Dixon Sand (Penrith) Pty Ltd

December 2016

Independent Environmental Audit

Haerses Road Quarry Project

Trevor
APPLIED ENVIRONMENTAL MANAGEMENT CONSULTANTS

REPORT: DS/HAERSES ROAD QUARRY/NOV 2016/REV1

Independent Environmental Audit

'Haerses Road' Quarry

November 2016

trevor brown & associates
applied environmental management consultants

Report ID: Dixon Sand/HRQ/Nov2016/Rev1

Independent Audit Certification Form

Development Name	Haerses Road Quarry
Development Consent No.	Development Consent 165-07-2005
Description of Development	Sand Quarry
Development Address	Haerses Road, Maroota 2756
Operator	Dixon Sand (Penrith) Pty Ltd
Operator Address	P O Box 4019 Pitt Town NSW 2756

Independent Audit

Title of Audit: Independent Environmental Audit - Haerses Road Quarry

I certify that I have undertaken the independent audit and prepared the contents of the attached independent audit report and to the best of my knowledge:

- *The audit has been undertaken in accordance with relevant approval condition(s) and in accordance with the auditing standard AS/NZS ISO 19011:2014 and Post Approval Guidelines – Independent Audits*
- *The findings of the audit are reported truthfully, accurately and completely;*
- *I have exercised due diligence and professional judgement in conducting the audit;*
- *I have acted professionally, in an unbiased manner and did not allow undue influence to limit or over-ride objectivity in conducting the audit;*
- *I am not related to any owner or operator of the development as an employer, business partner, employee, sharing a common employer, having a contractual arrangement outside the audit, spouse, partner, sibling, parent, or child;*
- *I do not have any pecuniary interest in the audited development, including where there is a reasonable likelihood or expectation of financial gain or loss to me or to a person to whom I am closely related (i.e. immediate family);*
- *Neither I nor my employer have provided consultancy services for the audited development that were subject to this audit except as otherwise declared to the lead regulator prior to the audit; and*
- *I have not accepted, nor intend to accept any inducement, commission, gift or any other benefit (apart from fair payment) from any owner or operator of the development, their employees or any interested party. I have not knowingly allowed, nor intend to allow my colleagues to do so. Note. a) The Independent Audit is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000. b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*

Signature

Name of Lead/Principal Auditor	Trevor Brown
Address	136 Sanctuary Point Road Sanctuary Point NSW 2540
Email Address	tebrown@bigpond.com
Auditor	MRACI Chartered Chemist 2428, approved by the Secretary of Department of Planning and Environment 8 November 2016
Date:	17 December 2016

DISTRIBUTION

Copies	Recipient	Copies	Recipient
1 pdf copy	Dixon Sand (Penrith Pty Ltd		

This document was prepared for the sole use of Dixon Sand (Penrith) Pty Ltd and the regulatory agencies that are directly involved in this project, as the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of trevor brown & associates.

by

trevor brown & associates

ABN: 65 850 181 279

136 Sanctuary Point Road, Sanctuary Point NSW 2540

17 December 2016

Trevor Brown

Principal Environmental Management Consultant/Auditor

Table of Contents

Glossary / Abbreviations

Annual Return	Annual Return required under EPL 3916 condition R1
Annual Review	Review required under Development Consent 250-09-01 Schedule 2 condition 7.2
BCA	Building Code of Australia
CCC	Community Consultative Committee
Council	The Hills Shire Council (previously Baulkham Hills Council)
Department	Department of Planning and Environment
DRE	Division of Resources and Energy, within the NSW Department of Primary Industry
DPI-Water	Department of Primary Industries - Water
EIS	*Environmental Impact Statement - Dixon Sand (Penrith) Pty Limited Haerses Road Sand Quarry*, Jun 2005
EMP	Environmental Monitoring Program, July 2006
EMS	Environmental Management Strategy, March 2007
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence 3916 issued under the POEO Act
ERMA	Environmental Resources Management Australia Pty Ltd
INP	*NSW Industrial Noise Policy* (NSW EPA, 2000)
Minister	Minister for Planning, or delegate
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
RMS	Roads and Maritime Services
Secretary	Secretary of the Department of Planning and Environment, or nominee
Site	Includes Lot 170 DP664767, Lots A and B DP407341 and Lots 176 and 177 DP 752039

Executive Summary

This Independent Environmental Audit of the Dixon Sand (Penrith) Pty Ltd Haerses Road Quarry Project was conducted by Trevor Brown & Associates in November 2016 to satisfy the requirement of Consolidated Development Consent DA 165-07-2005 Schedule 5 condition 6. This Independent Environmental Audit also assessed the status of the Dixon Sand response to the Department of Planning and Environment Compliance Audit reported in December 2015.

The Hearses Road Quarry is considered to be operating generally in compliance with the conditions of the Development Consent 165-07-2005.

The current Independent Environmental Audit of the Haerses Road Quarry operations identified six (6) Administrative Non-compliances (i.e. technical non-conformance with a condition of the consent that would not result in any risk or material harm to the environment), one (1) low risk non-compliances (i.e. Non-compliance with the potential for moderate environmental consequences, but is unlikely to occur, or, potential for low environmental consequence but is likely to occur), with Development Consent 165-07-2005 conditions at the date of this Independent Environmental Audit.

A summary of the findings of the Independent Environmental Audit are provided below and conclusions and any recommendations are provided in Section 6 of this Independent Environmental Audit Report.

Environmental Management Strategy **Status: Compliant**

The Environmental Management Strategy and supplementary Management Plan was prepared and submitted to the DoP on 27 July 2006 and approved on 19 April 2007. The Environmental Management Strategy provides an adequate environmental management system for the operation of the Haerses Road Quarry.

Environmental Monitoring Program **Status: Administrative Non-Compliance**

The Environmental Monitoring Program prepared to satisfy Development Consent 165-07-2005 Schedule 5 condition 3 was approved by Department of Planning on the 31 August 2006. The approved Environmental Monitoring Program addressed noise, air and groundwater monitoring but does not include waste and rehabilitation monitoring.

Noise **Status: Compliant Ongoing**

The Noise Management Plan (Environmental Management Strategy – Annex C) outlines the noise management procedures and the noise monitoring program to be applied at the Haerses Road Quarry. Noise monitoring is also outlined in the Environmental Monitoring Program. Noise monitoring at the Haerses Road Quarry site has been conducted to assess compliance with the noise assessment criteria for sensitive receivers around the Haerses Road Quarry. Noise monitoring reported between 2013 and 2016 demonstrated compliance with the noise assessment criteria in the Development Consent 165-07-2005 and EPL 12513.

Air Quality **Status Compliant Ongoing**

The Environmental Management Strategy Annex C - Air Quality Management Plan outlines the air quality management procedures to be applied and the air quality monitoring program for the Haerses Road Quarry. The Environmental Impact Statement (ERM, 2005) predicted dust deposition during quarrying Stages 1 to 5 to be between 2.2 and 3.0 g/m²/month for all receptors. Annualised dust deposition levels for the Haerses Road sites have been consistently less than 3 g/m²/month. The 24 hour average PM_{10} was complied with during the 1 July 2012 to 30 June 2013 period. A number of 24 hour average exceedances recorded during 1 July 2013 to 30 June 2014 were attributed by bushfire events occurring in the Sydney and Blue Mountains region, and one 24 hour average exceedance in 2014-2015 was due to a dust storm that swept across the north-western Sydney region. None of the recorded 24-hour average exceedances of PM_{10} were quarry related. No dust related complaints were received by Dixon Sand between July 2013 and November 2016.

Surface Water **Status Compliant Ongoing**

Surface water management at the Haerses Road Quarry site has been designed to ensure that surface runoff from disturbed areas of the quarry is directed to settlement basins or retained in the quarry pits to prevent the

loss of sediment to the surrounding environment. The management and mitigation measures implemented at the Haerses Road Quarry site control the flow of surface runoff and regular inspections and maintenance of sediment controls protect the surrounding environment from impact of water with high suspended solids.

Groundwater **Status: Compliant Ongoing**

The Groundwater Monitoring Program (prepared as section 4.2 of the Site Water Management Plan) was submitted to DoP for approval in July 2006 and approved on 19 April 2007. Groundwater monitoring is also included in the Environmental Monitoring Program July 2006. Groundwater levels measured monthly in all Haerses Road Quarry bores have been relatively stable with minor fluctuations attributable to the rainfall events over the period 2013 to 2016. Groundwater quality within Haerses Road Quarry boreholes are monitored annually and groundwater quality results indicate some fluctuations in pH and EC, particularly in the old boreholes that have exhibited similar observations since the commencement of the monitoring program in 2005.

Rehabilitation and Biodiversity

The Biodiversity Management Plan for the Hearses Road Biodiversity Offset Area was prepared to satisfy the requirements of the Old Northern Road Quarry Development Consent 250-09-01 Schedule 2 condition 3.49B and approved by the DP&E on 4 April 2016. The management and monitoring of the Hearses Road Biodiversity Offset Area has eliminated Crofton weed (*Ageratina adenophora*) from Haerses Road Offset Area and ongoing surveys and treatment will occur as required. Growth and regeneration of native flora species in the Haerses Road Offset A is proceeding strongly with species abundance and diversity improving especially in the middle and ground structural layers. There are many flora species present, such as *Drosera pygmaea* and *Darwinia biflora* (vulnerable), that are only present in this Haerses Road Offset A due to restoration activities that include soil and leaf litter translocation and Brush matting. All the plantings in the Haerses Road Offset A are exhibiting a high survival rate.

Traffic and Transport **Status Compliant Ongoing**

Upgrade works on Hearses Road were undertaken and approved by Baulkham Hills Council on 13 March 2008. Construction of a Type AUR intersection at Haerses Rd and Wisemans Ferry Road was completed and a Final Certificate issued by RMS on 4 September 2014. Truck movements and tonnage of product transported is reported monthly to The Hills Shire Council for Section 94 Contributions. The records of all truck movements in and out of the Hearses Road Quarry site each year are kept on the weighbridge dockets (retained at the Old Northern Road Quarry weighbridge) and summarised in the Annual Reviews.

Waste **Status Compliant Ongoing**

Operation of the Haerses Road Quarry incorporates waste reduction strategies in accordance with the NSW Waste Management Hierarchy (i.e. avoid, re-use, recycle/reprocess, dispose). Waste management for the Haerses Road Quarry is integrated with practices applied at the Old Northern Road Quarry site. Tailings generated from the processing of the Haerses Road Quarry product is disposed of to the tailings disposal area on Lots 29 and 196 of the Old Northern Road Quarry site.

Bushfire Management **Status Compliant**

The Bushfire Management Plan developed in consultation with The Hills Shire Council and relevant emergency services (RFS and SES) for the Harerses Road Quarry and Old Northern Road Quarry, provides a clear and detailed strategy for the management of any outbreak of fire on the quarry site. The implementation of the procedures in the Bushfire Management Plan appear to be satisfactory for the response to fuel loads management and fire response at the Dixon Sand quarries at Maroota.

1. Introduction

1.1 Background

Dixon Sand (Penrith) Pty Ltd (Dixon Sand) operates the sand quarry on Haerses Road (Lot 170 DP 664767, Lots A and B DP 407341, and Lots 176 and 177 DP 752039) Maroota, approximately 40 kilometres north of Parramatta.

An Independent Environmental Audit of the Dixon Sand Pty Ltd Haerses Road Quarry Project was conducted by Trevor Brown & Associates in November 2016 to satisfy the requirement of Development Consent 165-07-2005 Schedule 5 condition 6:

> ***Independent Environmental Audit***
> *Within 3 years of this consent and every 3 years thereafter, unless the Director-General directs otherwise, the applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:*
> *(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;*
> *(b) be consistent with ISO 19011:2002 – Guidelines for Quality and/or Environmental Systems Auditing, or equivalent updated versions of these guidelines;*
> *(c) assess the environmental performance of the development and its effects on the surrounding environment;*
> *(d) assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;*
> *(e) review the adequacy of the Applicants Environmental Management Strategy and Environmental Monitoring Program; and*
> *(f) (if necessary), recommend measures or actions to improve the environmental performance of the development and/or the environmental management and monitoring systems.*

The Independent Environmental Audit site inspection and documentation assessment for compliance with Development Consent 165-07-2005 and other environmental approvals for the Haerses Road Quarry, was carried out between 17 and 19 November 2016, by Trevor Brown (the Independent Environmental Auditor) endorsed by the Secretary of the Department of Planning and Environment on 8 November 2016.

1.2 Scope of Work

The Independent Environmental Audit was conducted generally in accordance with the Australian/New Zealand Standards ISO 19011:2002 – *Guidelines for Quality and/or Environmental Systems Auditing* and the *Independent Audit Guideline (DP&E October 2015)*. The scope of work for the independent environmental audit of the Haerses Road Quarry operations to assess compliance status for each condition at the date of this audit (i.e. November 2016) included:

- review of compliance with Development Consent 165-07-2005 conditions and other environmental approvals for the Haerses Road Quarry project;
- site inspection and review on-site documentation and monitoring data for the project, relevant to the Independent Environmental Audit;
- discussion of the development consent and other approval conditions and operation of the project with Haerses Road Quarry personnel;
- assessment of environmental performance of the development with the requirements in the Development Consent 165-07-2005 and Environment Protection Licence 12513 conditions (including assessments, plans or programs required under the consent/approvals);
- review of the adequacy of strategies, plans or programs prepared under Development Consent 165-07-2005 and Environment Protection Licence 12513;

- provision of recommendations if considered necessary for implementation of measures or actions to improve environmental performance of the development, and/or any assessment, plan or program required under the project approvals; and
- preparation of the Independent Environmental Audit Report providing assessment of compliance against each approval condition and provision of recommendations or actions where considered appropriate to improve the environmental performance of the development, and/or the environmental management and monitoring systems

1.3 Structure of the Report

The report has been prepared to provide comment on each condition of approval in a tabulated form, with additional discussion where required on specific matters, provided in the main text of the Independent Environmental Audit Report. The tabulated comments on the conditions of approval are in the Attachments A and B of this Independent Environmental Audit Report. The structure of the Independent Environmental Audit Report sections is:

Glossary and Abbreviations
Executive Summary

Section 1	Introduction
Section 2	Haerses Road Quarry Project
Section 3	Approvals and Licenses
Section 4	Department of Planning and Environment
Section 5	Review of Environmental Management
Section 6	Conclusions
Attachment A	Development Consent 165-07-2005
Attachment B	Environment Protection Licence No. 12513

1.3 Compliance Tables

This audit assessed the activities for compliance with the intent of the Development Consent 165-07-2005 and Environment Protection Licence No. 12513 conditions via site inspections, document review and verification of relevant documentation related to the conditions of approval. The compliance status for each condition at the date of this audit (i.e. November 2016), is expressed in Attachments A and B to this report as:

Status	Description
Compliant	Where verifiable evidence has been collected to demonstrate that the intent of the elements of the requirements of the regulatory approval and appropriateness of implementation against the Development Consent 165-07-2005 condition has occurred.
Compliant COMPLETE	Where verifiable evidence demonstrates that the intent of the elements of the requirements of the regulatory approval and appropriateness of implementation against the Development Consent Condition has occurred, and the required activity has been completed for the project.
Compliant Ongoing	The intent and specific requirements of the condition have been met and the requirements are ongoing for the operation of project.
Administrative Non-compliance	A technical non-conformance with a condition of the consent that would not result in any risk or material harm to the environment (e.g. the submission of a report to government later than required under the approval conditions).
Non-Compliance – Low Risk	Non-compliance with the potential for moderate environmental consequences, but is unlikely to occur, or, potential for low environmental consequence but is likely to occur.
Non-Compliance – Moderate Risk	Non-compliance with the potential for serious environmental consequences but unlikely to occur, or, potential for moderate environmental consequence but likely to occur.

Status	Description
Non-Compliant – High Risk	Non-compliance with the potential for significant environmental consequences, regardless of the likelihood of occurrence.
Not active / Not triggered	A regulatory approval requirement / condition has an activation or timing that had not been triggered at the time of the audit, therefore a determination of compliance could not be made.
Noted	A statement or fact where no assessment of compliance is required.

Any Non-compliance (if identified) will be subject to a risk assessment in accordance with the *Independent Audits Guideline* (DP&E October 2015) section 4.2 and reported in section 6 of this Independent Environmental Audit Report.

1.5 Limitations of the Audit

The auditor received complete cooperation from Dixon Sand personnel during the Independent Environmental Audit. Any documentation that could not be located during the site visit / inspection and document review, was provided to the auditor subsequent to the site inspection.

The findings of the Independent Environmental Audit are based upon visual observations on the site, interviews with site personnel and interpretation of records provided by Dixon Sand. Opinions presented within the audit apply to the site as observed at the time of the site inspection (17-19 November 2016) and from information provided by Dixon Sand personnel. Any changes to this information of which the Trevor Brown & Associates is not aware and has not had the opportunity to evaluate, cannot therefore be considered in this report. The auditor has taken due care to consider all reasonably available information provided during the audit and has taken this information to represent a fair and reasonable characterisation of the environmental status of the site.

The adequacy of strategy/ plans / programs required under the Development Consent were assessed by reference to the requirements of the consent conditions, where documentation from any relevant agency(s) to Dixon Sand had not been received confirming approval of documents at the date of this audit (November 2016).

1.6 Opening and Closing Site Audit Meetings

Opening and closing meetings were held on 17 and 19 November 2016 at Dixon Sand site office, 4610 Old Northern Road Maroota. The audit opening meeting outlined the process and agenda for the audit. The closing meeting identified findings at the time of the meeting following the site inspection and document review.
The meeting attendees were David Dixon General Management Dixon Sand and Hunsamon Churcher Environmental Officer.

2. Haerses Road Quarry Project

2.1 Project Site Description

The Haerses Road Quarry site (comprising of Lot 170 DP 664767, Lots A and B DP 407341, and Lots 176 and 177 DP 752039) is privately owned by Dixon Sand (Penrith) Pty Ltd. Lot 216 DP 752039, directly to the south of the Haerses Road site is also owned by Dixon Sand. The total area of the site is approximately 103.8 hectares, of which approximately 52 hectares is to be retained within buffers outside the sand extraction zone.

The topography of the Haerses Road Quarry site consists of a ridge between two valleys, with local relief to 40 metres and slopes of between 10 and 25 percent. Although draining towards the adjoining valleys to the east and west, the site has a gradual downwards slope to the south west. The Haerses Road site is within the Little Cattai Creek catchment that discharges to the Hawkesbury River approximately 12 km south west of the Haerses Road site. The local catchment of which the site is a part is approximately 9,980 hectares in area.

2.1.1 Project Location

The site is bounded by Wisemans Ferry Road to the north, freehold land to the north east and west, and Maroota State Forest to the east and south. (The Maroota State Forest has recently been granted to the Deerubbin Local Aboriginal Land Council under the NSW Aboriginal Land Rights Act, 1983).
Access to the site is gained from Haerses Road. Dixon Sand owns the residences near the Haerses Road Quarry except for one residence at 1725 Wisemans Ferry Road to the northeast of Haerses Road.

2.1.2 Local Geology

The Haerses Road Quarry site is comprised of the three lithological units described as:

- Maroota Sand - comprises poorly sorted, fine to coarse Tertiary sand. The Maroota Sand was deposited under fluvial conditions with a major channel identified parallel to Haerses Road;
- Eluvial Sand - an associated basal unit of the Maroota Sand comprising fine grained clayey sand and being a weathering product of the Hawkesbury Sandstone; and
- the underlying Hawkesbury Sandstone - deposited in the Triassic and is a massive, homogeneous quartz arenite with a fine to coarse matrix (unconformably overlain by the Maroota Sand.

The maximum thickness of the Maroota Sand identified at the site was 18 metres, with an average thickness of 10 to 12metres across the deposit.

Geographically, the Maroota Sand exists on the north south trending ridgeline parallel to Haerses road. As the elevation decreases to the east and west of the ridge the Maroota Sand pinches out and the Hawkesbury sandstone outcrops. The Hawkesbury sandstone was identified at the site at approximately 20 metres below ground level as a massive fine grained quartz arenite.

2.1.3 Soils Description

The majority of the extraction area of the Haerses Road site is consistent with the Maroota landscape unit and is characterised by two separate soil landscape units:

- Maroota (ma) that exhibits high erosion hazard, seasonal waterlogging (localised), highly permeable, and strongly acidic soils with low fertility; and
- Gymea (gy) erosional soil landscape predominantly found on the side-slopes with similar qualities and limitations as the Maroota landscape however it also exhibits rock outcrops, localised rock-fall hazard, steep slopes and high run-on and shallow soils.

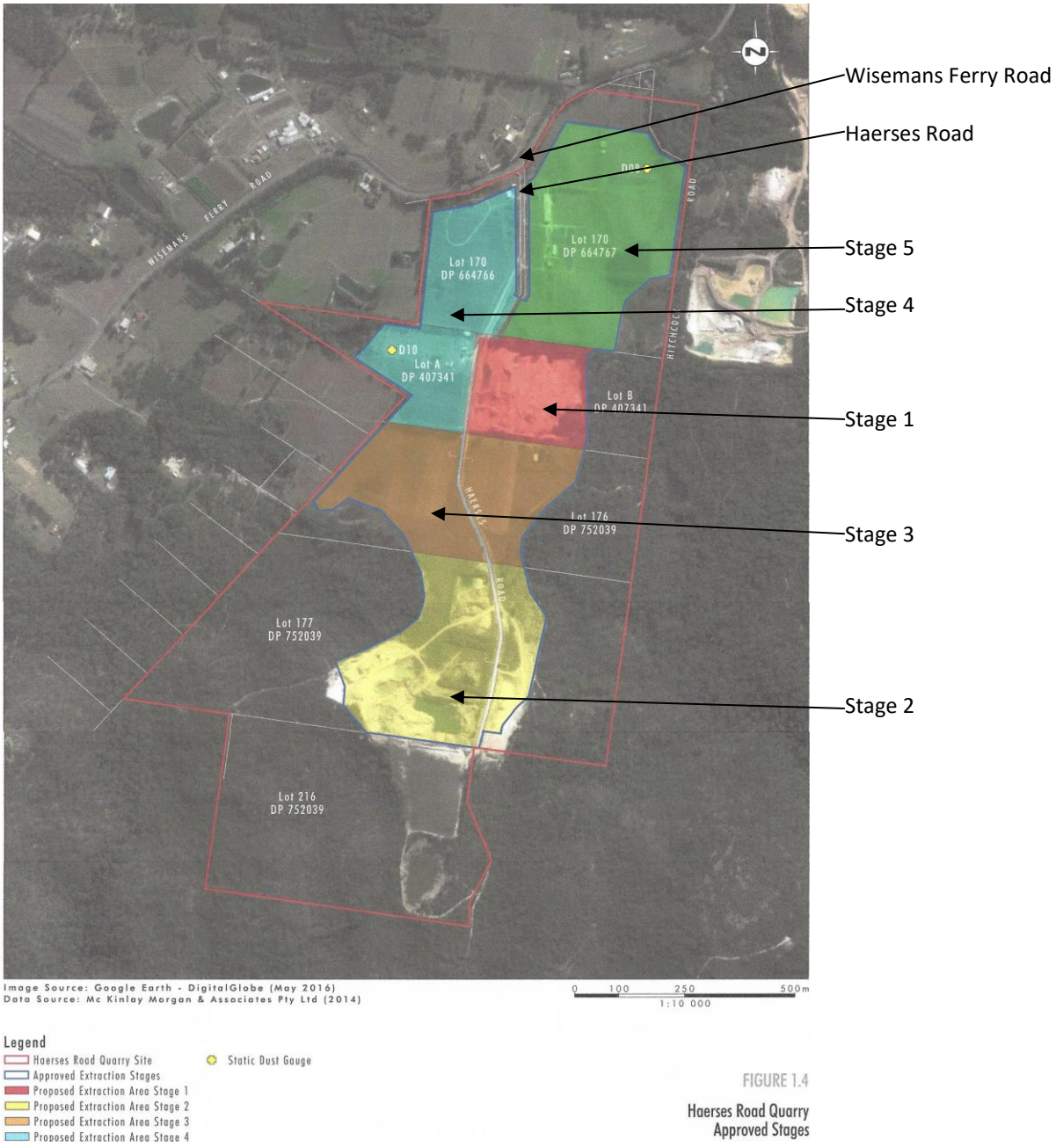

Figure 2.1.1: Haerses Road Quarry Layout – Approved Stages

2.1.3 Sand Processing

Dixon Sand has permission to extract sand at Lot 170 DP 664767, Lots A and B DP 407341, and Lots 176 and 177 DP 752039, Haerses Road, Maroota, and process the extracted sand at the existing process plant on Lot 196 DP 752025 at the Old Northern Road Quarry site. The processing involves the blending of variable quality sands from the Haerses Road Quarry site at the process plant on Lot 196, and use of the existing ancillary facilities including the workshop, weighbridge and office at the Old Northern Road site. Approximately 80% on the sand material is processed dry and the remaining 20% is washed to remove clay fines. The clay fines and silts are removed as tailings from the processing area and pumped to the tailings storage dam on the Old Northern Road Quarry site.

All hauled material unloaded at the Old Northern Road site process plant on Lot 196, will be washed to remove silt and clay fines. The tailings generated will aid in the backfill of voids on Lots 29 and 196, which will be dewatered and rehabilitated when the approved topographic levels are reached.

The existing processing plant at the Old Northern Road site has three dump hoppers, belt feeders and conveyors, vibrating screens, crushers, scrubbers, a radial stacker and cyclones. The existing processing plant has a maximum capacity of 250 tonnes per hour.

Plate 2.1.3: Processing plant at the Old Northern Road site on Lot 196

Material processed at the existing plant on Lot 196 will be stockpiled within the existing product stockpile area adjacent to the processing plant prior to sale, with additional piles for 4 weeks of raw feed from the Haerses Road site.

3. Approvals and Licences

3.1 Development Consent 165-07-2005

Development Consent 165-07-2005 was granted by the Minister for Planning on 14 February 2006 for the extraction of sand from Lot 170 DP 664767, Lots A and B DP 407341, and Lots 176 and 177 DP 752039, Haerses Road, Maroota. The quarry is owned by Dixon Sand (Penrith) Pty Ltd (Dixon Sand), and is approximately two kilometres south of the existing Dixon Sand Old Northern Road Quarry operations. The Development Consent allows Dixon Sand to extract sand from the Tertiary Maroota Sand resource and transport 'raw' sand from the Haerses Road site to the Old Northern Road Quarry for processing and tailings disposal.

