

AIR QUALITY AND DUST MANAGEMENT PLAN

Document No: ARMS-0000-H-PLN-N-0001 Rev 2

Project Name: Nolans Rare Earths

REVISION HISTORY

					
08/09/2022	Rev 2	Issue for Use	M. Robinson, ESG Manager	M. Robinson, ESG Manager	S. Watkins, GM Projects
July 2022	Rev 1	Issue for Use	M. Robinson, ESG Manager	M. Robinson, ESG Manager	S. Watkins, GM Projects
23/07/2021	Rev 0	Issue for Use	Mi. Robinson, ESG Manager	Brian Fowler, GM NT & Sustainability	S.Watkins , GM Projects
Date	Rev	Description	Prepared	Reviewed	Approved

TABLE OF CONTENTS

1.0	INTRODUCTION.....	5
1.1	Background.....	5
1.2	Purpose.....	5
1.3	Objectives.....	5
1.4	Relevant Legislation and Guidelines.....	6
1.5	Previous Investigations.....	6
1.6	Sensitive Receptors.....	6
1.7	Potential Dust and Pollutant Impacts.....	7
	1.7.1 Assessment Guideline Values.....	8
	1.7.2 Sources.....	8
	1.7.3 Impacts.....	9
1.8	Ongoing Dust Monitoring.....	11
2.0	MANAGEMENT AND MITIGATION	14
2.1	Key Activities and Impacts.....	14
2.2	Mitigation Objectives.....	16
2.3	Mitigation Measures.....	16
2.4	Trigger, Action and Response Plan.....	18
3.0	PERFORMANCE REVIEW	20
4.0	REFERENCES	21
4.1	Third Party Documents.....	21
5.0	ABBREVIATIONS AND DEFINITIONS	22
5.1	Abbreviations.....	22
5.2	Definitions.....	22

INDEX OF FIGURES

Figure 1.1 Dust Deposition Gauge Locations – Minesite.....13

INDEX OF TABLES

Table 1—1 Previous Investigations6
 Table 1—2 Sensitive Receptor Locations7
 Table 1—3 deposited dust level guidelines8
 Table 1—4 Potential Air Pollutants and Dust Sources.....9
 Table 1—5 Operations (Worst-case) Predicted Particle Concentrations at Receptors (GHD, 2016a)10
 Table 1—6 Predicted CO, NO₂ and SO₂ Concentrations at Receptors.....11
 Table 1—7 Dust Deposition Gauges.....12
 Table 2—1 Key Activities and Impacts14
 Table 2—2 Mitigation Objectives.....16
 Table 2—3 Mitigation Measures16
 Table 2—4 Trigger, Action and Response Plan18

1.0 INTRODUCTION

1.1 Background

The Nolans Rare Earths Project (the Project) is located approximately 135 km north west of Alice Springs, Northern Territory. The Project targets the Nolans Bore mineral deposit for rare earth elements. Activities will focus on construction, mining, processing, rehabilitation and decommissioning of an open-cut, rare earth mine, processing facility and its associated infrastructure.

The Project involves several key activities with the potential to impact on air quality and dust emissions, to which it must manage in accordance with the Air Quality and Dust Management Plan (AQDMP).

1.2 Purpose

The purpose of the AQDMP is to provide a framework for air quality and dust management across and adjacent to the Project site as well as providing information which is to be used in decision making and project management, detail planning and methods of work, and provide for a record of performance. The Plan has been developed in accordance with NTEPA requirements and references Commonwealth air quality legislation.

This document and its subsequent revisions form an integral part of the Project's Mining Management Plan (MMP). It is a dynamic document, a receptacle for information which is to be reviewed and updated regularly (or as determined by the MMP), enabling an accurate reflection of the current operational requirements and practices whilst allowing for responsiveness to conditions, input from stakeholders, and enabling flexibility in planning and prioritisation where required.

All referenced company policies, standards, registers, operational procedures, activity specific documents, forms and templates are stored and can be accessed from within the Arafura Resources Integrated Management System (ARMS).

The monitoring and management of radionuclides is covered in the Radiation Management Plan (Radiation Protection Programme) document.

