



Muswellbrook Coal

MP 36 Spontaneous Combustion Management Plan

Prepared by	Environmental Superintendent	Signature	GC399D3BE6A94E0D49D0EA10F39F0930 recityalga	Date:	28/07/2025
Reviewed by	Maintenance Superintendent	Signature	Saniel Beaven ODA2861AC4658951AE51E788091F66F9 (1903/ysligh	Date	28/07/2025
Reviewed by	Rehabilitation Operations Manager	Signature	Rod Lallagher 3D497CC7CCGBEF3C7B30470E0B00083C resolvation	Date:	28/07/2025
Reviewed by	Suitably Qualified Expert	Signature	Endorsement in Appendix 1	Date:	17/04/24
Approved by	Head of Muswellbrook Site	Signature	Brett O'Kane E4A74600EDF8CD4C6A7180407A7BBC90 (e-adysign	Date:	28/07/2025



TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	SCOPE	1
1.2	OBJECTIVES	1
2.0	LEGISLATION AND STATUTORY REQUIREMENTS	2
3.0	REFERENCES	4
4.0	DEFINITIONS/ACRONYMS	4
5.0	SUPPORTING DOCUMENTS	4
6.0	INFORMATION AND TRAINING	4
7.0	SPONTANEOUS COMBUSTION EMISSIONS STUDY	4
8.0	SPONTANEOUS COMBUSTION PROPENSITY OF MATERIAL	6
9.0	MANAGEMENT MEASURES	7
9.1	OPEN CUT 1	7
	.1.1 Preventative Measures	
9	.1.2 Control Measures	7
	.1.3 Trigger Action Response Plan (TARP)	
	OPEN CUT 2	
9.3		
	COMPLAINT MANAGEMENT	
	INCIDENT MANAGEMENT	
	EXTERNAL REPORTING	
12.	1 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT	9
	2 SPONTANEOUS COMBUSTION REPORTS	
13.0	REVIEW OF THE SCMP	9
14.0	ACCOUNTABILITIES	9
15.0	LIST OF APPENDICIES	10
16.0	REVISION DETAILS	10
	LIST OF TABLES	
	1: Statutory Requirements	
	2: Spontaneous Combustion Propensity of Material	
	3: Trigger Action Response Plan for Emplacement Areas	
Table	4: Organisational Responsibilities	9

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	i
Superintendent	,	Αμιιι 2024	Αμιίί 2021	July 2023	Į.



1.0 INTRODUCTION

Muswellbrook Coal Company (MCC) is a wholly owned subsidiary of the Idemitsu Kosan Company Ltd. Group. MCC has a long association with coal mining at Muswellbrook, with underground coal mining commencing in 1907 and open cut operations in 1944. The site is located on Muscle Creek Road, approximately 3 kilometres to the north-east of Muswellbrook.

On September 1, 2003, Development Consent for DA 205/2002 was granted by Muswellbrook Shire Council (MSC) to extend the former MCC No.1 Open Cut. The No.1 Open Cut Extension commenced operations in March 2005 and has a capacity to produce up to 2,000,000 tonnes coal per annum. This approval has subsequently been modified on several occasions with the latest modification granted in 2016 to allow mining in an area known as the "Continuation Project" and to extend the life of the mining operations to 2022. Rehabilitation activities will continue past this date. A modification to the approval was granted on 20 December 2022 to allow the storage, handling and transport of coal to continue until the end of March 2023. An additional modification to the consent was granted on 27 February 2024 to align rehabilitation requirements with updated mining lease conditions and other administrative changes.

Mining ceased at MCC in November 2022 with the last coal hauled from site in March 2023. Rehabilitation of the site and completion of mine closure activities are ongoing.

1.1 SCOPE

The Development Consent requires the preparation, approval and implementation of an Environmental Management Strategy (EMS) and subordinate Environmental Management Plans (EMP). One of these EMPs is the Spontaneous Combustion Management Plan (SCMP). Whilst this plan specifically addresses issues related to the management of spontaneous combustion, it should be read in conjunction with other EMP's.

This SCMP has been prepared by MCC and reviewed by a suitably qualified expert to the satisfaction of MSC (see **Appendix 1** for copies of correspondence).