The operation may also involve the selective extraction and screening of sand to be sold directly from the Haerses Road site to local and regional markets in accordance with Development Consent 165-07-2005 Schedule 2 condition 7.

The Haerses Road Quarry development comprises five stages of extraction. The operation can maintain an average extraction rate of 250 000 tonnes per annum for a period of 25 years (Development Consent 165-07-2005 Schedule 2 condition 6).

Modifications affecting the Haerses Road Quarry Development Consent have been:

Date	Modification to Consent
14 September 2016 Development Application lodged	Modification Application for Haerses Road Quarry was lodged to extend the life of the quarry to 2046, increasing the extraction area by approximately 19ha into friable sandstone resource. No new traffic movements proposed. Modification exhibited 12 October to 10 November 2016.
20 August 2008 MOD 1	A Development Application was lodged on 14 February 2006 for the transport and processing of Haerses Road Quarry sand at the central plant on the Old Northern Road Quarry site Lot 196 and to increase truck movements from the Haerses Road Quarry consistent with the approval under the Old Northern Road Development Consent 250-09- 01. This Modification was approved under Development Consent 250-09-01 MOD 2 in August 2008.

3.2 Environment Protection Licence No. 12513

The EPA issued an Environment Protection Licence 12513 to Dixon Sand (Penrith) Pty Ltd for the premises at Haerses Road and intersection of Wisemans Ferry Road Maroota for land based extractive activities on Lot 170 DP664767, Lots A and B DP407341 and Lots 176 and 177 DP 752039.

No Variations to the EPL 12513 have occurred between 24 July 2005 and November 2016.

3.3 Road Improvements

Dixon Sand obtained agreement from Baulkham Hills Shire Council for upgrade works to Haerses Road under the Roads Act 1993 section 38 and road improvement works from the intersection of Haerses Road and Wisemans Ferry Road. The upgrade works on Hearses Road were undertaken in accordance with Baulkham Hills Shire Council Works Authorisation Deed dated 16 November 2006. The completed road works were approved by Baulkham Hills Council on 13 March 2008, that indicated their satisfaction with the works undertaken and indicating that the alignment of the road meets the requirements of Council.

4. Department of Planning and Environment

4.1 DP&E Compliance Audit

A Compliance Audit was undertaken by officers of the DP&E as part of a strategic campaign of audits of NSW based operating sand quarries. The site component of the compliance audit was conducted on 4 August 2015 and the Compliance Audit Report was issued in December 2015.

The Haerses Road Sand Quarry was found to be operating generally in compliance with the conditions of the Development Consent 165-07-2005. Twenty (20) administrative non-compliances, twelve (12) low risk non-compliances and three (3) moderate risk non-compliance with consent conditions were identified where action was required to ensure compliance is achieved. A number of performance observations were also made.

The DP&E findings, and actions by Dixon Sand, were reviewed during this 2016 Independent Environmental Audit and the current status of compliance at the date of this audit (i.e. November 2016) were assessed.

The majority of the DP&E findings have been addressed by Dixon Sand.

Table 4.1: Independent Environmental Audit Findings on the Status of Each DP&E Non-Compliance

Development Approval 165- condition	D&E - Details of Non-Compliance	DP&E Recommendation	Dixon Sand Action and Findings of this IEA
DP&E Risk Ranking December 2015 - Non-Compliance (Low Risk)			**Status November 2016**
Schedule 3 Condition 1(c)	Extraction boundary markers are available however they are not clearly marked. It is noted that the extraction areas are clearly defined and this would only present an issue if the extraction areas are being extended.	Extraction boundaries to be clearly marked at defined intervals to delineate the extraction zone.	**Compliant** Survey conducted and boundary markers installed September 2015
Schedule 3 Condition 21(e)	Screen plantings have not been undertaken.	Implement screen plantings as required.	**Compliant** The 30m buffer of screen plantings along Wisemans Ferry Road boundary occurred in October 2016.
Schedule 3 Condition 24	No evidence could be provided that the Rehabilitation Bond has been lodged.	Rehabilitation Bond to be calculated and lodged if this has not yet been undertaken.	**Compliant** $300,000.00 Rehabilitation Bond lodged December 2016.
DP&E Risk Ranking December 2015 - Administrative Non-Compliance			**Status November 2016**
Schedule 3 Condition 3	No evidence provided that the revised Maximum Extraction Depth Map was submitted within 3 months following completion of the IEA in 2012.		**Administrative Non-Compliance** A review of the Maximum Extraction Depth Map will be conducted in accordance with the Recommendation in IEA condition 3.
Schedule 3 Condition 20	No evidence provided that the Site Water Management Plan had been reviewed within 3 months of the completion of each Independent Environmental Audit.		**Administrative Non-Compliance** Review of Site Water Management Plan was under way at the date of this IEA (November 2016).
Schedule 3 Condition 23	No evidence provided that the Rehabilitation and Landscape		**Administrative Non-Compliance**

Development Approval 165-condition	D&E - Details of Non-Compliance	DP&E Recommendation	Dixon Sand Action and Findings of this IEA
	Plan had been reviewed within 3 months of the completion of each Independent Environmental Audit.		Review of the Rehabilitation & Landscape Management Plan was under way at the date of this IEA (November 2016).
Schedule 3 Condition 25a, b and c	If no rehabilitation bond has been lodged, no review was undertaken following the IEA (2012).		**Administrative Non-Compliance** $300,000.00 Rehabilitation Bond lodged December 2016. A review of the bond will occur within 3months of the IEA 2016.
Schedule 3 Condition 30	Type 'AUR' treatment at the intersection of Haerses Road and Wiseman's Ferry Road works were not undertaken within 12 months of operations. Letter provided by Department providing an extension of the date to complete the works to 31 May 2009.		**Compliant COMPLETE** No further action Required. Road works completed and RMS issued a Final Certificate on 4 September 2014.
Schedule 5 Condition 1	Environmental Management Strategy has been developed (Dated March 2007) - submitted to Department on 27 July 2006. Letter provided by Department dated 19/4/07 that the EMS has been approved. Document was not prepared within three months of the commencement of the development.		**Compliant** The EMS approved on 19 April 2007 was under review at the date of this IEA (November 2016).
Schedule 5 Condition 2	No evidence provided that review of the Environmental Management Strategy had been undertaken within 3 months of the completion of each Independent Environmental Audit.		**Administrative Non-Compliance** Review of EMS was under review at the date of this IEA (November 2016).
Schedule 5 Condition 3	Letter dated 31/8/06 providing approval of Environmental Monitoring Program (noted that operations commenced in November 2006). Environmental Monitoring Program does not incorporate monitoring requirements for Rehabilitation and Landscape Management, however has been approved.		**Administrative Non-Compliance** Environmental Monitoring Program was under review at the date of this IEA (November 2016). Rehabilitation and waste monitoring to be included in the revision.
Schedule 5 Condition 4	No evidence provided that review of the Environmental Monitoring Program had been undertaken within 3 months of the completion of each Independent Environmental Audit.		**Administrative Non-Compliance** EMP review will be conducted to address conditions in the September 2016 Modification following the DP&E decision on consent.
Schedule 5 Condition 5 d	Comparison of monitoring results for dust for previous years was not provided in the AEMR for 2013/2014	Include a comparison of monitoring results for dust for previous years in the next and future AEMR's.	**Compliant** **A** review of dust monitoring results from previous years has been included in the 2015-2016 Annual Review

Development Approval 165-condition	D&E - Details of Non-Compliance	DP&E Recommendation	Dixon Sand Action and Findings of this IEA
Schedule 5 Condition 6	First IEA was undertaken by OSEM, April 2010 and submitted to the DoP, prior to OSEM being engaged by Dixon Quarry as the Environmental Officer. The DoP rejected the IEA (2010) due to potential conflict of interest. The letter stated that the IEA was to be completed promptly. The second IEA was undertaken by SMEC (2012) which included both ONR and Haerses Rd development consents. The next IEA is scheduled for April 2015 and approval granted by DoP (Elle Donnelly) to postpone the IEA. 2015 IEA in the process of liaison with DPE regarding suitable auditor.	Dixon Sands to liaise with the Department Assessment Team to determine a date that the IEA is to be completed	**Compliant** DP&E agreed to postpone the IEA for 6 months. DPE approved IEA to be undertaken before end of 2016. This IEA was conducted in November 2016 for submission to DP&E by 17 December 2016.
Schedule 5 Condition 7	Email dated 17/12/12 regarding submission of the IEA to the Department. It is noted that this was not within the 3month time period. Noted that there was no response from the proponent regarding the findings.		**Noted** 2016 IEA recommendations will be responded to by Dixon Sand and submitted to DP&E within 3 months of IEA.
Schedule 5 Condition 9a and b	No evidence available that all the current CCC members had been approved by the Director-General. Letters provided indicating approval of previous Chairpersons - however no letter provided for current Chairperson (Carolyn Hall).	Dixon Sands to liaise with the Department's Assessment Team to obtain approval for all members of the CCC.	**Compliant** Letter from DP&E dated 4 April 2016 approved current members of the CCC.
Schedule 5 Condition 10h	Copies of minutes are not always being forwarded to the Department within one month of the meeting.	Procedure to be established to ensure that minutes of meetings are forwarded to the Department within the allocated timeframe	**Compliant** Minutes of the May and November 2016 CCC Meetings forwarded to the Department within one month of the meeting.
Condition 11a	No evidence was provided that these documents are being provided to the relevant agencies, Council and CCC within 1 month.	Documents to be distributed as required by the conditions of consent.	**Compliant** Minutes of the May and November 2016 CCC Meetings forwarded to the stakeholders within one month of the meeting.

Responses to the findings of the DP&E Compliance Audit have been actioned by Dixon Sands and the only outstanding actions are Administrative Non-Compliances related to revision of documents / management plans, which was occurring at the date of this Independent Environmental Audit.

5. Review of Environmental Management

5.1 Environmental Management System

5.1.1 Environmental Management Strategy

[Development Consent 165-07-2005 Schedule 5 condition 1]

An Environmental Management Strategy prepared for the Haerses Road Quarry operation in accordance with the requirements of Development Consent 165-07-2005 Schedule 5 condition 1 was submitted to the DoP on 27 July 2006 and approved on 19 April 2007. The Environmental Management Strategy provides an overall framework for the management of environmental impacts from the excavation activities occurring during quarrying at the Haerses Road site.

This Environmental Management Strategy was developed to:

- provide a system to manage the site to minimise potential environmental impacts;
- ensure all site users are aware of the environmental protection measures and their environmental responsibilities;
- monitor site activities and environmental performance to determine compliance with required actions; and
- provide a system to identify and correct environmental degradation or non-compliance with consent requirements.

The Environmental Management System developed for the Haerses Road Quarry comprises the Environmental Management Strategy, environmental management plans and an Environmental Monitoring Program in accordance with the conditions of the Hearses Road Development Consent 165-07-2005 conditions.

The Environmental Management Strategy generally addresses each of the elements of ISO 14001.

Table 5.1.1 Environmental Management Strategy vs AS/NZS ISO14001 Elements

ISO 14001 Element	Construction Environmental Management Plan section
4.3.1 Environmental Aspects	Section 3 Site Works and Environmental Interactions
4.3.2 Legal and Other Requirements	Section 2.2 Statutory Requirements
4.3.3 Objectives and Targets	Section 2.1 Purpose of the Environmental Management Strategy
4.3.4 Environmental Management Programs	Section 4.1 Environmental Management Plans
4.4.1 Structure and Responsibility	Section 7.1 Responsibilities
4.4.2 Training Awareness and Competence	Section 7.2 Training
4.4.3 Communication	Section 6 Community Complaints and Dispute Resolution
4.4.7 Emergency Preparedness and Response	Section 5.2 Emergency Response
4.5.1 Monitoring and Measurement	Section 4 Monitoring Procedures
4.5.2 Non-conformance, Corrective Action	Section 5.1 Environmental Non-Compliance

5.1.2 Conclusion

The Environmental Management Strategy and supplementary Management Plan submitted to the DoP on 27 July 2006 was approved on 19 April 2007. The Environmental Management Strategy provides an adequate environmental management system for the operation of the Haerses Road Quarry.

5.2 Environmental Monitoring

5.2.1 Environmental Monitoring Program

[Development Consent 165-07-2005 Schedule 5 condition 3]

The Environmental Monitoring Program prepared to satisfy Development Consent 165-07-2005 Schedule 5 condition 3 was approved by Department of Planning on the 31 August 2006. The Environmental Monitoring Program had not been reviewed or revised since approval by DoP on 31 August 2006.

The Environmental Monitoring Program was to provide consolidate the various monitoring requirements in Schedule 3 of this consent into a single document. Monitoring requirements in Schedule 3 include attended / unattended noise monitoring (condition 10), air quality monitoring (condition 14), groundwater monitoring (condition 19), rehabilitation performance monitoring (condition 23), and waste generation monitoring (condition 32).

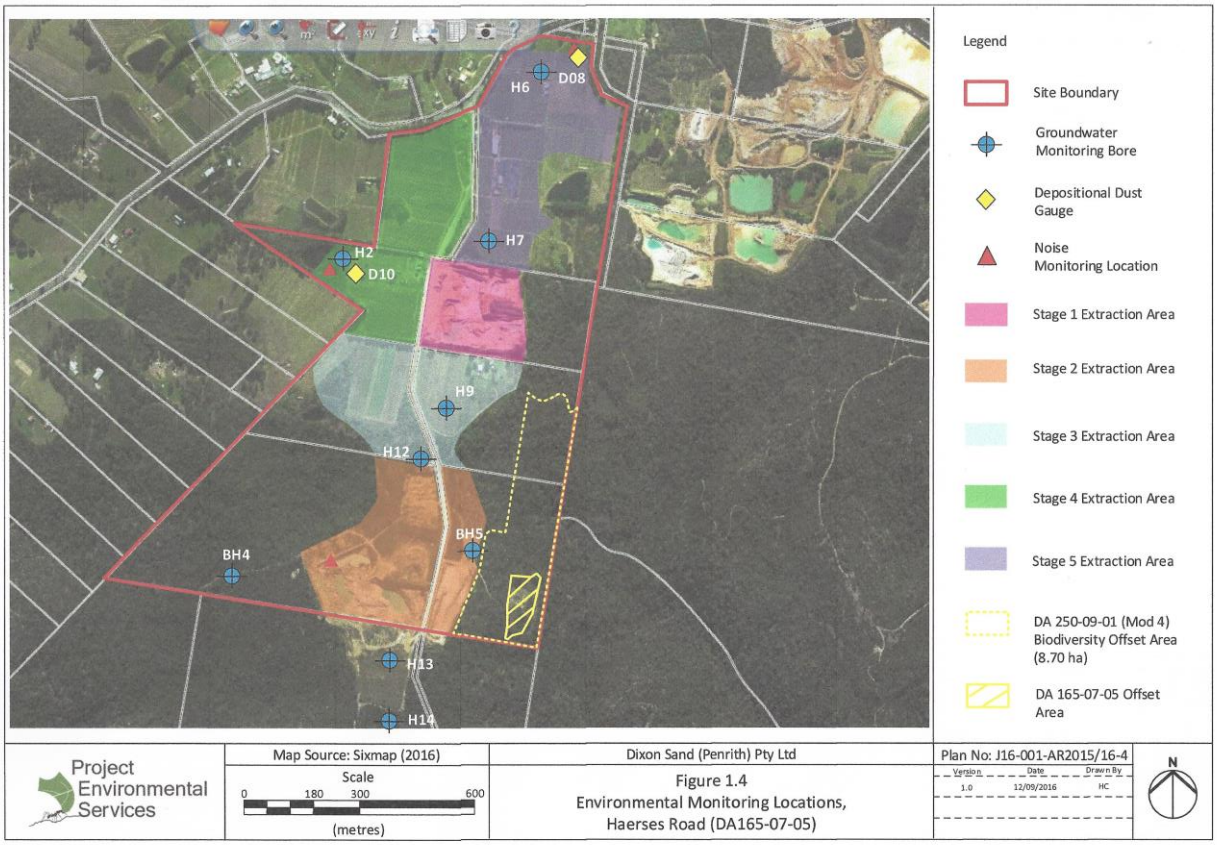

Figure 5.2.1: Monitoring Locations – Haerses Road (Environmental Monitoring Program)

The approved Environmental Monitoring Program addressed noise, air and groundwater monitoring but did does not include waste and rehabilitation monitoring.

5.2.1 Conclusion

The Environmental Monitoring Program prepared to satisfy Development Consent 165-07-2005 Schedule 5 condition 3 was approved by Department of Planning on the 31 August 2006. The approved Environmental Monitoring Program addressed noise, air and groundwater monitoring but does not include waste and rehabilitation monitoring.

Recommendation:

The Environmental Monitoring Program should be reviewed and revised to include all monitoring required under Development Consent 165-07-2005 Schedule 3 for noise, air quality and groundwater across the site in accordance with conditions 10, 14 and 17(b), respectively of Schedule 3 and also include rehabilitation performance monitoring (condition 23), and waste generation monitoring (condition 32).

5.3 Noise

[Development Consent 165-07-2005 Conditions 5 to 10]

5.3.1 Noise Monitoring Program

[Development Consent 165-07-2005 Condition 10]

The Environmental Management Strategy – Annex C Noise Management Plan, outlines the noise management procedures to be applied at the Haerses Road Quarry and the noise monitoring program for the Haerses Road Quarry. Noise monitoring in the Environmental Monitoring Program includes:

- Annual attended and unattended noise monitoring at the nearest residence to the operations area as identified for each respective stage of quarrying.
- Unattended measurements to be undertaken by means of a noise logger, set up for one week each year.
- $L_{Aeq(15\ minute)}$ noise is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary.
- $L_{A(max)}$ noise is to be measured at 1 metre from the dwelling façade for monitoring between 6am and 7am.
- Attended monitoring is not to be carried out when wind speed exceeds 3m/s or temperature inversion greater than 3°C/100m is present.
- Noise monitoring to be continued during rehabilitation works involving earthworks.
- If a noise complaint is received, noise monitoring may be conducted if deemed necessary

5.3.2 Environmental Impact Statement June 2005

5.3.2.1 Environmental Impact Statement - section 6.8 June 2005

Predicted noise from activities at the Haerses Road Quarry during calm and adverse weather conditions will not exceed relevant noise assessment criteria at nearby residences. Potential impacts will be minimised by bunding in the north east and north west of the site.

Residences to the east of Hitchcock Road are associated with the PF Graham (No 2) Pty Ltd sand quarry and are covered by an agreement with Dixon Sand to waiver any potential noise impacts from the proposed Haerses Road Quarry development.

Noise mitigation assumed in all modelling calculations included shielding provided by topographic features and box cut high walls constructed using the quarry overburden. Haul road traffic noise levels were found to be low compared to the measured ambient noise and would remain largely inaudible at the majority of nearest affected receptor locations.

The noise assessment considered the potential operational noise impacts of the proposed development on the nearest sensitive receptors and the noise modelling demonstrated that under calm weather conditions, with the addition of targeted noise mitigation, the nearest private residential properties would experience noise levels in compliance with the DEC Industrial Noise Policy.

The assessment also demonstrated that cumulative noise impacts from the Haerses Road Quarry in addition to the existing quarry noise in the area, would be well below Industrial Noise Policy recommended criteria.

5.3.4 Noise Management

The Noise Management Plan (Environmental Management Strategy – Annex C) outlines the noise management procedures to be applied at the Haerses Road Quarry for the site activities to meet the noise assessment criteria in Development Consent 165-07-2005 Schedule 3 condition 5, and Environment Protection Licence 12513 condition L6.1.

Mitigation measures to be implemented to reduce potential noise impacts include:

Mitigation Measure	Mitigation Measure Implementation	Status
Compliance with approved hours of operation.	Operating hours (7am to 6pm, Monday-Saturday (excluding public holidays) in accordance with Development Consent 165-07-2005 Schedule 3 condition 6, and Environment Protection Licence 12513 condition L6.2 and L6.3. Operating hours have been complied with for the quarry excavation works between 2013 and 2016.	**Compliant**
Regular maintenance of road surfaces, vehicles and equipment to reduce noise emissions; and	Dixon Sand had Haerses Road sealed from Wisemans Ferry Road intersection to the quarry entrance, and maintains the road surface in residential and school areas.	**Compliant**
Enforcement of speed limits for trucks and limited use of exhaust brakes in residential and school areas.	Vehicles and equipment used at the Haerses Road Quarry are maintained to reduce noise emission. All drivers undergo a Site Induction that includes the Site Transport Management Plan: Maroota, and sign the Site Induction for Drivers form. The Site Induction includes speed limits and non-use of exhaust brakes in residential and school areas.	**Compliant**
Construction of noise bunds in strategic locations as stipulated in the EIS and consent conditions	Acoustic bund construction required for Stage 4 and Stage 5 operations (Development Consent 165-07-2005 Schedule 3 condition 7), have a detailed set of procedures in the Environmental Management Strategy – Annex C - Noise Management to minimise noise emissions and nuisance to nearby residents. These procedures numbered 2 to 9 will be triggered prior to commencement of construction of the Stage 4 and Stage 5 acoustic bunds.	**Not yet triggered**

5.3.3 Noise Assessment Criteria

[Development Consent 165-07-2005 Schedule 3 condition 5]
[Environment Protection Licence 21513 condition L6.1]

The noise generated by the activities at the Haerses Road Quarry are not to exceed the noise impact assessment criteria set in Development Consent 165-07-2005 Schedule 3 condition 5 Table 1 (refer tot to Table 5.3.3).

Development Consent 165-07-2005 Schedule 3 condition 5 states: "If the Applicant has a written negotiated noise agreement with any landowner of the land listed in Table 1, ……. the Applicant may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement".

Agreements ae in place for the following land owners:

- Dixon Sand have a private agreement with B Ramm under Development Consent 165-07-2005 Schedule 3 condition 5.

- Dixon Sand has a private agreement with E Ramm under Development Consent 165-7-05Schedule 3, Condition 5).
- Dixon Sand had a noise agreement in place with the tenant in the J&D Young property, and Dixon Sand now owns this property.

Table 5.3.3: Noise impact assessment criteria dB(A)

Day	Shoulder 6.00am to 7.00am		Land
LAeq (15 minute)	LAeq (15 minute)	LA(max)	
37	37	45	F & J Roberts and J & D Young (Location 1)
40	40	45	E. Ramm
38	38	45	M. Ramm
37	37	45	B. Ramm (Monitoring Location 2)
35	35	45	All other residences on privately owned land

5.3.5 Noise Monitoring Results

[Development Consent 165-07-2005 Schedule 3 condition 5]
[Environment Protection Licence 21513 condition L6.1]

Quarry operations were audible at the Haerses Road Quarry monitoring locations during monitoring between December 2013 and June 2016. The audible components were intermittent and were not considered to significantly contribute to the noise environment at the monitoring locations.

The June 2015 daytime setback calculation yielded a predicted noise level of 37.7dBA (an exceedance of 0.7dBA over the noise limit under Development Consent 165-07-05 Schedule 3 Condition 5) at the sensitive receiver location 2 (Dixon Sand have a private agreement with B Ramm (location 2). The exceedance of 0.7dBA would not be discernible at the residence.

The noise setback calculation exceedance resulted in a review of the noise mitigation measures and additional noise monitoring (i.e. on a quarterly basis) until the noise levels complied with noise criteria outlined in Development Consent 165-07-2005 Schedule 3 Condition 5. Operational procedures were also reviewed and it was decided that to minimise the risk of noise exceedances from the Hearses Road Quarry operations, use of the Commander screener / crusher would be discontinued at Haerses Road and processing all product would occur at the Old Northern Road plant.

Attended noise monitoring for the sensitive receivers indicated that noise impacts associated with traffic on Wisemans Ferry Road, local fauna and other surrounding quarries contributed significantly to the noise experienced by the receivers.

Results obtained from noise monitoring conducted in 2015 - 2016 reporting period at the Hearses Road quarry site was consistent with the noise predictions made in the Haerses Road Environmental Impact Statement 2005. The predicted 'quarry only' noise contribution at the nearest sensitive receivers is below the limits set by the Development Consents and Environment Protection Licence.

The noise monitoring results reported annually from 2013 to 2016 quarry operations have consistently indicated compliance with the noise assessment criteria, and no noise related complaints have been received.

5.3.6 Conclusion

The Noise Management Plan (Environmental Management Strategy – Annex C) outlines the noise management procedures and noise monitoring program for the Haerses Road Quarry. Noise monitoring is also included in the Environmental Monitoring Program. Noise monitoring at the Haerses Road Quarry site conducted to assess compliance with the noise assessment criteria for sensitive receivers around the Haerses Road Quarry between

2013 and 2016 has demonstrated compliance with the noise assessment criteria in the Development Consent 165-07-2005 and EPL 12513. No noise related complaints have been received.

5.4 Air Quality

[Development Consent 165-07-2005 Conditions 10 to 14]

5.4.1 Air Quality Monitoring Program

[Development Consent 165-07-2005 Condition 14]

The Environmental Management Strategy – Annex C Air Quality Management Plan, outlines the air quality management procedures and air quality monitoring program for the Haerses Road Quarry. The Air Quality Monitoring Program includes:

- Conducting targeted TSP and PM_{10} monitoring during each excavation Stage (under adverse weather conditions where possible), on the boundary closest to nearest residence. This monitoring to be conducted using a high volume air sampler on two consecutive days, one prior to implementation of dust suppression measures and one following their implementation, to ascertain the effectiveness of these measures.
- Continuous PM_{10} monitoring at TEOM air quality monitoring station near the Maroota Public School. The TEOM device being connected to an alarm system triggered by a maximum PM_{10} level of 42µg/m^3 (rolling 24hour average).
- Wind speed, direction, temperature and rainfall to be measured by meteorological station at EPA approved Monitoring Point 3 near the Maroota Public School; and
- Air monitoring to be continued during rehabilitation works involving earthworks.

5.4.2 Environmental Assessment

[Environmental Impact Statement - section 6.7 June 2005]

Total Suspended Particles (TSP), PM_{10} concentrations and dust deposition from the proposed Haerses Road Quarry operations are predicted to be lower than the relevant air quality assessment criteria at all sensitive receptors. Air quality will be monitored and dust controls including water spraying of haul roads and disturbed areas, minimal exposure of active extraction areas, vehicle speed reduction and progressive rehabilitation will be used.

