

Dubbo Quarry

Air quality management plan

Prepared for Holcim (Australia) Pty Limited

September 2023

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Air quality management plan

Holcim (Australia) Pty Limited

E211117 RP4

September 2023

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Approved by



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26 September 2023

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1 Introduction

This Air Quality Management Plan (AQMP) for Dubbo Quarry (the quarry) has been prepared by EMM Consulting Pty Limited (EMM) on behalf of Holcim (Australia) Pty Ltd (Holcim). The AQMP has been prepared to comply with the requirements of condition B22 of Schedule 2 of the quarry's development consent (development consent, SSD 10417).

1.1 Background

Holcim (Australia) Pty Limited (Holcim) are the owners and operators of Dubbo Quarry (the quarry) located on Sheraton Road, Dubbo (Figure 1.1). The quarry has been operating since 1980 under a development consent granted by the former Talbragar Shire Council, now Dubbo Regional Council. Accessible basalt resources within the existing quarry boundary are close to exhaustion and planning approval (SSD 10417) was granted to allow the quarry to continue operating as the Dubbo Quarry Continuation Project (henceforth referred to as 'the project'). The project involves continued operation of the quarry through the development of two new resource areas to the south and west of the existing quarry boundary.

The project was classified as a State Significant Development (SSD) 10417 under Part 4, Division 4.7 of the NSW *Environmental Planning Assessment Act 1979* (EP&A Act).

The quarry is within an existing industrial precinct that consists of the South Keswick Quarry and Concrete Batching Plant, operated by Regional Hardrock Pty Ltd (MAAS Group), and Boral's Eulomogo Quarry (currently non-operational).

1.2 Project overview

The project involves expansion of existing quarry activities into two new resource areas:

- the quarry Western Extension Area (WEA) is located within part Lot 22 DP 793541, west and north-west of the existing quarry boundary
- the Southern Extension Area (SEA) is located within part Lot 100 DP 628628, to the south of the existing quarry boundary on the southern side of Eulomogo Creek.

The current consent restricts extraction and transportation of product by road to 500,000 tonnes per calendar year.

1.3 Purpose and scope

The AQMP describes the measures to be implemented by Holcim to manage air quality and greenhouse gas (GHG) emissions at the quarry, and the air quality monitoring requirements relating to condition B22 of the development consent.

The objectives of the AQMP are to:

- provide the quarry's employees and contractors with a description of their responsibilities regarding air quality and GHG management
- address the conditions/requirements of the development consent and other guidelines that are relevant to the AQMP
- describe the measures to be implemented to monitor air quality emissions from the quarry against relevant regulatory criteria

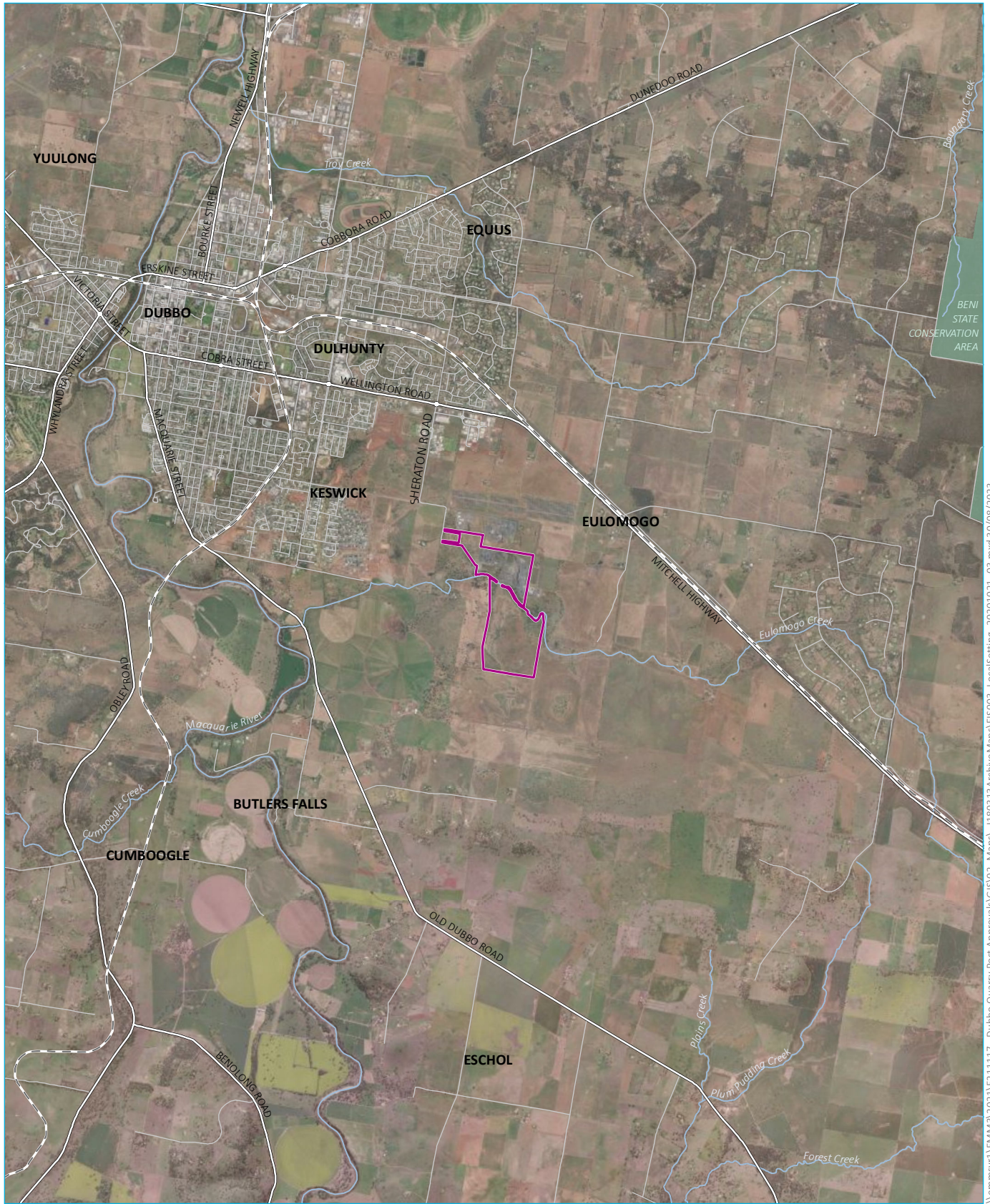
- provide a mechanism for assessing air quality monitoring results against the relevant regulatory criteria
- provide a mechanism for assessing the effectiveness of the air quality monitoring program
- provide mechanisms for the establishment of best practice with respect to minimising air quality and GHG impacts.

