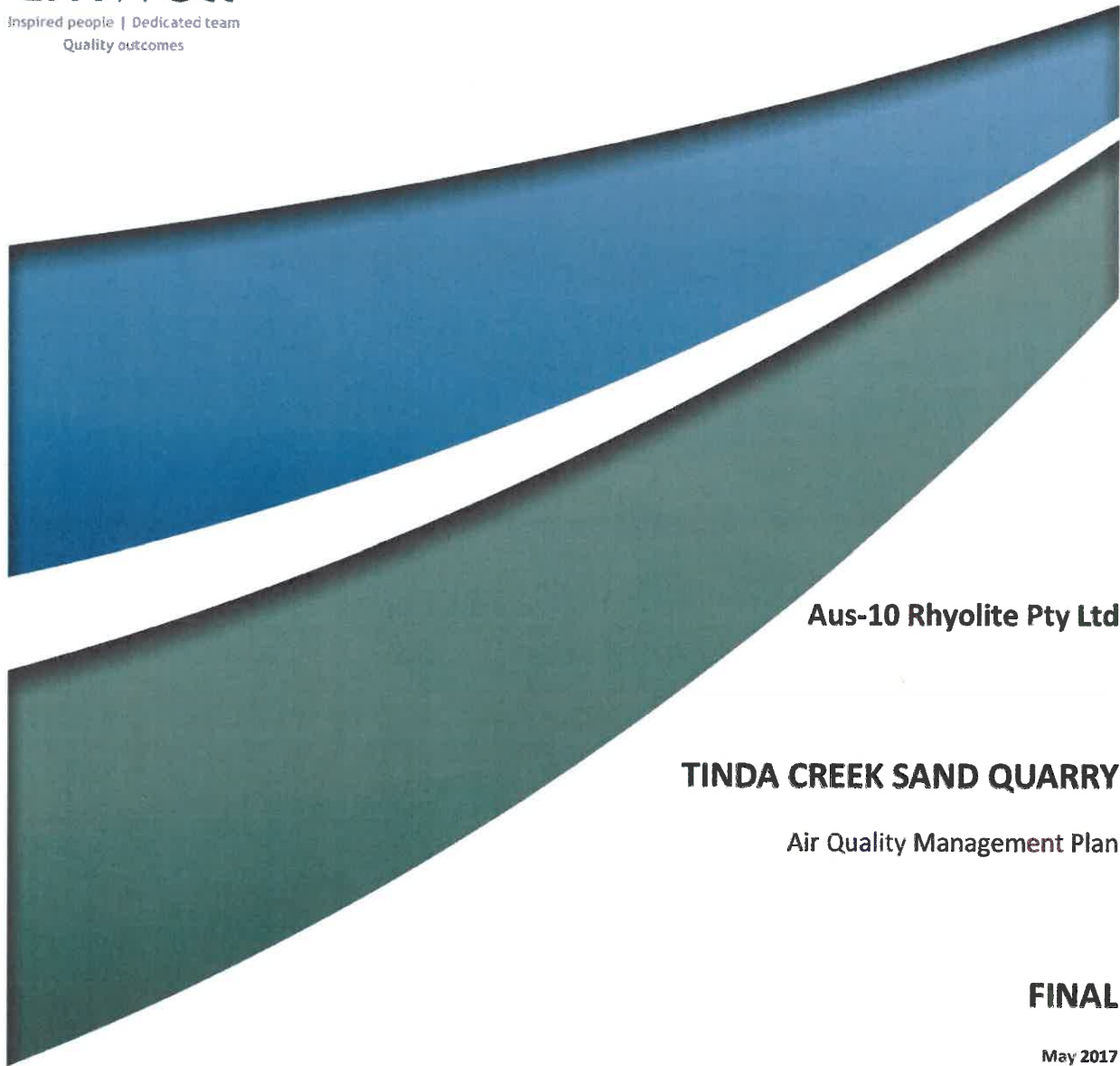


APPENDIX 2

Air Quality Management Plan



Aus-10 Rhyolite Pty Ltd

TINDA CREEK SAND QUARRY

Air Quality Management Plan

FINAL

May 2017

Aus-10 Rhyolite Pty Ltd

TINDA CREEK SAND QUARRY

Air Quality Management Plan

FINAL

Prepared by
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on behalf of
Aus-10 Rhyolite Pty Ltd

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Report No. **1731/R32/FINAL**
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1.0 Introduction

1.1 Background

Aus-10 Rhyolite Pty Ltd t/a Hy-Tec Concrete and Aggregates (Hy-Tec) operates Tinda Creek Quarry, a sand quarry located approximately 67 kilometres north of Windsor along Putty Road, NSW (refer to **Figure 1.1**). Quarrying activities have been undertaken at Tinda Creek Quarry for approximately 30 years with the quarry currently producing up to 125,000 tonnes of product per year. The existing operations have been developed in accordance with a number of development consents, licences and project approvals, including DA 134/95 (incorporating the 2009 modifications) and Environment Protection Licence (EPL) 12007.

