

Sydney Metro North West

Design and Construction of Surface
and Viaduct Civil Works



Construction Air Quality Management Plan

NWRLSVC-ISJ-SVC-PM-PLN-120209

Revision 8.0

5 May 2017

Construction Air Quality Management Plan

Surface and Viaduct Civil Works



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Document Revision History

Doc No NWRLSVC-ISJ-SVC-PM-PLN-120209

Revision	Description	Prepared by	Reviewed by	Approved by	Date
1.0	Issued for Approval	Rhonda Pollard /WSP	Steve Fermio	Sam Turnbull	31-Mar-14
2.0	Revised in response to TfNSW comments	Rhonda Pollard	Steve Fermio	Sam Turnbull	5-May-14
3.0	Revised in response to TfNSW and DP&E comments	Rhonda Pollard	Steve Fermio	Graeme Tait	16-Jun-14
4.0	Revised to address ER comment	Rhonda Pollard	Steve Fermio pp Neville Hattingh	Graeme Tait	12-Aug-14
5.0	Updated to address audit finding	T. Austin	I. Stuart	D. Vaggi	14-Oct-15
6.0		D. Malysiak	T. Austin	I. Stuart	9-Nov-15
7.0	General update	J. Burgin	B Tucker	G Perdikaris	22 Dec 16
8.0	Response to TfNSW comments	J. Burgin	B Tucker	G Perdikaris	5 May 17
Signature					

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DEFINITIONS AND ABBREVIATIONS

Abbreviation	Defintion
Ambient Level	Existing level of a phenomenon without the influence of construction activities
BoM	Bureau of Meteorology
Complaint	Complaints include any interaction with a community member or stakeholder who expresses dissatisfaction with the project, policies, contractor's services, staff members, actions or proposed actions during the project.
CEMF	Construction Environmental Management Framework (Submissions Report, Section 3)
CEMP	Construction Environmental Management Plan
CM	Construction Manager(s) (ISJV)
MCoA	Ministerial Conditions of Approval
DP&E	Department of Planning and Environment
EC	Environmental Coordinator
ECM	Environmental Control Map
EIS	Environmental Impact Statement
EM	Environment Manager (ISJV)
Emission	A discharge of a substance (e.g. dust) into the environment
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPL	Environment Protection Licence
ER	Independent Environmental Representative
IC	Independent Certifier
IMP-BMS	Impregilo S.p.A. (Australia) – Business Management System
Incident	Any unplanned or undesired event which results in or has potential to result in injury, ill health, damage, to or loss of property, interruption to operations or environmental impairment. An incident also includes a near miss, breach of procedure, quality failure, injuries to employees, contractors or members of the public and any other statutorily reportable occurrence.
ISJV	Impregilo S.p.A. (Australia) and Salini (Australia) Joint Venture / Principal Contractor
Mitigation Measures	Measures employed to reduce (mitigate) an impact
NOW	NSW Office of Water, Department of Primary Industries
OEH	Office of Environment and Heritage
PIRMP	Pollution Incident Response Management Procedure
PMS	Project Management System
POEO Act	Protection of the Environment Operations Act 1997
Pollution	The alteration of air, soil, or water as a result of human activities such that it is less suitable for any purpose for which it could be used in its natural state
REMM	Revised Environmental Mitigation Measures
RMS	Roads and Maritime Service (formerly RTA)
SMNW	Sydney Metro North West

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Abbreviation	Defintion
SSI	State Significant Infrastructure
SVC Works	Surface Viaducts and Civil Works, for the Sydney Metro North West Project
SWTC	Scope of Work and Technical Criteria
TfNSW	Transport for New South Wales

1 INTRODUCTION

1.1 Description of Sydney Metro Northwest Project

The Sydney Metro Northwest (SMNW) project is a key priority for the NSW Government. The SMNW will deliver a new high frequency single deck train system, initially operating as a shuttle between Cudgegong Road and Chatswood. The project includes eight new stations, approximately 15.5km of tunnels from Epping to Bella Vista, a 4.5km elevated 'skytrain' (viaduct) between Bella Vista and Rouse Hill, and conversion of the Epping to Chatswood Rail Link to deliver high frequency rapid transit services.

Stations are planned at Cherrybrook, Castle Hill, Showground, Norwest, Bella Vista, Kellyville, Rouse Hill and Cudgegong Road. Bus, pedestrian, cycling and easy access facilities will be provided at all stations, with approximately 4000 'Park and Ride' spaces spread across five sites.



Figure 1: The Sydney Metro North West service proposed alignment

1.2 Description of the SVC Project works

The scope of the SVC Project works consists of the detailed design, construction and handover of the viaducts, bridges and associated civil works required for the SMNW between Bella Vista and Cudgegong Road and includes establishment and reinstatement of worksites, spoil removal and disposal and all required utility relocations and adjustments at construction worksites.

The permanent infrastructure to be delivered includes:

- Approximately 4.5 km of viaduct between Balmoral Road and Rouse Hill Station including crossings over Memorial Avenue, Samantha Riley Drive, Windsor Road, Sanctuary Drive and White Hart Drive;
- Bulk earthworks requirements including all cut, fill and embankments between Balmoral Road and Cudgegong Road;
- A bridge over Windsor Road / Rouse Hill;
- A bridge over Second Ponds Creek;
- Allowance for station structures to be incorporated onto the viaduct at the Kellyville and Rouse Hill station sites;
- Adjustments to existing infrastructure and roads within the construction site and / or otherwise affected by ISJV activities;
- Safe, secure personnel access / egress into site areas including necessary temporary support services and site facilities, with hoardings, fencing and so on around worksites to be left in place upon completion;
- Construction traffic and transport management including temporary and permanent traffic management works; and
- Removal of all temporary work and site facilities not otherwise required for handover to subsequent contractors.

Activities associated with the temporary and SVC Contractor works required in order to complete construction include:

- Safe, secure personnel access / egress into site areas including necessary temporary support services and site facilities, with hoardings, fencing and the like around work sites to be left in place upon completion;
- Construction traffic and transport management including temporary and permanent traffic management works;
- Removal of all temporary work and site facilities not otherwise required for handover to subsequent contractors.;
- Construction, commissioning, operation and removal of two concrete batching plants;
- Construction, commissioning, operation and removal of a pre-cast concrete plant;
- Construction of temporary T-way car parking at Rouse Hill and Kellyville;
- Construction, removal and transportation of the gantry along the SVC construction zone;
- Temporary changes to site personnel access/egress;
- Signage, fencing and hoarding;
- Construction environmental management activities;
- Construction traffic management activities ;
- Interface and communications within SVC Contractor team and across SMNW team;
- Stakeholder liaison activities ; and
- Adherence to SMNW protocols and procedures.