1.4 Report preparation

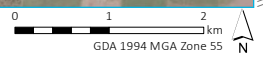
This AQMP has been prepared by Air Quality Associate, Francine Manansala and reviewed by Associate Director – Air Quality, Dr Paul Boulter. Francine has over 14 years of experience as an air quality consultant, specialising in atmospheric dispersion modelling, air quality impact assessments, meteorological processes, ambient air quality and management plans. Dr Paul Boulter has over 27 years of experience as an air quality specialist. He has extensive experience in emission model development, impact assessment, monitoring and air quality management.

1.5 Consultation

Condition B22 (b) of the development consent requires that the AQMP be prepared in consultation with the NSW Environment Protection Authority (EPA). This draft AQMP was provided to the EPA for review, via the DPE portal on 22 June 2023. A copy of the EPA's response is provided as Appendix A. The EPA's response does not provide any comments on the AQMP.



DFSI (2017); DFSI (2020); EMM (2023); ESRI (2023)



- KEY**
- Project area
 - Rail line
 - Major road
 - Minor road
 - Named watercourse
 - NPWS reserve

Local context

Dubbo Quarry Continuation Project
Air Quality Management Plan
Figure 1.1



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2 Environmental requirements

2.1 Legislation

This AQMP provides recommended air quality management measures for the quarry. The AQMP has been prepared to address the requirements of the development consent conditions, guided by the following guidelines and standards:

- Australian Standard AS 3580.14-2011 *Methods for sampling and analysis of ambient air Part 14: Meteorological monitoring for ambient air quality monitoring applications*
- NSW EPA 2022a, *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales*
- NSW EPA 2022b, *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.*

2.2 Development consent

Table 2.1 lists the requirements of the development consent conditions and references the sections of the AQMP where each of these requirements has been addressed.

Table 2.1 Applicable development consent conditions and relevant sections of report

Condition number	Condition	Relevant section of AQMP
Odour		
B18	The Applicant must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.	Section 3.2.3
Air quality criteria		
B19	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 5 at any residence on privately-owned land.	Section 3.1 and Chapter 4
Table 5: air quality criteria		
Pollutant	Averaging period	Criterion
Particulate matter <10 µm (PM ₁₀)	Annual	^{a, c} 25 µg/m ³
	24 hour	^b 50 µg/m ³
Particulate matter <2.5 µm (PM _{2.5})	Annual	^{a, c} 8 µg/m ³
	24 hour	^b 25 µg/m ³
Total suspended particulate (TSP) matter	Annual	^{a, c} 90 µg/m ³
Notes:		
^a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).		
^b Incremental impact (i.e. incremental increase in concentrations due to the development on its own).		
^c Excludes <i>extraordinary</i> events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.		
B20	The air quality criteria in Table 5 do not apply if the Applicant has an agreement with the owner/s of the relevant residence of infrastructure to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	-

Table 2.1 **Applicable development consent conditions and relevant sections of report**