Hy-Tec has recently been granted approval to increase production levels from Tinda Creek Quarry from approximately 125,000 tonnes per annum (tpa) up to 300,000 tpa by increasing the area subject to sand extraction to include additional identified resource domains. The duration of the Project is expected to be approximately 30 years.

The development consent allows for continued operations of the Tinda Creek Quarry across a broader area which will enable the extraction of additional sand resources (refer to **Figure 1.2**).

Hy-Tec is committed to implementing continued quarrying operations in the context of updated and contemporary environmental management requirements. This Air Quality Management Plan (AQMP) has been prepared in accordance with Condition 9 of Schedule 3 of the development consent.

1.2 Project description

The revised Tinda Creek Quarry Development Consent (SSD_4978) provides for the following:

- extraction of up to 300,000 tpa of sand in any calendar year until December 2045
- extension of the approved extraction as shown on **Figure 1.2**
- the transport of up to 300,000 tpa of sand from in the site in any calendar year
- the dispatch or receipt of up to 34 trucks per day, averaged over a calendar month.

To further reduce potential for dust generation from continued operations at the quarry, Hy-Tec will seal the haul road between the weighbridge and Putty Road.

1.3 Purpose and scope

The purpose of this AQMP is to provide a description of the measures to be implemented by Hy-Tec to manage air quality at Tinda Creek Sand Quarry and to detail the air quality monitoring requirements associated with the operation. This AQMP also provides a mechanism for assessing air quality monitoring results against the relevant air quality impact assessment criteria and operating conditions.

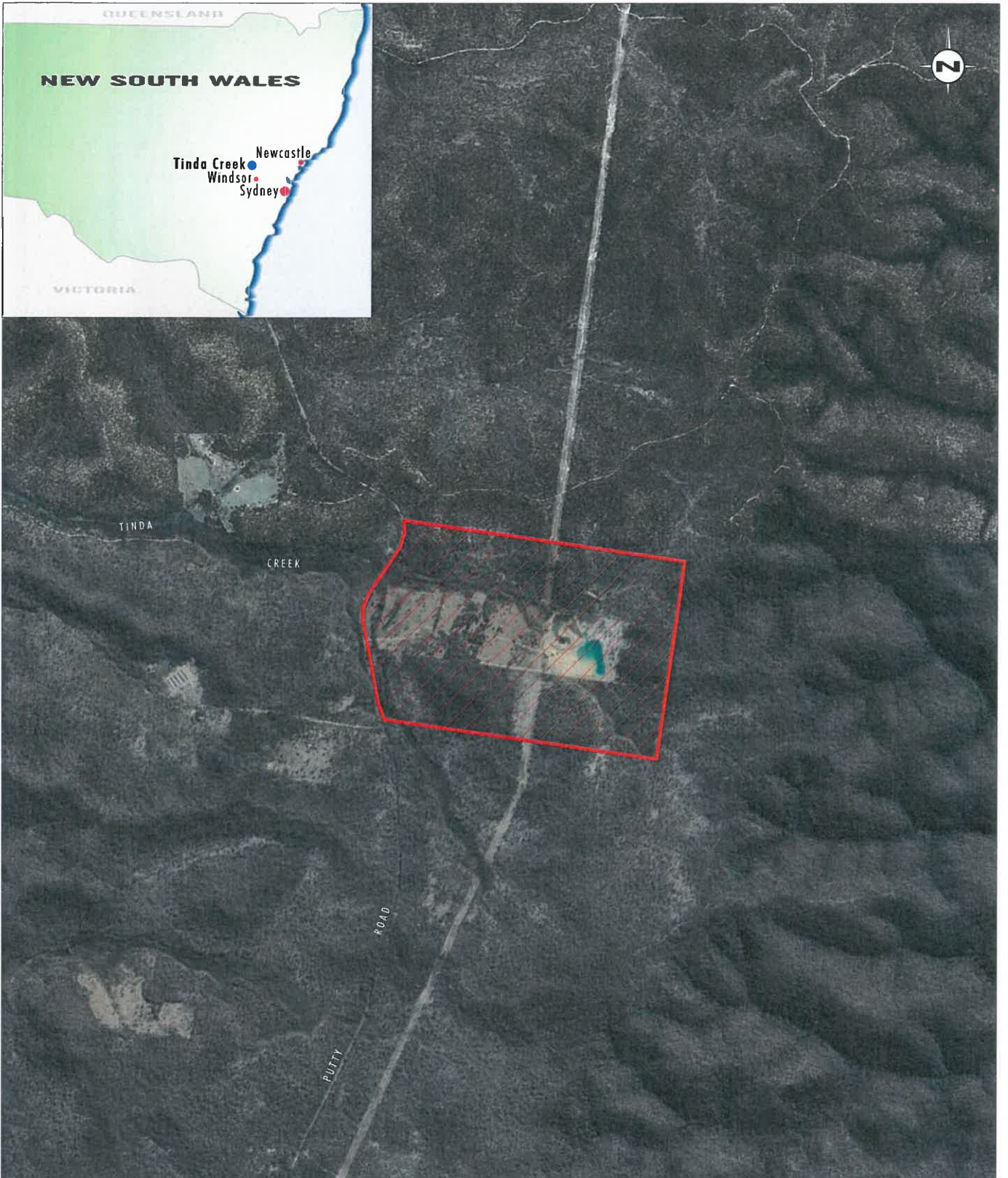
This AQMP also addresses the requirements detailed in Schedule 3 of the development consent. A brief outline of the development consent conditions and statement of commitments relevant to this plan is provided in **Sections 2.1** and **2.2** respectively, including a checklist of where each condition has been addressed within this document.