1.3 Objectives

This management plan aims to minimise the health risk or loss of amenity due to emission of dust or pollutants from the site activities to the environment and has been designed to achieve this objective through the following process:

- Characterising and ranking potential impacts of major dust and air quality emission sources assisted by modelling of dust and air quality;
- Implementation of a dust prevention strategy including dust suppression, dust evolution, primary and secondary dust capture and reduction of fugitive dust emissions;
- Monitoring of dust and air quality impact, followed by the identification of the sources; and
- Annual performance reviews against monitoring results to determine if additional mitigation measures are required.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

Responsibilities for the implementation of this plan are outlined in Table 2—4.

1.4 Relevant Legislation and Guidelines

The Project is obliged to comply with all relevant environmental legislation and Regulatory Authorities. A summary of key legislation and guidelines is outline in the Mine Management Plan, Section 3: Regulatory Requirements.

1.5 Previous Investigations

A summary of previous investigations relating to air quality at the site is provided in Table 1—1.

Table 1—1 Previous Investigations

Report Title	Author	Date	Purpose
Air Quality (GHD, 2016a)	GHD	March 2016	<p>The assessment was undertaken to address NTEPA Terms of Reference. The report:</p> <ul style="list-style-type: none"> ▪ Qualitatively assesses the likely level of dust generation and other pollutants associated with construction of the Project; ▪ Models dust and emissions from the operation of the Project; ▪ Assesses air quality impacts from the operation of the Project, including dispersion modelling and assessment against relevant air quality criteria; and ▪ Specifies intended air quality management and mitigation measures during establishment and operation of the Project to allow compliance with relevant air quality criteria.

1.6 Sensitive Receptors

The Project lies within the Burt Plain bioregion. Land use immediately adjacent is pastoral activities. Existing infrastructure includes the Stuart Highway, the Amadeus Gas Pipeline, pastoral station tracks and wells for stock watering. The nearest non-mining sensitive receptor is Aileron Roadhouse approximately 12 km to the southeast of the mine. The Alyuen outstation is about 12 km east of the processing facilities. The planned bitumen project access road runs northwest off the Stuart Highway with the main intersection located approximately 3 km south of the Alyuen outstation. A number of sensitive receptors identified in the wider region are listed in Table 1—2, distance has been taken from the reference point of Nolans Bore.

Table 1—2 Sensitive Receptor Locations

Name	Coordinates		Distance from site (km)
	Easting	Northing	
Accommodation Facility	322800	7493100	5
Annas Reservoir ^A	309200	7500600	9
Aileron Roadhouse	330000	7494900	14
Alyuen outstation	330600	7492000	16.5
Pinehill Station	299500	7523300	27.5
Laramba	269200	7506400	50
Napperby Station	268900	7509000	50
Coniston	241600	7559800	96
Alice Springs	386000	7378600	135
Note: ^A Potential ad-hoc camping location			

1.7 Potential Dust and Pollutant Impacts

An assessment for potential impact from dust and key air pollutants from the Project was completed as part of the EIS process (GHD, 2016). The assessment included the adjacent area to the mining area boundary and to the nearest sensitive receptors (GHD, 2016a).

A United States Environmental Protection Agency approved CALPUFF dispersion model (version 5.8.4) was used to predicted particle concentrations at a grid around the Project and inclusive of the nearest sensitive receptor locations. The dust model utilised on-site meteorological data obtained from Arafura Resources and activities input replicating worst-case total emissions for each pit and associated infrastructure stages.

The impacts of dust emissions fall under two categories, namely health and amenity as follows:

- Potential health impacts are attributable to the concentration of respirable particles in ambient air. Respirable particles of dust that have a diameter of 10 micron or smaller (PM₁₀) would have maximum impact under light winds and stable atmospheric conditions. These conditions most frequently occur overnight and very early in the morning. Greater amounts of dust can be generated from exposed surfaces under strong wind conditions which are associated with a neutral atmospheric stability; and
- Presence of Total Suspended Particles (TSP), greater than 35 microns, is likely to affect amenity by way of reducing visibility (whilst in the air column) and by soiling of materials via dust deposition. Amenity impacts are most noticeable in high wind conditions, when larger particles may be entrained into the air column from erodible surfaces and transported a significant distance before being deposited and soiling surfaces. Mitigation of amenity related dust impacts would in turn act to reduce health impacts due to dust emissions.