The land uses in the area of the Haerses Road Quarry are predominantly rural and extractive industry (i.e. other sand quarries).

Air quality sampling for TSP and PM_{10} was carried out between 24 January and 21 March 2001, and on Lot 2 approximately 1.5km to the north. TSP 24hour average varies from 12 µg/m^3 to 35 µg/m^3, with the average being 22µg/m^3. The nominated criterion for TSP is 90 µg/m^3 as an annual average (NSW EPA, NHMRC). It is anticipated that the existing air quality is less than NSW EPA guidelines.

PM_{10} 24hour average varies from 5 µg/m^3 to 21 µg/m^3 sampled weekly on site between 24 January and 21 March 2001. This is less than the nominated NEPM criterion of 50 µg/m^3 as a 24hour average.

Dust deposition data was collected from seven deposition gauges located on and around the existing Old Northern Road Quarry at Lots 29 and 196 from 2002 to 2004 were assessed and a background level for deposited dust determined from average values obtained.

Air quality monitoring results from the surrounding areas have been considered and background levels set at the following concentrations for the cumulative model predictions:

- TSP - 26 µg/m^3, 24hour average;
- PM_{10} - 13 µg/m^3, 24hour average (NSW EPA assessment criterion 50 µg/m^3);
- TSP - 25 µg/m^3, 90day average (annual average 90 µg/m^3);
- PM_{10} - 12 µg/m^3, annual average (NSW EPA assessment criterion 30 µg/m^3); and

- Deposited dust 2.1 g/m^2 per month (NSW EPA assessment criterion 2g/m^2/month as a maximum increase and 4g/m^2/month maximum total deposited dust level at sensitive receptors).

5.4.3 Air Quality Management

[Development Consent 165-07-2005 Conditions 12]

Management and mitigation measures implemented at the Haerses Road Quarry to control dust emissions are outlined in Table 5.4.3.

Table 5.4.3: Dust Mitigation Measures Implemented at Haerses Road Quarry

Mitigation Measure	Mitigation Measure Implementation	Status
All practical measures to minimise and/or prevent the emission of dust from the site will be implemented.	A water cart is available for use as required to dampen down disturbed areas (e.g. access tracks) and other road surfaces, to reduce dust generation potential.	**Compliant Ongoing**
All vehicles entering or leaving the site, carrying a load that may generate dust to be covered at all times, except during loading and unloading	All loaded trucks entering or leaving the Haerses Road Quarry site, have their loads covered in accordance with the Dixon Sand Site Traffic Management Plan: Maroota, to manage dust loss /dispersion.	**Compliant Ongoing**
Minimise exposed areas and disturbance as much as practicable, including restricting traffic to designated roads.	Exposed disturbed land within Haerses Road Quarry Stage 1 and Stage 2 is restricted to the resource excavation areas. Trucks are only allowed on designated access tracks.	**Compliant Ongoing**
Progressively rehabilitate extracted areas for agricultural use.	Rehabilitation has not commenced on the Haerses Road Quarry areas as resource is still being excavated.	**Not yet triggered**
Limit speed to 20kph on internal, unsealed access tracks.	A 20kph speed limit is imposed on all internal unsealed access tracks.	**Compliant Ongoing**
Surface initial 300m of Haerses Road in selected hard, nonfriable material.	Dixon Sand has sealed Haerses Road from Wisemans Ferry intersection to the quarry entrance.	**Compliant**
Seed any stockpiles present for more than four months.	Topsoil stockpile on Stage 1 area has been seeded to reduce dust generation.	**Compliant**
Regularly maintain equipment to minimise exhaust emissions.	All Dixon Sand equipment is regularly maintained at the workshop at Dixon Sand Old Northern Road Quarry site.	**Compliant Ongoing**
The local community (particularly residents within 200m of any construction works) are to be notified of the timing for the works.	Residents within 200m of any construction works at the Haerses Road Quarry are notified of the timing for commencement of works.	**Compliant Ongoing**

5.4.4 Air Quality Criteria

[Development Consent 165-07-2005 Schedule 3 condition 11]
[Environment Protection Licence 12513 condition O3.6]

Dust generated by the Haerses Road Quarry is not to exceed the air quality impact assessment criteria listed in Development Consent 165-07-2005 Schedule 3 condition 11, Tables 3, 4 and 5 at any residences on any privately owned land listed in Development Consent 165-07-2005 Schedule 3 condition 5 Table 1, or Environment Protection Licence 12513 condition O3.6.

Long term impact assessment criteria for particulate matter

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual	90µ g/m^3

Short term impact assessment criterion for particulate matter

Pollutant	Averaging Period	Criterion
Particulate matter <10microns (PM_{10})	24hour	50µg/m^3

Long term impact assessment criteria for deposited dust

Pollutant	Averaging Period	Maximum increase in deposited dust levels	Maximum total deposited dust levels
Deposited Dust	Annual	2 g/m^2 /month	4 g/m^2 /month

5.4.5 Air Quality Monitoring

[Development Consent 165-07-2005 Schedule 3 condition 14]

5.4.5.1 Dust Deposition

The Haerses Road Environmental Impact Statement (ERMA, 2005) predicted dust deposition during quarrying Stages 1 to 5 to be between 2.2 and 3.0 g/m²/month for all receptors. Annualised dust deposition levels for the Haerses Road sites have been consistently less than 3 g/m²/month except on two consecutive exceedances recorded at dust gauge D10 in August and September 2015. These results of 8.9g/m²/month and 14.0g/m²/month, respectively, exceeded the predicted levels. The quarry operations were located approx. 780m to the south of this dust gauge. An investigation undertaken indicated that the exceedances were likely caused by agricultural operations undertaken in neighbouring properties. In addition, a number of hazard reduction burns during the August 2015 monitoring period may have contributed to the high depositional dust results as poor air quality was clearly observed across the Sydney region from hazard reduction burns undertaken in the Hawkesbury region.

No dust related complaints were received between 2013 to 2016.

5.4.5.2 Tapered Element Oscillating Microbalance (TEOM) PM10 Results

In accordance with of Development Consent 165-07-2005 Schedule 3 condition 11 and Environment Protection Licence 12513 condition P1.1, PM_{10} is monitored with a Tapered Element Oscillating Microbalance (TEOM) near Maroota Public School.

The annual average PM_{10} results recorded at the TEOM location (Environment Protection Licence 12513 condition P1.1, EPA approved Monitoring Point 1), complied with the annual average PM_{10} criteria of 30µg/m^3 over the 2012 to 2016 period.

Exceedances of 24 hour PM_{10} average criteria recorded between 2013 and 2016 that exceeded the EPL trigger level of 42µg/m^3 or the NEPM short term criteria level of 50 µg/m^3 were:

- 10 days were recorded in September, November, December 2013 and January 2014 where 24 hour average PM_{10} levels exceeded the EPL trigger level of 42µg/m^3, with 6 days exceeding the NEPM short term criteria level of 50 µg/m^3. These exceedances were a result of bush fire events in the area.
- 6 May 2015 - 55.4µg/m^3 due to a dust storm event and fires at nearby residences
- 26 November 2015 – 42.6 µg/m^3 Strong dry and hot westerly winds across the region.
- 29 April 2016 – 68.2 µg/m^3 Scheduled hazard reduction burns in the Hawkesbury and Singleton areas.
- 8 May 2016 – 44.9 µg/m^3 Scheduled hazard reduction burns in the Western Sydney and Blue Mountains areas.

The PM_{10} 24-hour average exceedances of PM_{10} were not quarry related.

1 July to 30 June	PM_{10} Results	Comment
2012-2013	The annual PM_{10} average for the 2015-2016 reporting period was 12.3µg/m³.	The PM_{10} annual average results were less than the EPA long term criteria of 30µg/m³ and the 24 hour EPL management level of 42µg/m³ and the 24 hour NEPM short term criteria level of 50 µg/m³.
2013-2014	The rolling 24 hour PM_{10} mean values was 15.4µg/m³.	
2014-2015	The rolling 24 hour PM_{10} mean values was 13.4µg/m³.	
2015-2016	The annual PM_{10} average for the 2015-2016 reporting period was 11.6µg/m³.	

5.4.6 Conclusion

The Environmental Management Strategy Annex C - Air Quality Management Plan outlines the air quality management procedures to be applied and the air quality monitoring program for the Haerses Road Quarry.

The Environmental Impact Statement (ERM, 2005) predicted dust deposition during quarrying Stages 1 to 5 to be between 2.2 and 3.0 g/m²/month for all receptors. Annualised dust deposition levels for the Haerses Road sites have been consistently less than 3 g/m²/month.

The 24 hour average PM_{10} was complied with during the 1 July 2012 to 30 June 2013 period. A number of 24 hour average exceedances recorded during 1 July 2013 to 30 June 2014 were attributed by bushfire events occurring in the Sydney and Blue Mountains region, and one 24 hour average exceedance in 2014-2015 was due to a dust storm that swept across the north-western Sydney region. None of the recorded 24-hour average exceedances of PM_{10} were quarry related. No dust related complaints were received by Dixon Sand between July 2013 and November 2016.

5.5 Soil and Water

[Development Consent 165-07-2005 Conditions 15 to 20]

5.5.1 Site Hydrology

The Haerses Road Quarry site watershed coincides approximately with the location of Haerses Road. Runoff to the east of Haerses Road currently drains to a dam in the north east of the quarry site and an ephemeral watercourse to the east, connects to Little Cattai Creek 150 metres to the south east. Land to the west of Haerses Road drains to three small dams on Haerses Road Quarry site and an unnamed ephemeral creek to the west. This ephemeral creek is a tributary of the Stone Chimney Arm of Little Cattai Creek, which ultimately discharges to the Hawkesbury River approximately 12 kilometres south west of the site.

The local catchment of which the Haerses Road Quarry site is a part, has an area of approximately 9,980 hectares (to the junction with the Hawkesbury). The Haerses Road Quarry site itself has high infiltration rates due to the sandy nature of the soils.

The Haerses Road Quarry site and surrounding areas comprise Hawkesbury Sandstone overlain by Tertiary fluvial sediments. The quarry site generally comprises three lithological units including the Maroota Sand and an Eluvial Sand which extend to the underlying Hawkesbury Sandstone and associated perched water table at approximately 20 metres below ground level.

The topography of the site consists of a ridge between two valleys, with local relief to 40 metres and slopes of between 10 and 25 percent. Although draining towards the adjoining valleys to the east and west, the site has a gradual downwards slope to the south west.

5.5.2 Site Water Management Plan

[Development Consent 165-07-2005 Conditions 17]

A Site Water Management Plan prepared to satisfy Development Consent 165-07-2005 Schedule 3 condition 17 was submitted to DoP in July 2006 and approved by DoP on 19 April 2007. The Site Water Management Plan includes:

- Soil and Water Management Plan; and
- Groundwater Monitoring Program

The Site Water Management Plan was developed to:

- comply with the relevant Development Consent conditions;
- manage soil and water to ensure that there is no uncontrolled discharge of surface water from the quarry;
- water quality leaving the site meets appropriate standards;
- no detrimental impact on groundwater by maintenance of 2 metres extraction buffer to the groundwater table (wet weather high level);
- minimisation of the area of soil disturbed and exposed to erosion;
- adoption of appropriate land clearing procedures;
- conservation of topsoil for later rehabilitation and revegetation;
- control of water flow through the site (i.e. separating "clean" and "dirty" water and directing sediment laden water to sediment basins);
- rehabilitation of disturbed areas progressively

5.5.3 Soil and Water Management Plan

[Development Consent 165-07-2005 Conditions 18]

The Soil and Water Management Plan (prepared as section 3 of the Site Water Management Plan) to satisfy Development Consent 165-07-2005 Schedule 3 condition 18, was submitted to DoP for approval in July 2006 and approved on 19 April 2007.

The main potential water quality pollutant from the project consists of suspended sediment from:

- sequential clearing, soil stripping, and stockpiling undertaken to expose the tertiary Maroota sands;
- unsealed haul roads and surface water drains;
- active extraction areas; and
- uncontrolled overflow of sediment laden water from sediment settling basins.

As the soils on site are highly erodible under concentrated flows, erosion and sediment controls to control drainage on site, maximise infiltration and minimise the area of soil exposed to surface water flows include:

- maintenance of buffers and boundary setbacks and installation of silt fences where appropriate to prevent sediment transport and impact on adjoining land;
- minimisation of the area of disturbance by only clearing areas immediately prior to extraction within each stage or strip and progressive rehabilitation of completed strips (refer to rehabilitation strategy for soil stabilisation techniques);
- direction of stormwater runoff from disturbed areas to appropriate areas and sedimentation ponds for infiltration or treatment if and when necessary prior to discharge off-site;
- maintenance of a rim around the perimeter of the quarry area until rehabilitation is complete; and
- regular inspection and maintenance of sediment controls.

5.5.4 Environmental Assessment

5.5.4.1 Environmental Impact Statement - section 2.5, June 2005

The Haerses Road Quarry site is at the top of the local catchment that drains to the Hawkesbury River via Little Cattai Creek and the Broadwater Swamp. Containment and infiltration of surface water within the extraction area and the construction of sedimentation basins, will ensure that sediment entrained within the quarry is not transported off-site. The proposed quarry area will be more than 340m from Little Cattai Creek and more than 1100m from Stone Chimney Arm.

Due to the highly permeable sandy soils on the site it is unlikely that surface water runoff will be generated in any significant quantity except during very heavy rain. It is proposed that overburden is stripped and shaped to form a bank around the top edge of the extraction area to prevent surface runoff from undisturbed areas entering the extraction area. This bank will adjoin the buffer areas and, where possible, water will be directed to the existing dams on site and this water will be used for dust suppression on internal haul roads. The banks will be shaped, grass-seeded and maintained to prevent erosion of the drainage lines and sedimentation of downstream dams and waterways.

During extraction, water collected in the quarry floor will not drain to existing surface water catchments, with stormwater directed to low points on the quarry floor. The high permeability of the floor will maintain current infiltration and groundwater recharge rates. The permeability of the materials will also ensure that the depth and duration of any surface water ponding within the quarry is minimal.

The rim remaining around the perimeter of the quarry will prevent the majority of surface run off from leaving the site. Containment of surface water within the extraction area and the subsequent infiltration of water will ensure that sediment entrained within the quarry is not transported off-site.

The limited area of quarry floor that will be able to drain overland to existing surface water catchments is in the south western corner of Stage 2 and the north eastern corner of Stage 5. In Stage 2, a sedimentation basin will be constructed within the initial extraction and rehabilitation areas and will be maintained for the life of the quarry. The overall impact of the quarry on catchment flows is expected to be minor.

The quarry development will include a 40 metre buffer from any stream/drain alignments and appropriate surface water quality controls to protect the ecosystems within the Maroota State Forest. Appropriate buffers to adjoining habitat and minimal vegetation removal with appropriate surface water controls will reduce the environmental impacts of the proposed quarry.

5.5.4.2 Environmental Impact Statement - section 2.6, June 2005

Topsoil will be stripped immediately prior to sand extraction and used for rehabilitation. Excluding the first strips of Stages 1 and 2, topsoil will be stripped and spread immediately over previously quarried areas to be rehabilitated. In the event that a rehabilitation area is not ready for topsoil spreading, the topsoil will be stockpiled temporarily (less than 12 months) away from drainage lines. Silt fences around the base of the stockpiles will prevent soil loss off site. The stockpiles will be maintained at a height no greater than three metres to preserve aerobic soil microbes and organic material in accordance with Baulkham Hills Shire Council Development Control Plan No. 16 – Extractive Industries (DCP 16).

As the soils on site are highly erodible under concentrated flows, erosion and sediment controls are proposed to control drainage on site, maximise infiltration and to minimise the area of soil exposed to surface water flows.

Controls will include the following:

- maintaining buffers and boundary setbacks and installation of silt fences where appropriate to prevent sediment transport and impact on adjoining land;
- minimise the area of disturbance by only clearing areas immediately prior to extraction within each stage or strip and undertake progressive rehabilitation of completed strips;
- direct stormwater runoff from disturbed areas to sedimentation ponds for infiltration or treatment prior to discharge off-site;
- maintain the rim around the perimeter of the quarry area until rehabilitation is complete; and

- regularly inspect and maintain sediment controls.

Water management and erosion/sediment controls will be implemented and include the formation and seeding of a bank around the top edge of the extraction area, the construction of diversion drains to direct stormwater to existing dams, sedimentation basins and low points on the quarry floor. A sedimentation basin will be constructed in the south west of Stage 2 and will be maintained as required by the quarry.

Clean water (surface runoff from areas relatively undisturbed by extraction or related activities) will be diverted around the extraction areas using earth banks constructed in accordance with Landcom (2004). The location of the earth banks on the site will ensure that no clean water flows enter the Stage 2 extraction area. Outlets for water diverted by the of earth banks are designed to ensure flows do not cause erosion downstream.

5.5.4.3 Environmental Assessment, Umwelt, September 2016

The proposed approach to the water management system for the Modification is consistent with the current water management strategies at the Haerses Road Quarry site and will utilise the majority of the infrastructure of the existing water management system with the addition of three new sediment basins and associated drains as required.

As part of the Modification, the following improvements to the water management system are proposed:

- three additional sediment basins located in the south west, west and north west corners of the proposed Stage 2 extraction area to manage dirty water runoff as extraction progresses
- additional dirty water drains at the boundaries of the extraction areas to assist in directing dirty water to the appropriate sediment basins during extraction
- additional clean water drains to intercept runoff from the upslope catchment and convey runoff around the disturbed areas.

The proposed drains and sediment basins will assist in managing upslope runoff from the clean catchment areas upslope of the existing water management system. The additional quarry pit will incorporate a sump so that dirty water can be collected and recycled.

The location and maximum depth of the quarry pit have been determined through groundwater investigations so that there will be no impact to the Maroota Tertiary Sands Groundwater Source or the Greater Sydney Basin Groundwater Source.

5.5.5 Soil and Water Management

As the soils on site are highly erodible under concentrated flows, erosion and sediment controls are proposed to control drainage on site, maximise infiltration and to minimise the area of soil exposed to surface water flows.

Mitigation Measure	Mitigation Measure Implementation	Status
Maintain buffers and boundary setbacks, and installation of silt fences where appropriate to prevent sediment transport and impact on adjoining land.	An extraction area survey plan No. 91973.E.1 dated 9 June 2006, was approved by DoP on 31 July 2006. The buffers and boundary markers for the operational extraction areas have been maintained and where necessary were re-instated in September 2015. Sediment fences to prevent sediment transport and impact on adjoining land have been installed where necessary.	**Compliant Ongoing**
Minimise the area of disturbance by only clearing areas immediately prior to extraction within each stage or strip. Progressively rehabilitate completed strips	Only disturbance of areas of Stage 1 and Stage 2 required for extraction had occurred at the date of this audit (November 2016).	**Compliant Ongoing**

Mitigation Measure	Mitigation Measure Implementation	Status
(refer to rehabilitation strategy for soil stabilisation techniques).		
Direct stormwater runoff from disturbed areas to sedimentation ponds for infiltration or treatment if and when necessary prior to discharge off-site;	Stormwater runoff from disturbed areas of the Haerses Road Quarry site is directed to settlement ponds prior to any discharge off-site.	**Compliant Ongoing**
Maintain the rim around the perimeter of the quarry area until rehabilitation is complete.	The perimeter of the Stage 1 and Stage 2 areas of the Haerses Road Quarry site are raised above the extraction areas, so all runoff is retained within the pits.	**Not yet triggered**
Regularly inspect and maintain sediment controls.	The sediment controls are inspected monthly as part of the Dixon Sand Monthly Site Inspections and the status of the control are recorded on the Monthly Site Inspection Checklist.	**Compliant Ongoing**

5.5.6 Conclusion

Surface water management at the Haerses Road Quarry site has been designed to ensure that collection of runoff from disturbed areas of the quarry is directed to settlement basins or retained in the quarry pits to prevent the loss of sediment to the surrounding environment.

The management and mitigation measures implemented at the Haerses Road Quarry site control the flow of surface runoff and regular inspections and maintenance of sediment controls protect the surrounding environment from impact of water with high suspended solids.

5.6 Groundwater

[Development Consent 165-07-2005 Schedule 3 condition 19]

5.6.1 Local Hydrogeology

There are two aquifers in the Maroota area, both occur at the Haerses Road Quarry site:

- Maroota Tertiary Sands Groundwater Source (MTSGS) - occurs along the central portion of the Haerses Road Quarry site, to the east of and upslope of the proposed extraction area, in the Maroota Sands deposit and upper part of the Hawkesbury Sandstone (Eluvial sands). The MTSGS is recharged by direct rainfall infiltration and is subject to seasonal rainfall variations. Small aquifer zones have developed in the eluvial sand (such as the deposit which is the quarry resource for the approved Haerses Road Quarry), which comprises the leached and weathered profile of the Hawkesbury Sandstone and these zones often form perched aquifer systems above the deeper regional water level of the Hawkesbury Sandstone.
- Hawkesbury Sandstone, a regional fractured rock aquifer. The Hawkesbury Sandstone forms part of the Sydney Central Basin Groundwater Source (SCBGS). The SCBGS occurs below the proposed extraction area which will remain a minimum of two metres above the SCBGS wet weather groundwater level. The Hawkesbury Sandstone is generally an impermeable rock and although the rock has very little primary permeability, fracturing and jointing, where open and interconnected, provides secondary permeability and storativity.

The water level of the MTSGS has been monitored and recorded at the Haerses Road Quarry since 2005 while the regional water table of the SCBGS has been monitored and recorded since 2011.

5.6.2 Groundwater Monitoring Program

[Development Consent 165-07-2005 Conditions 19]

The Groundwater Monitoring Program (prepared as section 4.2 of the Site Water Management Plan) to satisfy Development Consent 165-07-2005 Schedule 3 condition 17 and 19, was submitted to DoP for approval in July 2006 and approved on 19 April 2007.

Groundwater monitoring is also included in the Environmental Monitoring Program July 2006 section 2.3. The Groundwater Monitoring Program includes:

- the Site Water Management Plan section 4.2 outlines establishing the site wet weather groundwater levels;
- Table 2.4 outlines the program to monitor any potential adverse impacts of the development on groundwater levels and quality; and
- Table 2.4 also outlines the contingency measures and response that would be put in place in the event that groundwater is breached and contaminated

An ongoing groundwater monitoring program includes:

- monthly measurement of water levels and establishment of the wet weather groundwater level prior to commencement of quarrying in each stage; and
- annual collection of water samples from the five monitoring wells for field parameter measurements and laboratory analysis.

If monitoring notes a degradation of the groundwater resource quality due to quarry activities on the site, a contingency plan for the remediation of the aquifer will be prepared and implemented.

5.6.2 Environmental Assessment

5.6.2.1 Environmental Impact Statement - section 6.5, ERMA, June 2005

Current infiltration and groundwater recharge rates are not predicted to be impacted by the proposed Haerses Road Quarry development. Ongoing groundwater depth monitoring will continue throughout the life of the operation to ensure extraction does not occur below the maximum wet weather groundwater level.

5.6.2.2 Environmental Impact Statement – section 6.5, ERMA, June 2005

The major findings in a Maroota Groundwater Study (conducted by DLWC, 2001) were that there are two groundwater systems that include a shallow aquifer comprising of the Maroota Sand and Eluvial Sand units and a deep aquifer consisting entirely of permeable and fractured zones within the underlying Hawkesbury Sandstone. Groundwater levels across the Haerses Road Quarry site vary from 171.50 to 185.73 metres AHD and indicate that the direction of groundwater movement is generally from north east to south west across the site.

Perched water tables occur within the shallow aquifer where clay layers prevent the infiltration of groundwater by gravity to lower levels of the aquifer. The perched water table measured in April 2005 in the southern portion of the site in the vicinity of borehole MW4 at 4.54 mbgl (AHD 184.41).

To manage any potential impacts to groundwater, a two metre buffer zone will be maintained above the wet weather groundwater level. Rainfall at the site infiltrates through the highly permeable Maroota Sands and collects at the Hawkesbury sandstone bedrock interface.

5.6.2.3 Environmental Assessment – Umwelt, September 2016

Groundwater monitoring data was used to establish groundwater elevations for the Maroota Tertiary Sands Groundwater Source (MTSGS) and the Sydney Central Basin Groundwater Source (SCBGS). The highest recorded

water level measured in each bore was used to develop a maximum potential extraction depth of two metres above the wet weather groundwater level sources.

The Groundwater Assessment found that the proposed extraction area remains entirely in the unsaturated zone and will not result in interception of the MTSGS and SCBGS during quarrying operations

5.6.3 Groundwater Management Procedures

Sand extraction at the Haerses Road Quarry will not occur within two metres of the wet weather groundwater table based on groundwater monitoring and survey information of the working area of the quarry. The wet weather groundwater level will be established immediately prior to commencement of quarrying each Stage. In the event of groundwater being breached, operations in the vicinity of the affected area will cease and Council and the DP&E will be consulted on how extraction may recommence.

Mitigation Measure	Mitigation Measure Implementation	Status
Any additional groundwater monitoring bores required by DEC to be installed and existing monitoring wells to be checked to ensure that they are in good working order.	Groundwater monitoring bores installed or existing are checked for integrity at each monitoring event (i.e. monthly groundwater table level monitoring).	**Compliant**
Extraction not to occur within 2 metres of the groundwater table (wet weather high level) based on groundwater monitoring and survey information of the working area of the quarry. The wet weather groundwater level is to be established prior to commencement of quarrying each stage.	Extraction has not occurred within 2 metres of the groundwater table (wet weather high level) in the Stage 1 or Stage 2 extraction areas of the Haerses Road Quarry.	**Compliant**
In the event of groundwater being breached, operations in the vicinity of the affected area are to cease and Council and the Director-General are to be consulted with respect to the basis upon which extraction may recommence.	Groundwater table has not been breached at the Haerses Road Quarry (see above).	**Not triggered**

5.6.4 Groundwater Monitoring

Monitoring to establish the wet weather groundwater level was conducted prior to commencement of quarrying in Stage 1 and Stage 2. Measurement of the groundwater levels within each of the Haerses Road Quarry monitoring bores is conducted monthly. Review and update of the Maximum Extraction Depth Map will occur prior to the commencement of extraction from each new Stage and reviewed within 3 months of the completion of each Independent Environmental Audit.

