APPLICATION AND EIS SUBMITTED 11/5/2017

Laterals

Planning
Engineering & Management
Environmental

Our Ref.: 1707
Your Ref:

The General Manager
Goulburn Mulwaree Council
Locked Bag 22
GOULBURN NSW 2580

Re: Proposed Argyle Quarry – Lots 1 and 2 DP 1094055
63 Curlewin Lane and 17033 Hume Highway, Boxers Creek

Dear Sir,

We act under instruction for the preparation and lodgement of a development application for the above land comprising a proposed basalt quarry on Lot 1 DP 1094055 with an access over Lot 2 DP 1094055. The quarry is to be known as Argyle Quarry and has been addressed to 63 Curlewin Lane and 17033 Hume Highway, Boxers Creek. The address on the Hume Highway has been determined by deduction from the address of the adjoining Curlewin property to the east by measurement.

We submit the following information:

A. Development Application incorporating:
   a. Completed Development Application form with accompanying application fee.
   b. Environmental Impact Statement prepared by Laterals Planning May 2017.
   c. Letter authorising consultants to communicate with Council.
   d. GMC DA fee quote dated 21-4-17.
   e. Appendix 2 to EIS – Review of Secretary's Requirements.

B. Appendix 1 to EIS – SEARS and Agency requirements.

C. Owners consent to easement 20/4/2017.

D. Operational Environmental Management Plan prepared by SEEC April 2017.

E. Quarry Site Plans (A3 copies) incorporating:
   a. SCCS survey report 9/1/2016 – Proposed Egress Point Tiyces Lane.
   b. Site Development & Landscape Plan 4/5/2017.
   c. Site Development & Landscape Plan Aerial 4/5/2017.
   d. Site Development & Landscape Plan Topographic 4/5/2017.
   e. Initial Quarry Pit Detail Plan 4/5/17.

1st floor, 35 Montague Street (PO Box 1326) Goulburn NSW 2580
Phone: 02 4821 0973 • Fax: 02 4822 0777 Email: admin@laterals.com.au
21 Station Street Johns River NSW 2443
Phone: 02 6556 5194 Mobile: 0427 210 973 Email: keith@laterals.com.au
ABN: 86 252 197 969

F. Flora and Fauna Assessment 2008 prepared by Laterals Environmental updated 2017.

G. Traffic Report prepared by Laterals Engineering and Management May 2017.

H. Materials testing results prepared by various construction materials testing laboratories incorporating:
   a. Boral Initial Aggregate Stripping Tests.
   b. Boral Methylene Blue Absorption Value Test.
   c. Boral Sampling Results.
   d. Boral Sieve Test for Crushed Aggregate.
   e. Petrographic report.

I. Plans incorporating various relevant site, geological and Council planning instruments:
   a. Extent of Basalt Outcrop.
   b. Cadastre & Cainozoic Map.
   c. Regolith Map.
   d. Solid geology Map.
   e. Site Plan - Aerial Photograph.
   f. Site Plan - Topographic map.
   g. GMLEP 2009 Land Zone Map.
   h. GMLEP 2009 Biodiversity Map.
   i. Sheet 1 - Proposed Site Office Plan.
      Sheet 2 – Proposed Site Office.
   j. Acceleration Lane Concept Design 8/2/17.
   k. Acceleration Lane Concept Design 8/2/17 Aerial.
   l. Visual Aspects Plan.
   m. Deceleration Lane Plan 16039_DA01_External Roadworks General Arrangement Plan-Issue02.
   n. Deceleration Lane Plan 16039_DA02_Cross sections – Sheet 1-Issue02.
   o. Deceleration Lane Plan 16039_DA03_Cross sections – Sheet 2-Issue02.
   p. Deceleration Lane Plan 16039_DA04_Vehicular turning movement plan – Prime Mover & Semi trailer (19m)-Issue01.
   q. Emergency Exit Plan prepared by Laterals dated 3/4/2017.

J. Geological Assessments:
   a. Marian Vale Geological Assessment of Potential Construction Material Resources by Geos Mining.
   b. Marian Vale Cored Drilling Assessment Report.

K. Mining of Construction Material from Marian Vale – A preliminary feasibility assessment prepared by Groundwater Imaging.

L. Pavement condition report regarding Tiyces Lane and pavement life reports incorporating:
   a. Pavement Condition Report – R2009142.
   b. Pavement ODS2009142-1 Remaining Life 1.

c. Pavement ODS2009142-1 Remaining Life 2.
d. Pavement ODS2009142-1 Remaining Life 3.
e. Pavement ODS2009142-1 Remaining Life 4.

N. Air Assessments by Benbow Environmental incorporating:
a. Quantitative Air Assessment October 2009.
b. Revised Air Assessment May 2016.
c. Air Quality Monitoring Report May 2016.

O. Noise Assessment by Benbow Environmental incorporating:
a. Revised Noise Assessment May 2016.
b. Noise Monitoring Report May 20160.

P. Water Cycle Management Study by SEEC incorporating:
a. Water Cycle Management Study April 2017.
b. Waste Water Assessment 23/3/2015.

Q. Archaeological assessments incorporating:
a. Towrang Survey Report – Aboriginal site survey and assessment by Stedinger Associates March 2009.
b. Lot 1 AHIMS search 17/5/2016.
c. Lot 2 AHIMS search 17/5/2016.
d. PLALC Report 15/8/2016.

R. RMS Advice dated 13/02/17.

S. Water supply matters incorporating:
a. Water Supply Review by Hydroilex.
b. WAL 35518 – Edition 3 - 50M 20/3/2015.

T. NSW Office of Water advice 18/12/2015.

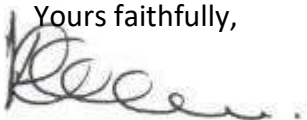
U. Geos Ripability Assessment Revised Memorandum.

V. The Rippability of Rock – F MacGregor thesis.

X. EPBC Protected Matters Report 4/4/17.

Eight (8) hard copies including a bound copy for public exhibition purposes and six (6) electronic copies have been provided and if you require any further information or clarification please do not hesitate to contact me.

Yours faithfully,



Keith Allen
Laterals Planning
9 May 2017

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GOULBURN MULWAREE COUNCIL
Locked Bag 22, (184 – 194 Bourke Street)
GOULBURN NSW 2580
Phone: 4823 4444 - Fax: 4823 4456

DA No:	
Modified DA No:	
CC No	
Modified CC No:	
Other No	

APPROVALS APPLICATION FORM & SUPPLEMENT

Section 1
Type of application

☒ **DEVELOPMENT APPLICATION** and / or
Made under Section 78A of the Environmental Planning & Assessment Act 1979.

☐ **MODIFY A DEVELOPMENT CONSENT** and / or
Made under Section 96 of the Environmental Planning & Assessment Act 1979
- ☐ A modification to correct a minor error, misdescription or miscalculation.
- ☐ A modification that will have minimal environmental impact.
- ☐ Any other modification.

☐ **CONSTRUCTION CERTIFICATE APPLICATION** and / or
Made under Sections 109C (1) (b) of the Environmental Planning & Assessment Act 1979.

☐ **MODIFY A CONSTRUCTION CERTIFICATE APPLICATION** and / or
Made under Clause 148 of the Environmental Planning & Assessment Regulation 2000

☐ **OTHER APPLICATION**
Reference to Section 9 of this form

Section 2
Assessment fee details

Building works

Value of work $ 577,647
(Note: The value must include the material and labour component for building / civil works)

and (if applicable)

Subdivision of land

Number of Existing Lots

Number of Proposed Lots

Does the development require the creation of a new road?
No ☒
Yes ☐

Lineal metres of new road

Section 3
Property details

No 63 - 65 Street name Tyces Lane
Suburb: Boxers Creek
Lot 1 & 2 Section: DP: 1094055
Please stipulate any access requirements for property inspection(s) by Council staff
Contact Peter Miller to arrange access - See authority letter
(i.e construction key required, gate locked, dangerous dog, 4WD access only etc).