1.7.1 Assessment Guideline Values

Dust

The dust assessment guideline values were adopted from the following references with the most conservative value utilised for the assessment:

- National Environment Protection (Ambient Air Quality) Measure (Air NEPM);
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Approved Methods);
- Victorian State Environment Protection Policy (Air Quality Management) - EPA Victoria; and
- Victoria Mining and Extractive Industries Protocol for Environmental Management (PEM) criteria for PM_{2.5} and PM₁₀.

The dust assessment levels from the NSW Approved Methods have been used in the development of the TARP trigger levels, as outlined in Table 1—3.

Table 1—3 deposited dust level guidelines

Averaging Period	Maximum increase in deposited dust level (g/m ² /month)	Maximum total deposited dust level (g/m ² /month)
Annual	2	4

Pollutants

The pollutant guideline values for assessing stack emissions from the power station were adopted from the following reference with the most conservative value utilised for the assessment:

- National Environment Protection (Ambient Air Quality) Measure (Air NEPM);
- National Environment Protection (Air Toxics) Measure (Air Toxics NEPM); and
- Victorian State Environment Protection Policy (Air Quality Management) - EPA Victoria.

1.7.2 Sources

The modelling assessed the operational stages of the various pit stage scenarios, including the initial establishment period. Mine site activities with potential to generate dust and pollutants were established and modelled. Activities included within the model are provided in Table 1—4.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

Table 1—4 Potential Air Pollutants and Dust Sources

Source Type	Source Location
Dust	
Wind erosion.	Open-cut pit, ROM Pad, long-term ore stockpiles, crushed ore stockpile, waste rock dumps.
Drilling of ore and waste rock.	Open-cut pit – ad hoc (limited).
Blasting of ore and waste rock.	Open-cut pit – assumed to occur every day (conservative).
Loading ore and waste rock into haul trucks using excavators/shovels or front-end loaders.	Open-cut pit.
Hauling ore and waste rock.	Haul roads from mine area to the ROM, long-term ore stockpiles and waste rock dump.
Unloading ore and waste rock from haul trucks.	ROM Pad, long-term ore stockpiles and waste rock dumps.
Dozing of waste rock and long-term ore stockpiles.	Waste rock dumps and long-term ore stockpiles.
Grading.	Haul roads and waste rock dumps.
Primary crusher.	Water spraying along crusher/conveyor lines.
Ore loading, handling and transfer.	Ore will be transported to the crushing infrastructure using a road train and dumped within the crushing shed. Once crushed ore will be conveyed via covered conveyors to the mill for grinding.
Potential Pollutants	
Stack emissions including Nitrogen (NO _x), Carbon Monoxide (CO) Carbon Dioxide and traces of SO _x	Power Station.
SO _x and traces of H ₂ SO ₄ (BDL).	Sulphuric Acid Plant.

1.7.3 Impacts

Construction

Construction activities were not modelled as part of the EIS process as the initial clearing activities are much smaller than when worst case operations are occurring for each pit stage scenario. Emission locations of dust during construction will consistently change throughout the program reducing potential persistent impacts across the establishment periods (clearing pit and dump areas and moving topsoil to storage areas). Dust emissions during construction are not considered to represent a significant source of emission with mitigation measures as outlined in Section 2.3.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

Operation

Modelled air emissions during the operations phase are unlikely to have an adverse impact, with particulate and other air pollutant concentrations below the assessment guidelines.

The predicted concentrations for CO, NO₂ and SO₂ at sensitive receptor locations are below the adopted assessment criteria. Impact contours for CO, NO₂ and SO₂ barely extend beyond the Project boundary.

A summary of predicted dust and pollutant impacts at sensitive receptors is provided in Table 1—5 and Table 1—6 respectively.

