

TITLE: AIR QUALITY MANAGEMENT PLAN

Badgerys Creek Quarry and Brick Making Project 235 Martin Road, Badgerys Creek, NSW, 2171

Table of Contents

1 INT 1.1		A Purpose
	1.2	Scope and Application4
	1.3	Interface with Environmental Management Strategy 4
	1.4	Definitions and Abbreviations5
	1.5	EMS link
2	STR 2.1	ATEGIC FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT
	2.2	Aspects and Impacts7
	2.3	Risk Assessment
3	PRC	DJECT APPROVAL CONDITIONS
4	REG	GULATORY FRAMEWORK
	4.1	Codes, Standards and Guidelines
	4.2	Permits and Licences
5	TRA	INING AND RESOURCE REQUIREMENTS
	5.1	Training
	5.2	Resource Requirements 15
6	AIR	QUALITY MANAGEMENT SYSTEM 16
	6.1	Air Quality Impact Mitigation Measures and Responsibilities 16
	6.2	Greenhouse Gas Mitigation and Management Measures 22
	6.3	Progressive Rehabilitation
7	MC	NITORING AND PERFORMANCE CRITERIA
	7.1	General
	7.2	Environmental Monitoring
	7.3	Operational Monitoring and Inspections 23
Pag	e 1 of 27	CSR Limited

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	7.4	Inspections	28
8	EVA	ALUATION AND REVIEW	29
	8.1	Annual review	29
	8.2	Plan and Program Revision	29
9	REF	PORTING	30
	9.1	Regular Reporting	30
	9.2	Incident and Non-compliance Reporting	30
1() REF	ERENCES	31
A	PPEND	IX A: FIGURES	32
FI	GURE	ONE - SITE LOCATION	33
FI	GURE	TWO - PROJECT LAYOUT PLAN	34
FI	GURE	THREE - ENVIRONMENTAL MONITORING POINTS	35
A	PPEND	IX B: EVIDENCE OF CONSULTATION	36

List of Tables

Air Quality Aspects and Impacts from Badgerys Creek operations	6
Conditions of Consent May 2018	8
General air quality measures	13
VENM emplacement	14
Trigger action response plan	14
Air quality monitoring requirements	14
Ambient air quality criteria	14
	Air Quality Aspects and Impacts from Badgerys Creek operations Conditions of Consent May 2018 General air quality measures VENM emplacement Trigger action response plan Air quality monitoring requirements Ambient air quality criteria

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1 INTRODUCTION

1.1 Purpose

CSR Building Products Limited (CSR) will implement all practicable measures to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the Badgerys Creek Quarry and Brick Making Project. This Air Quality Management Plan (AQMP) has been prepared to:

- describe the measures to ensure the relevant conditions of approval for Phase 1a of the Badgerys Creek Quarry and Brick Making Facility are complied with;
- describe the measures to ensure commitments in the Environmental Assessment in relation to air quality are implemented;
- describe the air quality monitoring program to evaluate the performance of the Badgerys Creek operations;
- describe the trigger action response plant to manage dust emissions from the site within prescribed criteria;
- outline community engagement procedures in relation to air quality issues;
- describe the protocol to determine exceedance with relevant conditions of the project approval; and
- outline reasonable and feasible measures to maintain greenhouse gas emissions at 2007 levels, including offsetting any increases through efficiency measures.

This AQMP also satisfies the Conditions of Approval (CoA) for the project, in particular Schedule 2, condition 13 Air Quality Management Plan.

1.2 Scope and Application

The Badgerys Creek Brickworks (site) is located at 235 Martin Road, Badgerys Creek, 41 kilometres to the southwest of Sydney, within the Liverpool City Council Local Government Area (LGA) (see Figure One). Primary access to the site is provided through Martin Road at the north-eastern corner of the site. Features of the existing site are shown on Figure Two.

As outlined in Section 2.1, this AQMP applies to Phase 1a of the Project including:

- Dewatering of pits 1, 2 and 3; and
- Importation of VENM to backfill pits 1, 2 and 3 as part of quarry rehabilitation works.

Hereafter, Phase 1a is referred to as 'the Project'. The Project layout including the location of pits to be dewatered and backfilled is shown on Figure Two.