Section 4
Applicants details

Name (please print): Madeleine Rose Miller – SOLE DIRECTOR/SOLE SECRETARY
Company (if applicable): Jasminco Resources Pty Ltd
Postal Address: PO Box 4
Suburb: Mittagong State: NSW Postcode: 2575
E-mail: pfm001@y7mail.com Fax:
Phone: – SEE AUTHORITY LETTER Mobile: 0434 450 290
Signature: Madeleine Miller Date: 17/4/2017

The Government Information Public Access Act 2009 (GIPAA) came into force on 1 July 2010 and affects your Development Application. Information is publically available and may be published on Council's Website. A factsheet detailing how GIPPA affects your Development Application is enclosed.

Owners consent

As the owner(s) of the above property, I / we consent to this application.

I consent to Staff from Goulburn Mulwaree Council to enter the above property for the purpose of inspections related to the above Development Application.

As owners of the above property, I have sought permission from the copyright owners of the enclosed plans/reports to be to be copied by Council for the purpose of Consultation and Notifications.

Please note: All owners of the property must sign this form.

Name:		Name:	
Signature:		Signature:	
Date:		Date:	

Company Consent

As the Owner(s) of the above property, I / we consent to this application.

I consent to Staff from Goulburn Mulwaree Council to enter the above property for the purpose of inspections related to the above Development Application.

As owners of the above property, I have sought permission from the copyright owners of the enclosed plans/reports to be to be copied by Council for the purpose of Consultation and Notifications.

Please note: Company signatories are to sign below and state their position within the Company.

Name:	James Seymour Miller	Name	Peter Francis Miller
Position	Director	Position	Managing Director/Secretary
Signature		Signature.	
Date:	17/4/2017	Date:	19/04/2017.

FOR ARGYLE GRAVEL & CONCRETE PTY LIMITED

ACTING AS TRUSTEE FOR

FIGTREE RESERVE SUPERANNUATION FUND

A.B.N. 55 869 379 342 (THE OWNER)

Council collects personal information only for a lawful purpose that is directly related to Council's functions and activities. Council is required under the Privacy & Personal Information Protection Act 1998 (PPIPA) to collect, maintain & use your personal information in accordance with the Privacy Principles & other relevant requirements of the PPIPA. For further information or clarification please contact Council's Privacy Officer or refer to Council's Privacy Management Policy at www.goulburn.nsw.gov.au.

Section 5

Disclosure of political donations and / or gifts

Has any person with a financial interest in this application made either of the following:

- A reportable political donation made to any local councillor and / or
- A gift made to any local councillor or employee of Council.

(Note: Reportable political donations include those of or above $1000. A gift includes a gift of money or the provision of any other valuable thing or service for no consideration or inadequate consideration. The disclosure obligation commences two years prior to the date the application is made and ends when the application is determined)

No ☒

Yes ☐ Please complete and lodge a detailed disclosure form available from Customer Service

Section 6

Description of proposed development / modification

Staging details

Quarry

(i.e. Description of any demolition work, construction work, the proposed use of the property and / or subdivision of land).

Does this application set out a **concept** for development of the site (where detailed proposals for separate parts of the site are to be subject of subsequent development applications)?

No ☒

Yes ☐ Please attach:

- Information which describes the overall concept and stages of your development
- A copy of consents (if any) you already have for part of your development

Section 7

Pre-lodgement discussions

Submitted documentation

Have you discussed your development proposal with a Council staff member prior to lodgement?

No ☒

Yes ☐ Please indicate with whom _____

Have you submitted all documentation stipulated in the DA supplement relevant to your development proposal?

Yes ☒

No ☐ Please stipulate documentation not provided at this stage:

Section 8

Environmental impact

To assess your proposal we need to understand the impacts it will have. Depending upon the nature and scale of your proposal you need to provide one or more of the documents listed below. See Section 3 of the **DA Supplement** for further information.

Is your proposal **designated development**?

No ☐ Please attach a statement of environmental effects.

Yes ☒ Please attach an environmental impact statement.

Is your proposal likely to significantly impact on **threatened species**, populations, ecological communities or their habitats?

No ☒

Yes ☐ Please attach a species impact statement.

Is your proposal identified on **Bush Fire Prone land**?

No ☐

Yes ☒ Please attach a Bush Fire Self Assessment or Certified Consultant Assessment.

Section 9

Other approvals required from Council

Please tick the appropriate box if you also need approval for any of the following:

Roads Act

☐ open a public road (i.e. construction of lay back and footpath crossing)

Local Government Act

☐ install, alter, disconnect or remove a water meter
☐ carry out water supply work.
☐ carry out sewerage work.
☐ carry out stormwater drainage work (including on-site stormwater drainage work)

Concurrent approval required from state agencies

- ☐ dispose of liquid trade waste (see separate Supplement for liquid trade waste)
- ☐ install a solid fuel heater
- ☐ sell goods on a footpath
- ☐ install an on-site sewage management facility
- ☐ alter an on-site sewage management facility
- ☐ other approval described below (see Attachment A of the DA Supplement).

Do you need the concurrence of a state agency to carry out the development? See Section 5 of the **DA Supplement** for further information

No ☐

Yes ☒ Please list any agencies whose concurrence you need (Water NSW)

Integrated approval required from state agencies

Are you seeking separate approval from a state agency to carry out the development? See Attachment B of the **DA Supplement** for further information

No ☐

Yes ☒ Please tick the appropriate box

Fisheries Management Act 1994#	☐ s144 ☐ s201 ☐ s205 ☐ s219
Heritage Act 1977#	☐ s58
Mine Subsidence Act 1961#	☐ s15
Mining Act 1992#	☐ s63 ☐ s64
National Parks and Wildlife Act 1974#	☐ s90
Petroleum (Onshore) Act 1991#	☐ s9
Protection of the Environment Act 1997#	☒ s43(a) ☐ s47 ☐ s55
Roads Act 1993	☒ s138
Rural Fires Act 1997#	☐ s100B
Water Management Act 2000#:	☐ s89 ☐ s90 ☐ s91

(Note: A $320 assessment fee payable to the relevant state agency is required where a # is shown above plus an additional $140 payable to Goulburn Mulwaree Council for administration of the integrated approval process)

Only complete Sections 10 & 11 if lodging an application for a Construction Certificate.

Section 10

Consent details

Have your previously gained development consent for your development?

No ☐

Yes ☐ Please provide the consent details (i.e. consent number and date of determination).

Builder, Owner Builder & Plumbing details

Is the building work for residential purposes in excess of $10,000 in value (including labour and materials)?

Yes ☐ Please provide the following information:

No ☐

Are you an Owner Builder?

Yes ☐ Please provide Council with a copy of your Owner Builders Permit prior to commencement of any work.

No ☐ Please provide the following information.

Builders Name _____ Licence No: _____

Postal Address _____

Suburb. _____ State: _____ Postcode: _____

E-mail: _____ Fax: _____

Phone _____ Mobile _____

Will the building work to be completed by a licensed builder exceed $20,000 in value?

Yes ☐ Please provide Council with a copy of your builders Home Warranty Insurance prior to commencement of any work.

No ☐

(Note: Building work completed by an Owner Builder that exceeds $20,000 in value requires Home Warranty Insurance if the property is sold within 6 years from the date the Occupation Certificate being

issued).

Will the building work involve plumbing and drainage work?