1.2 OBJECTIVES

The main objective of the SCMP is to minimise the occurrence and manage the effect from spontaneous combustion in:

- Open Cut 1,
- Open Cut 2, and
- Elsewhere with the disturbance area.

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	1
Superintendent	/	April 2024	April 2021	July 2023	'



2.0 LEGISLATION AND STATUTORY REQUIREMENTS

The relevant approval and licence conditions are shown in **Table 1** along with information on where they are addressed in this plan.

Table 1: Statutory Requirements

Approval/ Licence Condition No.	Condition	Section
	Development Consent	
31	The applicant must prepare a detailed Spontaneous Combustion Management Plan to the satisfaction of Council, and carry out the development in accordance with this plan. The plan must:	This plan
31(a)	Be prepared or reviewed by a suitably qualified expert/s;	Appendix 1
31(b)	Describe what measures are to be undertaken to minimise the occurrence of spontaneous combustion. Should spontaneous combustion occur, describe what methods would be employed to extinguish, or reduce the size and duration of the outbreak. This is to include details of the times, areas, locations etc. that will trigger actions, and criteria provided to indicate success or further works being required. The plan must break these activities up to be specific to the following areas: i. Pit 1; ii. Pit 2; and iii. Elsewhere with the disturbance area.	9.0
31(c)	Defines what constitutes a spontaneous combustion incident, and includes a protocol for notifying Council and other relevant stakeholders of spontaneous combustion incidents.	11.0
31(d)	Defines what will trigger a review of the Spontaneous Combustion Management Plan. This is to include a Trigger Action Response Plan resulting from a spontaneous combustion incident that has as one of its outcomes a review of this Management Plan.	13.0
	Environmental Protection Licence	
R4.4	The licensee must prepare and submit quarterly spontaneous combustion management reports to EPA. A copy of each quarterly report must be forwarded to the regional office of EPA no later than two (2) months after the quarterly period being reported. The quarterly report must include but not be limited to the following: a) A monthly summary of actions and procedures undertaken to prevent or control spontaneous combustion at the site	12.2

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental Superintendent	7	April 2024	April 2027	July 2025	2



Spontaneous Combustion Management Plan

MP 36

Approval/ Licence Condition No.	Condition	Section
	 b) An assessment of the effectiveness of the actions and procedures undertaken c) Spontaneous combustion areas capped in square meters d) Spontaneous combustion areas mined out in square meters e) Areas under water infusion f) Map of the approximate location of the areas subject to spontaneous combustion, areas capped, areas mined out and areas under water infusion. g) Number of complaints received in relation to spontaneous combustion. 	

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental Superintendent	7	April 2024	April 2027	July 2025	3



3.0 REFERENCES

- Environmental Planning and Assessment Act 1979.
- Protection of Environment Operations Act 1997.
- Development Consent DA 205/2002.
- Environmental Protection Licence 656.
- Continuation Project Statement of Environmental Effects (EMM) 2016.

4.0 DEFINITIONS/ACRONYMS

DA	Development Application
DA	Development Application

EPA Environmental Protection Authority
EPL Environmental Protection Licence
MCC Muswellbrook Coal Company Ltd
MSC Muswellbrook Shire Council

NSW New South Wales

5.0 SUPPORTING DOCUMENTS

- Development Consent DA 205/2002.
- MP 30 Environmental Management Strategy.
- MP 11 Emergency Management Plan.
- MP 20 Spontaneous Combustion Principal Hazard Management Plan.
- MOP 15-01 Complaint Handling Procedure.
- F1553 Community Complaint Record Form.

6.0 INFORMATION AND TRAINING

All workers required to work at the site must undertake the relevant site Induction. This includes information on spontaneous combustion management at the site. Training records will be maintained for each worker at the site.

The requirements of MOP 15-01 Complaint Handling Procedure will be communicated to workers involved in responding to complaints.

7.0 SPONTANEOUS COMBUSTION EMISSIONS STUDY

MCC has undertaken a spontaneous combustion emissions study in accordance with the requirements set by the EPA. This study involved undertaking 12 months of continuous monitoring between February 2018 and February 2019 to determine if emissions from the spontaneous combustion of coal were causing exceedances of relevant air quality criteria.

