

Tallawong Station South Precinct

Air Quality Management Plan

23-Jul-2021

Tallawong Station South Project

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Air Quality Management Plan

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Quality Information

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1.0 Introduction

Deicorp Construction Pty Ltd (Deicorp) engaged AECOM Australia to prepare an Air Quality Management Plan (AQMP) for the construction of the Tallawong Station South Precinct Project located at Rouse Hill, NSW (the Project).

The purpose of this AQMP is to assist Deicorp in managing air emissions during the construction phase of the Project in accordance with requirements and conditions listed in the draft Development Consent, application number SSD 10425. The AQMP constitutes a sub-plan that forms part of an overarching Construction Environmental Management Plan for the Project.

The AQMP has been prepared in accordance with requirements listed in the NSW Environment Protection Agency's Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (the Approved Methods).

1.1 Proposed Development

The proposed development consists of the construction of a mixed-use development on Lot 294/DP 1213279 at 2-12 Conferta Avenue, Rouse Hill. The location of the Project site in relation to Tallawong Station is presented in Figure 1. The proposed construction site layouts are presented in Figure 2 (Early Works) and Figure 3 (Construction Works).



Figure 1 Location of the Project site on Lot 294/DP 1213279

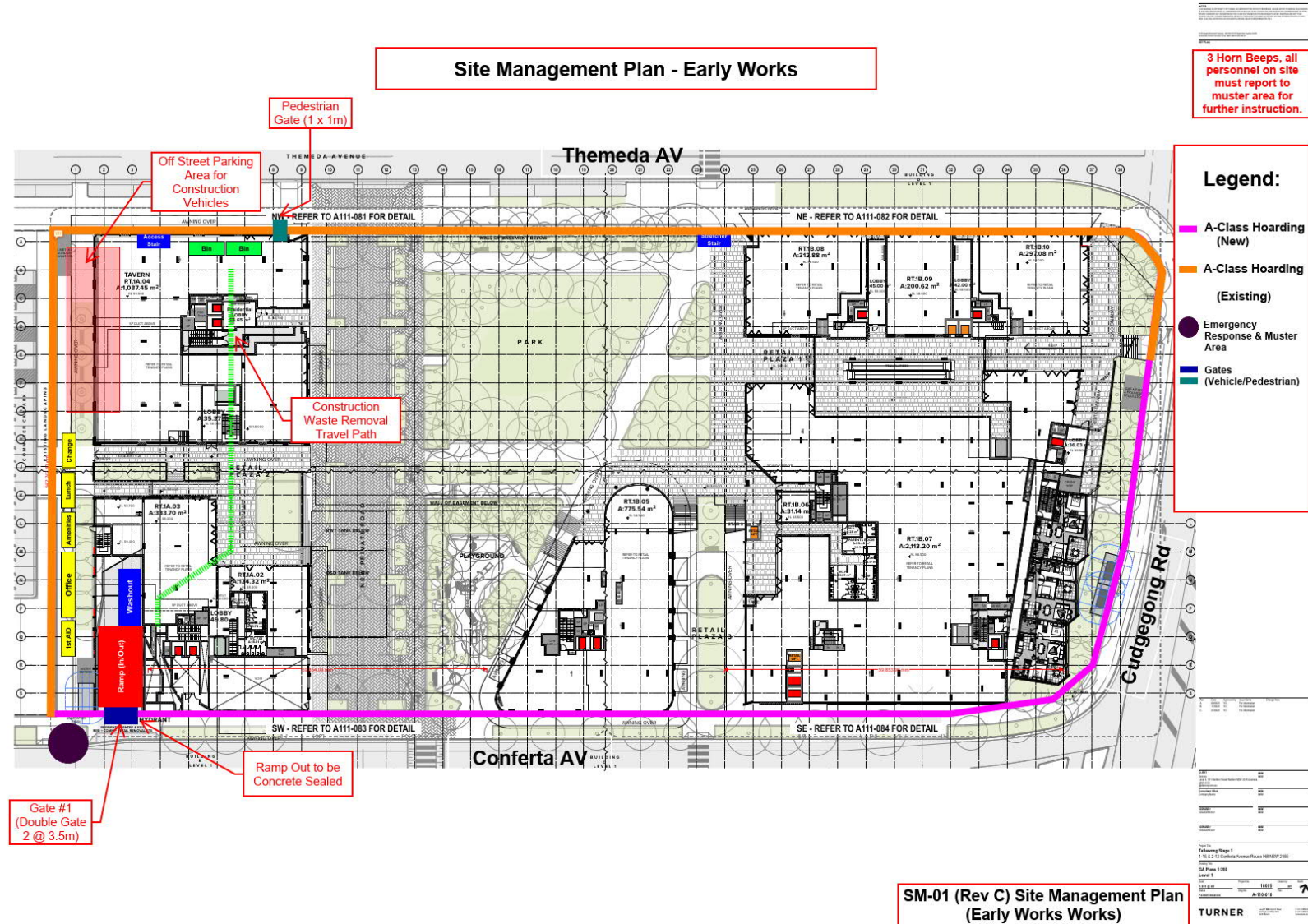


Figure 2 Site Management Plan (Early Works)