Yes ☐ Please complete an application for a Notice of Commencement of Work for Plumbing & Drainage prior to commencement of any work

No ☐

Section 11

Australian Bureau of Statistics

All new buildings

- Number of storeys (including underground floors). _____
- Gross floor area of existing building. _____ (m^2)
- Gross floor area of new building. _____ (m^2)
- Gross site area. _____ (m^2)

Residential buildings only

- Number of dwellings to be constructed _____
- Number of pre-existing dwellings on site. _____
- Number of dwellings to be demolished. _____
- Will the dwelling(s) be attached to other new buildings? Yes ☐ No ☐
- Will the dwelling(s) be attached to existing buildings? Yes ☐ No ☐
- Does the site contain a dual occupancy? Yes ☐ No ☐

Indication of materials to be used

Walls	Code		Code
☐ Brick (double)	11	☐ Curtain Glass	50
☐ Brick (veneer)	11	☐ Steel	60
☐ Concrete/Stone	20	☐ Aluminium	70
☐ Fibre Cement	30	☐ Other	80
☐ Timber	40	☐ Unknown	90

Roof	Code		Code
☐ Tiles	10	☐ Steel	60
☐ Concrete/Slate	20	☐ Aluminium	70
☐ Fibre Cement	30	☐ Unknown	90

Floor	Code		Code
☐ Concrete	20	☐ Timber	10
☐ Other	80	☐ Unknown	90

Frame	Code		Code
☐ Timber	40	☐ Steel	60
☐ Other	80	☐ Unknown	90

Approximate date that work is to commence: ___/___/___

Section 12

Office use only

Development Application Fee	$
Modified Development Application Fee	$
Plan Reform Fee (value of works > than $50 000)	$
Plan Reform Administration Fee	$
Concurrence / Integrated Processing Fee	$
On-site Sewage Management Facility Fee	$
Construction Certificate Fee	$
Long Service Levy (value of works >than $25,000)	$
Long Service Levy Administration Fee	$
File Storage Fee	$ 36
Notification of DA as per Council's Notification Procedure	$
Advertising Fee	$
Water Meter Fee	$
Water Connection to Main Fee	$
Sewer Connection to Main Fee	$
Other Fees	$
TOTAL AMOUNT	$
Receipt No.	
Receipted by	
Receipt date:	/ /

1. Describe the Proposal

What type of facility do you propose to carry install?

- Septic tank and absorption trench ☐
- Collection well ☐
- Aerated waste water treatment system ☐
- Dry composting toilet ☐
- Wet composting toilet ☐
- Hybrid system ☐

What type of disposal method is proposed? . . . . . .

What wastes will be discharge to the system? Toilet and .....

How many people will live on the premises? . . . . .

How many bedrooms are there in the house? . . . . .

Describe the system

Brand details: . . . . . .

Tank or well capacity: . . . . . .

Source of water supply . . . . . .

Installation firm. . . . . .

Other information: . . . . . .

Has development consent been granted for the development to which the on-site sewage management system is to be connected?

No ☐

Yes ☐ ➢ What is the development application no ?

What date was development consent granted?

2. Inspection details

Council requires a resident from each property to become self certified by the completion of a ½ day course attendance to learn the operation maintenance and inspection of on-site sewage management facilities. Self-certification has commenced for septic tank systems. If you have not already completed the course and received certification Council will contact you in the near future. The aerated wastewater treatment systems course is in preparation

Have you received a certificate of self-certification for the system you want to instal?

No ☐

Yes ☐ ➢ What is the name on the certificate?

What is the date of the certificate?

Will you be residing at the premises and able to carry out the inspections?

No ☐

Yes ☐ ➢ To where should inspections be sent? . . . . . .

If you are installing a aerated wastewater treatment system have you signed a service agreement contract?

No ☐ ➢ You need to sign an agreement

Yes ☐ ➢ What is the name and address of the agent?. . . . . What is the term of the agreement?. . . . . .

Under the agreement how many inspections will there be p.a?. . . . . .

DA Supplement

A guide to the information you need to include with your Land Use Application

Section 1. How to use this guide

This guide provides information to help you to complete your development application. If you need further assistance to complete the application, please contact Council

Section 2. Plans and supporting documentation for proposed development

Documentation to be submitted when lodging a development application.

The following information should be provided with all development applications:

- ☐ Site Plan
- ☐ Floor Plan
- ☐ Elevations and vertical section
- ☐ Statement of Environmental Effects

(Note: Four (4) copies of **all** plans shall be provided. At least 1 set of plans must be provided on A3 sized paper).

The following additional information should be provided with certain development applications depending upon the type of development:

New dwelling or alterations and additions – Rural area

- ☐ Wastewater Assessment / Geotech Report
- ☐ Bush Fire Self Assessment or Certified Consultant Assessment (if applicable)
- ☐ BASIX Certificate (if value of work exceeds $50,000)
- ☐ Location of gateway access (can be included on site plan)

(Note Four (4) copies of all documentation shall be provided)

New dwelling or alterations and additions –City

- ☐ Bush Fire Self Assessment or Certified Consultant Assessment (if applicable)
- ☐ BASIX Certificate (if value of work exceeds $50,000)
- ☐ Notification plan (on A4 sized paper) if two storey development is proposed
- ☐ Vehicle access details / footpath crossing
- ☐ Levels, contours, extent of cut & fill
- ☐ A Landscape Plan prepared in accordance with Clause 3.3 of Goulburn Mulwaree DCP 2009 for dual occupancy and multi - dwelling housing valued at more than $250,000

(Note Four (4) copies of all documentation shall be provided)

- ☐ Application for Water and Sewer Connection

Subdivision – Rural area

- ☐ Subdivision layout plan (including topographic and aerial overlay).
- ☐ Water cycle management study.
- ☐ Flora & fauna assessment
- ☐ Bush Fire Certified Consultant Assessment (if applicable)
- ☐ Aboriginal archaeological risk assessment (if applicable).
- ☐ Site analysis

(Note. Four (4) copies of all documentation shall be provided)

Subdivision – City

- ☐ Subdivision layout plan (with contours).
- ☐ Bush Fire Certified Consultant Assessment (if applicable).
- ☐ Notification plans (on A4 sized paper)
- ☐ Site analyses.

Documentation to be submitted when lodging a construction certificate application.

☐ Plans referred to above.

☐ Specifications describing the construction and materials of which the building is to be built and the method of drainage, sewerage and water supply.

(Note Four (4) copies of all documentation shall be provided)

☐ An Appointment of Principal Certifying Authority form

☐ Home Warranty Insurance (if applicable)

☐ Owner-builder permit (if applicable).

Documentation to be submitted when lodging an On-site Sewage Management Facility application.

☐ a copy of development consent to which the facility relates (if any).

☐ a copy of previous consent for an on-site sewage management facility consent on which you rely (if any)

☐ Wastewater Assessment Report.

☐ floor plans of the building (2 copies). The plans must:

- be drawn to a suitable scale and consist of a general plan to show each room and any fitting within the room to be connected to the on-site sewage management facility
- show the level of the lowest floor, the level of any yard or unbuilt area on that floor and the level of the ground.
- show the drainage lines from the fitting in the building to be connected to the on-site sewage management facility

Where you propose to alter, add to or rebuild a building that is already on the land or modify plans that have already been approved, please mark the general plan (by colour or otherwise) to show the change you propose to make.

☐ a general block plan (2 copies). The block plan must show:

- the location of the on-site sewage management facility and disposal area
- the distance of buildings and other structures from all boundaries
- the location of all fittings and drainage lines.
- describe the construction (including the standards that will be met), the materials which will be used to construct the facility and the methods of drainage.
- the location of the *on-site sewage management area* identified on a subdivision synopsis issued for the subdivision that created the lot indicating that the facility is located within that area.
- the distance from waterways to the disposal area (a waterway is any blue line on the 1:25,000 topographic map series applying over the land).
- the position of all other disposal areas used for on-site sewage management facilities
- where an aerated waste water treatment system is to be used, details of the irrigation system, the area to be irrigated and the proposed vegetation cover.
- state whether the materials proposed to be used are new or second hand and give details of any second-hand materials to be used

Where you propose to modify a system that has already been approved please mark the modifications (by colour or otherwise) to show the modification.

☐ evidence of any accredited component process or design on which you seek to rely including:

- Components, processes or designs that relate to the installation of an on-site sewage management facility are accredited under the Public Health Act 1991

Section 3. Assessing the environmental impacts of your proposal

The consent authority needs to assess the impacts your proposal will have. You need to attach one or more environmental reports to your application so this assessment can be made. The types of reports will depend upon whether your proposal is designated development or will impact upon threatened species

Designated development

If your proposal will have a high potential risk to the environment and is listed in Schedule 3 of the Environmental Planning and Assessment Regulation 2000 or in a planning instrument made under the *Environmental Planning and Assessment Act 1979*, it is known as designated development. The consent authority can help you determine if your proposal is designated development.

If your development is designated development, please attach an environmental impact statement (EIS) to your application

All other types of development

If your development is not designated development, please attach a statement of environmental effects (SEE). Table 1 sets out the information you need to include in your SEE.