A number of the bores originally installed at Hearses Road site have been decommissioned due to their location being in the active quarry operational areas, (i.e. Boreholes H1, H3, H4, H5, H8, H10 and H11). In 2011 two additional boreholes were added to Haerses Road quarry site (BH4 and BH5), bringing the total number of boreholes currently monitored to nine.

Groundwater quality monitoring within each water bearing bores is conducted annually.

The water level of the MTSGS has been monitored and recorded at the Haerses Road Quarry since 2005 while the regional water table of the SCBGS has been monitored and recorded since 2011. Annual summary of groundwater monitoring results, including groundwater level, water quality, and extraction data is reported in the Annual Reviews.

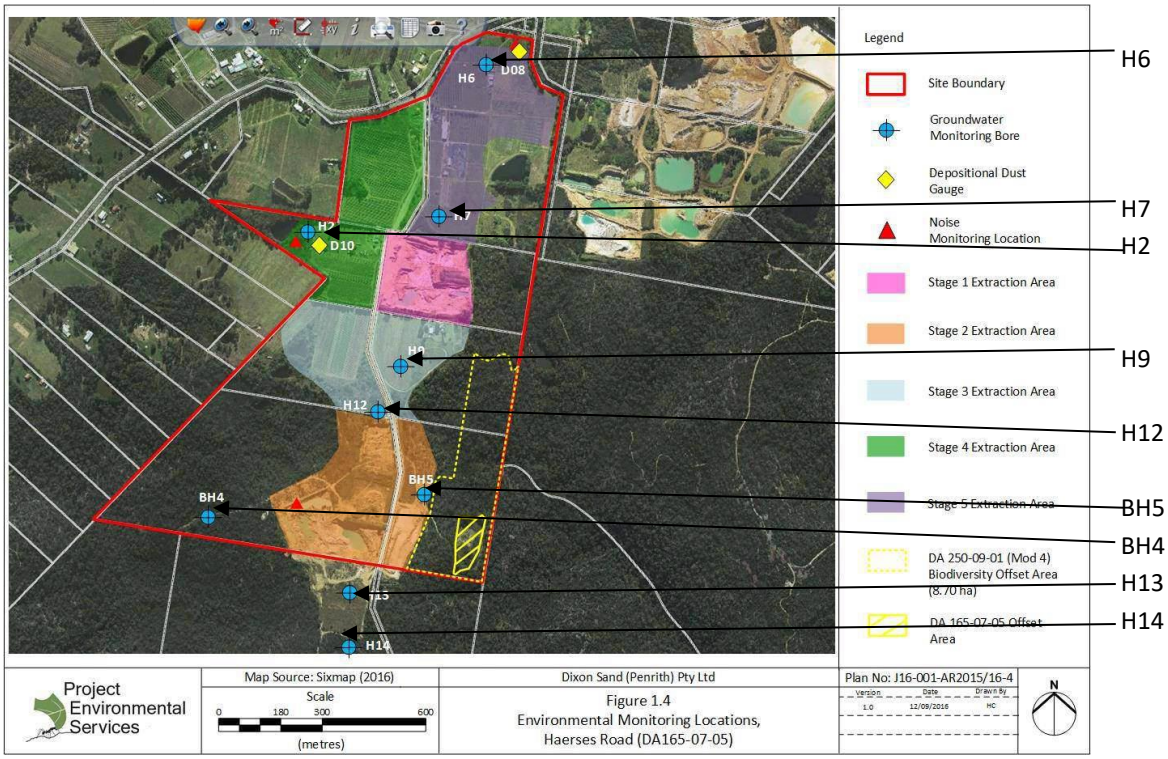

Figure 5.6.4: Groundwater Monitoring Bore Locations – Haerses Road Quarry

5.6.5 Groundwater Monitoring Results

A geotechnical investigation to confirm the depth of the regional groundwater aquifer at both Old Northern Road and Hearses Road sites was undertaken during the 2009-2010. This investigation involved the installation of 2 new groundwater bores (MW8 and MW) at Hearses Road site. Monitoring has continued at the existing bores on site, with the new bores added to the monitoring program.

Groundwater levels measured monthly in all Haerses Road Quarry bores have been relatively stable with minor fluctuations attributable to the rainfall events over the period 2013 to 2016.

Groundwater quality within Haerses Road Quarry boreholes is monitored six monthly. Groundwater quality results for Haerses Road Quarry boreholes indicate that there were some fluctuations in pH and EC, particularly in the old boreholes. These observations are similar to the measurements taken since the commencement of the groundwater monitoring program in 2005. Groundwater quality results for H13 in December 2015 was higher than all previous results for this bore and was considered an anomaly probably due to localised organic fertiliser application directly affecting the immediate perched groundwater aquifer.

5.6.6 Conclusion

The Groundwater Monitoring Program (prepared as section 4.2 of the Site Water Management Plan) was submitted to DoP for approval in July 2006 and approved on 19 April 2007. Groundwater monitoring is also included in the Environmental Monitoring Program July 2006. Groundwater levels measured monthly in all Haerses Road Quarry bores have been relatively stable with minor fluctuations attributable to the rainfall events over the period 2013 to 2016.

Groundwater quality within Haerses Road Quarry boreholes are monitored six monthly and groundwater quality results indicate some fluctuations in pH and EC, particularly in the old boreholes which has similar observations since the commencement of the monitoring program in 2005.

Recommendation:
The groundwater monitoring data from 2005 to 2016 and piezometer locations and depth should be reviewed and assessed to determine if the Maximum Extraction Depth Map approved on 31 August 2006 are still representative of the groundwater aquifer depth in the vicinity of the Haerses Road Quarry.

5.7 Flora and Fauna

5.7.1 Environmental Assessment

5.7.1.1 Environmental Impact Statement - section 6.6, June 2005

A number of threatened species have been recorded in the vegetated areas around the Haerses Road Quarry site, but none are expected to occur within the cleared areas that will be disturbed by quarrying.

The potential impact of proposed quarrying on protected and threatened flora and fauna has been significantly reduced by restricting quarrying activity to the cleared agricultural land and providing a buffer to native vegetation, springs and drainage lines, and Maroota State Forest.

The quarry will not disrupt any fauna movement corridors over the plateau. The proposed development incorporates a buffer totalling 52ha of which approximately 50 hectares is native vegetation.

The quarry plan will disturb approximately 51.9 hectares, which is predominantly cleared agricultural land. The quarry plan will clear scattered turpentine trees planted in rows, and scattered bloodwood trees within the area of woodland to the west of Haerses Road that was disturbed during bushfire fighting activities in 2001.

Broadwater Swamp is approximately eight kilometres to the south of the Haerses Road site and is currently impacted by agricultural land uses downstream of the Haerses Road Quarry site.

The quarry will not significantly impact the quality or quantity of groundwater or surface water flows as extraction will remain at least two metres above the wet weather groundwater level. The proposed quarry will not alter stormwater infiltration rates across the site and no tailings will be disposed at the Haerses Road site. Fines from the processing of sand product from Haerses Road Quarry at the Old Northern Road site will be disposed of in the existing dams on Lots 29 and 196 at Old Northern Road Quarry.

The proposal will not significantly reduce the length of time taken for groundwater to reach downstream ecosystems, as percolation through the sandy substrate into the shallow aquifer is currently rapid.

Provided the surrounding environment continues to function as a wildlife corridor, the proposed Haerses Road Quarry will not cause detrimental impacts on the health of the remaining vegetation in the buffer areas.

The eight-part test considered the impact on the large-eared pied bat and the threatened flora species *Darwinia biflora* and *Tetratheca glandulosa*. The eight-part test under the TSC Act concluded that threatened species, communities and populations are not going to be placed at risk of extinction by the proposed quarry. The proposal will not have a significant effect upon the health and viability of any threatened or migratory species listed under the provisions of the EPBC Act.

5.7.1.2 Environmental Impact Statement - September 2016

A detailed Biodiversity Assessment Report (BAR) was prepared to assess the potential ecological impacts of the Modification using the Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects (FBA).

Dixon Sand is committed to delivering a Biodiversity Offset Strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the Modification under the NSW Biodiversity Offsets Policy for Major Projects (OEH 2014). The proposed extraction area supports 0.08 hectares of Coastal Upland Swamp(s) which is listed under the *Threatened Species Conservation Act 1995* (TSC Act) and *Environment*

Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Modification has been designed to avoid a larger area of this community that occurs to the north of the Modification disturbance area.

It is currently proposed that the biodiversity offset strategy will consist of the establishment of proponent-managed offset sites, including the Haerses Road Offset Site and purchase of credits from the Biodiversity Credits Register for the residual credits that need to be retired.

5.7.2 Biodiversity Management Plan

[Development Consent No.250-09-01 Schedule 2 condition 3.49B]

The Biodiversity Management Plan for the Hearses Road Biodiversity Offset Area (to offset Old Northern Road Quarry disturbance in Lots 1 and 2 DP 547255), was prepared to satisfy the requirements of Development Consent 250-09-01 Schedule 2 condition 3.49B and approved by the DP&E on 4 April 2016.

The Biodiversity Management Plan outlines the management actions, reporting and persons responsible for the management of biodiversity within the Haerses Road Offset Area.

The Biodiversity Management Plan aims to make provisions to:

- Maintain existing areas of high quality forest and woodland vegetation;
- Implement assisted natural regeneration methods to increase the ecological integrity of the Haerses Road Offset Area and to enhance the native vegetation it contains;
- Introduce additional fauna habitat features, where required, to improve the availability of fauna habitat;
- Secure land to create and improve wildlife corridors and link to existing conservation reserves;
- Manage potential conflicts between proposed measures and any Aboriginal heritage values;
- Reduce weed species and feral animal distribution and abundance;
- Reduce areas of erosion;
- Minimise the risk of bushfires; and
- Create a substantial area of high quality habitat for native fauna that will be protected for conservation in the long-term.

5.7.3 Biodiversity Management

The clearing of native vegetation within the Development Consent 250-09-01 Mod 4 area at the Old Northern Road Quarry site has resulted in the need to ameliorate and manage the project impacts to biodiversity and to address residual impacts through the provision of biodiversity offsets.

Key performance indicators for the general maintenance of the Haerses Road Offset Area for erosion, site access and bushfire include:

- Measurable increase in the condition of vegetation;
- Observable reduction of signs of erosion (if any);
- Evidence of restrictions to site access; and
- Observable decrease in bushfire risk.

The Biodiversity Offset Strategy comprises:

- the Old Northern Road Rehabilitation Offset Area (6.83ha) within the Old Northern Road Quarry boundary; and
- the Haerses Road Offset Area (8.7ha), located at Haerses Road, Maroota.

The Haerses Road Quarry Offset Area is within the 8.7ha offset area established for the Old Northern Road Quarry at Haerses Road.

The Biodiversity Management Plan outlines the management actions, reporting and persons responsible for the management of biodiversity within the Haerses Road Offset Area.

To ensure the effective management of vegetation within the Haerses Road Offset Area, management actions will occur within the four vegetation communities across the site. This management zones will involve conservation and management of existing forest and woodland.

5.7.4 Biodiversity Offset Area Monitoring and Management

The monitoring program for the Haerses Road Offset Area includes:

- Collection of baseline data within the vegetation communities;
- Monitoring of native vegetation communities within the site to monitor the condition of native vegetation and to ensure vegetation communities are being maintained by reference to baseline data;
- Monitoring of fauna habitat;
- Monitoring of weed species; and
- Monitoring of feral animals.

The biodiversity offset area monitoring program Key performance indicators (KPIs) and completion criteria will be used to measure and direct the progress of biodiversity management within the Haerses Road Offset Area. Annual monitoring will be undertaken to collect data that can be evaluated against the KPIs to track the progress of the biodiversity management.

Table 5.7.4: Key performance indicators (KPIs) and completion criteria biodiversity management within the Haerses Road Offset Area

Description of Works	Management Objective	Key Performance Indicators	Status
Native Vegetation			
Management and monitoring of retained Vegetation - To be collected in baseline surveys (i.e. first year of monitoring).	Aim to maintain or increase vegetation condition from baseline condition identified during surveys.	% Native over storey cover (NOS)	**Ongoing** Threatened flora and fauna monitoring and survey commenced in September 2016
		% Native mid-storey cover (NMS)	
		% Native groundcover (NGC)	
		Mosses/lichen cover (%)	
		Organic litter cover (%)	
		Rock/bare ground cover (%)	
		Total native species richness (NPS)	
		Native species richness (canopy)	
		Native species richness (mid-storey)	
		Native species richness (groundcover)	
		% Canopy recruitment (REG)	
		Total length (m) of fallen logs (FL)	
Weeds			
Control and monitoring of weed species and their diversity and abundance - Species and extent of weed infestations identified during baseline surveys (i.e. first year of monitoring).	Decrease and control weed diversity, density and abundance.	Decline in weed diversity, density and abundance. Limited recruitment of weed species.	**Compliant Ongoing** Bush-It contractors manage weed control
Feral Animals			

Description of Works	Management Objective	Key Performance Indicators	Status
Control and monitoring of feral animal activity.	Decrease and control feral animal activity and impacts on vegetation and fauna habitat.	Decline in signs of feral animal activity.	**Ongoing** Feral animal surveys conducted with the flora and fauna monitoring program
General Maintenance for Erosion, Site Access and Bushfire			
Management and monitoring of erosion, fences, controlled activities and bushfire risk.	Monitor and control of Erosion. Maintenance of fences; Monitor and control of unauthorized site access. Reduce the risk of bushfires.	Degradation of vegetation, signs of erosion, visible signs of uncontrolled activities and unauthorized site access and increased risk of bushfire.	**Ongoing**

Works undertaken at Haerses Road offset area 2013-2016 by Bush-it Contractors have involved:

- Weed maintenance of the offset area, involving hand weeding, brush cutting and herbicide application, targeting Whiskey Grass, Lantana, Crofton Weed, Paspalum, African Lovegrass, Blackberry and Couch;
- Scattering of logs and soil for habitat formation in the offset area;
- Brush-matting with selected native species at zone 1 has resulted in improvement in the variety and health of native plants;
- Transplanting *Imperata cylindrica* (Blady grass) and Pellaea falcata (Sickle fern) in 2014-2015;
- Planting of 100 trees and shrubs including A*ngophora costata, Eucalyptus piperita, Acacia parramattensis* in 2013-2014*;*
- Direct seeding via leaf litter and topsoil translocation from adjacent bush in 2013-2014.

In 2015-2016, the elimination of Crofton weed (*Ageratina adenophora*) from Haerses Road offset area has been one of the focal management strategy over the years. An integrated approach has been undertaken that involves treatment of the adult plants to suppress flowering and seeding, and minimising the potential for the seed germination. Weeding operation has successfully controlled the spreading of Crofton weed in the offset area and along creek-lines. Bush-It also reported that the growth and regeneration of native flora species in the vegetation offset area is proceeding strongly. Species abundance and diversity, especially in the middle and ground structural layers, are steadily rising. There are many flora species present, such as *Drosera pygmaea* and *Darwinia biflora* (vulnerable), which are only present in this area due to restoration activities such as soil and leaf litter translocations, and Brush matting. All the plantings in this area have a strong survival rate and some of the earlier plantings are reaching a height of 9-10 metres.

In 2014-2015, the regeneration in the soil translocation area has developed into a resilient community with minimal weed invasion, aided by monthly weed control maintenance by Bush-It. The vegetation canopy is now reaching 3-4m in height. The Bush-It report for 2014-2015 concluded that the growth and regeneration of native flora species in the vegetation offset area is proceeding strongly. Species abundance and diversity, especially in the middle and ground structural layers, appeared to be steadily rising. There are many flora species present, such as *Drosera pygmaea* and *Darwinia biflora* (vulnerable), which are only present in this area due to restoration activities such as soil and leaf litter translocations, and Brush matting. All the plantings in this area have a strong survival rate and some of the earlier plantings reaching a height of 8-10 m.

In 2013-2014 the soil translocation into Hearses Rd Offset Area has been successful with a large diversity of species regenerating in the area. Ultimately this area will form a continuation of the surrounding bush and viable habitat for a range of species as the vegetation reaches maturity.

5.7.5 Conclusion

The Biodiversity Management Plan for the Hearses Road Biodiversity Offset Area was approved by the DP&E on 4 April 2016. The management and monitoring of the Hearses Road Biodiversity Offset Area has eliminated Crofton weed (*Ageratina adenophora*) from Haerses Road offset area and ongoing surveys and treatment will

occur as required. Growth and regeneration of native flora species in the offset area is proceeding strongly with species abundance and diversity improving especially in the middle and ground structural layers. There are many flora species present, such as *Drosera pygmaea* and *Darwinia biflora* (vulnerable), that are only present in this offset area due to restoration activities that include soil and leaf litter translocations, and Brush matting. All the plantings in the offset area are showing a high survival rate with some of the earlier plantings reaching a height of 9-10 metres.

5.8 Rehabilitation

[Development Consent 165-07-2005 Schedule 3 conditions 21 to 25]

5.8.1 Rehabilitation and Landscape Management Plan

[Development Consent 165-07-2005 Schedule 3 condition 22]

The Rehabilitation and Landscape Management Plan prepared in consultation with DPI and Baulkham Hills Council, to satisfy Development Consent 165-07-2005 Schedule 3 condition 22 was approved by DoP on 25 July 2007.

The purpose of the Rehabilitation and Landscape Management Plan is to:

- progressively rehabilitate all disturbed areas to a final land use of agricultural land (minimum Class 4) in general accordance with the final landform outlined in the Haerses Road EIS (ERM, 2005);
- ensure that a consistent final landform is achieved on either side of Hitchcock Rd through consultation with local landholders of Lot 167 DP 752039;
- conserve, maintain and enhance the vegetation on the site that will not be disturbed by the quarry;
- establish at least two hectares of vegetation on or adjacent to the site to offset the remnant vegetation removed by the development; and
- undertake screen planting in general accordance with the EIS (ERMA, 2005).

5.8.2 Rehabilitation Bond

[Development Consent 165-07-2005 Schedule 3 conditions 24 and 25]

Development Consent 165-07-2005 Schedule 3 conditions 24 and 25 requires a suitable rehabilitation bond for the Haerses Road development be lodged with the DP&E for the area of disturbance in each 3 year review period, calculated at $\$2.50/m^2$.

The process for lodgement of a Rehabilitation Bond for the 2016 area of disturbance has been instigated. A request was sent to the Westpac Bank on 8 December 2016, to lodge the $300,000.00 bank guarantee for the Rehabilitation Bond required under Development Consent 165-07-2005 Schedule 3 condition 24. Confirmation that the lodgement had been actioned by the Westpac had not been received at the date of this Indpendent Environmental Audit Report (N0vember 2016).

5.8.3 Environmental Assessment

5.8.3.1 Environmental Impact Statement - section 2.8 June 2005

The Haerses Road Quarry site will be rehabilitated with a slope profile suitable for the control of erosion, with the formation of a convex landform adjacent to Wisemans Ferry Road grading to a generally flat to undulating slope across the majority of the site. As the extractable resource generally follows the ridgeline of the site, the quarry floor would be similar but flatter in form than the current landform.

The more elevated portions of the site such as in Stages 1 and 2 will be reduced while the batters to the intersection of Haerses Road and Wisemans Ferry Road will be shaped to blend with the surrounding landscape.

Once the surface water rim is removed, the majority of the south eastern and south western edges of the quarry will blend into the topography of the surrounding landscape when rehabilitated. The quarry floor on the

northern, eastern, southern and north western edges of the site will be backfilled and battered to the top of the surrounding landform with an average grade of 1 in 3 (vertical : horizontal) in compliance with "*Baulkham Hills Shire Council Development Control Plan No. 16 – Extractive Industries" (*DCP 16).

5.8.3.2 Environmental Impact Statement - section 7.2.3 June 2005

Rehabilitation works for the Haerses Road Quarry site will include topsoil spreading, seeding and planting, and maintenance, with mitigation measures to be implemented during the progressive rehabilitation of the site:

- erosion and sediment controls will be retained until rehabilitation works are complete;
- establishment of a Farm Management Plan, outlining general crop management and monitoring practices for the site, including:
  - regular monitoring of the success of revegetation, and reseeding unsatisfactory areas when required;
  - the application of maintenance fertiliser in spring and autumn to pastures less than five years old, and the annual application to established pastures during autumn only.
  - the control of weeds within the quarry area and adjoining buffer zones.
- annual assessment of vegetated and weed infested areas to assess floristic structure and diversity and record any evidence of pests (e.g. rabbits);
- continue noise and air monitoring during rehabilitation works involving earthworks; and
- reduce visual impact of the quarry prior to rehabilitation at the nearest residences to the site.

5.8.3.3 Environmental Impact Statement – September 2016

The Rehabilitation and Landscape Management Plan prepared for the Haerses Road Quarry and approved by DP&E provides a description of the strategies that will be used to rehabilitate the areas disturbed by quarrying operations.

Dixon Sand proposes to progressively rehabilitate the additional extraction area by refilling and contouring the extraction area by emplacement of fines from the wash plant combined with unsuitable material from the quarrying process to achieve a landform generally consistent with the surrounding topography and pre-quarrying landform.

Rehabilitation of the quarry extraction area will be undertaken in accordance with the relevant key principles of the Strategic Framework for Mine Closure (Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia 2000) and encompasses the following objectives:

- provide a safe and stable landform compatible with the intended final land use;
- comply with relevant regulatory requirements;
- reduce the need for long term monitoring and maintenance by achieving effective rehabilitation;
- complete the closure, decommissioning and rehabilitation works as quickly and cost effectively as possible whilst achieving primary objectives;
- provide a sustainable plant cover through rehabilitation of disturbed areas; and
- ensure that the design periods and factors for safety for all site works take into account extreme events and other natural processes such as erosion.

5.8.4 Rehabilitation - Haerses Road

Rehabilitation works at the Haerses Road site has concentrated on the buffer zone and Offset Areas around the quarry site. No rehabilitation within the disturbed areas of Stage 1 and Stage 2 areas has occurred as the quarry works are continuing in these areas.

Works undertaken at Haerses Road Offset Area have predominantly involved:

- Weed maintenance, involving hand weeding, brush cutting and herbicide application targeting Whiskey Grass, Lantana, Crofton Weed, Paspalum, African Lovegrass, Blackberry and Couch;

- Scattering of logs and soil for habitat formation in the offset area; and
- Brush-matting with selected native species.

The elimination of Crofton weed (*Ageratina adenophora*) from Haerses Road offset area has been one of the focal management strategy over the years. An integrated approach has been undertaken which involves treatment of the adult plants to suppress flowering and seeding, and minimising the potential for the seed germination. Weeding operation has successfully control the spreading of Crofton weed in the offset area and along creek lines.

The Haerses Road Quarry has maintained links between the conservation areas, the newly proposed native vegetation rehabilitation corridor and adjoining areas of native vegetation, while known populations of threatened species have been protected from potential impacts of the quarry. The soil translocation into Hearses Road Offset Area has been successful with a large diversity of species regenerating in the area. The newly proposed Biodiversity Offset area which surrounds the existing offset area at Haerses Road will provide an important link for the fauna and flora in the area.

The 2016 Bush-It Report described the growth and regeneration of native flora species in the vegetation Offset Area is proceeding strongly. Species abundance and diversity, especially in the middle and ground structural layers, are steadily rising. There are many flora species present, such as *Drosera pygmaea* and *Darwinia biflora* (vulnerable), which are only present in this area due to restoration activities such as soil and leaf litter translocations, and Brush matting. All the plantings in this area have a strong survival rate and some of the earlier plantings are reaching a height of 9-10 metres.

5.9 Traffic and Transport

[Development Consent 165-07-2005 Schedule 3 conditions 26 to 31]

5.9.1 Road Works

[Development Consent 165-07-2005 Schedule 3 conditions 27 to 31]

Upgrade works on Hearses Road were undertaken by Dixon Sand in accordance with Baulkham Hills Shire Council Works Authorisation Deed dated 16 November 2006. The road works were approved by Baulkham Hills Council on 13 March 2008, indicating that the works undertaken and the alignment of the road meets the requirements of Council.

Dixon Sand arranged for the construction of a Type AUR treatment of the intersection of Haerses Road and Wisemans Ferry Road and a Final Certificate was issued by RMS on 4 September 2014.

5.9.2 Transport Records

[Development Consent 165-07-2005 Schedule 3 condition 26]

Dixon Sand keeps records of the amount of product transported from the Hearses Road Quarry to the Old Northern Road Quarry for processing each year, and the amount of product transported directly from the Hearses Road Quarry site to local and regional markets. The truck movements and tonnage of product transported is reported monthly to the Council for Section 94 Contributions. The records of all truck movements in and out of the Hearses Road Quarry site each year are kept on the weighbridge dockets and a summary of truck movements and product tonnage is reported in the Annual Reviews.

5.9.3 Environmental Assessment - September 2016

The proposed Modification to the Haerses Road Quarry lodged with DP&E in September 2016 would not change the total traffic movements for the quarry. The ability to transport a greater proportion of product direct to market would result in a decrease in truck numbers on Old Northern Road passing Maroota Public School and the township of Maroota.

The key intersections potentially affected by the Modification are the 'T' intersection of Haerses Road with Wisemans Ferry Road and Wisemans Ferry Road with Old Northern Road.

A Sidra intersection analysis completed at the intersection of Old Northern Road and Wisemans Ferry Road confirmed that the intersection operates well with negligible delays and congestion. All movements have Level of Service A and the delays are less than 7 seconds for all movements. It is considered that the intersection of Haerses Road and Wisemans Ferry Road would operate to a similar level of service and delays. With no increase to the truck numbers at this location the intersection will continue to operate at this level of service.

5.9.3 Conclusion

Upgrade works on Hearses Road were undertaken and approved by Baulkham Hills Council on 13 March 2008. Construction of a Type AUR intersection at Haerses Rd and Wisemans Ferry Road was completed and a Final Certificate issued by RMS on 4 September 2014. Truck movements and tonnage of product transported is reported monthly to The Hills Shire Council for Section 94 Contributions. The records of all truck movements in and out of the Hearses Road Quarry site each year are kept on the weighbridge dockets and a summary of truck movements and product tonnage is reported in the Annual Reviews.

5.10 Waste

[Development Consent 165-07-2005 Schedule 3 condition 32]

5.10.1 Environmental Impact Statement

[Environmental Impact Statement - section 6.13, June 2005]

The Waste Avoidance and Resource Recovery (WARR) Act, Waste Strategy (2003) emphasizes a life cycle approach to waste management. Two key areas identified by the Waste Strategy are the avoidance and prevention of generation of waste and the increased use of renewable and recovered materials.