1.3 Interface with Environmental Management Strategy

In operational terms, the AQMP aims to minimise the risk of impacts to Air Quality and minimise Greenhouse Gas emissions from the Project at CSR's Badgerys Creek facility. In this



way, the AQMP supports the Environmental Management Strategy (EMS) of Badgerys Creek Quarry and Brick Making Facility by helping minimise harm to the environment.

1.4 Definitions and Abbreviations

Ambient air quality

The surrounding air quality at a particular place and time made up of all sources in the environment near and far.

Conditions of Approval (CoA)

Conditions contained in Schedules 2 to 5 of the Project Approval under Section 75J of the EP&A Act for the Badgerys Creek Quarry and Brick Making Project

DPIE

NSW Department of Planning, Industry and Environment.

<u>Secretary</u>

Secretary of the Department of Planning, Industry and Environment, or

delegate.

DRG

Division of Resources and Geoscience, within DPIE.

<u>EPL</u>

Environment Protection Licence.

Deposited Dust

Insoluble solids, also known as deposited particulates or deposited dust, are measured using AS3580.10.1 (AM-19) and represent particles that settle from the ambient air into a container along with rainwater. The samples are usually collected over a 30 \pm 2 day period and are reported in g/m²/month.

Emissions

A discharge of a substance such as plant or vehicle exhaust into the environment.

Incident

An occurrence or set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the conditions of approval.

Non-compliance

An occurrence or set of circumstances that is a breach of conditions of approval 10_0014, or EPL 684, or ML 1771.



<u>TSP</u>

Total Suspended Particulates (TSP) are particles having an approximate Equivalent Aerodynamic Diameter (EAD) of less than 50 μ m and are therefore usually suspended in the atmosphere due to their small size.

<u>PM₁₀</u>

Particulate Matter with an EAD less than 10 μ m is known as PM₁₀. PM₁₀ is a subset of TSP.

<u>PM_{2.5}</u>

Particulate Matter with an EAD less than 2.5 μm is known as PM_{2.5}. PM_{2.5} is a subset of PM_{10} and TSP.

1.5 EMS link

EMS

Environmental Management Strategy – the latest approved plan can be found on the PGH website under Badgerys Creek.

https://www.pghbricks.com.au/-nsw-environmental-reporting#faq258852947



2 STRATEGIC FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

In addition to meeting the specific performance measures and criteria established under the project approval, CSR will implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction or operation of the project, and any rehabilitation required under the approval.

2.1 Environmental Context

Quarrying and brick making activities have been undertaken on the site for over 30 years. In August 2020, a modification (Mod 3&4) to the project approval was granted by the Minister for Planning and Public Spaces to continue operations on the site including dewatering of the quarry pits, extraction of clay (quarrying), brick manufacturing, and importation of VENM to backfill and rehabilitate the quarry pits.

The Department of Planning, Industry and Environment (DPIE) has since approved the delivery of the Project and associated strategies, plans and programs in stages as follows:

Phase 1a:

- Dewatering of pits 1, 2 and 3; and
- Importation of VENM to backfill pits 1, 2 and 3 as part of quarry rehabilitation works.

Phase 1b:

- Construction activities;
- Brickmaking activities; and
- Quarrying activities in Pit 3.

This AQMP applies to Phase 1a of the Project.

2.2 Aspects and Impacts

The Project may result in greenhouse gas emissions and potential air quality impacts as shown in **Table 1** below.

Table 1 Air quality aspects and impacts	Table 1	s and impacts
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Air Quality Aspect	Potential Environmental Impacts
Dust from earthworks associated with backfilling pits with VENM.	 Health and amenity impact on neighbouring residential dwellings.
Wheel generated dust from access roads and haul roads.	 Dust settling on private property.
Exhaust emissions from earth moving equipment.	



2.3 Risk Assessment

CSR maintains an Environmental Risk Register for the Badgerys Creek Quarry operation. This register ranks the following air quality impacts (including greenhouse gas emissions) as low to medium risks:

- Dust from VENM emplacement, internal haulage, and stockpiles.
- Dust from materials handling.
- Exhaust emissions from mobile plant

The Air Quality Impact Assessment for the project also identified dust, particularly PM_{10} to be the primary pollutant of concern, with the highest dust concentrations predicted to occur to the north of the site.

The above risks will be mitigated by the management measures outlined in this AQMP.



