SYDNEY FOOTBALL STADIUM REDEVELOPMENT

Construction Air Quality Management Sub Plan

SFS-JHG-00-PLN-PM060004

SSD-9835

Table of Contents

1 Revisions and Distribution

1.1 Revisions

Draft issues of this document are identified as Revision 1, 2, 3 etc. Upon initial issue (generally Contract Award) this will be changed to an alphabetical revision. Revisions will continue at Revision A, B, C etc.

Rev	Date	Prepared By [Name & Signature]	Reviewed By [Name & Signature]	Approved By	Remarks
1	10/01/2020	G Murray	C Funnell		
2	23/01/202	G Murray / H Madden	H Madden		
A	31/01/2020	M. Turner	S. Maclaren		Issue for Construction
B	4/5/2020	C. Newling	S. Maclaren		Updated as per comments from Site Auditor (Old Doc No.: SFS-JHG-PLN-CEMP-005)

Copy Holder Details		
Name	Position	Copy Number
Steve Maclaren	HSEQ Manager	1

1.2 Distribution List

Client's Representative	Via Aconex
Project Manager	Via Aconex
Project Site Manager	Via Aconex
HSEQ Manager	Via Aconex
Project Environment Representative	Via Aconex

The controlled master version of this document is available for distribution as appropriate and maintained on the document management system being used on the Project. All circulated hard copies of this document are deemed to be uncontrolled.

1.3 Compliance Matrix

Construction Environmental Management Plan requirements		Reference
B26	The Air Quality Management Plan (AQMP) must address, but not be limited to the following:	
a	Be prepared by a suitably qualified expert;	This Plan
b	Describe the measures that would be implemented on site to ensure: (i) The control of air quality and odour impacts of the Development during bulk earthworks and piling activities; (ii) That these controls remain effective over time; (iii) That all reasonable and feasible air quality management practice and measures are employed, including the relevant measures listed in Section 6 of the Air Quality Impact Assessment (report 18274-S2 Version A) prepared by Wilkinson Murray dated May 2019; (iv) That the mitigation and management measures are consistent with Guidance on the assessment of dust from demolition and construction (IAQM, 2014); (v) The air quality impacts are minimised during adverse meteorological conditions or extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Planning Secretary; and (vi) Compliance with the relevant conditions of this consent.	Section 6
c	Include performance objectives for monitoring dust and ensuring no unacceptable off-site air quality impacts to users of Moore Park, nearby residences, Kira Child Care centre, UTS and other businesses.	Section 7 and Section 9.1
d	Includes an air quality monitoring program in accordance with Section 6.2 of the Air Quality Impact Assessment (report 18274-S2 Version A) prepared by Wilkinson Murray dated May 2019 that: (i) Is capable of evaluating the performance of the construction works; (ii) Includes a protocol for determining any exceedances of the relevant conditions of consent and responding to complaints; (iii) Adequately supports the air quality performance objectives; and (iv) Evaluates and reports on the effectiveness of air quality management for the construction works	Section 7
e	Details on monitoring weather conditions and communicating changing conditions to the workforce; and	Section 7
f	Stop work procedures if performance in B25(c) are not being met.	Section 9 and 9.1
C24	**Dust Minimisation** During construction works, the Applicant must ensure that: (a) Dust minimisation measures identified in the CEMP are implemented at all times; (b) All construction waste and stockpiles are always covered; (c) Exposed surfaces and stockpiles are suppressed by appropriate methods; (d) All trucks entering and leaving the site with loads have their loads secured and covered; (e) Trucks associated with the development do not track dirt onto the public road network; (f) Public road used by Project related trucks are kept clean; and (g) Hydraulic shears are used instead of rock breakers, where feasible.	This Plan and Section 6
C25	**Air Quality Discharges** The Applicant must install and operate equipment in line with best practices to ensure that the construction works comply with all load limits, air quality criteria / air emission limits and air quality monitoring requirements as specified in the CAQMSP required by Condition B26.	Section 4.2 and Section 9.1
C26	**Air Quality Discharges** Dust deposition monitoring must be undertaken during the construction works (as per AS/NZS 3580). This would include monitoring points in appropriate locations on the site boundary in Paddington and Moore Park. Monitoring locations must include sensitive receivers that are most likely to be affected. The locations and frequency of the monitoring are to be agreed in consultation with the EPA and detailed within the CAQMSP.	Section 7