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2 GOALS, OUTCOMES, KEY ISSUES

Scope	<p>The Air Quality Management Plan has been prepared to manage potential air pollution (in particular dust and PM10) impacts during construction of the Surface Viaducts and Civil (SVC) Works component of the Sydney Metro Northwest. The scope of this Plan includes construction sites along the 4.6km above ground section of the route from Bella Vista to Rouse Hill, which is a combination of viaduct, embankment, at grade and cutting.</p> <p>This plan is based on identified environmental aspects and impacts to air quality from construction activities in each of the SVC construction sites, and identified guidelines and standards to be achieved.</p> <p>This plan forms part of the Impregilo S.p.A. (Australia) and Salini (Australia) Joint Venture (ISJV) Business Management System and should be read in conjunction with plans shown in Section 2.1, Figure 2.</p>
Goals	<p>Air Quality (Construction Environmental Management Framework Standard, SMNW, July 2012 (Section 16.1):</p> <ul style="list-style-type: none">• Minimise gaseous and particulate pollutant emissions from construction activities as far as feasible and reasonable.• Identify and control potential dust and air pollutant sources.• Meet MCoA E1 (SSI-5100) E8 (SSI-5414) and related consistency assessments.• Adhere to conditions of EPL No. 20454
Intended Outcomes	<ul style="list-style-type: none">• Achieve particulate concentrations and dust deposition rates from construction activities that meet ambient PM10 concentration (24-hour) of less than 50 µgm-3 at any off-site residential receptor (<i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (DEC 2005)• No environmental fines or prosecutions relating to dust and air emissions.• No reduced operating amenity for businesses, educational and other facilities surrounding construction site.
Key Issues and Sensitive Areas	<p>Construction activities have the potential to affect air quality if not properly managed. Due to the exposure of large surface areas and stockpiles to winds, there is potential for wind-blown sand and dust. Consequently, construction activities require careful construction planning and effective control measures to ensure that there are no significant emissions of dust.</p> <p>Dust could be generated from the following sources:</p> <ul style="list-style-type: none">• excavation and earth moving works associated with cut and embankment fill requirements;• construction and use of the haul road and associated access roads along the length of the project;• spoil handling & stockpiling;• transport of spoil by vehicles;• movements of construction vehicles and plant onsite• access / egress from site to public roads• Segment demolition• cleaning of steelwork and formwork prior to pours• demolition works associated with, generally the Balmoral Road and Windsor Road crossings and the pier construction at Memorial Avenue, the T-way car park adjacent to Samantha Riley Drive and in front of the Rouse Hill Shopping Centre;• piling works (typically bored piles) including break back of piles; and

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	<ul style="list-style-type: none"> erection of piers and deck. <p>The above activities and exhaust emissions from the operation of construction vehicles and plant are also a source of PM₁₀. Measures to manage these potential sources are described in Section 6. Operation of the batch plant is regulated under an Environment Protection Licence (EPL) from EPA.</p> <p>Sensitive areas are located within surrounding residential, commercial and rural areas.</p> <p>Key sensitive receivers include:</p> <ul style="list-style-type: none"> John XXIII Catholic Primary School Castlebrook Lawn Cemetery and Crematorium Community Facilities within Rouse Hill Town Centre Cafes & restaurants on the outskirts of the Rouse Hill Town Centre Endangered Ecological Communities and adjacent creek line (to be confirmed off sensitive areas map) Restaurant facilities on the western side of Old Windsor Road Car wash facility on the western side of Old Windsor Road
Statutory Requirements	<p><i>Protection of the Environment Operations Act, 1997 (POEO Act)</i></p> <ul style="list-style-type: none"> Do not cause air pollution by failing to maintain and operate plant, or carry out maintenance work on plant, in a proper and efficient manner. Must not allow soil or dust to be deposited or blown onto a public place. Material harm pollution incidents involving only odour are required to be notified to the EPA in the same manner as other environmental incidents. <p><i>Protection of the Environment Operations (Clean Air) Regulations, 2010</i></p> <ul style="list-style-type: none"> Vehicles must not emit visible air impurities for a continuous period of 10 seconds or more (Clauses 8 & 9). <p><i>Air Quality Guidelines</i></p> <p>Air quality is measured in terms of particulate matter - Total Suspended Particles (TSP), Particulate Matter with diameter less than 10 microns (PM₁₀), and dust deposition. OEH specify assessment criteria for each of these parameters in the <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (DEC 2005) . Dust is measured as 'insoluble solids' under Australian Standards.</p> <p>Additional guidelines and standards relating to the management of air quality are referenced in Section 9 of this Plan.</p>

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Relationship to Other Plans	<ul style="list-style-type: none">• Construction Environmental Management Plan (CEMP)• Construction Compound and Ancillary Facilities Management Plan (CCAFMP)• Construction Traffic Management Plan (CTMP)• Construction Soil and Water Management Plan (CSWMP)• Construction Spoil Management Plan (CSMP)• Carbon and Energy Management Plan (CaEMP)• Stakeholder and Community Involvement Plan (SCIP)
Environmental Aspects & Impacts	Refer to environmental aspects and impacts identified in the Environmental Risk Assessment contained in CEMP Appendix 5.
Licence & Permit Requirements	<ul style="list-style-type: none">• Section 6 outlines relevant licence conditions per EPL No. 20454 for SVC works. These requirements will be updated with each relevant licence variation issued by EPA.• There are no current permit requirements.

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2.1 Relationship to Other Plans