The Haerses Road Quarry development will involve the handling and production of waste from a limited number of sources:

- vegetative matter from minor clearing;
- overburden from extraction works;
- tailings from the washing plant on Lot 196;
- used oils, filters and machinery parts;
- wastewater from amenities block and remaining houses on Haerses Road site; and
- minor amount of general office and administrative waste.

Operation of the Haerses Road Quarry will incorporate waste reduction strategies in accordance with the NSW Waste Management Hierarchy: avoid, re-use, recycle/reprocess, dispose. Waste management will be reported in the Annual Reviews submitted to DP&E and Council. The Annual Review will include information on the type, composition and quantity of material removed and recycled and the method of disposal.

5.10.2 Waste Management

[Development Consent 165-07-2005 Schedule 3 condition 32]

Waste management for the Haerses Road Quarry will be integrated with the management practices applied to waste from the Old Northern Road Quarry operations. Tailings disposal for the Haerses Road Quarry product processed at the Old Northern Road Quarry plant will occur to the tailings disposal area on Lots 29 and 196 of the Old Northern Road Quarry site.

The quarry will reuse vegetative matter, overburden and clay interburden during the progressive rehabilitation of the Haerses Road Quarry area, and maintain the use of selected septic systems in the north of the site. Existing waste management measures on Lot 196 will be used for waste oils, filters and parts, and general office waste, while any waste from demolition of buildings on the Haerses Road site would be recycled where possible.

5.10.3 Conclusion

Operation of the Haerses Road Quarry development will incorporate waste reduction strategies in accordance with the NSW Waste Management Hierarchy (i.e. avoid, re-use, recycle/reprocess, dispose).

Waste management for the Haerses Road Quarry will be integrated with practices applied at the Old Northern Road Quarry site. Tailings generated from the processing of the Haerses Road Quarry product will be disposed of to the tailings disposal area on Lots 29 and 196 of the Old Northern Road Quarry site.

5.11 Bushfire

[Development Consent 165-07-2005 Schedule 3 condition 33]

5.11.1 Bushfire Management Plan

[Development Consent 165-07-2005 Condition 33(c)]

A Bushfire Management Plan was developed in consultation with developed in consultation with The Hills Shire Council and relevant emergency services (RFS and SES) to satisfy Development Consent 165-07-2005 Schedule 3 condition 33 and approved by DP&E on 1 November 2016.

The Bushfire Management Plan outlines mitigation measures to prevent the occurrence of unplanned bushfire and to minimise the danger of the spread of bushfires on or from Dixon Sand owned land.

The objectives of the Bushfire Management Plan are:

- Quarry activities will be managed in the way that risk of human-induced fire outbreak is minimised;
- In the event of a bushfire outbreak, mitigation measures are in place to contain and prevent the fire from spreading;
- Liaise with and provide support to the RFS should a fire outbreak occurs on the quarry site; and
- Undertake appropriate investigation for any outbreak of fire to determine the cause and measures to prevent similar events from occurring.

A set of bushfire mitigation measures implemented for the Haerses Road Quarry have been formulated for the Haerses Road site to ensure that Dixon Sand effectively minimises the risk of damage to life, property and the environment in the event of a bush fire.

The Bushfire Management Plan is consistent with any bushfire management measures for State Forests and National Parks in the region to minimise the risk of damage to life, asset, properties, and the environment in the event of a bush fire.

5.11.2 Environmental Impact Statement

[Environmental Impact Statement - section 3 June 2005]

The proposed Haerses Road Quarry development is within the Rural 1(b) zone. The proposal will not require the provision of any additional services and will not increase the risk of bushfire or other hazards on the site.

Approximately half the site is identified as having 'Vegetation Category 1' while the remaining areas of the site are classified as 'Vegetation Buffer (100m or 30m)' or are unclassified on Baulkham Hills Shire Council's Bush

Fire Prone Land map (Sheet 12, 11/7/2004). The development will remain within cleared areas and will not increase the bushfire hazard.

Haerses Road will continue to provide access to Wisemans Ferry Road and will remain open for the access of bushfire fighting personnel and equipment during the development and operations of the quarry. The proposal will progressively decrease the demand for emergency services through the demolition of the majority of structures currently on the site. The proposed quarry will be within cleared areas while the majority of Haerses Road will be progressively quarried and provide access to the site.

The mobile plant used at the quarry site, comprising front end loader, bulldozer and water cart would all be available for local fire-fighting if requested. Water supply for the fighting of fires and replenishment of firefighting tankers would be provided from the existing dams on the quarry property. The quarry development will progressively decrease the bushfire hazard on the site, along with the demand for emergency services.

Response procedures for the control of accidental fires will be established and training sessions on bushfire hazards and fire control will be provided for all employees. Potential fire hazards will be identified and coordinated response procedures will be established with Council and the Rural Fire Service, and spark arresters will be fitted on all equipment and fire extinguishers fitted to all quarry site vehicles.

5.11.3 Conclusion

The Bushfire Management Plan developed in consultation with The Hills Shire Council and relevant emergency services (RFS and SES) for the Harerses Road Quarry and Old Northern Road Quarry, provides a clear and detailed strategy for the management of any outbreak of fire on the quarry site. The implementation of the procedures in the Bushfire Management Plan appear to be satisfactory for the response to fuel loads management and fire response at the Dixon Sand quarries at Maroota.

5.12 Aboriginal Heritage

5.12.1 Environmental Assessment

[Environmental Impact Statement - section 6.10 June 2005]

5.12.1.1 Aboriginal Heritage

An Aboriginal heritage assessment conducted for the Environmental Impact Assessment (June 2005) by ERMA found no archaeological sites or areas of potential deposit within the Haerses Road Quarry area. Aboriginal AHIMS site #45-2-0081 is within the 40m buffer to the eastern boundary of the Haerses Road Quarry and is now contained within the the 8.7ha Biodiversity Offset Area established for the Old Northern Road Quarry under Develolpment Consent 250-09-01 MOD 4 Schedule 2 condition 3.49. The AHIMS site #45-2-0081 is protected by fencing with ample signage that clearly delineates the NO-GO zone

Quarrying will not significantly compromise the highly disturbed cultural landscape of the site. In the event any cultural material is exposed during quarrying, works that disturb the soil surface or subsurface will immediately cease, and a representative of the OEH contacted.

5.12.1.2 European Heritage

No European heritage items are listed on the heritage databases, registers or inventories are within the boundary of the Haerses Road Quarry area. No area or structures that might contain historical archaeological deposit, such as wells or dumps, were found during the heritage survey conducted for the Environmental Impact Statement (June 2005).

5.13 Visual Amenity

5.13.1 Environmental Assessment

[Environmental Impact Statement - section 6.12, June 2005]

The site is within a rural environment on the Maroota Ridge, bounded by the gullies of Little Cattai Creek to the east, Stone Chimney Arm to the south west and Wisemans Ferry Road to the north. There are views towards the quarry from neighbouring residences and points along Wisemans Ferry Road and Old Northern Road. Measures to minimise views to the Haerses Road site include the retention and planting of trees between the proposed quarry and Wisemans Ferry Road, vegetated bunding to residences to the north east and north west, and progressive rehabilitation. Where possible, the final landform will be designed to blend with the surrounding landscape to reduce long-term visual impact in the Maroota area.

The site is currently visible from several vantage points, listed in order of decreasing viewpoint sensitivity:

- residences to the north east, east and north west of the site. The nearest residences (receptor 1) are 20 metres to the north east and currently have views looking south to the site;
- Two residences to the east of Hitchcock Road have middle distance views of the quarry;
- Several residences along Wisemans Ferry Road adjacent to the site have middle distance views of the quarry when looking east;
- Motorists on Wisemans Ferry Road have foreground views of the site in between sparse roadside vegetation and existing dwellings on the site; and
- The exposed sand within the cleared areas of Stage 2 is visible in the far distance to motorists at one point on Old Northern Road at the southern end of Old Telegraph Road approximately 1.6 kilometres east of the site and two kilometres south of the Wisemans Ferry and Old Northern Road intersection. The site is otherwise screened from Old Northern Road.

5.13.2 Conclusion

Due to the existence of extractive and rural industries within the Haerses Road Quarry visual catchment, the quarry is not alien in this landscape. Due to the staging of operations and with progressive rehabilitation of the site, operations will have low visual impact on the surrounding area. Where sensitive viewpoints have been identified, significant vegetation buffers and sensitive quarry design has been incorporated to ameliorate negative visual impacts (this includes a 30m buffer and planting conducted in October 2016, along Wisemans Ferry Road).

6. Conclusions

The Independent Environmental Audit of the Dixon Sand Haerses Road Quarry project at Maroota was conducted in November 2016 in accordance with Development Consent 165-07-2005 Schedule 5 condition 6.

The Haerses Road Quarry is considered to be operating generally in compliance with the conditions of the Development Consent 165-07-2005.

The Independent Environmental Audit assessed the status of the approval conditions on the date of the Haerses Road Quarry site audit, and also assessed the status of Dixon Sand responses to the Department of Planning and Environment (DP&E) Compliance Audit reported in December 2015. The status of the DP&E findings has indicated that the majority of the Non-Compliances had been addressed with the remaining matters related to document review and revision, to be actioned following the findings of this audit.

The current Independent Environmental Audit identified six (6) Administrative Non-compliances and one (1) low risk non-compliances with Development Consent 165-07-2005 conditions, at the date of this Independent Environmental Audit.

Non-compliance - low risk

Non-compliance - low risk (i.e. Non-compliance with the potential for moderate environmental consequences, but is unlikely to occur, or, potential for low environmental consequence but is likely to occur)

Schedule 3 condition 2	Prior to carrying out any development, the Applicant shall: (a) establish the wet weather groundwater level for the site based on at least 12 months of site specific groundwater monitoring data; (b) engage an appropriately qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 10 of Schedule 2; (c) submit a Maximum Extraction Depth Map (contour map or similar) for the development to the Director-General; and (d) comply with the extraction depths specified in the map, to the satisfaction of the Director-General.	Extraction areas will be monitored for groundwater levels and periodically surveyed. Extraction has occurred 4-5 metres above the maximum wet weather groundwater level established in the approved Maximum Extraction Depth Map dated 31 August 206, prior to commencement of the Stage 1 and Stage 2 quarry works. The Maximum Extraction Depth Map was not reviewed and/or revised following the 2012 Independent Environmental Audit. **Recommendation:** The groundwater monitoring data from 2005 to 2016 and piezometer locations and depth should be reviewed and assessed to determine if the Maximum Extraction Depth Map approved on 31 August 2006 are still representative of the groundwater aquifer depth in the vicinity of the Haerses Road Quarry.

Administrative Non-Compliance

Administrative Non-Compliance – A technical non-conformance with a condition of the consent that would not result in any risk or material harm to the environment.

Schedule 3 condition 3	Within 3 months of the completion of the Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review and update the Maximum Extraction Depth Map for the	The Maximum Extraction Depth Map had not been reviewed and/or revised following the 2012 Independent Environmental Audit. The Maximum

	development to the satisfaction of the Director-General.	Extraction Depth Map should be reviewed and updated if necessary following the assessment of the groundwater data conducted to address the recommendation in condition 2.
Schedule 3 condition 20	Within 3 months of the completion of each Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review, and if required, revise the Site Water Management Plan to the satisfaction of the Director-General.	The Site Water Management Plan was not reviewed/revised following the 2012 Independent Environmental Audit. The Site Water Management Plan and Environmental Monitoring Program should be reviewed, and revised if necessary, to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.
Schedule 3 condition 23	Within 3 months of the completion of each Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review and if required revise the Rehabilitation and Landscape Management Plan for the development to the satisfaction of the Director-General.	The Rehabilitation and Landscape Management Plan was not reviewed / revised following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Rehabilitation and Landscape Management Plan should be reviewed, and revised if necessary, to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.
Schedule 5 condition 2	Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below) the Applicant shall review, and if necessary revise, the Environmental Management Strategy to the satisfaction of the Director-General.	The Environmental Management Strategy was not reviewed/revised following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Environmental Management Strategy should be reviewed, and revised if necessary, to ensure the Environmental Management Strategy still represents the procedures implemented on the Hearses Road Quarry site.
Schedule 5 condition 3	Prior to the commencement of the development the Applicant, shall prepare (and following approval) implement an Environmental Monitoring Program for the development in consultation with relevant agencies, and to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements in Schedule 3 of this consent into a single document.	The Environmental Monitoring Program was prepared and approved by DoP on 31 August 2006 for the Haerses Road Quarry project. This Environmental Monitoring Program consolidates the various monitoring requirements in Schedule 3 of this consent into a single document. Monitoring requirements in Schedule 3 Include: Condition 10 - noise monitoring Condition 14 - air quality monitoring Condition 19 – groundwater monitoring Condition 23 – rehabilitation performance monitoring Condition 32 – waste generation monitoring

		The Environmental Monitoring Program does not include waste and rehabilitation monitoring. The Environmental Monitoring Program should be reviewed and revised to include all monitoring required under Development Consent 165-07-2005 Schedule 3.
Schedule 5 condition 4	Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below), the Applicant shall review, and if necessary revise, the Environmental Monitoring Program to the satisfaction of the Director-General.	The Environmental Monitoring Program was not reviewed/revised following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Environmental Monitoring Program should be reviewed, and revised if necessary, to ensure the Plan and Program still represents the monitoring required for the Hearses Road Quarry site.

The Environmental Monitoring Program prepared to satisfy Development Consent 165-07-2005 Schedule 5 condition 3 was approved by Department of Planning on the 31 August 2006. The approved Environmental Monitoring Program addressed noise, air and groundwater monitoring but does not include waste and rehabilitation monitoring.

Recommendation:
The review and revision of the Environmental Monitoring Program should include all monitoring required under Development Consent 165-07-2005 Schedule 3 for noise, air quality and groundwater across the site in accordance with conditions 10, 14 and 17(b), respectively of Schedule 3, and also include rehabilitation performance monitoring (condition 23), and waste generation monitoring (condition 32).

Attachments

Attachment A Development Consent 165-07-2005

Attachment B Environment Protection Licence 12513

Assessment of compliance with the intent of the Development Consent 165-07-2005 and Environment Protection Licence 12513 conditions are expressed in these Attachments to the Independent Environmental Audit as:

Status	Description
Compliant	Where verifiable evidence has been collected to demonstrate that the intent of the elements of the requirements of the regulatory approval and appropriateness of implementation against the Project Approval Condition has occurred.
Compliant Ongoing	The intent and specific requirements of the condition have been met and the requirements are ongoing for the operation of project.
Administrative Non-compliance	A technical non-conformance with a condition of the consent that would not result in any risk or material harm to the environment (e.g. the submission of a report to government later than required under the approval conditions).
Non-Compliance – Low Risk	Non-compliance with the potential for moderate environmental consequences, but is unlikely to occur, or, potential for low environmental consequence but is likely to occur.
Non-Compliance – Moderate Risk	Non-compliance with the potential for serious environmental consequences but unlikely to occur, or, potential for moderate environmental consequence but likely to occur.
Non-Compliant – High Risk	Non-compliance with the potential for significant environmental consequences, regardless of the likelihood of occurrence.
Not active / Not triggered	A regulatory approval requirement / condition has an activation or timing that had not been triggered at the time of the audit, therefore a determination of compliance could not be made.
Noted	A statement or fact where no assessment of compliance is required.

Attachment A

Development Consent 165-7-2005

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>Schedule 2</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Obligation to Minimise Harm to the Environment</td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development</td><td></td><td>The implementation of the Management Plans, Induction of all staff and contractors and the Traffic Management Policy help minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the Haerses Road Quarry.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Terms of Approval</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>The Applicant shall carry out the development generally in accordance with the:
a) DA 165-7-2005
b) EIS titled Dixon Sand (Penrith) Pty Limited Haerses Road Sand Quarry EIS, dated June 2005,
c)conditions of this consent</td><td>• Environmental Impact Statement - Dixon Sand (Penrith) Pty Limited Haerses Road Sand Quarry, Jun 2005
• Development Consent 165-7-2005</td><td>The Haerses Road Quarry is being developed generally in accordance with the EIS titled Dixon Sand (Penrith) Pty Limited Haerses Road Sand Quarry EIS, June 2005, and conditions of Development Consent 165-7-2005.</td><td>Compliant Ongoing</td></tr>
<tr><td>3</td><td>If there is any inconsistency between the above, the conditions of this consent shall prevail to the extent of the inconsistency.</td><td></td><td>No significant inconsistencies between the EIS and the conditions of this consent have been noted.</td><td>Noted</td></tr>
<tr><td>4</td><td>The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
(a) any reports, plans or correspondence that are submitted in accordance with this consent; and
(b) the implementation of any actions or measures contained in these reports, plans or correspondence.</td><td></td><td></td><td>Noted</td></tr>
<tr><td></td><td>Limits on Approval</td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>This consent shall lapse 25 years after the date it commence</td><td></td><td>This Development Consent was granted on 14 February 2006 and will lapse in February 2031.</td><td>Noted</td></tr>
<tr><td>6</td><td>The Applicant shall not extract more than 250,000 tonnes of sand a year from the quarry</td><td>• Production Yearly Summary Financial Year 2015-2016
• Annual Review 2015-2016
• Annual Review 2014-2015
• AEMR 2013-2014</td><td>Extraction of product from the Haerses Road Quarry has not exceeded 250, 000 tonnes of sand a year.
<table>
<tr><th>1 July to 30 June</th><th>Tonnage of Product Extracted</th></tr>
<tr><td>2013-2014</td><td>105,112 tonnes</td></tr>
<tr><td>2014-2015</td><td>85,139 tonnes</td></tr>
<tr><td>2015-2016</td><td>35,875 tonnes</td></tr>
</table></td><td>Compliant</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td>7</td><td>The Applicant shall not transport more than 60, 000 tonnes of sand a year to local and regional markets directly from the quarry.</td><td>• Truck Movements and Production Summary Financial Year 2015-2016
• Annual Review 2015-2016
• Annual Review 2014-2015
• AEMR 2013-2014</td><td>Transport of sand directly from Haerses Road Quarry to local and regional markets has not exceeded 60,000 tonnes per year. During 1 July 2015 to 30 June 2016 5,442 tonnes were transported directly to markets from Haerses Road Quarry.</td><td>Compliant Ongoing</td></tr>
<tr><td>8</td><td>The Applicant shall not transport more than190, 000 tonnes of sand a year from the quarry to the existing quarry for processing.</td><td>• Truck Movements and Production Summary Financial Year 2015-2016
• Annual Review 2015-2016
• Annual Review 2014-2015
• AEMR 2013-2014</td><td>Transport of sand from Haerses Road Quarry to the Old Northern Road Quarry for processing has not exceeded 190,000 tonnes per year.
<table><tr><th>1 July to 30 June</th><th>Tonnage of Product Transported to ONR</th></tr><tr><td>2013-2014</td><td>112,828 tonnes</td></tr><tr><td>2014-2015</td><td>93,699 tonnes</td></tr><tr><td>2015-2016</td><td>76,548 tonnes</td></tr></table></td><td>Compliant Ongoing</td></tr>
<tr><td>9</td><td>The Applicant shall limit all truck movements from Wisemans Ferry Road into the quarry to right hand turn movements that comprise of the following:
a) A maximum of 10 right hand turn movements between the hours of 6am and 7am for the life of the development
b) A maximum of 15 right hand turn movements per day until such time that the intersection between Haerses Road and Wisemans Ferry Road has been upgraded to a Type AUR road
c) A maximum of 28 right hand turn movements per day following the upgrade of the intersection between Haerses Road and Wiseman’s Ferry Road Type ‘AUR’ treatment to the satisfaction of the RTA (see condition 32 of Schedule 3);</td><td>• Truck Movements Summary Financial Year 2015-2016
• Truck Movements Summary Financial Year 2014-2015
• Letter from RMS re Wisemans Ferry / Haerses Road Intersection Upgrade, - Final Certificate, 4 Sep 2014</td><td>Truck movements from Wisemans Ferry Road into the Haerses Road Quarry (truck transfers are undertaken by one truck owner):
a) have not exceeded 10 right hand turn movements between 6am and 7am;
b) did not exceed 15 right hand turn movements per day prior to the intersection between Haerses Road and Wisemans Ferry Road upgrade to a Type AUR road; and
c) has not exceeded 28 right hand turn movements per day following the Wisemans Ferry / Haerses Road Intersection Upgrade.</td><td>Compliant Ongoing</td></tr>
<tr><td>10</td><td>The Applicant shall not undertake any extraction within 2 metres of the established wet weather groundwater level.
Note: The wet weather groundwater level shall be established in accordance with condition 2 of Schedule 3.</td><td>•</td><td>Refer to Schedule 3 Condition 3
No any extraction had occurred within 2 metres of the established wet weather groundwater level, at the date of this audit (November 2016).</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Structural Adequacy</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>The Applicant shall ensure that all new buildings, and any alterations to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.
Notes:
Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.
Part 8 of the EP&A Regulation sets out the requirements for the certification of development.</td><td>•</td><td>No buildings have been constructed on the Haerses Road Quarry site. A small demountable is on site as a crib room and site office.</td><td>Not triggered</td></tr>
<tr><td></td><td>Demolition</td><td>•</td><td></td><td></td></tr>
</table>

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
12	The Applicant shall ensure that all demolition work is carried out in accordance with Australian Standards *AS 2601-2001: The Demolition of Structures,* or its latest version.	•	No demolition work has occurred on the Haerses Road Quarry site.	**Not triggered**
	Operation of Plant and Equipment	•		
13	The Applicant shall ensure that all plant and equipment used at the site is: a) Maintained in a proper and efficient condition b) Operated in a proper and efficient manner	•	Plant and equipment used at the Haerses Road Quarry site was observed to be maintained and operated in a proper and efficient condition.	**Compliant Ongoing**
	Protection of Public Infrastructure	•		
14	The applicant shall: a) Repair or pay the costs of repair for any public infrastructure that is damaged by the development b) Relocate or pay the full costs associated with relocating any public infrastructure that needs to be relocated.	•	No damage or relocation of public infrastructure has occurred during the development of the Haerses Road Quarry, beyond that described in the Environmental Impact Statement (2005), related to the Haerses Road alignment.	**Ongoing**
	Section 94 Contributions	•		
15	The applicant shall pay a contribution of 75 cents per tonne of material hauled from the site to Council for the maintenance/repair of public roads in accordance with Council's *Contributions Plan No: 6 – Extractive Industries,* to the satisfaction of Council.	• *Contributions Plan No: 6 – Extractive Industries,* Baulkham Hills Shire Council • Section 94 Contributions – Monthly to Hill Council, Dixon Sand 2015-2016 • Letter from The Hills Council re Contribution Rate, 3 Aug 2016	Section 94 Contributions are calculated and paid monthly to The Hills Council at a current rate of 0.99c (dated 3 August 2016) for extracted material transported on public roads, from both Old Northern Road and Hearses Road Quarries.	**Compliant Ongoing**
	SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS			
	GENERAL EXTRATION PROVISIONS			
	Setbacks and boundaries			
1	Within 6 months of the date of this consent, the Applicant shall: (a) engage a registered surveyor to mark out the boundaries of the: * approved limits of extraction; and * buffer zones and setback requirements of the Baulkham Hills Shire Council Development *Control Plan No. 16 – Extraction Industries;* (b) submit a survey plan of these boundaries to the Director-General; and (c) ensure that the boundaries of each operational extraction area is clearly marked on site in a permanent manner that allows operating staff and inspecting officers to clearly identify these limits, to the satisfaction of the Director-General	• Plan Showing Extent of Extraction Area at Proposed Sand Mine, Wisemans Ferry Road Maroota, Plan No. 91972: E.1, McKinlay Morgan & Associates Jul 2006 • Letter to DoP re Survey Plan, 28 Jul 2006Letter from DoP re Survey Plan, 31 Jul 2006	The extraction area survey plan No. 91973.E.1 dated 9 June 2006 was submitted to the DoP and approved on 31 July 2006. Boundary markers for the operational extraction areas were installed, and the markers were re-instated in September 2015.	**Compliant**
	Maximum Extraction Depth Map			

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td>2</td><td>Prior to carrying out any development, the Applicant shall:
(a) establish the wet weather groundwater level for the site based on at least 12 months of site specific groundwater monitoring data;
(b) engage an appropriately qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 10 of Schedule 2;
(c) submit a Maximum Extraction Depth Map (contour map or similar) for the development to the Director-General; and
(d) comply with the extraction depths specified in the map,
to the satisfaction of the Director-General.</td><td>• Letter from DoP re Approval Maximum Extraction Depth Map, 31 Aug 2006
• Letter from DoP re Approval of Environmental Management Strategy, 19 Apr 2007
• Letter from DoP re Rehabilitation and Landscape Management Plan, 25 Jul 2007
• Environmental Assessment Haerses Road Quarry Extraction Area Modification section 6.3.2, Sep 2016</td><td>Extraction areas are monitored for groundwater levels and periodically surveyed. Extraction has occurred 4-5 metres above the maximum wet weather groundwater level established in the Maximum Extraction Depth Map dated 31 August 2006.
Recommendation:
The groundwater monitoring data from 2005 to 2016 and piezometer locations and depth should be reviewed and assessed to determine if the Maximum Extraction Depth Map approved on 31 August 2006 are still representative of the groundwater aquifer depth in the vicinity of the Haerses Road Quarry.</td><td>Compliant Ongoing</td></tr>
<tr><td>3</td><td>Within 3 months of the completion of the Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review and update the Maximum Extraction Depth Map for the development to the satisfaction of the Director-General.</td><td>• Independent Environmental Audit, SMEC 2012
• Environmental Assessment Haerses Road Quarry Extraction Area Modification section 6.3.2, Sep 2016</td><td>The Maximum Extraction Depth Map had not been reviewed and/or revised following the 2012 Independent Environmental Audit. The Maximum Extraction Depth Map should be reviewed and updated if necessary following the assessment of the groundwater data conducted to address the recommendation in condition 2.</td><td>Administrative Non-Compliance</td></tr>
<tr><td></td><td>Extraction Sequence</td><td>•</td><td></td><td></td></tr>
<tr><td>4</td><td>Unless otherwise authorized by the DG, the applicant shall ensure the extraction is undertaken in accordance with the extraction plan and sequence in Figure 2.3 (a-d) of the EIS</td><td>• Environmental Impact Statement - Dixon Sand (Penrith) Pty Limited Haerses Road Sand Quarry, Jun 2005</td><td>The extraction from the Haerses Road Quarry is progressing generally in accordance with the sequence outlined in Figure 2.3a of the Environmental Impact Statement 2005. Extraction was occurring in Stage 1 and Stage 2 at the date of this audit (November 2016). The timing of the staging of extraction (outlined in the Environmental Impact Statement 2005) has been delayed due to changing market demands.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Noise</td><td>•</td><td></td><td></td></tr>
<tr><td></td><td>Noise Impact Assessment Criteria</td><td>•</td><td></td><td></td></tr>
<tr><td>5</td><td>The Applicant shall ensure that the noise generated by the development does not exceed the noise impact assessment in Table 1.
Table 1: Noise impact assessment criteria dB(A)
<table>
<tr><th>Day</th><th colspan="2">Shoulder 6.00am to 7.00am</th><th rowspan="2">Land</th></tr>
<tr><th>LAeq (15 minute)</th><th>LAeq (15 minute)</th><th>LA(max)</th></tr>
<tr><td>37</td><td>37</td><td></td><td>F & J Roberts and J & D Young</td></tr>
<tr><td>40</td><td>40</td><td></td><td>E. Ramm</td></tr>
<tr><td>38</td><td>38</td><td>45</td><td>M. Ramm</td></tr>
<tr><td>37</td><td>37</td><td></td><td>B. Ramm</td></tr>
</table></td><td>• Letter of Agreement between Lot 167 DP 752039 and Dixon Sand Pty Ltd, 18 Mar 2005
• Letter of Agreement between E H Ramm and Dixon Sand, 11 Oct 2005
• Letter of Agreement between Lot 214 DP752039 and Dixon Sand, 12 Dec 2005</td><td>Noise monitoring results for the Haerses Road Quarry have been generally compliant with the noise impact assessment criteria.

