

Hodgson Quarries and Plant Pty Ltd

Air Quality Management Plan for the Sand Quarry, Roberts Rd Maroota, NSW

Prepared by:

VGT Pty Ltd

in conjunction with:

Hodgson Quarries and Plant Pty Ltd

Hodgson Quarries and Plant Pty Ltd

Air Quality Management Plan for the Sand Quarry, Roberts Rd Maroota, NSW

Prepared by:

VGT Pty Ltd
4/30 Glenwood Drive,
Thornton NSW 2322
PO Box 2335
Greenhills NSW 2323

ph: (02) 4028 6412
email: mail@vgt.com.au
www.vgt.com.au
ABN: 79 103 636 353

Report Date: 14/12/2017
Report Number: 5072 AQMP R5
Copy Number:
Report Authorised by: Lisa Thomson
Martin Hodgson

Date
14/12/17
14/12/17

Revision Table

Date	
5/5/2016	R0 LT Draft for Internal Review
11/05/2016	R1 TO/LT incorporating internal edits
20/06/2016	R2 Incorporating client changes
22/06/2016	R3 Removed background data to Annual Review
7/11/2016	R4 Changes following DPE review 14/10/16
14/12/2017	R5 Changes following review triggered by independent audit

This Copyright is included for the protection of this document

COPYRIGHT

© VGT Pty Ltd

and

© Hodgson Quarries and Plant Pty Ltd

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of the private study, research, criticism or review, as permitted under the Copyright Act 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to VGT Pty Ltd.

Disclaimer

This report was prepared in accordance with the scope of services set out in the contract between VGT Pty Ltd ABN 79 103 636 353 and the Client and is not to be reproduced except in full. To the best of our knowledge, the report presented herein accurately reflects the Client's intentions when the document was printed. However, the application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document. In preparing the report, VGT used data, surveys, analyses, designs, plans and other information provided by individuals and organisations referenced herein. While checks were undertaken to ensure that such materials were the correct and current versions of the materials provided, except as otherwise stated, VGT did not independently verify the accuracy or completeness of these information sources.

Table of Contents

	Page No.
Section 1. Introduction	1
1.1. Site Description	1
1.2. Scope	1
1.3. Consultation and Review	3
1.4. Objectives	4
1.5. Targets	4
1.6. Air Quality Goals and Statutory Requirements	5
Section 2. Existing and Potential Sources of Dust	6
2.1. Definitions	6
2.2. Climate	6
2.3. Surrounding Environment	7
2.4. Site Activities	8
2.5. Potential Dust Sources	10
Section 3. Air Quality Monitoring Plan	11
3.1. Monitoring Locations	11
3.2. Monitoring Intervals	11
Section 4. Dust Suppression Measures	14
4.1. Reactive Dust Management	14
4.2. Extraction and Processing	14
4.3. Transportation	14
4.4. Wind Breaks and Bunds	14
4.5. Progressive Rehabilitation	14
Section 5. Trigger Action Response Plan	15
Section 6. Reporting and Review	16
Section 7. References	17

Figures

B1: Previous Air Quality Monitoring Locations	9
B2: Current Air Quality Monitoring Locations	13

Tables

Table 1. Air Quality Management Plan Consultation	3
Table 2. Changes from Draft AQMP	3
Table 3. Changes made 2017	4
Table 4. Air Quality Criteria	5
Table 5. Site Climate Data December 2013 to March 2016	7
Table 6. Insoluble Solids Annual Averages	8
Table 7. Particulate Matter (PM10)	8
Table 8. Monitoring Criteria	11

Appendices

Appendix A	Email approval of sites from EPA
Appendix B	Consultation with DPE

Section 1. Introduction

1.1. Site Description

Hodgson Quarries and Plant Pty Ltd (the client) operate a sand quarry on Roberts Road at Maroota, NSW. The site comprises lots 1 and 2 DP 228308 and lot 2 DP 312327 in The Hills Shire Council (see Figure One in the OEMP). The development application number 267-11-99 was for extraction and on-site processing of sand, clay, and pebble; and construction of a bund wall.

The development has been in operation continuously since the 1970's. This Air Quality Management Plan is intended to be included in the OEMP.

1.2. Scope

This report is intended to satisfy conditions 20 (b), 29 and 65 of the consent (NSW Department of Planning and Environment, March 2016):

Consent Condition	Where Addressed
20. The Operational EMP shall include, but not be limited to:	
(b) the Air Quality Management Plan (Condition 29);	This report
29. The Applicant shall prepare an Air Quality Management Plan as part of the EMP. The Air Quality Management Plan shall:	
(a) identify existing and potential sources of dust deposition, TSP and fine particulates (PM10 and PM2.5) and specify appropriate monitoring intervals and locations. The purpose of the monitoring is to evaluate, assess and report on these emissions and the ambient impacts with the objective of understanding the development's contribution to levels of dust deposition, TSP and fine particulates in ambient air around the site;	Section 2 Sections 3.2, 3.1, Section 6
(b) provide a monitoring plan having regard to local meteorology and the relevant Australian Standards, identifying the methodologies to be used, including justification for monitoring intervals, weather conditions, seasonal variations, selecting locations, periods and times of measurements;	Section 3
(c) provide details of dust suppression measures for all sources of dust from the development, including a planting and watering regime to ensure that no more than 3 hectares of the site are exposed and active at any one time. The use of a polymer in the water to minimise dust impacts shall be investigated as part of this Plan;	Section 4
(d) provide details of actions to ameliorate impacts if they exceed the relevant criteria; and	Section 5
(e) provide the design of the reactive management system intended to reduce the day-to-day impacts of dust and fine particulates due to the development.	Section 4.1
65. The Applicant shall ensure that the management plans required under this Consent are prepared in accordance with any relevant guidelines, and include:	
(a) detailed baseline data;	(Wilkinson Murray Pty Ltd, June 2015) & Section 2.4.1
(b) a description of:	

Consent Condition	Where Addressed
• the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 1.5
• any relevant limits or performance measures/criteria;	Section 1.5
• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 5
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 4
(d) a program to monitor and report on the:	
• impacts and environmental performance of the development;	Section 3
• effectiveness of any management measures (see c above);	Section 6
(e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 5
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 6
(g) a protocol for managing and reporting any:	Section 6
• incidents;	
• complaints;	
• non-compliances with statutory requirements; and	
• exceedances of the impact assessment criteria and/or performance criteria; and	
(h) a protocol for periodic review of the plan.	Section 6

An Air Quality Impact Assessment was prepared by Wilkinson Murray to accompany the Environment Assessment document in support of the 2016 consent modification. That report provided baseline data and predictive modelling in support of the modification application.