Condition number	Condition	Relevant section of AQMP
Air quality operating conditions		
B21	The Applicant must:	
	a) take all reasonable steps to:	Chapter 4
	i) minimise odour, fume, greenhouse gas and dust (including PM ₁₀ and PM _{2.5} emissions of the development	
	ii) minimise any visible off-site air pollution generated by the development	
	iii) minimise the extent of potential dust generating surfaces exposed on the site at any given point in time	
	b) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note c to Table 5 above)	Chapter 4
	c) carry out routine air quality monitoring or as directed by the Planning Secretary, to determine whether the development is complying with the relevant conditions in this consent. All monitoring must be in accordance with the <i>Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales</i> (EPA, 2022)	Chapter 5
	d) regularly assess meteorological and air quality monitoring data to:	-
	i) guide the day-to-day planning of quarrying operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent	Chapter 4
	ii) relocate, modify or stop operations on the site to ensure compliance with the relevant conditions of this consent.	
Air quality management plan		
B22	The Applicant must prepare an Air Quality Management Plan for the development. This plan must:	This report
	a) be prepared by a suitably qualified and experienced person/s	Section 1.4
	b) be prepared in consultation with the EPA	Section 1.5
	c) describe the measures to be implemented to ensure:	Chapter 5 and Appendix B
	i) compliance with the air quality criteria and operating conditions in this consent	
	ii) best practice management is being employed	
	iii) air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events	
	d) include an air quality monitoring program, undertaken in accordance with the <i>Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales</i> (EPA, 2022), that:	Chapter 5
	i) is capable of evaluating the performance of the development against the air quality criteria	
	ii) adequately supports the air quality management system	
	iii) includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.	

Table 2.1 **Applicable development consent conditions and relevant sections of report**

Condition number	Condition	Relevant section of AQMP
B23	The Applicant must not commence construction or quarrying operations until the Air Quality Management Plan is approved by the Planning Secretary.	-
B24	The Applicant must implement the approved Air Quality Management Plan.	-
Revision of strategies, plans and programs		
D4	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	a) a summary of relevant background or baseline data	-
	b) details of:	Section 2.1 and
	i) the relevant statutory requirements (including any relevant approval, licence or lease conditions)	Section 4.1.6
	ii) any relevant limits or performance measures and criteria	
	iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures	
	c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria	Chapter 4
	d) a program to monitor and report on the:	Chapter 5
	i) impacts and environmental performance of the development	
	ii) effectiveness of the management measures set out pursuant to condition A2(c)	
	e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible	Appendix B
	f) a program to investigate and implement ways to improve the environmental performance of the development over time	Section 4.1.6
	g) a protocol for managing and reporting any:	Chapter 6 and
	i) incident, non-compliance or exceedance of the impact assessment criteria or performance criteria	Appendix B
	ii) complaint, or	
	iii) failure to comply with statutory requirements	
	h) a protocol for periodic review of the plan.	Section 6.2

3 Relevant background

3.1 Air quality criteria

The main air pollutant generated by the quarry is particulate matter, including the following metrics:

- total suspended particulate matter (TSP)
- particulate matter less than 10 micrometres in aerodynamic diameter (PM₁₀)
- particulate matter less than 2.5 micrometres in aerodynamic diameter (PM_{2.5}).

Condition B19 of the development consent states:

The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 5 at any residence on privately-owned land.

The specific criteria from Table 5 of the development consent conditions are listed in Table 3.1.

Table 3.1 Air quality criteria relevant to the quarry

Metric	Averaging period	Impact assessment criteria
TSP	Annual	90 µg/m ³ ^{a,c}
PM ₁₀	24 hour	50 µg/m ³ ^b
	Annual	25 µg/m ³ ^{a,c}
PM _{2.5}	24 hour	25 µg/m ³ ^b
	Annual	8 µg/m ³ ^{a,c}

Notes: µg/m³: micrograms per cubic meter; g/m²/month: grams per square metre per month.

a – Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

b – Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

c – Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

In accordance with condition B20 of the development consent, the air quality criteria in Table 3.1 do not apply if Holcim has an agreement with the owner(s) of the relevant residence to exceed the air quality criteria, and if Holcim has advised the Department of Planning and Environment (DPE) in writing of the terms of this agreement.

3.2 Quarry emission sources

3.2.1 Dust emissions sources

A detailed air quality impact assessment (AQIA) for the quarry was prepared as part of the environmental impact statement (EIS) by EMM in January 2021 (EMM 2021a). A subsequent revision to the dispersion modelling was completed in September 2021. The AQIA assessed the following scenarios:

- existing scenario – existing pit operations only
- proposed (Scenario 2) – extraction occurring in both the western extension area (WEA) and southern extension area (SEA) with additional ‘floor rock’ excavated from the existing pit
- proposed (Scenario 3) – majority of extraction occurring in the SEA with floor rock extracted from the WEA.

The AQIA quantified annual emissions from the quarry and identified the following sources of air pollutant emissions:

- removal of topsoil and subsoil
- drilling and blasting rock
- loading and unloading materials to and from haul trucks
- conveying rock to and within the processing plant
- crushing and screening rock
- trucks hauling materials to stockpiles and off-site
- wind erosion of exposed areas and stockpiles
- diesel combustion by trucks and quarrying equipment.

