MUSWELLBROOK COAL COMPANY

2023
ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

Name of Leaseholder:	**Muswellbrook Coal Company Limited**
Name of Mine:	**Muswellbrook Coal**
Titles/Mining Leases:	**Consolidated Coal Lease 713** **Mining Lease 1304** **Mining Lease 1562**
AEMR Commencement Date: AEMR End Date:	**1 January 2023** **31 December 2023**
Reporting Officer:	**Julie Thomas**
Title:	**Environmental Superintendent**
Signature:	
Date:	**21 February 2024**

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1.0 INTRODUCTION

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

On 1 September 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 2022. Rehabilitation activities will continue past this date.

The current mine life at MCC is zero years. Mining operations ceased in 2022, with coal storage, handling and transport continuing until the end of March 2023. Rehabilitation of the mine was ongoing during 2023.

1.1 STRUCTURE OF THIS REPORT

The structure of this report incorporates the reporting requirements stipulated in the MCC Development Consent, specifically Condition 42. This report also incorporates the reporting requirements in MCC's water licences.

This Annual Environmental Management Report (AEMR) provides a summary of activities, environmental management and performance at MCC from 1 January 2023 to 31 December 2023 (herein referred to as the 'reporting period').

In accordance with the Development Consent, copies of this AEMR will be made available to:

- Muswellbrook Shire Council (MSC),
- Resources Regulator (RR),
- DPE – Office of Environment and Heritage,
- DPE – Water,
- Environment Protection Authority (EPA), and
- MCC Community Consultative Committee (CCC).

A copy of the report is also available on MCC's website:
https://www.idemitsu.com.au/operations/muswellbrook-coal/approvals-plans-reports/

1.2 CONSENTS, LEASES AND LICENCES

MCC operates under a number of development consents issued by Muswellbrook Shire Council (MSC). The primary consent is DA 205/2002, which was approved by MSC in 2003 for the operation of the Open Cut 1 extension. This DA has been modified on several occasions with the most recent modification being in 2022. Other active consents are ID712 – Operation of Washery and DA 18-88 – Coal Haulage. Both of these consents are issued by MSC.

Mining activities at MCC are carried out wholly within Consolidated Coal Lease 713, Mining Lease 1562 and Mining Lease 1304. As mining has now ceased the application for an Ancillary Mining Activity that has been reported previously is no longer required and the application has been revoked.

In addition to the above approvals MCC operates under the following licences:

- Environmental Protection Licence (EPL) 656 issued under the Protection of the Environment Operations Act 1997.
- Water Licences WAL39806, WAL41503, and WAL41521, issued under the Water Management Act 2000.

An application was submitted to MSC in April 2022 to vary the development consent to tidy up conditions relating to rehabilitation management. During the reporting period a modification to this application was submitted to MSC to allow the removal of the Muswellbrook Bypass area from MCC's consent. Approval of this modification was still pending at the end of the reporting period. It is expected to be approved during the next reporting period.

During the reporting period a variation to the Environmental Protection Licence (EPL) was approved by the EPA. This variation was to change the scheduled activities on site following the end of mining activities. No other changes were made to the EPL as part of this variation.

Applications were made to MSC during the reporting period to relinquish development consents DA18-88 (Coal Haul Road and Haulage of Coal) and ID721 (Operation of Washery). These consents are no longer required as coal haulage and washery activities are no longer occurring on site. Approval of these relinquishments was pending at the end of the reporting period.

Relevant consents, authorisations and licences are summarised in **Table 1**.

Table 1: Consents, Authorisations and Licences

Approval	Description	Consent Authority	Date Granted	Expiry/ Renewal Date
DA 205/2002 (MSC)	Approval for Extension of MCC Open Cut 1	Muswellbrook Shire Council	1 Sep 2003	Mining to 31 Dec 2022 and storage, handling and transport to end of March 2023 No end date to approval
DA 205/2002 (MSC) – Amendment to Condition 1.1	Power line relocation and additions to Workshop	Muswellbrook Shire Council	19 Dec 2005	
DA 205/2002 (MSC) Amendment to 1.1 and 11.3	Relocate office buildings, workshop and bathhouse	Muswellbrook Shire Council	13 July 2009	
DA 205/2002 (MSC) Amendment to 11.1	Extension of mining into Area C	Muswellbrook Shire Council	23 Dec 2010	
DA 205/2002 (MSC) Amendment to 1.1(a), 31, 33, 39, 45 and 58.	Revision to Mining Infrastructure Building Requirements and Rehabilitation Plan Revision to permit the continuation of mining operations for an additional 5 years.	Muswellbrook Shire Council	29 Oct 2013	

Approval	Description	Consent Authority	Date Granted	Expiry/ Renewal Date
DA 205/2002 (MSC) Amendment to 1.1, 1.2 & 6.3.2 and additional conditions 59 & 60.	Modification to Permit the Continuation of Mining Operations at Muswellbrook Coal Mine for an Additional Five (5) Years- Multiple Allotments- Coal Road Muswellbrook.	Muswellbrook Shire Council	12 Dec 2013	
DA 205/2002 (MSC) General revision of consent conditions	Modification to allow mining operations to mine additional areas and to extend the mine life to 2022.	Muswellbrook Shire Council	26 Oct 2016	
DA 205/2002 Conditions 2, 4 and 8 and Appendix A	Modification to allow the storage, handling and transportation of coal until the end of March 2023	Muswellbrook Shire Council	20 Dec 2022	
Consolidated Coal Lease 713	Mining Lease	NSW Resources Regulator	5 May 1990	24 Nov 2024
Mining Lease 1304	Mining Lease	NSW Resources Regulator	12 Jan 1993	24 Nov 2024
Mining Lease 1562	Mining Lease	NSW Resources Regulator	16 Feb 2005	16 Feb 2026
Environmental Protection Licence 656	Environmental Licence	Environmental Protection Authority	6 Dec 2000	Not applicable
WAL39806	Water Licence	WaterNSW	3 Nov 2016	Not applicable
WAL41503	Water Licence	WaterNSW	25 Oct 2017	Not applicable
WAL41521	Water Licence	WaterNSW	4 Nov 2019	Not applicable

1.3 MINE CONTACTS

The names and contacts of site personnel responsible for mining, rehabilitation and environmental management, planning and support functions are shown in **Table 2**.

Table 2: Mine Contacts

Name	Position	Contact Number
Brett O'Kane	Head of Muswellbrook Site	(02) 6542 2300
Julie Thomas	Environmental Superintendent	(02) 6542 2300
Rod Gallagher	Rehabilitation Operations Manager Mining Engineering Manager	(02) 6542 2300

1.4 EMPLOYEE LEVELS

The number of employees and full-time equivalent contractors at MCC for this reporting period is shown in **Table 3**, along with a comparison to the numbers from previous reporting periods.

Table 3: Employee Levels

Year	Employees	Full-Time Equivalent Contractors
2023	6	57
2022	8	32
2021	55	71
2020	62	82
2019	65	93
2018	67	77

1.5 ACTIONS REQUIRED FROM PREVIOUS AEMR REVIEW

Neither the RR or MSC conducted an AEMR inspection or provided feedback on the AEMR, so there are no actions arising from the previous AEMR.

1.6 COMPLIANCE STATUS

1.6.1 REPORTABLE INCIDENTS

During the reporting period, there were no reportable environmental incidents at MCC.

1.6.2 COMPLIANCE REVIEW

In accordance with the requirements of Condition 42 (a) of the development consent, a detailed compliance review of the performance of the project against conditions of this consent and statutory approvals was undertaken at the end of the reporting period. MCC were compliant with the conditions of consent and statutory approvals during the reporting period.

1.6.3 REGULATOR SITE INSPECTIONS

On 22 March 2022, the Regulator's Mining Act Inspectorate conducted a planned inspection of areas of erosion that had been identified in a previous inspection (conducted with Muswellbrook Shire Council on 21/04/21) and during an Independent Environmental Audit (IEA), (field component conducted on 15/11/21). This planned inspection was undertaken to follow up on erosion repair works and issues raised by the independent environmental audit in relation to the rehabilitation on site.

During the inspection, the Regulator raised concerns about ongoing erosion at MCC and following this inspection, MCC received a s240 notice (under the *Mining Act 1992)* to engage a suitably qualified expert to undertake an assessment of the long term erosional stability of the approved final landforms as part of the rehabilitation of the mine using an industry accepted Landform Evolution Model appropriate to the risk and scale of the landform of the site to determine the long-term landscape erosion behaviour.

A consultant has been engaged to prepare this model and associated report, and this was completed during the reporting period. The outcomes from this report have been incorporated into relevant site documentation.

2.0 ACTIVITIES DURING THE REPORTING PERIOD

2.1 EXPLORATION

Previous exploration has provided a good understanding of the resources in the area. For this reason, no additional drilling or other exploration activities were done during the reporting period. No further exploration is planned at MCC.

2.2 LAND PREPARATION

No further disturbance of remnant vegetation was undertaken during the reporting period. To allow for the continuation of the rehabilitation, tree clearing on historical rehabilitation was undertaken during the reporting period. Prior to this clearing commencing, a pre-clearance survey was undertaken by an ecologist to identify any habitat features or threatened species that needed additional management. No issues were identified during the pre-clearance survey that required additional management.

2.2.1 TOPSOIL MANAGEMENT

Previously stripped topsoil is stockpiled in locations around the site for use and will be used in future rehabilitation activities. Topsoil stockpiles have been sampled by an agronomist and analysed to determine suitability for use in rehabilitation. The stockpiled topsoil was found to have suitable chemical properties for use. The volume of topsoil remaining is very limited.

2.3 CONSTRUCTION

During the reporting period no construction activities occurred.

2.4 MINING

Coal mining at MCC was completed in November 2022 and coal haulage from site was completed in March 2023. No further coal mining activities are proposed at MCC.

Activities on site during this reporting period have focused on rehabilitation of the site.

The status of the operations at the end of the reporting period is shown in **Figure 1**.

2.5 MINERAL PROCESSING

Coal processing at MCC was finalised during December 2022. Demolition of the CHPP was completed during this reporting period. More details on the demolition of the CHPP can be found in the 2023 Annual Rehabilitation Report and 2024-2026 Forward Program.

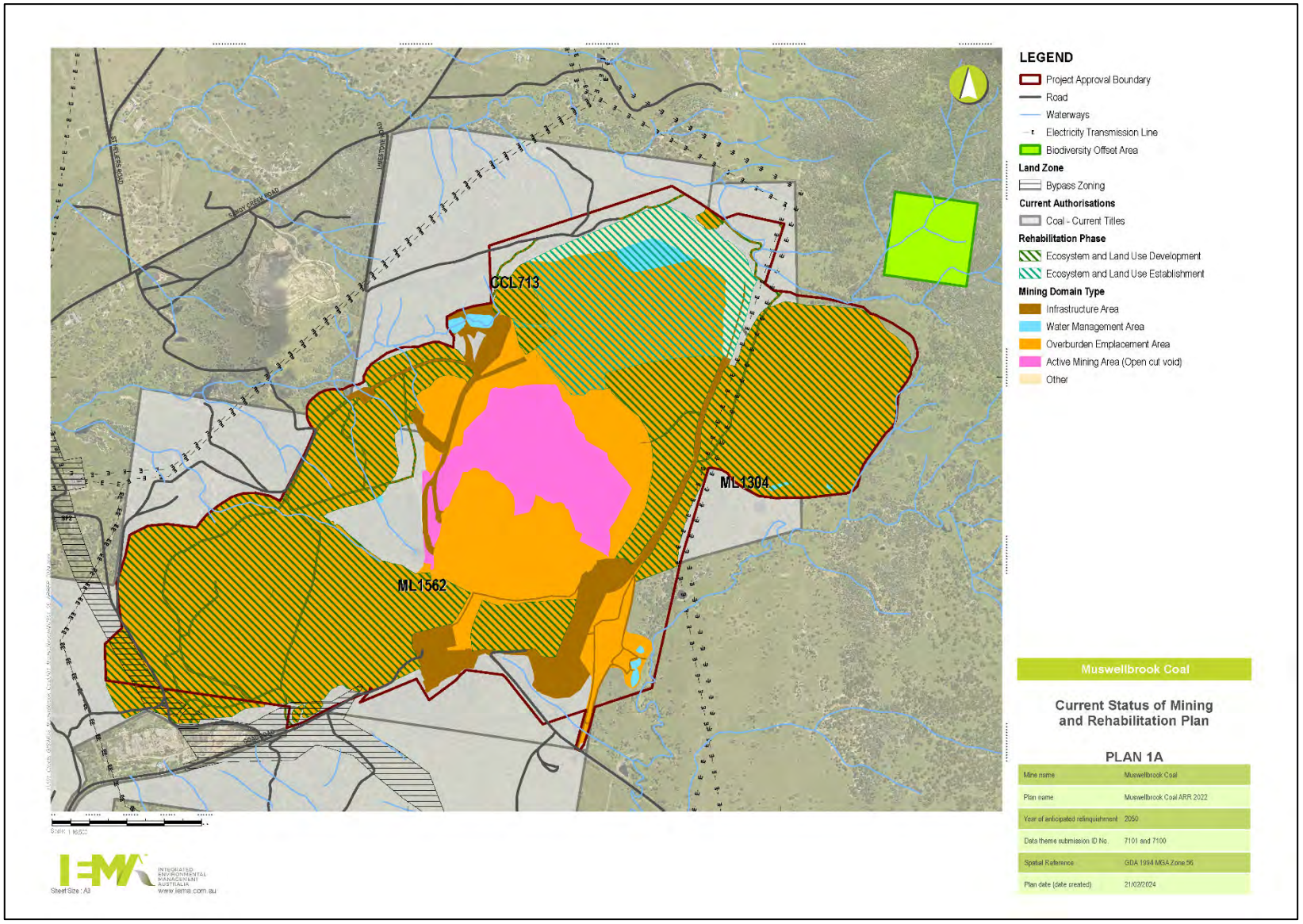

Figure 1: Status of Mining and Rehabilitation at End of Reporting Period

2.6 WASTE MANAGEMENT

During the reporting period MCC continued to maintain a Total Integrated Waste Management Service to manage all waste streams generated on site. This includes general waste, cardboard and paper recycling, timber, waste oil, and steel. MCC continue to separate and recycle waste materials, when possible, to assist in reducing the amount of waste going to the local landfill.

Table 4 shows the amount of waste that was removed from site during the reporting period. There was an increase in the total waste removed from site during this reporting period due the demolition and removal of the infrastructure associated with the CHPP. MCC has maintained a high percentage of waste recycled during the period.

Table 4: Waste Stream Generation

Month	Total Waste Removed (tonnes)	Total Waste to Landfill (tonnes)	Percentage Reused/ Recycled
January	42.58	1.48	96.52
February	666.50	2.07	99.69
March	1,551.44	40.59	97.38
April	1,053.66	17.59	98.33
May	920.14	22.06	97.60
June	343.35	42.41	87.65
July	26.84	0.64	97.62
August	35.35	0.97	97.26
September	32.78	2.38	92.74
October	72.62	0.62	99.15
November	54.49	0.56	98.98
December	59.68	3.35	94.39
Total	**4,859.42**	**134.71**	**97.23**

Figure 2 compares the annual total waste to landfill for this reporting period to previous reporting periods and **Figure 3** compares the percentage of recycled waste during this reporting period to previous reporting periods.

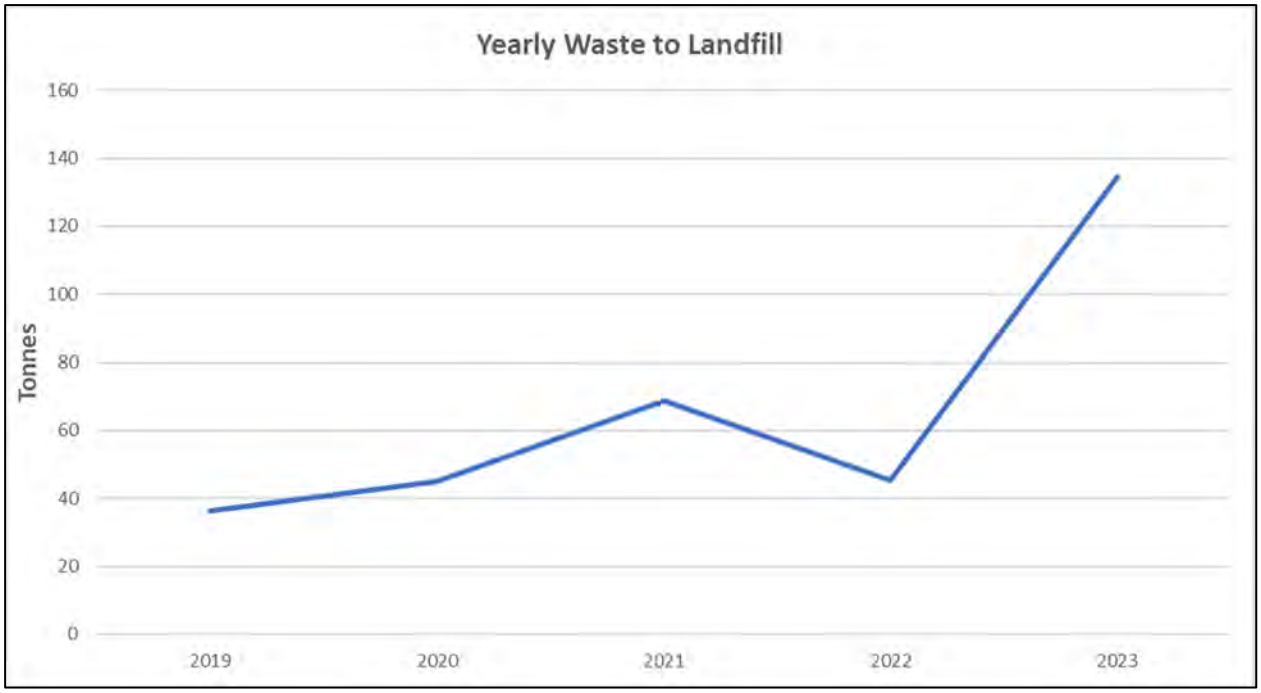

Figure 2: Annual Total Waste to Landfill

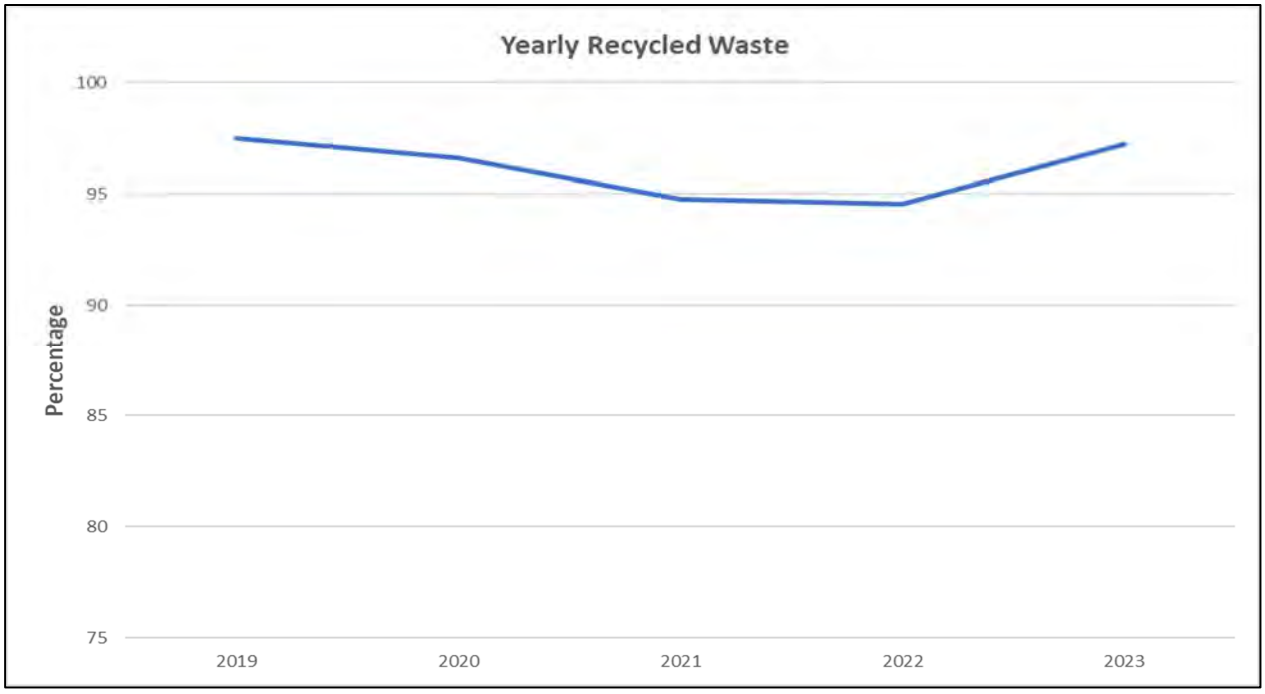

Figure 3: Waste Recycled Yearly

2.7 PRODUCT COAL AND TRANSPORT

Product coal was hauled from the product bin by truck to the stockpiles. Five product stockpiles had a total capacity of 100,000 tonnes. Product coal was trucked off site via Muscle Creek Road and the New England Highway to the Ravensworth Coal Terminal (RCT) for train loading. This coal was then transported to the Port of Newcastle. The last product coal was transported off site in March 2023.

2.8 PRODUCTION SUMMARY

The key production milestones and material production achieved during the reporting period are shown in **Table 5**.

Table 5: Key Production Milestones/Material Production

Material	Unit	This Report
Stripped topsoil	m^3	0.00
Overburden moved for coal production	m^3	0.00
ROM coal extracted	Mt	0.00
Reject material	Mt	0.00
Product	Mt	0.00

2.9 HAZARDOUS MATERIALS MANAGEMENT

2.9.1 FUEL STORAGE

Diesel fuel is stored in three Class C1 above ground, self-bunded tanks, with a capacity of 105,000L each.

2.9.2 EXPLOSIVES

Storage of explosives is in two external magazines and an above ground tank for raw materials with 30,000L capacity. Bulk explosive product can also be stored on the mobile processing unit with a capacity of 8,000L but it is not common practice to do so as this is only used on an as needs basis. Blasting contractors are employed to carry out total loading service on site.

All dangerous goods on the premises are listed under MCC's Notification of Hazardous Chemicals which was last updated 4 August 2021 (HazNot0001071).

2.10 WATER MANAGEMENT

The primary objective of the Water Management Plan (WMP) is to enable the effective management of on-site water to minimise the impact of mining operations on surface and ground water resources, both on and adjacent to the mine site. As mining has now been completed, some of the water management infrastructure is no longer required (e.g., water no longer needs to be supplied for coal processing) or needs to be relocated to allow rehabilitation activities to progress. During the reporting period water management infrastructure was decommissioned and/or relocated to address updated water management requirements.