Measures undertaken to minimise the risk of noise exceedances from the Hearses Road Quarry operations included discontinuing the use of the Commander screener / crusher at Haerses Road and processing all product at the Old Northern Road plant.
Noise Agreements are in place with:
• E H Ramm, Portion 91 DP397251
• Breen Holding Pty Ltd, Lot 214 DP 752039
• P F Graham, Lot 167 DP752039</td><td>Compliant Ongoing</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><td>35</td><td>35</td><td></td><td>All other residences on privately owned land</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td></td><td>
• If the Applicant has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DEC, then the Applicant may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.
• Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a swelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the LAeq (15 minute) noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 1 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise policy shall also be applied to the measured noise levels where applicable.
• Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the LA(max) noise limits in the above table.
• The noise emission limits identified in the above table apply under meteorological conditions of wind speeds of up to 3 m/s at 10 metres above ground level, except under conditions of temperature inversions.
</td><td>•</td><td></td><td>Noted</td></tr>
<tr><td></td><td>Operating Hours</td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>
The applicant shall comply with the operating hours in Table 2:
<table>
<tr><th>Activity</th><th>Days of the Week</th><th>Time</th></tr>
<tr><td>• Vehicle access to and from the site; and
• Sand loading onto vehicles</td><td>Monday–Saturday

Sunday and Public holidays</td><td>6am to 7am

No work at any time</td></tr>
<tr><td>• Topsoil/overburden stripping;
• Sand extraction and screening;
• Vehicle access to and from the site;
• Vehicle refuelling and washing;</td><td>Monday – Saturday

Sunday and Public holidays</td><td>7am to 6pm

No work at any time</td></tr>
</table>
</td><td>•</td><td>Sand extraction activities at the Hearses Road Quarry site only occur between 7.00am and 6.00pm Monday to Saturday.

Transport of product form the Hearses Road Quarry to the Old Northern Road Quarry for processing can only occur between 6.00am and 6.00pm to comply with the hours of operation of the Old Northern Road Quarry Development Consent 250-09-01 MOD 4 Schedule 2 condition 3.42.</td><td>Compliant Ongoing</td></tr>
</table>

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	• Sand loading onto vehicles; • Site rehabilitation, and • Maintenance works. — Monday – Friday: 8am to 5pm • Road and intersection works on Haerses Road and Wiseman's Ferry Road; and • Acoustic bund construction — Saturday, Sunday and Public holidays: No work at any time *Note: Delivery of material outside of the hours of operation permitted by condition 6 is only allowed, where that delivery is required by the police or other authorities for safety reasons; and/or where the operation or personnel or equipment are endangered. In such circumstances, prior notification be provided to the DEC and affected residents as soon as possible, or within a reasonable period in the case of emergency.*			
	Acoustic Bund Construction			
7	The Applicant shall construct the two acoustic bunds outlined in Figure 6.8 of the EIS (as reproduced in Appendix 2) to the satisfaction of the Director-General. The construction of the acoustic bunds must be restricted to the following schedule: (a) Western Bund: 3 weeks/year for 3 years starting in year 9; (b) Northern Bund: 3 weeks in year 11.		Only Stage 1 and Stage 2 excavation areas have commenced so the requirement for the construction of the western and northern acoustic bunds has not been triggered.	**Not yet triggered**
8	Prior to the construction of any acoustic bunds, the Applicant shall develop (and following approval implement) an Acoustic Bund Construction Noise Management Plan, which details the procedures that would be undertaken to: (a) keep surrounding residents informed of the proposed timing and duration of bund construction; (b) minimise and mitigate the noise impacts generated by the works; and (c) receive, handle and respond to complaints relating to the works.		Only Stage 1 and Stage 2 excavation areas have commenced so the requirement for the preparation of the Acoustic Bund Construction Noise Management Plan for the western and northern acoustic bunds, has not been triggered.	**Not yet triggered**
	Continuous Improvement			
9	The Applicant shall: (a) Investigate ways to reduce the noise generated by the development, including noise impacts that may be enhanced by temperature inversions during the shoulder periods (6am to 7am, Monday to Saturday); (b) implement all reasonable and feasible best practice noise mitigation measures on the site; and (c) report on the implementation of any new noise mitigation measure on site in the AEMR	• Environment Management Strategy – Annex C Noise Management Plan, Mar 2007 • AEMR 2012-2013 • Annual Return 2013-2014 • Annual Return 2014-2015 • Annual Return 2015-2016	(a) Noise management procedures are outlined in Annex C of the Environment Management Strategy provides mitigation measures for noise. (b) 1.2 km of Haerses Road from Wisemans Ferry Road to the entrance to the quarry work area has been sealed to reduce road noise impacts from the trucks transporting sand product to the Old Northern Road Quarry processing plant.	**Compliant Ongoing**

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>to the satisfaction of the Director-General.</td><td></td><td>All new equipment used on the Hearses Road Quarry site was purchased in 2012-2013.
(c) Measures taken to minimise the risk of noise exceedances from the Hearses Road Quarry operations included discontinuing the use of the Commander screener / crusher at Haerses Road and processing all product at the Old Northern Road plant.</td><td></td></tr>
<tr><td></td><td>Monitoring</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>Prior to carrying out any development the applicant shall prepare a Noise Monitoring Program in consultation with DEC and to the satisfaction of the Director-General. This program must include a combination of attended and unattended noise monitoring and a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this consent.</td><td>• Environment Management Strategy – Annex C Noise Management Plan, Mar 2007
• Letter to DoP re Consultation with DEC on Noise Management Plan, 27 Jul 2006
• Environmental Monitoring Program, Jul 2006
• Letter from DoP re Approval of Environmental Monitoring Program, 19 Apr 2007</td><td>• Annual attended noise monitoring undertaken at the nearest residence to the Hearses Road Quarry Stage 1 and Stage 2 operations areas, only occurs when wind speed is less than 3m/s or temperature inversion less than 3°C/100m.
• Unattended measurements are undertaken by a noise logger, set up for one week each year.
• LAeq(15 minute) noise is measured within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling is more than 30 metres from the boundary.
• LA(max) noise is measured at 1 metre from the dwelling façade during 6am and 7am noise monitoring.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Air Quality</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Impact Assessment Criteria</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>The applicant shall ensure that the dust generated by the development does not cause any additional exceedances of the air quality impact assessment criteria listed in Tables 3, 4 and 5 at any residences on any privately owned land listed in Table 1.
Table 3: Long term impact assessment criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90µ g/m^3</td></tr>
<tr><td>Particulate matter < 10 microns (PM_{10})</td><td>Annual</td><td>30µ g/m^3</td></tr>
</table>
Table 4: Short term impact assessment criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Particulate matter <10microns (PM_{10})</td><td>24hour</td><td>50µg/m^3</td></tr>
</table>
Table 5: Long term impact assessment criteria for deposited dust</td><td>• Annual Review 2014 – 2015
• Annual Review 2015 – 2016
• Environmental Monitoring Program, Jul 2006</td><td>Air quality monitoring is conducted in accordance with the requirements in Environment Protection Licence 12513 for PM_{10} and dust deposition and at additional environmental monitoring locations for dust deposition shown Environmental Monitoring Program, July 2006. Results are reported in the AEMR / Annual Reviews Figure 1.4.

Deposited dust results were generally compliant during 2013 and 2016 period.

The annual PM_{10} average for the 2015-2016 reporting period was 11.6µg/m³, below the EPA criterion of 30µg/m³. This annual average is lower than previous monitoring periods where the annual PM_{10} averages were recorded at 13.4 µg/m³ (2014-2015), 15.4 µg/m³ (2013-2014) and 12.3 µg/m³ (2012-2013). The 24 hour PM_{10} dust levels on the site have generally been satisfactory with the only exceedances in November 2015, April 2016 and May 2016 attributed to dry and hot westerly winds and scheduled RFS hazard reduction</td><td>Compliant Ongoing</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Development Consent 165-7-2005 Condition</th><th>• Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Maximum increase in deposited dust levels</th><th>Maximum total deposited dust levels</th></tr>
<tr><td>Deposited Dust</td><td>Annual</td><td>2 g/m^2 /month</td><td>4 g/m^2 /month</td></tr>
</table>
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method.</td><td></td><td>burns and a dust storm that passed through the Maroota area.</td><td></td></tr>
<tr><td></td><td>Operating Conditions</td><td></td><td></td><td></td></tr>
<tr><td>12</td><td>The applicant shall implement all practical measures to minimize and/or prevent the emission of dust from the site.</td><td></td><td>1.2 km of Haerses Road from Wisemans Ferry Road to the entrance to the quarry work area has been sealed to reduce road noise impacts from the trucks transporting sand product to the Old Northern Road Quarry processing plant.
A water cart and road sweeper are available for use on the site or on Hearses Road as required.</td><td>Compliant Ongoing</td></tr>
<tr><td>13</td><td>The applicant shall ensure that all vehicles entering or leaving the site, carrying a load that may generate dust are covered at all times.</td><td>• Site Traffic Management Plan Maroota – EP1.3</td><td>All vehicles entering or leaving the Haerses Road and the Quarry site, were observed to have the loads covered in accordance with the Site Traffic Management Plan item 12.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Monitoring</td><td></td><td></td><td></td></tr>
<tr><td>14</td><td>Prior to carrying out any development the applicant shall prepare and implement Air Quality Management Plan, in consultation with the DEC, and to the satisfaction of the DG. The program must include an air monitoring protocol for evaluating compliance with the air quality impact assessment criteria in the consent.
Note: Except as may be expressly provided by an Environment Protection Licence, the Air Quality Monitoring Program for the development shall include the following PM_{10} monitoring procedure:
Incorporates DEC GTA
• if any rolling 24-hour average PM_{10} result measured at the existing TEOM air quality monitoring station near the Maroota Public School is found to be greater than 42 ug/m^3, and the prevailing wind as measured the existing metrological station location near the Maroota Public School, is from the south-south west quadrant (between 180° and 240°), the Applicant shall:
○ immediately notify the DEC;
○ take immediate action to reduce PM_{10} emissions generated by the development; and
○ if dust levels do not return to levels below 42 ug/m^3 within 1 hour, cease all dust generating activities at the site; and</td><td>• Environment Management Strategy – Annex C Air Quality Management Plan, Mar 2007
• Environmental Monitoring Program, Jul 2006
• Letter from DoP re Approval of the Environment Monitoring Program, 19 Apr 2007
• AEMR 2013-2014
• Annual Review 2014-2015
• Annual Review 2015-2016</td><td>The Air Quality Management Plan, in the approved Environmental Monitoring Program July 2006 includes an air monitoring protocol for evaluating compliance with the air quality impact assessment criteria in the consent. The continuous monitoring with TEOM near Maroota Public School is connected to an alarm system triggered by a maximum PM_{10} level of 37.0µg/m^3 as a rolling 24hour average. If this trigger level is reached during a prevailing north-westerly wind:
• An alarm is received by Quarry Managers and Environmental Officer (via SMS).
• General Manager and Production Manager authorised to issue directive to relevant personnel to cease operations as per EPA licence condition M2.4.
• Management to evaluate conditions and employ the use of dust suppression measures immediately.
• Environmental Officer to notify EPA Environment Hotline 131 500 if the 24 hour average PM10 result exceeds the 42ug/m^3 and the prevailing wind at the site being a south-westerly (180°-240°).
• Environmental Officer to closely monitor and communicate PM_{10} levels to management.</td><td>Compliant Ongoing</td></tr>
</table>