The AQIA demonstrated compliance with the 24 hour impact assessment criteria for particulate matter with dust control measures applied, including the application of water at conveyor transfer points, on haul routes, on stockpiles, in drill holes, and when crushing and screening, and partial rehabilitation in some areas.

3.2.2 Source significance

In September 2021, a revised assessment was completed to support an addendum to the Response to Submissions (RtS) report for the quarry. The assessment considered changes in the layout of the quarry and produced updated predicted concentrations at assessment locations (EMM 2021b). Changes included re-location of the processing plant, an increase in exposed areas, and minor adjustments to haul routes entering and exiting the processing plant. The emission sources described in Section 3.2.1 did not change.

Based on the revised emissions inventory from EMM (2021b), a summary of the significance of emission source type by particle size is presented in Figure 3.1. The plot represents emissions for Scenario 3. As the distribution of emissions for Scenario 2 were very similar to Scenario 3, these have not been shown.

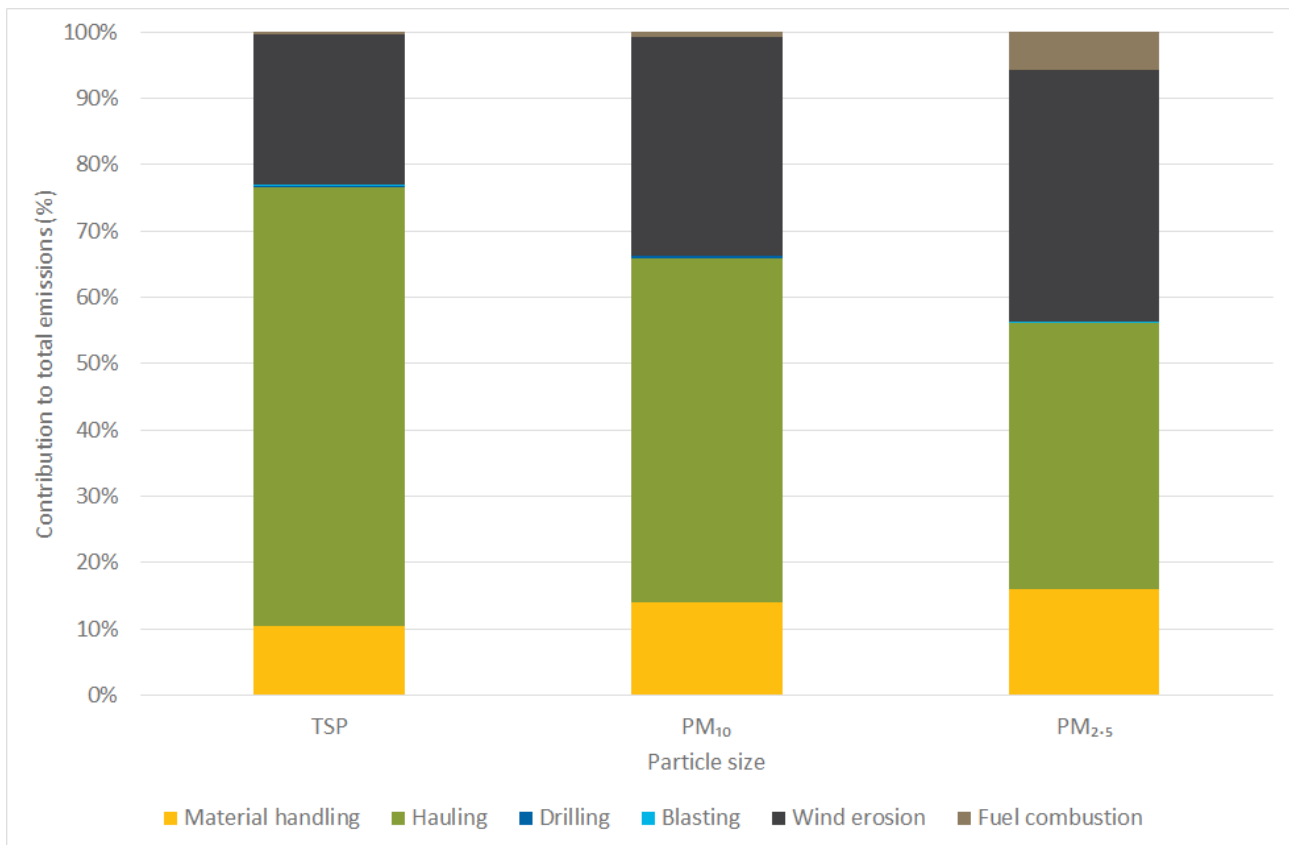


Figure 3.1 Emission source significance by particle size – AQIA inventory

The following notes are made in relation to the site emissions presented in Figure 3.1:

- The movement of trucks along unpaved haul routes is the primary contributor to particulate emissions.
- Material processing and wind erosion emissions are the second highest contributors to annual emissions of all size fractions.
- The significance of diesel combustion emissions increases with decreasing particle size.

3.2.3 Other emission sources

The quarry does not feature significant odour or fume-generating emission sources. These sources have not been discussed further in this AQMP.