Table 1: What to include in a Statement of Environmental Effects

- what you consider to be the environmental impacts of the development
- how you have identified the environmental impacts of the development
- the steps you will take to protect the environment or to lessen the expected harm to the environment

Where relevant, your Statement of Environmental Effects may also need to include additional information:

For shops, offices, commercial or industrial development:

- the hours of operation
- the plant and machinery to be installed
- the type, size and quantity of goods to be made, stored or transported
- the loading and unloading facilities that will be available
- A Landscape Plan prepared in accordance with Clause 3.3 of Goulburn Mulwaree DCP 2009 for development valued at more than $250,000.

To change the use of a building (where you are not doing any building work):

You do not need to include these lists if the building will now be used as a single dwelling or a non-habitable building or structure (such as a private garage, carport, shed, fence, antenna or swimming pool).

- a list of Category One Fire Safety Provisions relating to the proposed change
- a list of Category One Fire Safety Provisions used in the existing building or on the land
- a list of fire safety measures currently used in the building

Each list is to describe the extent, capability and the basis of design of each of the provisions/measures.

For a subdivision:

- the details of the existing and proposed subdivision pattern (including the number of lots and the location of roads)
- the consultation you have carried out with the public authorities who provide, or will increase, the services you will need (eg water, road, electricity, sewerage)
- preliminary engineering drawings which show proposed roads, water, sewer, and earthworks

For demolition:

- the age and condition of the building or structure you will demolish
- whether the building or structure has heritage value

For advertisements:

- the size, type, colour, materials and position of the sign board or structure on which the advertisement will be displayed

For building or demolition:

- the methods that will be used to protect the site during construction or demolition

Threatened species

Please use the test set out in **Table** 2 to work out whether your proposal is likely to significantly impact on threatened species, populations, ecological communities or their habitats. If you need help to do the test, please contact the consent authority the National Parks and Wildlife Service or NSW Fisheries.

If your development will impact on threatened species, populations, ecological communities or their habitats, please attach a species impact statement (SIS) to your application. If you are also required to attach an EIS to your application, you can address the requirements of the SIS in your EIS. Contact the National Parks and Wildlife Service and/or NSW Fisheries about what you need to include in your SIS.

Table 2: Will your proposal impact on threatened species?

The following factors are to be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:

- in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction
- in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised
- in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed
- whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community
- whether critical habitat will be affected (there is no critical habitat in Mulwaree Shire)

- whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region
- whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process
- whether any threatened species, population or ecological community is at the limit of its known distribution.

Source: section 5A *Environmental Planning and Assessment Act 1979*.

Section 4. Other approvals from Council

Attachment A of this Guide sets out a number of activities that can only be carried out if you have an approval from your Council. If the consent authority is the Council, you can also apply for an approval for one or more of these activities in your development application.

Please complete Attachment A to identify

- the approvals you need
- the documents you have included with your application which are needed to obtain these approvals

Please include Attachment A with your application if you have identified that you need one or more approvals and the appropriate fee.

Section 5. Concurrences from State agencies

You may need the agreement of a State agency to carry out your development. The consent authority will refer a copy of your application to the relevant agencies to seek their agreement.

If your development is within the Warragamba Dam Catchment your development may require concurrence from the Sydney Catchment Authority.

Section 6. Approvals from State agencies

If you need development consent and one or more of the approvals listed in Attachment B of this Guide. The Council can help you fill out the attachment. Alternatively the relevant state agency can be contacted directly.

Council will refer your application to the agency(s) you identify. The agency(s) will tell the Council whether or not it will approve your application and, if so, what the general terms of the approval will be. If your application is approved, the conditions of the consent will include those general terms.

Contact details for state agencies

NSW Fisheries
Internet www.fisheries.nsw.gov.au
Phone: (1300) 550 474
Email: information-advisory@dpi.nsw.gov.au

NSW Heritage Branch
Internet www.heritage.nsw.gov.au
Phone (02) 9873 8500
Email: heritage@planning.nsw.gov.au

National Parks and Wildlife Service
Internet: www.npws.nsw.gov.au
Phone: (02) 9995 5000

NSW Rural Fire Service
Internet www.rfs.nsw.gov.au
Phone: (1800) 679 737

Environment Protection Authority
Internet www.environment.nsw.gov.au
Phone: (02) 9995 5000

NSW Department of Planning
Internet. www.planning.nsw.gov.au
Phone: (02) 9228 6333
Email: information@planning.nsw.gov.au

NSW Department of Water & Energy
Internet www.dwe.nsw.gov.au
Phone: (02) 8281 7777
Email information@dwe.nsw.gov.au

Roads and Maritime Services
Internet. www.rta.nsw.gov.au
Phone (02) 9218 6888
Email. rta@rta.nsw.gov.au

ATTACHMENT A - Approvals under the Environmental Planning and Assessment Act 1979 and the Local Government Act 1993

If you wish to carry out one of the following activities, you need approval from Council. Please identify the activities you propose to carry out and indicate what approvals you require by ticking the relevant box in section 6 of the Land Use Application.

Structures or places of public entertainment

☐ Installing a manufactured home, dwelling or associated structure on land

Water supply, sewerage and stormwater drainage work

☐ Installing, altering, disconnecting or removing a meter connected to a service pipe
☐ Carrying out water supply work
☐ Drawing water from a council water supply or a standpipe or selling water so drawn
☐ Carrying out sewerage work
☐ Carrying out stormwater drainage work
☐ Connecting a private drain or sewer with a public drain or sewer under the control of a council or with a drain or sewer which connects with such a public drain or sewer

Management of waste

☐ For fee or reward, transporting waste over or under a public place
☐ Placing waste in a public place
☐ Placing a waste storage container in a public place
☐ Disposing of waste into a sewer or CEO system of the council

If you want to dispose of trade waste into a sewer that the Council controls or that connects to a sewer the Council controls please attach the following information to your application

- the plans and specifications of the work you will do
- the plans and specifications of the equipment you will use
- the nature, quantity and rate of disposal of trade waste

☐ Installing, constructing or altering a waste treatment device or a human waste storage facility or a drain connected to any such device or facility.

☐ Operating a system of sewerage management (i.e. an on-site sewage management facility).

Community land

☐ Engage in a trade or business
☐ Direct or procure a theatrical, musical or other entertainment for the public
☐ Construct a temporary enclosure for the purpose of entertainment
☐ For fee or reward, play a musical instrument or sing
☐ Set up, operate or use a loudspeaker or sound amplifying device
☐ Deliver a public address or hold a religious service or public meeting

Public roads

☐ Swinging or hoisting goods across or over any part of a public road by means of a lift, hoist, or tackle projecting over the footway
☐ Expose or allow to be exposed (whether for sale or otherwise) any article in or on or so as to overhang any part of the road or outside a shop window or doorway abutting the road or hang an article beneath an awning over the road

Other activities

☐ Operating a public car park.
☐ Operating a caravan park or camping ground
☐ Operating a manufactured home estate
☐ Installing a domestic oil or solid fuel heating appliance, other than a portable appliance
☐ Installing or operating amusement devices (within the meaning of the *Construction Safety Act 1912*)
☐ Installing or operating amusement devices prescribed by the regulations under the *Local Government Act 1993* in premises
☐ Use a standing vehicle or any article for the purpose of selling any article in a public place
☐ carry out an activity prescribed by the regulations or an activity of a class or description prescribed by the regulations

ATTACHMENT B - Approvals from state agencies

You may need to obtain development consent from Council and one or more of the following approvals set out in this attachment. Follow through each group of questions to decide whether you need any of these approvals then indicate what approvals you require by ticking the relevant box in section 8 of the Land Use Application.

Aquaculture

Do you want to carry out aquaculture?

No ☐

Yes ☐ > You need a permit under section 144 of the *Fisheries Management Act 1994* from NSW Fisheries.

Dredging or reclamation

Do you want to carry out dredging or reclamation work in a waterway (a stream, river, lake, lagoon, estuary or marine waters)?

No ☐

Yes ☐ > You need a permit under section 201 of the *Fisheries Management Act 1994* from NSW Fisheries.