Table 1—5 Operations (Worst-case) Predicted Particle Concentrations at Receptors (GHD, 2016a)

Receptor	PM ₁₀	TSP	Dust deposition
Averaging period	24-hour	Annual	Monthly
Rank	Highest	Max	Rolling 12-month average
Guideline	60 µg/m ³	90 µg/m ³	2.0 g/m ² /month (increment)
Source	VIC Mining PEM	NSW Approved Methods	NSW Approved Methods
Accommodation Facility	<19.8 (6)	<16 (5)	<0.06 (2)
Aileron Roadhouse	<6.5 (6)	<5 (4)	<0.02 (2)
Alyuen Outstation	<6.5 (6)	<5 (4)	<0.02 (2)
Pinehill Station	<10.5 (2)	<6.7 (5)	<0.18 (2)
Laramba Community	BDL	BDL	BDL
Napperby Station	BDL	BDL	BDL
Coniston Station	BDL	BDL	BDL
Alice Springs	BDL	BDL	BDL
<p>Note: PM₁₀: Particulate Matter < 10 µm. TSP: Total Suspended Particulates. BDL – Below Detection Limit (outside modelled grid). '<' sign indicates beyond the model grid limits. Bracket number indicates worst-case stage.</p>			

Table 1—6 Predicted CO, NO₂ and SO₂ Concentrations at Receptors

Receptor	CO	NO ₂ 1		SO ₂
		1-hour	Annual	
Averaging period	1-hour	1-hour	Annual	1-hour
Rank	99.9%ile	99.9%ile	Max-	99.9%ile
Guideline	29,000 µg/m ³	190 µg/m ³	62 µg/m ³	450 µg/m ³
Source	EPP (VIC EPA)	EPP (VIC EPA)	NSW Approved Methods	Air Toxics NEPM
Nolans Bore – on-site, open-pit area	14	3	< 1	132
Accommodation Facility	7	2	< 1	105
Annas Reservoir	<9	< 1	< 1	<75
Aileron Roadhouse	11	2	< 1	<126
Alyuen Outstation	4	1	< 1	<65
Pinehill Station	<4	< 1	< 1	<59
Laramba Community	BDL	BDL	BDL	BDL
Napperby Station	BDL	BDL	BDL	BDL
Coniston Station	BDL	BDL	BDL	BDL
Alice Springs	BDL	BDL	BDL	BDL
Note: 1 Taken as 30% of NO _x results. BDL – Below Detection Limit – well outside modelled grid '<' sign indicates beyond the model grid limits				

1.8 Ongoing Dust Monitoring

A series of dust deposition gauges are present across the Mine site that were utilised for the EIS Air Quality (GHD, 2016a). The locations bound the Mine site upwind (NDDG2), adjacent (NDDG1 and NDDG3) and downwind (NDDG4 and NDDG5).

In addition, NDDG6 will be installed at the nearest sensitive receptor (the Accommodation Facility), NDDG07 downwind of the haul road, and NDDG8 downwind of the residue storage facility and processing plant. Dust deposition monitoring will continue to be done through the construction and operational phases. Samples will be analysed by an independent NATA Accredited Laboratory. A summary of the gauge locations and sample frequencies are provided in Table 1—7, with the locations illustrated on Figure 1.1.

The onsite meteorological monitoring station is to be utilised throughout the construction and operations phase to determine local wind conditions at the time of any high dust event.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

Table 1—7 Dust Deposition Gauges

ID	Details	Sampling Frequency
NDDG1	Downwind / adjacent to west WRD	Monthly
NDDG2	Upwind, situated southeast of the Mine site	
NDDG3	Adjacent to haul road on southern edge of Mine Site	
NDDG4	Adjacent, situated north of Mine Site and East WRD	
NDDG5	Downwind of Mine site	
NDDG6	Adjacent to accommodation	
NDDG7	Downwind / adjacent to haul road north of Processing Plant	
NDDG8	Downwind of Residue Storage Facility and Processing Plant	