The plan outlines the control measures to be implemented as part of the continued operations at the Tinda Creek Sand Quarry to minimise the potential air quality impacts on the local community.

1.4 Objectives

The objectives of this plan in relation to air quality management are to:

- detail the controls to be implemented to minimise dust generation from operations
- establish a system to assess the air quality impact on surrounding receivers
- provide a mechanism to assess monitoring results against air quality impact assessment criteria
- provide an air quality protocol for determining exceedances of the relevant criteria
- manage air quality related community complaints in a timely and effective manner
- provide management commitments and strategies for dealing with air quality related issues.



Source: Google (2002)

0 0.5 1.0 2km
1:35 000

Legend
Project Area

FIGURE 1.1
Locality Map



Source: Google Earth (2012), LPI NSW (2007)

- Legend**
- Project Area
 - Proposed Extraction Area
 - Domain 3 Extraction Area
 - Domain 7 Extraction Area
 - Private Holding Duck Farm
 - Private Holding Hobby Farm
 - National Park Boundary

FIGURE 1.2

Proposed Expansion of Tinda Creek Sand Quarry Project

2.0 Regulatory requirements

2.1 Development consent

The development consent for the Tinda Creek Sand Quarry Expansion Project was assessed under the *Environmental Planning and Assessment Act 1979* (EP&A Act). Approval for the project was granted by the Minister for Planning on 10 April 2015. The requirement for this AQMP arises from Condition 7 of Schedule 3 of the Tinda Creek Sand Quarry Development Consent. The requirements from the development consent relating to air quality, and where these requirements are addressed within this document, are provided in **Table 2.1**.

Table 2.1 Development consent conditions

Conditions		Addressed in Section
Schedule 3 – Environmental Performance Conditions Air Quality Criteria		
7.	The Applicant shall implement all reasonable and feasible avoidance and mitigation measures so that particulate matter emissions generated by the development do not exceed the criteria in Tables 3 to 5 at any residence on privately-owned land.	Section 5.0
Schedule 3 – Environmental Performance Conditions Air Quality Management Plan		
6.	The Applicant shall prepare and implement an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:	This document
	<ul style="list-style-type: none"> be prepared in consultation with the EPA, and submitted to the Secretary within 6 months of the date of this consent, unless the secretary agrees otherwise; 	EPA was forwarded a copy of the AQMP in November 2015 and responded by email on 18 November 2015 that there were no comments.
9.	<ul style="list-style-type: none"> describe the measures that would be implemented to ensure: <ul style="list-style-type: none"> compliance with the air quality criteria and conditions under this consent; and best management practice is being employed. 	Sections 4.0 to 7.0