The objectives of the WMP are to:

- Meet the water supply needs of the project,
- Separate clean water runoff produced by undisturbed catchments from dirty (sediment-laden) and contaminated runoff from disturbed catchments,
- Use appropriate sedimentation controls for dirty water,
- Where possible, recycle and reuse dirty and contaminated mine water for dust suppression and wash down activities,
- Allow clean water to flow through the catchment,
- Where possible, and where mine safety permits, use disused open cuts and underground mines as mine water storages,
- Have nil discharge of saline mine water by containing all saline mine water on site and minimising the risk of accidental off-site discharge,
- Monitor surface and groundwater to determine significant impacts to water quality or beneficial

use and undertaking remedial action where required, and

- Monitoring the surface water and groundwater to demonstrate that mine closure objectives relating to water quality have been met.

2.10.1 WATER STORAGE

Volumes of stored water available at MCC are provided in **Table 6**.

Table 6: Stored Water

VOLUMES (m^3)	START REPORTING PERIOD	END REPORTING PERIOD	STORAGE CAPACITY
DIRTY WATER			
Brickworks Dam 1	9,500	6,100	30,000
Brickworks Dam 2	4,300	4,000	20,000
Dam 3	10,400	10,200	30,000
SALINE OR MINE WATER			
Dam1	22,300	26,000	30,000
Dam 2	14,000	12,000	20,000
Final Settling Pond	6,500	3,500	10,100

2.10.2 GROUNDWATER EXTRACTION

MCC holds three licences to extract ground water. The volumes of groundwater extracted in this reporting period are shown **Table 7**. No new bores were constructed during the reporting period. No changes were made to groundwater extraction entitlements during the reporting period.

Table 7: Groundwater Extraction

Licence No.	Source	Water Sharing Plan	Volume Extracted (ML)	Extraction Entitlement (ML)
WAL39806 (small borehole)	Sydney Basin-North Coast Groundwater Source	North Coast Fractured and Porous Rock Groundwater Sources 2016	226.02	1,000
WAL41503 (large borehole)	Sydney Basin-North Coast Groundwater Source	North Coast Fractured and Porous Rock Groundwater Sources 2016	572.80	2,200
WAL41521 (open cut voids)	Sydney Basin-North Coast Groundwater Source	North Coast Fractured and Porous Rock Groundwater Sources 2016	99.60	1,400

2.10.3 WATER BALANCE

The calculated water balance for the reporting period is provided in **Table 8**. The water balance indicates a water surplus for the year. Extra water has been stored in on-site surface and underground water storages.

The water balance model was last updated in 2015 as part of the DA modification received in 2016. Each year inputs and outputs are measured or estimated based on the water balance developed for the site.

There are no predictions from the 2016 SEE to compare the water balance data to, however the SEE notes that the site generally operated in water deficit up until the 2014 water balance. The water balance is now generally in surplus due to lower volumes of water being used for dust suppression and spontaneous combustion management as the operational areas are condensed into smaller areas. Water is no longer required for coal washing, as this process is no longer occurring on site.

Table 8: Site Water Balance

INPUTS	**ML/year**
Ground Water Seepage	100.0
Surface Water Runoff and Dam Capture	121.0
Entrainment in Coal	0.0
Potable Water	17.2
Underground Workings – Dewatering Bores	898.4
TOTAL	**1,136.6**
OUTPUTS	**ML/year**
Entrainment in Coal	0.0
Discharge Off Site	0.0
Spontaneous Combustion Management – water infusion and sprays	342.8
Dust Suppression – water carts	45.7
Evaporation from Dams	113.3
Septic Pump Out	0.4
TOTAL	**502.2**
Balance	**634.4**

2.11 OTHER INFRASTRUCTURE MANAGEMENT

MCC maintains Muscle Creek Road as per the requirements of the Development Consent and in accordance with a Routine Maintenance Annual Plan (RMAP), which has been approved by MSC. During the reporting period, MCC commissioned a Commission Assessment Report of Muscle Creek Road. This report identifies the final maintenance work required before the maintenance of this road is handed back to MSC. The report has been submitted to MSC for their review and acceptance. At the end of the reporting period, MCC were still waiting on feedback from MSC on this report.

3.0 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 ENVIRONMENTAL MANAGEMENT

To measure compliance with the management plans, the development consent and various licences, MCC undertakes a comprehensive monitoring program. Details on the individual monitoring programs are provided in the following sections.

3.2 METEOROLOGICAL

During the reporting period, MCC continued to maintain a Meteorological Monitoring Station (MMS) on rehabilitated land to the immediate west of Open Cut 1. The MMS provides 10m elevation wind speed and direction, 2m and 10m elevation air temperature, rainfall, humidity, barometric pressure, sigma theta and stability class.

Meteorological data provided in this report was sourced from the MMS. Wind data, rainfall and temperature results are summarised below. Data recovery for the monitoring period was 99.95%.

3.2.1 WIND SPEED AND DIRECTION

Quarterly wind roses are provided in **Figure 4**. These results are generally consistent with the predominant wind patterns in the Hunter Valley.

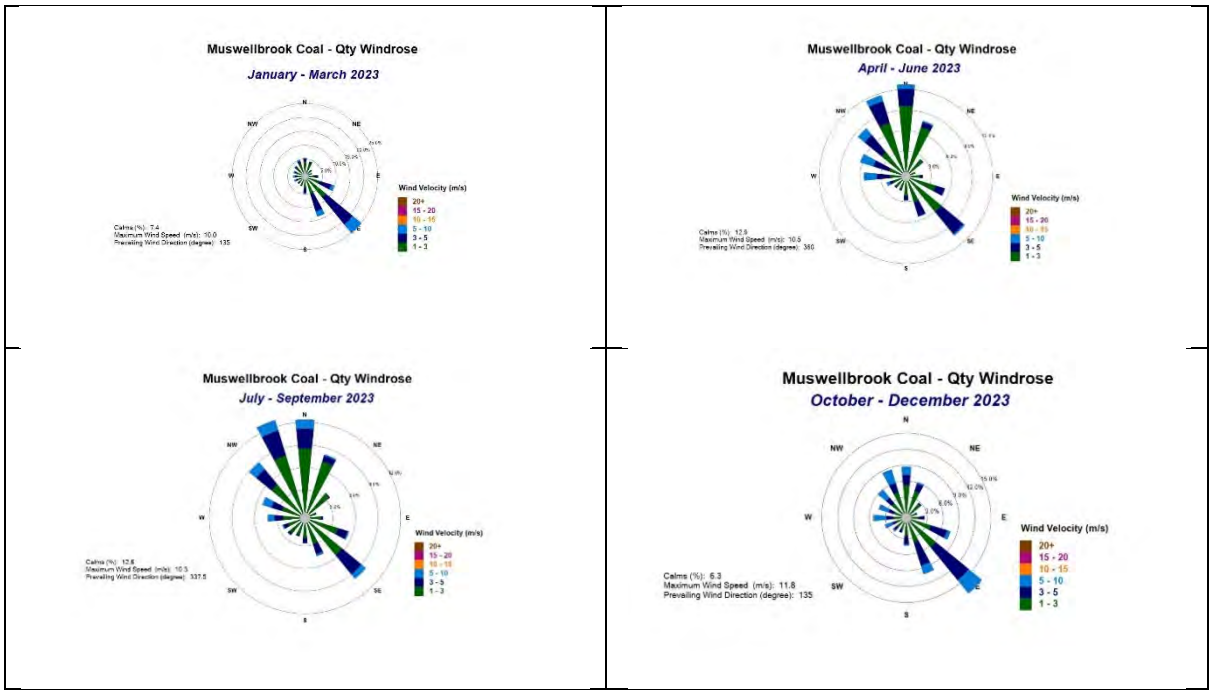

Figure 4: Quarterly Wind Roses

3.2.2 RAINFALL

Total rainfall recorded during the reporting period was 495.0mm, which is significantly below the long-term average recorded onsite since 2005 of 623.7mm. A summary of rainfall during the reporting period, compared to the long-term average recorded onsite since 2005, is provided in **Table 9** and **Figure 5**.

Table 9: Rainfall Data

Month	Muswellbrook Coal Actual (mm)	Muswellbrook Coal Average (mm)
January	53.8	61.5
February	49.0	70.8
March	74.2	72.7
April	51.6	35.9
May	2.0	26.9
June	13.0	55.7
July	10.6	38.5
August	38.6	35.3
September	13.8	35.0
October	44.0	49.0
November	33.0	80.4
December	111.4	62.1
Total	**495.0**	**623.7**

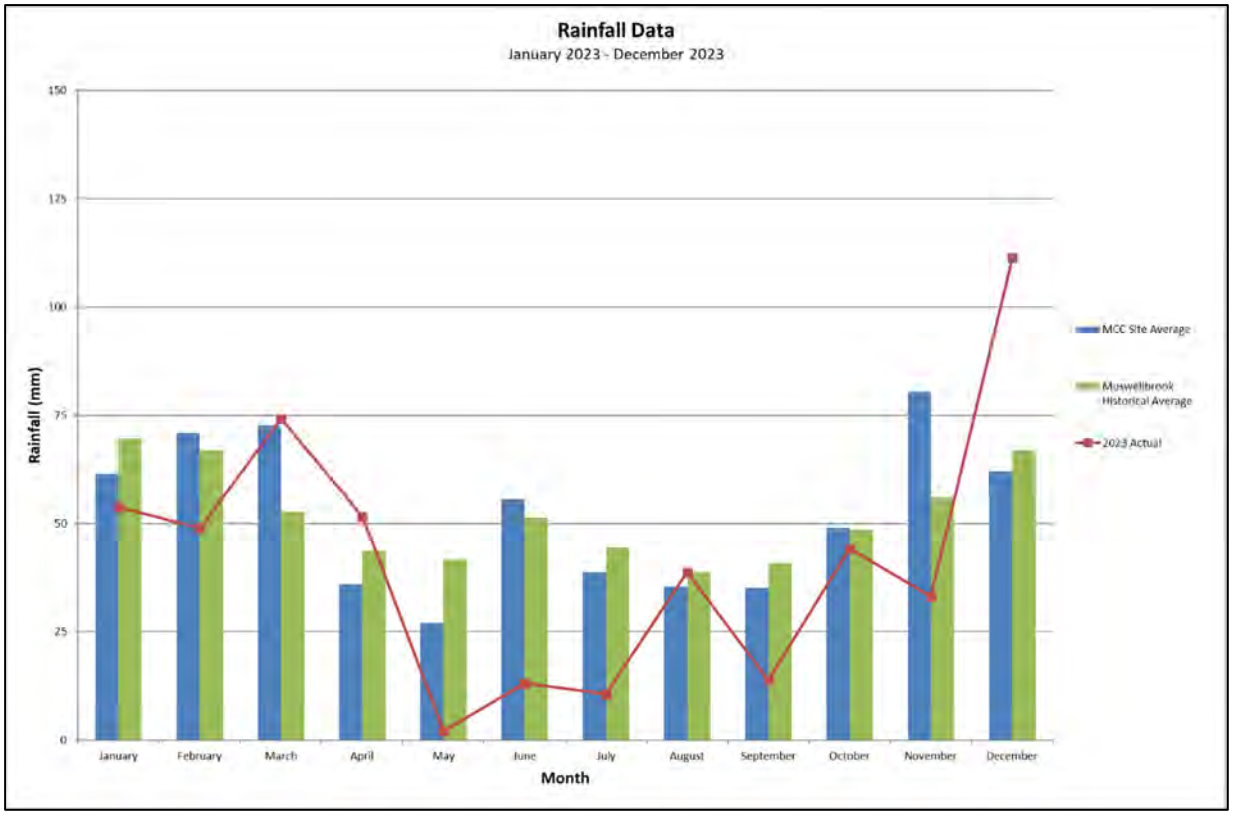

Figure 5: Rainfall Graph

3.2.3 TEMPERATURE

Maximum temperature recorded during the reporting period was 41.4°C and the minimum recorded was -3.2°C. A summary of minimum, maximum and average monthly temperatures during the reporting period is provided in **Table 10** and **Figure 6**.

Table 10: Temperature Data

Month	Minimum Temperature (°C)	Average Temperature (°C)	Maximum Temperature (°C)
January	12.0	22.9	38.6
February	9.6	23.5	39.6
March	10.8	22.8	41.0
April	6.6	16.7	29.2
May	0.2	12.2	24.2
June	-3.2	11.4	24.8
July	-2.6	11.5	24.6
August	1.9	13.2	25.8
September	0.8	16.8	34.4
October	6.0	19.3	35.6
November	9.2	21.1	36.0
December	13.2	24.8	41.4
Summary	**-3.2**	**18.0**	**41.4**

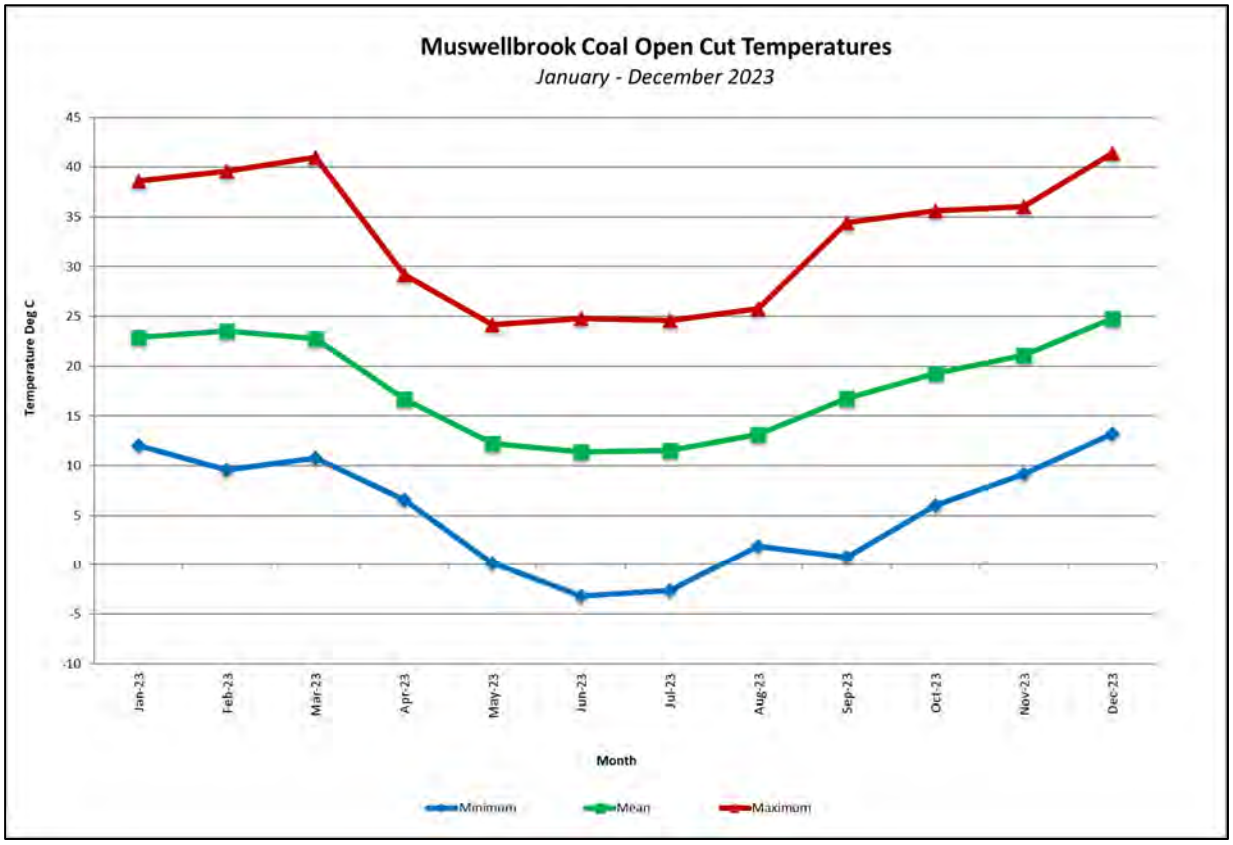

Figure 6: Temperature Graph

3.3 AIR QUALITY MANAGEMENT

3.3.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to operate in accordance with the approved Air Quality Management Plan (AQMP). The primary objective of air quality management at MCC is to manage and minimise the impact of dust from the operations on the environment and nearby residences. MCC utilise a daily dust forecasting tool to assist with managing dust emissions from the site.

During the reporting period, MCC updated the AQMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The AQMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the AQMP from MSC at the end of the reporting period.

3.3.2 AIR QUALITY MONITORING

The air quality criteria that apply to MCC are shown in **Table 11** to **Table 13**. The air quality monitoring sites are displayed in **Figure 7**.

Table 11: Long Term Particulate Matter Criteria

Pollutant	Standard / Goal
Particulate Matter <10μg (PM_{10})	30μg/m^3 (annual mean)

Table 12: Short Term Particulate Matter Goal

Pollutant	Standard/Goal
Particulate Matter <10μm (PM_{10})	50μg/m^3 (24-hour average)

Table 17 and 18 Note: • Total impact (i.e., incremental increase in concentrations due to the development plus background concentrations due to all other sources); • Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, (but not Spontaneous Combustion within the mine) or any other activity agreed by Council.

Table 13: Atmospheric Gas Content Criteria

Pollutant	Criterion	
Sulphur Dioxide (SO_2)	80ppb (24-hour average)	200ppb (1 hour average)
Hydrogen Sulphide (H_2S)	100ppb (24-hour average)	500ppb (1 hour average)

Note:

- *Total impact (i.e., incremental increase in concentrations due to the development plus background concentrations due to all other sources).*
- *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, (but not Spontaneous Combustion within the mine) or any other activity agreed by Council*

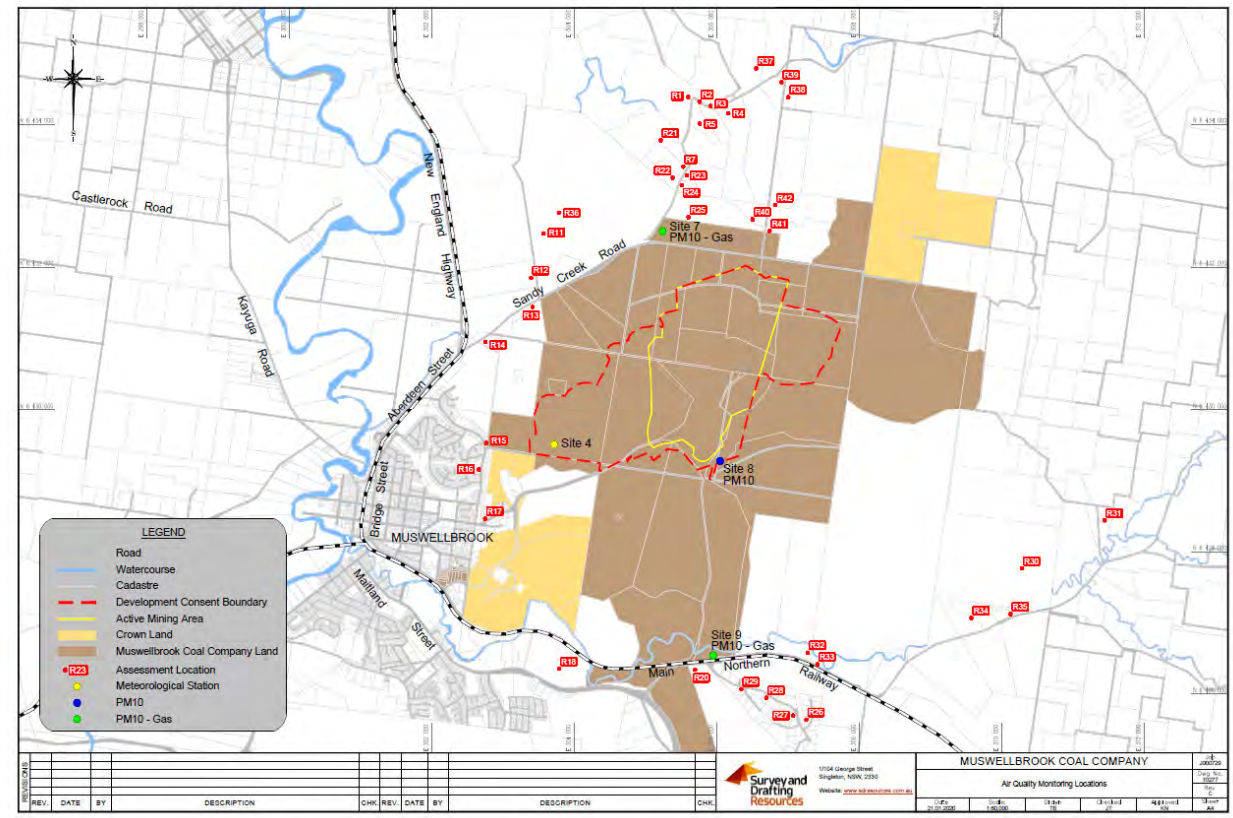

Figure 7: Air Quality Monitoring Locations

Particulate Matter <10µg (PM_{10})

MCC operate three real-time PM_{10} monitoring units with all three units continuously relaying data to a password protected website.

The PM_{10} units are continuous electronic monitoring systems that are subject to equipment faults, communication losses, power outages and maintenance downtime. High data recovery is considered essential and data recovery levels obtained during the reporting period were 97.4% across the three units. The losses of data were due to power supply interruptions, equipment calibrations and minor malfunctions.

The criteria in the development consent apply to PM_{10} levels at residential locations and as monitoring location Site 8 is used as a management tool, it is not subject to the criteria in the development consent. There was one day during the reporting period where the 24-hour PM_{10} result was above the 24-hour criteria of 50µg/m^3 at the compliance-based monitoring locations. This result was 50.6µg/m^3 at Site 7 on 7 December 2023 and occurred on a day when smoke from a significant bushfire in western NSW was affecting the air quality in the region. This result was not attributable to operations at MCC and is therefore not classed as an exceedance or a reportable incident.

The annual average PM10 did not exceed the 30µg/m^3 annual criteria during the reporting period. **Table 14** displays the average PM10 value at each site during the reporting period with the results graphically presented in **Figure 8** to **Figure 10**. A table of comprehensive PM10 results is provided in **Appendix 1**.

Table 14: Real-Time PM_{10} Averages

Site Number	Annual Average PM_{10} Concentration (µg/m³)	Annual Average Criteria (µg/m³)	Data Recovery %
7	14.47	30	98.9
8	20.55	NA	95.9
9	15.80	30	98.9

Table 15 compares the results from Sites 7 and 9 for this reporting period, background results and predictions made in the 2016 Statement of Environmental Effects (SEE). The results this reporting period are lower than the background levels and the predicted results in the SEE.