3.3 Neighbouring emission sources

Regional Quarries Australia Pty Ltd operates the South Keswick Quarry to the immediate north of the Dubbo Quarry. South Keswick Quarry is a potentially significant source of dust in the area. Emissions from the South Keswick Quarry were included in the cumulative assessment of the AQIA as part of the EIS. This source has also been considered in determining air quality monitoring locations in this AQMP (see Chapter 5).

4 Mitigation and management

In accordance with the development consent, Holcim will implement a range of best practice management measures to mitigate the generation of dust and GHG emissions from the quarry. These measures are described in the following sections.

4.1 Dust management and control measures

4.1.1 Routine operational measures for specific activities

A range of routine air quality mitigation measures have been included in the quarry design and will be implemented by Holcim in the ongoing operation of the quarry.

These mitigation measures, as well as others to be implemented at the facility, are detailed in Table 4.1. These measures will be implemented upon commencement of the relevant activity and will continue to be implemented over the life of the quarry.

Table 4.1 Routine dust management measures to be employed at the quarry

Dust generating activity	Management measure
Conveyors and transfer points	Watering will be applied at conveyor transfer points.
	Scrapers will be used to clean conveyor belts and spillages will be minimised.
Drilling	Water, for dust suppression, to be injected in drill holes.
	Dust extraction cyclones to be used.
Blasting	Blast shots will be delayed during unfavourable weather (where practical).
	Blast areas will be designed to minimise the number of blasts needed per year.
Dozers	Dozer travel speeds and distance will be minimised where possible.
	Water carts will be used to keep dozer routes moist.
Wheel generated dust from trucks	Water carts to be used on unpaved haul routes.
	Road surfaces will be gravel.
	Access road to the quarry will be partially sealed.
	Truck travel speeds will be maintained below 20 km/h on operational areas other than haul routes.
	Larger vehicles will be used to minimise the number of trips where possible.
	Conveyors will be used instead of hauling in the processing area of the existing pit as much as practicable.
Wind erosion from stockpiles	Stockpiles will be watered when in use.
Wind erosion from exposed areas	Water carts will be used to water exposed areas when possible.
	Exposed areas will be progressively rehabilitated.
	A bund will be erected in the WEA.
Loading and dumping rock	Wherever possible, material drop heights will be minimised when unloading trucks.

Table 4.1 Routine dust management measures to be employed at the quarry

Dust generating activity	Management measure
Crushing and screening	Water sprays will be applied at crushing areas.
	The silo is to be fitted with a baghouse or filter.
Vehicle exhaust emissions	Maintenance of plant equipment to ensure good working conditions and minimise visible smoke.
	Vehicles with excessive smoke to be sent for maintenance.
	Minimise truck idling.
	Any vehicle or item of plant or machinery which emits visible and constant air pollutants will not be permitted on-site
	Performance of pre-start checks.
	Ensure that all vehicles and machinery are fitted with appropriate emission-control equipment.
Other/general	Prevailing wind conditions and weather forecasts will be monitored to provide warnings of any adverse meteorological conditions that may give rise to dust dispersal.
	No materials, including waste, will be burnt on-site.
	In dry and windy conditions, minimise as far as possible any dust-generating activities, increase use of watering systems and stop work if nuisance dust is excessive.
	Real-time monitoring for the management of dust emissions.
	Visual monitoring of air quality will be undertaken daily, including the monitoring of dust generating activities and emissions from plant and equipment.
	Non-essential electrical appliances, including lights, will be switched off when not in use. Energy and fuel usage per tonne of product will be monitored with a goal to continually improve efficiencies.

4.1.2 Proactive management measures

Proactive air quality management will involve the planning of activities in advance of potentially adverse conditions. Specifically, the proactive air quality management approach will include:

- discussion of the weather conditions and dust considerations at daily pre-shift meetings
- modifying or suspending the planned activities, as appropriate, to minimise dust impacts
- quarry design, including progressive rehabilitation, use of gravel roads and paving the access road
- water sprays on stockpiles and exposed areas.

i Trigger Action Response Plan (TARP)

Conditions B21 and B22 of the development consent require that the AQMP includes an air quality monitoring program for the quarry. The air quality monitoring program, which includes real time measurement, is detailed in Chapter 5.

Air quality impacts and triggers will be assessed using a Trigger Action Response Plan (TARP), as presented in Appendix B. The TARP provides a simple, transparent and useable reference for the short-term management of air quality at the quarry.

The TARP will be subject to an initial verification period of around six months after the installation of the real-time dust monitors, during which the appropriateness of the alarm levels and corresponding responses will be evaluated and, if necessary, adjusted.

4.1.3 Reactive management measures

Reactive air quality management will include the modification or suspension of activities in response to the following triggers:

- Visual conditions, such as visible dust from trucks above wheel height.
- Meteorological conditions, such as dry, windy conditions, with winds blowing towards sensitive receptors.
- Ambient air quality conditions (that is, elevated 1 hour PM₁₀ concentrations).

Details of the trigger levels linked to real-time particulate matter monitoring and associated action responses are provided in the TARP (Appendix B).