1.3. Consultation and Review

The following summarises the consultation undertaken in preparation of this report.

Table 1. Air Quality Management Plan Consultation

Date	Originator	Recipient	Description	Where addressed in this Plan
30/3/16	VGT	EPA	Approval for gauges locations sought and received. EPA advised that they have no comments or requirements for AQMP.	Appendix A
15/7/16	VGT	DPE	Draft Air Quality Management Plan submitted	
10/10/16	DPE	Proponent	Review of EMS Attachment A (black text, Table 2)	Appendix B
10/10/16	VGT	DPE	Response to review of EMS (green text, Table 2)	Appendix B
14/10/16	DPE	Proponent	Attachment A_14 Oct (red text, Table 2)	Table 2

Table 2. Changes from Draft AQMP

Air Quality Management Plan – condition 29, Schedule 2	Satisfactory (Yes/No)	Comment	Action Required
<i>The Applicant shall prepare an Air Quality Management Plan as part of the EMP. The Air Quality Management Plan shall:</i>			
(a) identify existing and potential sources of dust deposition, TSP and fine particulates (PM10 and PM2.5) and specify appropriate monitoring intervals and locations. The purpose of this monitoring is to evaluate, assess and report on these emissions and the ambient impacts with the objective of understanding the development's contribution to levels of dust deposition, TSP and fine particulates in ambient air around the site;	No	The frequency of monitoring for TSP, PM10 and PM2.5 has been specified as 24 hours every 6 days for 12 months. This frequency is acceptable however, the MP does not specify the schedule of monitoring following this 12 month period. <i>Response: Section 3.2.2: A correlation will be developed for the site between the varying size fractions using a high volume air sampler method and the overall dust collected in the dust deposition gauges. This correlation will be presented to the DPE in the 2016 Annual Review with the aim of ensuring compliance using dust deposition gauges alone. It is the intention that the form of the ongoing monitoring will be decided following consultation with DPE.</i>	The MP should specify ongoing monitoring arrangements for TSP, PM10 and PM 2.5 <i>Response: Please include this information in the management plan.</i>
Where addressed in this report?			Section 3.2.2

An independent audit undertaken in 2017 triggered a review of all management plans. The following changes were made to this plan as a result of the 2017 review.

Table 3. Changes made 2017

Change	Section
This table added	1.3
“Hire” removed from proponent name	Throughout document
Inclusion of PM ₁₀ standards from NEPM	1.6.2

1.4. Objectives

The objectives of the Air Quality Management Plan are to prevent adverse impacts on the surrounding environment from dust and plant emissions generated from the operation and ensure compliance with relevant guidelines and statutory requirements.

1.5. Targets

The targets of the Air Quality Management Plan are to receive no reasonably preventable complaints from members of the public or statutory authorities regarding air quality emissions from the site, and for monitoring to show that air quality criteria are being met.

1.6. Air Quality Goals and Statutory Requirements

Table 4. Air Quality Criteria

Parameter	Criteria	Units	Averaging Period	Source
Total Suspended Particulates (TSP)	90	µg/m ³	Annual	DA Sched 2 28
PM10	50	µg/m ³	24 hours	DA Sched 2 28
PM10	30	µg/m ³	Annual	DA Sched 2 28
Insoluble Solids	4	g/m ² /month	Annual	DA Sched 2 28

1.6.1. Department of Planning and Environment

Schedule 2, Condition 28 (NSW Department of Planning and Environment, March 2016) states:

"28. The Applicant shall take all practical steps to manage the development so that the ambient air quality goals for total suspended particles (TSP) of 90 µg/m³ (annual average), particulate matter (PM10) of 50 µg/m³ (24 hours average) and 30 µg/m³ (annual average) and the dust deposition goal of 4gm/m² (annual average) are not exceeded as a result of the development, when measured at any monitoring location specified in the Air Quality Management Plan. "

1.6.2. National Environmental Protection Measure

The National Environmental Protection Council (NEPC) amended the National Environmental Protection Measure (NEPM) for Ambient Air Quality in February 2016. The following are relevant standards for this site.

Pollutant	Averaging Period	Maximum Concentration Standard	Maximum Allowable Exceedences
Particles as PM ₁₀	1 day	50 µg/m ³	None
	1 year	25 µg/m ³	None
Particles as PM _{2.5}	1 day	25 µg/m ³	None
	1 year	8 µg/m ³	None

1.6.3. NSW EPA

The site operates under NSW Environment Protection Licence number 6535 for the scheduled activities of Crushing, Grinding or Separating and Extractive Activities. There are no licenced discharge points and the following conditions relating to Air Quality:

"O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

O3.2 All loaded trucks entering or leaving the premises must have their loads covered.

O4 Other operating conditions

O4.1 The licensee must prevent any tracking of mud on to public roads by vehicles leaving the premises."

Section 2. Existing and Potential Sources of Dust

2.1. Definitions

Insoluble solids, also known as dust deposition, are measured using the EPA approved AS3580.10.1 and represent particles that settle from the ambient air into a container along with rainwater. The samples are usually collected over a 30 ± 2 day period, and are reported in $\text{g/m}^2/\text{month}$.

Total Suspended Particulates (TSP) are particles having an approximate Equivalent Aerodynamic Diameter (EAD) of less than $50 \mu\text{m}$ and are therefore usually suspended in the atmosphere due to their small size. Ambient air is drawn through a filter at a known rate by a high volume air sampler. The TSP inlet hood acts to prevent the ingress of rainfall and debris. TSP is measured using AS3580.9.3 which superseded the EPA approved AS2724.3.

Particulate Matter with an EAD less than $10 \mu\text{m}$ is known as PM10. The NSW EPA approved Australian Standard for measuring PM10 is AS3580.9.6 and uses a high volume air sampler in a similar manner to TSP, except that a size selective inlet replaces the hood. PM2.5 may also be measured using a high volume air sampler with a different size selective inlet, according to AS3580.9.14.

All high volume air samplers are typically sampled on a 6-day cycle for 24 hours. This averages out diurnal variations, operational changes over the week, and seasonal changes. All ambient air monitoring sites are located according to AS3580.1.1.

2.2. Climate

The climate of the region can be characterised using data from the Richmond RAAF weather station of the Bureau of Meteorology, approximately 20km south-west of the site. In summary, January is the hottest month (mean maximum temperature of 30°C) and July the coldest (mean minimum of 3.6°C). Rainfall occurs mostly in the summer, with February being the wettest month (average of 123mm over 8.4 days) and July the driest month (average of 28.5mm over 3.9 days).