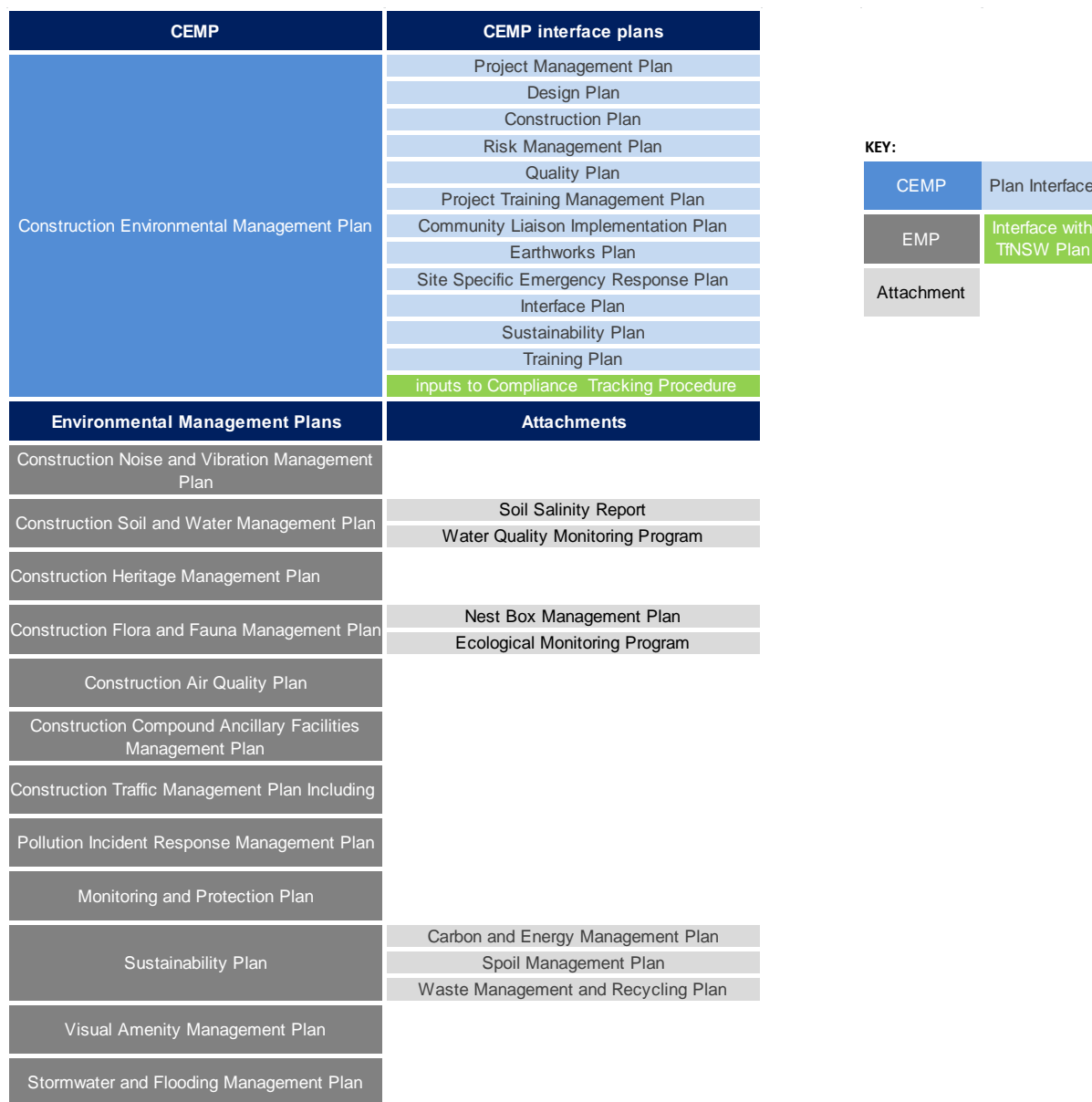


Figure 2: ISJV CEMP Structure

Note: Site Specific Emergency Response Plan has been renamed to Project Emergency Plan

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Project Management Plan			
Risk Management Plan	Design Plan	Construction Plan	Construction Environmental Management Plan
Technical Risk Management Plan	Engineering and Competency Management Plan	Earthworks Plan	Inputs to Compliance Tracking Procedure
Safety Assurance Plan	Engineering Plan	Monitoring and Protection Plan	Construction Noise and Vibration Management Plan
Assurance Documentation Management Plan	Engineering Project Management Plan	Community Liaison Implementation Plan	Construction Traffic Management Plan Including
Requirements Management	Engineering Quality Management Plan	Stakeholder and Community Involvement Plan	Construction Soil and Water Management Plan
Reliability, Availability & Maintainability Management Plan	Engineering Governance Plan	Business Management Plan	Soil Salinity Management Plan
Quality Plan	Requirements Management Plan	Security Management Plan	Water Quality Monitoring Program
Project Records Management Plan	Configuration Management Plan	Site Specific Emergency Response Plan	Construction Heritage Management Plan
Project Purchasing Management Plan	Technical Maintenance Plan	Pollution Incident Response Management Plan	Construction Flora and Fauna Management Plan
Project Training Management Plan	Competency Plan	Sustainability Plan	Nest Box Management Plan
Industrial Relations Plan	Technical Data Management Plan	Carbon and Energy Management Plan	Ecological Monitoring Program
Project Aboriginal Participation Plan		Spoil Management Plan	Construction Air Quality Plan
Project WHS Management Plan		Waste Management and Recycling Plan	Visual Amenity Management Plan
Project WHS Development Plan			Construction Compound Ancillary Facilities Management Plan
	Asset Management Information Delivery Plan		Stormwater and Flooding Management Plan
	Interface Management Plan		

KEY:

Plan	Sub Plan	This Plan
TfNSW Plan	Sub - Sub Plan	

Figure 3: Air Quality Management Plan within Project Management Plan

Note: Site Specific Emergency Response Plan has been renamed to Project Emergency Plan

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3 COA REQUIREMENTS

3.1 Major Civil Construction Works - North West Rail Link (SSI-5100)

No.	Ref.	Relevant Requirement	Reference
1.	E1	The SSI (State Significant Infrastructure) shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of minimising visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	This Plan, Section 7
2.	E46 (g)	(g) a Construction Air Quality Management Plan to detail how construction impacts on air quality will be minimised and managed. The Plan shall include, but not necessarily be limited to:	This Plan
3.		i. the identification of potential sources of air pollutants of concern, in particular dust and PM10;	Section 2
4.		ii. air quality management objectives;	Section 2
5.		iii. mitigation measures to be implemented, including measures during adverse weather conditions (eg strong winds in dry weather);	Section 7
6.		iv. a monitoring program to assess compliance with the identified objectives;	Section 8
7.		v. mechanisms for the monitoring, review and amendment of this plan.	Section 10

3.2 Stations, Rail Infrastructure and Systems - North West Rail Link (SSI-5414)

No.	Ref.	Relevant Requirement	Reference
8.	E8	The SSI shall be constructed in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of minimising visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	This Plan, Section 7
9.	E46 (g)	(g) a Construction Air Quality Management Plan to detail how construction impacts on air quality will be minimised and managed. The Plan shall include, but not necessarily be limited to:	This Plan

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No.	Ref.	Relevant Requirement	Reference
10.		i. the identification of potential sources of air pollutants of concern, in particular dust and PM10;	Section 1
11.		ii. air quality management objectives;	Section 1
12.		iii. mitigation measures to be implemented, including measures during adverse weather conditions (eg strong winds in dry weather);	Section 7
13.		iv. a monitoring program to assess compliance with the identified objectives;	Section 8
14.		v. mechanisms for the monitoring, review and amendment of this plan.	Section 10

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4 ENVIRONMENTAL MITIGATION MEASURES

4.1 Stage 1 Submissions Report (SSI-5100)

No.	Original Ref.	Relevant Requirement	Reference
15.	A1	Working face and areas of open excavation would be kept to a minimum, where feasible and reasonable	Section 7, AQ2
16.	A2	Water suppression would be used for active earthwork areas, stockpiles, gravel roads and loads of soil being transported to reduce wind-blown dust emissions.	Section 7, AQ9
17.	A3	Waste or any other material would not be burnt on construction sites.	Section 7, AQ5
18.	A4	The amount of excavated material held on site would be minimised.	Section 7, AQ4
19.	A5	Areas of exposed earth would be minimised by staging construction activities and progressively landscaping and vegetating completed areas as the construction activities proceed, where feasible and reasonable.	Section 7, AQ3
20.	A6	Enclosed rubble chutes and conveyors would be used where feasible and reasonable. Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment would be minimised and/or water used to suppress dust emissions from such equipment.	Section 7, AQ10
21.	A7	Cutting, grinding or sawing equipment would only be used in conjunction with suitable dust suppression techniques such as water sprays or local extraction.	Section 7, AQ6
22.	A8	Wind breaks, which may include site hoardings, would be constructed, where construction works are in close proximity to sensitive receptors and where feasible and reasonable.	Section 7, AQ21 ECMs.
23.	A9	Dust generating activities would be assessed during periods of strong winds and rescheduled, where required.	Section 7, AQ7
24.	A10	All vehicles carrying loose or potentially dusty material to and/or from the site would be covered.	Section 7, AQ8
25.	A11	Stockpiles would be located away from sensitive receivers, where feasible and reasonable, and protected from the elements through barriers, covering or establishing a cover crop.	Section 7, AQ15
26.	A12	Longer term and/or heavily used haul roads would generally be sealed. The criteria for sealing haul roads would be defined during detailed construction planning. Sealed haul roads would be regularly cleaned	Section 7, AQ27
27.	A13	Unsealed haul roads would be regularly damped down with fixed or mobile sprinkler systems.	Section 7, AQ25
28.	A14	Vehicular and foot traffic would be restricted to designated areas.	Section 7, AQ14
29.	A15	Appropriate site speed limits would be imposed and signed on haul routes.	Section 7, AQ26