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	4
Superintendent	/	April 2024	April 2027	July 2025	4



MP 36

All monitoring data was reviewed by an air quality expert and the following main conclusions were made:

- There were eight (8) unique days in the 12-month period when monitored H₂S concentrations exceeded the odour detection threshold at the installed monitoring locations. It was noted that some individuals may be able to detect H₂S at lower levels than the referenced odour detection threshold. The data showed that H₂S concentrations were generally highest in spring and autumn, depending on the location, and almost always highest in the morning, coinciding with stable atmospheric conditions.
- Most (58%) of the odour complaints in the 12-month period related to reported incidents in the morning. The H2S monitoring data also showed that concentrations were typically highest in the morning.
- H₂S concentrations did not exceed health-based criteria at any time during the 12-month period, indicating that the measured levels would not have caused adverse health effects.
- Measured 24-hour average PM10 concentrations exceeded the EPA's 24-hour average assessment criteria on six (6) days in the 12-month period. Two of the six "exceedance" days were potentially due to activities or emissions at Muswellbrook Coal Mine. The remaining four "exceedance" days were due to regional events or other, non-mine related, factors. Annual average PM10 concentrations did not exceed the EPA's criteria or National standards.
- SO₂ concentrations did not exceed the EPA criteria or National standards.

In addition to analysis, the air quality expert used the monitoring data to derive an estimate of spontaneous combustion emissions (as H₂S) for input to a site-specific odour dispersion model. The odour dispersion model was based on one year of representative meteorological data and was prepared using the procedures outlined in the EPA's "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (EPA 2016). The modelling was based on emissions that were conservatively high however the process did highlight that:

- Emissions from spontaneous combustion are extremely difficult to measure and predict due to the sporadic nature, distribution and intensity of coal fires.
- Areas to the east-northeast of Muswellbrook Coal Mine may experience higher effects of spontaneous combustion emissions (as H₂S) than other locations, because of the elevated terrain. In addition, H₂S from Muswellbrook Coal Mine may be detectable in most areas of the model domain from time-to-time, depending on the location and sensitivity of the individual.

The outcomes of the monitoring and modelling also led to the following recommendations:

- Continued monitoring of H₂S (nominally until 12 months after mining ceases) to assist with the verification of community concern since the complaints data, monitoring data and modelling results indicated that off-site odour (as H₂S) is detectable from time-to-time. The availability of longer-term monitoring data may also assist with examining the effectiveness of management controls in terms of off-site odour (as H₂S). Any changes to the monitoring arrangements would need to be with the agreement of the EPA, and consistent with the Consent.
 - MCC continues to monitor H₂S and SO₂ in the local community in accordance with the requirements of the Air Quality Management Plan (AQMP). Any changes to this monitoring will be approved by the EPA and Council.
- Development of a procedure for identifying whether MCC may have contributed to

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	A north 2004	April 2027	July 2025	Е
Superintendent	/	April 2024	April 2027	July 2025	5





MP 36

monitored H_2S concentrations on a day of interest (for example, a day of elevated H_2S).

- MCC has developed a procedure to identify whether MCC may have contributed to monitored H₂S concentrations on a day of interest.
- Incorporation of the findings from this study into the Air Quality Management Plan (AQMP) and Spontaneous Combustion Management Plan (SCMP) during the next periodic review of these documents.
 - The findings of the study have been incorporated into the reviews of the AQMP and SCMP in 2020.

8.0 SPONTANEOUS COMBUSTION PROPENSITY OF MATERIAL

The spontaneous combustion propensity of the material handled at MCC is shown in **Table 2**.

Table 2: Spontaneous Combustion Propensity of Material

rane in openiance of material repending or material					
Material Type	Propensity to Spontaneously Combust				
Interburden					
Fleming	Low				
Hallet	Medium				
Muswellbrook/St Heliers	Medium				
Upper Lewis/W01	Medium				
Lower Lewis	Medium				
Loder	Medium				
Co	oal				
Fleming	High				
Hallet	High				
Muswellbrook/St Heliers	High				
Upper Lewis/W01	Medium				
Lower Lewis	Medium				
Loder	Low				

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	Amril 2024	Amril 2027	July 2025	6
Superintendent	/	April 2024	April 2027	July 2025	0



9.0 MANAGEMENT MEASURES

9.1 **OPEN CUT 1**

9.1.1 Preventative Measures

The following preventative measures are used at MCC for managing spontaneous combustion in Open Cut 1.