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

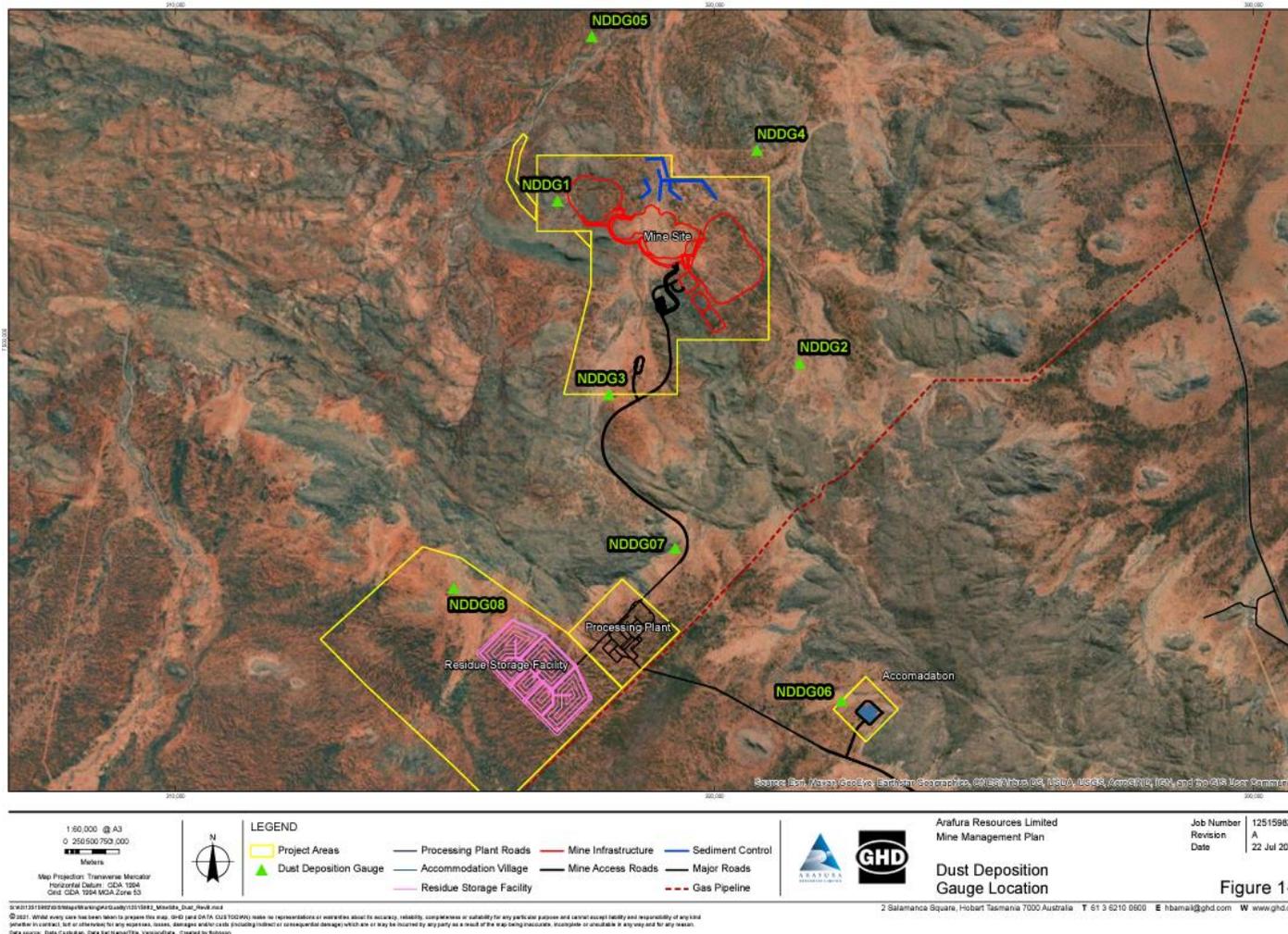


Figure 1.1 Dust Deposition Gauge Locations – Minesite

2.0 MANAGEMENT AND MITIGATION

Air quality and dust management refers to previous monitoring and modelling carried out across the Project as detailed in the EIS GHD 2016a . Management of air quality and dust at the Project is to be structured as follows:

- **Key Activities, Impacts and Residual Risks:** A summary of the key activities being undertaken during the management period. The potential environmental impacts and residual risk levels are identified for each environmental aspect.
- **Objective:** The guiding environmental management objective(s) and activities that apply to the element.
- **Mitigation Measures:** The procedures to be used to ensure that the relevant objectives are met.
- **Responsibility:** Nominates the responsible position for implementing actions and monitoring.
- **Trigger, Action, Response Plan (TARP):** The actions to be implemented in the case of non-compliance. This includes strategies of remediation and the person(s) responsible for the actions.

