Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: November 2020

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 15 December 2020

Approved by: Brooke York
Environmental Superintendent

Table of Contents

List of Tables

List of Figures

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
01/11/20	-	OC1	-	-	Wet Weather
02/11/20	-	OC1	S21	S22	Wet Weather
03/11/20	-	OC1	S21	S22	
04/11/20	OC1	OC1	-	S22	
05/11/20	OC1	OC1	-	S22	Wet Weather
06/11/20	-	OC1	-	S22	Wet Weather
07/11/20	-	OC1	-	S22	
08/11/20	-	OC1	-	S22	
09/11/20	OC1	S22	RL185 Dump	S22	

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
10/11/20	S22	OC1	-	S22	
11/11/20	-	S22	OC1	S22	
12/11/20	S22	OC1	Underground Workings (S22)	S22	
13/11/20	S22	OC1	-	S22	Wet Weather
14/11/20	S22	OC1	-	S22 & ROM	Wet Weather
15/11/20	S22	OC1	-	S22	
16/11/20	S22	OC1	-	S22	
17/11/20	-	OC1	-	-	
18/11/20	-	OC1	-	-	
19/11/20	-	OC1	-	-	
20/11/20	-	OC1	-	-	
21/11/20	S22	OC1	-	S22	
22/11/20	-	OC1	-	-	
23/11/20	S23	OC1	S22	-	
24/11/20	S22	OC1	-	-	
25/11/20	S22	OC1	S22	-	
26/11/20	S23	OC1	-	-	
27/11/20	S23	S22	-	S22	
28/11/20	-	S22	S22	-	
29/11/20	-	OC1	-	S22	
30/11/20	S23	OC1	-	S22	

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* 78* 22*	Mining Capping Infusion	2,700** 35,200** 4,260**
Open Cut 2	N/A	0*	None Required	0**
SUMMARY				
Total Area Affected		100*		
Total Area Controlled		42,160**		

* - at end of reporting period

** - during reporting period

No spontaneous combustion outbreaks were observed in Open Cut 2 throughout November 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 both received on 23rd November 2020 at 3:58am and 8:28am from Muscle Creek (Site 10).

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 – November (%)	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	92.2	91.6
		1 hour	90.8	90.5
		24 hours	93.3	94.2
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	95.8	95.8
		1 hour	94.9	94.8
		24 hours	100.0	99.2
Point 15, Nisbet	Sulphur Dioxide	1 hour	92.2	**88.9**
		24 hours	96.7	92.6
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	95.1	95.0
		24 hours	100.0	99.5