2 Definitions

AMS – Activity Method Statement

CA/Client – Contract Administrator/Client

ECP – Environmental Control Plan

EMP – Environmental Management Plan

EPA – Environment Protection Authority

Fm – Foreman / Supervisor

JH – John Holland

JHET – John Holland Event Tracker

OEH – Office of Environment and Heritage

OH – Occupational Hygienist

PER – Project Environmental Representative

PM – Project Manager

SEP – Site Environmental Plan

SFS – Sydney Football Stadium (the Project)

SM – Site Manager / Superintendent

TRA – Task Risk Assessment

WRA – Workplace Risk Assessment

3 Scope of the Air Quality Management Plan

EMS reference
Environment Management Manual JH-MAN-ENV-001

The Sydney Football Stadium Redevelopment Stage 2 (The Project) is an Infrastructure NSW initiative to build a new rectangular stadium. The Project is part of the SCSGT Precinct, adjacent to the SCSGT and part of the wider Moore Park sports and entertainment precinct.

Stage 2 works include Detailed design, construction and operation of a new stadium comprising:

- construction of the stadium, including:
    - 45,000 seats (additional 10,000 - person capacity in the playing field in concert mode) in four tiers including general admission areas, members seating and corporate I premium seating;
    - roof cover over all permanent seats and a rectangular playing pitch;
    - a mezzanine level with staff and operational areas;
    - internal pedestrian circulation zones, media facilities and other administration areas on the seating levels;
    - a basement level (at the level of the playing pitch) accommodating pedestrian and vehicular circulation zones, 50 car parking spaces, facilities for teams and officials, media and broadcasting areas, storage and internal loading areas;
    - food and drink kiosks, corporate and media facilities; and
    - four signage zones.
- construction and establishment of the public domain within the site, including:
    - hard and soft landscaping works;
    - publicly accessible event and operational areas;
    - public art; and
    - provision of pedestrian and cycling facilities.
- wayfinding signage and lighting design within the site;
- reinstatement of the existing Moore Park Carpark 1 (MP1) upon completion of construction works with 540 at-grade car parking spaces and vehicular connection to the new stadium basement level;
- operation and use of the new stadium and the public domain areas within the site for a range of sporting and entertainment events; and
- extension and augmentation of utilities and infrastructure.

The works are proposed to be staged as shown below in Table 1

Table 1 - Construction Staging

CC No.	Proposed works	Duration	Start Date	Finish Date
CC1	Bulk earthworks, retaining walls, enabling and temporary works (for example shoring) to facilitate future stages.	11 months	March 2020	February 2021
CC2	Stadium sub-structure elements including piles, foundations, footing construction and in-ground services	7 months	April 2020	October 2021
CC3	Structure - basement to concourse level construction.	9 months	July 2020	March 2021
CC4	Above concourse level works (structure – Level 1 to Level 5)	7 months	November 2020	May 2021
CC5	Roof, façade, fit-out and remaining elements.	18 months	February 2021	July 2022

This Environmental Management Plan (EMP) Sub-Plan specifies the requirements of the John Holland Environmental Management System (EMS) (which is certified to ISO AS/NZS14001) that Sydney Football Stadium Redevelopment (the Project) will use to enhance its environmental performance. Consistent with John Hollands Environment Policy, the intended outcomes of this EMP include:

- enhancement of environmental performance on the Project;
- fulfilment of the Project's compliance obligations; and
- achievement of the Project's environmental objectives.

This Sub Plan (the Plan) enables the Project to manage its environmental responsibilities in a systematic manner and contribute to the environmental pillar of sustainability. This Plan is applicable to the Project and applies to the environmental aspects of the Project's activities, products and services that the Project determines it can either control or influence considering a life cycle perspective.

This Air Quality Management Plan is applicable to all construction phase works (Stage 2) associated with the Sydney Football Stadium Redevelopment (John Holland and subcontractors).