2.1 Key Activities and Impacts

The key activities and potential environmental impacts that have been identified for air and dust quality and are listed in Table 2—1.

Table 2—1 Key Activities and Impacts

ID No	Activity	Potential Environmental Impact
1	Site establishment (including vegetation clearing and soil compaction) results in altered environment character and modification to ecological processes from construction of Project.	Dispersion of particulate matter in the air resulting in reduced air quality at nearby sensitive receptors or beyond the Project boundary with impacts to human health, in particular PM ₁₀ . Impacts from other particulate sizes (TSP) from dust fallout and deposition, including to flora and amenity at sensitive receptors.
2	Haulage and transport of material within the Project area, along haul roads within the mine site, and along access tracks; and general site movements over unsealed surfaces resulting in generation and dispersion of particulate or dust (TSP).	Dispersion of particulate matter (predominantly TSP, with some PM ₁₀) in the air resulting in reduced air quality at the Project boundary and/or at nearby sensitive receptors, with impacts to human health.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN



ID No	Activity	Potential Environmental Impact
3	Wind erosion mobilising dust from exposed surfaces, such as pits, waste dumps, tailings storage facility, residue storage facility, laydown areas, stockpiles, roads and sites of vegetation clearing.	Dispersion of particulate matter in the air (TSP and PM ₁₀), excluding radioactive material, resulting in reduced air quality at nearby sensitive receptors with impacts to human health. Impacts from dust fallout and deposition, including to flora, and amenity at sensitive receptors.
4	Drilling, blasting, excavation and materials handling at the mine site during operations results in dispersion of particulates and dust.	Dispersion of particulate matter (excluding radioactive material) in the air from activity contained to the mine pit over typically limited time frames, resulting in reduced air quality at nearby sensitive receptors at or beyond the Project boundary with impacts to human health.
5	Operation of concentrator (comminution and beneficiation circuits) at the Processing Site, resulting in dispersion of particulate, gas or dust.	Dispersion of particulate matter (TSP and PM ₁₀) in the air resulting in reduced air quality beyond the Project boundary or at nearby sensitive receptors with impacts to human health.
6	Operation of RE processing units, sulphuric acid plant and gas fired generators at the Processing Site results in dispersion of emissions.	Emission of fine particles and gaseous pollutants from the processing site, including SO _x , NO _x , CO, fluoride compounds and sulphuric acid. Dispersion resulting in reduced air quality at nearby sensitive receptors (> 5 km) with impacts to human health.
7	Vehicle emissions and heavy equipment emissions results in impacts to air quality.	Emissions of CO, NO _x , SO _x , Particles and Volatile Organic Compounds (VOC) released from combustion sources including earthmoving equipment, haul trucks and site vehicles. Dispersion resulting in reduced air quality beyond the Project boundary or at nearby sensitive receptors with impacts to human health.
8	Operation of the gas fired power station.	Emissions from the stack potentially impacting the workforce and/or sensitive receptors.

2.2 Mitigation Objectives

The air quality and dust management objectives have been established and are detailed in Table 2—2.

Table 2—2 Mitigation Objectives

Objective	Target	KPI
Minimise dust impacts at the Project.	No reports of dust impacts from the Project at sensitive receptors.	Number of incidents of dust deposition at selected sensitive receptor sites.
Minimise air pollutant impacts at the Project.	No reports of pollutant impacts from the Project at sensitive receptors.	Number of pollutant impacts/complaints at selected sensitive receptor sites.
	Utilise best practice for the management of the Power Station and Acid Plant with SCADA monitoring of stack emissions.	Number of stack emissions outside of design specification.

2.3 Mitigation Measures

Mitigation measures have been developed to minimise potential impacts associated with air quality and dust management within the Project area. The mitigation measures, timing and responsibilities are provided in Table 2—3.