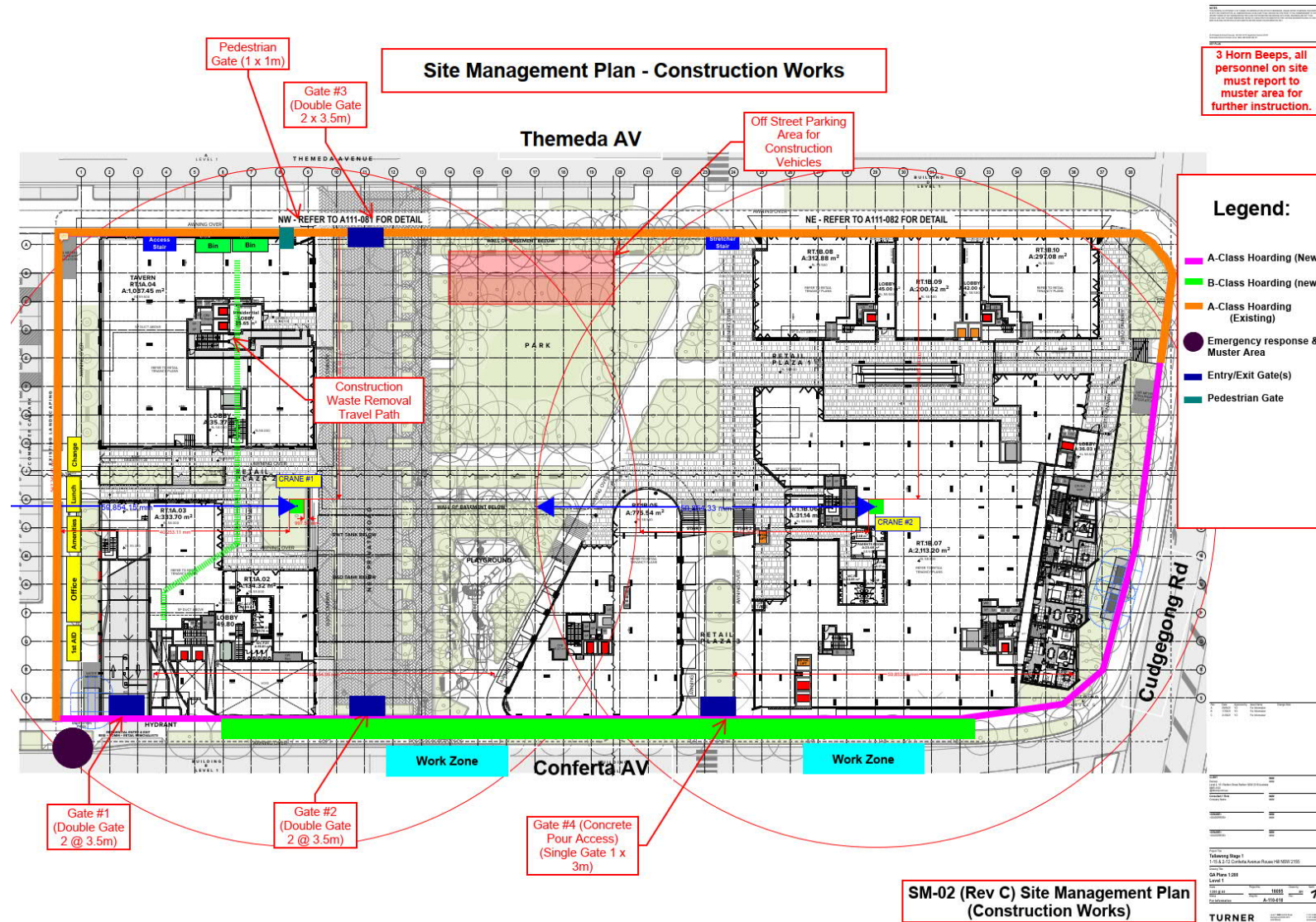


Figure 3 Site Management Plan (Construction Works)