4.1.4 Actions during adverse weather conditions

From the perspective of dust emissions from the quarry, adverse meteorological conditions are considered to be sustained periods of hot and dry weather and/or high wind speeds. A key environmental management responsibility of quarry personnel is the visual monitoring of dust emissions. In the event of adverse weather conditions, the quarry manager is required to maintain vigilance for visual dust emissions leaving quarry boundary and implement appropriate additional mitigation strategies. Additional mitigation measures will include the targeted use of water sprays at the quarry to the identified contributing dust emission sources, or the temporary restriction and/or cessation of the activity until adverse weather conditions have eased.

4.1.5 Dust mitigation performance monitoring and responsibilities

Quarry personnel are responsible for monitoring the performance of onsite air pollution mitigation measures on a day-to-day basis. Responsibilities for air pollutant emission management are as set as follows:

The quarry foreperson is responsible for:

- regular visual monitoring of the dust levels at the quarry
- managing vehicle speed movements
- restricting operations during periods of strong wind
- utilising spray systems where applicable
- cleaning of the material storage/processing areas
- completion of a complaint form if dust complaint is received
- coordinating with the quarry manager to ensure the complaint is investigated.

The quarry manager is responsible for:

- implementing this procedure
- reviewing the site on a regular basis to ensure compliance with condition B21 for air pollutant emissions
- coordinating investigation of the dust incidents or complaints
- documenting the results of the investigation and actions taken
- maintaining the records of any dust complaints
- liaison with the complainant regarding the steps to be taken to minimise further air pollution emissions, where appropriate
- ensuring that the nominated personnel have been trained in the requirements of this procedure.

4.1.6 Performance measures

Holcim commits to the following key performance indicators (KPIs) to demonstrate the performance of ongoing dust control management practices at the quarry:

- successful implementation of the control measures in accordance with B21 of the development consent conditions (see Chapter 4)
- no air quality exceedances due to Holcim's quarry operations (see Section 3.2.1) of the annual and 24 hour total impact PM₁₀ criteria (25 µg/m³ and 50 µg/m³ respectively)
- no confirmed air quality-related complaints from the operation of the quarry.

In the event that KPIs are not met, dust mitigation measures and maintenance practices will be reviewed and amended as necessary.

4.2 Greenhouse gas management

In accordance with condition B21(a) of the development consent, Holcim will take all reasonable steps to minimise GHG emissions.

GHG emissions from the quarry are principally associated with diesel combustion and the consumption of purchased electricity. The quarry features conventional extraction and hauling techniques, which are largely dependent on the use of diesel-powered equipment.

Measures and practices designed to improve energy efficiency will assist with the management of the quarry's GHG emissions. The following management practices will be implemented by Holcim to minimise emissions from the combustion of diesel and electricity consumption during the life of the quarry:

- use of equipment that incorporate best-practice emissions reduction technologies (e.g. high efficiency motors)
- perform pre-start inspections at each shift on mobile plant and vehicles
- maintain the equipment in good operating order (e.g. routine servicing)
- minimise engine idle time

- optimise the design of roads to minimise the distance travelled by construction equipment
- track electricity bills and fuel usage
- install energy-efficient electrical equipment where possible (e.g. lighting).

GHG emissions will be tracked and reported annually in the Annual Review, prepared in accordance with condition D9 of the development consent, and through the NGER Scheme under the *NGER Act*, if the relevant reporting thresholds are exceeded.

5 Air quality monitoring

5.1 Monitoring program

Condition B22 (d) of the development consent states that the AQMP must:

(d) include an air quality monitoring program, undertaken in accordance with the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (EPA, 2022), that:

- is capable of evaluation the performance of the development against the air quality criteria;
- adequately supports the air quality management system; and
- includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.

In addition, condition B21 (c) and (d) of the development consent states that the Applicant must:

(c) carry out routine air quality monitoring or as directed by the Planning Secretary, to determine whether the development is complying with the relevant conditions of this consent. All monitoring must be in accordance with the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* (EPA, 2022); and

(d) regularly assess meteorological and air quality monitoring data to:

- guide the day-to-day planning of quarrying operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent; and
- relocate, modify or stop operations on the site to ensure compliance with the relevant conditions of this consent.

As identified in Section 3.2.1, pollutant concentrations near the quarry are expected to be below the air quality criteria and can be managed with appropriate dust mitigation measures in place. To track environmental performance, Holcim proposes to install two real-time PM₁₀ monitors at the quarry. The proposed monitor locations, illustrated in Figure 5.1, are as follows. The exact locations will be confirmed pending further site and power investigations.

- PM₁₀ monitor 1 – on the north-eastern boundary
- PM₁₀ monitor 2 – on the south-western boundary.

As far as practicable, and taking site constraints into consideration, the siting of the monitors will be conducted in accordance with AS/NZS 3580.1.1:2016: *Methods for sampling and analysis of ambient air – Part 1.1: Guide to siting air monitoring equipment*.