Table 2—3 Mitigation Measures

Mitigation Measure	Timing	Responsibility
Site Induction (Risk Activity 1 – 8)		
Site induction is to include the following components for air and dust management: Description of dust risks across the Project and areas of higher risk (i.e. adjacent to the Stuart Highway); and Requirement for speed restrictions across the Project.	Site Induction	Environmental Officer
Water Cart / Water Spraying (Risk Activity 2 and 4)		
Water carts are to operate across the Project during construction and operation.	Construction Operation	Area Managers
Application of chemical binding agents on unsealed roads or large areas of disturbance are to be considered for managing dust levels.	Construction Operation	Area Managers

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN



Mitigation Measure	Timing	Responsibility
Water trucks are to spray ore during excavation when deemed necessary.	Construction Operation	Area Managers
Dust General (Risk Activity 1, 2 and 4)		
Defined access roads and haul routes are to be used.	Construction Operation	Area Managers
Tailings are to be kept moist (dust emission insignificant).	Operation	Area Managers
Stockpiles of soils across the Project are to be managed to reduce dust emission including spraying with water or covering with vegetation.	Construction Operation	Area Managers
Areas cleared which are no longer required and topsoil storage areas must be rehabilitated in accordance with the Mine Closure Plan and Erosion and Sediment Control Plan.	Construction Operation	Area Managers
Access Road from the Mine site to Stuart Highway shall be sealed and maintained.	Operation	Area Managers
Offloading of waste and ore is to be undertaken from minimum heights with water sprays utilised at high frequency dump locations (i.e. start of crushing circuit).	Operation	Area Managers
Processing (Risk Activity 4 and 5)		
Ore may be sprayed with water prior to entering crushing circuit.	At all times	Area Managers
Low-grade ore stockpiles are to be managed to reduce dust emissions.	At all times	Area Managers
Air Pollutants General (Risk Activity 6, 7 and 8)		
All construction and maintenance equipment/vehicles are to be operated and maintained to manufacturer's specifications to minimise exhaust emissions.	Construction Operation	Area Managers
Power Station stack height is to be a minimum of 12.5 m Acid Plant stack height is to be a minimum of 32 m (final heights to be confirmed during FEED, Non-flue gas will also be emitted via stacks, such as the cooling tower. This will be height limited.	Design Construction Operation	Area Managers
Inspection and Monitoring (Risk Activity 1 – 8)		
Regular visual dust inspections of work areas to determine if additional dust suppression measures are required.	As required	Area Supervisors
Monitoring and reporting against project guidelines for the DDG in accordance with Section 1.8.	Monthly	Environmental Officer

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN

Mitigation Measure	Timing	Responsibility
Monthly assessment of dust mitigation measures and laboratory data.	Monthly	Environmental Officer
Annual stack emission testing, assessment, and recommendation for mitigation measures.	Annual	Environmental Officer

2.4 Trigger, Action and Response Plan

The Trigger, Action and Response Plan (TARP) outlines remedial actions and responses to the situation. The levels of incidents and TARP are provided in Table 2—4.

Table 2—4 Trigger, Action and Response Plan

Trigger	Action	Response
Dust complaint received but not validated.	Undertake an investigation of the complaint including an assessment of operations, weather conditions and visual observation of impact. Record in the Complaints Register.	Provide feedback to complainant.
Dust complaint received and confirmed as valid.	Undertake an investigation of the complaint including an assessment of operations, weather conditions and visual observation of impact. Review efficiency of dust mitigation measures and detail additional mitigation measures and associated monitoring at sensitive receptors (including complainant location where appropriate).	Review and implement additional dust mitigation measures provided by the HSEC Manager. Provide feedback to complainant.
Monthly DDG exceeds 4 g/m ² /month OR one or more incremental monthly value increase exceeds 2 g/m ² /month	Environmental Officer: Undertake an investigation of the exceedance including an assessment of operations and prevailing weather conditions.	Area Manager: Provide feedback to HSEC Manager.
Rolling 12-month DDG exceeds 4 g/m ² /month OR one or more incremental monthly value increase exceeds 2 g/m ² /month	Environmental Officer: Undertake an investigation of the exceedance including an assessment of operations and prevailing weather conditions. Review efficiency of dust mitigation measures and detail additional mitigation measures to be considered.	Area Manager: Review and implement additional dust mitigation measures provided by the HSEC Manager.