Table 15: Comparison of Real-Time PM_{10} Results (Sites 7 and 9)

Year	Monitoring Results (µg/m³)		Background Results (µg/m³)		SEE Predicted Results (µg/m³)	
	Site 7	Site 9	Site 7	Site 9	Site 7	Site 9
2023	14.5	15.8	16.9	16.9	23.0	17.0
2022	13.1	13.1	16.9	16.9	23.0	17.0
2021	13.1	14.1	16.9	16.9	23.0	17.0
2020	17.1	18.1	16.9	16.9	23.0	17.0
2019	26.7	24.2	16.9	16.9	23.0	17.0

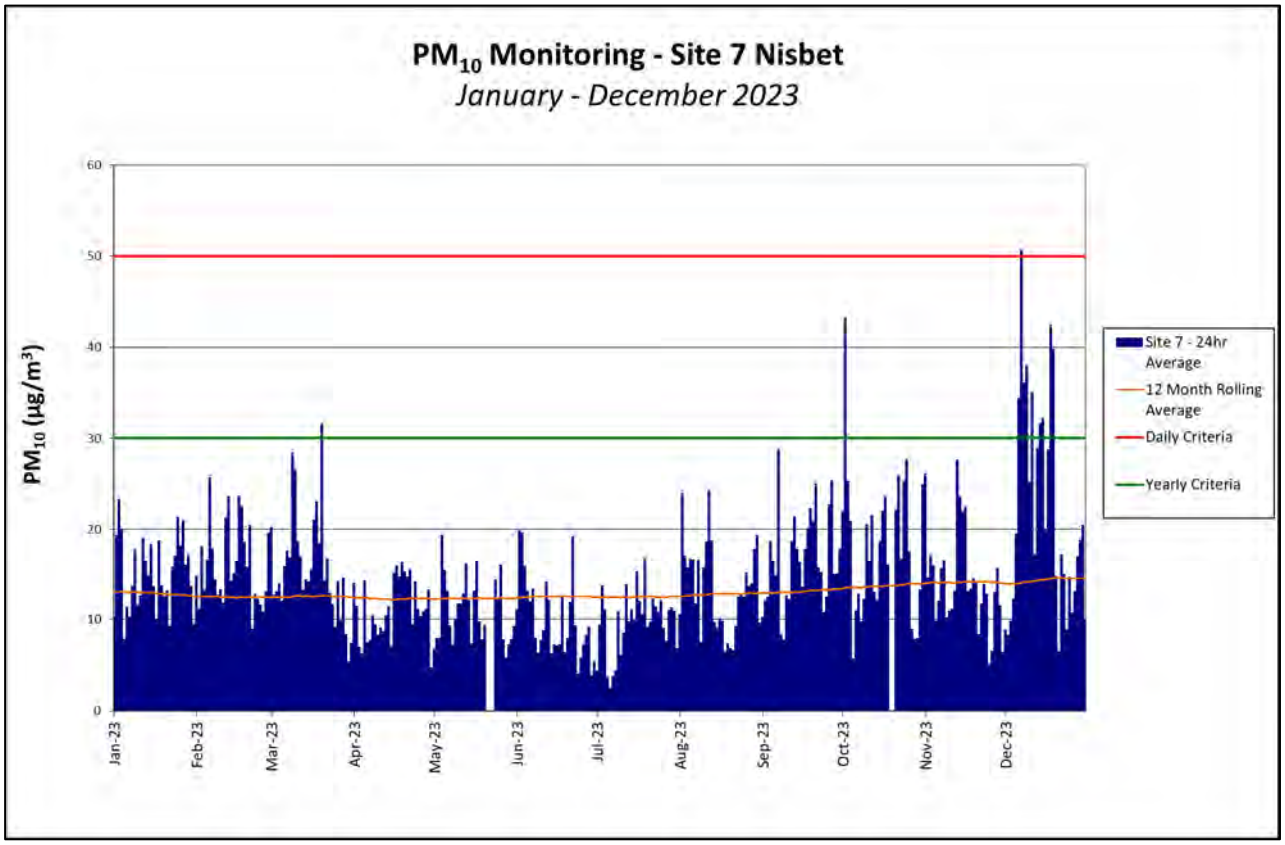

Figure 8: Site 7 PM_{10} Results

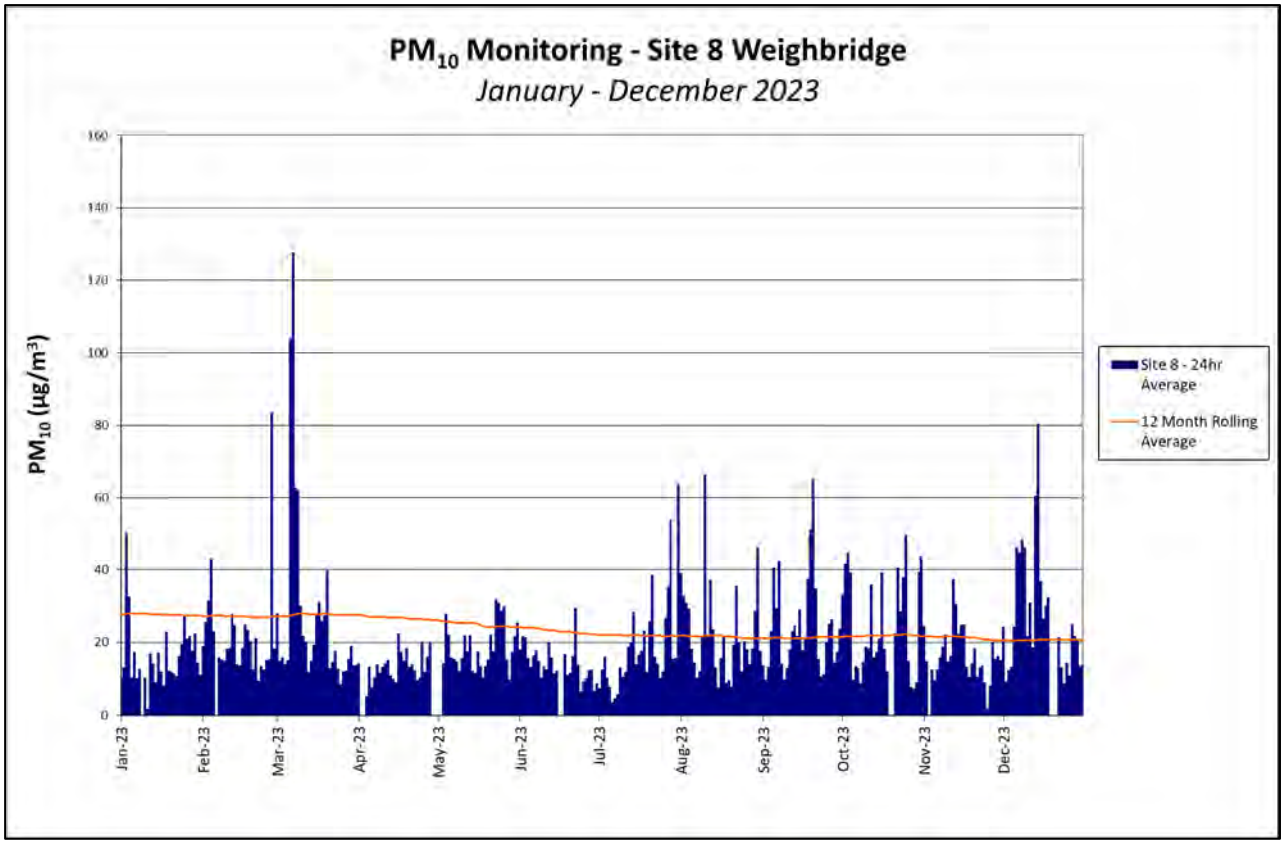

Figure 9: Site 8 PM_{10} Results

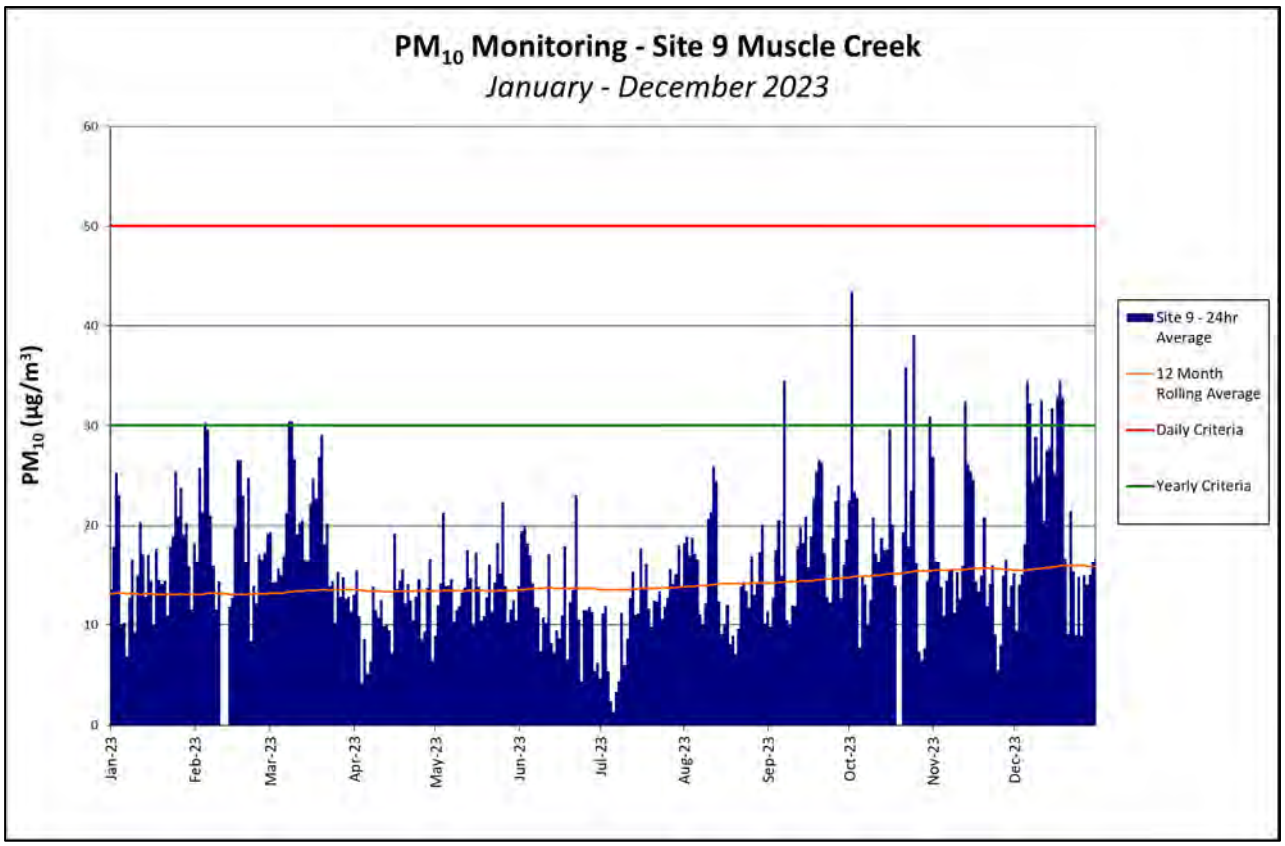

Figure 10: Site 9 PM_{10} Results

Gas Monitoring (Hydrogen Sulphide and Sulphur Dioxide)

MCC operate two real-time gas monitors that measure Hydrogen Sulphide (H_2S) and Sulphur Dioxide (SO_2). The locations of these monitors are shown in **Figure 7**.

The criteria for H_2S and SO_2 are shown in **Table 13**. A summary of the monitoring results is shown in **Table 16** and this shows that there were no results above these criteria during the reporting period. 24 hour data is missing in December due to equipment malfunction.

Table 16: Summary of Gas Data Results

Month	Highest H_2S 1-hour result (ppb)	Highest H_2S 24-hour result (ppb)	Highest SO_2 1-hour result (ppb)	Highest SO_2 24-hour result (ppb)
Site 7 – Nisbet				
January	11.7	4.4	47.4	5.8
February	8.2	2.5	58.1	8.8
March	18.5	1.9	77.8	14.5
April	10.2	3.5	23.8	3.8
May	7.3	3.8	37.8	4.6
June	16.6	7.0	18.6	4.7
July	10.8	6.4	29.4	10.8
August	10.5	2.7	10.7	2.1
September	9.2	2.5	9.9	4.0
October	10.3	3.5	12.0	4.5
November	4.7	3.4	16.8	4.9
December	1.6	No data	1.4	No data
Site 9 – Muscle Creek				
January	84.2	12.7	79.8	12.0
February	81.0	10.3	64.0	10.1
March	124.0	15.9	115.7	14.7
April	55.3	4.6	46.9	4.5
May	18.1	2.7	19.7	2.7
June	26.8	3.6	24.8	2.9
July	35.7	6.7	33.7	6.6
August	35.2	4.3	30.9	3.9
September	13.3	3.1	13.7	3.3
October	23.9	3.7	10.3	3.6
November	21.4	4.9	20.2	4.8
December	32.6	4.8	32.5	5.2

3.3.3 ACTIVITIES NEXT REPORTING PERIOD

MCC will continue to manage and monitor air quality impacts in accordance with the AQMP. MCC will continue to work with MSC to obtain approval of the updated AQMP.

3.4 GREENHOUSE GAS

No methane drainage or ventilation issues were associated with the Open Cut operations during this reporting period. Several boreholes intersect the underground workings that are used for gas and water monitoring. These boreholes are capped and opened only for monitoring purposes.

MCC supply data to Idemitsu Australia for their corporate reporting requirements for the National Greenhouse and Energy Reporting (NGER's) process.

3.5 EROSION AND SEDIMENT CONTROL

3.5.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to manage erosion and sediment in accordance with the approved Water Management Plan (WMP) prepared in accordance with condition 25 of the DA. During the reporting period, MCC updated the WMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The WMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the WMP from MSC at the end of the reporting period.

The key considerations for erosion and sediment control at MCC include:

- restricting the extent of disturbance to the minimum that is practical and in accordance with the Rehabilitation Management Plan,
- progressive rehabilitation of disturbed land, where possible, and the construction of drainage controls to improve the stability of rehabilitated land,
- protection of natural drainage lines and watercourses by the construction of erosion control devices such as diversion banks and channels and sediment retention dams as necessary,
- restriction of access to rehabilitated areas,
- management of erosion and sediment control of affected surface watercourses/water bodies, including creek lines within or adjacent to the development consent boundary,
- regular inspection of dams to monitor their efficiency and any required maintenance, and
- inspection and maintenance, if required, of sediment and erosion controls including dams and drainage lines following storm events.

Two main natural catchments exist around the mining area, associated with Muscle and Sandy Creeks. The area contains undisturbed land surfaces that drain towards Sandy Creek. However, some of the runoff is captured by dams. Water from undisturbed catchments is diverted around mining operations by diversion banks and channelled into adjacent watercourses.

Drainage from the old stockpile area is collected in a dam and re-used for dust suppression. All disturbed or newly rehabilitated areas contain diversion banks (major and minor graded banks) to control the flow of water from catchment areas and to contain dirty runoff on the mine site.

During the reporting period MCC maintained water management structures to contain any potentially contaminated water on site. This work included desilting of dams to maintain capacity and drain cleanout to remove blockages.

An assessment of surface water obligations relating to mine closure was undertaken during the reporting period. This assessment included consideration of erosion and sediment control and made recommendations to be implemented as part of mine closure activities. These recommendations included review of erosional stability of the rehabilitation areas.

3.5.2 EROSION AND SEDIMENT CONTROL MONITORING

Erosion and sediment control monitoring is conducted as part of the surface water monitoring program. Surface water monitoring is discussed in **Section 3.6**.

3.5.3 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period, MCC will continue to manage and monitor erosion and sediment impacts in accordance with the WMP. MCC will continue to work with MSC to obtain approval of the updated WMP.

3.6 SURFACE WATER MANAGEMENT

3.6.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to manage surface water impacts in accordance with the approved Water Management Plan (WMP) prepared in accordance with condition 25 of the DA. During the reporting period, MCC updated the WMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The WMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the WMP from MSC at the end of the reporting period.

An assessment of surface water obligations relating to mine closure was undertaken during the previous reporting period. This assessment included consideration of surface water quality and management and made recommendations to be implemented as part of mine closure activities. These recommendations included changes to the surface water monitoring program. In addition to the surface water assessment, the geochemical assessment for mine closure also recommended changes to the water monitoring program. These changes were implemented during this reporting period. These changes included changes to frequency of monitoring, and changes to the analytes being monitored.

The trigger values for water quality in Muscle Creek are presented in **Table 17**. If monitored conditions are outside the upper or lower trigger levels for 3 continuous monthly results, MCC will investigate the results. There are no surface water quality limits defined in the EPL.

Table 17: Trigger Values for Muscle Creek Water Quality

Site	pH 20th/80th Percentile Trigger Values	EC (µS/cm) 80th Percentile Trigger Values	TSS (mg/L) 80th Percentile Trigger Values
SW07 – Muscle Creek – Upstream	7.7–8.0	4,048	13
SW08 – Muscle Creek – Downstream	7.8–8.0	5,136	10

3.6.2 SURFACE WATER MONITORING

MCC undertake a surface water monitoring program that consists of monthly and quarterly monitoring. The locations of the surface water monitoring sites are shown in **Figure 11**. The monthly surface water monitoring results are provided in **Appendix 2**.

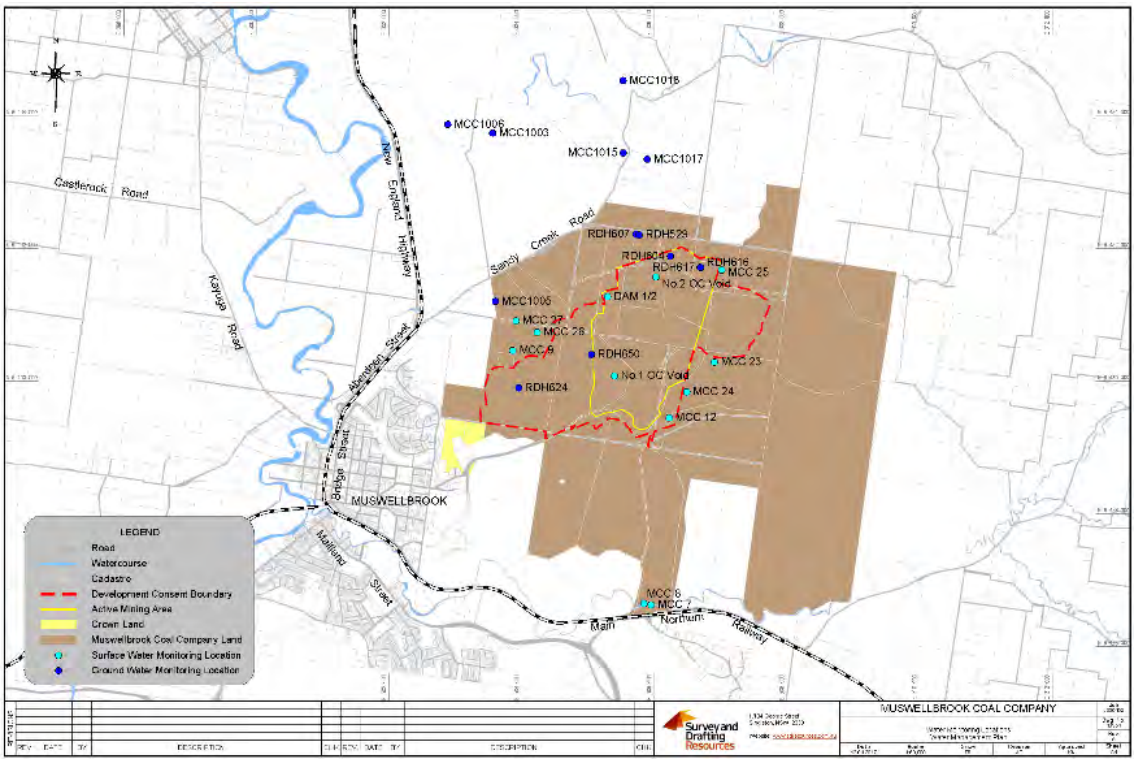

Figure 11: Water Monitoring Locations

pH

The pH levels at surface water monitoring sites were within the recommended ecosystem pH levels of 6.5–9.5 throughout the reporting period (**Figure 12**). As shown in **Figure 13,** the results from this reporting period are consistent with the results from previous reporting periods. There are no predictions to compare these results to.

Electrical Conductivity (EC)

Typically, EC levels for mine water are greater than 4,000µS/cm (**Figure 14**). EC levels in water courses surrounding the mining operation are influenced by rainfall and runoff. They are lower during periods of high rainfall and higher during periods of low rainfall.

A comparison of EC results from the reporting period to previous reporting periods is shown in **Figure 15**. There are no predictions to compare these results to.

Total Suspended Solids (TSS)

The results from this reporting period are shown in **Figure 16.** A comparison of TSS results from the reporting period to previous reporting periods is shown in **Figure 17**. TSS results can be highly variable with disturbance from desilting works and runoff from heavy rainfall causing short-term increases before conditions return to normal. There are no predictions to compare these results to.