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	○ *dust generating activities on site may only recommence when the rolling 24-hour average PM_{10} result as measured at the existing TECM air quality monitoring station near the Maroota Public School is less than 42µg/m^3 for 4 consecutive 15minute periods*		• Operations may only re-commence upon approval from General Manager and Production Manager when the rolling 24hr average PM_{10} is less than 42ug/m^3 for 4 consecutive 15 minute periods as informed by Environmental Officer. If the dust level does not return to below the allowable limit within 1 hour of ceasing all operations must stop.	
	SURFACE AND GROUNDWATER			
	Pollution of Waters			
15	Except as may be expressly provided by an EPL the applicant shall comply with section 120 of the POEO Act.	• *Protection of the Environment Operations Act 1997* • Environment Protection Licence 12513	There are no EPA approved monitoring point(s) for surface water discharge and no surface water quality limits for the Haerses Road site in Environment Protection Licence 12513.	**Noted**
	Operating Conditions			
16	The applicant shall: a) Install and maintain sediment basins with sufficient capacity to contain that rainfall and runoff generated from a 90th percentile, 5day rainfall event b) Ensure that the accumulated sediment in all sediment dams is kept below 30% of the design capacity c) Ensure that no fuel, oil, or other chemicals are stored on site d) Undertake appropriate measures to ensure that vehicles do not track any material onto public roads	• ? EMS/EMP	(a) There are no designated sediment dams for the Hearses Road Quarry site. The Stage 1 and Stage 2 extraction areas act as collection and settlement basins to capture surface runoff and sediment and have the capacity to contain 90th percentile of the surface runoff from a 5 day rainfall event. The Stage 2 extraction area has a spillway with straw bales to filter any overflow from the pit; (b) Accumulated sediment in the settlement basins is kept below 30% of the design capacity (above); (c) No fuel, oil, or other chemicals are stored on site; (d) A water cart and road sweeper are available for use on the site or on Hearses Road as required. No tracking of material onto public roads from the Hearses Road intersection was observed during the audit site inspection.	**Compliant Ongoing**
	Site Water Management Plan			
17	Prior to carrying out any development the applicant shall develop and implement a Site Water Management Plan, in consultation with DEC, DNR and to the satisfaction of the D-G. The plan shall include: a) A Soil and Water Management Plan b) A Groundwater Monitoring Program	• Site Water Management Plan, Jul 2006 • Environmental Monitoring Program section 2.3 Groundwater, Jul 2006 • Letter to DoP re Consultation with DEC re Site Water Management Plan, 27 Apr 2006 • Letter from DoP re Approval of Environmental Monitoring Program, 19 Apr 2007	A Site Water Management Plan was prepared to satisfy Development Consent 165-7-2005 Schedule 3 conditions 17 and 18 and was submitted to DoP for approval in July 2006. DoP approved the Site Water Management Plan on 19 April 2007.	**Compliant**
18	The Soil and Water Management Plan shall:	• Site Water Management Plan, section 3.2 and 4.1, Jul 2006	The Soil and Water Management Plan (prepared as section 3 of the Site Water Management Plan) to satisfy	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	a) Describe what measures would be implemented to minimize soil erosion, and the discharge of sediment and other pollutants, during each stage of the development: • road and intersection works • initial clearing and topsoil stripping • extraction • noise bund construction b) include control measures that have the capacity to contain the rainfall and runoff generated by the design event specified in condition 18 above; and c) be consistent with the *Landcom Managing Urban Stormwater: Soils and Construction* Manual (Volume 1, addition 4, March 2004).	• Environmental Monitoring Program, Jul 2006	Development Consent 165-7-2005 Schedule 3 condition 18, was submitted to DoP for approval in July 2006 and approved on 19 April 2007. The Site Water Management Plan includes: (a) sections 3.2 describes measures to be implemented to minimize soil erosion, and the discharge of sediment and other pollutants, during each stage of the development: • road and intersection works – section 3.2.6; • initial clearing and topsoil stripping - • extraction – section 3.2.7; • noise bund construction – section 3.2.3 (b) section 3 and Annexure B provide control measures that have the capacity to contain the rainfall and runoff generated by the design event specified in condition 18 above; and (c) Annexures A-C provide parameters and calculations consistent with the *Managing Urban Stormwater: Soils and Construction* Manual Landcom (Volume 1, March 2004).	
19	The Groundwater Monitoring Program shall: a) Describe what measures would be put in place to establish the sites wet weather groundwater levels; b) Monitor any potential adverse impacts of the development on groundwater levels and quality; c) Detail the contingency measures that would be put in place in the event that groundwater is breached and contaminated.	• Site Water Management Plan, section 3.3 and 4.2, Jul 2006 • Environmental Monitoring Program section 2.3 Groundwater, Jul 2006	The Groundwater Monitoring Program (prepared as section 4.2 of the Site Water Management Plan) to satisfy Development Consent 165-7-2005 Schedule 3 condition 17 and 19, was submitted to DoP for approval in July 2006 and approved on 19 April 2007. Groundwater monitoring is also included in the Environmental Monitoring Program July 2006 section 2.3. The Groundwater Monitoring Program includes: (a) along with the Site Water Management Plan section 4.2, the outline for establishing the site wet weather groundwater levels; (b) Table 2.4 outlines the program to monitor any potential adverse impacts of the development on groundwater levels and quality; (c) Table 2.4 – Response outlines the contingency measures that would be put in place in the event that groundwater is breached and contaminated.	**Compliant**
20	Within 3 months of the completion of each Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review, and if required, revise the Site Water Management Plan to the satisfaction of the Director-General.		There was no record of review of the Site Water Management Plan and Groundwater Monitoring Program following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Site Water Management Plan and Environmental Monitoring Program should be reviewed and revised if necessary to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.	**Administrative Non-Compliance**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	REHABILATION AND LANDSCAPE MANAGEMENT			
	Specific Measures			
21	The applicant shall: (a) progressively rehabilitate all disturbed areas on site to a final land use of agricultural land (minimum class 4), and in general accordance with the final landform in Figure 2.4 of the EIS (as reproduced in Appendix 3); (b) consult with the landowners of Lot 167 DP 752039 to ensure that a consistent final landform is achieved on either side of Hitchcock Road; (c) conserve, maintain and enhance the vegetation on site that would not be disturbed by the development; (d) establish at least 2 hectares of vegetation on or adjacent to the site to replace the remnant vegetation removed by the development; and (e) undertake screen planting in general accordance with Figure 2.2 of the EIS (as reproduced in Appendix 4), to the satisfaction of the Director-General		Rehabilitation activities at Haerses Raod: (a) No progressive rehabilitation on the Haerses Road Quarry site had occurred to the date of this audit as the extraction areas were still active. (b) Consultation will be undertaken with landholders prior to the extraction of Stage 5. Discussions have been held with PF Formation (neighbour to north of site). (c) A high diversity of species regenerating in the soil translocation area at Haerses Road offset area was observed. A significant canopy has developed from the planted and regenerating tree species. (d) An area of 2 hectares has been planted to the east of Stage 2 at the Haerses Road site. Planting of 250 trees and shrubs included *Angophora costata, Corymbia gummifera, Eucalyptus piperita, Acacia sp*. (e) A 30 metre buffer screen planting wax undertaken in October 2016 to minimise the visibility of the quarry from Wisemans Ferry Road has been undertaken. Species utilised for screen planting are native to the area and include: *Banksia serrata*, *Kunzea ambigua* and *Casuarina glauca*.	**Not yet triggered** **Compliant Ongoing**
	Rehabilitation and Landscape Management Plan	•		
22	Within 6 months of the commencement of the development the Applicant shall prepare, and following approval, implement a Rehabilitation and Landscape Management Plan, in consultation with Council and DPI, and to the satisfaction of the Director-General. The plan must: (a) include a Vegetation Clearing Protocol; (b) identify the areas likely to be disturbed by the development; (c) describe in general the short, medium, and long-term measures that would be implemented to: * rehabilitate the site; * conserve, maintain and enhance the remnant vegetation on site; and * conserve, maintain and enhance the vegetation established on site for offset and screening purposes; (d) describe in detail the measures that would be implemented over the next 5 years to: * rehabilitate the site; * conserve, maintain and enhance the remnant vegetation on site; and * conserve, maintain and enhance the vegetation established on site for offset and screen purposes;	• Letter from DPI re Review of Rehabilitation and Landscape Management Plan, 8 Jul 2007 • Letter from DoP re Approval of Rehabilitation and Landscape Management Plan,25 Jul 2007 • Rehabilitation and Landscape Management Plan, Dec 2007	The Rehabilitation and Landscape Management Plan prepared in consultation with DPI and Baulkham Hills Council, to satisfy Development Consent 165-7-2005 was approved by DoP on25 July 2007. The Rehabilitation and Landscape Management Plan includes: (a) section 3.3.1 outlines the Vegetation Clearing Protocol; (b) section 2 identifies the areas likely to be disturbed by the development; (c) section 4.2 addresses the short, medium, and long-term measures that would be implemented to: • rehabilitate the site; • conserve, maintain and enhance the remnant vegetation on site; and • conserve, maintain and enhance the vegetation established on site for offset and screening purposes; (d) section 4.2 describes the measures that would be implemented over the next 5 years to:	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	(e) establish performance and completion criteria for: * the rehabilitation of the site; * the maintenance of remnant vegetation on site; and * the maintenance of vegetation established for offset and screening purposes; (f) describe the measures that would be implemented to minimise or manage any ongoing environmental effects of the development; and (g) describe how the performance of each measure described in the plan would be monitored over time. *Note: The Vegetation Clearing Protocol must be finalised prior to the commencement of any clearing works. The Applicant may wish to submit this plan separately.*		• rehabilitate the site; • conserve, maintain and enhance the remnant vegetation on site; and • conserve, maintain and enhance the vegetation established on site for offset and screen purposes; (e) section 6.1 establishes performance and completion criteria for: • the rehabilitation of the site; • the maintenance of remnant vegetation on site; and • the maintenance of vegetation established for offset and screening purposes; (f) section 5 describes rehabilitation methods and measures that would be implemented to minimise or manage any ongoing environmental effects of the development; and (g) section 6 describes monitoring and reporting for performance of each measure described in the plan would be monitored over time.	
23	Within 3 months of the completion of each Independent Environmental Audit (see condition 5 of Schedule 5), the Applicant shall review and if required revise the Rehabilitation and Landscape Management Plan for the development to the satisfaction of the Director-General.		There was no record of review of the Rehabilitation and Landscape Management Plan following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Rehabilitation and Landscape Management Plan should be reviewed and revised if necessary to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.	**Administrative Non-Compliance**
	Rehabilitation Bond			
24	Prior to the commencement of the development, the Applicant shall lodge a suitable rehabilitation bond for the development with the Director-General. The sum of the bond shall be calculated at $\$2.50/m^2$, or as otherwise directed by the Director-General, for the area of disturbance in each 3year review period. *Notes: If the rehabilitation is completed to the satisfaction of the Director-General, the Director-General will release the rehabilitation bond.* *If the rehabilitation is not completed to the satisfaction of the Director-General, the Director-General will call in all, or part of, the rehabilitation bond, and arrange for the satisfactory completion of these works*		A request was sent to the Westpac Bank on 8 December 2016, to lodge the $300,000.00 bank guarantee for the Rehabilitation Bond required under Development Consent 165-07-2005 Schedule 3 condition 24. Confirmation that the lodgement had been actioned by the Westpac had not been received at the date of this Indpendent Environmental Audit Report.	**Administrative Non-Compliance**
25	Within 3 months of the completion of each Independent Environmental Audit the applicant shall review and if required update the sum of the rehabilitation bond to the satisfaction of the DG. This review must consider:		A review of the Rehabilitation Bond will be due within 3 months of the completion of this Independent Environmental Audit.	**Noted**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	a) the effects of inflation b) any changes of the area of disturbance c) the performance of any progressive rehabilitation which has been undertaken			
	TRAFFIC AND TRANSPORT			
	Transport Records			
26	The Applicant shall: (a) keep records of the amount of sand transported from the site each year to the existing quarry for processing, and directly from the site to local and regional markets; (b) keep records of all traffic movements in and out of the site each year; and (c) include these records in the AEMR.	• Truck Movement Data Sheets • Weighbridge Spreadsheets • Monthly Product Tonnage Registers • AEMR 2013-2014 • Annual Review 2014-2015 • Annual Review 2015-2016	Dixon Sand keeps: (a) records of the amount of sand transported from the Hearses Road Quarry each year to the Old Northern Road Quarry for processing, or transported directly from the site to local and regional markets; (b) records of all traffic movements in and out of the site each year are kept on the weighbridge dockets; and (c) the records of truck movements and production rates are reported in the AEMR / Annual Reviews.	**Compliant Ongoing**
	Road Works: Council			
27	Prior to carrying out any development, the Applicant shall upgrade Haerses Road to meet the requirements for 'internal haul roads', under Baulkham Hills *Development Control Plan No. 16 – Extractive Industries,* to the satisfaction of Council.	• Baulkham Hills Shire Council Works Authorisation Deed, 2006 • Letter from Baulkham Hills Shire Council re Completion of Haerses Road Works, 16 Nov 2006 • Letter from Baulkham Hills Shire Council re Haerses Road Works, 13 Mar 2008	Upgrade works on Hearses Road were undertaken in accordance with Baulkham Hills Shire Council Works Authorisation Deed dated 16 November 2006. The road works were approved Baulkham Hills Council on 13 March 2008, indicating their satisfaction with the works undertaken and indicating that the alignment of the road meets the requirements of Council.	**Compliant COMPLETE**
28	The Applicant shall: (a) maintain safe access to the site to the public and emergency services for the duration of the development; and (b) reinstate the extracted length of Haerses Road, to the satisfaction of Council. *Notes:* • *The applicant shall ensure that the final alignment and design of Haerses Road is approved by Council prior to the commencement of the development;* • *All works are to be in accordance with Council's Design Guidelines and Work Specifications for Subdivisions and Developments* • *Following the reconstruction of Haerses Road, the Applicant shall rehabilitate any temporary access roads that were established on site.*		Haerses Road traverses the middle of Dixon Sand owned land and provides access to the active quarry sites. Berms have been constructed between the edge of Hearses Road and excavation of Stage 1. Access to Haerses Road from Wisemans Ferry Road is not restricted, as Haerses Road it is a public road, so public access and emergency services access are not limited. Houses along Haerses Road are owned by Dixon Sand and rented to employees so traffic on the road is mainly Dixon Sand personnel and trucks travelling to and from the Stage 2 quarry works. .	**Ongoing**
	Road Works: RTA			
29	Prior to carrying out any development, the Applicant shall: (a) provide for appropriate sight distances at the intersection of Haerses Road and Wiseman's Ferry Road, by clearing and/or		Requirements of this condition have been addressed: (a) sight distances at the intersection of Haerses Road and Wiseman's Ferry Road, appeared appropriate with	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	loping vegetation along the eastern approach of Wiseman's Ferry Road; (b) provide warning signage ("Truck Turning") on the eastern and western approach of Wiseman's Ferry Road to the satisfaction of the RTA.		no vegetation obscuring the intersection on the eastern approach of Wiseman's Ferry Road; (b) Truck Turning signs have been erected on the eastern and western approach of Wiseman's Ferry Road to the intersection with Haerses Road.	
30	Within 12 months of the commencement of operations, the Applicant shall construct a Type 'AUR' treatment at the intersection of Haerses Road and Wiseman's Ferry Road to the satisfaction of the RTA. Until the intersection works have been completed to the satisfaction of the RTA, the Applicant shall limit the Number of trucks entering the site to 15 truck movements per day.	• Letter from DP&I re Extension of date to Complete Haerses Road Intersection Works, 31 May 2009 • Letter from RMS re Wisemans Ferry / Haerses Road Intersection Upgrade, - Final Certificate, 4 Sep 2014	The construction of a Type AUR treatment at the intersection of Haerses Rd and Wisemans Ferry Road was completed and a Final Certificate issued by RMS on 4 September 2014.	**Compliant COMPLETE**
	Construction Traffic Management			
31	Prior to commencement of the works referred to in conditions 31 and 32 above, the Applicant shall prepare and implement a Traffic Control Plan for the development to the satisfaction of the RTA.	•Traffic Control Plan, J K Williams •Letter from RTA re Approval of Traffic Control Plan, 12 Aug 2016	A Traffic Control Plan was prepared by J K Williams contractor prior to the commencement of works.	**Compliant COMPLETE**
	WASTE MINIMISATION			
32	The applicant shall: a) Monitor the amount of waste generated by the development; b) Investigate ways to minimize waste generated by the development; c) Implement reasonable and feasible measures to minimize waste generated by the development; d) Report on waste and management and minimization in the AEMR.	• AEMR 2013-2014 • Annual Review 2014-2015 • Annual Review 2015-2016	Dixon Sand: (a) Monitors the amount of waste generated by the Haerses Road Quarry. Limited waste is generated as only extraction activities are undertaken on the site; (b) All waste materials generated at the Haerses Road Quarry site are taken to the Old Northern Road Quarry site and managed there for recycling, reuse or disposal; (d) Waste and management and minimization is reported in the Annual Reviews.	**Compliant Ongoing**
	BUSHFIRE MANAGEMENT			
33	The applicant shall: a) Ensure the development is suitably equipped to respond to any fires on site; and b) Assist the Rural Fire Service and emergency services as much as possible if there is a fire on site during the development; and c) Prepare a conservation sensitive Bushfire Management Plan for the site in consultation with Rural Fire Services.	• Bushfire Management Plan, Nov 2016	(a) The Old Northern Road and Hearses Road Quarry sites operate a road registered water truck that would be available to fight fires. (b) Assist the Rural Fire Service and emergency services as much as possible if there is a fire on site during the development; and (c) A Bushfire Management Plan has been prepared for the Dixon Sand quarries in consultation with Rural Fire Services, and approved by DP&E on 1 November 2016.	**Compliant**
	Production Data			
34	The applicant shall:	• AEMR 2013-2014	Dixon Sand:	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	a) Provide annual production data to the DPI using the standard form for that purpose; and b) Include a summary in the AEMR	• Annual Review 2014-2015 • Annual Review 2015-2016	a) Annual production data is provided to the DPI using the standard form; and b) a summary of sand production from Haerses Road and Old Northern Road Quarries is provided in the Annual Reviews Table 5.1 in the AEMR / Annual Reviews.	
	Schedule 4 - Notification of Landowners			
1	If the results of monitoring required in Schedule 3 identify that impacts generated by the development are greater than the relevant impact assessment criteria in Schedule 3, then the Applicant shall notify the Director-General and the affected landowners and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in Schedule 3.		Results of air and noise monitoring required in Schedule 3 of this Development Consent have not indicated any impacts generated by the development that are greater than the relevant impact assessment criteria.	**Not triggered**
	Independent Review			
2	If the landowner considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Director-General in writing for an independent review of the impacts of the development on his/her land. If the Director-General is satisfied that an independent review is warranted, the Applicant shall within 3 months of the Director-General advising that an independent review is warranted: (a) consult with the landowner to determine his/her concerns; (b) commission a suitably qualified, experience and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to determine whether the development is complying with the relevant criteria in Schedule 3, and identify the source/s and scale of any impact on the land, and the development's conditions to this impact; and (c) give the Director-General and landowner a copy of the independent review.		No request for an independent review of the monitoring the impact assessment criteria in Schedule 3 had been received at the date of this audit (November 2016).	**Not triggered**
3	If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Applicant may discontinue the independent review with the approval of the Director-General.			**Not triggered**
4	If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Applicant shall: (a) take all practicable measures, in consultation with the landowner, to ensure that the development complies with the relevant criteria; and			**Not triggered**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	(b) conduct further monitoring to determine whether these measures endure compliance; or (c) secure written agreement with the landowner to allow exceedances of the relevant criteria in Schedule 3, to the satisfaction of the Director-General. In the additional monitoring referred to above subsequently determine that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Applicant may discontinue the independent review with the approval of the Director-General. If the Applicant is unable to finalise an agreement with the landowner, then the Applicant or landowner may refer the matter to the Director-General for resolution.			
5	If the landowner disputes the results of the independent review, either the Applicant of the landowner may refer the matter to the Director-General for resolution. If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 5).			**Not triggered**
	SCHEDULE 5 - ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITIONG AND PEPORTING			
	ENVIRONMENTAL MANAGEMENT STRATEGY			
1	Within 3 months of the commencement of the development the Applicant shall prepare (and following approval implement) and Environmental Management Strategy for the development to the satisfaction of the Director-General. This strategy must: (a) provide the strategic context for environmental management of the development; (b) identify the statutory requirements that apply to the development; (c) describe in general how the environmental performance of the development would be monitored and managed during the development; (d) describe the procedures that would be implemented to: • keep the local community and relevant agencies informed about the operation and environmental performance of the development; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the development; • respond to any non-compliance; • manage cumulative impacts; and • respond to emergencies; and (e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.	• Environmental Management Strategy, Mar 2007 • Letter from DoP re Approval of the Environmental Management Strategy, 19 Apr 2007	The Environmental Management Strategy for the Haerses Road Quarry was prepared and submitted to the DoP on 27 July 2006 and approved on 19 April 2007. The Environmental Management Strategy includes: (a) section 2 provides the strategic context for environmental management of the development; (b) section 2.2 identifies statutory requirements that apply to the Haerses Road Quarry development; (c) section 4 describes in general how environmental performance would be monitored and managed during the development; (d) describe the procedures to be implemented to: • Section 2.1 outlines information exchanges with local community and relevant agencies about the operation and environmental performance; • section 6 describes receipt, handling, response and recording of complaints; • section 6.2 outlines dispute resolution; • section 5.1 outlines response to any non-compliance; • section 3.3 outlines management and cumulative impacts; and • section 5.2 addresses response to emergencies; and (e) section 7 describes the role, responsibility, authority, and accountability of the key personnel.	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
2	Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below) the Applicant shall review, and if necessary revise, the Environmental Management Strategy to the satisfaction of the Director-General.	• Environmental Management Strategy, Mar 2007	There was no record of review of the Environmental Management Strategy following the 2012 Independent Environmental Audit, or the DP&E Compliance Audit 2015. The Environmental Management Strategy should be reviewed and revised if necessary to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.	**Administrative Non-Compliance**
	ENVIRONMENTAL MONITORING PROGRAM			
3	Prior to the commencement of the development the Applicant, shall prepare (and following approval) implement an Environmental Monitoring Program for the development in consultation with relevant agencies, and to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements in Schedule 3 of this consent into a single document.	• Environmental Monitoring Program, Jul 2006 • Letter from DoP re Approval of Environmental Monitoring Program, 31 Aug 2006	The Environmental Monitoring Program was prepared and approved by DoP on 31 August 2006 for the Haerses Road Quarry project. This Environmental Monitoring Program was to consolidate the various monitoring requirements in Schedule 3 of this consent into a single document. Monitoring requirements in Schedule 3 include: Condition 10 - attended / unattended noise monitoring Condition 14 - air quality monitoring Condition 19 – groundwater monitoring Condition 23 – rehabilitation performance monitoring Condition 32 – waste generation monitoring The Environmental Monitoring Program does not include waste and rehabilitation monitoring. The Environmental Monitoring Program should be reviewed and revised to include all monitoring required under Development Consent 165-7-2005 Schedule 3.	**Administrative Non-Compliance**
4	Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below), the Applicant shall review, and if necessary revise, the Environmental Monitoring Program to the satisfaction of the Director-General.		There was no record of review of the Environmental Monitoring Program following the 2012 Independent Environmental Audit, or DP&E Compliance Audit 2015. The Environmental Monitoring Program should be reviewed and revised if necessary to ensure the Plan and Program still represent the soil and water management procedures implemented on the Hearses Road Quarry site.	**Administrative Non-Compliance**
	ANNUAL REPORTING			
5	Each year, the Applicant shall prepare and AEMR to the satisfaction of the Director-General. This report must: (a) identify the standards and performance measures that apply to the development; (b) include a summary of the complaints received during the past year, and compare this to the complaints received in the previous 5 years;	• Letter from DP&E re AEMR 2014-2015, (not dated) • AEMR 2013-2014 • Annual Review 2014-2015 • Annual Review 2015-2016	The AEMR / Annual Reviews for the Haerses Road Quarry are combined in a single AEMP document prepared for the two Dixon Sand quarries at Old Northern Road Quarry and Haerses Road Quarry. The DP&E responded to the submission of the AEMR (dated 2014-2015) stating "*the Department has reviewed the AEMR and is satisfied with the form, content and*	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	(c) include a summary of the monitoring results on the development during the past year; (d) include an analysis of these monitoring results against the relevant: * limits/criteria of this consent; * monitoring results from previous years; and * predictions in the EIS; (e) identify any trends in the monitoring over the life of the development; (f) identify and discuss any non-compliance during the previous year; and (g) describe what actions were, or are being, taken to ensure compliance. *Note: The Applicant may, with the approval of the Director-General, combine the reporting requirements for the development in the AEMR for the Applicant's existing quarry, however, if it does this it must endure that the above obligations are fully met in the combined process.*		*presentation, noting that it generally meets the requirements of condition 7.2 of Schedule 2 of the Development Consent*". The Annual Reviews sections 2 to 8 include: (a) standards and performance measures that apply to the development; (b) a summary of the complaints received during the past year, and compare this to the complaints received in the previous 5 years; (c) a summary of the monitoring results on the development during the past year; (d) an analysis of the monitoring results against the relevant limits/criteria of this consent, monitoring results from previous years, and predictions in the EIS are provided in the 2015-2016 Annual Review; (e) trends in the monitoring over the life of the development; (f) discussion of any non-compliance during the previous year; and (g) description of actions taken to ensure compliance	
	INDEPENDENT ENVIRONMENTAL AUDIT			
6	Within 3 years of this consent and every 3 years thereafter, unless the Director-General directs otherwise, the applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must: (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General; (b) be consistent with ISO 19011:2002 – Guidelines for Quality and/or Environmental Systems Auditing, or equivalent updated versions of these guidelines; (c) assess the environmental performance of the development and its effects on the surrounding environment; (d) assess whether the development is complying with the relevant standards, performance measures, and statutory requirements; (e) review the adequacy of the Applicants Environmental Management Strategy and Environmental Monitoring Program; and (f) if necessary, recommend measures or actions to improve the environmental performance of the development and/or the environmental management and monitoring systems.	• Independent Environmental Audit Report, SMEC, Aug 2012 • Letter from DP&E re Commissioning of IEA, 27 Aug 2015 • Letter from DP&E re Extension of Time for Completion of the Independent Environmental Audit, 13 May 2016 • Letter to DP&E re nomination of Independent Environmental Auditor, 7 Nov 2016 • Letter from DP&E re Approval of Trevor brown as Independent Environmental Auditor, 8 Nov 2016	The first Independent Environmental Audit Report was commissioned and the audit conducted by SMEC in April 2012 and the Report finalised in August 2012. Dixon Sand requested an extension of time from DP&E for commissioning the second Independent Environmental Audit and DP&E granted an extension on 13 May 2016. This second Independent Environmental Audit has been conducted by Trevor Brown of Trevor Brown & Associates in November 2016 and report submitted to Dixon Sand for submission to the DP&E by 17 December 2016. This 2016 Independent Environmental Audit was; (a) conducted by suitably qualified, experienced expert endorsed by the DP&E on 8 November 2016; (b) was generally consistent with ISO 19011:2002 – *Guidelines for Quality and/or Environmental Systems Auditing*; (c) section 5 assessed environmental performance of the Haerses Road Quarry development and effects on the surrounding environment; (d) Attachments A and B assessed compliance with the relevant standards, performance measures, and statutory requirements;	**Compliant**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
			(e) section 5 reviewed the adequacy of the Environmental Management Strategy and Environmental Monitoring Program; and (f) Section 6 presents conclusions and recommend measures to improve the environmental performance of the development and/or the environmental management and monitoring systems.	
7	Within 3 months of commissioning this audit, the Applicant shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations contained in the audit report.	•		**Noted**
	Community Consultative Committee	•		
8	Prior to the commencement of the development the Applicant shall: (a) establish a Community Consultative Committee to oversee the environmental performance of the development; or (b) combine the function of this CCC for the Applicant's existing quarry	•	The Community Consultative Committee has been established with a combined meeting held for the Old Northern Road and Haerses Road Quarries (both quarries owned and operated by Dixon Sand at Maroota).	**Compliant Ongoing**
9	The CCC (or combined CCC) shall: (a) be composed of: • 2 representatives from the Applicant, including the person responsible for environmental performance of the development; • 1 representative from Council (if available); and • at least 2 representatives from the local community, whose appointment has been approved by the Director-General in consultation with the Council; (b) be chaired by an independent chairperson, whose appointment has been endorsed by the Director-General; (c) meet at least twice a year; and (d) review and provide advice on the environmental performance of the development, including any construction or environmental management plans, monitoring results, audit reports, or complaints.	• Letter to DP&E re Nomination of CCC Members, 31 Mar 2016 • Letter from DP&E re Membership of the Combined CCC, 4 Arp 2016 • CCC Minutes • 13 Nov 2012 • 7 May 2013 • 20 Nov 2013 • 13 MAY 2014 • 18 Nov 2014 • 12 May 2015 • 17 Nov 2015 • 10 May 2016 • 15 Nov 2016	Membership of the Community Consultative Committee has been the subject of correspondence during 2016 in relation to nomination by Dixon Sand and approval by DP&E of a new Chairperson and new members. The membership of the CCC at the date of this audit were: a) 2 representatives of Dixon Sand and 1 representative from The Hills Shire Council (Kristine McKenzie) b) Kristine McKenzie – Acting Chairperson c) CCC Meetings held in May and November each year; d) Dixon Sand representatives provide advice on environmental management and environmental performance.	**Compliant Ongoing**
10	The Applicant shall, at its own expense: (a) ensure that 2 of its representatives attend the Committee's meetings; (b) provide the Committee with regular information on the environmental performance and management of the development; (c) provide meeting facilities for the Committee; (d) arrange site inspections for the Committee, if necessary; (e) take minutes of the Committee's meetings; (f) make these minutes available to the public; (g) respond to any advice or recommendations the Committee may have in relation to the environmental management or performance of the development; and		Dixon Sand has: a) two (2) representatives attend each CCC meeting; b) provide the committee regular information on environmental management and environmental performance; c) meeting facilities at the 4160 Old Northern Road site; d) Arrange site inspections as required; e) Minutes of the CC Meetings are taken by a Dixon Sand representative; f) CCC Minutes are available on the Dixon Sand website; g) Respond to recommendation from the committee; h) A copy of the CCC Minutes are submitted to DP&E.	**Compliant Ongoing**

Condition No.	Development Consent 165-7-2005 Condition	• Verification	Comments	Compliance
	(h) forward a copy of the minutes of each Committee meeting, and any responses to the Committee's recommendations to the Director-General within a month of the Committee meeting.			
	Access to Information			
11	Within 1 month of the approval of any management plan / strategy or monitoring program required under this consent (or any subsequent revision of these management plans/strategies or monitoring programs), the completion of the independent audits required under this consent (see condition 6 above), or the completion of the AEMR (see condition 5 above), the Applicant shall: (a) provide a copy of the relevant document/s to the Council, relevant agencies and the CCC; (b) ensure that a copy of the relevant documents is made publicly available at the quarry and/or the Applicant's regional office; and (c) put a copy of the relevant document/s on the Applicant's website, to the satisfaction of the Director-General		Management plans, audits etc will be provided to the Council, and are available at the Dixon Sand quarry office. A copy on the relevant documents are placed on the Dixon Sand website: **www.dixonsand.com.au.**	**Ongoing**
12	During the life of the development, the Applicant shall: (a) make the results of the monitoring required under the consent publicly available both at the quarry (and/or the Applicant's regional office) and on the Applicant's website; and (b) update these results on a regular basis (every 3 months or as soon as available), to the satisfaction of the Director-General.	www.dixonsand.com.au/environment	Results of the monitoring required under this consent are available at the quarry and on the Dixon Sand website. Results are updated on a regular basis.	**Compliant Ongoing**

Attachment B

Environment Protection Licence – No. 12513

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
1	**Administrative Conditions**			
A1	**What the licence authorises and regulates**			
A1.1	Not applicable			Not applicable
A1.2	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition: Schedule Activity – Extractive activities Fee Based Activity – Land based extractive activity >100,000-500,000 T obtained		Activities at the Haerses Road Quarry involves land based extraction activities, with the annual production rate less than 50,000 tonnes.	**Compliant Ongoing**
A1.3	Not applicable			Not applicable
A2	**Premises to which this licence applies**			
	The licence applies to the following premises: Dixon Sand (Penrith) Pty Limited Haerses Road and intersection of Wisemans Ferry Road, Maroota NSW 2756 Lot 170 DP664767, A and B DP407341 and Lots 176 and 177 DP 752039		The Haerses Road Quarry site is located within Lot 170 DP664767, Lots A and B DP407341 and Lots 176 and 177 DP 752039 Maroota.	Compliant
A3	Other activities			
A3.1	Not applicable			**Not applicable**
A4	**Information provided to the EPA**			
A4.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to: (a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and (b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.			**Noted**

<table>
<tr><th>Condition No.</th><th>EPL 12513 Condition</th><th>Verification</th><th>Comments</th><th>Compliance Status</th></tr>
<tr><td>2</td><td>Discharges to air and water and applications to land</td><td></td><td></td><td></td></tr>
<tr><td>P1</td><td>Location of monitoring/discharge points and areas</td><td></td><td></td><td></td></tr>
<tr><td>P1.1</td><td>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.
Air
<table>
<tr><th>EPA ID No.</th><th>Type of Monitoring Point</th><th>Description of Location</th></tr>
<tr><td>1</td><td>Ambient air monitoring</td><td>Ambient air monitoring site location near the Maroota Public School as marked in "Figure 1.3 - Existing and Proposed Development" provided to the DEC (by Fax) on 30 Nov 2004.</td></tr>
<tr><td>2</td><td>Meteorological Station</td><td>Meteorological station near Maroota Public School as marked in "Figure 1.3 – Existing and Proposed Development" provided to the DEC (by Fax) on 30 Nov 2004.</td></tr>
<tr><td>3</td><td>Ambient air monitoring</td><td>Dust deposition gauge located at a site to be determined in negotiation with the DEC indicatively, on the site between Stage 4 works and the west most dam on the site near Stage 4 works.</td></tr>
</table></td><td></td><td>The ambient air quality monitoring program for the Haerses Road Quarry has been conducted at Monitoring Point 1 and 3 in accordance with Condition P1.1.

The meteorological station was installed near the Maroota Public School EPA Monitoring Point 2, and ambient air monitoring location Point 1 located adjacent to the Old Northern Road Quarry.

 
Meteorological station, dust gauge and TEOM at EPA Monitoring Points 1 and 2.</td><td>Compliant</td></tr>
<tr><td>P1.2</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>P1.3</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>3</td><td>Limit conditions</td><td></td><td></td><td></td></tr>
<tr><td>L1</td><td>Pollution of waters</td><td></td><td></td><td></td></tr>
<tr><td>L1.1</td><td>Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.</td><td>• Protection of the Environment Operations Act 1997</td><td></td><td></td></tr>
<tr><td>L2</td><td>Load Limits</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>L3</td><td>Concentration limits</td><td></td><td></td><td></td></tr>
<tr><td>L3.1</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>L3.2</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>L3.3</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>EPL 12513 Condition</th><th>Verification</th><th>Comments</th><th>Compliance Status</th></tr>
<tr><td>L3.4</td><td>For each monitoring/discharge or utilisation area specified below (Point 1), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified in the other columns:
Point 1
<table>
<tr><th>Pollutant</th><th>Unit</th><th>Averaging Period</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>PM_{10}</td><td>$\mu g/m^3$</td><td>15 minute</td><td>Continuous</td><td>AS3580.9.8-2001</td></tr>
</table></td><td>• Environment Protection Licence 3916 condition P1.1 and P1.3.</td><td>The PM_{10} monitoring for the Haerses Road Quarry has been conducted at Monitoring Point 1 (condition P1.1) using a TEOM. The TEOM monitoring also applies to the Old Northern Road Quarry EPA Monitoring Point 1.</td><td>Compliant</td></tr>
<tr><td>L4</td><td>Volume and Mass Limits</td><td></td><td></td><td></td></tr>
<tr><td>L4.1</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>L6</td><td>Noise Limits</td><td></td><td></td><td></td></tr>
<tr><td>L6.1</td><td>Noise generated at the premises must not exceed the noise limits presented in the table below. Note that the noise limits represent the noise contribution from the Haerses Road sand quarry site at Maroota.
Noise Limits (dB(A))
<table>
<tr><th>Location</th><th>Day</th><th colspan="2">Shoulder (6am to 7am)</th></tr>
<tr><td></td><td>LAeq(15 min)</td><td>LAeq(15 min)</td><td>LA(max)</td></tr>
<tr><td>F&J Roberts & adjoining Residence</td><td>37</td><td>37</td><td>45</td></tr>
<tr><td>E Ramm</td><td>40</td><td>40</td><td>45</td></tr>
<tr><td>M Ramm</td><td>38</td><td>38</td><td>45</td></tr>
<tr><td>B Ramm</td><td>37</td><td>37</td><td>45</td></tr>
<tr><td>All other residences on privately owned land</td><td>35</td><td>35</td><td>45</td></tr>
</table></td><td>• Development Consent 165-07-2005 Schedule 3 condition 5
• Environmental Monitoring Program, Jul 2006</td><td>Noise monitoring has occurred in accordance with the Environmental Monitoring Program and noise levels measured or calculated with the setback formula in the Industrial Noise Policy. Noise monitoring results have exhibited compliance with the noise limits in EPL 12513 condition L6.1 and Development Consent 165-07-2005 Schedule 3 condition 5.