3.1 Objectives

The objectives of this Air Quality Management Plan are to:

- Ensure appropriate measures are implemented to address the relevant Conditions of Approval (CoA) outlined in the State Significant Development Consent (SSD-9835).
- Ensure best management practice controls and procedures are implemented during the construction activities to avoid or minimise the risk of air quality and odour impacts.
- Minimise dust generation and any other potential air quality impacts as a result of construction activities.
- Implement proactive measures to mitigate impacts at the source, path and receiver to minimise complaints from and potential impacts to sensitive receivers.
- Manage potential air quality issues so they are identified and controlled to meet legislative requirements.

3.2 Project Location

The site is located at 40-44 Driver Avenue, Moore Park within the Sydney Cricket Sports Ground Trust (SCSGT) Precinct bounded by Moore Park Road to the north, Paddington Lane to the east, the existing SCSGT stadium to the south, Driver Avenue to the west, and is located within the City of Sydney local government area.

The site is legally described as Part Lots 1528 and 1530 in Deposited Plan 752011 and Lot 1 in Deposited Plan 205794 and is Crown Land, with the SCSGT designated as the sole trustee under the Sydney Cricket and Sports Ground Act 1978.

The site is largely surrounded by Centennial and Moore Parks, the Fox Studios and Entertainment Quarter precincts and the residential suburb of Paddington.

The site is approximately 3km from the Sydney CBD and approximately 2km from Central Station, is connected to Sydney's transport network through existing bus routes and will benefit from a dedicated stop on the soon to be completed Sydney CBD and South East Light Rail.

Figure 1: Site boundaries: 1: Allianz Stadium, 2: Sheridan Centre, 3: Sydney Roosters, 4: Cricket NSW, 5: MP1 Carpark

4 Performance

4.1 Project general context

- Construction activities are undertaken in accordance with this AQMP (Air Quality Management Plan).
- No verified complaints or community concerns relating to airborne dust or odour generation during the construction phase of the Project.
- Corrective action in response to any complaint occurs within 48 hours following the receipt of a complaint.
- No significant visible dust outside of the Project area boundary.

4.2 Targets

The following are the air quality impact assessment criteria (dust and particulate matter) used by Wilkinson Murray (May 2019).

Pollutant	Averaging Period	Impact	Criteria
Total suspended particulates (TSP)	Annual	Total	90 µg/m^3
Particulate matter ≤10 µm (PM_{10})	Annual	Total	25 µg/m^3
Particulate matter ≤10 µm (PM_{10})	24-hour	Total	50 µg/m^3
Particulate matter ≤2.5 µm ($PM_{2.5}$)	Annual	Total	8 µg/m^3
Particulate matter ≤2.5 µm ($PM_{2.5}$)	24-hour	Total	25 µg/m^3
Deposited Dust (DD)	Annual	Total	4g / m² / month
Deposited Dust (DD)	Annual	Incremental	2g / m² / month

**Adapted from EPA guideline; Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA 2016)

*Dust is assessed as insoluble solids as defined by AS/NZS 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air – determination of particulate matter – deposited matter – gravimetric method

Wilkinson Murray (May 2019) subsequently developed reactive management trigger levels for PM10. Further details are provided in Section 9.1. These levels were adopted for Stage 1 works with the Project continuing to monitor PM10 for Stage 2 activities (as detailed in Section 7- monitoring of this Plan).

5 Legislation and Guidance Documentation

5.1 Federal Legislation and Guidelines

- National Environment Protection (Ambient Air Quality) Measure 2016 (NEPM AAQ 2016).
- National Environment Protection (Ambient Air Quality) Measure, Technical Paper No. 5 Data Collection and Handling, 2001 (NEPM Technical Paper No. 5).
- National Environment Protection (Air Toxics) Measure, 2015 (NEPM AAQ 2015).