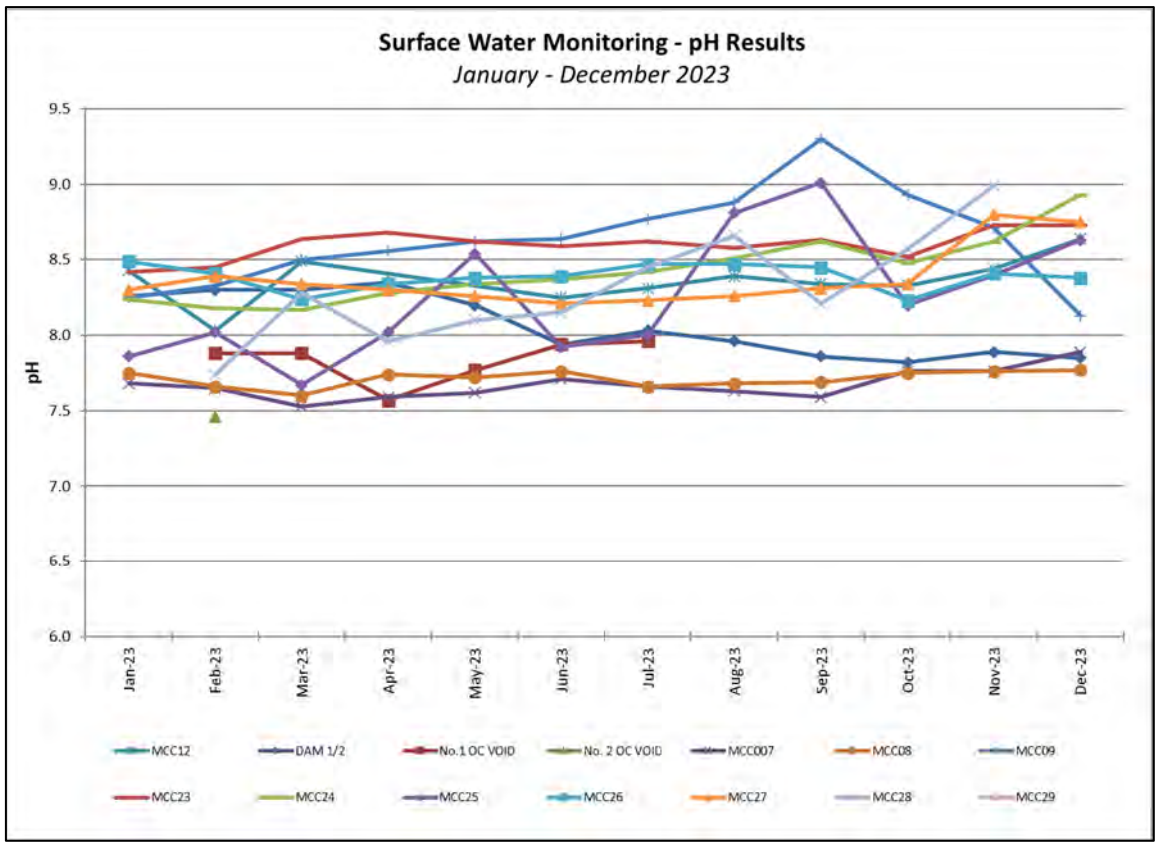

Figure 12: Surface Water Monitoring Results – pH

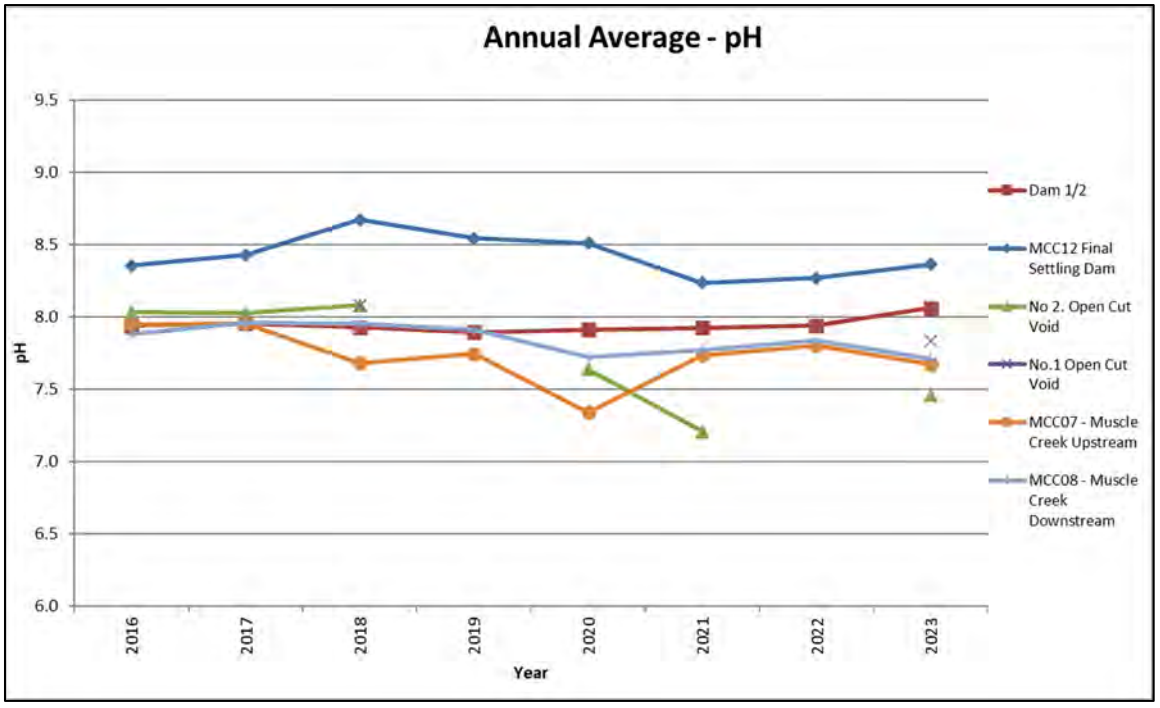

Figure 13: Comparison of pH results to Historical Results

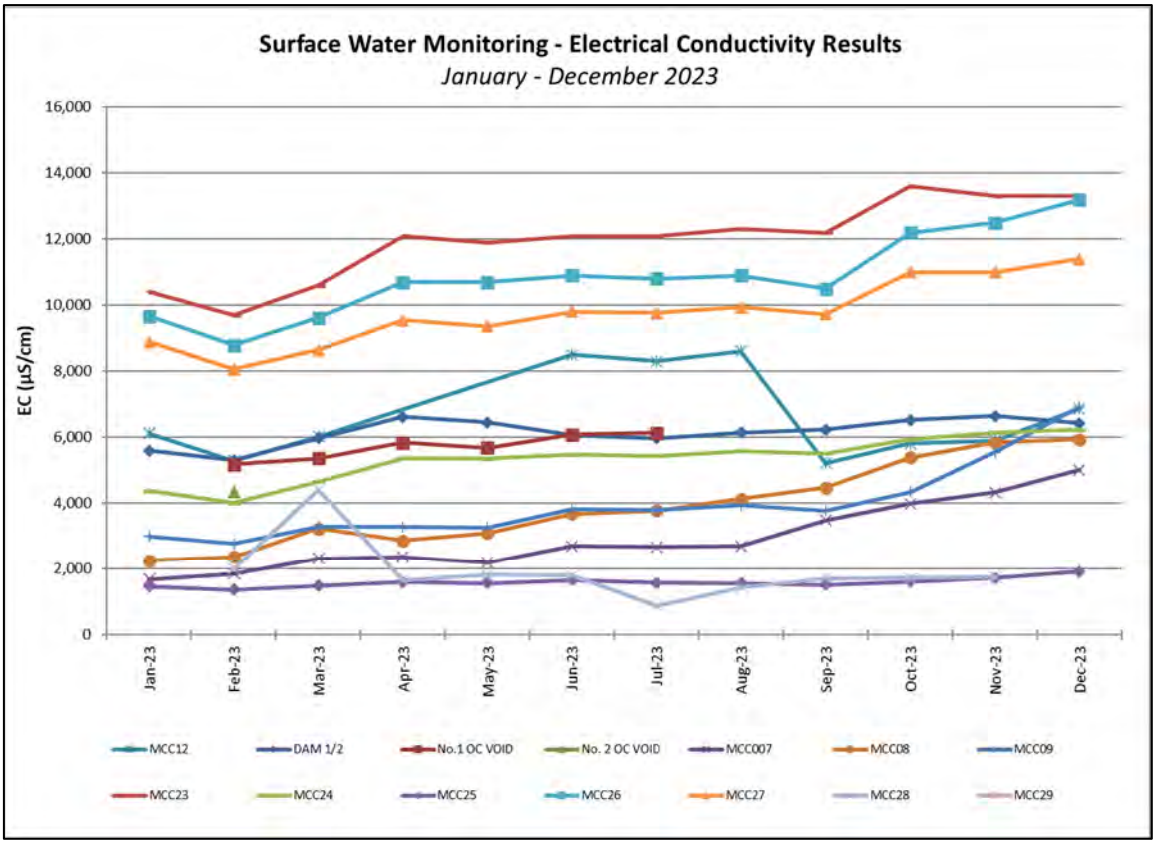

Figure 14: Surface Water Results – Electrical Conductivity

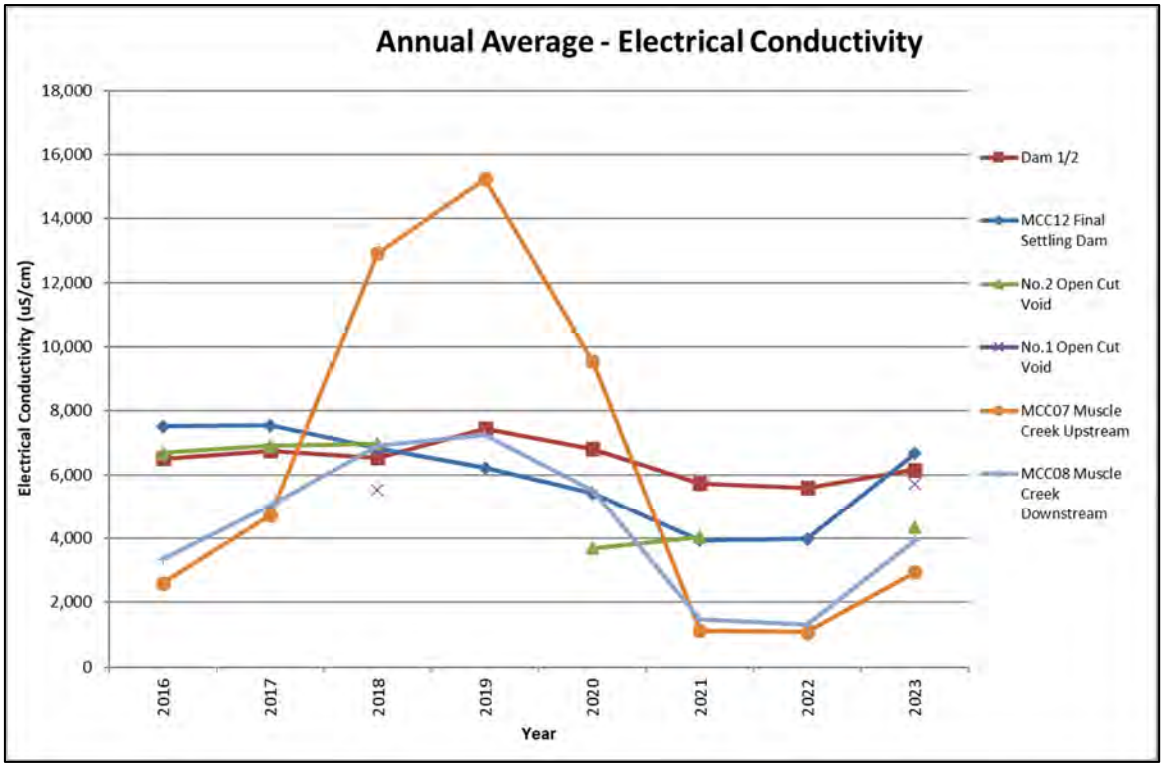

Figure 15: Comparison of EC results to Historical Results

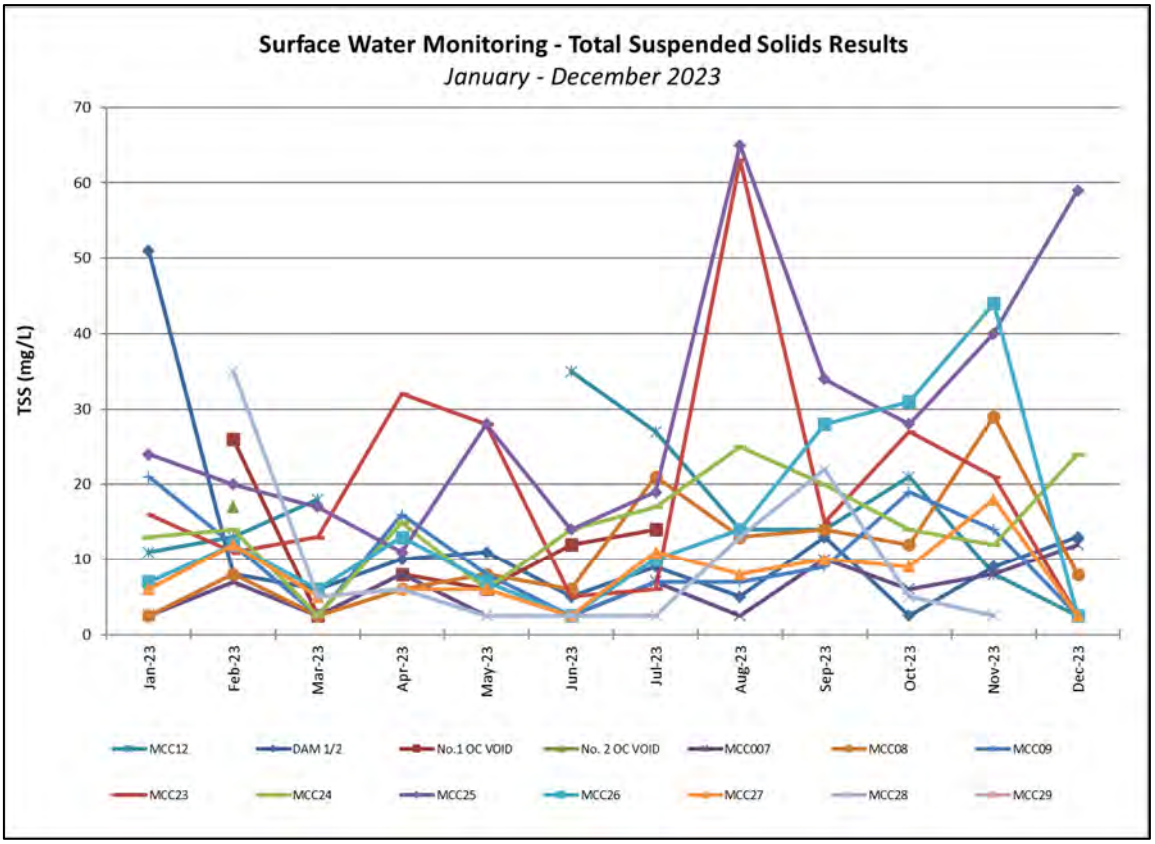

Figure 16: Surface Water Results – Total Suspended Solids

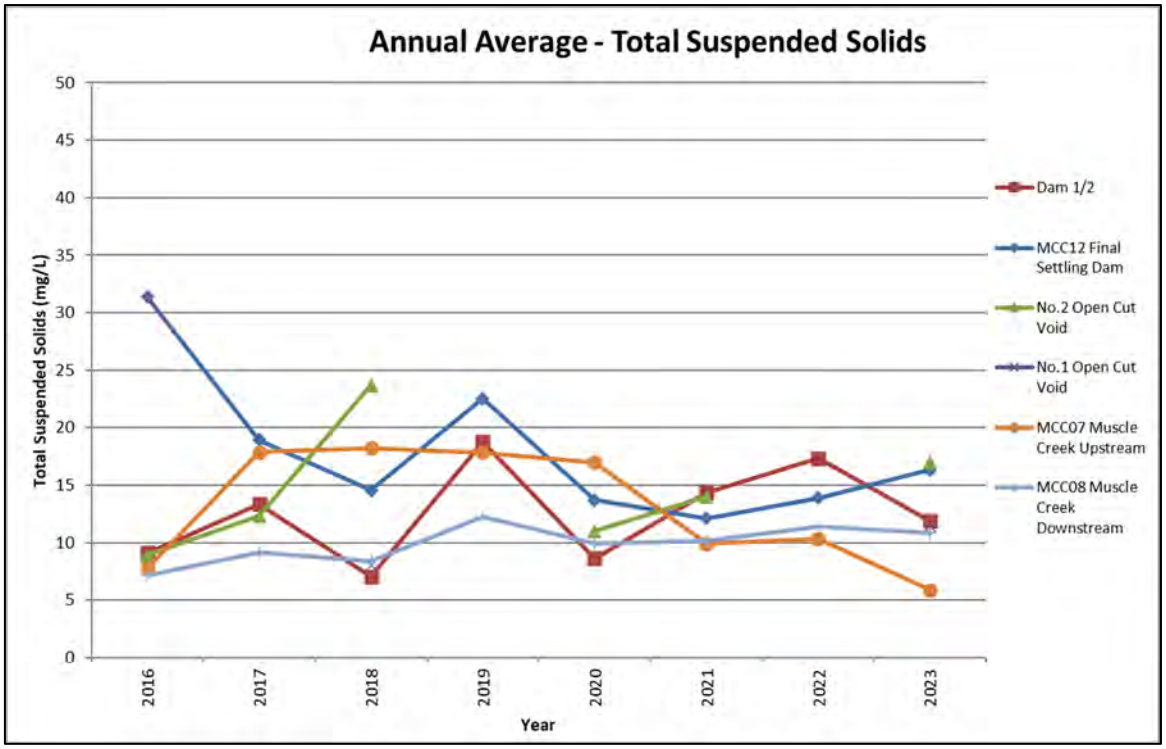

Figure 17: Comparison of TSS results to Historical Results

3.6.3 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period, MCC will continue to manage and monitor surface water quality impacts in accordance with the WMP. MCC will continue to work with MSC to obtain approval of the updated WMP.

3.7 GROUNDWATER MANAGEMENT

3.7.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to manage groundwater impacts in accordance with the approved Water Management Plan (WMP) prepared in accordance with condition 25 of the DA. During the reporting period, MCC updated the WMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The WMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the WMP from MSC at the end of the reporting period.

An assessment of groundwater obligations relating to mine closure was undertaken during the previous reporting period. This assessment included consideration of groundwater quality and management and made recommendations to be implemented as part of mine closure activities. These recommendations included changes to the groundwater monitoring program. In addition to the groundwater assessment, the geochemical assessment for mine closure also recommended changes to the water monitoring program. These changes were implemented during this reporting period. These changes included changes to frequency of monitoring, and changes to the analytes being monitored.

Groundwater trigger levels have been established for selected sites with the trigger levels shown in **Table 18**. If monitored conditions are outside the upper or lower trigger levels for 3 continuous monthly results, MCC will investigate the results.

Table 18: Groundwater Monitoring Trigger Levels

WATER LEVELS			
Bore/Well	**Aquifer**	**Lower Trigger Level (m) BTOC**	**Lower Trigger Level (m) AHD**
MCC1003	Alluvial	8.6	146.5
MCC1005	Alluvial	11.3	138.9
MCC1006	Alluvial	10.3	144.6
MCC1017	Hardrock	18.1	180.7
MCC1018	Hardrock	19.0	181.9
pH			
Bore/Well	**Aquifer**	**Lower Trigger pH**	**Upper Trigger pH**
MCC1003	Alluvial	7.1	7.3
MCC1005	Alluvial	6.9	7.2
MCC1006	Alluvial	7.1	7.4
ELECTRICAL CONDUCTIVITY			
Bore/Well	**Aquifer**	**Upper Trigger EC**	
MCC1003	Alluvial	1,666	
MCC1005	Alluvial	5,584	
MCC1006	Alluvial	1,152	

3.7.2 GROUNDWATER MONITORING

MCC undertake a groundwater monitoring program that consists of bi-monthly monitoring. The locations of the groundwater monitoring sites are shown in **Figure 11**.

As shown in **Table 19** the levels in the underground workings, and the pH and Electrical Conductivity results from this reporting period are consistent with previous years. There are no predictions to compare these results to.

Table 19: Comparison of Underground Working Results

Year	Average pH	Average EC *(µS/cm)*	Relative Level (RL) *(AHD metres)*
2023	7.2	6,158	107
2022	7.0	6,338	107
2021	7.0	6,306	106
2020	7.1	6,098	106
2019	7.3	6,265	104
2018	7.0	5,965	107
2017	7.5	6,455	114

The water level, pH and Electrical Conductivity of the groundwater data for this reporting period are shown in **Figure 18, Figure 19** and **Figure 20**.

These results show that there is no impact on alluvial water sources from operations at MCC. The groundwater monitoring results are provided in **Appendix 2**.