2.0 Goals, Outcomes, Key Issues

Table 1 Goal, outcomes and key issues for the Project

Scope	<p>This <i>Air Quality & Odour Management Sub-Plan</i> details prevention and management measures for air quality issues associated with construction of the Project. It defines mitigation measures to be implemented during relevant construction activities, a monitoring program that would enable assessment of the impacts of construction activities on potentially affected areas if required, and contingency measures that may be implemented if complaints are received or exceedances are measured.</p> <p>This sub-plan forms part of the Environmental Management Plan (EMP) and should be read in conjunction with other plans that form part of the Environmental Management Plan.</p>
Goals (Mission Statement)	<ul style="list-style-type: none"> • To ensure that construction activities are managed to meet air quality and odour objectives as set out in environmental assessments and the Development Consent SSD 10425 issued by the Minister for Planning and Public Spaces. • To provide a reactive monitoring regime that if required, would allow early detection of air quality and odour issues associated with construction and allow a real-time assessment of various activities on the site. • To effectively manage excavation/construction activities to prevent potential odour / air quality issues.
Intended Outcomes	<ul style="list-style-type: none"> • Mitigation measures are implemented and maintained to achieve ambient air criteria for airborne pollutants that minimise adverse effects on sensitive receptors. • Air quality and odour mitigation measures effective and properly maintained.
Key Issues and Sensitive Areas	<p>Air quality is regulated by the EPA and Minister's Conditions of Approval (MCOA) requirements.</p> <p>Surrounding Land Use & Receptors</p> <p>The nearest receptors are located approximately 180 m south of the site, on the southern side of Schofields Road. The Tallawong Train station is immediately to the north of the Project site, and the Tallawong Station carparks to the west of the Project site. There are two rural residences to the east of the site, the closest located approximately 180m from the Project boundary. The locations of sensitive receptors are included in Appendix A.</p> <p>Adverse Wind Conditions</p> <p>Due to the proximity to receptors on the southern side of the Project, winds from the northwest, north and northeast would present the highest potential for offsite impacts. These winds blow frequently during autumn, spring and winter, both during the day and night-time hours. A summary of existing wind conditions at the nearby Rouse Hill EES station is presented in Appendix B.</p> <p>Potential Impacts - Air Quality</p> <p>Dust can be generated from all types of construction activities involving soil, including excavation, handling, loading and unloading from stockpiles, and wind erosion of exposed areas and stockpiles.</p> <p>Disturbance of contaminated soil may generate emissions of odour and/or Volatile Organic Compounds (VOCs)/ Semi-Volatile Organic Compounds (SVOCs) and Polycyclic Aromatic Hydrocarbons (PAHs). However, no soil hydrocarbon contamination was found by the Detailed Site Investigation (Appendix 12 of the Project Environmental Impact Statement). Therefore, the potential for odour or VOC emissions due to soil contamination is low.</p> <p>Construction activities will involve use of diesel-powered plant and equipment. The combustion of diesel fuel generates a range of pollutant emissions, such as oxides of nitrogen (NO_x), carbon monoxide (CO) and particulate matter.</p>

Statutory Requirements	<p>Protection of the Environment Operations Act 1997 (POEO Act) (NSW)</p> <p>Section 129 provides that the applicant must not cause or permit the emission of any offensive odour from the premises, apart from where the emission is identified in an EPL as a potentially offensive odour and the odour was emitted in accordance with the condition of a licence directed at minimising odour.</p> <p>Sections 124 & 125 require that no air pollution is caused by failing to maintain and operate plant, or carry out maintenance work on plant, in a proper and efficient manner.</p> <p>Section 126 states that soil or dust must not be deposited or blown onto a public place.</p> <p>Protection of the Environment Operations (Clean Air) Regulation 2010 (NSW):</p> <p>Vehicles must not emit visible air impurities for a continuous period of 10 seconds or more (clauses 8 & 9).</p> <p>Stack emissions must not exceed the regulatory limits for the type of plant operated on site.</p>
Relationship to Other Plans	<p>Construction Management Plan</p> <p>Construction Environmental Management Plan</p> <p>Construction Waste Management Sub-Plan.</p> <p>Construction Soil and Water Management Sub-Plan</p> <p>Remediation Action Plan</p> <p>Community Communication Strategy.</p>