The weather monitored at the site between December 2013 and March 2016 is summarised in the table below. The hottest day in this time was 23rd November 2014 (43.4°C) and the coldest was 5th July 2015 (0.9°C). The maximum wind speed recorded was 7.6 m/s and the average for the time period was 0.95 m/s. Rainfall was received on 43% of the recorded days. The low wind speeds and high number of rain days ensures the site is at low risk of producing dust impacts off site.

Table 5. Site Climate Data December 2013 to March 2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature												
Max °C	39.6	40.2	35.9	33.9	25.8	21.2	22.7	26.4	31.8	37.5	43.4	38.4
Min °C	11.9	11.7	4.1	7.2	33	1.8	0.9	2.0	4.0	5.6	8.0	11.1
Mean Wind Speed m/s	0.8	0.9	0.8	0.8	1.1	0.9	1.2	1.0	1.1	1.0	1.1	1.0
Max Wind Speed m/s	4.9	4.0	7.2	5.8	5.8	7.2	7.2	5.4	7.6	6.3	6.7	5.8
Mean Rain mm	466.2	193.6	104.0	79.0	53.6	41.0	41.0	151.8	72.4	74.8	144.2	309.6
Mean Rain Days	20	17	15	12	8	9	8	12	14	10	9	14
9am												
Mean Max °C	22.4	21.6	19.6	17.7	14.5	11.6	9.9	11.6	14.8	19.5	20.5	20.8
Mean Min °C	20.9	20.0	18.1	16.2	13.1	10.2	8.1	9.9	13.1	17.6	18.7	19.0
Mean Wind Speed m/s	0.7	0.9	0.8	0.9	1.3	1.1	1.3	1.1	1.4	1.1	1.0	0.8
3pm												
Mean Max °C	24.7	25.1	22.5	19.3	19.6	16.9	16.2	17.1	20.4	25.4	27.0	26.4
Mean Min °C	23.8	23.9	21.4	18.4	18.9	16.1	15.3	16.1	19.3	24.1	25.2	24.9
Mean Wind Speed m/s	1.3	1.3	1.0	1.0	1.7	1.4	2.0	1.8	1.9	1.7	2.1	1.8

2.3. Surrounding Environment

The surrounding landuses are dominated by agriculture and quarrying. Although some areas to the east of the site are well vegetated, the adjoining properties are cleared for farming and sand quarrying activities. Sources of dust and particulate matter in the region include:

- Traffic on sealed and unsealed roads
- Exhaust fumes
- Quarrying and earth moving activities
- Agricultural activities
- Fires: including bushfires, operation of fireplaces and wood stoves, and agricultural burning
- Local building and construction, and
- Animal grazing

2.4. Site Activities

Activities within the site that have the potential to cause dust and particulate matter include:

- Dozers ripping sandstone
- Loading and unloading of raw material using dump trucks
- Loading the hopper
- Screening
- Loading processed material into trucks
- Traffic on unsealed haul road
- Operation of diesel-powered plant and equipment
- Wind erosion from extraction and processing areas.

2.4.1. Baseline Data

Past results for depositional dust and particulate matter less than 10 microns (PM10) are summarised in the following tables. Insoluble Solids have been measured according to AS3580.10.1 continuously at three sites around the quarry since 2008. PM10 was measured according to AS3580.9.6 during 2008, and from October 2011 to February 2013. The locations of these past monitoring sites are given on Figure B1.

All previous results are within recommended guidelines and specified consent criteria. The past site activities have presented a low impact from dust generation, and existing dust mitigation measures have been effective.

Table 6. Insoluble Solids Annual Averages

Location	Insoluble Solids g/m ² /month			
	2012	2013	2014	2015
D1 SE	0.8	2.0	1.5	1.0
D2 E	1.2	1.1	1.5	1.0
D3 N	2.0	1.7	2.0	1.9
<i>Condition 28 Criteria</i>	<i>4.0</i>	<i>4.0</i>	<i>4.0</i>	<i>4.0</i>

Table 7. Particulate Matter (PM10)

Location	Particulate Matter <10µm µg/m ³	
	Maximum 24 hour	Annual Average for 2012
East	26	7.3
West	44	7.8
<i>Condition 28 Criteria</i>	<i>50</i>	<i>30</i>
<i>Richmond Average*</i>	<i>99.2</i>	<i>15.1</i>

* From NSW Office of Environment and Heritage Air Quality Data

Figure B1: Location of Previous Air Monitoring Sites

Plan of: Previous Dust Gauge Locations	Location: Roberts Road, Maroota	Projection: N/A	Date: 28/03/2013	Version: A
		Contour Interval: N/A	Sheet: 1 of 1	Survey: N/A
		Plan By: TO		Source: NOW website, VGT 2011
Figure: B1	Council: Baulkham Hills Shire Council	Project Manager: TO		
Client: Hodgson Quarries and Plant Hire Pty Ltd	Scale:	Office: Thornton	Our Ref: 2801_HMA_AQMP2016_C001_V1_FB1.cdr	

