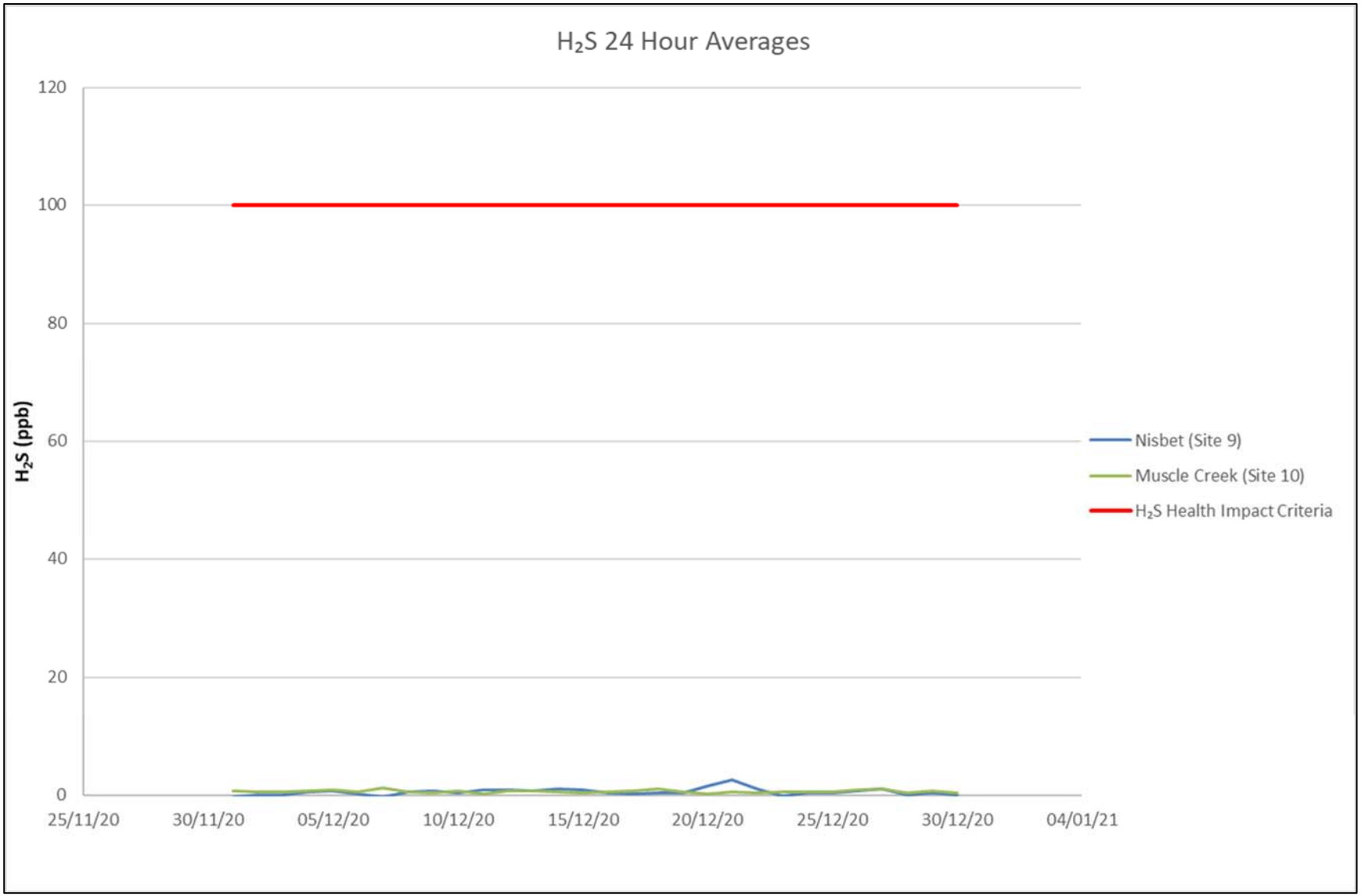

Figure 7: Hydrogen Sulphide 24 Hour Results

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. The responses to any alarms received during the reporting period are shown in **Table 5.**

Table 5: 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
21/12/2020 10:30pm	Nisbet	At the time of the alarm, the wind speed was 1.8 m/s from the south and rain had been falling throughout the day with 26mm received by 10:30pm.	A clay seal had been installed during day shift on the 21st December 2020 to manage spontaneous combustion from hot material. Persistent wet weather prevented equipment from being used in mining operations and spontaneous combustion management during night shift when the alarm was received.	Combination of Class B and C
27/12/2020 04:24am	Nisbet	At the time of the alarm, the wind speed was 1.5 m/s from the south east and 2.2 mm of rain had fallen by 4:00am that morning.	Due to the Christmas shutdown period, there was no staff onsite to respond to the alarm. Prior to the shutdown, spontaneous combustion prevention measures had been undertaken including sealing hot material with clay and cooling hot material with water sprays.	Combination of Class B and C

5.0 CORRELATION BETWEEN MANAGEMENT ACTIVITIES AND GAS LEVELS

A review of the correlation between spontaneous combustion management activities, gas levels and complaints has been undertaken. This review has found that spontaneous combustion management activities were occurring throughout the reporting period and gas levels during the reporting period were generally low. All possible prevention and management controls for spontaneous combustion were being undertaken at the time of the elevated gas levels to reduce the spontaneous combustion emissions.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There was one complaint received during the reporting period which related to odour impacts from spontaneous combustion. This was received on 13 December 2020, at 9:46pm from a resident in Scone, 27 km north of the mine. A south easterly wind was blowing at 3.6 m/s at the time of the complaint. The mine areas were inspected for spontaneous combustion emissions and no odour was detected.

A review of the gas data for the complaint received on 13 December 2020 shows that the 30 minute and 1-hour gas levels were <1.5 ppb for sulphur dioxide and <0.6 ppb for hydrogen sulphide at both monitoring locations at the time of the complaint.