- High and medium risk interburden material to be limited to a maximum lift of 10m and will be placed in lower areas of the dump,
- High and medium risk material will be placed in lower portions of the spoil emplacement areas for deep burial (encapsulation),
- Overburden material will be placed as per the mine design,
- Daily inspections and monitoring, and
- Maintain dozer access on each high and medium risk dump lift to access dump lifts in case of heating.

9.1.2 Control Measures

The following control measures are used at MCC for managing spontaneous combustion in Open Cut 1.

- Covering the outside edge of high and medium risk interburden with low risk material,
- Utilising water cart to target hot areas, and
- Track roll and compact hot material with a dozer. Use a water cart to wet and cool material.

9.1.3 Trigger Action Response Plan (TARP)

The TARP for spontaneous combustion outbreaks for emplacement areas in Open Cut 1 are shown in **Table 3**.

Table 3: Trigger Action Response Plan for Emplacement Areas

Type of Activity	Trigger	Control Action	Response Timeframe	Responsibility
Normal activities	No heating	Inspection and monitoring	Daily	Thiess Rehabilitation
Normal activities	Visual signs of heating in accessible dumps	 Cover with low-risk material Dozer/bench push hot material Target with the water cart to wet and compact the area 	Complete within 2 business days unless circumstances beyond MCC's control (e.g. rain) prevent access	Thiess Rehabilitation

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	Amril 2024	Amril 2027	July 2025	7
Superintendent	/	April 2024	April 2027	July 2025	/



Type of Activity	Trigger	Control Action	Response Timeframe	Responsibility
Special Outbreak	Visual signs of heating in non-accessible dumps	Develop a specific plan to manage the issue	Within 5 business days of noticing the outbreak	Thiess Rehabilitation

9.2 OPEN CUT 2

The preventative and control measures for Open Cut 2 are the same for in Open Cut 1 shown in **Section 9.1**.

9.3 ELSEWHERE WITHIN THE MINE DISTURBANCE AREA

If an unexpected outbreak of spontaneous combustion occurs in any other area within the mine disturbance area a specific action plan will be developed to manage the outbreak. This plan will be developed within 5 business days of the outbreak being detected.

A thermal image of the site is captured each year in Winter. This image assists with identifying any potential spontaneous combustion outbreaks in the non-active mining areas.

10.0 COMPLAINT MANAGEMENT

Spontaneous combustion related complaints by the community can be directed to the 24-hour toll-free telephone Environmental Contact Line 1800 600 205. Complaints shall be recorded and responded to in accordance with the Environmental Management Strategy.

11.0 INCIDENT MANAGEMENT

A spontaneous combustion incident at MCC is defined as an uncontrolled event that is not managed by the TARP process.

In the event that an initial investigation concludes that a spontaneous combustion related incident has occurred the incident will be reported to MSC and the EPA within 24 hours of confirming the incident.

Within seven days of confirming the incident, MCC will submit a written report to MSC and the EPA that:

- a) Describes the date, time, and nature of the incident,
- b) Identifies the cause (or likely cause) of the incident,
- c) Describes what action has been taken to date, and
- d) Describes the proposed measures to address the incident.

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	
Superintendent	/	April 2024	April 2027	July 2025	8



12.0 EXTERNAL REPORTING

Within 2 weeks of approval of this SCMP, a copy will be made available for public viewing via the MCC website.

The performance of MCC's SCMP will be reported through a number of external reporting requirements, which include;

- Annual Environmental Management Report (AEMR);
- Annual Rehabilitation Report (report on management of any spontaneous combustion outbreaks in rehabilitated areas);
- Annual Community Newsletter; and
- Spontaneous Combustion Reports.

12.1 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

The AEMR will include a summary of:

- Summary of spontaneous combustion related complaints;
- Measures undertaken during the period to manage spontaneous combustion; and
- Review of the performance of management measures.

12.2 SPONTANEOUS COMBUSTION REPORTS

Regular reporting will be provided to the EPA as required by the Muswellbrook Coal Environment Protection Licence (No. 656).

13.0 REVIEW OF THE SCMP

The SCMP will be reviewed:

- Within 6 months of changes to Development Consent or licence conditions relating to spontaneous combustion management,
- Following reportable incidents at MCC relating to spontaneous combustion management,
- Following an independent environmental audit which recommends changes to the SCMP, and
- At the completion of rehabilitation activities.