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No.	Original Ref.	Relevant Requirement	Reference
30.	A16	Wheel-wash facilities or rumble grids would be provided and used near site exit points, and a street-cleaning regime would be implemented to remove any dirt tracked onto roads.	Section 7, AQ28, AQ29
31.	A23	Engines of onsite vehicles and plant would be switched off, if left idling for extended periods of time.	Section 7, AQ34
32.	A24	Low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices would be used, where feasible and reasonable.	Section 7, AQ37
33.	A25	Plant would be well maintained and serviced in accordance with manufacturers' recommendations.	Section 7, AQ36
34.	A26	Haul routes and plant (including generators) would be sited away from sensitive receivers, such as dwellings and schools, where feasible and reasonable.	Section 7, AQ13
35.	A27	Vehicle emissions would be minimised through methods such as using alternative modes of transport, such as encouraging car pooling by construction workers, and maximising vehicle utilisation by ensuring full loading and efficient routing.	Section 7, AQ32
36.	A28	Precautions would be implemented to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oils.	Section 7, AQ38
37.	A31	Truck unloading activities at concrete batching plants would be carried out in a way that minimises potential fugitive dust emissions, such as a silo or two sided enclosure.	Section 7, AQ45
38.	A32	Water sprays would be utilised in concrete batch plants to reduce the emissions from the dumping of aggregate into the storage bins.	Section 7, AQ44
39.	A33	Bulk cement and other bulk fine powder materials would be stored in silos with dust filters and suitable emission control systems to prevent escape of material and overfilling during delivery.	Section 7, AQ46
40.	A34	Sand and aggregate stockpiles at concrete batch plants would be stored in hoppers, bunkers, storage bins or similar which shields the materials from winds.	Section 7, AQ47

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4.2 Stage 2 Submissions Report (SSI-5414)

No.	Original Ref.	Relevant Requirement	Reference
41.	A1	Working face and areas of open excavation would be kept to a minimum, where feasible and reasonable.	Section 7, AQ2
42.	A2	Water suppression would be used for active earthwork areas, stockpiles, gravel roads and loads of soil being transported to reduce wind-blown dust emissions.	Section 7, AQ9
43.	A3	Waste or any other material would not be burnt on construction sites.	Section 7, AQ5
44.	A4	The amount of excavated material held on site would be minimised.	Section 7, AQ4
45.	A5	Areas of exposed earth would be minimised by staging construction activities and progressively landscaping and vegetating completed areas as the construction activities proceed, where feasible and reasonable.	Section 7, AQ3
46.	A6	Enclosed rubble chutes and conveyors would be used where feasible and reasonable. Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment would be minimised and/or water used to suppress dust emissions from such equipment.	Section 7, AQ10
47.	A7	Cutting, grinding or sawing equipment would only be used in conjunction with suitable dust suppression techniques such as water sprays or local extraction.	Section 7, AQ11
48.	A8	Wind breaks, which may include site hoardings, would be constructed, where construction works are in close proximity to sensitive receptors and where feasible and reasonable.	Section 7, AQ21
49.	A9	Dust generating activities would be assessed during periods of strong winds and rescheduled, where required.	Section 7, AQ7
50.	A10	All vehicles carrying loose or potentially dusty material to and/or from the site would be covered.	Section 7, AQ8
51.	A11	Stockpiles would be located away from sensitive receivers, where feasible and reasonable, and protected from the elements through barriers, covering or establishing a cover crop.	Section 7, AQ15
52.	A12	Longer term and/or heavily used haul roads would generally be sealed. The criteria for sealing haul roads would be defined during detailed construction planning. Sealed haul roads would be regularly cleaned	Section 7, AQ27
53.	A13	Unsealed haul roads would be regularly damped down with fixed or mobile sprinkler systems.	Section 7, AQ25
54.	A14	Vehicular and foot traffic would be restricted to designated areas.	Section 7, AQ14
55.	A15	Appropriate site speed limits would be imposed and signed on haul routes.	Section 7, AQ26
56.	A16	Wheel-wash facilities or rumble grids would be provided and used near site exit points, and a street-cleaning regime would be implemented to remove any dirt tracked onto roads.	Section 7, AQ28, AQ29
57.	A23	Engines of onsite vehicles and plant would be switched off, if left idling for extended periods of time.	Section 7, AQ34

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No.	Original Ref.	Relevant Requirement	Reference
58.	A24	Low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices would be used, where feasible and reasonable.	Section 7, AQ37
59.	A25	Plant would be well maintained and serviced in accordance with manufacturers' recommendations.	Section 7, AQ36
60.	A26	Haul routes and plant (including generators) would be sited away from sensitive receivers, such as dwellings and schools, where feasible and reasonable.	Section 7, AQ13
61.	A27	Vehicle emissions would be minimised through methods such as using alternative modes of transport, such as encouraging car pooling by construction workers, and maximising vehicle utilisation by ensuring full loading and efficient routing.	Section 7, AQ32
62.	A28	Precautions would be implemented to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oils.	Section 7, AQ38

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5 DEED REQUIREMENTS

No.	Original Ref.	Relevant Requirement	Reference
63.		<ul style="list-style-type: none">No relevant requirements	

5.1 SWTC Requirements

No.	Original Ref.	Relevant Requirement	Reference
64.	App 24.4, (g)(vii)	The Construction Environmental Management Plan must include, as sub-plans, the following plans that are required by the Project Planning Approvals: <ul style="list-style-type: none">Construction Air Quality Management Plan	This Plan

5.2 CEMF Requirements

No.	Original Ref.	Relevant Requirement	Reference
65.	16.1 (a)	The following air quality management objectives will apply to the construction of the project: <ul style="list-style-type: none">i. Minimise gaseous and particulate pollutant emissions from construction activities as far as feasible and reasonable.ii. Identify and control potential dust and air pollutant sources.	Section 7 Section 1
66.	16.2 (a)	SMNW Principal Contractors will develop and implement an Air Quality Management Plan which will include, as a minimum: <ul style="list-style-type: none">i. The air quality mitigation measures as detailed in the environmental approval documentation.ii. The requirements of any applicable EPL conditions.iii. Site plans or maps indicating locations of sensitive receivers and key air quality / dust controls.iv. The responsibilities of key project personnel with respect to the implementation of the plan.v. Air quality and dust monitoring requirements.vi. Compliance record generation and management.	Section 7 Section 6 ECMs Sections 7 & 10 Section 8 Section 10
67.	16.2 (b)	Air quality and dust monitoring on the SMNW will involve the following as a minimum: <ul style="list-style-type: none">i. Meteorological conditions will be monitored and appropriate responses will be organised and undertaken periodically by the Principal Contractor.ii. Regular visual monitoring of dust generation from work zones.	Section 8