Conditions		Addressed in Section
	<ul style="list-style-type: none"> • include an air quality monitoring program that: <ul style="list-style-type: none"> ○ evaluates and reports on: <ul style="list-style-type: none"> ▪ the effectiveness of the air quality management measures; and ▪ the compliance with the air quality criteria and operating conditions; and ○ defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and the relevant stakeholders of any air quality incidents. 	Section 6.0
Schedule 5 – Environmental Management, Reporting and Auditing Management Plan Requirements		
3.	The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
	<ul style="list-style-type: none"> • detailed baseline data; 	Section 3.0
	<ul style="list-style-type: none"> • a description of: <ul style="list-style-type: none"> ○ the relevant statutory requirements (including any relevant approval, licence or lease conditions); ○ any relevant limits or performance measures/criteria; and ○ the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	Sections 2.0 and 4.0
	<ul style="list-style-type: none"> • a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; 	Section 5.0
	<ul style="list-style-type: none"> • a program to monitor and report on the: <ul style="list-style-type: none"> ○ impacts and environmental performance of the development; and ○ effectiveness of any management measures; 	Sections 6.0 and 7.0
	<ul style="list-style-type: none"> • a contingency plan to manage any unpredicted impacts and their consequences; 	Section 7.2.1
	<ul style="list-style-type: none"> • a program to investigate and implement ways to improve the environmental performance of the development over time; 	Section 8.0

Conditions		Addressed in Section
	<ul style="list-style-type: none"> • a protocol for managing and reporting any: <ul style="list-style-type: none"> ○ incidents; ○ complaints; ○ non-compliances with statutory requirements; and ○ exceedances of the impact assessment criteria and/or performance criteria; and 	
	<ul style="list-style-type: none"> • a protocol for periodic review of the plan. 	Sections 6.4 and 8.0

2.2 Statement of commitments

The statement of commitments relevant to the AQMP, and where they are addressed in this document, is detailed in Table 2.2.

Table 2.2 Statement of commitments

Commitment	Addressed in Section
<p>The existing dust control measures will continue to be implemented on site, including:</p> <ul style="list-style-type: none"> • minimisation of the total disturbed/working areas at any one time; • sealing of the haul road between Putty Road and the weighbridge; and • watering of remaining unsealed roads, working areas and stockpiles as required to ensure that dust is controlled under prevailing weather conditions. 	Section 5.0

3.0 Baseline data

3.1 Existing environment

The quarry has operated for approximately the last 30 years and over this time there have been no recorded concerns or complaints in regard to impacts on air quality.

The extraction and separation process at the site is predominantly a wet operation and as a result has limited potential to generate dust. As a result the only potential sources of dust are from the haul road which can be readily controlled by watering and from disturbed areas and from future extraction within Domain 2 which will involve pushing sand into the dredge pond with a bulldozer. A significant portion of the disturbed areas comprise dredge ponds, tailings dams and sedimentation dams all of which also have limited dust generation potential.

There has been no specific air quality monitoring undertaken at the site since operations commenced. Therefore apart from anecdotal observations there is no baseline data for comparison purposes during ongoing operations. In 30 years of operations, dust has not been reported as an issue at the quarry.

4.0 Air quality assessment criteria

Goals for dust concentration are referred to as long term (annual average) and short term (24 hour maximum) goals. The goals relate to the total ambient dust concentrations and dust deposition levels, i.e. quarry contribution in addition to the background contribution. Condition 7 of Schedule 3 of the development consent specifies the air quality criteria for Tinda Creek Sand Quarry. The development consent criteria for particulate matter are outlined in Tables 4.1, 4.2 and 4.3.

Table 4.1 Long-term criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Total suspended particulates (TSP)	Annual	^a 90 µg/m ³
Particulate matter <10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 4.2 Short-term criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Particulate matter <10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 4.3 Long-term criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^b 4 g/m ² /month

Notes to Tables 4.1, 4.2 and 4.3:

- a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources)
- b Incremental impact (i.e. incremental increases in concentrations due to the development on its own)
- c Deposited dust is to be assessed as insoluble solids as defined by AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method
- d Excluded extraordinary events such as bush fires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with the EPA.

5.0 Air quality management controls

Hy-Tec is committed to implementing all reasonable and feasible air quality mitigation measures, to reduce the potential impact of the operation on sensitive receivers. In order to mitigate any potential air quality impacts from the operation, a number of air quality management controls will be implemented throughout the life of the operation.