3.0 Air Quality DA Consent Requirements

Table 2 DA Consent Conditions relevant to Air Quality

No.	Original Ref.	Relevant Requirement	Reference in This Document
1	C21	Prior to the commencement of any earthwork or construction, the Applicant shall submit to the satisfaction of the Certifier an Air Quality Management Sub-Plan (AQMP) for the development. A copy of the AQMP must be submitted to the Planning Secretary and Council for information. The Sub-Plan must include, as a minimum, the following elements:	-
		<ul style="list-style-type: none"> Relevant environmental criteria to be used in day to day management of dust and volatile organic compounds (VOC's) / odour; 	Section 5.0
		<ul style="list-style-type: none"> Mission statement; 	Section 2.0
		<ul style="list-style-type: none"> Dust and VOC's / odour management strategies; 	Section 4.0
		<ul style="list-style-type: none"> Objectives and targets; 	Section 2.0
		<ul style="list-style-type: none"> Risk assessment; 	Appendix C
		<ul style="list-style-type: none"> Suppression improvement plan; 	Section 4.0 Section 8.0
		<ul style="list-style-type: none"> Monitoring requirements including assigning responsibility (for all employees and contractors); 	Section 5.0
		<ul style="list-style-type: none"> Communication strategy; and 	Section 6.0 and Project Community Communication Strategy
		<ul style="list-style-type: none"> System and performance review for continuous improvement. 	Section 8.0
2	C22	The Sub-Plan must detail management practices to be implemented for all dust and VOC/odour sources at the site. The Sub-Plan must also detail the dust, odour, VOC and semi-volatile organic compounds (SVOC) monitoring program (e.g. frequency, duration and method of monitoring) to be undertaken for the project.	Section 4.0 and Section 5.0
3	C23	The Applicant must also develop and implement an appropriate comprehensive Reactive Air Quality and Odour Management Plan which will incorporate an Ambient Air Monitoring Program and Reactive Management Strategy to ensure that the assessment criteria are met during the works.	Section 6.0
4	D22	The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent. During construction, the Applicant must ensure that:	Section 4.0

No.	Original Ref.	Relevant Requirement	Reference in This Document
		<ul style="list-style-type: none">• exposed surfaces and stockpiles are suppressed by regular watering;• all trucks entering or leaving the site with loads have their loads covered;• trucks associated with the development do not track dirt onto the public road network;• public roads used by these trucks are kept clean; and land stabilisation works are carried out progressively on site to minimise exposed surfaces.	

4.0 Mitigation Measures

Table 3. Mitigation control measures

Ref	Mitigation Measure	Relevant Location/ Activity	Relevant Approval Condition Reference	Responsibility	Timing
Dust and Material Management					
AQ1	Cover all loads coming onto the site and departing site, including internal loads, to minimise potential spillage / dust generation. Immediately clean up any spills.	Entire site	C21, C22, D22	Construction Manager (CM), Environmental Manager (EM)	Throughout construction
AQ2	Ensure all vehicles leaving the site pass a rumble-grid and pit prior to exiting, with physical removal of dirt / mud using a pressure washer if required.	Entire site	C21, C22, D22	CM, EM	Until all roads are sealed
AQ3	The roads surrounding the site shall be regularly swept to ensure pavements are kept free of dust	Off-site roads	C21, C22, D22	CM, EM	Throughout construction
AQ4	Locate stockpiles to minimise wind erosion. Maintain all stockpiles at manageable sizes to allow covering or spraying, if required.	Stockpile areas	C21, C22, D22	CM	Throughout construction
AQ5	Cover any stockpiled spoil material identified as being restricted, hazardous or special waste whilst not active, including overnight.	Stockpile areas	C21, C22, D22	CM, EM	Throughout construction
AQ6	Use water sprays to suppress dust emissions from spoil stockpiles, loading and unloading activities, unless spoil is damp.	Entire site	C21, C22, D22	CM, EM	Throughout construction
AQ7	Cover or coat with sealant stockpiled material that is to remain inactive for a period greater than two weeks to prevent odour / dust generation.	Stockpile areas	C21, C22, D22	CM, EM	Throughout construction
AQ8	Use dust sealants or hydromulch on exposed areas vulnerable to wind erosion.	Entire site	C21, C22, D22	CM, EM	Throughout construction
AQ9	Where feasible, reduce handling / stockpiling of excavated materials through pre-testing and validation, allowing direct transport off-site.	Entire site	C21, C22, D22	CM, EM	Throughout construction
AQ10	Use solid 2.4m or 3m high hoardings at the site perimeter, and wind barriers at internal excavation boundaries where possible.	Entire site	C21, C22, D22	CM	Throughout construction