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

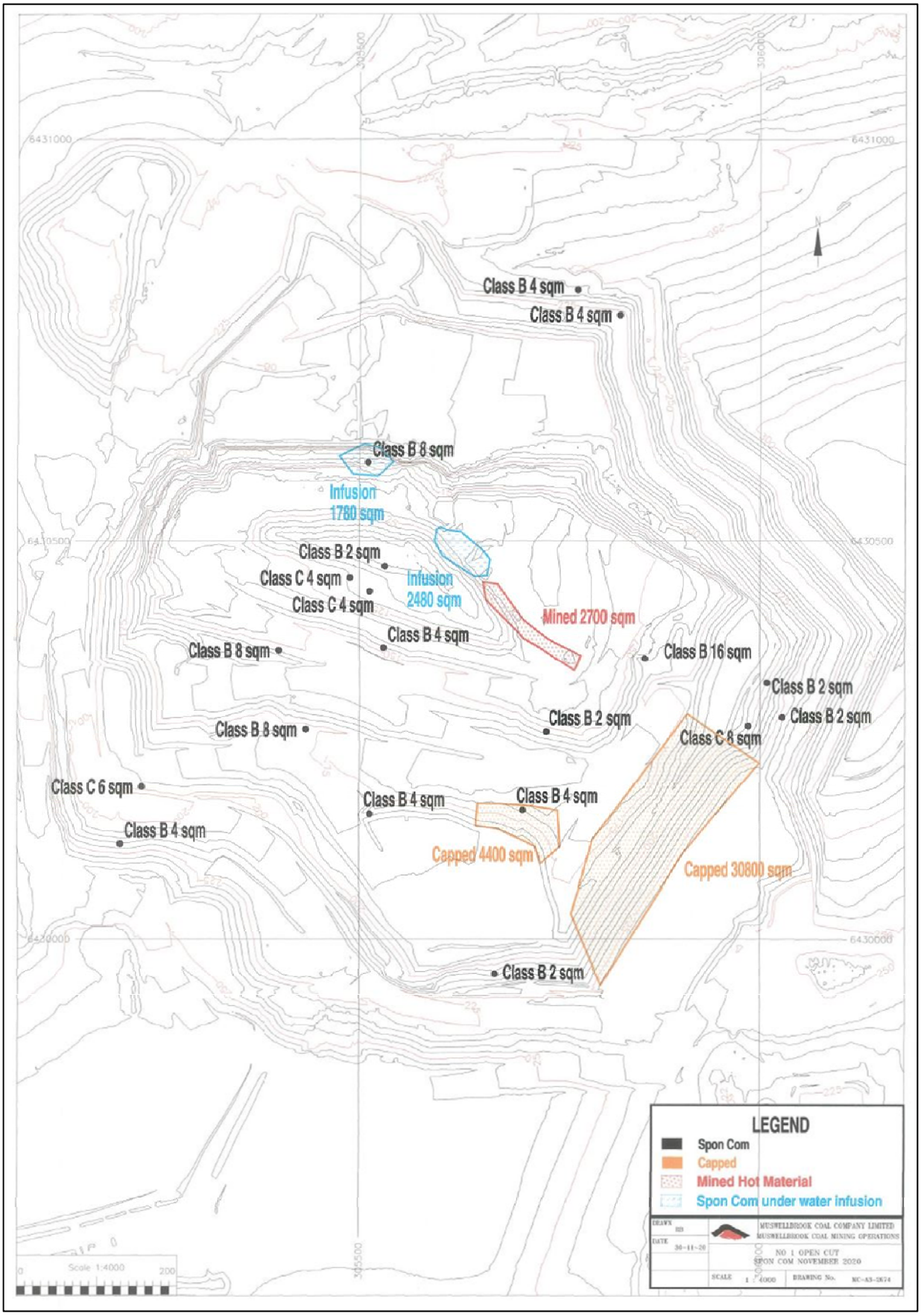

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

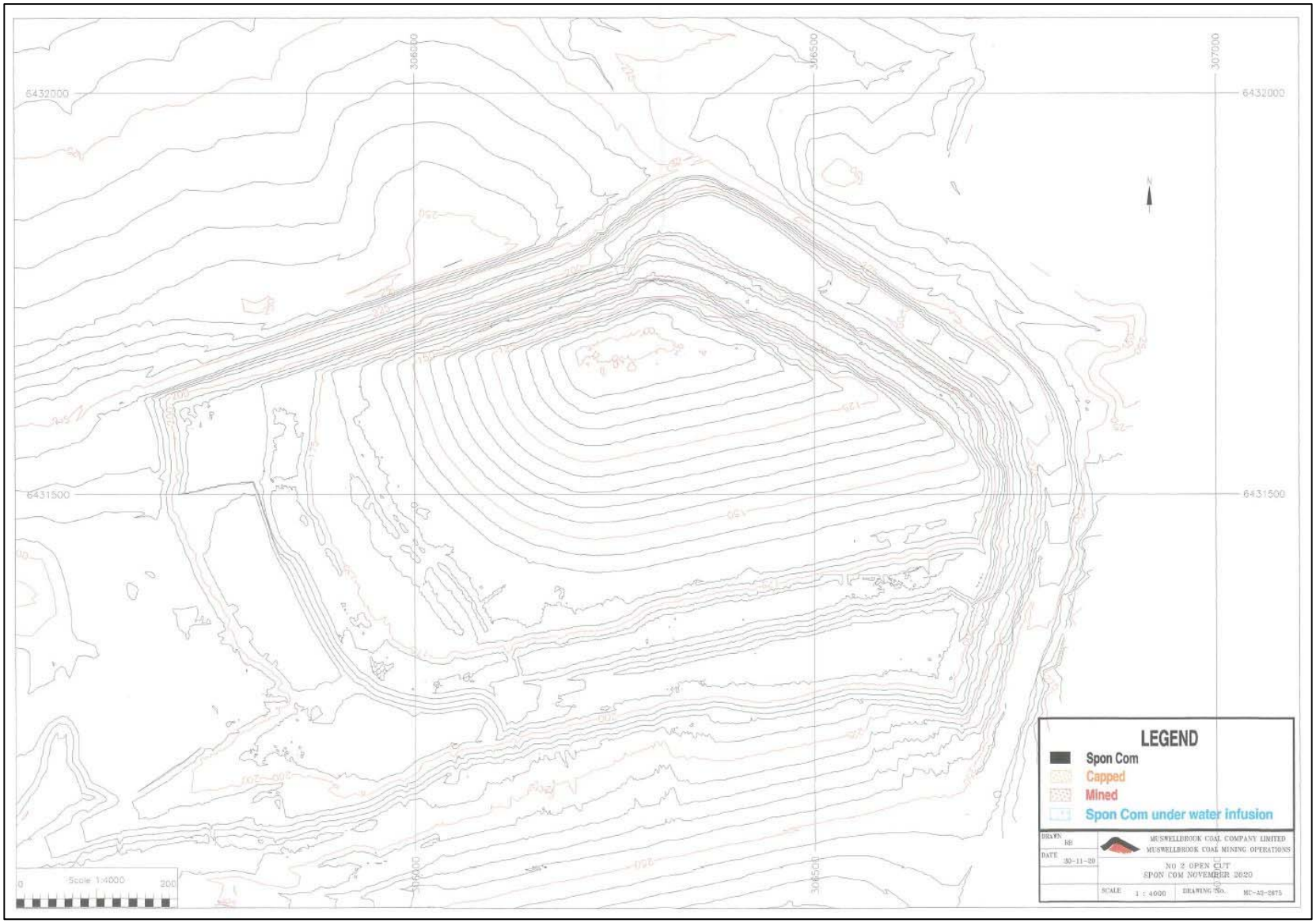

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

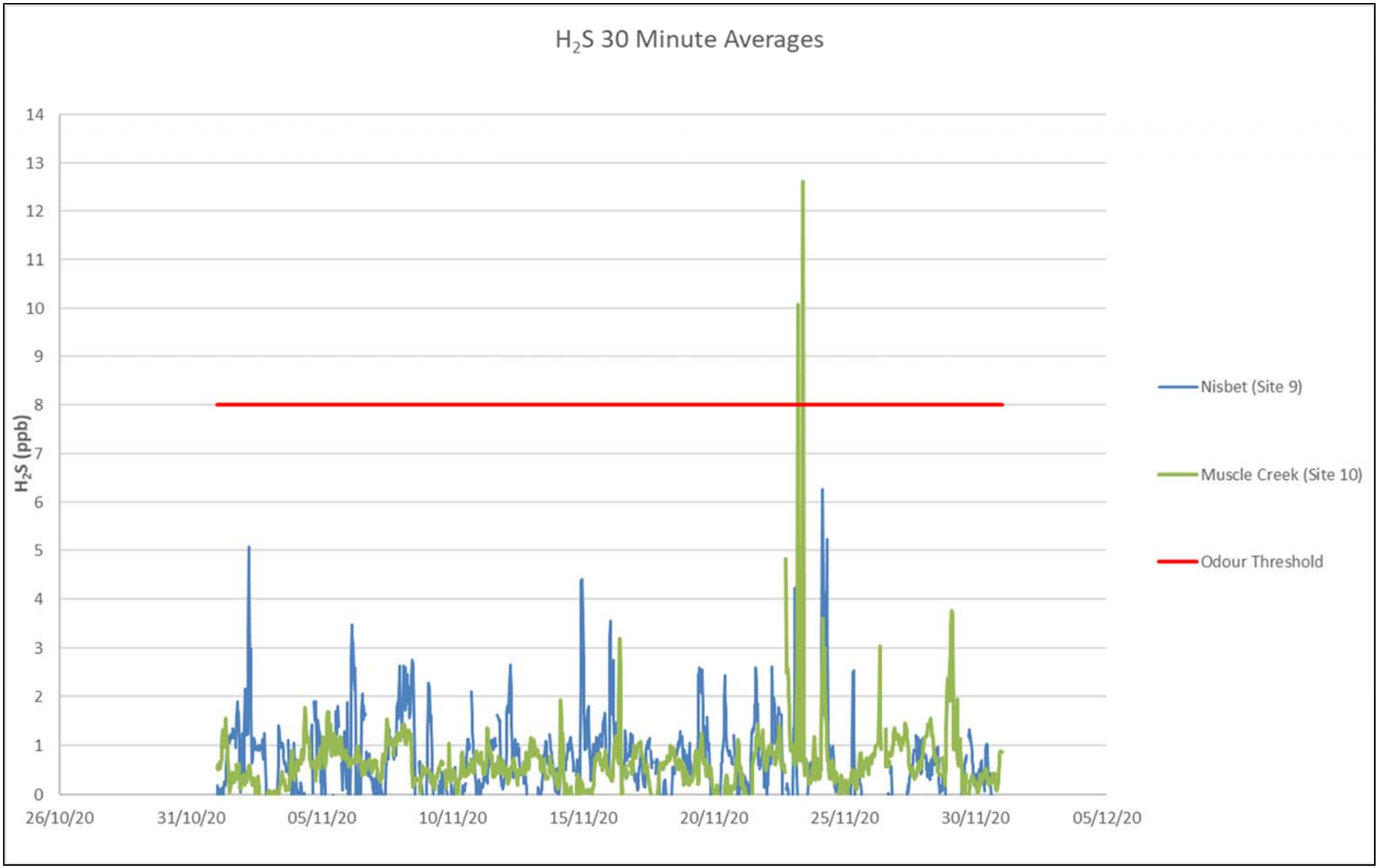