3 PROJECT APPROVAL CONDITIONS

Any exceedance of criteria and/or performance measures required by the conditions of approval constitutes a breach of the approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. **Table 2** reproduces the Air Quality related CoA. *Table 2 Conditions of consent*

Sched	Condition	Condition Text	Where covered
3		AIR QUALITY	
3		Air Quality Impact Assessment Criteria	
3	9	The Proponent must ensure that particulate matter emissions generated by the project do not cause exceedances of the criteria in Table 4 [Table 7] at any residence on privately-owned land.	6.0, Table 7
3		Operating Conditions	
3	10	 The Proponent must: (a) implement best practice management to minimise the dust emissions of the project; (b) implement all air quality management and mitigation measures that were committed to in the EA (Mod 3 and 4); (c) implement real-time monitoring of 24-hour average PM₁₀ and meteorological conditions; (d) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this approval; (e) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Table 4); (f) monitor and report on compliance with the relevant air quality conditions in this approval; and (g) minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary. 	6.0 6.1 , table 3 7.3 and table 6 6.1, Table 3 &4 7.0, table 5 7.3, 9.0 Table 4, 6.3



Sched	Condition	Condition Text	Where covered
3		Air Quality Management Plan	
3	13	 The Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with relevant WSA authorities; (b) be submitted to the Secretary for approval prior to commencing Phase 1, unless otherwise agreed by the Secretary; (c) describe the proposed air quality management system; (d) describe the measures to be implemented to ensure: • compliance with the air quality criteria and operating conditions of this approval; • best practice management is being employed; and • the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; 	
3		 (e) describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to air quality are implemented; (f) include a program to ensure surface disturbance associated with quarrying operations is minimised; (g) include an air quality monitoring program that: is capable of evaluating the performance of the project and informing day to day operational decisions; includes a protocol for determining any exceedances of the relevant conditions of this approval; and effectively supports the air quality management system; and (h) include a program to: notify affected landowners of the potential health-related impacts associated with dust; and respond effectively to enquiries or complaints. The Proponent must implement the Air Quality Management Plan as approved by the Secretary. 	6.1Part of Phase 1b7.09.2
3		Meteorological Monitoring	



Sched	Condition	Condition Text	Where co	overed
3	14	For the life of the project, the Proponent must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales guideline and is capable of measuring meteorological conditions in accordance with the <i>NSW Noise Policy for Industry</i> (EPA 2017).	Figure and 7.3	Three
3		Greenhouse Gas Emissions		
3	16	The Proponent must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.	6.2	
4	ADDITIONA	AL PROCEDURES		
4		NOTIFICATION OF LANDOWNERS		
4	1	As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing: (a) an exceedance of any criteria in Schedule 3, the Proponent must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria; and	9.2	
4		(b) an exceedance of any air quality criteria in Schedule 3, the Proponent must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).	9.2	
5	ENVIRONN	IENTAL MANAGEMENT, REPORTING AND AUDITING		
5		Evidence of Consultation		



5	2	 Where the conditions of this approval require consultation with an identified party, the Proponent must: (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and (b) provide details of the consultation undertaken, including: the outcome of that consultation, matters resolved and unresolved; and details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed any unresolved matters. However, if the Secretary agrees, a strategy, plan or program may be prepared without consultation being undertaken with an identified party required under a condition of this approval. 	Appendix B
5		Management plan requirements	
5	3	 The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) a summary of relevant background or baseline data; (b) a description of: the relevant statutory requirements (including any relevant approval, licence or lease conditions); any relevant limits or performance measures/criteria; and the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; 	7.3.1.2 4.0 7.3 7.0
5		 (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the project; and • effectiveness of any management measures (see (c) above); 	6.1 8.0 9.0
5		 (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; (f) a program to investigate and implement ways to improve the environmental performance of the project over time; 	table 5 8.0



5	 (g) a protocol for managing and reporting any: incidents; complaints; and non-compliances with statutory requirements; 	9.2
5	 (h) a protocol for periodic review of the plan; and (i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval. 	8.0 In header



4 REGULATORY FRAMEWORK

4.1 Codes, Standards and Guidelines

The following legislation is relevant to the project:

- NSW Protection of the Environment Operations Act 1997 (PoEO Act);
- NSW Protection of the Environment (General) Regulation 2009 (POEO General Regulation);
- NSW Protection of the Environment Operations (Clean Air) Regulation 2010; and
- (Commonwealth) National Greenhouse and Energy Reporting Act 2007 (NGER Act).
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, Dept of Environment and Conservation NSW, January 2007.
- Approved Methods for Modelling and Assessment of Air Pollutants in NSW, Environment Protection Authority, January 2017.
- Australian Standards for siting, sampling and testing as detailed in section 7.2.
- National Environmental Protection Measure for Ambient Air Quality.
- National Greenhouse and Energy Reporting Guidelines.