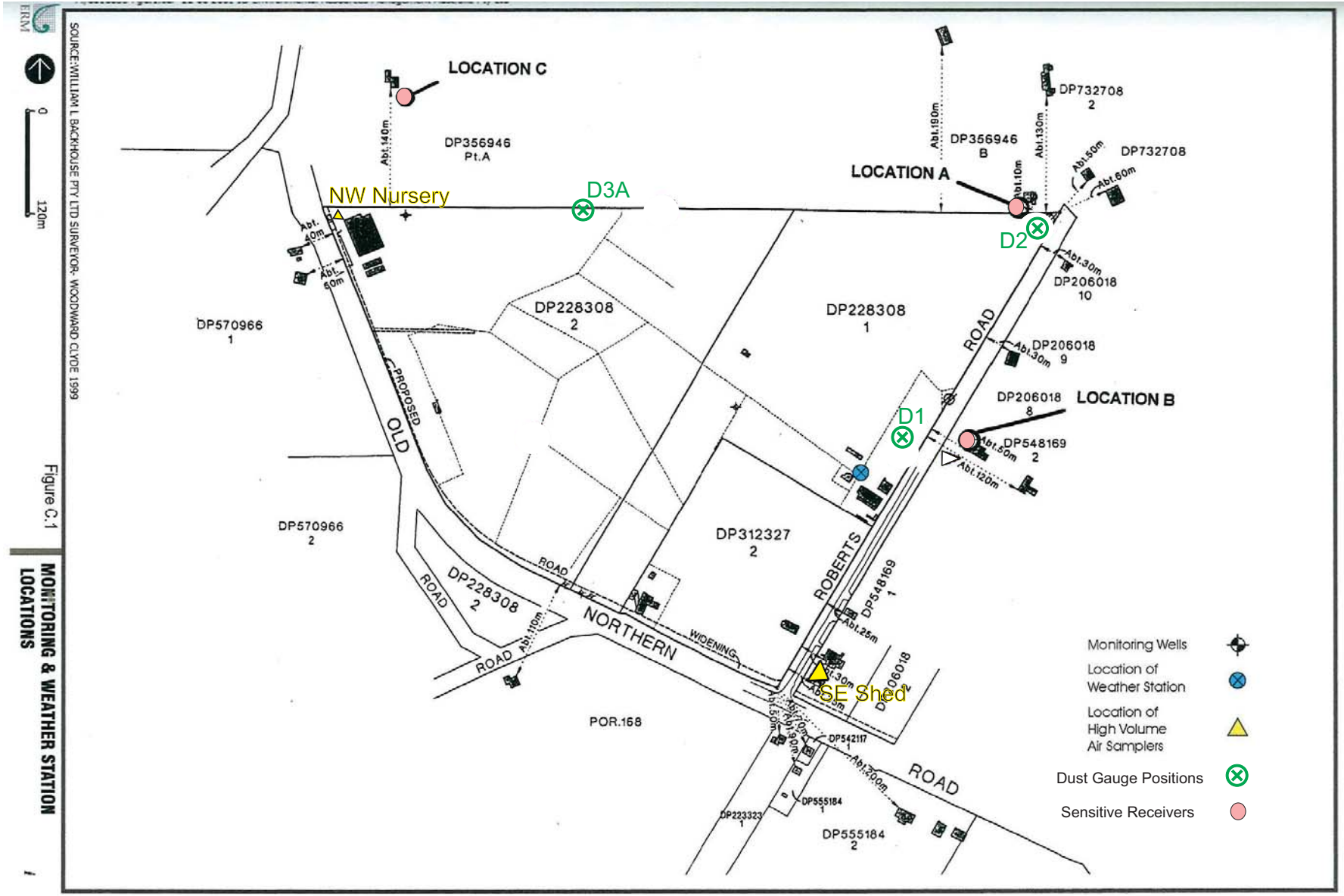


Figure C.1
MONITORING & WEATHER STATION LOCATIONS

2.5. Potential Dust Sources

The dust generating activities on the site will not differ from past practices, and will include:

- Dozers ripping sandstone
- Loading and unloading of raw material using dump trucks
- Loading the hopper
- Screening
- Loading processed material into trucks
- Traffic on unsealed haul road
- Wind erosion from extraction and processing areas.

The Air Quality Impact Assessment (Wilkinson Murray Pty Ltd, June 2015) used software modelling to predict the impact assessment on sensitive receptors surrounding the operation. The relevant tables are reproduced below:

Table 8-2 24 hour average PM₁₀ - total impact

Receptor	Ground Level Concentration ($\mu\text{g}/\text{m}^3$)			Criteria ($\mu\text{g}/\text{m}^3$)	Complies?
	North West	North East	South East		
R1	17	41	18	50	Yes
R2	28	49	27	50	Yes
R3	31	28	33	50	Yes
R4	15	17	27	50	Yes
R5	24	20	14	50	Yes
R6	20	16	15	50	Yes

Table 8-4 Annual average PM₁₀– total impact

Receptor	Ground Level Concentration ($\mu\text{g}/\text{m}^3$)			Criteria ($\mu\text{g}/\text{m}^3$)	Complies?
	North West	North East	South East		
R1	11	14	11	30	Yes
R2	11	15	12	30	Yes
R3	12	14	12	30	Yes
R4	11	11	14	30	Yes
R5	11	10	10	30	Yes
R6	11	10	10	30	Yes

The impact assessment predicts that the operation will comply with recommended guidelines and development conditions at the nearest sensitive receptors:

“Dispersion modelling results for the three worst case future extraction scenarios indicated that the continued operation of the site is unlikely to impact on sensitive receptors providing that the application of dust mitigation measures identified in the existing air quality management plan continues.”

(Wilkinson Murray Pty Ltd, June 2015)

Section 3. Air Quality Monitoring Plan

Table 8. Monitoring Criteria

Parameter	Method	Sampling Period / Interval	Location (see Figure Two)	Performance Criteria
Insoluble Solids g/m ² /month	AS3580.10.1	30 ± 2 days / continuous	D1A D2 D3A	≤ 4 annual average
TSP µg/m ³	AS3580.9.3	24 hrs every 6 days for 12 months	D1A	≤ 90 annual average
PM10 µg/m ³	AS3580.9.6	24 hrs every 6 days for 12 months	D1A	≤ 50 over 24 hrs, ≤ 30 annual average
PM2.5 µg/m ³	AS3580.9.14	24 hrs every 6 days for 12 months	D1A	None required

3.1. Monitoring Locations

The Air Quality Impact Assessment (Wilkinson Murray Pty Ltd, June 2015) investigated the local meteorology and seasonal impacts and identified 6 sensitive receptors. The report also predicted that dust impacts on these receptors would be minimal. The monitoring of dust deposition gauges will continue at three sites (north, east and south) on the perimeter of the operation, as shown on Figure B2. Due to security and power availability, High Volume Air Samplers will be located adjacent to D1A near the office area and the weather monitoring equipment.

This site has been approved by the NSW EPA, as advised by email on 30/3/2016 (Appendix A). The email also states that the EPA do not approve Air Quality Monitoring Plans, although they do require a site to have one.

The sites also comply with AS3580.1.1 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment. The ongoing compliance of the locations and general condition of the gauges will be checked on a monthly basis and any non-compliances reported on the Sampling Report.

3.2. Monitoring Intervals

3.2.1. Dust Deposition Gauges

The dust deposition gauges will be sampled every 30 days ± 2 days as recommended in AS3580.10.1. The gauges contain 2.5L bottles, which are large enough to collect the highest average monthly rainfall of 123mm (equivalent to 2.1L). Continuous monitoring will provide a total amount of dust present on the perimeter of the development in all seasons and weather conditions. Past trends indicate that even in the dry July months, the dust levels have been, and are predicted to remain, below air quality goals.