Aquaculture / fishing related activities

Do you want to:

- set a net, netting or other material,
- construct or alter a dam,
- otherwise create an obstruction across or within a bay, inlet, river or creek or across or around a flat?

No ☐

Yes ☐ > You need a permit under section 219 of the *Fisheries Management Act 1994* from NSW Fisheries.

Heritage

Does your development involve a building, a place or land that has a permanent conservation order, an interim conservation order or an interim heritage order protecting it, or which is listed on the State Heritage Register?

No ☐

Yes ☐ > You need an approval under section 57 of the *Heritage Act 1977* from the NSW Heritage Branch.

Mining lease

Do you want a mining lease?

No ☐

Yes ☐ > You need an approval under section 63 &64 of the *Mining Act 1992* from the NSW Mineral Resources.

Aboriginal relics and places

Do you want to consent to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to a relic or Aboriginal place?

No ☐

Yes ☐ > You need an approval under section 90 of the *National Parks and Wildlife Act 1974* from the National Parks and Wildlife Service

Petroleum production lease

Do you want a petroleum production lease?

No ☐

Yes ☐ > You need an approval under section 9 of the Petroleum (Onshore) Act 1991 from the NSW Mineral Resources.

Potentially polluting activities

Do you want to carry out scheduled development work as defined in the *Protection of the Environment Operations Act 1997*

No ☐

Yes ☐ > You need a licence under section 43 of the *Protection of the Environment Operations Act 1997* from the Environment Protection Authority

Roads

Do you want to:

- erect a structure or carry out a work in, on or over a public road, or
- dig up or disturb the surface of a public road, or
- remove or interfere with a structure, work or tree on a public road, or
- pump water into a public road from any land adjoining the road, or
- connect a road (whether public or private) to a classified road?

No ☐

Yes ☐ ➢ You need consent under section 138 of the *Roads Act 1993* from the Roads and Maritime Services or Council. *If the Council can give this consent, however, the development is not integrated development*

Bush Fire Prone Land

Do you want to build or subdivide on land classified as 'Bush Fire Prone'?

No ☐

Yes ☐ ➢ You need an approval under section 79BA of the *Environmental Planning and Assessment Act 1979* from Council or an approval under section 100B of the *Rural Fires Act 1997* from the NSW Rural Fire Service

Rivers and lakes

Is your development within 40 metres of a stream, river, lake or lagoon?

No ☐

Yes ☐ ➢ You need a permit under section 89, 90 or 91 of the *Water Management Act 2000* from the Department of Water and Energy

ENVIRONMENTAL IMPACT STATEMENT

ARGYLE QUARRY

PROPOSED BASALT QUARRY

LOTS 1 & 2 DP 1094055

63 CURLEWIN LANE, BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK

Reference No. 1707 May 2017

Laterals Planning
1st Floor, 35 Montague Street
(PO Box 1326) Goulburn NSW 2580
Tel: (02) 4821 0973 * Fax: (02) 4822 0777
24 Thomas Street Johns River NSW 2443
Mobile 0427 210 973
Email: keith@laterals.com.au

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List of Attachments

1.	Locality Map	Laterals
2.	Site Development & Landscape Plan	Laterals
3.	Site Development & Landscape Plan - Aerial underlay	Laterals
4.	Site Development & Landscape Plan – Topographic underlay	Laterals
5.	Quarry Pit Detail Plan	Laterals
6.	Site Office Plan sheet 1	Bert Hall Designs
7.	Site Office Plan Sheet 2	Laterals
8.	Visual Aspects Plan	Laterals
9.	Emergency Exit Plan	Laterals
10.	Aerial Photograph	Laterals
11.	Topographic map	Laterals
12.	GMC LEP 2009 Biodiversity map	Laterals
13.	GMC LEP 2009 Land Zone map	Laterals
14.	Acceleration Lane Concept Design	Laterals
15.	Acceleration Lane Concept Design – aerial underlay	Laterals
16.	Deceleration lane Plan DA01	NCE
17.	Deceleration lane Plan DA02	NCE
18.	Deceleration lane Plan DA03	NCE
19.	Deceleration lane Plan DA04	NCE
20.	Survey Report – Egress Point Tiyces Lane	SCCS
21.	RMS concurrence letter 13/12/2017	RMS
22.	Revised Quantitative Air Assessment	Benbow Environmental
23.	Air Quality Monitoring Plan	Benbow Environmental
24.	An Aboriginal Site Survey and Assessment	Stedinger Associates
25.	Pejar LALC Report	Pejar
26.	Lot 1 AHIMS Report	OEH
27.	Lot 2 AHIMS Report	OEH
28.	Flora and Fauna Assessment	Laterals Environmental
29.	EPBC Protected Matters Report	Laterals
30.	Revised Quantitative Noise Assessment	Benbow Environmental
31.	Noise Monitoring Plan	Benbow Environmental
32.	Traffic Assessment	Laterals Engineering
33.	Water Cycle Management Study	SEEC
34.	Soil and Water Management Plan	SEEC
35.	Water Access License 35518	LTO
36.	NSW Office of Water advice 18/12/2015	DPI
37.	Water Supply Review	Hydroilex
38.	Initial Aggregate Stripping Tests	Boral
39.	Methylene Blue Absorption Value Test	Boral
40.	Sampling Results	Boral
41.	Sieve Test for crushed aggregates	Boral
42.	Cadastre & Cainozoic map	Laterals
43.	Extent of Basalt Outcrop	Campbell & Anderson
44.	Marian Vale Cored Drilling Assessment Report	Geos Mining
45.	Marian Vale Geological Assessment of Potential Construction Material Resources	Geos Mining
46.	Mining of Construction material from Marian Vale – A preliminary Feasibility Assessment	Groundwater Imaging
47.	Petrographic Report	Geochempet Services
48.	Regolith map	Laterals
49.	Solid Geology plan	Laterals
50.	Geos Ripability Assessment Revised memorandum	Geos mining
51.	Pavement Condition Report	PMS Fugro
52.	Pavement Surface Report Remaining Life 1	PMS Fugro

53. Pavement Surface Report Remaining Life 2	PMS Fugro
54. Pavement Surface Report Remaining Life 3	PMS Fugro
55. Pavement Surface Report Remaining Life 4	PMS Fugro
56. Operational Environmental Management Plan	SEEC

Statement of Validity

Development Application

Applicant name	Jasminco Resources Pty Limited
Applicant address	PO Box 4, Mittagong NSW 2575
Land to be developed	63 Curlewin Lane, Boxers Creek. Access at 17033 Hume Highway (Highway calculated location)
Lot No. and DP	Lots 1 & 2 Deposited Plan 1094055
Proposed development	Establishment of a basalt quarry for the extraction of 30,000 cubic metres per annum.

EIS prepared by

Name	Keith Allen
Qualifications	MBA, AD T and C Planning, AD Environmental Control, Surveying Certificate
Address	Laterals Planning 1st Floor, 35 Montague Street, PO Box 1326 Goulburn 2580
In respect of	Designated Development Application for Jasminco Resources Pty Limited at Boxers Creek

Certification

I certify that I have prepared the content of this Statement and to the best of my knowledge

- it is in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, and
- All available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates; and
- That the information contained in the statement is neither false nor misleading.

Keith Allen
Laterals Planning
4 May 2017

EXECUTIVE SUMMARY

Introduction

This statement accompanies a development application to the Goulburn Mulwaree Council for the development of a quarry (to be known as Argyle Quarry) on Lot 1 DP 1094055, Curlewin Lane Boxers Creek, with access over Lot 2 DP 1094055 and along Tiyces Lane. The lot with the quarry contains an area of 44.08 hectares and which with the access over Lot 2 DP 1094055 an estimated 4.6 hectares will be disturbed to establish the quarry as a whole (some of which is construction impact area which would be rehabilitated – 1.16ha).

In the preparation of the development proposal Laterals acted under instruction to plan and seek approval for the development of the quarry on the property. The proposal has previously been considered by Council and has now been amended to include a separate entry from the Hume Highway, and alter the exit to Tiyces lane with the provision of a new acceleration lane to the Hume Highway from Tiyces lane and make provision for an office, parking, and infrastructure facilities.