4.2 Permits and Licences.

4.2.1.1 Environment Protection Licence 684

The site is subject to Environment Protection Licence (EPL) 684, issued under the NSW POEO Act. The EPL includes the following requirement in relation to air quality management and monitoring measures:

• The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

Reporting protocols are included in section 9.0.



5 TRAINING AND RESOURCE REQUIREMENTS

5.1 Training

The induction for all site personnel and contractors working on site (as described in detail in Section 5.2 of the <u>EMS</u>) will cover air quality and greenhouse gas management procedures, in particular the control of dust and emissions. The following specialised training will be required for the stated plant personnel as part of the effective implementation of the AQMP:

- operation and maintenance of the on-site meteorological station Environmental Officer;
- changing filters on the HVAS Environmental Officer;
- operation and maintenance of the real-time dust monitor Environmental Officer; and
- any new reporting requirements under the NGERS scheme Environmental Manager.

5.2 Resource Requirements

CSR will engage specialised, and where relevant NATA accredited, technical service providers for the following tasks:

- Deployment and calibration of dust monitoring equipment.
- Sampling and testing of dust deposition gauges.
- Testing of HVAS filters.



6 AIR QUALITY MANAGEMENT SYSTEM

CSR will manage air quality impacts to ensure that particulate matter emissions from the Project do not cause exceedances of the criteria in Table 7 at any residence on privately owned land.

6.1 Air Quality Impact Mitigation Measures and Responsibilities

The general air quality management measures in Appendix 6 of the Project Approval will be implemented (**Table 3**)

TUDIE J GEHELUI UN UUUNLV MEUJULEJ	Table 3	General	air aualitv	measures
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Ac	tion	Responsibility	When	Reference
Th (A Ge ex fo	e Proponent will prepare an Air Quality Management Plan QMP) for the project to the satisfaction of the Director- eneral. The AQMP will outline the purpose, methodology and pected outcomes of the dust monitoring, and will include the llowing content:	Site Manager	Prior to works	This plan
1.	Dust fraction to be measured, i.e., TSP, PM10, PM2.5 etc.	Site Manager	Table 7	Table 7
2.	Equipment to be used to measure selected dust fraction.	Site Manager		
3.	Frequency of the monitoring, i.e., sample collection schedule.	Site Manager		
4.	Duration of the monitoring program.	Site Manager	7.3	7.3
5.	Location of the monitoring station/s.	Site Manager	Prior to works	Figure three
6.	Standards/guidelines that are to be followed for location/construction of the monitoring station, equipment calibration, collection of samples and analysis of samples.	Site Manager	Duration of monitoring	7.3
7.	Calibration methodology and schedule.	Site Manager	Duration of monitoring	7.3
8.	Reporting procedure.	Site Manager	Duration of monitoring	9
9.	Regulatory guidelines and compliance criteria.	Site Manager	Duration of monitoring	4, Table 7
10.	Action levels and contingency measures in the event that pollutant concentrations approach or are likely to exceed the relevant compliance criteria.	Site Manager	Duration of monitoring	Table 5



 A consultation program that involves nearby agricultural producers and residents, in order to determine if the dust mitigation measures are being affective. 	Site Manager	Duration of monitoring	EMS Section 10 and Section 9.8
The existing HVAS will be moved to as close to the northern boundary of the property and the closest sensitive receiver as possible.	Site Manager	Prior to works	7.3, Figure three
The existing deposited dust gauges will be relocated to appropriate positions as close to the property boundaries and nearest sensitive receivers as possible.	Site Manager	Prior to works	7.3, Figure three

The VENM emplacement specific measures in **Table** will be implemented.