5.2 State legislation

- Protection of the Environment Operations Act 1997 (NSW)
- Protection of the Environment Operations (Clean Air) Regulations 2010 (NSW)
- Protection of the Environment Operations (General) Regulations 2009 (NSW)

5.3 Standards / Codes

- AS/NZS 3580.1.1: 2007 Methods for Sampling and Analysis of ambient air – guide to siting air monitoring equipment.
- Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (January 2007).
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2016).
- Guidance on the assessment of dust from demolition and construction (IAQM, 2014).

5.4 Supporting Documentation

- Construction Environmental Management Plan (CEMP)
- Construction Waste Management Plan (CWMP)
- Construction Soil and Water Management Plan (CSWMP)
- Site Environmental Plan (SEP)
- John Holland Safety Quality and Environment Risk Management Procedure
- Sydney Football Stadium Stage 2 Construction and Operation, Environmental Impact Statement (EIS) and appendices prepared by Ethos Urban (12 June 2019)
- Sydney Football Stadium Redevelopment – Stage 2 – Air Quality Impact Assessment (Version A) prepared by Wilkinson Murray, May 2019 for Construction Management Plan.
- State Significant Development Consent SSD-9835.
- Douglas Partners Asbestos Assessment (99553.00.R.004) – (February 2020)
- Douglas Partners Remediation Action Plan (99533.00.005) – (March 2020)
- Section B Site Audit Statement (JC-NSW27) – (March 2020)
- EP Risk Asbestos in Soil Management Plan (EP1599.002), (March 2020)

6 Dust and Air Quality Management Action Planning

Inductions, Training and Awareness	Staff Responsible	When
Training will be provided to all Project personnel, including subcontractors on the requirements of this AQMP through inductions and toolbox meetings	SM	Prior to personnel commencing onsite and at toolbox meetings

General Requirements	Staff Responsible	When
Burning of materials and/or rubbish is not permitted on site	All Staff	At all times
During the Project, all reasonable and feasible measures will be implemented to minimise dust generation.	All Staff	At all times

Design and Planning	Staff Responsible	When
Plan the site layout to locate dust generating activities and spoil stockpiles away from sensitive receivers, as far as practicable.	SM	Prior to commencing works
Utilise existing perimeter hoarding as a solid screen or use temporary fencing with shade cloth to minimise fugitive dust emissions.	FM	Prior to commencing works
Keep site fencing, barriers and scaffolding clean using wet methods (or suitable alternative methods)	PER	As required

Pre-Construction	Staff Responsible	When
A stabilised construction access / egress will be established where construction traffic enters or leave from a public road.	PD / SM	Prior to commencing works

Plant and equipment movement and access	Staff Responsible	When
Spoil, mud or the like spilt onto internal sealed roads and public roads (as necessary) to be removed within a reasonable timeframe through use of a street sweeper or other means.	SM / FM	At all times
All trucks entering or leaving the site with loads have their loads secured and covered where applicable.	SM / FM	At all times
All plant and equipment (including trucks) are to minimise the amount of idling and shall be turned off (or throttled down if appropriate) when not in use for an extended period of time.	FM	At all times
Truck routes for construction waste transport to be in accordance with the endorsed Construction Traffic and Pedestrian Management Plan.	SM	At all times

Plant and equipment movement and access	Staff Responsible	When
Impose and signpost traffic speed limits to minimise dust generation which must be adhered to at all times	SM	At all times
Plant and equipment are to be regularly inspected and maintained to ensure it is running optimally. Use Pre-start Checks and Logbooks as appropriate to record and determine suitability of inspection and maintenance.	SM / FM	At all times
Use diesel particulate filters on plant where feasible.	SM	At all times

Dust Control Measures	Staff Responsible	When
Exposed surfaces and stockpiles are suppressed by appropriate methods.	SM	As required
All construction waste and stockpiles must be appropriately covered or otherwise managed.	SM	As required
All stockpiles must be appropriately treated where inactive for a period of greater than 28 days.	SM / FM	At all times
All trucks entering or leaving the site with loads must have their loads secured and covered where needed	FM	At all times
Where there is a risk of mud or dirt being tracked onto public roads, rumble grids or wash bays must be established for site entries and exits	SM	Prior to commencing works
Dust and other material likely to fall from wheels, underside or body of any vehicles, trailer or motorised plant leaving the site must be removed as far as practicable before leaving the premises.	SM / FM	As required
Public roads used by Project related trucks are kept clean.	FM / PER	As required (within 24 hours of any tracking or spills)
Airborne dust to be kept to a minimum through the use of dust suppression as appropriate, including but not limited to: • Wetting of stockpiles • Targeted dust suppression/wetting for specific activities. (e.g. loading of trucks, excavation).	FM / PER	As required