Figure 3: Hydrogen Sulphide 30 Minute Results

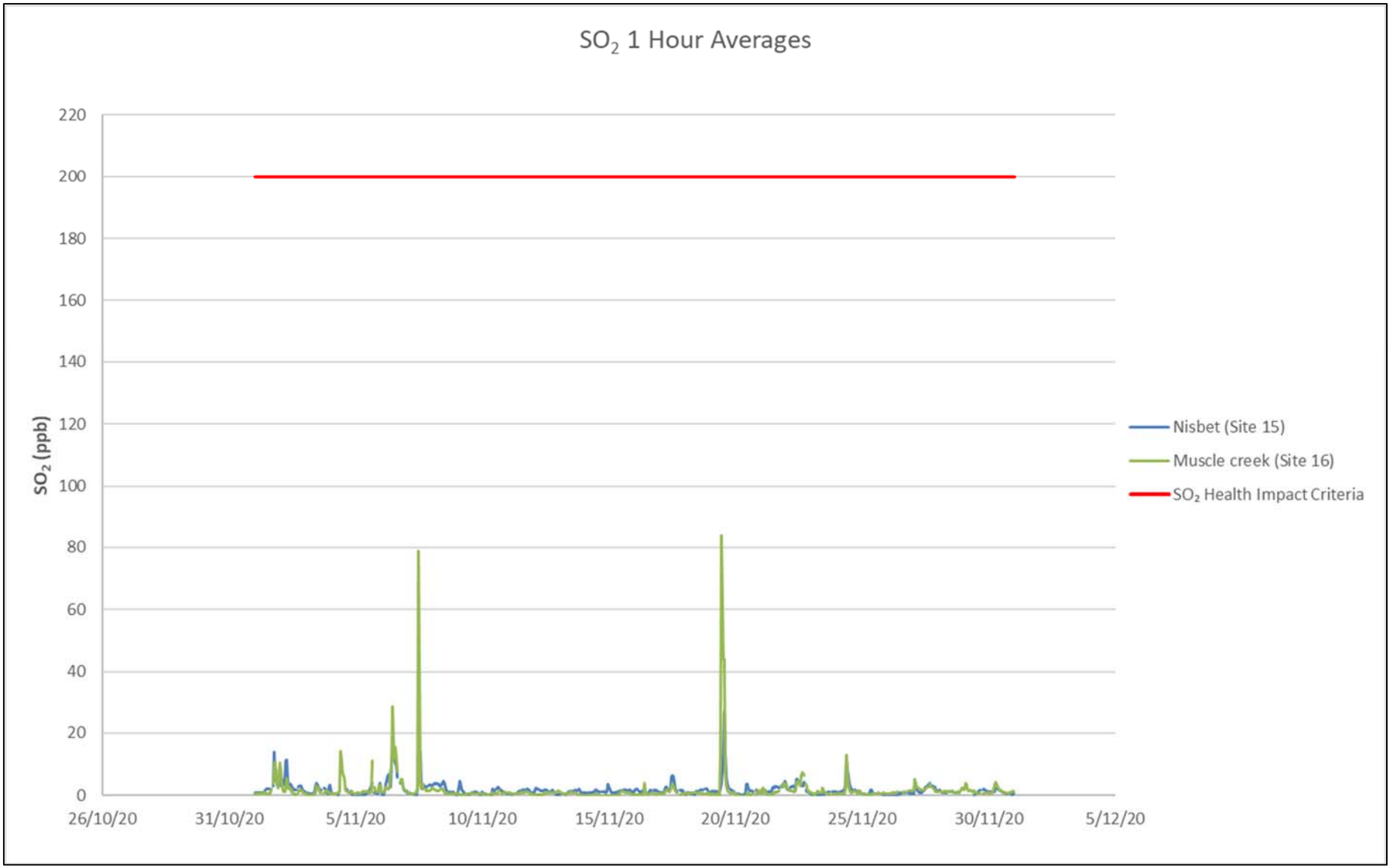

Figure 4: Sulphur Dioxide 1 Hour Results

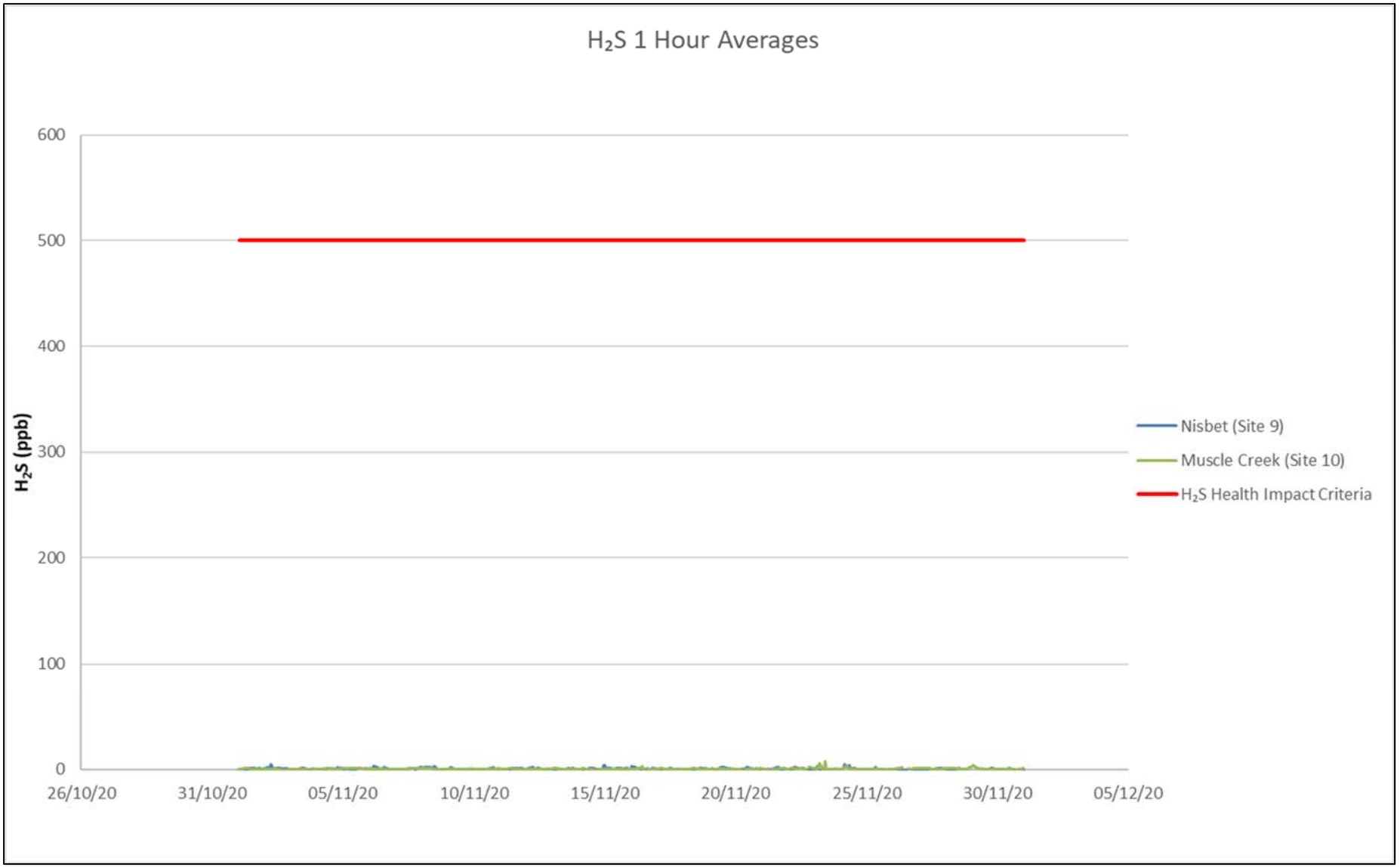

Figure 5: Hydrogen Sulphide 1 Hour Results

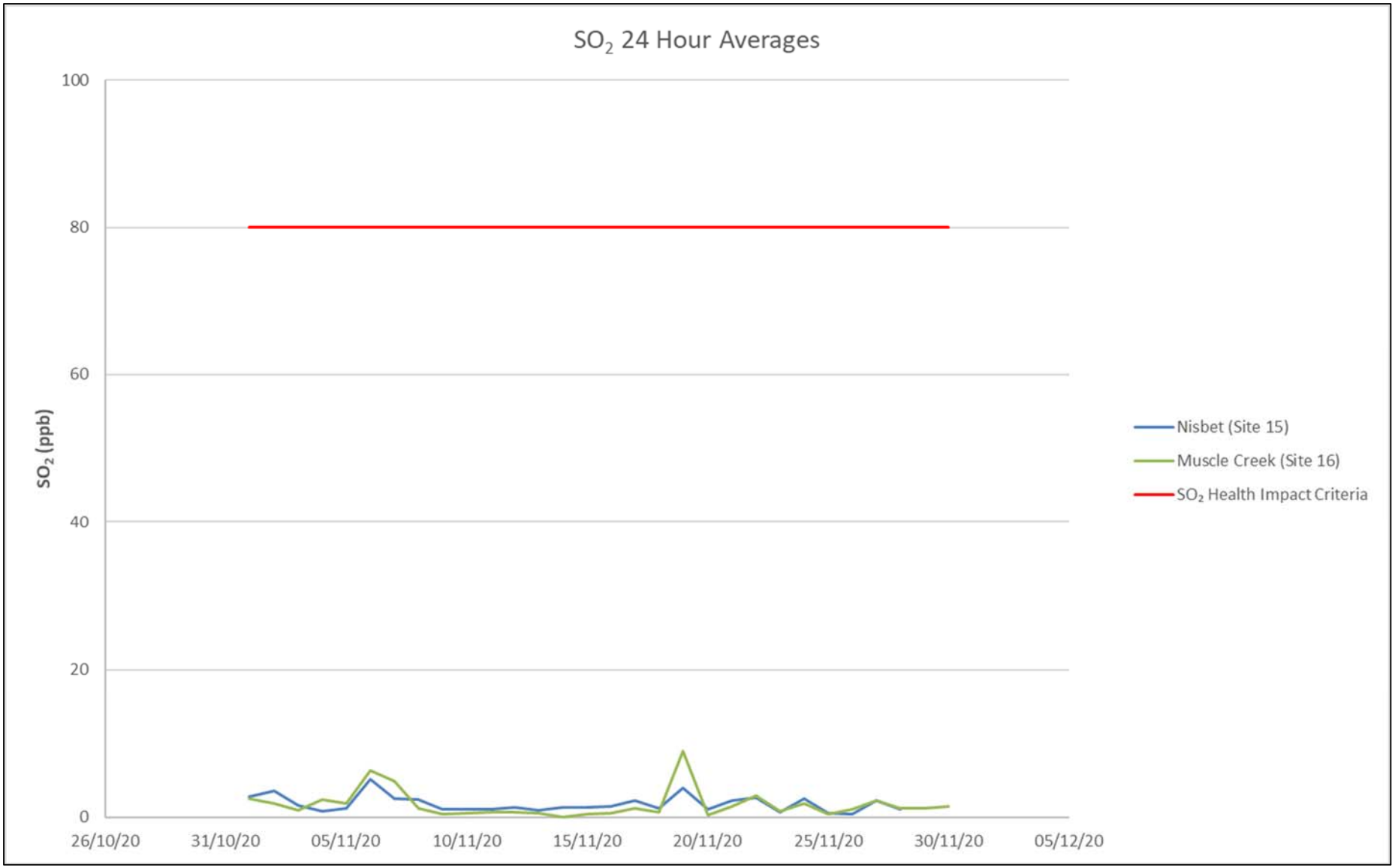

Figure 6: Sulphur Dioxide 24 Hour Results