Table 4 VENM emplacement

Action	Responsibility	When
Control dust from ground disturbance by spraying with water	Contractors	As required
Control dust from loading of material to haul trucks by reducing bucket drop heights	Contractors	During loading
Control dust from material haulage by limiting speeds on haul roads to 15 km/h	Contractors	During loading
Haul roads should be watered using water carts such that the road surface has sufficient moisture to minimise visible on-road dust generation but not so much as to cause pooling and mud/dirt track out to occur.	Contractors	During dry weather
Disturbed soil surfaces to be revegetated in accordance with the RMP for the Project Site.	Contractors	Rehabilitation
Unloading of trucks to be controlled using water sprays/dust suppression when generating excessive visible dust.	Contractors	During unloading operations
Operational practices to be reviewed to ensure 'best practice' techniques are being employed and that operational equipment is working efficiently.	Contractors	At all times
Operate and maintain vehicles and mobile plant to keep emissions at reasonable levels	Contractors and	At all times
Shut down engines when plant are idle over prolonged periods	Contractors and	At all times
Consult with neighbouring agricultural producers and residents to assess the effectiveness of dust mitigation measures in accordance with the Community Consultation Plan	Site Manager	As required

Table 5 presents the Trigger Action Response Plan (TARP) which includes suggested dust trigger levels and sets out the corresponding response if the trigger is reached.



The suggested dust trigger levels will be refined and modified on an ongoing basis as the actual performance is confirmed, operational experience increases and as the operations change over time. Consideration of the prevailing winds and dispersion conditions is paramount in this method of analysis, and it is anticipated that as operator experience with the operations and surrounding influences develops, more appropriate trigger levels will be developed over time.

Reactive controls may include operational measures such as scheduling certain operations during favourable meteorological conditions or to alternative areas and may, in extreme cases, require all dust generating activities to cease. Appropriate actions should take into account the type of dust source (i.e. wind sensitive or wind insensitive) and the prevailing meteorological conditions in undertaking dust mitigating action.



Table 5 Trigger action response plan

Event	Potential Adverse Outcome	Trigger Level	Actions to be Implemented	Responsibility
1 – Alert level	Dust impacts on surrounding communities	1-houraveragePM2.5>25μg/m³wheremonitorisdownwind of activity1-houraveragePM10>50μg/m³wheremonitorisdownwind of activityactivity	 Check forecast for that day Identify potential operational risk areas Notify onsite managers to be on alert 	Site Manager
2 – Remedial action level	Dust impacts on surrounding communities	1-hour average PM ₁₀ >150 μg/m ³ where monitor is downwind of activity 1-hour average PM _{2.5} >75 μg/m ³ where monitor is downwind of activity	 Increase dust suppression. Where possible relocate dust generating activities away from downwind residential receptors. Visual observation of dusty activity, apply additional dust control as necessary. 	site Manager
3 – Action level	B – Action evel Dust impacts on surrounding communities		 Cease some or all dust generating activities when the elevated dust concentrations are not caused by an external regional pollution event such as bushfires, prescribed burning, dust storms or fire incidents and cannot be overcome by level 1 and 2 actions. 	Site Manager



Event	Potential Adverse Outcome	Trigger Level	Actions to be Implemented	Responsibility
24-hour Air Quality Goal exceeded	Dust impacts on surrounding communities	PM ₁₀ >50μg/m ³ on HVAS	 Notify relevant parties (9.2); and investigate circumstances (including prevailing meteorological conditions, site operations, background concentrations), ensure dust mitigation measures (6.1) have been followed, and implement additional dust mitigation measures that target the main source of dust identified though investigation of site operations. 	Site Manager
Annual average Air Quality Goals exceeded	Dust impacts on surrounding communities	Insoluble Solids >4g/m ² /month PM ₁₀ >25µg/m ³ on HVAS	 Notify relevant parties (9.2); and investigate circumstances (including prevailing meteorological conditions, site operations, background concentrations), ensure dust mitigation measures (6.1) have been followed, and implement additional dust mitigation measures that target the main source of dust identified though investigation of site operations. 	Site Manager



Event	Potential Adverse Outcome	Trigger Level	Actions to be Implemented	Responsibility
Adverse weather conditions	Dust impacts on surrounding communities	Prolonged period of hot, dry, windy weather	 Ensure disturbed areas have been appropriately stabilised with vegetation and/or surfactants. Suspend or modify all non-essential earth-moving activities and reduce truck speeds. Quarry Manager to review activities and notify operators as to when operations may re-commence. Review monitoring to determine whether exceedances have occurred. 	Quarry Manager
Complaints	Adverse community perception and/or dust impacts on surrounding community	Complaint received regarding adverse air quality	Investigate in accordance with the <u>Community and Stakeholder</u> <u>Consultation</u> <u>Procedure</u> .	HSE Manager



6.2 Greenhouse Gas Mitigation and Management Measures

Greenhouse gas emissions from the operations will be calculated annually and be used to identify trends in greenhouse gas emissions and energy use and identify areas to improve/reduce its emissions.