As noted in Section 3.3, the South Keswick Quarry is a significant source of dust located immediately north of the Dubbo Quarry. The location of the air quality monitors will therefore be sited with the intention of allowing Holcim to determine where peak concentrations originate from.

PM₁₀ concentrations will be measured using a Tapered Element Oscillating Microbalance (TEOM) or an equivalent monitor in accordance with the methods in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (NSW EPA 2022b).

Data from the real-time monitors will be compared with concurrent real-time meteorological monitoring data from the quarry to determine the source(s) of recorded concentrations.

The meteorological station at the will be located on the south-western boundary of the existing pit (see Figure 5.1) and will comply with AS/NZS 3580.1.1:2016: *Methods for sampling and analysis of ambient air - Part 1.1: Guide to siting air monitoring equipment*; and Australian Standard AS 3580.14-2014 *Methods for sampling and analysis of ambient air Part 14: Meteorological monitoring for ambient air quality monitoring applications*.

At the end of a 12 month period, demonstrated compliance with the development consent air quality criteria for PM₁₀ (see Table 3.1) will represent a key performance measure for the quarry (see Section 4.1.6).

The PM₁₀ monitoring results will be used in conjunction with the TARP (see Appendix B).

The air quality monitoring program will be reviewed at least every three years, when updates to the plan are required, or as directed by the Secretary in consultation with other agencies. The review process is to reflect changes in environmental legislation and guidelines, and changes in technology or operational procedures.

5.2 Managing exceedances

5.2.1 Identifying exceedances

Exceedances of air quality criteria will be identified using the proposed air quality monitoring network (see Section 5.1) and the criteria listed in Section 3.1. An investigation of the exceedance will be completed using information relevant to the time of the exceedance such as quarry operations and meteorological conditions. This will be used to determine whether the exceedance was the result of the quarry or not.

As stated in Section 4.1.2, a TARP will be used in conjunction with the monitoring program to identify exceedances of the air quality criteria and to allow the appropriate site personnel to respond with additional management and mitigation measures.

5.2.2 Non-compliance notification

Non-compliance notifications will be addressed in accordance with the requirements of condition D8 of the development consent.

Within seven days of becoming aware of a non-compliance, Holcim will notify DPE of the non-compliance.

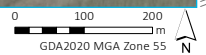
The notification will be made in writing through DPE's Major Projects website and will:

- identify the development (including the application number and name)
- set out the condition of the development consent that has not been complied with
- explain why it does not comply
- provide the reasons for non-compliance (if known)
- state the actions that have been or will be undertaken to address the non-compliance.

It is noted that a non-compliance that has been notified as an incident does not also need to be notified as a non-compliance under condition D8 of the development consent.



Source: EMM (2023); DFSI (2017, 2021); GA (2011); Metromap (2023)



KEY

- Project area
- Monitoring location
 - Proposed meteorological station
 - Proposed PM₁₀ monitor
- Existing environment
 - Minor road
 - Vehicular track
 - Named watercourse

Preliminary siting options for
air quality monitoring

Dubbo Quarry
Air Quality Management Plan
Figure 5.1



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6 Review and improvement

6.1 Annual review

In accordance with condition D9 of the development consent, by the end of March in each year after commencement of the development (or other timeframe agreed by the Planning Secretary), a report will be submitted to DPE reviewing the environment performance of the development to the satisfaction of the Planning Secretary. The report will include (of relevance to air quality):

- a comprehensive review of the air quality monitoring results and air quality-related complaints with a comparison to:
 - air quality criteria (see Section 3.1)
 - requirements of the AQMP
 - air quality monitoring results from the previous year
 - air quality predictions made in the EIS
- an evaluation of the effectiveness of
 - the air quality management measures (see Chapter 4)
 - compliance with performance measures (see Section 4.1.6), air quality criteria (see Section 3.1) and operating conditions in the development consent
- identify trends in the air quality monitoring data over the life of the quarry.

6.2 Review of the AQMP

In accordance with condition D5 of the development consent, this AQMP will be reviewed and, if necessary, revised within three months of the submission of:

- the submission of an incident report under condition D7
- the submission of an Annual Review under condition D9
- the submission of an independent environmental audit under condition D11
- the approval of any modification of the development consent
- the issue of a direction of the Planning Secretary under condition A2(b) that requires a review.

Review of this AQMP will also take place if air quality monitoring results indicate that it is warranted or in the event of any significant change to air quality management procedures at the quarry. The AQMP must be revised to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review.

6.3 Air quality complaint management system

A complaint management system – to support active community consultation and maintain positive relations with local residents – will be implemented for the site.

For the purpose of this AQMP, a verified complaint that is deemed to be the direct result of operational emissions from the quarry will be classified as an air quality incident. As soon as Holcim becomes aware of an air quality incident, the DPE and any other relevant agencies will be notified.

Further, a non-compliance is defined as an exceedance of an assessment criterion detected by the air quality monitoring network (see Chapter 5) that is attributable to quarry operations.