The existing entry to the site is 630m along Curlewin Lane from its intersection with Tiyces Lane which emanates from the Hume Highway. Curlewin Lane is not sealed and Tiyces Lane is a sealed road. The site contains a farm, 2 bores and rural sheds and installations used in association with the agricultural use of the property for grazing. The entry to the quarry development is proposed to be from the Hume Highway (at 17033 – measured) and is located 975m east of Tiyces Lane. The exit from the quarry is proposed to be to Tiyces Lane to the Hume Highway incorporating the construction of a new acceleration lane to the Hume highway.

An initial concept was prepared and discussed with the Council for a proposed quarry under Part 4 of the Environmental Planning and Assessment Act 1979. Council provided a response that provided advice on matters to consider in the preparation of the development proposal. Subsequently the application has been the subject of a court appeal which was discontinued but during which process the application has been amended to what is now incorporated into this EIS and accompanying reports.

Considerable investigation has been carried out over the land which included the whole of Marian Vale for the utilization of geological resources available on the land. Geological reports are attached that indicate the most significant value of the basalt resource on land at and adjacent to the site. This site is now proposed for a quarry of limited size to supply local and regional demand.

The reports and plans attached to or referenced in this statement and now submitted with the development application and consolidates the information pertaining to the land and proposed development. The area is rural in character and is predominantly undulating with patches of rural activity and patches of timber.

This statement and the reports and plans included as attachments provide detailed information and assessment of the site and the amended proposed development. Key planning issues are discussed which, in accordance with the provisions of clauses 72 and 73 of the Environmental Planning and Assessment Regulation 2000, environmental planning instruments and requirements for the Environmental Impact Statement from government agencies, in combination with a summary assessment of the environmental management and mitigation measures, represents the required Environmental Impact Statement.

Permissibility

The proposed development is included in the generic definition of an "Industry" and more specifically defined as an "Extractive Industry" under *Goulburn Mulwaree Local Environmental Plan 2009* where the land is within an E3 Environmental Management zone in which an "Extractive Industry" is prohibited. The use however is identified as permissible pursuant to Clause 7 (3) (a) under *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industry)* 2007 where the development is proposed "on land on which development for the purposes of agriculture or industry may be carried out (with or without consent)".

In that the activity is proposed to process 30,000 cubic metres per annum of material the use is identified as a "Designated Development" (Clause 19 of Schedule 3 of the *Environmental Planning and Assessment Regulations 2000*) requiring the preparation of an Environmental Impact Statement, and also due to the Council advising that the E3 zone is identified as an "environmentally sensitive area". As designated development the application for development requires the preparation of an Environmental Impact Statement in accordance with the requirements of the Director-General of the Department of Planning and Infrastructure and other relevant government authorities **(Copies of Director-General's requirements and responses from other government authorities are provided in Appendix 1)**.

The development also requires assessment under the following environmental planning instruments, policies, strategies and guidelines:

- State Environmental Planning Policy (Mining, petroleum Production and Extractive Industries) 2007.
- State Environmental Planning Policy (Rural Lands) 2008
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011.
- State Environmental Planning Policy No 33 – Hazardous and Offensive Development.
- State Environmental Planning Policy No 44 – Koala Habitat Protection.
- State Environmental Planning Policy No 55- Remediation of Land;
- State Environmental Planning Policy (infrastructure) 2007
- State Environmental Planning Policy (State & Regional Development) 2011
- Goulburn Mulwaree Local Environmental Plan 2009
- Sydney - Canberra Corridor Strategy
- National Parks and Wildlife Act (NSW) 1974 (as amended)
- Protection of the Environment Operations Act 1997 (as amended)

After the full assessment of the site constraints and legislative requirements the development would require the following consents at development application stage:

1. Development consent from Goulburn the Joint Regional Planning Panel in accordance with *State Environmental Planning Policy (Mining, Petroleum production and Extractive industries)* 2007 and *Goulburn Mulwaree Local Environmental Plan 2009* and relevant provisions of the *Environmental Planning and Assessment Act 1979* and *Environmental Planning and Assessment Regulations 2000.*
2. A license under the *Protection of the Environment Operations Act 1997* (Schedule 1).
3. Concurrence of the Roads & Maritime Service for the highway deceleration and acceleration lanes.
4. Concurrence of Water NSW for water quality and Neutral or Beneficial Impact Assessment.

An application was previously refused by the Joint Regional Planning Panel. The application was subject to an appeal to the Land & Environment Court which was discontinued for the lodgement of a new development application.

Compliance is addressed in detail in Chapter 20.

Objectives

Jasminco Resources Pty Ltd seeks to achieve the following objectives in proposing a quarry on Lot 1 DP 1094055, and access over Lot 2 DP 1094055, 63 Curlewin Lane, Boxers Creek -

1. Provide a basalt resource for use within the local and regional area.
2. Develop the quarry and utilise the resource and further prove the suitability of the resource. Only limited data can be obtained of an underground resource from drilling and tests.
3. Develop the quarry and extract the resource before any further rural development results in the sterilization of the resource.
4. Provide for the continuing employment of 6 people.
5. Supply the ongoing needs for basalt to industry.
6. Develop the facility in accordance with current best practices for safety and operation.
7. Develop the facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural environment.
8. Carry out works within the existing natural environment that will provide for a neutral or beneficial impact on the water cycle.
9. Provide for the installation of the following infrastructure and facilities at the site–
   - The construction of an ingress road from the Hume Highway with associated drainage, and an exit road to Tiyces Lane;
   - The construction of an acceleration lane from Tiyces Lane to the Hume Highway.
   - The construction emergency access roads from Curlewin Lane to the quarry and office facilities for emergency access for bushfire and other emergency egress;
   - The installation of an office, parking for 5 vehicles and a truck along with on-site waste water management facilities;
   - The installation of water management ponds per reports by SEEC and as outlined in the Operational Environmental Management Plan;
   - The installation of grassed sound control bunds around parts of the quarry sides; and
   - The placement of a transportable rock crusher inside the quarry.

   The details of the quarry are shown in the Operational Environmental management Plan prepared by SEEC.

   The facilities will also enable -

   - The safe operation of the business;
   - The operation of the quarry with a minimal impact on the surrounding environment;
   - The Provision of an efficient operation of the facility;
   - The provision for the employment of people in this new operation;
   - The supply of ongoing needs for the industries and agriculture that calls for the products produced at the facility;
   - The development of a facility in accordance with current best practices for safety and operation;
   - The development of a new facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural or living environment;
   - Provision of a development that will not be visually imposing given the extent of surrounding vegetation and general topography;
   - The planting of trees as shown on the attached plan and the report prepared by SEEC; and
   - It is proposed to utilise part of an existing bore license (10ML of WAL 35518 - 50 Megalitres) for quarry purposes as a backup and additional supply source.

Proposal

The development involves providing for the installation of the following facilities at the existing site

1. A basalt quarry (1.04 Ha) for the extraction of up to 30,000 cubic metres of basalt per annum. The operation of the quarry by the extraction of the resource (Non-blasting), crushing using a mobile crusher, screening to size the materials, stockpiling within the quarry area and transport from the site.
2. The construction of an ingress road from the Hume Highway with associated drainage. The entry point from the Hume Highway would be fenced with gates at the intersection point of the entry lane and then splayed back to the boundary fence along the highway. The gate would be stock proof with a stock grate to prevent stock from entering the highway. The fencing standard would be stock proof fencing as required by RMS.
3. The construction of an exit road to Tiyces Lane with associated drainage and gateway;
4. The construction of a new acceleration lane from Tiyces Lane to the Hume Highway;
5. The construction emergency access roads from Curlewin Lane to the quarry and office facilities for emergency access for bushfire and other emergency egress;
6. The installation of an office, parking for 5 vehicles and a truck along with on-site waste water management facilities;
7. The installation of water management ponds per reports by SEEC and as outlined in the Operational Environmental Management Plan;
8. The planting of trees as shown in the report by SEEC in the Operational Environmental management Plan;
9. The installation of grassed sound control bunds around parts of the quarry sides;
10. The construction of a security fence around the quarry 2.1m high. Quarry pit gates will similarly be made of two panels of 2.1m high x 2.4m wide galvanised construction/security fencing (giving a vehicular entry opening to the pit itself of about 4.4m wide). They will also be sign-posted with "No Unauthorised Access" signs. The fencing would be permanently fixed to the property and contain 1 strand of barb wire over the top. One strand of electric fencing may also be inserted at 1.2m height around the fence to keep any cattle or deer from rubbing/pushing against the quarry pit security fence. The electric fencing will be powered by an approved Gallagher solar energizer (uncomfortable if touched but generally safe for humans). The electric fencing will be adequately signposted with "Electric Fence" signs/warnings and the security fencing sign-posted with "No Trespassing" signs and "Danger - Keep Out" signs.
11. The placement of a transportable rock crusher inside the quarry.
12. The use of the following machinery during operations -
    - Crusher (mobile) (1)
    - Material sizing screen (1)
    - Bulldozer (1)
    - Front end loader (1)
    - Backhoe (1)
    - Trucks (estimate average of 3)
    - Water truck (1)
13. Utilise an existing bore license for quarry purposes as a backup and additional water supply source.
14. The installation of the following site infrastructure for the quarry operations:
    - Office and staff amenities;
    - Security compound fencing around the quarry (including lockable access gate to Hume Highway);