Greenhouse gas mitigation and management practices include:

- Regular reviews and investigate ways to reduce energy consumption during project planning phases and reviewing energy efficient alternatives;
- Carefully planning and managing site operations to minimise the distance travelled by all vehicles on site;
- Monitoring the consumption of fuel and regularly maintaining diesel and petrol powered equipment to ensure operational efficiency; and,
- Monitoring the total site electricity consumption and investigating avenues to minimise electricity use.

6.3 Progressive Rehabilitation

Progressive rehabilitation works will be undertaken on the Project. Once the dewatering works are completed, the rehabilitation works within pits 1, 2 and 3 can commence. Appropriate measures will be undertaken to minimise dust creation by ensuring water trucks are running along the area where rehabilitation works are undertaken.



7 MONITORING AND PERFORMANCE CRITERIA

7.1 General

Inspection, monitoring, and auditing will be undertaken to assess and record whether activities are in compliance with regulatory requirements and the objectives outlined in the Environmental Management Strategy, which guides Project site operations.

7.2 Environmental Monitoring

A summary of parameters to be monitored and their performance criteria are in the tables below. Monitoring locations are on Figure Three.

7.3 Operational Monitoring and Inspections

Table 6 summarises specific performance criteria relating to operational activities within thesite and responsibilities and accountabilities.**Table 7** summarises the ambient air qualitycriteria.

All monitoring equipment is located in accordance with AS3580.1.1 to the greatest extent practicable whilst still meeting the requirements of the project approval and are shown on Figure Three. The monitoring program will continue until reviewed in accordance with section 8.0.

Condition	Action	Equipment	Responsible Staff	Accountability	When
S3 C9	Particulate matter emissions generated by the Project will not exceed criteria (Table 7) at any residence on privately owned land	High Volume Air Sampler (HVAS) Real-time dust monitor (DustTrak aerosol monitor) Depositional dust gauges	Laboratory	Site Manager	During all operations Excluding extraordinary events
S3 C14	Operate a meteorological station in the vicinity of the site	rate a Meteorological eorological station will measure on in the wind speed, hity of the site direction, sigma theta, temperature at 10m and 2m, relative humidity and		Site Manager	During all operations

Table 6	Air aualit	v monitorina	requirements
100100	/ III quante	,	i e quin criterito



	rainfall and be		
	capable of sending		
	relevant alarms. The		
	weather station		
	would comply with		
	the requirements in		
	the Approved		
	Methods for		
	Sampling of Air		
	Pollutants in New		
	South Wales (DECC,		
	2007) and be capable		
	of measuring		
	meteorological		
	conditions in		
	accordance with the		
	NSW Noise Policy for		
	Industry (EPA, 2017)		

Table 7 Ambient air quality criteria

Pollutant	Averaging Period	Method	Criterion	
Particulate Matter < 10 μm (PM ₁₀)	Annual	HVAS: AS3580.9.6 and DustTrak aerosol monitor (real-time dust monitor)	^{a,d} 25 μg/m ³	
Particulate Matter < 10 μm (PM ₁₀) (real-time monitoring)	24 hours	HVAS: AS3580.9.6 and DustTrak aerosol monitor (real-time dust monitor)	^b 50 μg/m³	
Particulate Matter < 2.5 μm (PM _{2.5})	Annual	DustTrak aerosol monitor (real-time dust monitor)	^{a, d} 8 μg/m ³	
Particulate Matter < 2.5 μm (PM _{2.5})	24 hours	DustTrak aerosol monitor (real-time dust monitor)	^b 25 μg/m ³	
Total Suspended Particulates (TSP)	Annual	Ratio calculated from PM ₁₀	^{a,d} 90 μg/m³	
Deposited Dust (Insoluble Solids)	Annual	Deposition gauges AS3580.10.1	^b 2 g/m²/month	^{a,d} 4 g/m²/month

Notes:

^a Total impact (i.e., increase in concentrations due to the project plus background concentrations due to all other sources).