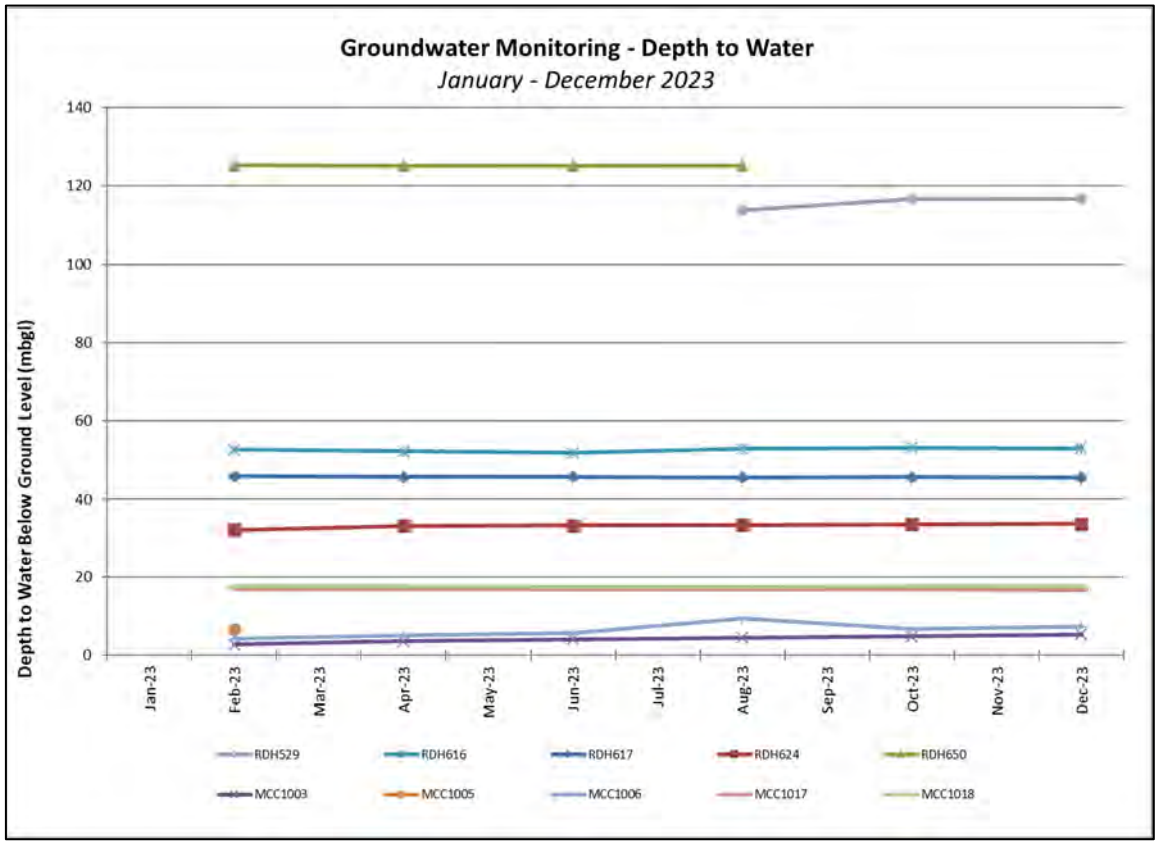

Figure 18: Groundwater Monitoring Results – Depth to Water

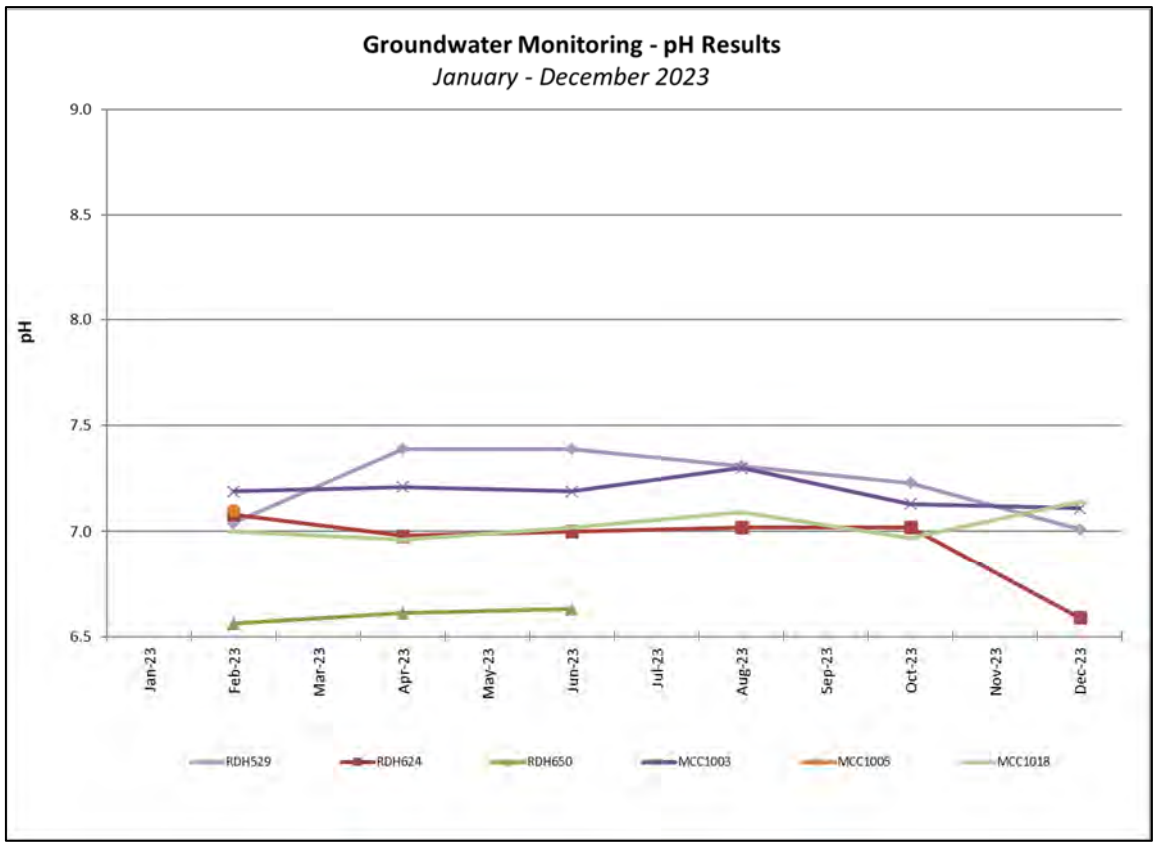

Figure 19: Groundwater Monitoring Results – pH

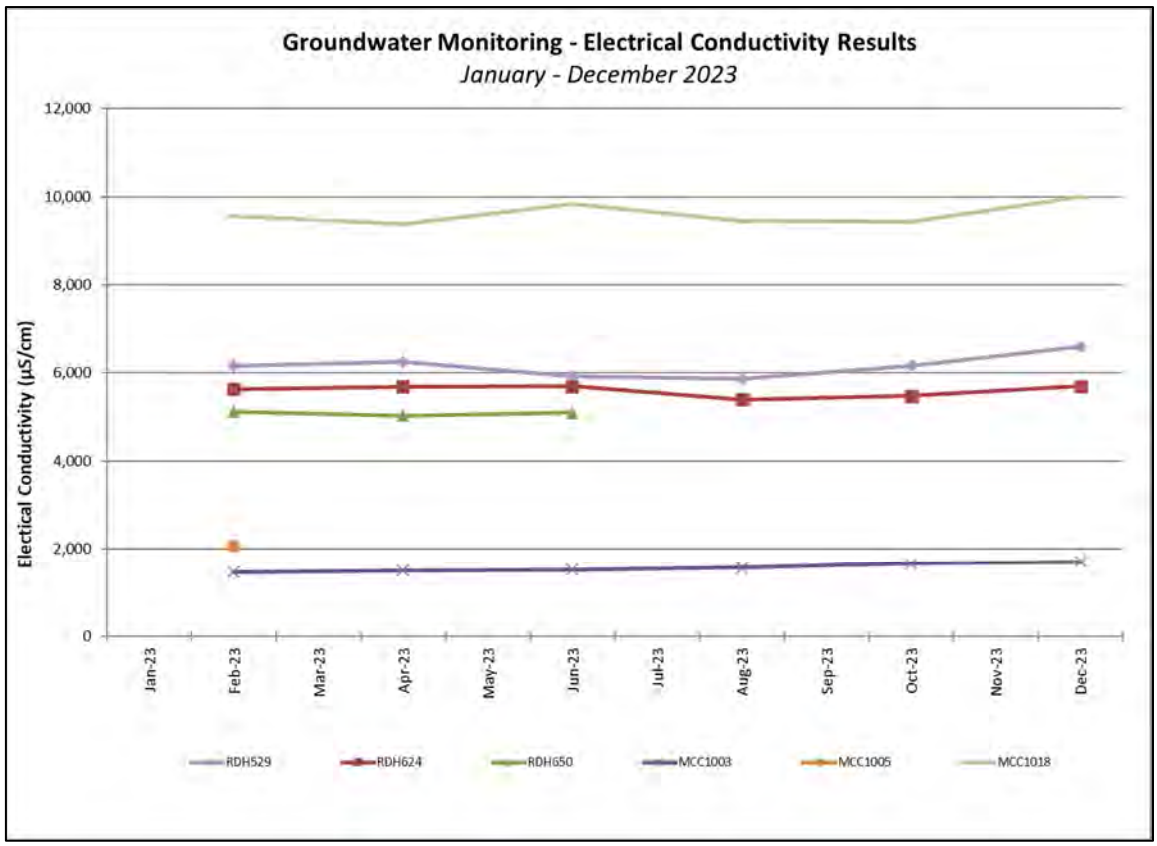

Figure 20: Groundwater Monitoring Results – Electrical Conductivity

As shown in **Figure 21** to **Figure 23**, the results from this reporting period are generally consistent with the results from previous reporting periods. There are no predictions to compare these results to.

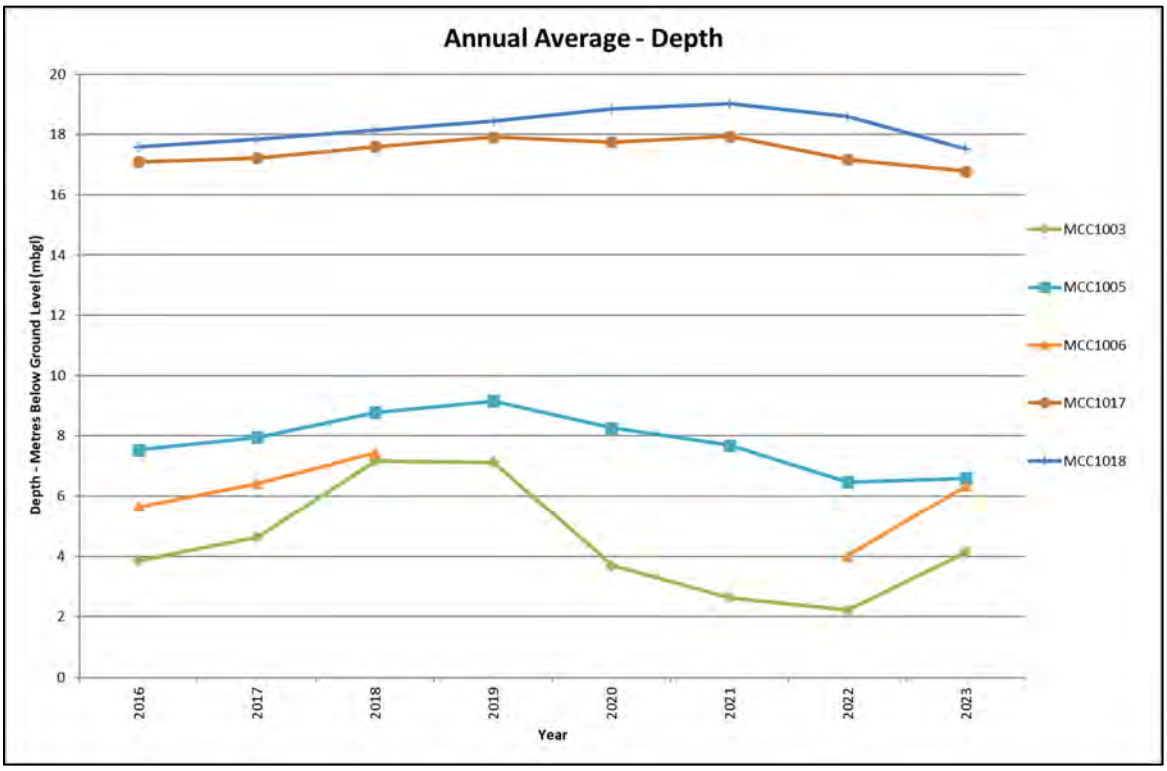

Figure 21: Comparison of Depth to Historical Results

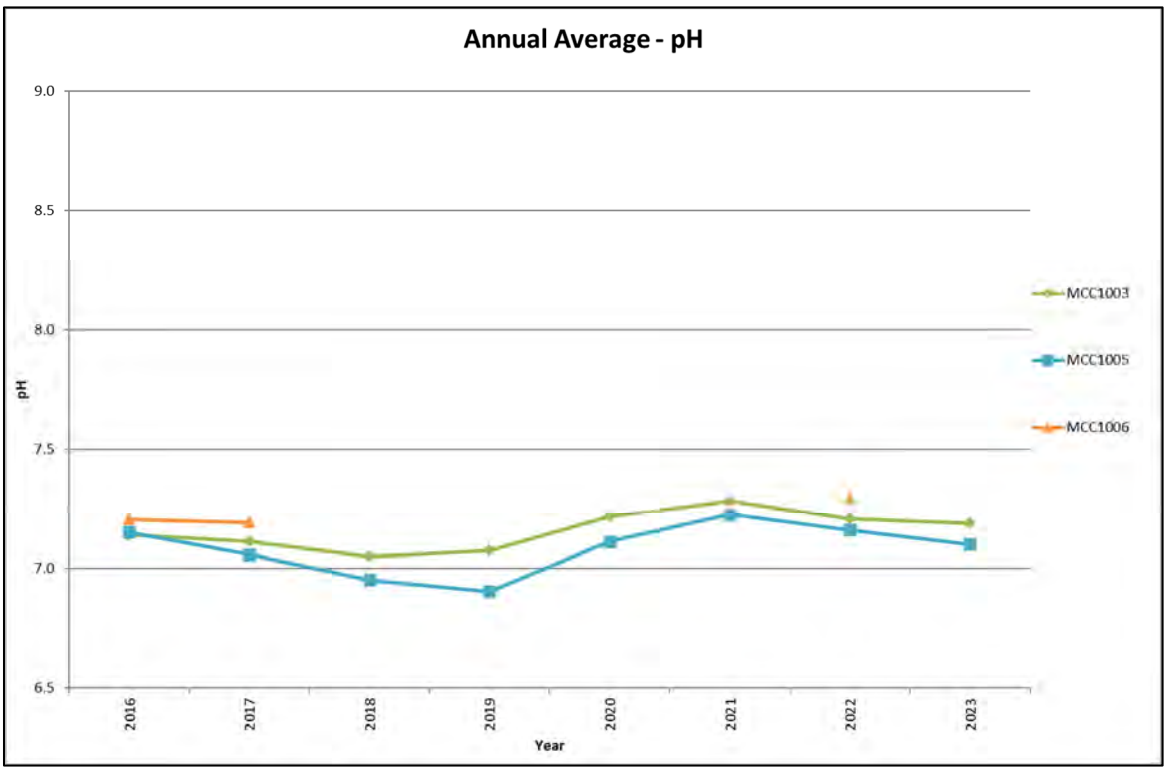

Figure 22: Comparison of pH Results to Historical Results

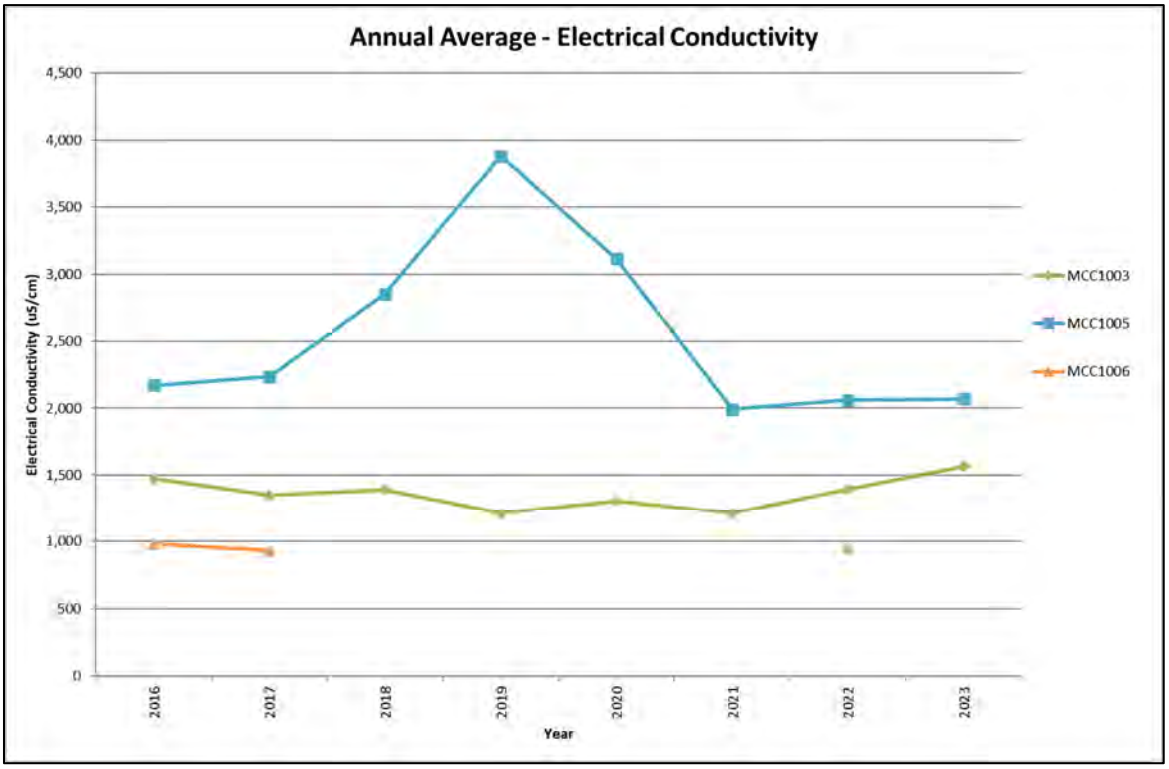

Figure 23: Comparison of Electrical Conductivity Results to Historical Results

3.7.3 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period, MCC will continue to manage and monitor groundwater quality impacts in accordance with the WMP. MCC will continue to work with MSC to obtain approval of the updated WMP.

3.8 CONTAMINATED LAND

During the reporting period, preliminary and detailed contamination assessments continued to be undertaken across the site as part of rehabilitation of the site. The assessments have focused on areas that are no longer required for active operations on site (e.g. CHPP area). These reports have identified that for most of the areas assessed that there is no contamination remediation work that needs to be undertaken. In some areas there is minor remediation work that is required to be completed as part of the rehabilitation of the site.

Contamination assessments will continue to be undertaken as areas are no longer required for active operations on site (e.g., ammonium nitrate storage areas).

3.9 FLORA AND FAUNA MANAGEMENT

MCC continues to manage impacts on flora and fauna in accordance with the Rehabilitation Management Plan (MCC).

MCC is set amongst an area of existing disturbed and mined land. The mining area is extensively altered from its natural state through current and past mining operations.

Five vegetation communities have been identified within the DA boundary at MCC. These are:

- Hunter Floodplain Red Gum Woodland,
- Central Hunter Grey Box-Ironbark Woodland,

- Regenerating Central Hunter Grey Box-Ironbark Woodland,
- Aquatic Forbland, and
- Mine Rehabilitation.

No threatened flora species have been identified at MCC. The area to be disturbed is not considered important habitat for threatened fauna. The area is also not considered critical habitat.

To allow for the continuation of the rehabilitation, tree clearing on historical rehabilitation was undertaken during the reporting period. Prior to this clearing commencing, a pre-clearance survey was undertaken by an ecologist to identify any habitat features or threatened species that needed additional management. No issues were identified during the pre-clearance survey that required additional management.

3.10 WEEDS, PEST AND FERAL ANIMALS

MCC continues to manage weeds, pest and feral animals on site.

Weed Control

Weed control and eradication techniques used at MCC include:

- Promotion of vigorous pasture growth to out-compete weeds,
- Minimisation of area available for weed infestation, through prompt revegetation of bare areas,
- Spraying with selective herbicides, and
- Physical removal by chipping/slashing.

Feral Animal Control

During the reporting period, MCC undertook a wild dog and fox baiting program, as well as a rabbit control program.

3.11 BLASTING

3.11.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to manage blasting impacts in accordance with the approved Blast Management Plan (BMP) prepared in accordance with condition 33 of the DA. During the reporting period, MCC updated the BMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The BMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the BMP from MSC at the end of the reporting period.

Members of the public are notified of proposed blasting times by contacting the Blast Information Service Line where they hear a recorded message or by looking at the “Blasting Notices” page of the Muswellbrook Shire Council Website.

The primary objective of blast management at MCC is to manage and minimise the impact of blasting operations on nearby residences. The intent of best practice goals in drill and blast activities is to comply with the fragmentation requirements for each blast. The use of best practice techniques will reduce air blast overpressure, ground vibration, fumes and odours from blasting activities.

3.11.2 BLAST MONITORING

All blasts are monitored by four automatically triggered blast monitors. The monitors are maintained in accordance with the relevant standards and calibrated annually.

The blasting criteria that apply to MCC are shown in **Table 20**.

Table 20: Blast Criteria

Vibration (mm/s)	Allowable Exceedance
5	5% of total number of blasts over a 12-month period
10	0%
Overpressure (dB(L))	**Allowable Exceedance**
115	5% of total number of blasts over a 12-month period
120	0%

The blast monitoring network is provided in **Table 21** and locations are displayed in **Figure 24**.

Table 21: Blast Monitoring Network

Blast Monitor	Location
B1 (Queen St)	In the vicinity of the nearest non-company owned residence
B2 (School)	At the Muswellbrook Public School, Roger Street, North Muswellbrook
B3 (99 Queen St)	At the northern end of Queen Street, North Muswellbrook
B4 (Nisbet)	Sandy Creek Road, approximately 1.2km to the north of MCC

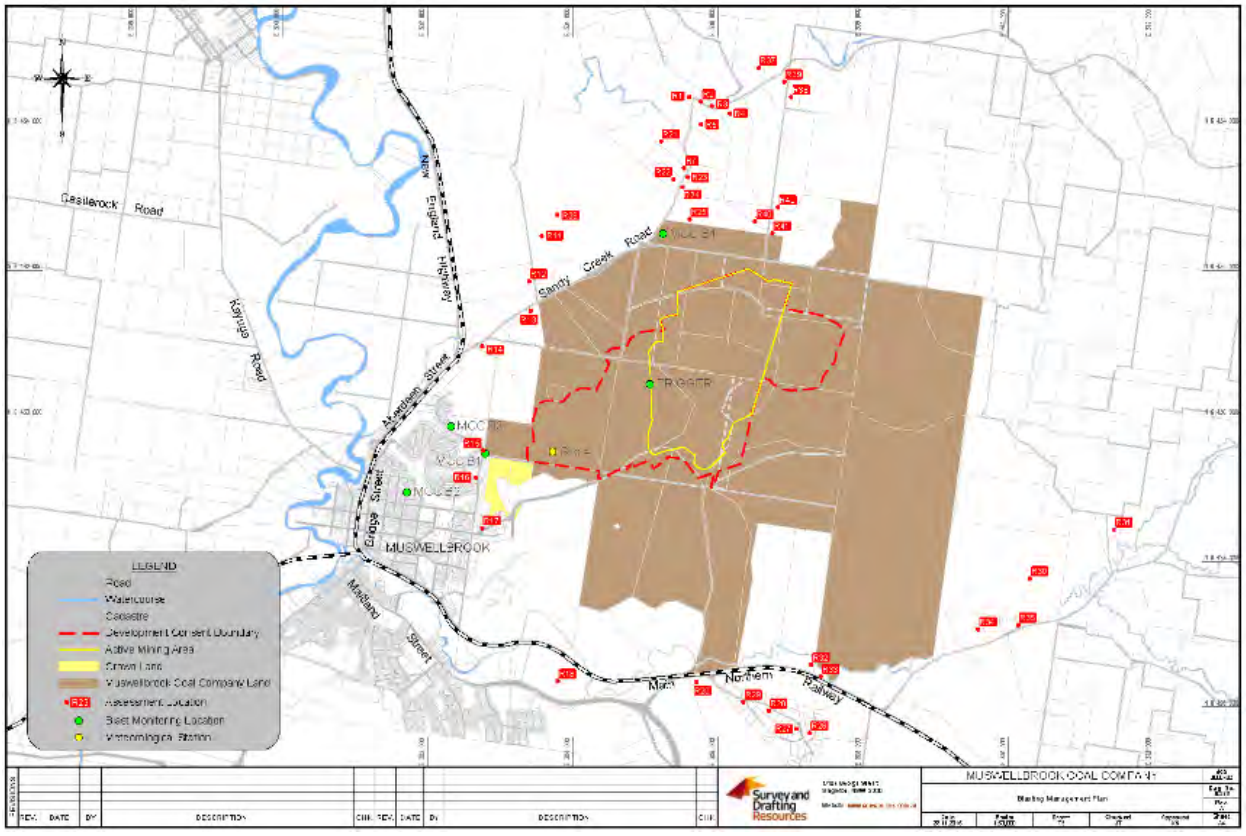

Figure 24: Blast Monitoring Locations

During the reporting period, two blast events occurred at MCC. These blasts were required to allow removal of the highwall in Open Cut 1 as part of the rehabilitation activities on site. The four blast monitors were operational throughout the reporting period, with 100% of data captured during the reporting period.

A summary of blast monitoring results is displayed in **Table 22**

Table 22: Blast Monitoring Results

Date/ Time	B1 Queen St		B2 School		B3 99 Queen St		B4 Nisbet	
	Overpressure (dB(L))	Vibration (mm/s)	Overpressure (dB(L))	Vibration (mm/s)	Overpressure (dB(L))	Vibration (mm/s)	Overpressure (dB(L))	Vibration (mm/s)
07/12/23 12:02pm	97.9	0.32	98.5	0.14	100.3	0.33	106.5	0.74
15/12/23 09:45am	110.8	0.77	110.1	0.78	112.4	1.23	107.3	1.25

Table 23 compares the average results from the blast monitoring sites during this reporting period, historical monitoring results, and predictions made in the 2016 Statement of Environmental Effects (SEE). The results this reporting period are higher than historical monitoring results and are consistent with the predicted results in the SEE. The results this reporting period are higher than previous reporting periods due to the type of blasting that occurred on site this reporting period (small operational blasts vs elevated highwall blasts).