Ref	Mitigation Measure	Relevant Location/ Activity	Relevant Approval Condition Reference	Responsibility	Timing
AQ11	Sweep and water haul routes, materials handling areas, site entry points and other areas as needed using on-site sweepers and water carts. A watering rate of greater than 2L per m ² per hour is required.	Entire site	C21, C22, D22	CM	Throughout construction
AQ12	Minimise dust by limiting accessibility to roads for construction vehicles. Seal haul roads outside the bulk excavation area.	Entire site	C21, C22, D22	CM, EM	Throughout construction
AQ13	Adjust work practices based on wind and weather conditions, inclusion of the day's weather forecast and potential background particulate concentrations shall be included in the daily pre-start toolbox talks. Air quality alerts are available from NSW EPA at: https://www.dpie.nsw.gov.au/air-quality/air-quality-alerts	Entire site	C21, C22, D22	CM, EM	Throughout construction
AQ14	Undertake emergency dust suppression if needed during dust generating conditions (e.g. dry and windy weather) during longer non-working periods (e.g. long weekends, holidays).	Bulk excavation area	C21, C22, D22	CM, EM	Throughout construction
AQ15	All staff and contractors to actively monitor for visible dust and unexpected odour and report observations to Construction Manager or Environmental Manager.	Entire site	C21, C22, D22	All staff and contractors	Throughout construction
Control volatilisation/ odours during excavation					
AQ16	Apply covers, odour sealant or odour suppressant to control odours generated at the point of excavation or at stockpiles, where required.	Excavations and stockpiles	C21, C22	CM, EM	Throughout excavation works
Minimise combustion emissions					
AQ17	Turn engines off while parked on site.	Entire site	C21, C22	CM, EM	Throughout construction
AQ18	Regularly tune and maintain equipment, plant and machinery to minimise visible smoke / emissions.	Entire site	C21, C22	CM, EM	Throughout construction
AQ19	Implement site speed limits.	Entire site	C21, C22	CM, EM	Throughout construction
AQ20	Use mains power where available and suitable.	Entire site	C21, C22	CM, EM	Throughout construction

5.0 Air Quality Monitoring Strategy

Table 4 Air quality monitoring equipment and strategy

Monitoring Requirements						
<p>Dust Construction dust emissions can generally be adequately managed using standard mitigation controls such the use of water to wet surfaces and the covering of stockpiles. The mitigation strategies outlined in Section 4.0 are expected to adequately reduce dust emissions from the Project. Based on this, continuous monitoring of dust is not recommended for the Project. However, in case of multiple substantiated dust complaints, or persistent visible observed dust leaving site, monitoring may be required, and suitable monitoring equipment and methodologies are provided in this table.</p> <p>VOCs/ Odour In general, the likelihood of significant VOC or odour emissions due Project excavation works is low. Soil concentrations of hydrocarbons were below the investigation levels for all soil samples tested as part of the Project's Detailed Site Investigation. Based on this, mandatory air monitoring for VOCs and odour is not recommended for the construction of the Project. However, in case of unexpected significantly contaminated soil being uncovered, reactive monitoring may be required and therefore suitable air monitoring equipment and methodology are provided in this table.</p>						
Monitoring Equipment						
Parameter	Equipment	Frequency	Locations	Criteria	Sampling Method	Timing
PM ₁₀	Dustrak or similar optical method particulate analyser	If required	To be determined based on requirement	50 µg/m ³ as a 24 hour average; 25 µg/m ³ as an annual average	AM-16 AS 2724.4-1987	If required
VOCs and SVOCs	Photo Ionisation Detector (PID)	If required	On Project boundary Immediately downwind from earthworks activities	0.4 ppm 1-minute average ¹	AM-21 AS 3580.11.1-1993	If required
Odour	Portable olfactometer	Upon receipt of odour complaint	Off-site both upwind and downwind from suspected odour source	Project-attributable 4 Odour Units above background odour (based on a population of ~125 people)	Odour annoyance survey	Within 24 hours of receipt of odour complaint
1. Based on EPA1-hour benzene criteria of 0.009 ppm, assuming 5 % benzene, converted via Turners equation ((1-hr avg * [60/1])^0.2) to 1-minute average						

6.0 Communication and Complaints Handling

The Community Communication Strategy identifies policies and procedures for managing community specific issues arising from construction activities. If an environmental complaint is received, the complaints management process outlined in the Strategy will be followed. This will involve the complaint being referred directly to the Environment Manager and/or Construction Manager. If they are on site at the time an entry in the Project consultation database will be made to ensure appropriate action and monitoring. A response would be required to 'close out' the complaint, and the resolution would be recorded in the database.