3.2.2. High Volume Air Samplers

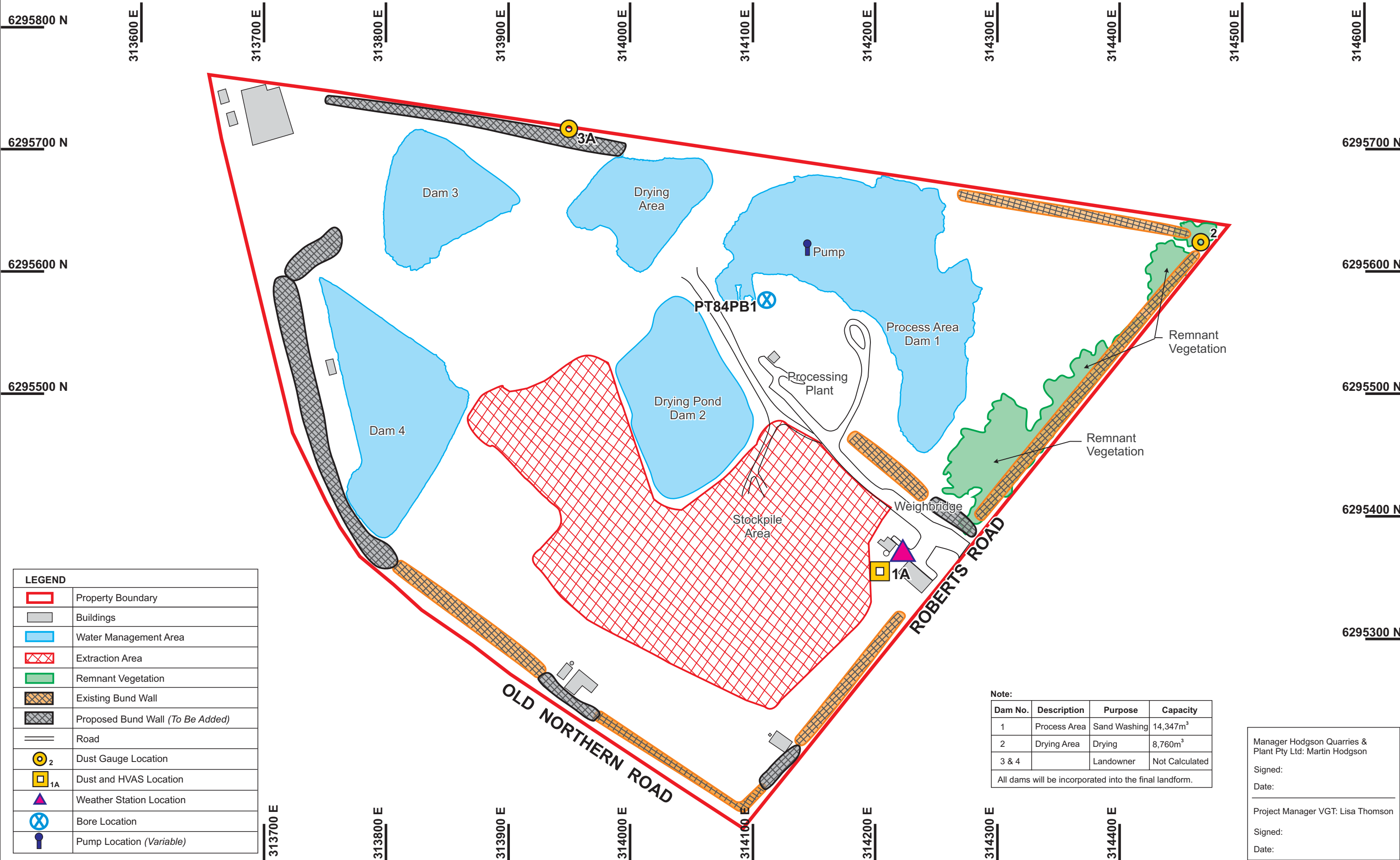
The particulates (TSP, PM10 and PM2.5) will be monitored weekly for twelve continuous months to allow for seasonal variations and a variety of weather conditions. They will collect ambient air for 24 hours on a 6-day cycle as recommended in AS3580.9.3, AS3580.9.6 and AS3580.9.14.

Following the initial twelve month period, a correlation will be developed for the site between the varying size fractions using a high volume air sampler method and the overall dust collected in the dust deposition gauges. This correlation will be presented to the DPE in the Annual Review with the aim of ensuring compliance using dust deposition gauges alone.

Figure B2: Air Quality Monitoring Locations

Plan of:	Roberts Rd Maroota Sand Quarry Environmental Management Plan - Environmental Monitoring Locations	Location:	Maroota Quarry, Roberts Road, Maroota, NSW	Source:	Integral Surveying - Google Earth Pro-Image Date 12 April 2017	Our Ref:	5072_HMA_EMP17_C005_V0_SubA_F2.cdr
Figure:	TWO - Sub Plan A	Council:	Hills Shire Council	Survey:	Integral Surveying	Plan By:	LT/JD
Sheet:	1 of 1	Tenures:	N/A	Projection:	MGA	Project Manager:	LT
Version/Date:	V0 07/12/2017	Client:	Hodgson Quarries & Plant Pty Ltd	Contour Interval:	1m	Office:	Thornton

This figure may be based on third party data which has not been verified by vgt and may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and vgt does not warrant its accuracy.



LEGEND	
	Property Boundary
	Buildings
	Water Management Area
	Extraction Area
	Remnant Vegetation
	Existing Bund Wall
	Proposed Bund Wall (To Be Added)
	Road
	Dust Gauge Location
	Dust and HVAS Location
	Weather Station Location
	Bore Location
	Pump Location (Variable)

Note:

Dam No.	Description	Purpose	Capacity
1	Process Area	Sand Washing	14,347m ³
2	Drying Area	Drying	8,760m ³
3 & 4		Landowner	Not Calculated

All dams will be incorporated into the final landform.

Manager Hodgson Quarries & Plant Pty Ltd: Martin Hodgson
 Signed: _____
 Date: _____

Project Manager VGT: Lisa Thomson
 Signed: _____
 Date: _____

Section 4. Dust Suppression Measures

The following dust suppression measures have been described in previous Air Quality Monitoring Plans and recommended in the EA and EIS (Nexus Environmental Planning Pty Ltd, September 2015) (Nexus Environmental Planning Pty Ltd, May 2015) (Nexus Environmental Planning Pty Ltd, November 1999). Past monitoring indicates that the measures have been effective and the Air Quality Impact Assessment recommends their continuation.