^b Incremental impact (i.e., increase in concentrations due to the project alone, with zero allowable exceedances of the criteria over the life of the project.

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.



The air quality monitoring network is shown in Figure 3 in Appendix A. The air quality monitoring network includes one existing HVAS, four (4) existing dust deposition gauges and an existing meteorological station. The HVAS and dust deposition gauges are in good working order and will continue to be used to monitor dust. The meteorological station is being replaced with a new meteorological station.

The HVAS will be relocated from its current position immediately north of the existing administration office, to a new position closer to the northern boundary of the property and the closest sensitive receivers. The new meteorological station will be erected next to the HVAS. The dust deposition gauges will be relocated to appropriate positions as close to the property boundaries and nearest sensitive receivers as possible. Figure 3 in Appendix A shows the new positions of the air quality monitoring network.

The four dust deposition gauges are located through the site as shown on Figure 3 in Appendix A and at the coordinates shown in the table below. The gauges have been installed on an approximately 1.2m high metal rod with a concrete footing. The gauges are enclosed by fencing to protect them.

Dust Deposition Gauge IDs	Location coordinates
D1	-33°53'33", 150°45'27"
D2	-33°54'4", 150°45'41"
D3	-33°54'4", 150°45'41"
D4	-33°54'4", 150°45'41"

The HVAS has a PM_{10} inlet and is sampled in accordance with AS3580.9.6, which is 24 hours every 6 days. Dust Deposition Gauges are sampled in accordance with AS3580.10.1, which is every 30 ± 2 days.

The meteorological station will comply with the requirements in the latest version of the *Approved Methods for Sampling of Air Pollutants in New South Wales* (**DECC, 2007**). The weather station will measure and record wind speed and wind direction at 10 metres (m) above ground, sigma-theta (the standard deviation of horizontal wind directions), temperature at 10m and 2m and relative humidity and rainfall.

The equipment will be calibrated and maintained generally in accordance with the relevant Australian Standards, and tested by a NATA accredited laboratory.

Real-time monitoring of 24-hour average PM_{10} impacts will be conducted using a DustTrak aerosol monitor. The DustTrak aerosol monitor is capable of measuring $PM_{2.5}$ and PM_{10} simultaneously with data available in real-time to assist with the dust management of the operations. The location of the DustTrak aerosol monitor will initially be adjacent to the HVAS



and meteorological station and is shown in Figure 3 in Appendix A. The DustTrak aerosol monitor is portable and would be relocated as necessary to measure dust concentrations downwind of the onsite activities.

7.3.1.1 TSP to PM₁₀ ratio

The ratio of PM_{10} / TSP is determined from the relationship of the Ambient Air Quality Criteria (refer to **Table 7**) for PM_{10} of $25\mu g/m^3$ and TSP of $90\mu g/m^3$ calculated to be 3.6 (90/25). This ratio will be used to calculate TSP impacts during operations at the Badgerys Creek site from the on-site High Volume Air Sampler with a PM_{10} inlet. This methodology is based on the known relationship of PM_{10} as a subset of TSP and the applicable assessment criteria (in accordance with the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (**EPA, 2017**). This approach would likely result in a conservative estimate of the ambient TSP levels as it is almost invariably the case that PM_{10} is the limiting criterion for extractive operations in NSW.

7.3.1.2 Expected Outcomes

The HVAS with a PM_{10} inlet and a Davis weather station were installed on the site in December 2016. Since then, there have been no activities on the site and so the air quality monitoring and meteorological results, shown on the following graphs, can be considered localised background levels.



Figure 7.1 (Graph 1) HVAS Results for 2017 – 2018



Figure 7.2 (Graph 2) Wind Rose 2017 – 2018 9am





Figure 7.3 (Graph 3) Wind Rose 2017 – 2018 3pm



The Annual Average for PM₁₀ for 2017 was 20 μ g/m³ and for 2018 was 21 μ g/m³.

The winds during 2017-2018 were predominantly from the southwest in the mornings, and the west and northeast in the afternoons.

The 24-hour average PM_{10} result exceeded the impact criteria of $50\mu g/m^3$ on 19^{th} March 2018, when no activities were occurring on the site. On this day, other air quality monitors at Liverpool and Bringelly also recorded elevated levels and would indicate a regional dust event was the cause of the elevated reading.