The Community Communication Strategy also outlines several proactive strategies for dealing with community and stakeholder issues.

7.0 Reactive Air Quality and Odour Management Plan

Table 5 Reactive management plan and situation handling

No.	Situation	Response	Responsibility
1	Visible emissions evident from site machinery / plant.	Switch off the plant or machinery immediately if safe to do so. Investigate causes of the emissions and tag-out the plant or machinery until the problem is resolved. If required, replace the item of plant or machinery.	CM, EM
2	Unexpected odour detected by staff / contractors on the site.	<p>Cease works if safe to do so and remove workers from the immediate vicinity of the detected odour. Investigate the source and nature of the odour in consultation with the Environment Manager or Construction Manager. Eliminate or mitigate the source of the odour as per item 4 below. Only after the area has been deemed safe to work are workers permitted to return the area.</p> <p>In the event of an odour complaint; information would be obtained regarding the character of the odour, frequency, duration and intensity of odour observations and whether impacts of offensive odours are currently occurring</p> <p>An investigation of the odour complaint would be conducted as soon as practicable after an odour complaint has been received; and</p> <p>If odour impacts are immediately occurring; action would be undertaken to reduce odour impacts.</p>	CM, EM
3	High levels of dust due to weather conditions.	Cease dust generating activities under direction of the Environment Manager or Construction Manager until adverse conditions subside. Spray (with water or sealant) or cover exposed stockpiles and other dust generating areas, and remove other causes of dust such as sediment accumulation on sealed surfaces.	CM, EM
4	High levels of dust, contaminants, or odour due to site activities	<p>Investigate causes of the exceedance, and if necessary implement the following additional measures:</p> <ul style="list-style-type: none"> • Increase the use of water sprays to suppress dust in open areas or roadways. • Consolidate material stockpiles. • Promptly remove exposed heavily contaminated materials. • Use fine mist sprays around the excavation area. 	CM, EM

8.0 Performance and Review

This AQMP will be reviewed and updated, with the necessary approval, throughout the course of the Project to reflect changes in construction techniques, staging, or the natural environment. The review will take into consideration:

- Any significant changes to construction activities or methods;
- Key changes to roles and responsibilities within the Project;
- Changes in industry best practice standards or recommended dust controls;
- Changes in response to any complaints received;
- Implementation of any dust, VOC or odour monitoring;
- Changes in legal or other requirements (social and environmental legal requirements, consent conditions, Transport Agency objectives and relevant policies, plans, standards, specifications and guidelines);

9.0 Training

Compliance with this AQMP is the responsibility of all Deicorp staff and contractors employed on or working in association with the Project. All staff and contractors shall be educated on the contents of the plan and their responsibility as part of their site inductions and ongoing tool box talks.

With respect to air quality management, the training programme for all personnel on site will include at minimum the following aspects:

- The responsibilities of all personnel for carrying out the work on site in a manner which does not result in adverse effects on the environment, local residents and in accordance with DMP;
- The potential legal ramifications of adverse environmental effects occurring as a result of the project and non-compliance with resource consent conditions;
- The minimum requirements for dust and odour control for all activities on site;
- The requirements for staff to monitor weather and visually inspect the site for dust discharges, assess the adequacy of dust control methods and implement additional dust control methods when required;
- The actions to be taken in an extreme dust and weather event; and
- The actions to be taken if a complaint is received from the public or consent authority.

Appendix A

Sensitive Receptor Locations

Appendix A Sensitive Receptor Locations



Appendix B

Existing Meteorological Conditions

Appendix B Existing Wind Conditions

The nearest automatic weather station to the Project is the NSW Department of Environment, Energy and Science (EES) operated station at Rouse Hill, about one kilometre north of the Project site. Rouse Hill EES Monitoring station wind data is presented in the following wind roses. The data period is May 2019 to December 2020. Winds often blow from the north, especially during spring, winter and autumn. Although these winds from the north are frequently light. The strongest winds are from the east and southeast during summer daytimes.