Bulk Excavation	Staff Responsible	When
Earthworks and exposed areas / long-term soil stockpiles are to be stabilised as soon as practicable following completion of works.	PER	As required
Use hessian, mulches or tackifiers (soil stabiliser) where revegetation is not possible	PER	As required
Exposed surfaces (and stockpiles) are suppressed by appropriate methods.	FM	During active works

Operations	Staff Responsible	When
Where there is a risk of concrete cutting / sawing or drilling resulting in concrete dust being blown to nearby receivers, use dust suppression techniques such as water sprays.	FM	During construction
Ensure there is an adequate supply of water on site for effective dust suppression (using non-potable water supply where practicable).	SM	Daily

Management and Removal of Excavated Materials	Staff Responsible	When
Unless being reused on site, remove materials that have a potential to produce dust from site as soon as possible.	FM	At all times
Avoid any unnecessary movement of material from stockpiles	FM	At all times
Exposed surfaces and stockpiles are suppressed (dust minimisation) by appropriate methods	FM	At all times
Implement appropriate speed limits on internal haulage routes to prevent dust generation (e.g. 25 km/hr on surfaced haulage routes and 15 km/hr on un-surfaced haulage routes).	FM	At all times

Management and Removal of Asbestos Contaminated Soil	Staff Responsible	When
Capping of asbestos contaminated soils would be carried out in accordance with the documents listed in Section 5.4	PER/SM/FM	At all times
An occupational hygienist will supervise all works in asbestos exclusion zones	OH	At all times
Clearances certificates would be issued by the occupational hygienist progressively to allow works to proceed in capped areas	OH	At all times
Water carts and foggers would be used to manage dust	FM	At all times
Asbestos air monitoring would be carried out in on the site boundary and other areas determined by the occupational hygienist	OH	

Adverse weather conditions	Staff Responsible	When
Construction activities to be modified, reduced or controlled during adverse conditions (i.e., high or unfavourable wind conditions, or during bushfires, prescribed burns, dust storms, fog or fire) with the potential to increase off-site dust generation. Corrective Actions are provided in Section 9.	FM	As required
Minimise disturbance to surfaces at risk from wind erosion: • Minimise activities likely to produce dust during hot / windy conditions (visual determination based on intended activity) • Maintain landscaped areas to avoid or minimize areas of exposed soil. • Wet down or cover exposed areas.	SM / FM	As required.

Odour management	Staff Responsible	When

The Project will ensure that the carrying out of works does not cause or permit the emission of offensive odours from the site, as defined under Section 129 of the POEO Act.	All staff	At all times
Odorous material that may cause a disturbance to nearby receivers shall be removed from site as soon as practicable or, if stockpiling is required, stockpiled away from sensitive receivers and covered to prevent fugitive emissions.	FM	As required

Stakeholder Communications and Complaints	Staff Responsible	When
Develop and implement a Stakeholder Communications Plan that includes community engagement before commencing construction works. The Plan should include: ▪ The name and contact details of the person responsible for air quality and dust issues at the site boundary. ▪ Contact information for the relevant site office.	PD/SM	Prior to commencing works
Record all dust and air quality complaints, identify the causes, take appropriate measures to reduce emissions in a timely manner and record the measures taken.	FM	As required