4.1. Reactive Dust Management

- Visually assess activities during adverse weather conditions and modify activities as required to minimise dust, including:
 - Increase use of the water cart in dry weather
 - Delaying non-essential earth-moving activities during periods of high wind
 - Reducing truck speeds

4.2. Extraction and Processing

- No more than 3 hectares is to be exposed and active at any one time (condition 29 (c)).
- Damping Down
 - Hardstand and manoeuvring areas are to be kept in a sufficient state of dampness so as to minimise dust raised into the air by the passing of vehicles.
 - Water is applied by water cart. Frequency of water application shall be as often as required so as to prevent dust rising into the air under the prevailing conditions.
 - Potential dust generating material is to be processed and stored in a damp condition.

4.3. Transportation

- All vehicles are restricted to a speed limit of 30km/h.
- Trucks are covered when entering and leaving the premises carrying loads of potentially dust generating material.
- All vehicle movements on unsealed areas are to be restricted to internal haul roads and working areas.

4.4. Wind Breaks and Bunds

- Wind breaks of natural vegetation around the boundary of the site are to be established and maintained in accordance with the *Rehabilitation Plan*.
- Bund walls are to be constructed at the corner of Roberts Road and Old Northern Road.

4.5. Progressive Rehabilitation

- Progressively rehabilitate the site, where possible, to minimise the area exposed to wind erosion (Refer to *Rehabilitation Plan* for planting and watering details).

Section 5. Trigger Action Response Plan

Event	Potential Adverse Outcome	Trigger Level	Actions to be Implemented	Evidence/Reference	Responsibility
24 hour Air Quality Goal exceeded	Dust impacts on surrounding communities	PM10 >50µg/m ³	1 st month of exceedance: investigate circumstances, ensure dust mitigation measures have been followed, increase use of water cart 2 nd consecutive month of exceedance: if source is stockpiles, install sprinkler system; if source is traffic add polymer to water cart, if source is disturbed area, implement planting program	(NSW Department of Planning and Environment, March 2016)	Plant Manager
Annual average Air Quality Goals exceeded	Dust impacts on surrounding communities	Insoluble Solids >4g/m ² /month TSP >90µg/m ³ PM10 >30µg/m ³	1 st month of exceedance: investigate circumstances, ensure dust mitigation measures have been followed, increase use of water cart 2 nd consecutive month of exceedance: if source is stockpiles, install sprinkler system; if source is traffic add polymer to water cart, if source is disturbed area, implement planting program	(NSW Department of Planning and Environment, March 2016)	Plant Manager
Mud tracked onto road	Dust impacts on surrounding communities	Visible mud on Roberts Rd	Trucks off site to cease until sealed area of haul road cleaned off. If water cart in use – cease, if rain is cause, cease all unnecessary traffic until weather has eased	(NSW EPA, 2015)	All drivers
Dust emitting from loaded vehicles	Dust impacts on surrounding communities	Loaded truck not covered	Driver to be stopped and load covered	(NSW Department of Planning and Environment, March 2016) (NSW EPA, 2015)	All staff
Visible dust emitting from disturbed areas	Dust impacts on surrounding communities	Visible dust travelling off site	Ensure water cart has been used appropriately. Cease all non-essential earth-moving activities, and reduce truck speeds. Review monitoring to ensure no exceedances have occurred.	(NSW Department of Planning and Environment, March 2016) (NSW EPA, 2015)	Plant Manager

Section 6. Reporting and Review

The laboratory will present the client with monthly reports on all dust monitoring sampling and analysis. The plant manager will review the results monthly to determine whether there are any exceedances or trends. Results will be summarised in the Annual Review and Conditions Compliance Report and compared to assessment criteria and performance expectations, as presented in Table 1. Any exceedances will be investigated and actioned as outlined in Section 5. An interpretation of the effectiveness of the management measures described in Section 4, any plans developed to investigate environmental performance improvements, and an assessment of the impacts of the development will be presented annually in the Annual Review and Conditions Compliance Report.

A review of the Air Quality Management Plan will be undertaken as required by Condition 67:

"67. Within 3 months of the submission of:

- (a) an annual review under Condition 66 above;
- (b) an incident report under Condition 68 below;
- (c) an audit report under Condition 70 below; or

(d) any modification to the conditions of this Consent (unless the conditions require otherwise), the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this Consent to the satisfaction of the Secretary.

Where this review leads to revisions in any such document, then within 4 weeks of the review, unless the Secretary agrees otherwise, the revised document must be submitted to the Secretary for approval."

Any incidents, complaints, non-compliances or exceedances will be managed and reported according to the procedures outlined in the OEMP and the Pollution Incident Response Management Plan (PIRMP) required by the EPA.

Section 7. References

- Nexus Environmental Planning Pty Ltd. (May 2015). *Environmental Assessment Section 75W Mod 3.*
- Nexus Environmental Planning Pty Ltd. (November 1999). *Environmental Impact Statement.*
- Nexus Environmental Planning Pty Ltd. (September 2015). *Environmental Assessment Section 75W Mod 2.*
- NSW Department of Planning and Environment. (March 2016). *DA 267-11-99.*
- NSW EPA. (2015). *Environment Protection Licence 6535.*
- Wilkinson Murray Pty Ltd. (June 2015). *Air Quality Impact Assessment.*

Appendix A: Email approval of sites from EPA

Lisa Thomson

From: Alexander Spaller <Alexander.Spaller@epa.nsw.gov.au>
Sent: Wednesday, 30 March 2016 2:00 PM
To: Lisa Thomson
Subject: RE: Ambient air testing for PM 10 and PM 2.5 - HB Maroota sand mine

Hi Lisa

The EPA has reviewed your requested information and provides the following comments. Based on the information provided, the EPA approves those proposed monitoring locations. The EPA has no objections to points 2, 3 and 4. However, in relation to points 5, 6 and 7 the EPA advises that it will not approve an Air Quality Management Plan but we do require you to have one in place.

Regards

Alexander Spaller

Regional Operations Officer - Sydney Industry Section

Metropolitan Branch, NSW Environment Protection Authority

+61 2 9995 5894 +61 452 100 366

Alexander.Spaller@epa.nsw.gov.au www.epa.nsw.gov.au [@EPA_NSW](https://twitter.com/EPA_NSW)

Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555



From: Lisa Thomson [mailto:Lisa@vgt.com.au]
Sent: Friday, 26 February 2016 3:51 PM
To: Alexander Spaller
Subject: RE: Ambient air testing for PM 10 and PM 2.5 - HB Maroota sand mine

Alex,

Thank you for your phone call this morning. As I mentioned, our client has the following condition within their Department of Planning and Environment consent:

36. A meteorological station measuring wind speed and direction must be installed and operated by the Applicant at a site determined in consultation with the EPA.