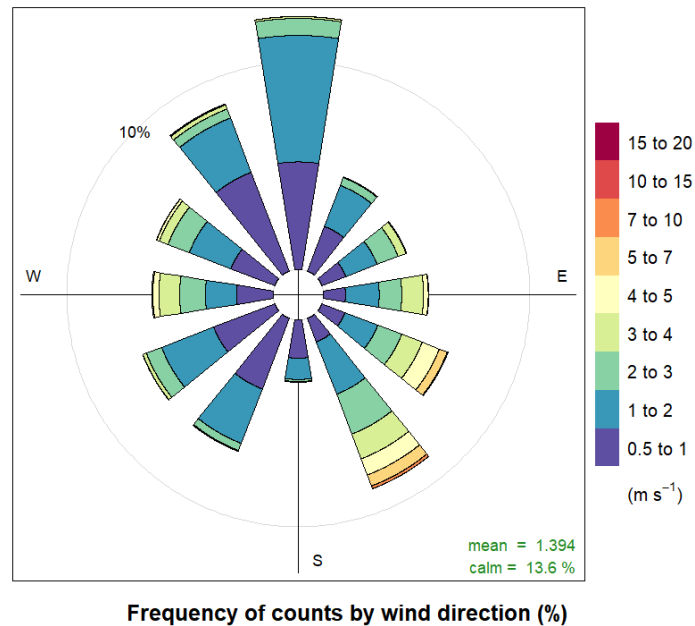


Figure 4 All hours (May 2019 to December 2020) for Rouse Hill

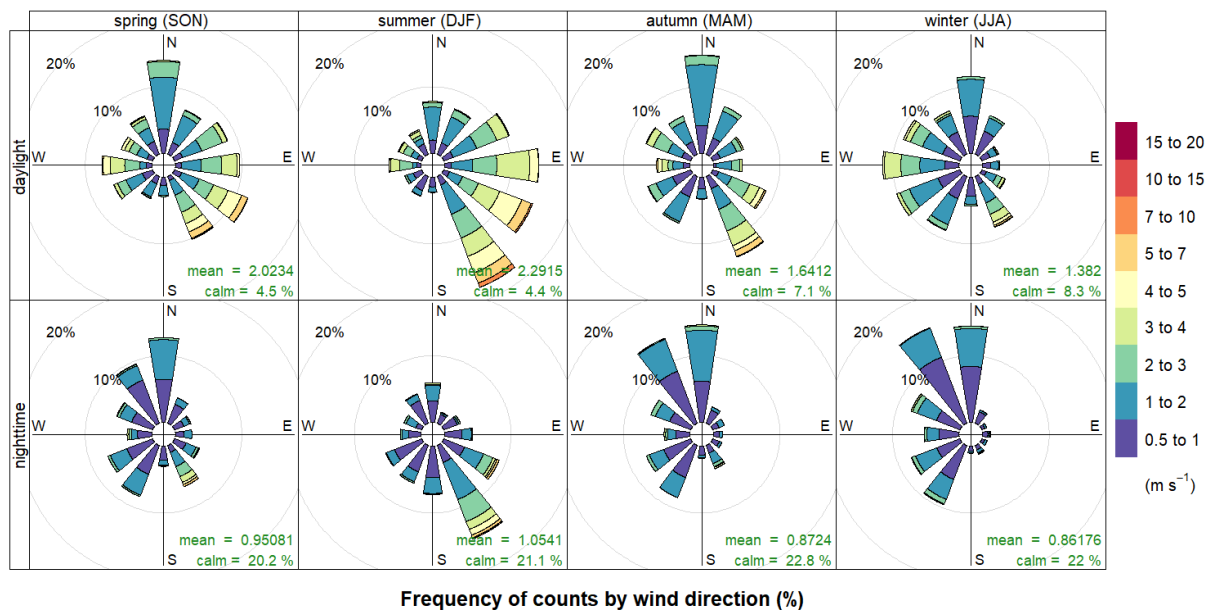


Figure 5 Day/night winds by season (May 2019 to December 2020) for Rouse Hill

Appendix C

Risk Assessment

Appendix C Risk Assessment

Risk assessment process

As risk assessment to potential air quality impacts was undertaken to determine the suitability and requirement of the mitigation controls listed in Section 4.0. This section presents an overview of the risk assessment process.

Rating Risk

Risk ratings were assessed by considering the consequence and likelihood of an event occurring. In assessing the consequence, the extent, severity and duration of the risks were considered. These are discussed below.

Assigning the consequences of risks

'Consequence' refers to the maximum credible outcome of an event affecting an asset, value or use. Consequence criteria were developed for the GB Energy Gas Project to enable a consistent assessment of consequence across the range of potential environmental effects. Consequence criteria were assigned based on the maximum credible consequence of the risk pathway occurring. Where there was uncertainty or incomplete information, a conservative assessment was made on the basis of the maximum credible consequence.

Consequence criteria have been developed to consider the following characteristics:

- Extent of impact
- Severity of impact
- Duration of threat.

The consequence framework and consequence criteria are presented in the following tables, C-1 and C-2, respectively.