AIR QUALITY AND DUST IMPACT MANAGEMENT PLAN



Trigger	Action	Response
Stack emission tests indicate concentrations exceed design criteria by 20%	Assess subcontractors report and recommendations. Evaluate the viability of mitigation measures and produce summary report for HSEC and Area Manager	Review summary report of emissions failure and potential mitigation measures. Determine in consultation with the subcontractor and HSEC Manager what remedial works will be undertaken.

3.0 PERFORMANCE REVIEW

A regular review of performance of this management plan is to coincide with the review process of the Project's Mining Management Plan (MMP).

The review process is to assess performance against objectives of this plan and the stated actions within the MMP, with any relevant outcomes, supporting information, reports and/or data, discussed within the relevant section of the MMP, and supporting information/reports provided within the appendices.

Any outcomes of the performance review that will assist in continually improving this management plan, its objectives, methods or controls, are to be included or reflected in an updated version of this document.

The mitigation objectives and measures outlined in this EMP have been developed to reduce the risk of key project activities to an acceptable level for construction and operation of the Project.

4.0 REFERENCES

4.1 Third Party Documents

Ref No.	Title	Document Number
C1.	Environmental Protection Authority (1996). <i>Best Practice Environmental Management - Environmental Guidelines for Major Construction Sites</i> . Melbourne, EPA Victoria.	
C2.	GHD (2015). <i>Air Quality Technical Report</i> (Document No. G:\43\22301\WP\36700.docx).	
C3.	GHD (2016). <i>Nolans Project Environmental Impact Statement, May 2016</i> . A report for Arafura Resources Limited	
C4.	GHD (2016a). <i>Nolans Project Environmental Impact Statement. Appendix Q: Air Report</i> . Unpublished report for Arafura Resources Limited	
C5.	GHD (2017). <i>Nolans Project Environmental Impact Statement - Supplementary Report, October 2017</i> . A report for Arafura Resources Limited	
C6.	National Pollutant Inventory (2012) <i>Emission Estimation Technique Manual for Mining</i> . Version 3.1. Canberra, A.C.T. Department of Sustainability, Environment, Water, Population and Communities	
C7.	Northern Territory Department of Infrastructure, Planning and Logistics (2014). <i>Standard Specification for Environmental Management</i> . Palmerston, NT.	
C8.	NSWEPA (2016). <i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales</i> . Environment Protection Authority, NSW	
C9.	Victoria Environment Protection Authority (1996) <i>Environmental Guidelines for Major Construction Sites</i> . Melbourne, Environment Protection Authority.	
C10.	Victoria Environment Protection Authority (2007) <i>Protocol for Environmental Management: Mining and Extractive Industries</i> . Southbank, Vic.: EPA Victoria	

5.0 ABBREVIATIONS AND DEFINITIONS

5.1 Abbreviations

Abbreviation	Meaning
Arafura / ARU	Arafura Resources Limited
BDL	Below Detection Level
NDDG	Nolans Dust Deposition Gauge
NO _x	A collective name for the N _y O _z compounds
PM ₁₀	Particles with diameter of 10 micron or smaller
PM _{2.5}	Particles with diameter of 2.5 micron or smaller
SO _x	A collective name for the S _y O _z compounds
TSP	Total Suspended Particulates

5.2 Definitions

Term	Definition
Shall / Must	A requirement is mandatory
Project	Mean the Nolans Rare Earths Project. The Project include the exploration, Site preparation, Site construction, commissioning and operations of the works.
Regulatory Authority	Any person, body or authority who is appointed under a statutory act or administers any part of the Regulatory Requirements.
Regulatory Requirements	As defined in the Agreement and includes: <ul style="list-style-type: none"> a) Acts of the Commonwealth of Australia; b) Acts and ordinances of the Country, State and Territory in which the Project is located and any of the related works or services are carries out; c) Ordinances, regulations, by-laws, orders, or proclamations under acts and ordinances; d) Rules issued by a Regulatory Authority appointed by the Country; e) Direction given by any person, pursuant to the exercise of the statutory powers, which affect the performance of the Works; and f) all other laws, regulations, conventions, orders rules and directions given by or on behalf of any governmental or semi-governmental authority or body which may apply to the Project.