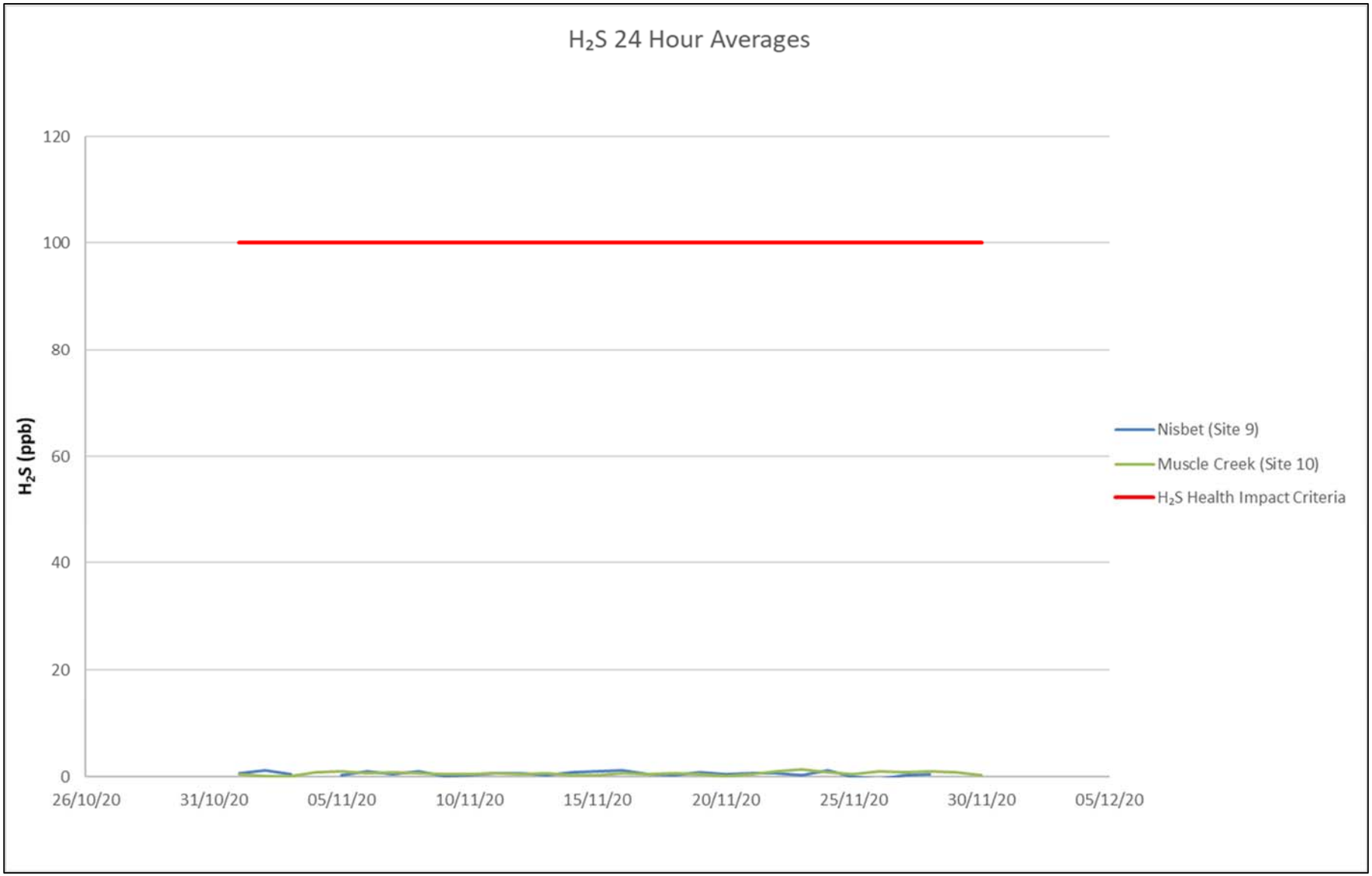

Figure 7: Hydrogen Sulphide 24 Hour Results

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
23/11/2020 3:58am and 8:28am	Muscle Creek	At the time of the first alarm, the wind speed was 2.9 m/s from the south. At the time of the second alarm, the wind speed was 2.3 m/s from the north. No rainfall for the day.	Waste was being mined in Open Cut 1 and dumped into Open Cut 2. Two water carts were cooling spontaneous combustion areas in Open Cut 1, water infusion sprays were working in Strip 23 and hot material in Strip 22 was being capped with clay and inert material.	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 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 was one complaint received during the reporting period which related to odour impacts from spontaneous combustion. This was received on 11 November 2020, at 7:58am from a resident in Muscle Creek, 7 km east of the mine. A northerly wind was blowing at 1.7 m/s at the time of the complaint. An odour observation was conducted after the complaint was received and no spontaneous combustion odours were detected at the nearest monitoring location.

A review of the gas data for the complaint received on 11 November 2020 shows that the 30 minute and 1-hour gas levels were <0.6 ppb for sulphur dioxide and <1.3 ppb for hydrogen sulphide at both monitoring locations at the time of the complaint.