7.4 Inspections

Monitoring of the implementation of this plan will be undertaken as part of quarterly site inspections by CSR management and HSE Personnel. On-going monitoring of these activities is essential to ensure compliance with regulatory requirements and conditions of approval.



8 EVALUATION AND REVIEW

8.1 Annual review

Prior to commencement of VENM import, and annually thereafter, CSR will review the environmental performance of the project in accordance with Section 8.1 of the <u>EMS</u>.

As part of this review and through the Community Consultation Committee, the nearby agricultural producers, WSA and residents will be consulted regarding the effectiveness of the dust mitigation measures. The results of this consultation and any proposed actions will be reported as part of the review.

The annual review report will be submitted to the Secretary of the DPIE, Council and the Community Consultative Committee. It will also be available on the website, once approved and to any interested person on request.

8.2 Plan and Program Revision

This plan will be reviewed and revised within three (3) months of the following:

- the submission of an Incident Report (refer 9.2);
- the submission of an annual review (refer 8.1);
- the submission of an Independent Environmental Audit report; and
- any modification to the conditions of approval (unless the condition requires otherwise).

This is in accordance with the intent of the conditions of approval to ensure that strategies, plans, and programs are updated on a regular basis, incorporate any recommended measures to improve the environmental performance of the Project, and update for new technologies and Best Practice procedures.

All approved management plans, strategies and programs will be implemented until any updated measures have been approved by the relevant authorities.



9 REPORTING

CSR will provide regular reporting in accordance with the project approval and EPL conditions. All monitoring results and environmental performance will be published on the website, in accordance with procedures detailed in the <u>EMS</u>.

9.1 Regular Reporting

9.1.1.1 Reporting under the Conditions of Approval

In accordance with the conditions of approval and as detailed in Section 9 of the <u>EMS</u>, CSR will provide regular reporting to the DPIE, EPA, WSA and other interested stakeholders.

9.1.1.2 Information Required on the Website

As detailed in Section 9.4.1 of the <u>EMS</u>, CSR will provide regular reporting on the environmental performance of the Project on its website.

9.2 Incident and Non-compliance Reporting

As soon as possible after CSR becomes aware of a non-compliance against any of the conditions of approval, or any other incident, notification will be made via phone and/or email in accordance with the protocol detailed in Section 9.2 of the <u>EMS</u>.

As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing:

- a) an exceedance of any criteria in Table 7, CSR will notify the affected landowners in writing including WSA as an affected landowner of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria; and
- b) an exceedance of any air quality criteria in Table 7, CSR will send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).



10 REFERENCES

AECOM. (May 2010). Air Quality Impact Assessment for Badgerys Ck.

APP. (2013). Environmental Management Strategy.

Element Environment. (2017). *Badgerys Creek Brick Making Facility Modification 2* Environmental Assessment.

National Environment Protection Council. (February 2016). *National Environment Protection* (Ambient Air) Measure.

Appendix A: Figures



APPENDIX A: FIGURES

FIGURE ONE - SITE LOCATION







FIGURE TWO - PROJECT LAYOUT PLAN

Figure 1 Overview of Preferred Project

CSR ADVANCED MANUFACTURING HUB Modification 3 and 4









FIGURE THREE - ENVIRONMENTAL MONITORING POINTS





APPENDIX B: EVIDENCE OF CONSULTATION

WSA consultation summary			
item	WSA comment	CSR response	Reference
	1 CSR to inform WSA when they have an exceedance or higher than	CSR will endeavour to do and continue our working relationship	9.2
	average results so we are aware when CSR activities may be	with WSA	
	affecting WSA AQ monitoring results		
	2 Section 8.1 annual review - We request that WSA be consulted as	we will update this section to include WSA as a consulted party	8.1
	part of the annual review		
	3 Section 9.1.1.1 could a copy of regular reporting to be sent to WSA	This information will be readily available in our website, I can send	9.1.1.1
	Environment Manager	you the link wo when a new report is updated WSA environmental	
		manager can review, I will endeavour to send reminders when the	
		documents are uploaded, on that note can you send me the contact	
		details of WSA environmental manager?	
	4 Section 9.2 - request notification of a NCR or incident to WSA	we will endeavour to also notify WSA when the NCR or incidents	9.2
		affects WSA as an authority or landowner affected	