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No.	Original Ref.	Relevant Requirement	Reference
		iii. Monitoring emissions from plant and construction vehicles to ensure they have appropriate emission controls and are being maintained correctly.	
68.	16.2 (c)	The following compliance records will be kept by the Principal Contractor: i. Records of any meteorological condition monitoring. ii. Records of any management measures implemented as a result of adverse, windy weather conditions. iii. Records of air quality and dust inspections undertaken.	Section 8
69.	16.3	Examples of air quality mitigation measures include: <ul style="list-style-type: none">• Plant and equipment will be serviced and maintained in good working order to reduce unnecessary emissions from exhaust fumes.• Water suppression will be used for active earthwork areas, stockpiles, unsurfaced haul roads and loads of soil being transported to reduce wind blown dust emissions.• Wheel-wash facilities or rumble grids will be provided and used near the site exit points, as appropriate.	Section 7

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5.3 Sustainability Requirements

NSW Sustainable Design Guidelines for Rail v2.0

Initiative	Score	Theme	Requirement	Initiative/Implementation	Plan Interface	Responsibility	Timing
1.13 Alternative fuels in construction vehicles	4	Energy and greenhouse	Use alternative fuels to reduce greenhouse gas emissions in construction vehicles.	Include requirements for subcontractors in appropriate contract documentation. This Plan, AQ40	Project Purchasing Management Plan	ISJV	Procurement Construction

SWTC Appendix 10

Sustainability Category	Clause	Targets/Requirements	Initiative/Implementation	Responsibility	Design Plan Interface	Timing
Resource - Waste and Materials	10.9.1 (l)	The SVC Contractor must use a minimum 5% bio diesel mix for all diesel powered plant and equipment and a minimum 10% blended ethanol mix for all petrol powered plant and equipment where practicable.	Include requirements for subcontractors in appropriate contract documentation. This Plan, AQ40	ISJV	Construction Environmental Management Plan	Procurement Construction

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ISCA Rating Tool

Sustainability Category	Targets/Requirements			Initiative/Implementation	Responsibility	Timing
Dis-4 Air Quality	Measures to minimise adverse impacts to local air quality during construction and operation have been identified and implemented. AND Monitoring of air emissions and/or air quality is undertaken at appropriate intervals and in response to complaints during construction and operation.	The requirements for Level 1 are achieved. AND Monitoring and modelling demonstrates no recurring or major exceedences of air emission or air quality goals.	The requirements for Level 2 are achieved. AND Monitoring and modelling demonstrates no exceedences of air emission or air quality goals.	<ul style="list-style-type: none"> - Air modelling was done for the EIS which addressed ambient air quality assessment criteria and air pollutants of concern during the construction works. As the pollutants of concern were identified as dust and diesel emissions, Section 7 of the Construction Air Quality Management Plan identifies measures to minimise these adverse impacts to local air quality during construction. The requirements for Level 1 and Level 2 are achieved. - Demonstration that mitigation measures have been implemented will be through the inspection and auditing process. - Monitoring strategies are outlined in Section 8 of the Construction Air Quality Management Plan (this plan). - The process of responding to complaints related to dust emissions is described in Section 11 Numbers 2 and 3. Complaints will be recorded as outlined in Section 7 AQ20. - Exceedences of air emission or air quality levels above the goals are measured by occurrence of incidents or complaints. - In the instance of recurring or major complaints, or an authorised agency request, regarding exceedance of dust emissions, dust monitoring would be conducted. 	ISJV	Construction

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6 LICENCE AND PERMIT REQUIREMENTS

6.1 EPA Licence No. 20454

No.	Original Ref.	Relevant Requirement	Reference
70.	O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) Must be maintained in a proper and efficient condition; and b) Must be operated in a proper and efficient manner.	Section 7, This Plan
71.	O3.1	The licensee must minimise the emission of dust at the premises and prevent its emission from the premises to the greatest extent practicable.	Section 7, This Plan
72.	M4.1	The licensee must monitor hourly temperature, humidity, wind velocity and rainfall at the nearest Australian Bureau of Meteorology weather station or the project weather station.	Section 8, This Plan
73.	R4.3	Dust and Weather Reports a) The licensee must, when requested by an authorized officer of the EPA, provide a report concerning dust control and management at the premises b) The licensee must, for the period specified by the authorized officer, include the following in the report: (i) The results of monitoring undertaken in accordance with condition M4.1; (ii) Details of any incident during which dust was emitted from the premises, including any photographs taken of the incident; and (iii) Details of the type and frequency of any dust control measures implemented at the premises. c) The report must be submitted to the email address nominated from time to time by the EPA by 4.30pm on the second working day after receiving a request referred to in this condition.	Section 8 & 11, This Plan

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7 MITIGATION MEASURES

ISJV Ref.	Mitigation Measure	Design	Construction	Relevant Location / Activity	Relevant Approval Conditions	Responsibility	Timing
General Construction							
AQ1.	Cease construction activities generating visible dust until effective mitigation measures are implemented to control dust levels.		■	Entire project	SSI-5100, CoA, E1 SSI-5414, CoA, E8	EM	Throughout construction
AQ2.	Minimise working face and areas of open excavation, where feasible and reasonable. IND		■	Entire project	SSI-5100, REMM, A1 SSI-5414, REMM, A1	CM	Throughout construction
AQ3.	Minimise areas of exposed earth by staging construction activities and progressively landscaping and vegetating completed areas as the construction activities proceed, where feasible and reasonable. Stripped areas not being actively worked could be stabilised with tackifiers, erosion control matting, geofabric, cover crops etc. IND		■	Entire project	SSI-5100, REMM, A5 SSI-5414, REMM, A5	CM	Throughout construction
AQ4.	Minimise the amount of excavated material stored on site. IND		■	Entire project	SSI-5100, REMM, A4 SSI-5414, REMM, A4	SS	Throughout construction
AQ5.	Burning of any materials is prohibited . IND		■	Entire project	SSI-5100, REMM, A3 SSI-5414, REMM, A3	CM	Throughout construction
AQ6.	Non-potable water should be used where practical. Water to be reused from rainwater tanks, sedimentation basins or treated concrete washout water where water quality is indicated as being satisfactory for this purpose (Refer Appendix 3, Construction Soil and Water Management Plan)		■	Entire project	SSI-5100, CoA, E34, SSI-5414, CoA, E28	CM	Throughout construction
AQ7.	The Beaufort Wind Scale (Appendix 2) is to be used to determine wind conditions. If wind conditions are classified as "Strong Winds" per Beaufort scale number 6, than all dust generating activities are to cease, where required. For wind categories less than "strong winds" (ie between Beaufort scale numbers 2-5 inclusive), assess dust generating activities and record on Environmental Inspection Checklist (ISJV-PMSF43), mitigate further or reschedule, to when dust can be contained on-site. Wind speeds are monitored through daily weather updates which are circulated to		■	Entire project	SSI-5100, REMM, A9 SSI-5414, REMM, A9	EM	Throughout construction