References

Australian Standard 2014, AS 3580.14-2014 Methods for sampling and analysis of ambient air Part 14: Meteorological monitoring for ambient air quality monitoring applications.

NSW EPA 2022a, Approved methods for sampling and analysis of air pollutants in New South Wales.

NSW EPA 2022b, Approved methods for the modelling and assessment of air pollutants in NSW, prepared by the NSW EPA, August 2022.

EMM 2021a, Dubbo Quarry Continuation Project – air quality impact assessment, prepared by EMM Consulting Pty Limited, January 2021.

EMM 2021b, Addendum submissions report, Dubbo Quarry Continuation Project, prepared by EMM Consulting Pty Limited, September 2021.

Appendix A

NSW EPA letter in response to consultation



DOC23/661556-1

EMM Consulting Pty Ltd
Return via email: msiebert@emmconsulting.com.au

Attention: Mary-Anne Siebert

24 August 2023

Dear Ms Siebert,

**Post Approval Management Plan Consultation
Dubbo Quarry Continuation Project – Air Quality Management Plan (SSD-10417)**

Thank you for consulting with the Environment Protection Authority (EPA) in regard to the post approval consultation on the Air Quality Management Plan for the Dubbo Quarry Continuation Project (SSD-10417).

The EPA encourages the development of Environmental Management Plans to ensure that licensees have determined how they will meet their statutory obligations and designated environmental objectives as specified by any project approval.

Being a regulatory authority, the EPA's role is to set environmental management objectives rather than being directly involved in the development of strategies to achieve those objectives. The EPA has therefore not reviewed this management plan and offers no comments in relation to it.

If you have any questions about this matter, please contact Jenny Rushton on (02) 6883 5301 or by e-mail to info@epa.nsw.gov.au.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'S. Lund'.

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Appendix B

Trigger Action Response Plan (TARP)

B.1 TARP

The TARP uses the continuous data from the three on-site real-time monitors to enable short-term, reactive air quality management at the quarry.

Trigger values are set at three 'levels' in response to PM₁₀ concentrations, as defined in Table B.1. The Level 1 and Level 2 PM₁₀ triggers are applied to the *rolling* 1 hour average mass concentration from either of the two monitors and with respect to wind direction (e.g. when the monitor is downwind of quarry operations).

For each monitor location, wind direction alarm triggers can be set as noted below. The wind directions listed aim to capture potential dust concentrations from the quarry and potential contribution from the South Keswick Quarry.

- PM₁₀ monitor 1 – wind direction $\geq 180^\circ$ and $\leq 270^\circ$
- PM₁₀ monitor 2 – wind direction $\geq 330^\circ$ and $\leq 150^\circ$.

The TARP will be subject to an initial verification period of around six months, during which the appropriateness of the alarm levels and corresponding responses will be evaluated and, if necessary, adjusted.

Furthermore, discussion of the forecast weather conditions, and associated dust emissions management considerations will be held at daily pre-shift meetings. In addition to the above trigger levels, operational activities will be modified or suspended when unfavourable meteorological conditions are forecast (e.g. high winds) or visible dust is observed leaving the quarry boundary.

Table B.1 TARP levels, actions and responses

Alarm level	Action required	Response
<p>Level 1 Limit = 50 mg/m³ Based on <i>rolling</i> 1-hour average PM₁₀ (i.e. 12 consecutive 5 minute concentrations). Triggered when the reading exceeds the limit consecutively for a period of 2 hours. Alarm <i>does not repeat</i> during sustained exceedance.</p>	<p>Quarry Manager to coordinate a desktop-based review of wind speed and direction conditions, real-time PM₁₀ concentrations at the two real time monitors to determine upwind-downwind concentration and review current site operations to identify potential source of concentrations.</p>	<p>Should the desktop- review identify that the quarry operations are the contributing source of concentrations, the Quarry Manager or delegate will organise increased dust control practices specific to the contributing source(s) and consider temporarily modifying operations.</p>
<p>Level 2 Limit = 80 mg/m³ Based on <i>rolling</i> 1-hour average PM₁₀. Triggered when the reading exceeds the limit consecutively for a period of 2 hours. Alarm <i>does not repeat</i> every hour during sustained exceedance.</p>	<p>Following completion of Level 1 actions, the Quarry Manager or delegate to undertake an in-person inspection of likely contributing source of concentrations.</p>	<p>If site investigations identify that the facility is the contributing source of concentrations, implement additional controls, relocate or cease dust emitting activities.</p>
<p>Level 3 Limit = 200 mg/m³ Based on <i>rolling</i> 1-hour average PM₁₀. Triggered when the reading exceeds the limit consecutively for a period of 30 minutes. Alarm <i>does not repeat</i> every 30 minutes during sustained exceedance.</p>	<p>Following completion of Level 2 actions, the Quarry Manager or delegate to undertake an in-person inspection of likely contributing source of concentrations.</p>	<p>If site investigations identify that the facility is the contributing source of concentrations, cease those activities immediately (as practicable to do so). Determine and implement additional controls and/or relocate activities prior to recommencement. NB: classified as an air quality incident.</p>

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