The noise monitoring results reported annually from 2013 to 2016 quarry operations have consistently indicated compliance with the noise assessment criteria, and no noise related complaints have been received.</td><td>Compliant</td></tr>
<tr><td>L6.2</td><td>For the purpose of condition L6.1
• Day is defined as the period from 7am to 6pm Sunday and Public Holidays.
• Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>L6.3</td><td>Noise from the premises is to be measured at the most affected point or within the residential boundary or at the most affected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary to determine compliance with the LAeq(15 minute) noise limit in condition L6.1. Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternate means of determining compliance. See chapter 11 of the NSW Industrial Noise Policy.</td><td></td><td></td><td>Noted</td></tr>
</table>

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
	The modification factors presented in Section 4 of the NSW Industrial Noise Policy must also be applied to the measured noise levels where applicable. **Definition** LA10(15 minute) is the sound pressure level that is exceeded for 10% of the time when measured over a 15minute period. *Note: Noise measurement* *For the purpose of noise measures required for this condition, the LA10 noise level must be measured or computed at any point specified in the tables above over a period of 15 minutes using "FAST" response on the sound level meter.* *For the purpose of the noise criteria for this condition, 5dBA must be added to the measured level if the noise is substantially tonal or impulsive in character. The location or point of impact can be different for each development, for example, at the closest residential receiver or at the closest boundary of the development. Measurement locations can be:* *1 metre from the facade of the residence for night time assessment; at the residential boundary;* *30 metres from the residence (rural situations) where boundary is more than 30 metres from residence.*			
L6.4	Noise from the premises is to be measured at 1m from the dwelling façade to determine compliance with the LA (max) noise level in condition L6.1 condition.			**Noted**
L6.5	The noise emission limits identified in condition L6.1 apply under all meteorological conditions (wind speed up to 3m/sec at 10 metres above ground level), except under conditions of temperature inversions. Noise impacts that may be enhanced by temperature inversions must be addressed by: • Documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions; and • Where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversions conditions should be developed and implemented.			**Noted**
L6.6	All construction work at the premises must only be conducted between 0700 hours and 1800 hours Monday to Saturday, and no time on Sundays and Public Holidays.		Any construction / establishment work at the Haerses Road premises is only be conducted between 0700 hours and 1800 hours Monday to Saturday.	**Compliant**
L6.7	Activities at the premises, other than construction work, may only be carried out between 0600 hours and 1800 hours Monday to Saturday, and at no time on Sundays and Public Holidays.		Activities at the Haerses Road premises, has only occurred between 0600 hours and 1800 hours Monday to Saturday,	**Compliant**
L6.8	A Construction Noise Management Protocol shall be prepared by the Applicant. The Protocol shall include but not necessarily be limited to: • compliance standards;		Construction of the acoustic bunds at Haerses Road Quarry had not commenced at the date of this audit (November 2016).	**Not triggered**

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
	• community consultation; • complaints handling monitoring/system; • site contact person to follow up complaints; • mitigation measures; • the design/orientation of the proposed mitigation methods demonstrating best practice; • construction times; • contingency measures where noise complaints are received; • monitoring methods and program.			
L6.9	This condition does not apply to the delivery of material outside the hours of operation permitted by condition **L6.6** or **L6.7**, if that delivery is required by police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency.			**Noted**
L6.10	The hours of operation specified in conditions L6.6 and L6.7 may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected.			**Noted**
L7	Potentially Offensive Odours			
L7.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises. *Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.*	• *Protection of the Environment Operations Act 1997,*	No emission of offensive odours has occurred beyond the boundary of the Haerses Road Quarry.	**Compliant**
4	Operating Condition			
O1	**Activities must be carried out in a competent manner**			
O1.1	Licensed activities must be carried out in a competent manner. This includes: (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity		Handling, movement and storage of materials and substances used to carry out the quarrying activity, and the storage, processing, transport and disposal of waste generated by the activity, has been carried out in a competent manner.	**Compliant Ongoing**
O2	**Maintenance of plant and equipment**			
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: (a) must be maintained in a proper and efficient condition; and (b) must be operated in a proper and efficient manner.		All plant and equipment used in connection with the Haerses Road Quarry activities have been maintained and operated in a proper and efficient manner.	**Compliant Ongoing**
O3	**Dust**			

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.		Generation of dust from the Haerses Road Quarry operations is managed under the Site Environmental Management Strategy Annex C - Air Quality Management, to minimise dust emissions from the site.	**Compliant Ongoing**
O3.2	Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.		All loads are covered on trucks operating in or out the Haeres Road Quarry site.	**Compliant Ongoing**
O3.3	The licensee must maintain and operate a continuous dust monitoring device at Point 1 identified in condition P1.1 of this licence. The continuous dust monitoring device must be fitted with an automatic alarm system alerting the quarry staff once the trigger value for PM10 (42 µg/m^3) is reached.		The PM_{10} monitoring for the Haerses Road Quarry conducted at Monitoring Point 1 (condition P1.1) with a TEOM, has an automatic alarm system alerting the quarry staff once the trigger value for PM_{10} is reached.	**Compliant Ongoing**
O3.4	All dust deposition gauges installed at the site must be operated and maintained in accordance with Australian Standard 2724.1 (1984) for deposition gauges.		Dust deposition gauges installed at the site are maintained in accordance with AS 2724.1-1984.	**Compliant Ongoing**
O3.5	The licensee must maintain and operate a continuous automatic meteorological station at monitoring Point 2, identified in condition P1.1 of this licence, as per requirements of AS 2923 - 1987. This wind monitoring components of the meteorological station must be interfaced with the continuous dust monitoring device, identified in the above condition O3.3		A continuous automatic meteorological station has been installed at EPA Monitoring Point 2, **(**identified in condition **P1.1** of EPL 12513), as per requirements of AS 2923 - 1987. The wind monitoring components of the meteorological station are interfaced with the TEOM continuous dust monitoring device.	**Compliant Ongoing**

<table>
<tr><th>Condition No.</th><th>EPL 12513 Condition</th><th>Verification</th><th>Comments</th><th>Compliance Status</th></tr>
<tr><td>O3.6</td><td>The licensee must ensure that the dust generated by the development does not cause any additional exceedances of the air quality impact assessment criteria listed in tables 1,2 & 3 at any residence on any privately owned land, listed in condition L6.1
Table 3: Long term impact assessment criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90µ g/m^3</td></tr>
<tr><td>Particulate matter < 10 microns (PM_{10})</td><td>Annual</td><td>30µ g/m^3</td></tr>
</table>
Table 4: Short term impact assessment criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Particulate matter <10microns (PM_{10})</td><td>24hour</td><td>50µg/m^3</td></tr>
</table>
Table 5: Long term impact assessment criteria for deposited dust
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Maximum increase in deposited dust levels</th><th>Maximum total deposited dust levels</th></tr>
<tr><td>Deposited Dust</td><td>Annual</td><td>2 g/m^2 /month</td><td>4 g/m^2 /month</td></tr>
</table>
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for sampling and Analysis of Ambient Air - Determination of Particulates – Deposition Matter – Gravimetric Methods.</td><td>• Development Consent 165-07-2005 Schedule 3 condition 11
•</td><td>Air quality monitoring is conducted in accordance with the requirements in Environment Protection Licence 12513 for PM_{10} and dust deposition and at additional environmental monitoring locations for dust deposition shown on Figure 1.4 Environmental Monitoring Locations Haerses Road Quarry in the Annual Reviews. Deposited dust results were generally compliant during 2013 and 2016.

The annual PM_{10} average for the 2015-2016 reporting period was 11.6µg/m³, well below the EPA criterion of 30µg/m³. This annual average is lower than the previous monitoring periods where the annual PM_{10} averages were recorded at 13.4µg/m³ (2014-2015), 15.4µg/m³ (2013-2014) and 12.3µg/m³ (2012-2013).
The 24 hour PM_{10} dust levels on the site have largely been satisfactory during the reporting period. The exceedances in November 2015, April 2016 and May 2016 were attributed to dry and hot westerly winds and scheduled RFS hazard reduction burns and a dust storm that passed through the Maroota area.
Deposited dust results were generally compliant during 2015 and 2016.</td><td>Compliant</td></tr>
<tr><td>O4</td><td>Stormwater Management</td><td></td><td></td><td></td></tr>
<tr><td>O4.1</td><td>A Site Water Management Plan (SWMP) must be implemented for the development, in consultation with DEC and DNR. The plan must include:
1. a Soil and Water Management Plan; and
2. a Groundwater Monitoring Program.
The Soil and Water Management Plan must:
1. describe what measures would be implemented to minimise soil erosion, and the discharge of sediment and other pollutants, during each stage of the development including:
• road and intersection works;
• initial clearing and topsoil stripping:
• extraction; and
• noise bund construction.
2. include control measures that have the capacity to contain the rainfall and runoff generated by the “design event” specified in condition O4.7
The Groundwater Monitoring Program must:</td><td>• Development Consent 165-07-2005 Schedule 3 condition 17, 18 and 19
•</td><td>The Soil and Water Management Plan (prepared as section 3 of the Site Water Management Plan) to satisfy Development Consent 165-7-2005 Schedule 3 condition 18, was submitted to DoP for approval in July 2006 and approved on 19 April 2007. The Site Water Management Plan includes:
(a) sections 3.2 describes measures to be implemented to minimize soil erosion, and the discharge of sediment and other pollutants, during each stage of the development:
• road and intersection works – section 3.2.6;
• initial clearing and topsoil stripping -
• extraction – section 3.2.7;
• noise bund construction – section 3.2.3
(b) section 3 and Annexure B provide control measures that have the capacity to contain the</td><td>Compliant</td></tr>
</table>

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
	1. describe what measures would be put in place to establish the site's wet weather groundwater levels; 2. monitor any potential adverse impacts of the development on groundwater levels and quality; 3. detail the contingency measures that would be put in place in the event that groundwater is breached and/or contaminated. The SWMP should be prepared in accordance with the requirements of Landcom's Manual titled "*Managing Urban Stormwater Soil and Construction Volume 1, 4th Edition, March 2004".*		rainfall and runoff generated by the design event specified in condition 18 above; and (c) Annexures A-C provide parameters and calculations consistent with the *Managing Urban Stormwater: Soils and Construction* Manual Landcom (Volume 1, March 2004). The Groundwater Monitoring Program (prepared as section 4.2 of the Site Water Management Plan) to satisfy Development Consent 165-7-2005 Schedule 3 condition 17 and 19, was submitted to DoP for approval in July 2006 and approved on 19 April 2007. Groundwater monitoring is also included in the Environmental Monitoring Program July 2006 section 2.3. The Groundwater Monitoring Program includes: (a) the Site Water Management Plan section 4.2 outlines establishing the site wet weather groundwater levels; (b) Table 2.4 outlines the program to monitor any potential adverse impacts of the development on groundwater levels and quality; (c) Table 2.4 – Response outlines the contingency measures that would be put in place in the event that groundwater is breached and contaminated	
O4.2	A Stormwater Management Scheme must be prepared for the development and must be implemented. Implementation of the Scheme must mitigate the impacts of stormwater run-off from and within the premises following the completion of construction activities. The Scheme should be consistent with the Stormwater Management Plan for the catchment. Where a Stormwater Management Plan has not yet been prepared the Scheme should be consistent with the guidance contained in Landcom's Manual titled "*Managing Urban Stormwater Soil and Construction Volume 1, 4th Edition, March 2004".*		The Stormwater Management Scheme must be prepared and implemented for the development to mitigate the impacts of stormwater run-off from and within the premises following the completion of construction activities. Construction activities at the Haerses Road Quarry have not yet been completed.	**Not yet triggered**
O4.3	If mud, sediment or other raw materials are found to be tracked off the premises the Company must install, operate and maintain on the premises an automatic wheel wash or similar facility that will be capable of washing the underside of vehicles, wheels, wheel arches and axles of all vehicles leaving the premises. In addition to this, appropriate measures must be put in place that ensures that all vehicles leaving premises must go through the wheel wash facility.		Mud, sediment or other raw materials have not been found to be tracked off the premises to the public Haerses Road-Wisemans Ferry Road intersection. No wheel wash or similar facility capable of washing the underside of vehicles, wheels, wheel arches and axles of all vehicles leaving the premises, has been installed at the Haerses Road site.	**Not triggered**

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
O4.4	The entrance to the premises must be maintained in a sealed state.		Dixon Sand have sealed Haerses Road from the Wisemans Ferry intersection to the quarry entrance.	**Compliant**
O4.5	The sealed access road to the premises must be kept free of dust, sediment and other raw materials at all times.		The sealed road from the Wisemans Ferry intersection to the quarry entrance is maintained by Dixon Sand, with a water cart and road sweeper available for both Haerses Road and Old Northern Road maintenance.	**Compliant Ongoing**
O4.6	A sediment basin must be installed and maintained in extraction area called stage 1 prior to any extraction activities being undertaken. The dam must have a storage capacity of no less than 222 cubic metres as specified in the additional information supplied by the proponent's consultant Environmental Resources Management Australia via letter date 11 August 2005		The Stage 1 excavation acts as a collection basin for surface runoff from the area disturbed by the Stage 1 sand extraction, the storage capacity of which is greater than 222m^3. Water collected in the excavation does not discharge to the surrounding environment.	**Compliant Ongoing**
O4.7	Appropriate sediment dams must be installed and maintained for every stage of the extraction area for the life of the sand quarry. The dams must be in place prior to any extraction taking place in the respective strip of each stage and must be designed and constructed in accordance with Landcom's Manual titled "*Managing Urban Stormwater Soil and Construction Volume 1, 4th Edition, March 2004".* Notwithstanding the above, the capacity of the dams must have a sufficient capacity to contain the rainfall and runoff generated from a 90 percentile, 5day rainfall event ("the design event") for the life of the development.	• *Managing Urban Stormwater Soil and Construction,* 4th Edition, Landcom, March 2004	Sediment dams / collection sumps were installed and maintained for Stage 1 and Stage 2 extraction areas prior to any extraction taking place in each stage and were designed and constructed in accordance with Landcom Manual titled "*Managing Urban Stormwater Soil and Construction Volume 1, 4th Edition, March 2004".*	**Compliant Ongoing**
5	**Monitoring and recording conditions**			
M1	**Monitoring records**			
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.			**Noted**
M1.2	All records required to be kept by this licence must be: (a) in a legible form, or in a form that can readily be reduced to a legible form; (b) kept for at least 4 years after the monitoring or event to which they relate took place; and (c) produced in a legible form to any authorised officer of the EPA who asks to see them.		All records required kept for EPL 12513 are: a) in a legible form, electronically; b) kept for at least 4 years after the monitoring or event; and c) can be produced any authorised officer of the EPA who asks to see them.	**Compliant Ongoing**
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: (a) the date(s) on which the sample was taken; (b) the time(s) at which the sample was collected; (c) the point at which the sample was taken; and (d) the name of the person who collected the sample.		Chain-of-Custody / Sampling records include the date / time on which the sample was taken; the sample monitoring point at which the sample was taken; and the name of the person who collected the sample.	**Compliant Ongoing**

<table>
<tr><th>Condition No.</th><th>EPL 12513 Condition</th><th>Verification</th><th>Comments</th><th>Compliance Status</th></tr>
<tr><td>M1.4</td><td>The following records for monitoring Point 1 identified in licence condition P1.1, must be kept electronically:
(a) each 15 minute PM_{10} result;
(b) each rolling 24-hour average PM_{10} results (each 15 minutes);
(c) each daily 24-hour average PM_{10} result (midnight to midnight); and
(d) the rolling annual average PM_{10} result (each day, midnight to midnight, and over the total number of days of monitoring since monitoring began for first year of monitoring only).</td><td>• Environmental Monitoring Air Quality TEOM and Meteorological Data Reports, Nov 2015, Apr 2016 & May 2016, Carbon Based Environmental Pty Ltd</td><td>PM_{10} records for Monitoring Point 1 (identified in EPL 12513 condition P1.1) are kept for:
a) 15 minute PM_{10} results;
b) rolling 24-hour average PM_{10} results (each 15 minutes); and
c) daily 24-hour average PM_{10} result (midnight to midnight).</td><td>Compliant Ongoing</td></tr>
<tr><td>M1.5</td><td>The following records for Point 2 identified in licence condition P1, must be kept electronically for each 15 minute, 1hour and 24hour result as indicated in the table at condition M2.3.</td><td></td><td>Meteorological records identified in licence condition P1.1, Point 3 are kept electronically, for each 15minute, 1 hour and 24hour result as required in EPL 12513condition M4.1.</td><td>Compliant Ongoing</td></tr>
<tr><td>M2</td><td colspan="3">Requirement to monitor concentration of pollutants discharged</td><td></td></tr>
<tr><td>M2.1</td><td>Not applicable</td><td></td><td></td><td>Not applicable</td></tr>
<tr><td>M2.2</td><td>For each monitoring/discharge or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified in the other columns:
Air
<table>
<tr><th>Pollutant</th><th>Unit</th><th>Averaging Period</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>PM_{10}</td><td>µg/m^3</td><td>15 minute</td><td>Continuous</td><td>AS3580.9.8-2001</td></tr>
</table></td><td>• Environment Protection Licence 12513 condition L3.4</td><td>A TEOM for the monitoring of PM_{10} has been installed at EPA approved Monitoring Point 1 (in accordance with EPL 12913 condition P1.1).</td><td>Compliant</td></tr>
<tr><td>M2.3</td><td>For each monitoring point specified in the table below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.
Weather
<table>
<tr><th>Parameter</th><th>Units</th><th>Averaging Period</th><th>Frequency</th><th>Method</th></tr>
<tr><td>Rainfall</td><td>mm</td><td rowspan="5">15 minute</td><td rowspan="5">Continuous</td><td>AM-4</td></tr>
<tr><td>Temperature@2m</td><td>^{o}C</td><td>AM-2</td></tr>
<tr><td>Sigma Theta@10m</td><td>-</td><td rowspan="3">AM-2 and AM-4</td></tr>
<tr><td>Wind speed</td><td>m/s</td></tr>
<tr><td>Wind direction@10m</td><td>-</td></tr>
</table></td><td>• AS 2923-1987 Ambient Air – Guide for measurement of horizontal wind and air quality applications
• EPL 3916 condition M4.1
• Development Consent 250-09-01 MOD 4 Schedule 2 condition 4.2</td><td>The meteorological station installed at EPA approved Monitoring Point 1 (in accordance with EPL 12513 condition P1.1) near the Maroota Public School, records the required parameters in condition M2.3.
(The automatic meteorological station also applies to Development Consent 250-09-01 MOD 4 Schedule 2 condition 4.2 and EPL 3916 condition M4.1) installed at EPA Monitoring Point 3, (identified in condition P1.1 of EPL 3916), as per requirements of AS 2923 – 1987.</td><td>Compliant</td></tr>
<tr><td>M2.4</td><td>If any rolling 24-hour average PM_{10} result measured at Point 1 in licence condition M2.2 is found to be greater than 42 µg/m^3 and the</td><td></td><td>Continuous monitoring with the TEOM near Maroota Public School is connected to an alarm system triggered by a maximum PM_{10} level of</td><td>Compliant Ongoing</td></tr>
</table>

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
	prevailing wind at the site is between 1800 and 2400 as measured at Point 2: i) the licensee must take immediate action to reduce its PM_{10} emissions; ii) the licensee must immediately notify the EPA Manager Sydney Industry; iii) if the dust level does not return to below 42 $\mu g/m^3$ within 1 hour then all dust generating activity on site must stop; and, iv) dust generating activity may only recommence when the rolling 24-hour average PM_{10} result measured at Point 1 is less than 42$\mu g/m^3$ for 4 consecutive 15minute period.		37$\mu g/m^3$ as a rolling 24 hour average. If this trigger level is reached during a prevailing south-westerly wind: • An alarm is received by Quarry Managers and Environmental Officer (via SMS message). • General Manager and Production Manager authorised to issue directive to relevant personnel to cease operations as per EPA licence condition M2.4. • Management to evaluate conditions and employ the use of dust suppression measures immediately. • Environmental Officer to notify EPA Environment Hotline 131 500 if the 24 hour average PM_{10} result exceeds the 42ug/m^3 criteria and the prevailing wind at the site being a south-westerly (180^o-240^o). • Environmental Officer to closely monitor and communicate PM_{10} levels to management. • Operations may only re-commence upon approval from General Manager and Production Manager when the rolling 24hr average PM_{10} is less than 42ug/m^3 for 4 consecutive 15 minute periods, as informed by Environmental Officer. • If the dust level does not return to below the allowable limit within 1 hour of ceasing all operations must stop.	
M2.5	A comprehensive written action plan must be developed to ensure compliance with condition M2.4.	• Environmental Monitoring Program - section 2.2, Jul 2006 • Environmental Management Strategy Mar 2007	The Environmental Monitoring Program includes an Air Quality Monitoring Program in section 2.2, and Environmental Management Strategy Annex C.	**Compliant Ongoing**
M3	**Testing Methods**			
M3.1	Not applicable			**Not applicable**
M3.2	Not applicable			**Not applicable**
M3.3	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by the EPA's general terms of approval, or a licence under the Protection of the Environment Operations Act 1997, in relation to the development or in order to comply with a relevant local calculation protocol must be done in accordance with: • any methodology which is required by or under the POEO Act 1997 to be used for the testing of the concentration of the pollutant; or	• *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*, EPA 1997 • AS 3580.10.1-2003 Method for sampling and analysis of ambient air: Determination of Particulate Matter-Deposited Dust	The air quality monitoring is conducted generally in accordance with the *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*, EPA 1997. VGT Environmental Compliance Solutions specify the method of sampling for deposited dust is in accordance with AS 358010.1.	**Compliant Ongoing**

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	• if no such requirement is imposed by or under the POEO Act 1997, any methodology which the general terms of approval or a condition of the licence or the protocol (as the case may be) requires to be used for that testing; or • if no such requirement is imposed by or under the POEO Act 1997 or by the general terms of approval or a condition of the licence or the protocol (as the case may be), any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. *Note: The POEO (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".*	• Test Reports – Dust Deposition, VGT Environmental Compliance Solutions, 2015-2016		
M4	**Recording of Pollution Complaints**			
M4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.			**Noted**
M4.2	The record must include details of the following: (a) the date and time of the complaint; (b) the method by which the complaint was made; (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; (d) the nature of the complaint; (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and (f) if no action was taken by the licensee, the reasons why no action was taken.	• Complaints Register Form – Dixon Sand • Environmental Management Strategy section 6, Mar 2007 • Environment Protection Licence 3916 conditions M5 and M6.	Complaints received by Dixon Sand Quarry are recorded in a Complaints Register with: a) date and time of the complaint; b) means by which the complaint was made; c) details of the complainant that were provided; d) nature of the complaint; e) action(s) taken by the Old North Road Quarry personnel in relation to the complaint; f) if no action was taken comment on why no action was taken. A summary of complaints is provided in the Annual Review submitted to the DP&E and the Complaints Register can be made available for inspection by the EPA or the Secretary upon request	**Compliant Ongoing**
M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.			**Noted**
M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.			**Noted**
M5	**Telephone complaints line**			
M5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.		The Dixon Sand (Penrith) Pty Ltd website provides the contact information to lodge a complaint regarding the Old Northern Road Quarry operations: • Email to feedback@dixonsand.com.au, or • Phone Maroota office 02 4566 8348, or • Fill in a Contact form via the Dixon Sand Website	**Compliant**
M5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.			**Compliant**

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
M5.3	Conditions M5.1 and M5.2 do not apply until 3 months after: (a) the date of the issue of this licence or (b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.			
M6	**Requirement to monitor volume or mass**			
M6.1	Not applicable			Not applicable
6	**Reporting conditions**			
R1	**Annual return documents**			
R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: (a) a Statement of Compliance; and (b) a Monitoring and Complaints Summary. A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	• Annual Return 2015-2016 • Annual Return 2014-2015 • Annual Return 2013-2014	Annual Returns have been prepared for EPL 12513 with a Statement of Compliance and Monitoring and Complaints Summary completed for the end of each reporting period, on the standard EPA Annual Return reporting form, and submitted to the EPA by the 22 September each year.	**Compliant**
	Period covered by Annual Return			
R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below. *Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period*.		The Annual Return reporting period for EPL 12513 is 25 July to 24 July each year.	**Noted**
R1.3	Where this licence is transferred from the licensee to a new licensee: (a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and (b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.			**Not applicable**
R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: (a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or (b) in relation to the revocation of the licence - the date from which notice revoking the licence operates			**Not applicable**
	Deadline for Annual Return			

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R1.5	The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	• Annual Return 25 Jul 2015 to 24 Jul 2016	Annual Returns have been prepared for EPL 12513 on the standard EPA Annual Return reporting form, and submitted to the EPA by the 22 September each year.	**Compliant Ongoing**
	Notification where actual load cannot be calculated			
R1.6	**Not applicable**			
	Licensee must retain copy of Annual Return			**Not applicable**
R1.7	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.		A copy of the Annual Return supplied to the EPA is retained by Dixon Sand.	**Compliant Ongoing**
	Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary			
R1.8	Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: (a) the licence holder; or (b) by a person approved in writing by the EPA to sign on behalf of the licence holder	• Annual Return 23 Jul 2015 to 24 Jul 2016 • Annual Return 23 Jul 2014 to 24 Jul 2015 • Annual Return 23 Jul 2013 to 24 Jul 2014 • Annual Return 23 Jul 2012 to 24 Jul 2013	Annual Returns have been prepared for EPL 12513 with a Statement of Compliance and Monitoring and Complaints Summary completed for the end of each reporting period, on the standard EPA Annual Return reporting form, and submitted to the EPA by the 22 September each year. The Statement of Compliance has been certified and the Monitoring and Complaints Summary signed by the Directors of Dixon Sand Pty Ltd.	**Compliant**
R1.9	A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.			**Not applicable**
R2	**Notification of environmental harm**			
R2.1	Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.			**Noted**
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.			**Noted**
R3	**Written Report**			
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: (a) where this licence applies to premises, an event has occurred at the premises; or (b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.			**Noted**

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R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.			**Noted**
R3.3	The request may require a report which includes any or all of the following information: (a) the cause, time and duration of the event; (b) the type, volume and concentration of every pollutant discharged as a result of the event; (c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; (d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; (e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and (g) any other relevant matters.			**Noted**
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.			**Noted**
	General Conditions			
G1	**Copy of licence kept at the premises**			
G1.1	A copy of this licence must be kept at the premises to which the licence applies.		A copy of Environment Protection Licence 12513 is kept at the Dixon Sand office at 4610 Old Northern Road Maroota.	**Compliant**
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.		Environment Protection Licence 12513 can be produced to any authorised officer of the EPA on request.	**Compliant**
	The licence must be available for inspection by any employee or agent of the licensee working at the premises.		Environment Protection Licence 12513 is available for inspection by any employee or agent of the licensee working at the Haerses Road Quarry, at the Dixon Sand office at 4610 Old Northern Road Maroota.	**Compliant**
G2	***Community liaison***	•		
G2.1	The licensee must establish a community environment liaison committee, comprising representatives of the community and the applicant, that will meet at least every 6 months (if not already established). Discussion at the meetings must include implementation of the development consent and other statutory approvals, and provide adequate time for the community to raise	• Development Consent 250-09-01 Schedule 2 condition 5.3 • Development Consent 165-07-2005 Schedule 5 conditions 8 to 10	A Community Consultative Committee (CCC) was established and has held bi-annual meetings in May and November each year. The appointments to the initial CCC were approved by DIPNR on 9 August 2004.	**Compliant Ongoing**

Condition No.	EPL 12513 Condition	Verification	Comments	Compliance Status
	matters of concern associated with the environmental impact of the development, with a view to achieving mutually satisfactory solutions		The last official Liaison and Review Committee Meeting and the first CCC Meeting in relation to the Haerses Rad Quarry and Old Northern Road Quarry, was held in November 2004. The Community Consultative Committee (CCC) was established for both DA 250-09-01 (Old Northern Road Quarry and Development Consent 165-07-2005 (Haerses Road Quarry).	