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ISJV Ref.	Mitigation Measure	Design	Construction	Relevant Location / Activity	Relevant Approval Conditions	Responsibility	Timing
	Project personnel through email.						
AQ8.	Cover all truck spoil loads that leave the site that have the potential to generate dust. Cover loads within the site over longer distances, if carrying particularly dusty loads and/or in times of high winds. IND		■	Entire project	SSI-5100, REMM, A10 SSI-5414, REMM, A10	SS	Throughout construction
AQ9.	Use water carts to dampen disturbed areas (eg for active earthwork areas, stockpiles, gravel roads and loads of soil being transported) and reduce dust generation.		■	Entire project	SSI-5100, REMM, A2 SSI-5414, REMM, A2	CM	Throughout construction
AQ10.	Enclosed rubble chutes and conveyors will be used where feasible and reasonable. Drop heights from conveyors, loading shovels, hoppers, and other loading or handling equipment will be minimised and/or water used to suppress dust emissions from such equipment.	■	■	Entire project	SSI-5100, REMM, A6 SSI-5414, REMM, A6	SS	Throughout construction
AQ11.	Cutting, grinding or sawing equipment must only be used in conjunction with suitable dust suppression techniques, such as water sprays or local extraction. Slurry from saw-cutting of road pavements (internal and external) to be collected to prevent drying and generating dust with vehicle movements. IND	■	■	Entire project	SSI-5100, REMM, A7 SSI-5414, REMM, A7	SS	Throughout construction
AQ12.	Construct drift fences made of geofabric screens about 900mm high at regular intervals around stockpiles and erodable areas to minimise wind erosion. Remove sand collected in fences when at capacity, where deemed necessary by the EC.		■	Entire Project	SSI-5100, REMM, A8 SSI-5414, REMM, A8	CM	Throughout construction
AQ13.	Site haul routes and plant (including generators) to be located as far as practically possible from sensitive receivers, such as dwellings and schools.	■	■	Entire project	SSI-5100, REMM, A26 SSI-5414, REMM, A26	CM	Throughout construction
AQ14.	Define and signpost trafficable areas to ensure vehicular and foot traffic stays in designated areas.	■	■	Entire project	SSI-5100, REMM, A14 SSI-5414, REMM, A14	CM	Throughout construction
AQ15.	Not used						
AQ16.	Not used.						
AQ17.	Report incidents involving significant dust generation that could impact on traffic or sensitive receivers immediately to the Environmental Manager or Environmental Co-ordinators. IND		■	Entire project	Best Practice.	CM and/or SS	Throughout construction
AQ18.	Report immediately all incidents that cause or are likely to cause environmental harm to EPA's Environment Line (131 555) and notify each		■	Entire project	POEO Act	EM	Throughout construction

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ISJV Ref.	Mitigation Measure	Design	Construction	Relevant Location / Activity	Relevant Approval Conditions	Responsibility	Timing
	of other authorities per EPAs notification protocol. Refer Pollution Incident Response Management Plan. IND						
AQ19.	Implement the incident management procedure in the event of a potential air pollution incident. Refer Table 11 Incident Planning and Response, (This Plan) and Pollution Incident Response Management Plan.		■	Entire project	SSI-5100, CoA, D6 SSI-5414, CoA, D6	EM	Throughout construction
AQ20.	Record all complaints in accordance with Community Liaison Implementation Plan (CLIP) and TNSW Construction Complaints Management System	■	■	Entire project	SSI-5100, CoA, D2, D3 SSI-5414, CoA, D2, D3	EC	Throughout construction
AQ21.	Prior to construction suitable site hoarding or shade cloth shall be installed where other dust mitigation measures are unable to protect residential premises and other sensitive areas from dust impacts. Locations of site hoarding / shade cloth will be illustrated on Environmental Control Maps prior to construction.		■	Entire project	SSI-5100, REMM, A8 SSI-5414, REMM, A8	CM and/or SS	Prior and throughout construction
Spoil Stockpiles							
AQ22.	Locate stockpiles away from sensitive receivers, where feasible and reasonable. Cover temporary soil stockpiles that will be undisturbed on site for more than 10 days using suitable geofabric, cover crop, polymer binder, erosion control matting or similar, where required upon environmental assessment. Stockpiles will have sediment fencing around their lower edge and be sited above the 20-year ARI flood level unless they are short-term (i.e. less than 10 days) and significant rainfall is not predicted.	■	■	Entire project	SSI-5100, REMM, A11 SSI-5414, REMM, A11	CM	Throughout construction
AQ23.	Compact exposed areas of stockpiles as they are being created in accordance with Construction Soil and Water Management Plan.		■	Entire project	SSI-5100, REMM, A11 SSI-5414, REMM, A11	CM	Throughout construction
AQ24.	For longer term stockpiles, including topsoil, spray with polymer soil binder, establish a cover crop or cover the stockpiles refer to Construction Soil and Water Management Plan.		■	Entire project	SSI-5100, REMM, A11 SSI-5414, REMM, A11	CM	Throughout construction
Haul Roads							
AQ25.	Regularly dampen unsealed haul roads with fixed or mobile sprinkler		■	Unsealed roads	SSI-5100, REMM, A13	CM	Throughout

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ISJV Ref.	Mitigation Measure	Design	Construction	Relevant Location / Activity	Relevant Approval Conditions	Responsibility	Timing
	systems; and/or Cover unsealed roads with densely graded road base and keep moist should dust be excessive IND				SSI-5414, REMM, A13		construction
AQ26.	Restrict speeds of construction traffic to 20km/h. Signpost the speed limit at entry points and at intervals along all unsealed construction roads. All personnel & visitors to comply with speed limit. IND	■	■	Construction roads	SSI-5100, REMM, A15 SSI-5414, REMM, A15	CM	Throughout construction
AQ27.	Seal internal construction related roads and manoeuvring areas that are to be in place over the life of the project, using additives / material by hierarchy of effectiveness (eg tackifiers, bitumen seal, DGB with Bitumen seal, asphalt (cold or hot mix) .	■		Construction related roads	SSI-5100, REMM, A12 SSI-5414, REMM, A12	CM	Throughout construction
AQ28.	Install and use rumble grids at exit points to prevent mud being tracked onto public roads in accordance with Construction Soil and Water Management Plan.	■	■	Site exit points	SSI-5100, REMM, A16 SSI-5414, REMM, A16	CM	Throughout construction
AQ29.	Stabilise site access roads and use wheel washers where appropriate, to minimise tracking of dirt. Refer to Construction Soil and Water Management Plan.	■	■	Site exit points & Construction roads	SSI-5100, REMM, A16 SSI-5414, REMM, A16	CM	Throughout construction
AQ30.	Check tailgates, under-rigs, wheels and towing apparatus of all trucks to ensure they are clean and secure, prior to leaving the worksite.		■	Site exit points	Best Practice	All Personnel	Throughout construction
AQ31.	Dirt tracked on hardstand, pavements, or roads, will be appropriately cleaned up and disposed of using brooms or a street sweeper as required.		■	Site exit points	SSI-5100, REMM, A16 SSI-5414, REMM, A16	SS	Throughout construction
Vehicles and Equipment							
AQ32.	Minimise vehicle emissions by using alternative modes of transport, such as encouraging car pooling of construction workers, and maximising vehicle utilisation by ensuring full loading and efficient routing.	■	■	Entire project	SSI-5100, REMM, A27 SSI-5414, REMM, A27	CM	Throughout construction
AQ33.	Inspect plant exhaust emissions as part of the pre-start inspection process. Refer MSF31-5 Daily Plant Inspections. IND		■	Entire project	Best Practice	All Personnel	Throughout construction
AQ34.	Do not leave machinery and vehicles running or idling when not in use. IND		■	Entire project	SSI-5100, REMM, A23 SSI-5414, REMM, A23	All Personnel	Throughout construction
AQ35.	Locate refuelling areas away from areas of public access and sensitive receivers.	■		Entire project	Best Practice	SS	Throughout construction
AQ36.	Maintain and service all plant in accordance with manufacturer's	■	■	Entire project	SSI-5100, REMM, A25	All Personnel	Throughout