14.0 ACCOUNTABILITIES

Table 4 outlines the responsibilities relating to the SCMP.

Table 4: Organisational Responsibilities

Role	Accountability	
Head of Muswellbrook Site	Provide adequate resources to implement the requirements of the SCMP	
	Oversee the implementation of the SCMP	

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	0
Superintendent	/	April 2024	April 2027	July 2025	9



Role	Accountability
Thiess Rehabilitation	Undertake inspections of the operational areas for signs of spontaneous combustion
	Implement spontaneous combustion control measures as outlined in SCMP
	Coordinate response to all spontaneous combustion related complaints
Environmental Superintendent	 Coordinate reviews of the SCMP Coordinate reporting as required in SCMP

15.0 LIST OF APPENDICIES

Appendix 1: Correspondence Regarding Spontaneous Combustion Management Plan

16.0 REVISION DETAILS

Revision No.	Date	Reviewed By	Details/Reason for Revision
1	February 2005	MCC Technical Services Department, Carbon Based Environmental	Original Management Plan
2	December 2010	MCC Technical Services Department, Carbon Based Environmental	5 Yearly Review
3	December 2015	MCC Environmental, Technical Services and Production Departments	5 Yearly Review
4	June 2017	MCC Environmental, Technical Services and Production Departments Peer review by approved Technical Expert	Update following modification for Continuation Project
5	October 2020	MCC Environmental Department	3 Yearly Review
6	April 2023	Environmental, Production, Administration and Maintenance Departments	End of mining operations (not approved by Council due to consent modification process and additional updates required)
7	April 2024	Environmental, Production, Administration and Maintenance Departments Peer review by suitably qualified expert	Consent modification 9

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	10
Superintendent	/	April 2024	April 2027	July 2025	10



Appendix 1: Correspondence Regarding Spontaneous Combustion Management Plan



Mining Operation Services Pty Ltd

PO Box 3102 DC Singleton NSW 2330 Mobile: +61 418 688 194 ian.pankhurst@miningop.com.au

17 April 2024

Julie Thomas Environmental Superintendent Muswellbrook Coal Company PO Box 123 MUSWELLBROOK 2333

Dear Julie

RE: REVIEW OF MUSWELLBROOK COAL COMPANY SPONTANEOUS COMBUSTION MANAGEMENT PLAN

I have reviewed the final draft version of the Muswellbrook Coal Company Spontaneous Combustion Management Plan MP 36 received on Tuesday 16 April 2024.

I endorse the Spontaneous Combustion Management Plan as being adequate for its purpose, including use as a basis for internal spontaneous combustion action plans.

Yours Faithfully

Ian Pankhurst Director Mining Operation Services

Document Owner	Version No.	Approved	Next Review	Approved Date	Page
Environmental	7	April 2024	April 2027	July 2025	11
Superintendent	/	April 2024	April 2027	July 2025	''



Spontaneous Combustion Management Plan

MP 36



Enquiries

 Please ask for Direct
 Tracy Ward

 02 6549 3700

 Our reference
 CM 25/39495

22 July 2025

Julie Thomas Environmental Superintendent Muswellbrook Coal

Dear Ms Thomas,

Muswellbrook Coal Spontaneous Combustion Management Plan (MP36 v7) – Approval Letter

Reference is made to the 'Muswellbrook Coal Spontaneous Combustion Management Plan v7'.

Staff have carefully reviewed this document and are satisfied with all aspects proposed.

Accordingly, Council Staff approve the 'Muswellbrook Coal Spontaneous Combustion Management Plan v7'.

Please ensure that the approved plan is placed on the project website at the earliest convenience

Should you need to discuss the above, please contact Tracy Ward (Sustainability Officer) on 02 6549 3700 or email council@muswellbrook.nsw.gov.au.

Yours faithfully

Theresa Folpp

Environmental Planning Officer

J. Furpp

Muswellbrook Shire Council	% (02) 6549 3700	@ council@muswellbrook.nsw.gov.au
🖺 Campbell's Corner 60-82 Bridge	Street Muswellbrook NSW 2333	PO Box 122 Muswellbrook 2333
muswellbrook.nsw.gov.au	🚹 🚺 🖿 muswellbrook shire council	ABN 86 864 180 944
•		Page 1 of 1