Further, a DPE audit noted the following as a non-compliance:

Confirm the change in monitoring locations for air quality monitoring with the EPA, and revise DDG location D2 against AS/NZS 3580.10.1:2003 to ensure the equipment collect representative samples.

The non compliance was against the following condition:

28. The Applicant shall prepare and implement an Air Quality Management Plan as part of the EMP. The Air Quality Management Plan shall:

(a) identify existing and potential sources of dust deposition, TSP and fine particulates (PM10 and PM2.5) and specify appropriate monitoring intervals and locations. The purpose of the monitoring is to evaluate, assess and report on these emissions and the ambient impacts with the objective of understanding the development's contribution to levels of dust deposition, TSP and fine particulates in ambient air around the site;

There had been vegetation that had grown greater than 2m tall surrounding the D2 gauge site which has since been removed. In all other aspects, the gauge complies with AS3580.1.1 and AS3580.10.1, it is intended to relocate this gauge to within the weather monitoring compound. The attached figure shows a map of the site, and the location of the existing Dust Deposition gauges (in green). The pink triangle shows the location of the weather monitoring equipment, and is the proposed locations for the monitoring equipment for the TSP, PM10 and PM2.5 particulates.

- 1) Is it possible for the EPA to approve the locations of this monitoring equipment?
- 2) Can we please receive clarification that the siting of the dust monitoring equipment would be according to "AS3580.1.1:2007 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment" rather than the superceded AS2922-1987 as mentioned in the Approved Methods for Sampling and Analysis of Ambient Air Pollutants in NSW (AM1)?
- 3) Is it possible to use "AS 3580.14:2014 Methods for sampling and analysis of ambient air – Metrological monitoring for ambient air quality monitoring applications" rather than USEPA EPA 454/R-99-005 for the determining the compliance of the weather monitoring equipment (AM4)?
- 4) Is it possible to use "AS3580.10.1:2003(R2014) Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method" rather than the superceded AS3580.10.1-1991 (AM-19)
- 5) Is it possible to use "AS3580.9.3:2015 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method" rather than the superceded AS2724.3-1984 (AM-15)?
- 6) Is it possible to use "AS3580.9.9:2006 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM10 low volume sampler - Gravimetric method rather than AS3580.9.6-1990 (now version 2015)?
- 7) Since there is no Approved Method for PM2.5, would it be possible to use this method: "AS3580.9.10:2006 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM 2.5 low volume sampler - Gravimetric method"

In short, our client uses a NATA accredited laboratory to undertake all sampling and testing according to the most up-to-date Australian Standards. Is this practice compliant with NSW EPA requirement for air monitoring?

Regards,
Lisa Thomson,
VGT Pty Ltd

Ph: 02 4028 6412
Mob: 0427 334471
Fax: 02 4028 6413
Web: www.vgt.com.au

[Have your say! Click here and fill in a short survey so we can improve for you!](#)



Please consider the environment before printing my email

From: Alexander Spaller [<mailto:Alexander.Spaller@epa.nsw.gov.au>]
Sent: Friday, 26 February 2016 10:30 AM
To: Lisa Thomson <Lisa@vgt.com.au>
Subject: Ambient air testing for PM 10 and PM 2.5 - HB Maroota sand mine

Greetings Lisa

As discussed

Which method have you used for the siting of the sampling units? Please provide the sampling units as well as any other supporting documentation.

Regards

Alexander Spaller

Regional Operations Officer - Sydney Industry Section

Metropolitan Branch, NSW Environment Protection Authority

+61 2 9995 5894 +61 452 100 366

Alexander.Spaller@epa.nsw.gov.au www.epa.nsw.gov.au [@EPA_NSW](https://twitter.com/EPA_NSW)

Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555



----- Original Message -----

From: Lisa Thomson [lisa@vgt.com.au]

Sent: 22/02/2016 15:27

To: info@environment.nsw.gov.au

Subject: Approval of methodology and siting for ambient air monitoring

Dear Cathy Graham,

Thankyou for your time on the phone today. As discussed, I am enquiring on behalf of HB Maroota Pty Ltd (EPL 6535). HB Maroota have been asked by the Department of Planning and Environment to undertake ambient air monitoring for TSP, PM10 and PM2.5 particulates, as well as Insoluble Solids. They have been given the goals of achieving TSP < 90 ug/m3 (annual average), Insoluble Solids < 4 g/m2.month (annual average), PM10 < 50 ug/m3 in 24 hrs and <30 ug/m3 annual average.

Does the NSW EPA consider the Australian Standard "AS3580.9.9 Determination of suspended particulate matter – PM10 low volume sampler – gravimetric method" suitable for undertaking PM10 and PM2.5 testing?

Further, HB Maroota have been asked for NSW EPA approval for the siting of their monitoring points. Do you have a contact to whom we could send in some air photography with location points marked?

Regards,

Lisa Thomson

Principal Environmental Consultant

02 4028 6412

0427 334471

Plan of:	HB Maroota Quarry Conditions Compliance Report - Meteorological Station and Static Dust Gauge Locations	Location:	Maroota Quarry, Roberts Road, Maroota, NSW	Source:	Photomapping - Image Date December 2013	Our Ref:	2469_HMA M_CCR_C004_V0_F4.cdr
Figure:	FOUR	Council:	Hills Shire Council	Survey:	Photomapping - Image Date December	Plan By:	TO/JD
Sheet:	1 of 1	Tenures:	N/A	Projection:	MGA	Project Manager:	GVT
Version/Date:	V0 27/01/2016	Client:	Hodgson Quarry Products Pty Ltd	Contour Interval:	1m	Office:	Thornton

This figure may be based on third party data which has not been verified by vgt and may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and vgt does not warrant its accuracy.



LEGEND	
	Property Boundary
	30metre Buffer
	Contours
	Weather Station Location
	Dust Gauge Location

Director: Greg Thomson
Signed:
Date: 29/01/2016

Project Manager: Tara O'Brien
Signed:
Date: 29/01/2016

Appendix B: Consultation with DPE

From: genevieve.seed@planning.nsw.gov.au
To: [Lisa Thomson](#)
Cc: Jessie.Evans@planning.nsw.gov.au
Subject: RE: Roberts Road Sand Quarry - Management Plan Review
Date: Friday, 14 October 2016 2:44:04 PM
Attachments: [image001.jpg](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)
[image005.jpg](#)
[Response to review comments_14 Oct.pdf](#)
[Attachment A_14 Oct.docx](#)
[Attachment B.docx](#)

Hi Lisa

Please find the attached response to your review comments. I have also attached comments in relation to the Groundwater Monitoring Program.