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ISJV Ref.	Mitigation Measure	Design	Construction	Relevant Location / Activity	Relevant Approval Conditions	Responsibility	Timing
	recommendations. Keep records of maintenance. Refer MSF31-5 Daily Plant Inspections				SSI-5414, REMM, A25		construction
AQ37.	Use low emission vehicles and plant fitted with catalysts, diesel particulate filters, or similar devices, where feasible and reasonable.	■	■	Entire project	SSI-5100, CoA, E46(g) (i) SSI-5100, REMM, A24 SSI-5414, REMM, A24	CM	Throughout construction
AQ38.	Implement precautions to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oil, such as maintaining plant, shutting down plant or throttled down to a minimum in the intervening periods between work.	■	■	Entire project	SSI-5100, REMM, A28 SSI-5414, REMM, A28	CM	Throughout construction
AQ39.	Any de-gassing / re-gassing of air con units in mobile plant and site shed units will be undertaken using appropriate de-gassing / re-gassing procedures. Procedures to be developed with supplier / fitter and documented in SHEWMS or equivalent.	■	■	Entire project	SSI-5100, REMM, A25 SSI-5414, REMM, A25	CM	Throughout construction
AQ40.	To reduce greenhouse gas emissions use a minimum 5% bio diesel mix for all diesel powered plant and equipment and a minimum 10% blended ethanol mix for all petrol powered plant and equipment where practicable. Include requirements for subcontractors in appropriate contract documentation.	■	■	Entire project	Resource - Waste and Materials 10.9.1 (I)	PM	Procurement and Construction
Responsibility Key: EM – Environment Manager, CM – Construction Manager, SS – Site Supervisor, EC – Environment Co-ordinator, PM – Procurement Manager							

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8 MONITORING

Item	Frequency	Standards	Reporting	Responsibility
Visual surveillance in accordance with MSP41 Monitoring and measurement.	Daily during works	Dust control measures are in an adequate condition		Site Supervisor
Visual surveillance in accordance with MSP41 Monitoring and measurement.	Weekly during works	No long term visible dust emissions from the site or batch plant	MSF43-2 Environmental Inspection Checklist	Environmental Co-ordinator / Environment Manager
Visual surveillance of main exit/entry points and site compound for material tracked onto road.	Daily	No mud tracking off site		Site Supervisor
Visual Inspection and Reporting of main exit/entry points and site compound for material tracked onto road.	Weekly under dry weather conditions; & During/post rainfall events	No mud tracking off site	MSF43-2 Environmental Inspection Checklist	Environment Co-ordinator
Monitor weather forecasts for windy conditions utilising Meteorological Data. Weather conditions and forecasts will be obtained from the Bureau of Meteorology (http://www.bom.gov.au).	Daily during works	N/A	Monthly Report, as required	Environment Manager
Hourly temperature, humidity, wind velocity and rainfall at the nearest Australian Bureau of Meteorology weather station or the project weather station.	Hourly	EPA Licence No. 20454, Condition M2	Report downloaded from BOM website, and provided when requested per condition R4.3 of EPL No. 20454	Environment Manager
Inspections of vehicle and plant exhaust emissions to ensure emissions comply with the <i>POEO Act</i> and record in MSF31-5 Daily Plant Inspections.	Periodically	<i>POEO Act</i>	MSF31-5 Daily Plant Inspections	Operators / Site Supervisor
Dust monitoring in response to recurring or major complaints, or authorised agency request, regarding exceedance of air emissions.	As required.	<i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales</i>	As agreed with requesting party/authority	Environment Manager

9 TRAINING AND RESOURCES

Training

Inductions are required and are to address:

Matters identified by the term “**IND**” (“Induction”) in the mitigation measures section.

Environmental Manager/Coordinator to provide specific briefing/instruction to:

Construction crew:

- On requirements of dust suppression at all times
- How to avoid and suppress dust across worksite (whether active or idle).

Supervisors and key labourers:

- How to install and maintain effective dust suppression controls.

Toolbox talks to be conducted on (In accordance with MSP15 Training Management and MSP22 Risk Management):

- Available dust suppression options (including tools such as water carts, and selection of work methods to prevent dust generation such as maintaining site speed limits or slower in windier conditions).
- Covering trucks loads;
- Cleanliness of vehicles prior to exiting site;
- Road cleanliness with regard to trucks leaving the site;
- Sensitive areas / receivers
- Potential for condition changes and response strategies in windy conditions

Resources

- Temporary erosion and sediment controls (e.g. geotextile, etc);
- Tackifiers, polymers, additives; DGB, bitumen seal, asphalt; wet-vac,;
- Excavators;
- Rumble grid/shakers;
- Water carts and sprays available/accessible;
- Street sweeper and brooms available/accessible;
- BoM Meteorological Data;
- Labour to maintain stockpiles and dedicated crew of 2 to 3 people to maintain erosion and sediment controls throughout project;
- Environmental Manager, Environmental Co-ordinators.