- Electricity extension to office compound;
- Telephone extension to office compound;
- Water supply – existing dams on site and to be constructed and the bore (10 Ml of WAL 35518 - 50 ML license)

The following calculations have been carried out to identify the extent of quarrying that would be carried out on the land.

Area of basalt resource	1.04 ha
Depth of basalt quarry resource	17 m
Maximum extraction per annum	30,000 m^3

IMPACT AREA

Allowing for 3m impact area (1.16Ha) around all development during construction and including quarry area, access roads, berms, Office & Parking areas and effluent Management system	(4.1ha) 40988 m^2
Waste Water Effluent Management Area	200 m^2
Installation of water management ponds per reports by SEEC, (including the area of the existing dam adjacent to Tiyces Lane)	4900 m^2
CONSTRUCTION TOTAL	**(4.61) 46,088m^2**
DEVELOPED SITE TOTAL (after 3m impact area is rehabilitated) Excluding the 3m buffer area of 1.16Ha (which would be rehabilitated following construction) the completed development impact area covers	**(3.45 ha) 34,488 m^2**

Volume of Basalt within basalt quarry area (17m x 10,400m^2)	176,800 m^3
Annual extraction limit	30,000 m^3

Average daily extraction rate (assuming 250 days of operation per annum)	
Average daily extraction rate (30,000 over 250 days)	120m^3

Volume of quarry material at basalt quarry site	
Total volume estimated to extract within quarry area	176,800 m^3
Time period for extraction (176,800 / 30,000)	5.9 years

Planned extraction rate – year 1	
Overburden (7,620m^3)	15,240 tonnes
Basalt (22,380m^3)	44,760 tonnes
Totals (30,000m^3)	**60,000 tonnes**

Planned extraction rate – year 2 onwards	
Basalt (30,000m^3)	60,000 tonnes

Stockpile area for crushed material– year 2 onwards	
Monthly rate of extraction of basalt	2,500m^3

At up to 4m height and with 1:3 battered sides a base area of 1400m^2 is provided for the quarry stockpile. As the depth of the quarry increases the stockpile can be contained within a smaller area within the quarry and located elsewhere in the quarry basalt quarry area to allow for a rotation of the quarry operation.

Crushing would occur over a 10 working day period (excluding weekends and public holidays).

Site Development Plan and Process

The site development and landscape plan and quarry detailed plan are shown in the following figures.

The process for the quarry would be as follows –

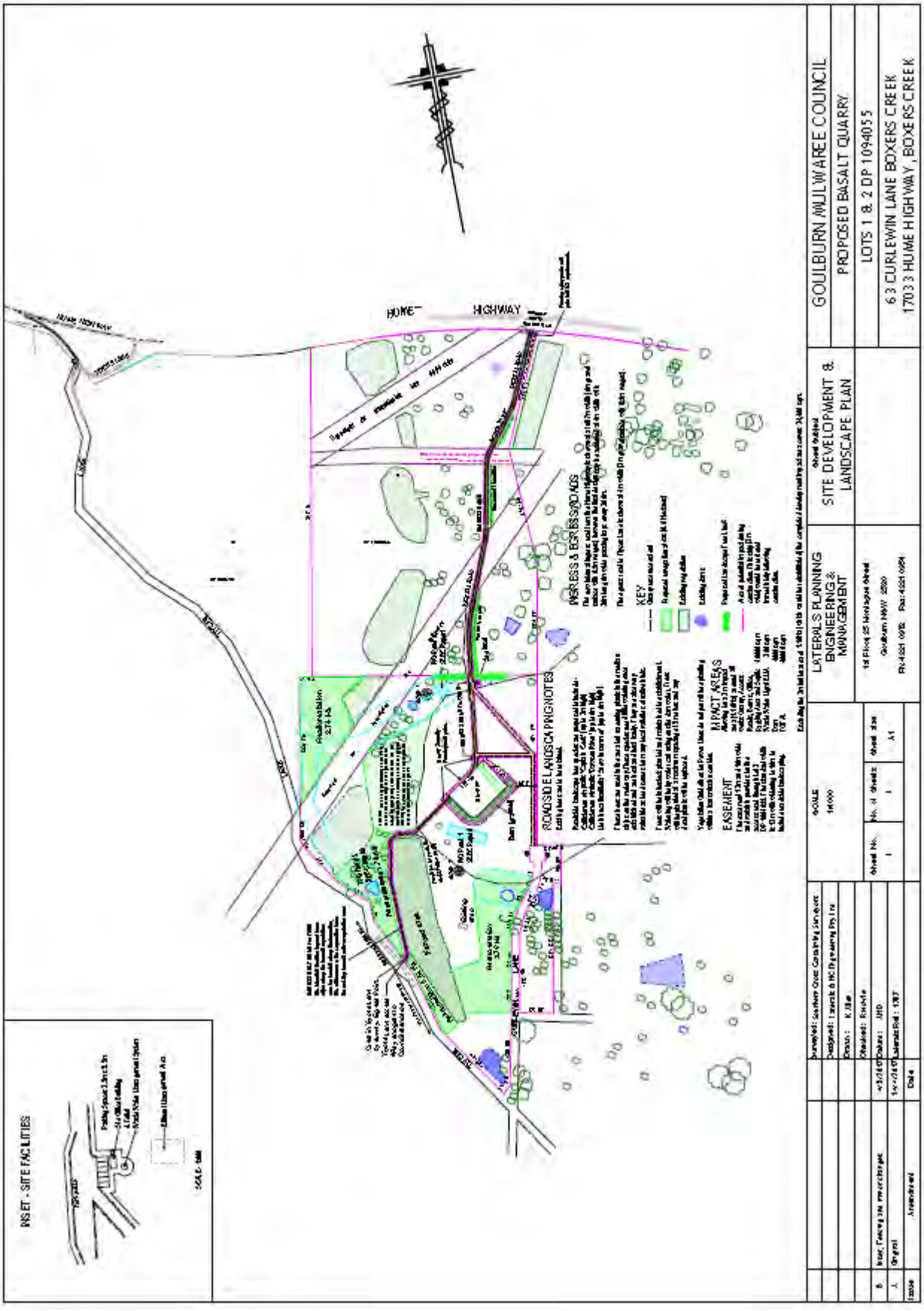
1. The installation of and erosion and sediment controls in accordance with the SEEC Plan in the Operational Environmental Management Plan and the construction of the quarry area, the ingress and exit roads and emergency access roads, water management facilities, office and parking areas and waste water facilities.
2. The berms around the quarry would be built with the overburden from the basalt quarry. The overburden was calculated to contain up to 7,620cm which would be used for the berm construction. The upper volume of overburden is a conservative estimation of overburden material from a couple of test pits however the depth varies in the lower levels to as little as 300mm. As such the overburden amount may vary from 4,480cm to 7,620cm. The berm would utilise approximately 3500cm of material, with excess being utilised for the establishment of the temporary berm within the quarry area along the eastern edge utilising approximately a further 1500cm. Any excess overburden would then be stored within the quarry area and some used for the vegetation of the dam wall (200cm). The temporary berm material would later be removed as the depth of the quarry increases, and the crusher can be lowered, with the material being stored within the quarry area.
3. The installation of security and access fencing and gates and installation of visual landscaping.
4. The initial quarry floor contains a calculated volume of 9,000 cm of material which would be stored within the quarry area as shown as the stockpile area which has a capacity of 11,000cm. This enables the initial extracted material to be processed and stored within the quarry area for sale and transport.
5. The ramp to the quarry would be constructed of quarry material to a depth initially of 2m below the north western ground surface ramping down to the initial quarry floor. The ramp would be extended as the quarry expands to an additional depth of 15m.
6. Overall the quarry floor varies from 15m to 25m below natural surface from west to east.
7. At the end of quarrying rehabilitation would be conducted as outlined in the SEEC Operational Environmental Management Plan.
8. All machinery would be contained within the quarry which would be contained within the security fencing.
9. The planting of reafforestation areas.