The dust control measures available for quarry operations are generally a combination of engineering controls, operational controls, and planning controls with existing dust control measures in place continuing to be implemented as part of the quarry expansion. As the majority of the quarry extraction processes are 'wet', the operation has inherent dust control. Additional dust control measures include:

- visual inspections to ensure that appropriate stockpile moisture content is maintained. This can readily be determined on-site by observing if sand is being mobilised under low wind conditions. If there are signs of sand mobilisation, additional moisture is added to the surface of the stockpile. During normal operations the surface of the stockpile is continually dampened by the overhead cyclone
- sealing of the access road between Putty Road and the weighbridge
- use of a water cart on other trafficked areas as required
- minimising the areas and duration of exposed soils
- prompt commencement of stabilisation/rehabilitation in accordance with the existing Environmental Management Plan (Umwelt, 2015).

The effectiveness of the dust management controls utilised at the Tinda Creek Sand Quarry will be reported to the Department as part of the annual review. The annual review will also identify whether any additional dust management controls are required to be implemented at Tinda Creek Sand Quarry, or whether there are any technological advancements in dust control which are suitable for implementation at the quarry.

6.0 Air quality monitoring

Hy-Tec will monitor dust deposition levels monthly at one location to the west of the quarry (refer to **Figure 6.1**) as an indicator of overall air quality performance of quarry operations. Should community complaints be received regarding ambient particulate matter concentrations Hy-Tec will consider the implementation of ambient particulate matter monitoring.

6.1 Monitoring standards

The dust deposition gauges will be operated in accordance with AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

6.2 Air quality compliance assessment

Measured dust deposition levels will be assessed against the criteria given in **Table 4.3**.

6.3 Meteorological monitoring

A meteorological station is to be installed at the Tinda Creek Sand Quarry as detailed on **Figure 6.1**. The meteorological monitoring data obtained from the station will be in accordance with the requirements of Condition 10 of Schedule 3 of the development consent.

6.4 Independent review

In the event that an adjoining landowner considers that the Tinda Creek Sand Quarry is exceeding air quality criteria at his or her property, the landowner may request an independent review of the air quality impacts at the property. The independent review will be conducted in accordance with the procedure described in Condition 2 of Schedule 4 of the development consent.



Source: Google Earth (2012), LPI NSW (2007)

- Legend**
- ▭ Project Area
 - ▭ National Park Boundary
 - ▨ Proposed Extraction Area
 - ▨ Dust Deposition Monitoring Location
 - ▨ Domain 3 Extraction Area
 - Receiver Location
 - ▨ Domain 7 Extraction Area
 - ▭ Meteorological Station
 - ▨ Private Holding Duck Farm
 - ▨ Private Holding Hobby Farm

FIGURE 6.1
Dust Deposition Monitoring Location

7.0 Reporting

7.1 External reporting

A summary of air quality monitoring results will be provided in the Tinda Creek Sand Quarry annual review. The following information will be reported in the annual review in accordance with Condition 4 of Schedule 5 of the development consent.

By the end of December each year Hy-Tec shall review the environmental performance of the development to the satisfaction of the Secretary. The requirements of the review are detailed in **Table 2.1**.

In addition, in accordance with *Protection of the Environment Legislation Amendment Act 2011* (Amendment Act) and Condition 11 of Schedule 5 of the development consent, Hy-Tec will also publish air quality monitoring results on the Hy-Tec website (<http://www.hy-tec.com.au/>).

Performance monitoring, which includes an assessment of the effectiveness of air quality monitoring and compliance with the relevant development consent and EPL conditions, may be discussed at Community Consultative Committee (CCC) meetings.

7.2 Air quality criteria exceedance reporting protocol

Any exceedances of air quality criteria should they occur, will be classified as environmental incidents and will be managed in accordance with the Tinda Creek Sand Quarry Environmental Management Strategy (EMS). The EMS includes a procedure for the management of environmental incidents and community complaints. In accordance with this procedure, all environmental incidents will be investigated to a level commensurate to their risk level, by the Tinda Creek Sand Quarry Manager in consultation with environmental personnel from Hy-Tec and quarry staff who are aware and trained in implementing air quality control measures at the site. Additional controls will be implemented where required, based on the outcomes of the investigation. All environmental incidents/exceedances will be reported annually in the annual review.

Incidents that have caused, or threaten to cause material harm to the environment will be reported to the Department and Environment Protection Authority (EPA) immediately Hy-Tec becomes aware of the incident. Reporting for material harm incidents will be undertaken in accordance with Condition 7 of Schedule 5 of the development consent.