7 Monitoring

Monitoring Required	Staff Responsible	When
Weather forecasts are to be reviewed daily and appropriate measures implemented if dry weather or strong winds are anticipated.	FM / PER	Daily
Communicate adverse weather conditions to Fm to adjust work practices, or stop work, accordingly.	PER	As required
Public roads adjacent to site entry and exit points shall be inspected daily for soil or mud build-up as a result of construction activities. Material tracked onto roads shall be cleaned with water-assisted dust sweepers, as required.	FM / PER	Daily (cleaning as required)
Visual monitoring of dust emissions should be carried out continually and appropriate controls put in place in the case of localised generation of excessive dust with potential to disperse beyond site boundaries. Corrective Actions are provided in Section 9.	FM / PER	At all times
Undertake daily on-site and off-site inspection to monitor dust. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the site boundary, with cleaning to be provided if necessary.	FM / PER	Daily
Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during any periods of prolonged dry or windy conditions.	FM / PER	As required
Any excessive air quality or visual amenity issues shall be recorded on the Enviro Inspection Checklist. Informal daily observations to be recorded in site diaries – including consideration of weather conditions and certain activities with a high dust generation potential.	FM / PER	Weekly
Depositional dust monitoring gauges/samples shall be retrieved in accordance with the approved sampling period (typically monthly), with the samples sent to a NATA accredited lab for analysis and reporting.	PER	Monthly
Asbestos air monitoring would be carried during works were asbestos may be impacted	OH	Daily

Should complaints be received, appropriate monitoring will be undertaken at a location relevant to the nearest sensitive receiver.	PER	Following a complaint
Record inspection results and make available to relevant authorities.	PER	At all times
Undertake audits to assess compliance with this Plan and the effectiveness of environmental controls, in accordance with the CEMP audit requirements.	PER	In accordance with CEMP

Dust Deposition Monitoring (bulk earthworks and piling activities)	Staff Responsible	When
Dust deposition monitoring must be undertaken during bulk earthworks and piling c (as per AS/NZS 3580). This would include monitoring points in appropriate locations on the site boundary and in Paddington and Moore Park. Monitoring locations must include sensitive receivers that are most likely to be affected. The locations and frequency of the monitoring are to be agreed in consultation with EPA and detailed within this AQMP.	PER / PM	prior to works commencing.
Locations of depositional dust monitoring locations are found in Appendix A.	PER	During bulk earthworks and piling
Monthly depositional dust monitoring would be undertaken during bulk earthworks and piling	PER	During bulk earthworks and piling

PM10 Monitoring (bulk earthworks and piling activities)	Staff Responsible	When
Monitoring equipment should be capable of measuring ambient PM10 concentrations are providing notifications when levels exceed certain thresholds. The notifications should be provided in a timely manner (i.e. 1 hour) to facilitate the implementation of reactive management.	PER / PM	During bulk earthworks and piling
PM10 monitoring equipment would be consistent with the equipment specified in the Air Quality Impact Assessment (Wilkinson Murray, May 2019). This report recommended that optical equipment, such as an Aeroqol Dust Sentry, is used for the monitoring. While it is noted that these units are not approved under the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (EPA, 2007), they are well suited to reactive management of construction dust as they can provide data in near real-time and have significantly lower capital costs compared to other equipment.	PER	During bulk earthworks and piling
Locations of PM10 monitoring locations are found in Appendix A	PER	During bulk earthworks and piling
Reactive Management Trigger Levels (PM10) are provided in Section 9.1.	SM/PER	As per trigger level

8 Reporting

Reporting Required	Staff Responsible	When
Details of field observations shall be reported via the Enviro Inspection Checklist, and communicated to all staff during pre-starts, toolbox and team meetings.	PER	At all times
All complaints / incidents regarding air quality shall be reported immediately to the PER.	All staff	Following incident/complaint
The Project Director shall be notified immediately of all incidents and valid complaints. Relevant JH procedures for incidents and complaints handling reporting shall be followed.	PER	Following receipt of incident / complaint
JH Operations HSE Team is to be immediately informed of any incident that has caused or is likely to cause material harm to the environment and will advise on the notification of relevant regulators and stakeholders (As required by the Protection of the Environment Operations Act 1997).	PD / PER	Following incident
The JH Project Director shall notify the client of all significant incidents and valid complaints, verbally within 2 hours, and in writing within 24 hours.	PD	Verbally within 2 hours, and in writing within 24 hours
A summary of monitoring results is to be provided monthly to the Project Director.	PD / PER	Monthly
A summary of monitoring results is to be provided monthly to the client.	PD / PER	Monthly
A summary of incidents and valid complaints shall be provided monthly to the client and include the actions that were taken to address the complaint.	PD / PER	Monthly