Table C- 1 Consequence framework

Level	Qualitative or quantitative description of biophysical/environmental consequence	Qualitative or quantitative description of socio-economic consequence
Negligible	No detectable change in a local environmental setting	No detectable impact on economic, public health and safety, cultural, recreational, aesthetic or social values
Minor	Short-term, reversible changes, within natural variability range, in a local environmental setting	Short-term, localised impact on economic, public health and safety, cultural, recreational, aesthetic or social values
Moderate	Medium-term but limited changes to local environmental setting that can be managed	Medium-term change in quality of economic, public health and safety, cultural, recreational, aesthetic or social values in local setting. Limited impacts at regional level
Major	Long-term, significant changes resulting in risks to human health and/or the environment beyond the local environmental setting	Significant, long-term change in quality of economic, public health and safety, cultural, recreational, aesthetic or social values at local, regional and State levels. Limited impacts at national level
Severe	Irreversible, significant changes resulting in widespread risks to human health and/or the environment at a regional scale or broader	Significant, permanent impact on regional economy, public health and safety and/or irreversible changes to cultural, recreational, aesthetic or social values at regional, state and national levels

Table C- 2 Air Quality Consequence criteria

Aspect	Negligible	Minor	Moderate	Major	Severe
Air Quality	Undetected changes to ambient air quality, beyond the site boundaries	Detectable changes to air quality result in amenity impacts on a small number (<10) of sensitive receptors, and no exceedances of relevant air quality criteria beyond site boundaries.	Detectable localised changes to air quality result in amenity impacts on 10 to 100 sensitive receptors and/or short-term exceedances of relevant air quality criteria beyond site boundaries.	Detectable widespread changes to air quality result in amenity impacts on a large number (>100) of sensitive receptors and/or substantial medium-term exceedances of relevant air quality criteria beyond site boundaries.	Detectable widespread changes to air quality result in amenity impacts on a large number (>100) of sensitive receptors and substantial long-term exceedances of relevant air quality criteria beyond site boundaries.

Assigning the likelihood of risks

'Likelihood' refers to the chance of an event happening and the maximum credible consequence occurring from that event. The likelihood criteria are presented in Table A-3.

Table C- 3 Likelihood guide

Level	Description
Rare	The event may occur only in exceptional circumstances
Unlikely	The event could occur but is not expected
Possible	The event could occur
Likely	The event will probably occur in most circumstances
Almost Certain	The event is expected to occur in most circumstances

Risk matrix and risk rating

Risk levels are assessed using the matrix presented in Table C-4.

Table C- 4 Risk assessment matrix

		Consequence ratings				
		Negligible	Minor	Moderate	Major	Severe
Likelihood rating	Rare	Very Low	Very Low	Low	Medium	Medium
	Unlikely	Very Low	Low	Low	Medium	High
	Possible	Low	Low	Medium	High	High
	Likely	Low	Medium	Medium	High	Very High
	Almost Certain	Low	Medium	High	Very High	Very High

Risk evaluation and treatment

The risk assessment process was used as a screening tool to prioritise potential impacts and the subsequent level of assessment undertaken as part of the impact assessment. Where initial risk ratings were found to be 'medium' or higher, options for additional design changes or mitigation and management measures were considered where practicable.

Risk assessment

The air quality risk assessment for the project is presented in Table A-5.

Table C- 5 Risk assessment

Risk ID	Risk name	Risk pathway	Initial risk			Mitigation Measures	Residual risk		
			C	L	Risk		C	L	Risk
AQR1	Dust from excavation and construction works	Excavation and/or construction activities result in the generation of dust (particulates) resulting in deterioration of the existing air quality environment.	Moderate	Possible	Medium	AQ4-AQ15	Moderate	Rare	Low
AQ3	Extreme weather (hot windy conditions)	Climatic conditions result in the generation of dust (particulates) resulting in deterioration of the existing air quality environment.	Moderate	Likely	Medium	AQ13	Moderate	Unlikely	Low
AQ4	Transportation of materials to and from site	Increased dust emissions near the construction worksite (within urban environment) due to transportation of materials resulting in deterioration of the existing air quality environment.	Moderate	Possible	Medium	AQ1-AQ3	Moderate	Rare	Low
AQ5	Combustion emissions from construction activities	Construction equipment, vehicles and plant results in the generation of combustion emissions resulting in deterioration of the existing air quality environment.	Minor	Unlikely	Low	AQ17-20	Minor	Unlikely	Low
AQ6	Odour from construction activities	Odour from contaminated soils resulting in amenity impacts.	Moderate	Unlikely	Low	AQ7, AQ9, AQ16	Moderate	Rare	Low