Have a nice weekend.

Kind regards,

Gen

From: Lisa Thomson [mailto:Lisa@vgt.com.au]
Sent: Wednesday, 12 October 2016 1:54 PM
To: Gen Seed <genevieve.seed@planning.nsw.gov.au>
Cc: Jessie Evans <Jessie.Evans@planning.nsw.gov.au>
Subject: RE: Roberts Road Sand Quarry - Management Plan Review

Hi Genevieve and Jessie,
I have attached our comments on your responses. I hope this clarifies some of your issues.

Regards,
Lisa Thomson,
VGT Pty Ltd

Ph: 02 4028 6412
Mob: 0427 334471
Fax: 02 4028 6413
Web: www.vgt.com.au

[Have your say! Click here and fill in a short survey so we can improve for you!](#)



Please consider the environment before printing my email

From: genevieve.seed@planning.nsw.gov.au [mailto:genevieve.seed@planning.nsw.gov.au]
Sent: Friday, 7 October 2016 12:45 PM
To: Lisa Thomson <Lisa@vgt.com.au>
Cc: Jessie.Evans@planning.nsw.gov.au
Subject: RE: Roberts Road Sand Quarry - Management Plan Review

Hi Lisa

I have attached the document in word format.

Hope this helps.

Kind regards,

Gen

From: Lisa Thomson [<mailto:Lisa@vgt.com.au>]
Sent: Friday, 7 October 2016 10:07 AM
To: Gen Seed <genevieve.seed@planning.nsw.gov.au>
Cc: Jessie Evans <Jessie.Evans@planning.nsw.gov.au>
Subject: RE: Roberts Road Sand Quarry - Management Plan Review

Thanks Ladies,

Would it be possible to have attachment A in a spreadsheet format?

Regards,
Lisa Thomson,
VGT Pty Ltd

Ph: 02 4028 6412

Mob: 0427 334471

Fax: 02 4028 6413

Web: www.vgt.com.au

[Have your say! Click here and fill in a short survey so we can improve for you!](#)



Please consider the environment before printing my email

From: genevieve.seed@planning.nsw.gov.au [<mailto:genevieve.seed@planning.nsw.gov.au>]
Sent: Friday, 7 October 2016 9:49 AM
To: Lisa Thomson <Lisa@vgt.com.au>
Cc: Jessie.Evans@planning.nsw.gov.au
Subject: Roberts Road Sand Quarry - Management Plan Review

Good Morning Lisa

Please find the attached review comments for the Roberts Road Quarry Management Plans.

Kind regards,

Gen

Genevieve Seed
Planning Officer
Resource Assessments

Attachment A
 Roberts Road Sand Quarry Management Plan Review
 Air Quality Management Plan Comments Only

Green Text: VGT comments

Red text: Department comments

Air Quality Management Plan – condition 29, Schedule 2	Satisfactory (Yes/No)	Comment	Action Required
<i>The Applicant shall prepare an Air Quality Management Plan as part of the EMP. The Air Quality Management Plan shall:</i>			
(a) identify existing and potential sources of dust deposition, TSP and fine particulates (PM10 and PM2.5) and specify appropriate monitoring intervals and locations. The purpose of this monitoring is to evaluate, assess and report on these emissions and the ambient impacts with the objective of understanding the development's contribution to levels of dust deposition, TSP and fine particulates in ambient air around the site;	No	The frequency of monitoring for TSP, PM10 and PM2.5 has been specified as 24 hours every 6 days for 12 months. This frequency is acceptable however, the MP does not specify the schedule of monitoring following this 12 month period. <i>Response: Section 3.2.2: A correlation will be developed for the site between the varying size fractions using a high volume air sampler method and the overall dust collected in the dust deposition gauges. This correlation will be presented to the DPE in the 2016 Annual Review with the aim of ensuring compliance using dust deposition gauges alone. It is the intention that the form of the ongoing monitoring will be decided following consultation with DPE.</i>	The MP should specify ongoing monitoring arrangements for TSP, PM10 and PM 2.5 Response: Please include this information in the management plan.
(b) provide a monitoring plan having regard to local meteorology and the relevant Australian Standards, identifying the methodologies to be used, including justification for monitoring intervals, weather conditions, seasonal variation, selecting locations, periods and times of measurements;	Yes	Monitoring locations approved by EPA. Refer to comment above re: monitoring intervals	n/a
(c) provide details of dust suppression measures for all sources of dust from the development, including a planting and watering regime to ensure that no more than 3 hectares of the site are exposed and active at any one time. The use of a polymer in the water to minimise dust impacts shall be investigated as part of this Plan;	Yes	-	n/a
(d) provide details of actions to ameliorate impacts if they exceed the relevant criteria; and	Yes	Section 5	n/a
(e) provide the design of the reactive management system intended to reduce the day-to-day impacts of dust and fine particulates due to the development.	Yes	Section 4.1	n/a



Lisa Thomson
Principal Environmental Consultant
Vgt Environmental Compliance Solutions
PO Box 2335
GREENHILLS NSW 2323

Dear Ms Thomson

**Roberts Road Sand Quarry (DA 267-11-99)
Management Plans**

I refer to your email dated 25 November 2016 submitting revised management plans for the Roberts Road Sand Quarry including the:

- Noise Management Plan, dated November 2016 (condition 46, Schedule 2);
- Air Quality Management Plan, dated November 2016 (condition 29, Schedule 2);
- Construction Environmental Management Plan, dated July 2016 (condition 18, Schedule 2);
- Road Noise Management Plan, dated November 2016 (condition 48, Schedule 2);
- Flora and Fauna Management Plan, dated November 2016 (condition 55, Schedule 2);
and
- Environmental Management Strategy, dated July 2016 (condition 63, Schedule 2).

The Department has reviewed these plans and considers that they meet the conditions of consent. As such, the Secretary has approved these plans.

The Department notes that you have also submitted the Operations Environmental Management Plan (condition 19, Schedule 5). This plan is required to include the Water Management Plan (WMP) and Rehabilitation Management Plan (RMP), which have not yet been approved by the Secretary. Consequently, the Department will await the approval of the WMP and RMP before approving this plan.

If you have any enquiries about this matter, please contact Genevieve Seed.

Yours sincerely

Howard Reed
Director

9.12.16

Resource Assessments
As nominee of the Secretary