9 Corrective Action Plan

Problem	Suggested Corrective Action
Excessive dust from excavation	▪ Increase frequency of water truck spraying ▪ Avoid excavation during high wind events, particularly if wind direction is likely to impact on any sensitive receivers. ▪ Erect temporary dust screens, particularly between dust sources and sensitive receivers.
Excessive dust creation from hauling operations	▪ Spray haul roads with water, use soil stabilisation binder, apply crushed rock or a combination of these measures. ▪ Reduce vehicle speeds. ▪ Cover loads causing dust impacts. ▪ Consider relocation of haul roads to less sensitive areas. ▪ Clean dirty road surfaces increase frequency of spraying/chemical application. ▪ Install shakedown devices at entry and exit points.
Excessive dust from stockpiles	▪ Spray stockpiles with water/water trucks. ▪ Hydromulching/seed or stabilise stockpiles, cover stockpiles with geofabric (or similar) where appropriate. ▪ Locate stockpiles away from sensitive receivers. ▪ Leave larger buffer zones. ▪ Erect temporary dust screens, particularly between the source and sensitive receivers.
Creation of excessive vehicle emissions	▪ Repair or undertake maintenance on equipment, plant and vehicles where necessary. ▪ Remove non-compliant equipment, plant and vehicles from operation where repair or maintenance is not practicable. ▪ Restrict equipment, plant and vehicle hours of operation when working in the vicinity of sensitive receivers.
Community query / complaint on dust levels	▪ Investigate the complaint and affected area to determine cause. ▪ Follow the reporting requirements in Section 8 of this AQMP ▪ Consult with Supervisors, Operators, Project Engineers, Construction Manager ▪ Visually monitor the site if the activity is still occurring ▪ Application of dust suppression (i.e., water trucks, chemical suppressants) ▪ Establish wind fencing where practicable ▪ Review and alter construction schedule to avoid certain activities such as earthworks during periods of high wind (based on weather forecasts) ▪ Other practicable management controls as determined at the time by the SM / PER ▪ Monitor the site visually and/or through reporting results to establish if the controls and/or mitigation measures are effective. ▪ Where appropriate, exceedance and remediation methods implemented to be communicated to Project team and wider work force. ▪ Summary of exceedances and remedial action to be submitted to the Client.
Exceedance of air quality criteria	▪ Application of dust suppression (i.e., water trucks, chemical suppressants) ▪ Establish wind fencing where practicable ▪ Review and alter construction schedule to avoid certain activities such as earthworks during periods of high wind (based on weather forecasts) ▪ Other practicable management controls as determined at the time by the SM / PER ▪ Monitor the site visually and/or through reporting results to establish if the controls and/or mitigation measures are effective. ▪ Where appropriate, exceedance and remediation methods implemented to be communicated to Project team and wider work force. ▪ Summary of exceedances and remedial action to be submitted to the Client.

9.1 Reactive Management Trigger Levels (PM10)

The following trigger levels are proposed for reactive management in relation to PM10 air quality monitoring during bulk excavation and piling activities. The values have been developed with a view to ensuring that ambient dust and particulate matter concentrations in the surrounding area comply with the impact assessment criteria presented in Section 4.2 but are expressed in time scales short enough to support reactive management.

Trigger Stage	Averaging Period	Trigger Value (ug/m3)	Action Required
1 Investigate	1 hour	85	SM/PER to undertake a review of possible dust sources operating during the average period. Identify possible measures for these activities; action if deemed necessary.
	3 hours	80	
2 Action	1 hour	470	SM/PER to attend site and ensure implementation of the control. Effectiveness of control actions to be reviewed and escalate where appropriate.
	3 hours	160	
3 Stop Work	1 hour	940	Targeted shut down of dust generating activities until the measured pollutant levels are below the stated trigger value. Identify long-term solutions to dust issues.
	3 hours	320	

Appendix A – Air Quality Monitoring Locations