Table 23: Comparison of Blasting Results

Year	Vibration (mm/s)		Overpressure (dBL)	
	Average Monitoring Results	EA Predicted Results	Average Monitoring Results	EA Predicted Results
2023	0.70	0.7	105.5	111.0
2022	0.22	0.7	93.5	111.0
2021	0.25	0.7	97.1	111.0
2020	0.20	0.7	98.0	111.0
2019	0.19	0.7	100.1	111.0
2018	0.20	0.7	101.3	111.0

3.11.3 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period, MCC will continue to manage and monitor blasting impacts in accordance with the BMP. MCC will continue to work with MSC to obtain approval of the updated BMP.

All blasting activities will be finalised during the next reporting period. Following the last blast at MCC, the blast monitoring locations will be decommissioned.

3.12 NOISE MANAGEMENT

3.12.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to operate in accordance with the approved Noise Management Plan (NMP) prepared in accordance with condition 39 of the DA. During the reporting period, MCC updated the NMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The NMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the NMP from MSC at the end of the reporting period.

The main objective of the NMP is to manage and minimise the impact of noise from mining operations on the environment and nearby residences.

3.12.2 NOISE MONITORING

The noise monitoring network is provided in **Table 24** and locations are displayed in **Figure 25**.

Table 24: Noise Monitoring Network

Location	Description
R13	Sandy Creek Road
R15	Queen St
R17	Queen St
R25	Sandy Creek Road
R32	Muscle Creek Road

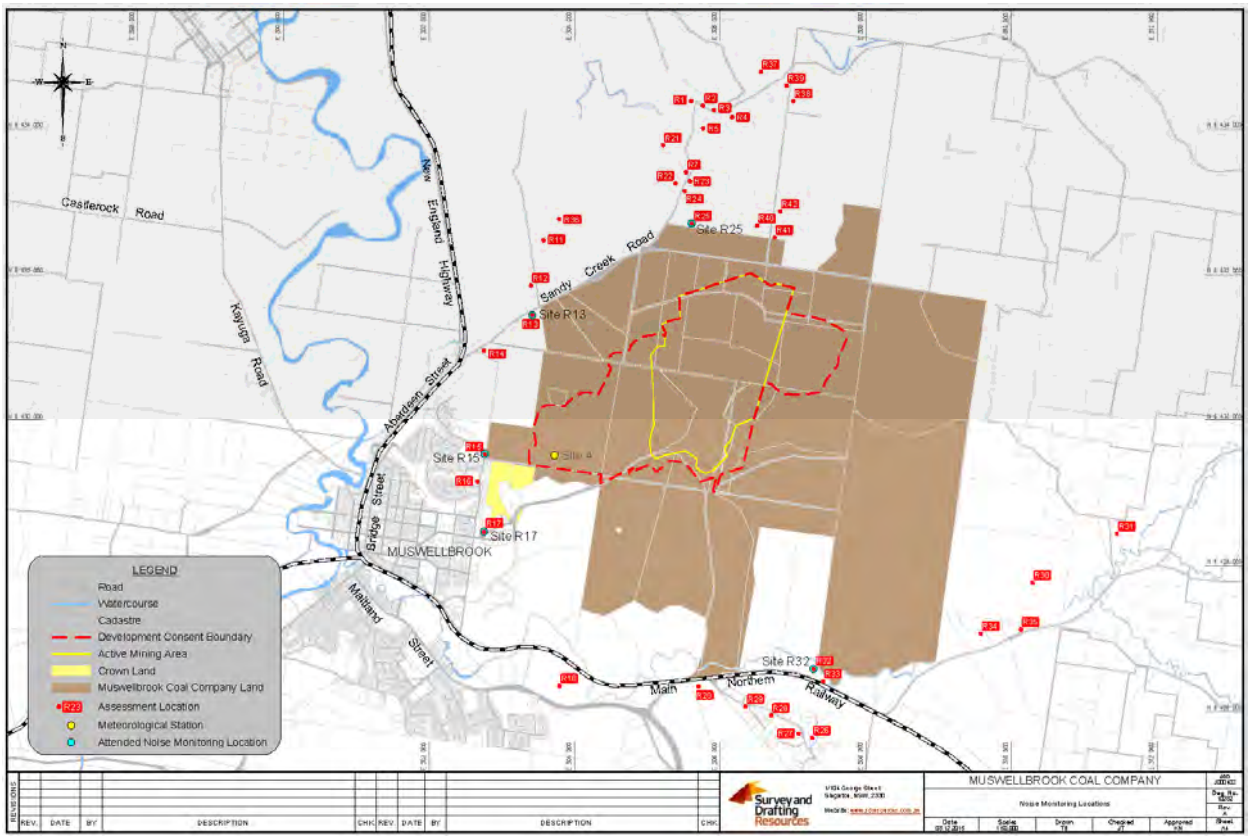

Figure 25: Noise Monitoring Locations

MCC has a network of five attended noise survey locations. Monitoring is conducted at these sites monthly. Monthly attended monitoring allows for a variety of operating configurations, weather conditions and seasonal variations to be measured. The noise consultant schedules the monitoring to occur at times unknown to MCC and they determine the intervals between surveys and the time of measurement. Each attended noise survey is conducted during night periods only. Following the end of mining, there were no night-time activities on site until August 2023, when night-time rehabilitation activities commenced, therefore no noise monitoring was conducted between January and July 2023.

All noise surveys are performed in accordance with the EPA "NSW Noise Policy for Industry", the Periodic Noise Monitoring programme and Australian Standard 1055 "Acoustics, Description and Measurement of Environmental Noise" as specified in the NMP. Five attended noise surveys were undertaken during the reporting period.

Measurements were taken in third-octave bands with an instrument that has Type 1 characteristics as defined in AS1259-1990 "Acoustics – Sound Level Meters". The instrument has a current calibration

as per manufacturer's instructions and calibration was also confirmed prior to and at the completion of measurements with a Sound Level Calibrator. The LA_{eq} (15-minute) noise emission levels, at each monitoring site, were determined.

The actual noise level received at individual residences may vary due to:

- The location of mining equipment,
- The elevation of mining equipment,
- Impacts from other noise sources, and
- Prevailing meteorological conditions.

A summary of the results are shown in **Appendix 3** and **Figure 26** to **Figure 30.** The mining related noise sources were from engine noise, dozer tracks, dumping noise, mine hum, and modulated frequency reverse alarms.

Table 25 and **Table 26** compare the average noise monitoring results for this reporting period, historical monitoring results, and predictions made in the 2016 Statement of Environmental Effects (SEE). The results are generally consistent with historical monitoring results and below the predicted results in the SEE.

Table 25: Comparison of Average LA_{eq} Noise Results

Year	R13 Sandy Creek Road		R15 Queen Street		R17 Queen Street		R25 Sandy Creek Road		R32 Muscle Creek Road	
	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted
2023	30	40	23	37	19	34	30	41	18	32
2022	23	40	20	37	20	34	24	41	17	32
2021	24	40	22	37	18	34	27	41	25	32
2020	27	40	24	37	22	34	25	41	26	32
2019	29	40	25	37	24	34	29	41	20	32
2018	29	40	29	37	31	34	30	41	24	32

Table 26: Comparison of Average LA_{max} Noise Results

Year	R13 Sandy Creek Road		R15 Queen Street		R17 Queen Street		R25 Sandy Creek Road		R32 Muscle Creek Road	
	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted
2023	32	37	24	33	20	31	34	40	18	32
2022	25	37	22	33	22	31	26	40	19	32
2021	28	37	28	33	22	31	33	40	29	32
2020	31	37	28	33	26	31	28	40	29	32
2019	33	37	29	33	28	31	33	40	23	32
2018	34	37	34	33	37	31	35	40	26	32

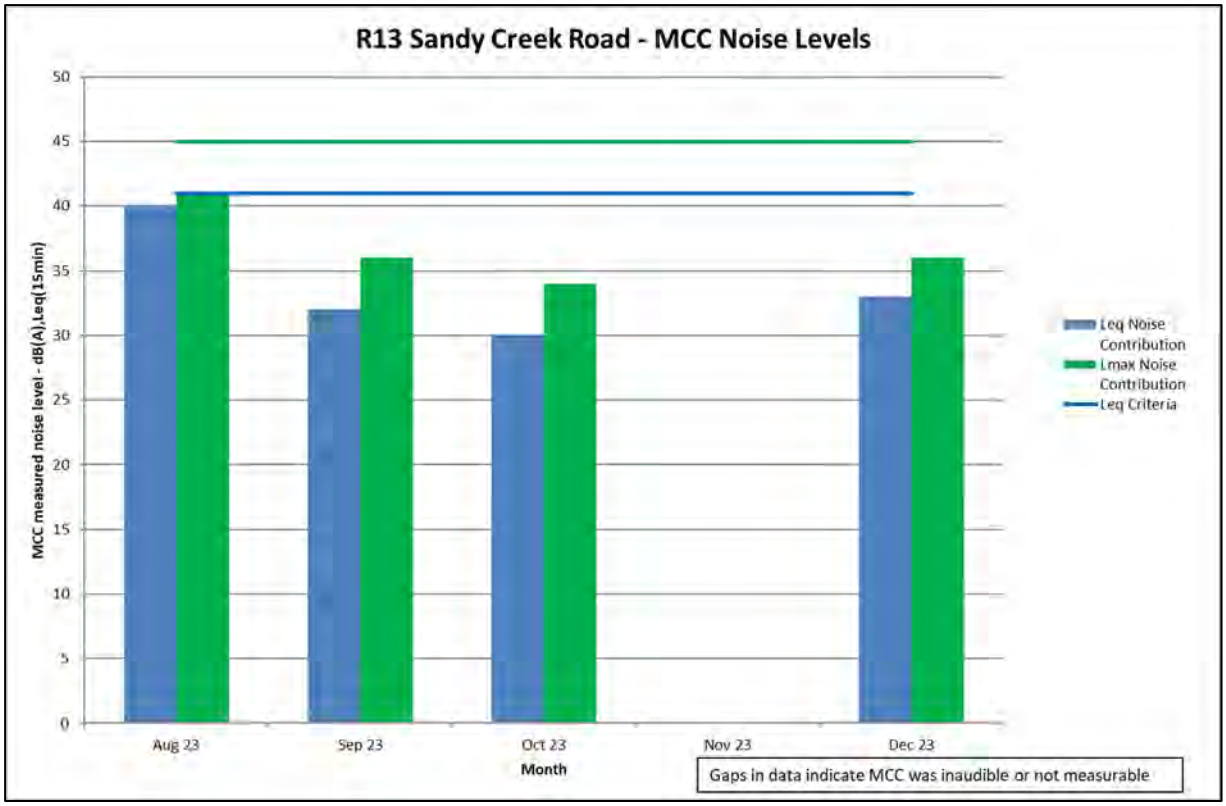

Figure 26: R13 Sandy Creek Road Noise Monitoring Results

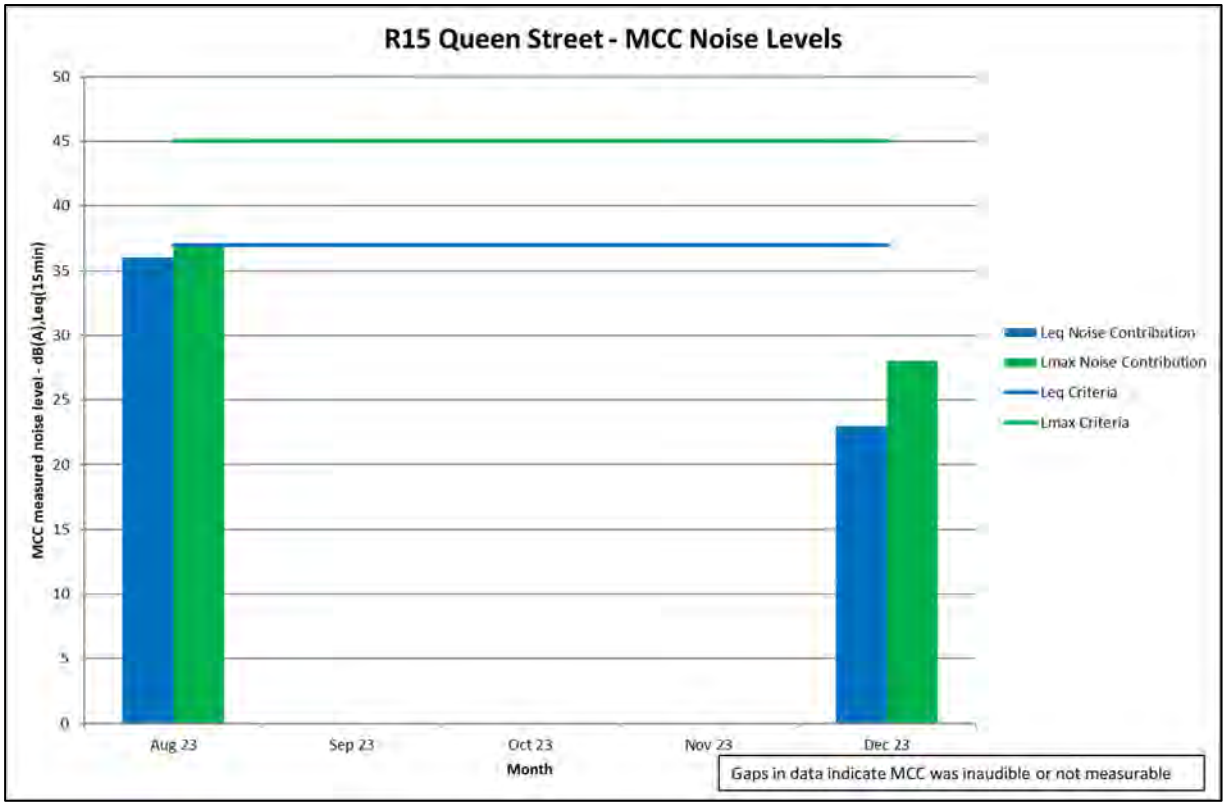

Figure 27: R15 Queen Street Noise Monitoring Results

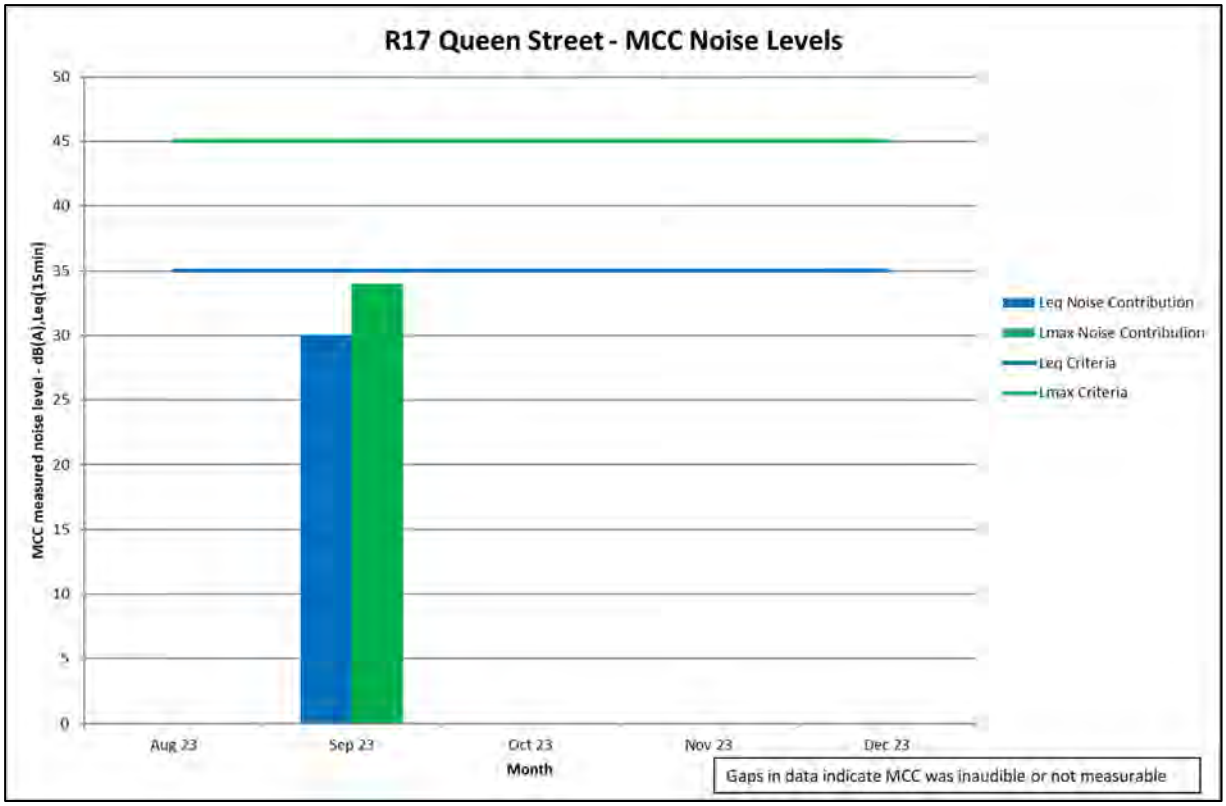

Figure 28: R17 Queen Street Noise Monitoring Results

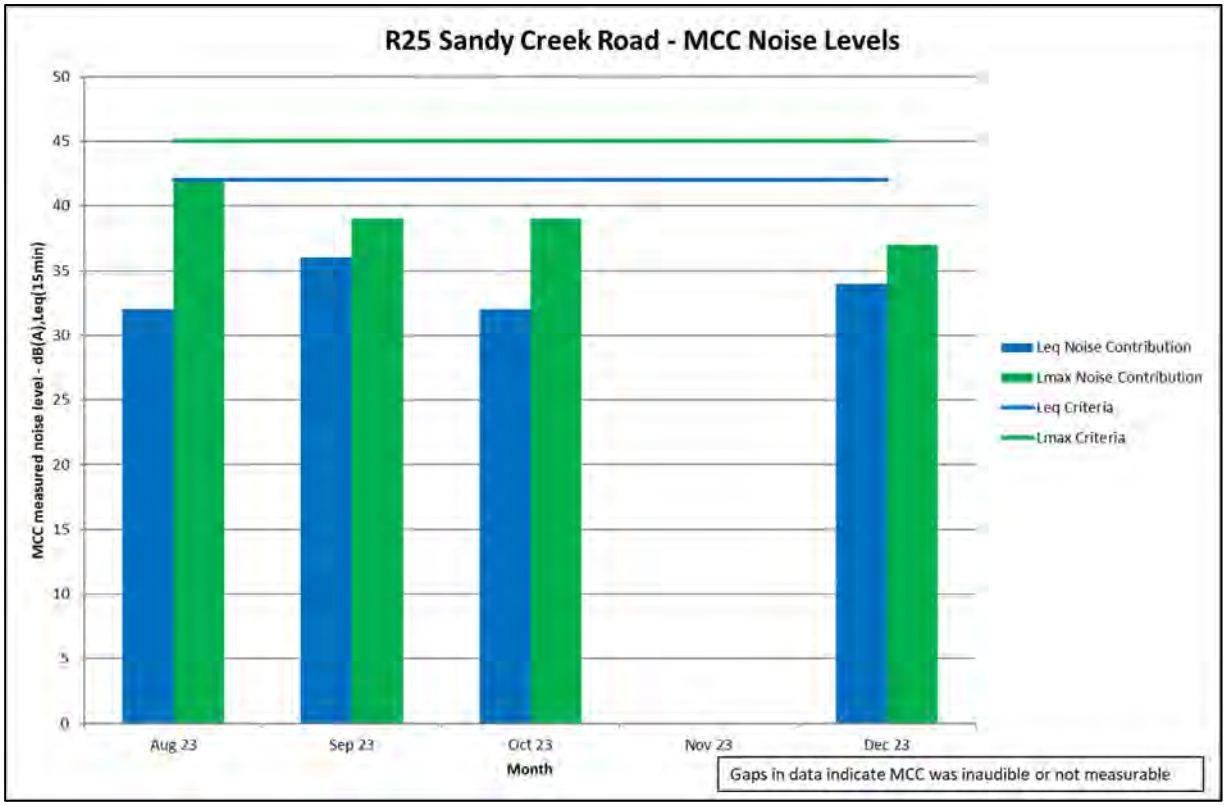

Figure 29: R25 Sandy Creek Road Noise Monitoring Results

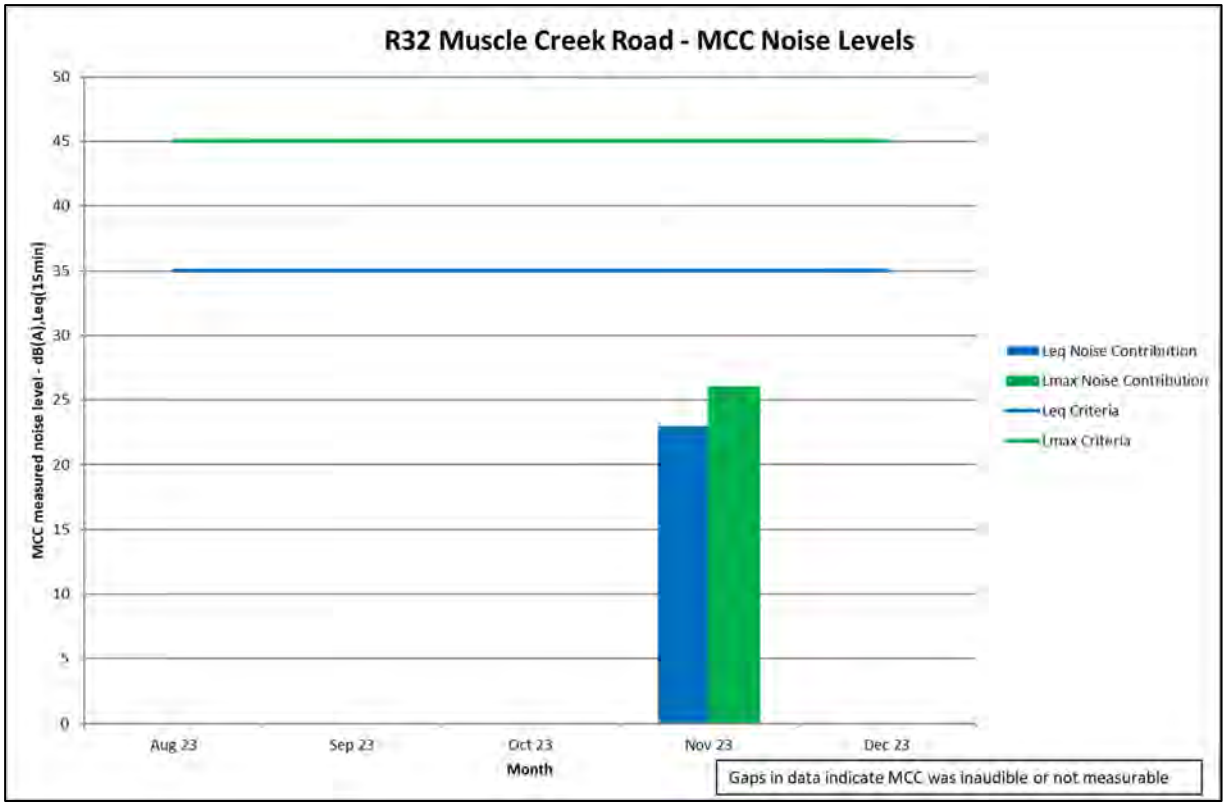

Figure 30: R32 Muscle Creek Road Noise Monitoring Results

3.12.3 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period MCC will continue to manage and monitor noise related impacts in accordance with the NMP. MCC will continue to work with MSC to obtain approval of the updated NMP.