Additionally, in accordance with Schedule 4, Condition 1 of the development consent, in the event an exceedance of the air quality impact assessment criteria is identified, Hy-Tec will notify relevant government agencies and any affected landowner(s) and provide regular monitoring results to each of these parties until the results show that the operation is complying with the relevant criteria (refer to **Section 4.0**).

7.2.1 Adaptive management

In accordance with Condition 2 of Schedule 5 of the development consent, Hy-Tec will assess and manage air quality related risks to ensure compliance with the criteria outlined in **Section 4.0**.

Where a non-compliance relating to air quality impact has occurred, Hy-Tec shall, at the earliest opportunity to the satisfaction of the Secretary:

- take all reasonable and feasible measures to ensure the exceedance ceases and does not recur
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action
- implement remediation measures as directed by the Secretary.

7.3 Complaint response

Complaints relating to air quality from the Tinda Creek Sand Quarry are to be managed in accordance with the requirements of the Tinda Creek Sand Quarry EMS. This includes:

- responding to the complainant acknowledging that the complaint has been received
- making a record of the complaint
- investigating the reason for the complaint
- implementing appropriate measures to address the complaint.

A summary of complaints if any are received will be available to regulatory authorities on request and provided in the annual review.

8.0 Review and improvement

Ongoing monitoring and review on the performance and implementation of this AQMP will be undertaken in accordance with Tinda Creek Sand Quarry EMS.

In accordance with Condition 5 of Schedule 5, Hy-Tec shall review, and if necessary revise, the strategies, plans, and programs required under development consent to the satisfaction of the Secretary, within 3 months of the submission of:

- (a) *the submission of an annual review under condition 4 above*
- (b) *the submission of an incident report under condition 7 below*
- (c) *the submission of an audit report under condition 9 below*

the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

The Tinda Creek Sand Quarry Manager and Hy-Tec environmental personnel will review and if necessary, revise this AQMP and resubmit to the Department every year or earlier if required. Any changes made to the AQMP as a result of the review will be made in consultation with the Department, EPA and Hawkesbury City Council. A copy of the revised AQMP will be supplied to the Department for approval. The AQMP will reflect changes in environmental requirements, technology and operational procedures.

Updated versions of the approved AQMP will be made publicly available on the Hy-Tec website (<http://www.hy-tec.com.au/>).

Continuous improvement will also occur through independent review as a result of the three-yearly compliance audit, which is required in accordance with Condition 9 of Schedule 5 of the development consent.

9.0 Definitions

The terminology used within this AQMP is defined in:

Table 9.1 Definitions

Term	Definition
Dust Deposition	Dust particles that settle out from the air - measured in grams per square metre per unit time (g/m ² /month).
Incident	A set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits of performance measures/criteria in the Project Approval.
Non-compliance	Occurs when environmental monitoring results fall outside acceptable regulatory limits (i.e. Development Consent or EPL criteria).
PM ₁₀	Particulate matter less than 10 micrometres (µm) in size.
PM _{2.5}	Particulate matter less than 2.5 micrometres (µm) in size.
TSP	Total Suspended Particulates (µg/m ³). The nominal size of this fraction has particles with a diameter of up to 50 micrometres (µm).
µg/m ³	Micrograms per cubic metre.

10.0 Accountabilities

Relevant roles and responsibilities associated with this NMP are presented in **Table 10.1** below.

Table 10.1 Accountabilities

Role	Accountabilities for this document
Quarry Manager	Implementation of air quality control measures, monitoring and reporting. This will be done in consultation with Hy-Tec environmental personnel and staff at the quarry who are aware and trained in managing air quality at the site.

11.0 Consultation

A copy of the Air Quality Management Plan was provided to EPA on 10 November 2015. EPA Senior Operations Officer – Sydney Industry (Mark Hanemann) advised by email on 18 November 2015 that EPA had no comments in regard to the Air Quality Management Plan.

12.0 References

NSW Environment Protection Authority (EPA) 2007. Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.

Standards Australia, AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

Umwelt (Australia) Pty Limited, 2014. Proposed Expansion of Tinda Creek Sand Quarry, Environmental Impact Statement, Report prepared for Aus-10 Rhyolite Pty Ltd.

Umwelt (Australia) Pty Limited, 2015. Environmental Management Plan 2013-2014, prepared on behalf of Hy-Tec Concrete & Aggregates.