10 REFERENCES AND REVISIONS

Related Documents
ISJV Management System - MSP22R Air Quality Management Procedure
<i>SSI-5100 North West Rail Link: Environmental Impact Statement – Stage 1 – Major civil Construction Works</i> (March 2012)
<i>SSI-5100 North West Rail Link: Submissions Report, Stage 1 - Major civil Construction Works, Incorporating Preferred Infrastructure Report</i> (July 2012)
<i>SSI-5414 North West Rail Link: Environmental Impact Statement – Stage 2- Stations, Rail Infrastructure and Systems</i> (October 2012)
<i>SSI-5414 North West Rail Link: Submissions Report, Stage 2 - Major civil Construction Works</i> (March 2013)
EIS - appendices, specialist reports
North West Rail Link, SVC Project Deed, Design and Construction of Surface and Viaduct Civil Works. Exhibit A, Scope of Works and Technical Criteria, Appendix 24 – Project Plan Requirements
References
<ul style="list-style-type: none">AS 3570 - Automotive Diesel FuelsAS 3580.10.1 - Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method (2003)Safe Work Australia 2011 - Workplace Exposure Standards for Airborne ContaminantsNational Environment Protection Council 1998 - Ambient Air: National Environment Protection Measure for Ambient Air QualityNSW EPA 2005 - Approved Method for Modelling and Assessment of Air Pollutants in NSWNSW EPA 2007 - Approved methods for Sampling and Analysis of Air Pollutants in NSW<i>Protection of the Environment Operations Act 1997</i>Bureau of Meteorology website (http://www.bom.gov.au) or Beaufort Wind Scale in the absence of electronic meteorological informationLocal Government Air Quality Toolkit
Revision, Control & Amendment
<p>Revisions to this plan will be made as required, as referenced in section 4.2.3 of the CEMP, and in accordance with MSP18 'Document and Data Control'. The Environmental Manager will review outstanding issues and comments provided by the ER, IC, Principal's Representative or authorities and address these either:</p> <ul style="list-style-type: none">in time to be endorsed by the IC and reviewed by the Principal's Representative prior to commencement of any related activities or work; orat the next Management Review of the plan as outlined in the Project Management Plan.

11 INCIDENT PLANNING AND RESPONSE

Table 11: Incident Planning and Response Situation Description, response and Responsibility.

Incident Planning & Response			
<p>Environmental (including air quality) incidents will be reported immediately as per ISJV's SVC Incident Management Procedure (MSP42) to a Site Supervisor who will contact either the Project Manager, or Environmental Manager. All incidents will be investigated and appropriate actions taken to address the issue. Environmental incidents that cause or threaten material harm will be reported to EPA and other authorities in accordance with the ISJV's Pollution Incident Response Management Plan. Details will also be reported to the ER, DP&E, and TfNSW, as per the PIRMP and SVC Incident Management Procedure.</p> <p>Potential air quality related incidents that could arise during the works and their responses include (but are not limited to) the following:</p>			
No.	Situation	Response	Responsibility
1	Excessive/visible dust that may impact on traffic or sensitive receivers	<p>Activity causing excessive/visible dust to immediately cease and the Environment Manager contacted.</p> <p>Reassess and investigate the cause of the excessive/visible dust. Work to only resume when situation rectified.</p> <p>Depending on the nature / extent of the incident the Environment Manager is required to follow the Pollution Incident Response Management Plan</p>	SS / CM / EM
2	Dust emissions exceeding legislative, guidelines or contract requirements.	<p>Any dust related non-conformance (generated from complaints, monitoring, site inspections and internal/external audits) and subsequent corrective actions to be resolved in accordance with MSP44 Non Conformance and MSP45 Improvement, Opportunities, Corrective and Preventative Action. (In accordance with MSP22R Air Quality Management System Procedure).</p> <p>Depending on the nature / extent of the unauthorised discharge, the Environment Manager is required to follow the Pollution Incident Response Management Plan. Dust monitoring would be conducted in response to an authorised agency request, in accordance with <i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales</i> for ambient PM10 (24-hour) to assess against limit of 50 µgm-3 at any off-site residential receptor.</p>	EM
3	Complaints due to excessive dust	All complaints are to be promptly investigated, actioned and recorded in accordance with MSP44A Complaint Management and the Community Liaison Implementation Plan. Dust monitoring would be conducted in response to recurring or major complaints regarding dust emissions.	EM / CSM
4	Dust impacts on Rouse Hill Shopping Centre (sensitive receiver)	Managed through Community Liaison Implementation Plan (CLIP).	EM/CSM
5	Dust impacts to major roads including Windsor Road	Immediate cessation of works. Management through Construction Traffic Management Plan.	EM/CM/CSM

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6	Failure of plant and equipment emission controls	Plant with non-compliant controls to immediately cease activity onsite. Replacement plant to be utilised until controls are rectified.	CM / SS
7	Inadequate application of dust suppression measures	Activities causing dust to immediately cease until appropriate mitigation measures have been applied.	CM / SS
8	Excessive deposition of dust in areas containing sensitive vegetation or fauna	Activities causing dust to immediately cease. Remedial measures to be implemented prior to works recommencing.	EM / CM / SS
9	Wind induced dust from exposed areas and/or stockpiles	Exposed areas to be dampened in accordance with AQ9. Exposed stockpiles to be mitigated in accordance with AQ22, AQ23 and AQ24.	CM / SS
10	Odour detected that has the potential to cause material harm	Activity causing odour ceased or mitigation measures put in place to reduce odour. Advice requested from appropriate authority.	
Responsibility Key: EM – Environment Manager, CM – Construction Manager, CSM – Community and Stakeholder Manager, EC – Environment Co-ordinator			

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APPENDIX 1 - **STRONG WIND WORK MODIFICATION RECORD** (IMP-MSF22R-1/ V1R0 – 30/11/13)

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STRONG WIND WORK MODIFICATION RECORD

Management System Form



Project: _____ Date: _____ **SWMMR No:** _____

Weather Details

Temperature: _____ Wind Speed: _____ Wind Direction: _____

Impact details

Distance between activity and sensitive receiver(s): _____

Receivers impacted: (tick as applicable)

- ☐ Residential premises
- ☐ Commercial Premises
- ☐ Traffic/safety
- ☐ Sensitive vegetation or other environmental feature
- ☐ Other (describe) _____

Dust suppression measures implemented: (tick as applicable)

- ☐ Water cart
- ☐ Tackifiers
- ☐ Water sprays/sprinklers
- ☐ Wind breaks/netting
- ☐ Coverings (geotextile, plastic etc)
- ☐ Other (describe) _____

Modify/stop work details

Person modifying/stopping works: _____ Phone no: _____

Company: _____ Position: _____

Date/Time Work stopped _____

Comments

Recommence work details

Company: _____

Authorised by: _____ Position: _____

Signature: _____ Date: _____

Comments

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Commercial in Confidence

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APPENDIX 2 - BEAUFORT SCALE

Beaufort wind scale

Beaufort scale number	Descriptive term	Units in km/h	Units in knots	Specifications for estimating speed over land
0	Calm	0	0	Smoke rises vertically
1-3	Light winds	19 km/h or less	10 knots or less	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
4	Moderate winds	20 - 29 km/h	11-16 knots	Raises dust and loose paper; small branches are moved.
5	Fresh winds	30 - 39 km/h	17-21 knots	Small trees in leaf begin to sway; crested wavelets form on inland waters
6	Strong winds	40 - 50 km/h	22-27 knots	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty.
7	Near gale	51 - 62 km/h	28-33 knots	Whole trees in motion; inconvenience felt when walking against wind.
8	Gale	63 - 75 km/h	34-40 knots	Twigs break off trees; progress generally impeded.
9	Strong gale	76 - 87 km/h	41-47 knots	Slight structural damage occurs -roofing dislodged; larger branches break off.
10	Storm	88 - 102 km/h	48-55 knots	Seldom experienced inland; trees uprooted; considerable structural damage.
11	Violent storm	103 -117 km/h	56-63 knots	Very rarely experienced - widespread damage
12+	Hurricane	118 km/h or more	64 knots or more	Very rarely experienced - widespread damage

Source: Australian Bureau of Meteorology