3.13 VISUAL AMENITY, LIGHTING AND LANDSCAPING

During the reporting period MCC continued to operate in accordance with the approved Visual Amenity, Lighting and Landscaping Management Plan (VALLMP) prepared in accordance with condition 22 of the DA. During the reporting period, MCC updated the VALLMP following the end of mining to confirm the management requirements associated with the rehabilitation of the site. The VALLMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the VALLMP from MSC at the end of the reporting period.

The primary objectives of the VALLMP are to implement visual reduction strategies to minimise the visual amenity, lighting and landscape impact on the community and meet the development consent requirements.

During the next reporting period MCC will continue to manage visual amenity, lighting and landscaping in accordance with the VALLMP. MCC will continue to work with MSC to obtain approval of the updated VALLMP.

3.14 ABORIGINAL HERITAGE

During the reporting period, no ground disturbance operations required consultation with Aboriginal groups.

MCC has successfully completed salvage operations and continues to maintain and protect one Aboriginal cultural site located within the mine lease boundary. The site is fenced, and sign posted to prevent disturbance by mine personnel but is outside the area to be disturbed for mining. MCC has no ongoing requirement to protect the site post-mining. Once rehabilitation has been completed, the fencing and signage will be removed.

3.15 EUROPEAN HERITAGE

There are no European Heritage sites located at MCC that require ongoing management.

3.16 SPONTANEOUS COMBUSTION

3.16.1 ACTIVITIES THIS REPORTING PERIOD

During the reporting period MCC continued to operate in accordance with the approved Spontaneous Combustion Management Plan (SCMP) prepared in accordance with condition 31 of the DA. During the reporting period, MCC updated the SCMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The SCMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the SCMP from MSC at the end of the reporting period.

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

- The highwall and existing U/G mine workings in Open Cut 1,
- The overburden/interburden removal and coal removal in Open Cut 1,
- Active and recent emplacement areas within Open Cut 1,
- Open Cut 2,
- Coal emplacement and storage areas, and
- Elsewhere with the disturbance area.

The SCMP lists the preventative measures, control measures and trigger action response plans (TARP's) for each of these areas.

Regular spontaneous combustion reports are provided to both RR and EPA. These reports identify existing and new incidents of spontaneous combustion, mitigation procedures and improvements to these procedures, effectiveness of actions, areas capped, areas mined, areas under water infusion and complaints received. The report also includes a plan showing the extent and location of problem areas.

All affected areas during the reporting period were within the open cut and overburden emplacement areas. The areas that were treated each month are shown in **Table 27.** A historical comparison of affected areas without active control measures is provided in **Table 28**. There has been an increase in the amount of area affected by spontaneous combustion without active control this reporting period. This is due to the dozer push of carbonaceous material as part of the rehabilitation activities on site. While this work is occurring, it is not possible to use infusion sprays as they make the area unsafe to operate in. As part of the final landform establishment the carbonaceous material needs to be disturbed, which releases small areas of spontaneous combustion. This spontaneous combustion will be removed once the inert material is placed over the carbonaceous material during the landform establishment.

Table 27: Spontaneous Combustion Report Summary

Reporting Month	Areas Capped (m^2)	Areas Mined (m^2)	Area Under Water Infusion (m^2)
January	0	0	8,250
February	0	0	5,972
March	3,605	0	6,502
April	515	0	7,100
May	2,405	0	30,060
June	0	0	27,560
July	0	0	0
August	0	0	0
September	0	0	9,725
October	0	0	8,360
November	0	0	13,390
December	0	0	0

Table 28: Summary of Spontaneous Combustion Affected Areas Without Active Control

Total Area Affected by Spontaneous Combustion Without Active Control (m^2)						
	2018	**2019**	**2020**	**2021**	**2022**	**2023**
Jan-Mar	96	52	114	250	153	2,171
Apr-Jun	60	44	166	356	167	1,888
Jul-Sep	36	64	258	424	1,395	37,147
Oct-Dec	56	87	286	597	1,710	9,996
Yearly Average	**62**	**62**	**206**	**149**	**856**	**12,800**

One of the requirements of the SCMP is to prepare an annual plan in relation to spontaneous combustion management activities and then at the end of the reporting period to review the actual activities against the planned activities and identify any opportunities for improvement in relation to spontaneous combustion management. Below is a summary of the review of the action plan from this reporting period.

The planned activities for this reporting period were to commence final landform establishment of Open Cut 1 and the CHPP area. This work involved the movement of carbonaceous material into the final position and to continue covering this material with inert material. This work commenced in July 2023 and continued for the remainder of the reporting period. Prior to this work commencing spontaneous combustion management included infusion sprays and capping spontaneous combustion with material removed from on-site dams, as part of the clean out of mine water dams.

All the work was undertaken as per the plan. Gas levels and odour complaints were low throughout the reporting period.

3.16.2 ACTIVITIES NEXT REPORTING PERIOD

During the next reporting period MCC will continue to manage spontaneous combustion in accordance with the SCMP. MCC will continue to work with MSC to obtain approval of the updated SCMP.

3.17 BUSHFIRE

Management of bushfire risks are undertaken in accordance with the approved Bushfire Management Plan (BFMP) prepared in accordance with condition 23 of the DA. During the reporting period, MCC updated the BFMP following the end of mining to confirm the management and monitoring requirements associated with the rehabilitation of the site. The BFMP has been submitted to MSC for their review and approval. MCC is awaiting approval of the BFMP from MSC at the end of the reporting period.

The objectives of the Bushfire Management Plan are:

- To manage activities on site to minimise the risk of outbreak of fire,
- Contain fuel loads to acceptable levels to moderate fire intensity,
- To put in place hazard mitigation measures to contain an outbreak of fire should one occur, and
- To put in place arrangements to liaise with and support the Rural Fire Service (RFS) should an outbreak of fire occur at MCC or threaten MCC's operations.

There were no bushfire outbreaks within the development consent area during the reporting period. Annual inspections are conducted of the access tracks and powerline easements. These are slashed regularly to maintain access and reduce fuel loads. Weeds are sprayed in asset protection zones around all infrastructure, including buildings, electrical infrastructure and explosives storage facilities.

During the next reporting period MCC will continue bushfire management in accordance with the BFMP. MCC will continue to work with MSC to obtain approval of the updated BFMP.

3.18 HYDROCARBON CONTAMINATION

Hydrocarbon storage facilities were constructed as part of the workshop, stores and blasting facilities. These storage facilities comply with the requirements of *AS1940 – The storage and handling of flammable and combustible liquids*. Activities undertaken on site to reduce the risk of hydrocarbon contamination include:

- Above ground fuel storage tanks are self-bunded to contain any spillage which may occur,
- Waste oil from the workshop is stored in a bunded waste oil tank and is removed as required,
- Oily water runoff from the re-fuelling bay drains into an above ground sump which is fully bunded, and
- Runoff from the hardstand wash-down bay passes through a three-staged silt trap and an oil/water separator. The collected silt is routinely cleaned out.

3.19 METHANE DRAINAGE/VENTILATION

As no underground mining occurred at MCC during the reporting period, no methane drainage or ventilation was required.

3.20 PUBLIC SAFETY

During the reporting period, public safety was managed in accordance with current MCC procedures. Fences surrounding the operational areas and along property boundaries were inspected and maintained.

A security patrol is conducted by a local security firm when the site is not manned. A series of security cameras are established around the site to monitor access to the site.

3.21 OTHER ISSUES AND RISKS

No incidents of unauthorised damage to surface infrastructure were recorded during this reporting period.

4.0 COMMUNITY RELATIONS

MCC undertakes community consultation through the Community Consultative Committee, discussions with community members and operating a toll free 24-hour Environmental Contact Line (1800 600 205). MCC are a member of the Upper Hunter Mining Dialogue – a forum for the mining industry and the community to discuss concerns relating to mining impacts.

4.1 ENVIRONMENTAL COMPLAINTS

MCC operates a toll free 24-hour Environmental Contact Line where community members can communicate their concerns to site personnel. On receiving a complaint, site personnel investigate the complaint, take action to reduce impact as required and report back to the complainant with the findings. The recording of environmental complaints and the operation of the Environmental Contact Line is conducted in accordance with the MCC Development Consent and Environmental Protection Licence conditions.

Five complaints were received during the reporting period. More details on the complaints are provided in **Appendix 4**. **Table 29** and **Figure 31** provide a summary of the complaints received during the reporting period.

Table 29: Summary of Complaints

Type of Complaint	Number	Percentage
Odour	3	60%
Haulage	1	20%
Blast	1	20%
Total	**5**	**100%**

In comparison to the previous reporting periods, there has been a decrease in the number of complaints received. The complaint history chart is shown in **Figure 32**.

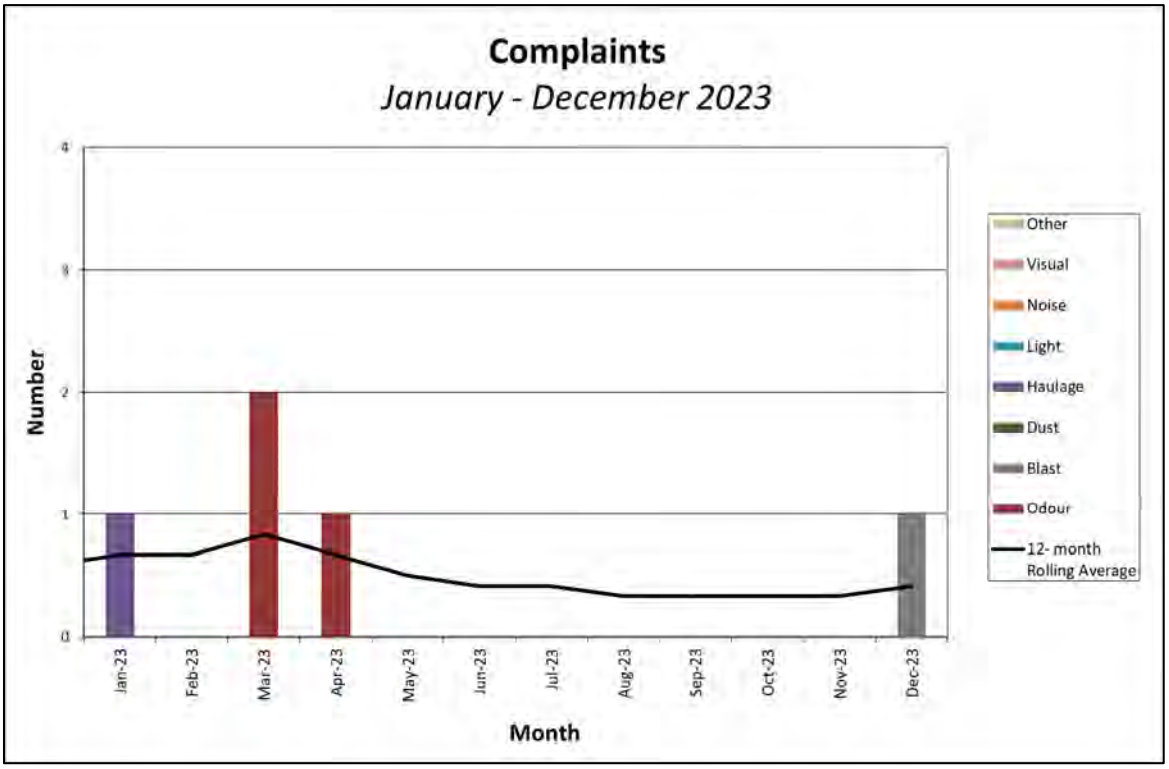

Figure 31: Complaint Summary

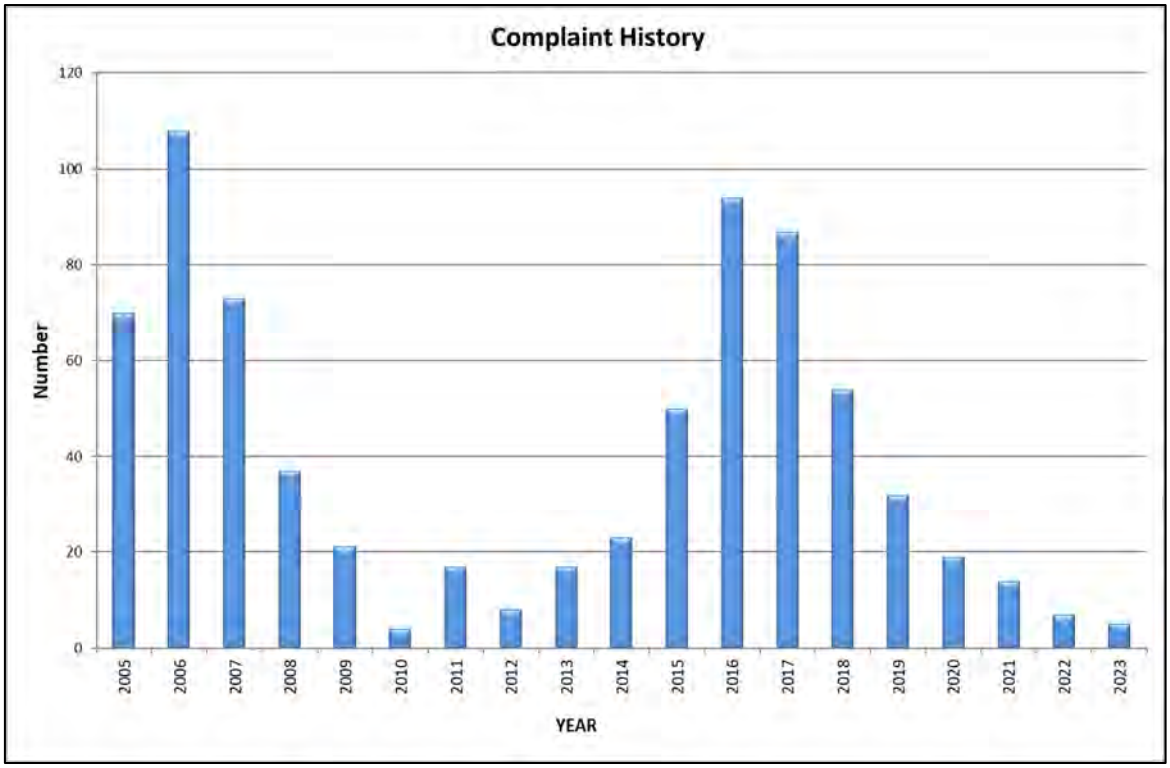

Figure 32: Complaint History

4.2 COMMUNITY LIAISON, SPONSORSHIPS AND DONATIONS

MCC personnel maintain contact with nearby residents and are committed to continually fostering and developing strong links with the community. Community support throughout the reporting period included donations to the following organisations:

- Variety – The Childrens Charity;
- Muswellbrook Council – Rock'n the Brook;
- Muswellbrook Race Club;
- Muswellbrook Rugby League Club;
- Wybong Wild Dog Association – Aerial Baiting;
- Special Childrens Christmas Party; and
- Cancer Council.

4.3 COMMUNITY CONSULTATIVE COMMITTEE

MCC's Community Consultative Committee (CCC) provides information regarding mine operations to the local community. The aim of the committee is to provide an effective communication mechanism so that members of the local community have adequate information on mining and environmental matters. CCC meetings were held in June 2023 and December 2023 at the MCC office with additional updates provided to the members in March 2023 and September 2023. Committee members are actively involved in the review of environmental monitoring data and are kept up to date on mining operations through presentations and site visits.

The CCC is comprised of one Councillor, one council staff representative, five community representatives (including Wanaruah Local Aboriginal Lands Council), a representative from Thiess and two MCC representatives.

5.0 ANNUAL REHABILITATION REPORT

Please refer to the 2023 Annual Rehabilitation Report for details of the rehabilitation undertaken during the reporting period. A copy of the report is available on MCC's website:
https://www.idemitsu.com.au/operations/muswellbrook-coal/approvals-plans-reports/

6.0 REHABILITATION FORWARD PROGRAM

Please refer to the 2024-2026 Forward Program for details of the rehabilitation proposed to be undertaken during the next reporting period. A copy of the report is available on MCC's website:
https://www.idemitsu.com.au/operations/muswellbrook-coal/approvals-plans-reports/

7.0 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

During the next reporting period, the following activities are planned:

- Implement the updated consent after approval by Council.
- Continue to work with Council to finalise the updates to the Environmental Management Plans.
- Continue to implement obligations in the Environmental Management Plans including the Rehabilitation Management Plan.
- Continue rehabilitation activities as committed to in the Forward Program.
- Continue with detailed environmental studies associated with the closure of the site.

Appendix 1: Air Quality Monitoring Results

REAL-TIME PM_{10} MONITORING RESULTS

January 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Jan-23	10.3	10.0	13.5
02-Jan-23	19.4	13.1	17.8
03-Jan-23	23.3	50.4	25.3
04-Jan-23	20.0	32.5	23.1
05-Jan-23	7.9	10.3	9.9
06-Jan-23	11.4	17.2	10.2
07-Jan-23	10.3	10.1	6.8
08-Jan-23	13.6	12.7	12.7
09-Jan-23	17.7	No Data	16.6
10-Jan-23	11.6	10.2	9.2
11-Jan-23	12.7	1.7	14.9
12-Jan-23	19.1	16.8	20.4
13-Jan-23	16.6	14.1	17.1
14-Jan-23	14.8	9.0	12.8
15-Jan-23	18.3	17.0	17.1
16-Jan-23	13.6	11.9	14.4
17-Jan-23	10.0	8.1	10.0
18-Jan-23	18.8	22.7	17.7
19-Jan-23	13.7	12.0	14.5
20-Jan-23	12.6	11.9	14.1
21-Jan-23	13.2	11.4	14.4
22-Jan-23	9.3	10.7	10.9
23-Jan-23	15.8	16.1	17.9
24-Jan-23	17.1	19.5	19.0
25-Jan-23	21.4	27.0	25.4
26-Jan-23	18.2	20.9	20.9
27-Jan-23	21.0	21.6	23.8
28-Jan-23	16.0	17.6	19.1
29-Jan-23	17.2	22.5	20.3
30-Jan-23	13.7	14.3	15.9
31-Jan-23	9.6	11.1	11.5

February 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Feb-23	14.7	19.0	18.2
02-Feb-23	11.1	25.6	16.3
03-Feb-23	18.2	31.5	25.8
04-Feb-23	13.2	43.3	21.3
05-Feb-23	16.7	22.9	30.3
06-Feb-23	25.7	No Data	29.6
07-Feb-23	17.9	15.7	21.0
08-Feb-23	14.4	15.3	15.9
09-Feb-23	12.7	14.8	11.5
10-Feb-23	13.3	18.1	14.3
11-Feb-23	11.8	18.3	No Data
12-Feb-23	21.3	27.7	No Data
13-Feb-23	23.6	24.6	No Data
14-Feb-23	14.3	13.9	11.8
15-Feb-23	15.1	13.5	12.6
16-Feb-23	16.3	18.3	19.8
17-Feb-23	23.7	24.8	26.6
18-Feb-23	22.5	23.3	26.6
19-Feb-23	18.6	20.2	23.0
20-Feb-23	15.8	12.5	16.2
21-Feb-23	20.5	21.1	24.8
22-Feb-23	8.9	9.4	8.4
23-Feb-23	12.7	13.4	13.8
24-Feb-23	12.3	12.4	12.1
25-Feb-23	11.6	15.1	17.1
26-Feb-23	10.8	15.1	16.5
27-Feb-23	13.0	83.5	17.3
28-Feb-23	19.6	18.3	19.2

March 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Mar-23	20.2	28.0	19.3
02-Mar-23	12.7	14.8	14.2
03-Mar-23	13.1	15.8	14.2
04-Mar-23	13.9	13.9	15.6
05-Mar-23	12.1	15.0	14.9
06-Mar-23	15.9	104.0	16.9
07-Mar-23	17.7	127.7	21.3
08-Mar-23	16.9	62.7	30.4
09-Mar-23	28.5	62.1	30.4
10-Mar-23	26.7	30.0	26.7
11-Mar-23	18.7	21.6	19.1
12-Mar-23	17.0	20.3	20.3
13-Mar-23	13.2	11.8	20.6
14-Mar-23	14.4	14.9	16.5
15-Mar-23	14.1	19.3	16.5
16-Mar-23	15.5	27.6	22.2
17-Mar-23	21.1	31.1	24.7
18-Mar-23	23.0	25.7	22.7
19-Mar-23	18.5	27.4	26.9
20-Mar-23	31.6	39.8	29.1
21-Mar-23	14.3	12.9	18.2
22-Mar-23	16.8	14.5	20.2
23-Mar-23	12.9	17.6	13.9
24-Mar-23	11.7	12.6	14.3
25-Mar-23	9.2	8.4	10.2
26-Mar-23	14.2	11.9	15.2
27-Mar-23	9.9	12.0	12.8
28-Mar-23	14.6	15.4	14.7
29-Mar-23	8.4	19.0	12.6
30-Mar-23	5.4	13.5	12.8
31-Mar-23	7.4	13.8	11.3

April 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Apr-23	14.0	14.1	13.0
02-Apr-23	11.5	No Data	15.5
03-Apr-23	7.0	No Data	10.8
04-Apr-23	6.3	5.2	4.2
05-Apr-23	14.3	13.2	8.6
06-Apr-23	7.5	7.5	5.1
07-Apr-23	7.7	10.3	6.4
08-Apr-23	10.4	13.9	13.8
09-Apr-23	9.5	11.5	11.4
10-Apr-23	8.3	13.2	10.7
11-Apr-23	9.1	14.1	12.5
12-Apr-23	8.6	15.0	9.9
13-Apr-23	10.5	10.9	10.0
14-Apr-23	11.4	10.0	9.4
15-Apr-23	7.1	9.0	7.1
16-Apr-23	15.2	22.4	19.2
17-Apr-23	15.9	17.2	13.6
18-Apr-23	14.7	14.9	14.4
19-Apr-23	16.3	18.3	15.5
20-Apr-23	15.3	13.2	12.1
21-Apr-23	14.7	14.0	14.1
22-Apr-23	15.5	12.3	12.4
23-Apr-23	9.5	9.6	10.5
24-Apr-23	14.2	10.3	12.8
25-Apr-23	11.1	19.9	14.6
26-Apr-23	10.4	11.7	8.5
27-Apr-23	10.9	16.0	9.3
28-Apr-23	11.2	20.0	13.6
29-Apr-23	13.3	No Data	16.7
30-Apr-23	4.7	No Data	6.5

May 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-May-23	6.8	No Data	8.9
02-May-23	7.9	No Data	11.9
03-May-23	7.9	14.1	14.1
04-May-23	19.4	27.7	21.3
05-May-23	15.4	22.0	13.9
06-May-23	13.1	15.7	13.9
07-May-23	9.3	15.4	14.5
08-May-23	7.2	14.7	10.3
09-May-23	10.0	12.1	11.5
10-May-23	11.8	15.5	11.9
11-May-23	11.7	21.8	13.2
12-May-23	12.9	17.4	13.7
13-May-23	16.2	21.8	17.5
14-May-23	12.1	12.2	14.7
15-May-23	7.4	11.5	10.0
16-May-23	13.1	17.4	17.3
17-May-23	16.4	13.3	13.8
18-May-23	9.7	10.2	10.4
19-May-23	7.8	13.4	10.9
20-May-23	9.4	15.3	12.7
21-May-23	No Data	22.0	16.0
22-May-23	No Data	17.5	11.3
23-May-23	No Data	31.7	14.2
24-May-23	14.4	30.8	18.2
25-May-23	12.3	28.6	15.1
26-May-23	16.0	29.8	22.3
27-May-23	7.8	15.1	13.8
28-May-23	5.8	9.8	10.2
29-May-23	7.3	17.2	11.5
30-May-23	7.9	21.6	12.5
31-May-23	9.3	25.4	10.4

June 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Jun-23	11.1	18.0	13.9
02-Jun-23	19.9	21.6	19.5
03-Jun-23	19.7	21.4	20.0
04-Jun-23	15.8	15.7	18.2
05-Jun-23	13.2	13.3	17.0
06-Jun-23	12.0	16.4	14.1
07-Jun-23	13.4	17.9	11.8
08-Jun-23	8.0	14.9	11.7
09-Jun-23	6.3	10.3	7.4
10-Jun-23	7.7	13.4	10.7
11-Jun-23	8.8	12.4	10.2
12-Jun-23	14.1	20.0	17.1
13-Jun-23	12.1	15.7	8.1
14-Jun-23	6.2	11.4	7.2
15-Jun-23	7.3	12.1	9.4
16-Jun-23	7.1	No Data	8.6
17-Jun-23	7.3	No Data	10.9
18-Jun-23	12.6	16.7	17.9
19-Jun-23	6.4	11.1	6.5
20-Jun-23	7.9	11.6	12.3
21-Jun-23	11.9	16.1	13.5
22-Jun-23	19.2	29.3	23.1
23-Jun-23	9.4	13.8	10.5
24-Jun-23	4.0	6.3	4.4
25-Jun-23	5.8	9.1	11.4
26-Jun-23	7.3	10.0	11.4
27-Jun-23	8.3	12.3	11.8
28-Jun-23	9.2	12.5	11.2
29-Jun-23	3.9	6.5	5.3
30-Jun-23	5.4	8.6	6.2

July 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Jul-23	4.3	7.2	4.6
02-Jul-23	9.4	12.4	11.1
03-Jul-23	13.7	16.0	11.9
04-Jul-23	11.1	10.3	5.4
05-Jul-23	3.6	7.6	2.4
06-Jul-23	2.4	3.4	1.4
07-Jul-23	3.8	4.6	3.3
08-Jul-23	4.4	5.7	4.4
09-Jul-23	10.9	13.0	11.2
10-Jul-23	6.1	10.5	6.0
11-Jul-23	8.5	11.7	8.5
12-Jul-23	13.9	18.7	12.6
13-Jul-23	9.7	20.0	15.3
14-Jul-23	11.1	28.3	11.0
15-Jul-23	9.9	14.0	11.1
16-Jul-23	15.3	16.6	17.8
17-Jul-23	12.0	17.7	13.6
18-Jul-23	10.6	23.2	16.1
19-Jul-23	16.9	11.8	11.6
20-Jul-23	9.2	25.8	9.8
21-Jul-23	9.8	38.5	12.4
22-Jul-23	12.3	15.9	12.3
23-Jul-23	11.4	14.2	13.3
24-Jul-23	10.8	10.0	10.6
25-Jul-23	12.1	11.9	11.8
26-Jul-23	9.0	26.7	12.6
27-Jul-23	7.6	35.3	15.5
28-Jul-23	11.0	54.1	14.1
29-Jul-23	11.3	15.5	15.1
30-Jul-23	10.9	15.6	18.0
31-Jul-23	6.9	63.7	13.7

August 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Aug-23	10.6	38.9	18.3
02-Aug-23	24.0	32.6	18.9
03-Aug-23	17.1	30.9	17.0
04-Aug-23	15.7	29.2	18.8
05-Aug-23	16.8	18.1	17.2
06-Aug-23	16.7	14.3	16.6
07-Aug-23	11.8	10.3	11.1
08-Aug-23	16.6	11.9	10.0
09-Aug-23	7.5	21.8	12.1
10-Aug-23	15.7	66.4	20.7
11-Aug-23	18.7	21.9	21.4
12-Aug-23	24.3	37.2	26.0
13-Aug-23	18.8	23.5	24.5
14-Aug-23	9.7	13.0	12.3
15-Aug-23	9.0	7.5	9.0
16-Aug-23	10.2	15.5	10.0
17-Aug-23	9.8	21.9	12.0
18-Aug-23	6.5	8.7	8.0
19-Aug-23	7.4	9.6	8.9
20-Aug-23	6.8	7.8	7.1
21-Aug-23	6.6	19.2	9.6
22-Aug-23	9.3	35.4	13.8
23-Aug-23	12.5	20.0	14.3
24-Aug-23	12.9	11.9	13.4
25-Aug-23	12.5	20.2	11.7
26-Aug-23	15.2	17.9	17.0
27-Aug-23	13.7	13.8	13.0
28-Aug-23	14.0	18.3	14.2
29-Aug-23	17.9	28.4	17.3
30-Aug-23	19.4	46.1	20.1
31-Aug-23	9.6	17.5	10.1

September 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Sep-23	10.3	13.6	11.3
02-Sep-23	12.1	9.6	9.8
03-Sep-23	12.5	13.2	12.7
04-Sep-23	18.7	23.0	17.5
05-Sep-23	16.5	40.3	20.6
06-Sep-23	14.9	29.2	14.8
07-Sep-23	28.8	42.3	34.5
08-Sep-23	8.4	14.1	10.4
09-Sep-23	7.8	9.7	10.0
10-Sep-23	12.6	12.8	11.9
11-Sep-23	12.3	18.0	11.8
12-Sep-23	18.8	23.0	18.0
13-Sep-23	21.5	24.5	19.8
14-Sep-23	17.8	21.7	18.3
15-Sep-23	16.3	29.0	20.9
16-Sep-23	13.6	17.8	15.7
17-Sep-23	17.9	21.0	19.0
18-Sep-23	20.1	37.3	22.7
19-Sep-23	22.3	51.3	25.5
20-Sep-23	20.8	65.2	26.6
21-Sep-23	25.0	34.7	26.3
22-Sep-23	15.7	15.5	17.3
23-Sep-23	15.2	10.5	12.8
24-Sep-23	10.8	11.2	12.2
25-Sep-23	12.5	19.9	18.7
26-Sep-23	22.7	25.0	22.5
27-Sep-23	25.4	26.3	24.0
28-Sep-23	15.0	14.4	12.7
29-Sep-23	15.0	17.2	16.0
30-Sep-23	17.8	23.7	18.6

October 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Oct-23	22.1	33.1	22.6
02-Oct-23	43.3	41.5	43.4
03-Oct-23	25.3	44.8	23.4
04-Oct-23	20.9	39.1	22.8
05-Oct-23	5.6	9.7	7.7
06-Oct-23	10.9	13.4	14.9
07-Oct-23	12.8	12.8	14.0
08-Oct-23	9.8	8.6	10.1
09-Oct-23	12.3	14.5	12.5
10-Oct-23	20.6	18.7	20.8
11-Oct-23	16.4	18.4	17.2
12-Oct-23	21.6	35.9	16.3
13-Oct-23	13.0	15.7	18.8
14-Oct-23	12.1	17.3	17.5
15-Oct-23	18.7	20.9	17.6
16-Oct-23	22.0	39.1	29.6
17-Oct-23	23.6	18.2	20.1
18-Oct-23	16.0	11.8	13.9
19-Oct-23	No Data	No Data	No Data
20-Oct-23	No Data	No Data	No Data
21-Oct-23	22.2	22.4	19.3
22-Oct-23	25.9	40.5	35.9
23-Oct-23	16.7	28.5	17.9
24-Oct-23	25.3	38.0	23.6
25-Oct-23	27.8	49.8	39.1
26-Oct-23	17.6	14.9	16.1
27-Oct-23	8.9	7.7	7.3
28-Oct-23	7.8	7.1	6.5
29-Oct-23	7.9	8.9	7.7
30-Oct-23	13.3	39.4	14.4
31-Oct-23	25.0	44.0	30.9

November 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Nov-23	26.2	24.5	26.9
02-Nov-23	14.6	14.6	16.5
03-Nov-23	17.2	No Data	16.3
04-Nov-23	15.9	12.4	13.8
05-Nov-23	9.9	9.6	10.9
06-Nov-23	12.0	12.4	14.4
07-Nov-23	15.6	15.7	15.5
08-Nov-23	16.6	18.7	15.5
09-Nov-23	10.2	21.9	11.2
10-Nov-23	10.9	14.6	15.2
11-Nov-23	11.2	16.1	12.6
12-Nov-23	13.2	37.3	15.9
13-Nov-23	27.7	30.4	32.5
14-Nov-23	23.6	22.2	26.2
15-Nov-23	21.9	24.9	25.5
16-Nov-23	22.5	24.8	24.6
17-Nov-23	13.1	13.3	14.4
18-Nov-23	13.4	10.5	13.3
19-Nov-23	14.5	14.1	14.9
20-Nov-23	14.1	18.4	20.8
21-Nov-23	8.3	10.5	11.8
22-Nov-23	11.8	12.9	14.1
23-Nov-23	13.9	13.6	15.9
24-Nov-23	12.7	8.9	9.1
25-Nov-23	5.1	1.9	5.4
26-Nov-23	6.6	8.1	7.9
27-Nov-23	13.0	19.7	14.9
28-Nov-23	15.7	15.5	16.6
29-Nov-23	11.5	16.2	11.8
30-Nov-23	6.4	15.1	13.9

December 2023			
SAMPLE DATE	SITE 7	SITE 8	SITE 9
01-Dec-23	8.9	24.2	15.1
02-Dec-23	8.3	9.1	9.4
03-Dec-23	9.9	12.3	14.0
04-Dec-23	12.3	13.2	15.0
05-Dec-23	19.5	24.3	18.1
06-Dec-23	34.4	46.3	34.5
07-Dec-23	50.6	44.9	32.2
08-Dec-23	36.1	48.7	24.3
09-Dec-23	38.0	46.4	28.9
10-Dec-23	25.2	21.6	25.1
11-Dec-23	35.1	30.9	32.6
12-Dec-23	17.2	18.5	20.5
13-Dec-23	29.0	60.5	27.6
14-Dec-23	31.7	80.3	27.7
15-Dec-23	32.3	36.8	31.7
16-Dec-23	20.0	26.4	25.2
17-Dec-23	28.8	29.9	32.9
18-Dec-23	42.5	32.4	34.5
19-Dec-23	39.8	No Data	32.8
20-Dec-23	14.7	No Data	16.7
21-Dec-23	6.5	No Data	9.1
22-Dec-23	17.2	21.3	21.5
23-Dec-23	14.9	13.1	15.3
24-Dec-23	8.9	8.6	9.0
25-Dec-23	14.7	14.2	14.8
26-Dec-23	10.8	10.9	8.9
27-Dec-23	13.1	24.9	14.9
28-Dec-23	17.0	21.6	14.0
29-Dec-23	18.8	20.8	15.0
30-Dec-23	20.5	13.3	16.2
31-Dec-23	10.1	13.7	16.7

Appendix 2: Water Monitoring Results

SURFACE WATER MONITORING RESULTS – pH

Date	Dam 1/2	MCC12	No.2 Open Cut Void	No.1 Open Cut Void	MCC07	MCC08	MCC9	MCC23	MCC24	MCC25	MCC26	MCC27	MCC28
January	8.26	8.43	No access	No access	7.68	7.75	8.25	8.42	8.24	7.86	8.49	8.30	Dry
February	8.30	8.03	7.46	7.88	7.65	**7.66**	8.33	8.45	8.18	8.02	8.41	8.39	7.74
March	8.30	8.49	No access	7.88	7.53	**7.60**	8.50	8.64	8.17	7.67	8.24	8.34	8.28
April	8.35	Dry	No access	7.57	7.59	7.74	8.56	8.68	8.28	8.02	8.34	8.30	7.96
May	8.20	No access	No access	7.77	**7.62**	7.72	8.62	8.62	8.34	8.54	8.38	8.26	8.10
June	7.94	8.25	No access	7.94	7.71	7.76	8.64	8.59	8.37	7.92	8.39	8.21	8.15
July	8.03	8.31	No access	7.96	**7.66**	**7.66**	8.77	8.62	8.42	8.00	8.47	8.23	8.45
August	7.96	8.39	No access	No access	**7.63**	**7.68**	8.88	8.58	8.51	8.81	8.47	8.26	8.66
September	7.86	8.34	No access	No access	**7.59**	**7.69**	9.30	8.63	8.62	9.01	8.45	8.31	8.21
October	7.82	8.33	No access	No access	7.76	7.75	8.93	8.52	8.48	8.20	8.23	8.34	8.57
November	7.89	8.44	No access	No access	7.76	7.76	8.71	8.73	8.62	8.40	8.41	8.80	8.99
December	7.85	8.64	No access	No access	7.89	7.77	8.13	8.73	8.93	8.63	8.38	8.75	Dry

SURFACE WATER MONITORING RESULTS – ELECTRICAL CONDUCTIVITY (µS/cm)

Date	Dam 1/2	MCC12	No.2 Open Cut Void	No.1 Open Cut Void	MCC07	MCC08	MCC9	MCC23	MCC24	MCC25	MCC26	MCC27	MCC28
January	5,600	6,120	No access	No access	1,680	2,260	3,000	10,400	4,380	1,460	9,670	8,890	Dry
February	5,310	5,290	4,350	5,180	1,850	2,370	2,770	9,690	4,010	1,360	8,790	8,060	2,000
March	5,980	6,030	No access	5,370	2,320	3,230	3,290	10,600	4,660	1,490	9,620	8,650	4,420
April	6,620	Dry	No access	5,840	2,370	2,860	3,280	12,100	5,360	1,600	10,700	9,550	1,660
May	6,450	No access	No access	5,680	2,190	3,100	3,270	11,900	5,350	1,560	10,700	9,360	1,820
June	6,060	8,500	No access	6,080	2,700	3,680	3,830	12,100	5,480	1,660	10,900	9,810	1,790
July	5,970	8,310	No access	6,130	2,670	3,780	3,790	12,100	5,440	1,570	10,800	9,770	879
August	6,150	8,610	No access	No access	2,700	4,140	3,940	12,300	5,590	1,560	10,900	9,940	1,440
September	6,230	5,220	No access	No access	3,490	4,470	3,780	12,200	5,510	1,510	10,500	9,730	1,710
October	6,520	5,820	No access	No access	3,990	5,390	4,340	13,600	5,940	1,610	12,200	11,000	1,720
November	6,650	5,900	No access	No access	4,330	5,840	5,550	13,300	6,140	1,720	12,500	11,000	1,750
December	6,430	6,870	No access	No access	5,010	5,940	6,910	13,300	6,230	1,920	13,200	11,400	Dry

SURFACE WATER MONITORING RESULTS – TOTAL SUSPENDED SOLIDS (mg/L)

Date	Dam 1/2	MCC12	No.2 Open Cut Void	No.1 Open Cut Void	MCC07	MCC08	MCC9	MCC23	MCC24	MCC25	MCC26	MCC27	MCC28
January	51	11	No access	No access	3	<5	21	16	13	24	7	6	Dry
February	8	13	17	26	7	8	12	11	14	20	12	12	35
March	6	18	No access	<5	<5	<5	<5	13	<5	17	6	5	5
April	10	Dry	No access	8	8	6	16	32	15	11	13	6	6
May	11	No access	No access	6	<5	8	8	28	6	28	7	6	<5
June	5	35	No access	12	<5	6	<5	5	14	14	<5	<5	<5
July	9	27	No access	14	7	21	7	6	17	19	10	11	<5
August	5	14	No access	No access	<5	13	7	63	25	65	14	8	13
September	13	14	No access	No access	10	14	9	15	20	34	28	10	22
October	<5	21	No access	No access	6	12	19	27	14	28	31	9	5
November	9	8	No access	No access	8	29	14	21	12	40	44	18	<5
December	13	<5	No access	No access	12	8	<5	<5	24	59	<5	<5	Dry

Extra analysis for quarterly surface water data is available from MCC on request.

GROUND WATER MONITORING RESULTS – DEPTH TO WATER (mbgl)

Date	RDH529	RDH616	RDH617	RDH624	RDH650	MCC1003	MCC1005	MCC1006	MCC1017	MCC1018
February	No data	52.64	45.93	32.19	125.28	2.69	6.60	4.20	16.77	17.53
April	No data	52.29	45.66	33.30	125.18	3.52	Removed from program – unsafe to access due to wombat hole	5.01	16.83	17.51
June	No data	51.88	45.74	33.38	125.16	4.02		5.62	16.78	17.40
August	113.7	52.87	45.61	33.50	125.16	4.46		9.27	16.81	17.47
October	116.7	53.23	45.65	33.63	Removed from program – bailer stuck; no samples can be collected	4.82		6.71	16.78	17.58
December	116.7	53.03	45.61	33.75		5.31		7.22	16.75	17.67

GROUND WATER MONITORING RESULTS – pH

Date	RDH529	RDH616	RDH617	RDH624	RDH650	MCC1003	MCC1005	MCC1006	MCC1017	MCC1018
February	6.94	Depth only	Depth only	6.96	6.75	7.14	7.05	Depth only	Depth only	6.85
April	7.29			6.66	6.52	7.22	Removed from program – unsafe to access due to wombat hole			6.75
June	7.14			6.59	6.42	7.11				6.87
August	7.35			6.69	No result	7.37				7.10
October	7.06			6.62	Removed from program – bailer stuck; no samples can be collected	7.09				6.99
December	6.88			6.65		7.08				6.86

GROUND WATER MONITORING RESULTS – Electrical Conductivity

Date	RDH529	RDH616	RDH617	RDH624	RDH650	MCC1003	MCC1005	MCC1006	MCC1017	MCC1018
February	5,900	Depth only	Depth only	5,970	4,950	1,370	2,160	Depth only	Depth only	9,220
April	5,940			5,680	5,210	1,529	Removed from program – unsafe to access due to wombat hole			9,710
June	5,700			5,390	4,730	1,442				8,930
August	5,820			6,150	No result	1,487				8,850
October	5,450			5,070	Removed from program – bailer stuck; no samples can be collected	1,552				8,770
December	5,670			5,230		1,456				7,800

Extra analysis for bi-monthly groundwater data is available from MCC on request.

Appendix 3: Noise Monitoring

Noise Monitoring Results – MCC Contribution LA_{eq}

Month	R13 Sandy Creek Rd	Criteria	R15 Queen St	Criteria	R17 Queen St	Criteria	R25 Sandy Creek Rd	Criteria	R32 Muscle Creek Rd	Criteria
Aug 23	40	41	36	37	Inaudible	35	32	42	Inaudible	35
Sep 23	32	41	<20	37	30	35	36	42	<20	35
Oct 23	30	41	<20	37	<20	35	32	42	Inaudible	35
Nov 23	Inaudible	41	Inaudible	37	Inaudible	35	Inaudible	42	23	35
Dec 23	33	41	23	37	Inaudible	35	34	42	Inaudible	35

Noise Monitoring Results – MCC Contribution $LA1_{1min}$

Month	R13 Sandy Creek Rd	R15 Queen St	R17 Queen St	R25 Sandy Creek Rd	R32 Muscle Creek Rd	Criteria
Aug 23	41	37	Inaudible	42	Inaudible	45
Sep 23	36	<20	34	39	<20	45
Oct 23	34	<20	<20	39	Inaudible	45
Nov 23	Inaudible	Inaudible	Inaudible	Inaudible	26	45
Dec 23	36	28	Inaudible	37	Inaudible	45

Appendix 4: Complaints Summary

SUMMARY OF COMPLAINTS

Date of Complaint	Time of Complaint	Date of Incident	Time of Incident	Location	Type of Complaint	Mode of Contact	Nature of Complaint	Action Taken
19-Jan-23	10:30 AM	18-Jan-23	4:00 PM	Other	HAULAGE	Environmental Hotline - Environmental Superintendent responded	Damage to car (headlight) from coal falling off a truck & dog hauling coal.	Truck had a red tarp and was travelling north. Photo sent through of damaged headlight. Quote received for repairs - agreed that MCC would pay for repair. Incident will be noted in TBT to Haulage Operators with a reminder to check their vehicles after loading and tipping for hang-up.
03-Mar-23	9:39 AM	03-Mar-23	9:39 AM	McCully's Gap	ODOUR	Environmental Hotline & direct call to MCC Office - Ops Manager responded	Reported being able to smell burning coal	Caller was interested in information relating to mine cessation and commencement of rehabilitation. Ops Manager explained spray had been moved previous day which may have contributed to odour. Will continue to infuse areas showing signs of heating and areas will be capped as part of rehabilitation.
06-Mar-23	1:36 PM	06-Mar-23	1:36 PM	Woodlands Ridge	ODOUR	Environmental Hotline - Environmental Superintendent (ES) responded	Caller wanted to know how much longer the smell from the mine would continue.	No mining activities. Spon com management activities, including infusion sprays currently in place. ES discussed status of operations plus rehabilitation activities still to be undertaken. Complainant was appreciative of the feedback.
06-Apr-23	9:16 AM	06-Apr-23	9:16 AM	Woodlands Ridge	ODOUR	Direct call to MCC Office	Spon com odour	No activities at time of complaint. Wind direction indicates wind was not blowing from MCC towards complainant's house at the time of the complaint. Source of odour is most likely from somewhere else.
15-Dec-23	1:12 PM	15-Dec-23	9:45 AM	Muswellbrook	BLAST	Environmental Hotline - Thiess Environment & Community Superintendent responded.	Massive shake in the house	Blast 2 in Zone 2 at 9:45am. Results were within criteria. Blast design and performance will be reviewed for Blast 3. Thiess Environment & Community Superintendent attempted to call complainant, but there was no answer. A message was left.