All material would be loaded within the quarry and transport will leave from the quarry.

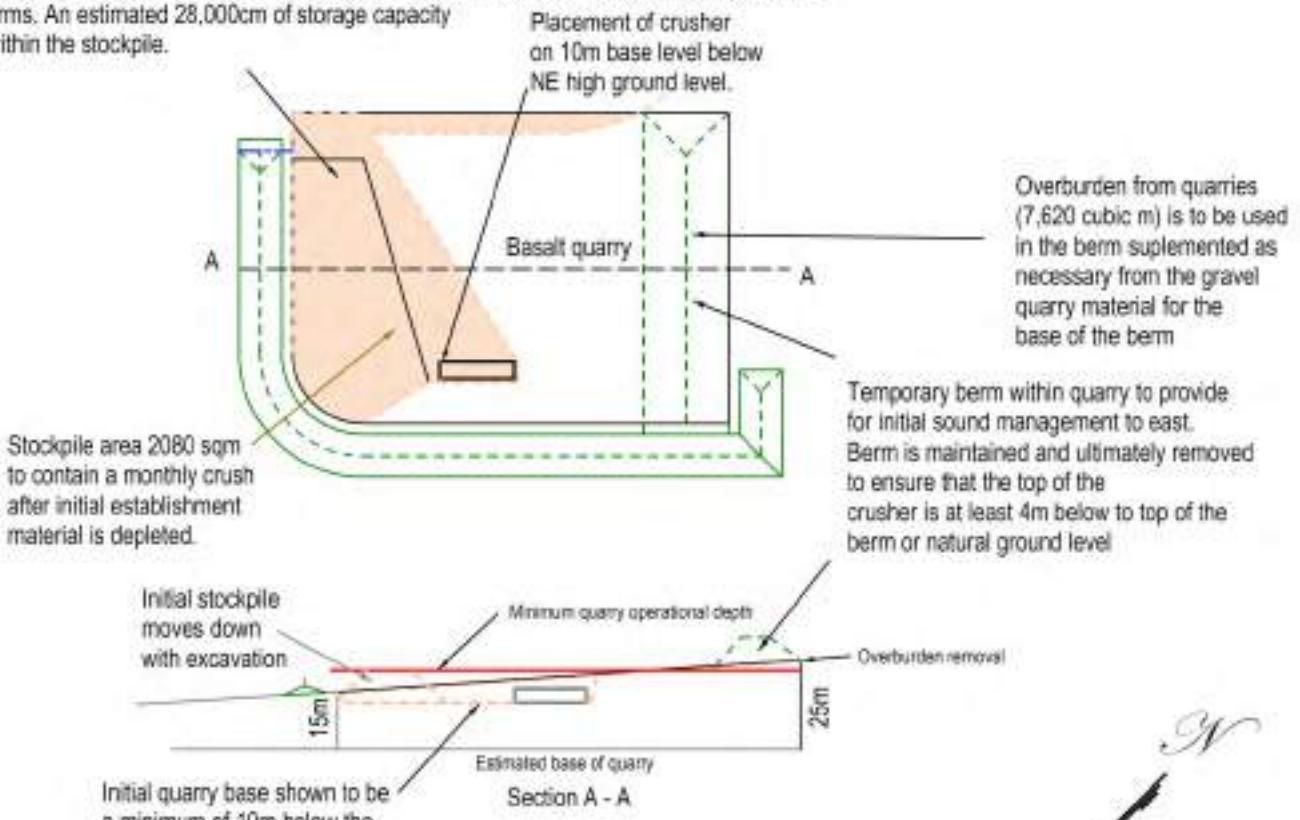
Crushing would take place over a 10 working day (excluding weekends and public holidays) period to enable a month's supply to be stockpiled within the quarry.

It is not proposed that the development be carried out in stages as defined by section 83B of the *Environmental Planning and Assessment Act 1979*.

Access to the site is to be from the Hume Highway and Tiyces Lane in the locations shown on the Site Development & Landscape Plan prepared by Laterals.


HUME HIGHWAY
INSET - SITE FACILITIES
KEY
ROADSIDE LANDSCAPING NOTES
EASEMENT
IMPACT AREAS
SITE DEVELOPMENT & LANDSCAPE PLAN
GOULBURN MULWAREE COUNCIL
PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
63 CURLEWIN LANE BOXERS CREEK
1703 3 HUME HIGHWAY, BOXERS CREEK
LATERALS PLANNING ENGINEERING & MANAGEMENT

Initial quarry establishment area. Contains an estimated 34,720 cm of material for initital storage within the temporary berm and stockpile area as well as providing base material for the establishment of the permanent berms. An estimated 28,000cm of storage capacity is contained within the stockpile.



NOTES:	PLAN Proposed Basalt Quarry Lots 1 & 2 DP 1094055 63 Curlewin Lane, Boxers Creek 17033 Hume Highway, Boxers Creek Scale - 1:1250 on A3	Laterals Planning 1st Floor, 35 Montague Street (PO Box 1326) Goulburn NSW 2580 Phone 02 4821 0973 Fax 02 4821 0954 24 Thomas Street, Johns River NSW 2443 Mobile 0427 210 973	SHEET NO: 1 No OF SHEETS: 1 DATE: 4/5/2017 PLAN NO: 1707 Initial quarry pit detail plan

Laterals PLANNING

Access

The proposed entry driveway is located on the Hume Highway where there is adequate sight distance. The entry at the Hume Highway is proposed to be constructed to RMS Standards (AUSTROADS as amended by RMS standards).The access is proposed to be constructed in gravel to Council's required standards beyond the Hume Highway boundary.

Hours of Operation

Crushing would take place over a 10 working day period (excluding weekends and public holidays) to enable a month's supply to be stockpiled within the quarry.

The proposed hours of operation of the site would extend to 7:00am to 5:00pm Monday to Friday and 7:00am to 1:00pm Saturdays, with no operations on Sundays and Public Holidays.

Transport

Assuming 37 tonne capacity trucks and $1m^3$ of basalt weighing approximately 2 tonnes, movements over the 10 day period are estimated to be -

$120m^3$ x 2 / 37 = 6.5 (say 7) truck loads x 2 movements	14 movements per day
Workers and deliveries assumed at 4 vehicles per day	8 movements per day
Total estimated vehicle movements per day	22 movements per day

It is anticipated that the transport vehicle will comprise a truck and trailer configuration not exceeding 19m in length.

Alternatives and Consequences of No Development

The proponent previously considered a number of alternative sites within the area of Marian Vale and Curlewin and has established the proposed site as most suitable resource available for extraction due to geological investigations. It is noted that Marian Vale is not now in the ownership of the proponent. The geological investigations clearly pointed to the value of the basalt resource and recommended its development. Whilst other resources are available the basalt resource is the most confined and compact of the resources and involves little establishment for the extraction of the resource. The area provides good long term security without potential for urban or rural residential encroachment and is on land that is available and can be developed at a reasonable cost enabling the maximum utilization of financial resources for the development of the industry.

The location is in reasonable proximity of Goulburn and has a direct connection to the Hume Highway through Lot 2 DP 1094055 and Tiyces Lane for the resource to be transported north and south along the highway. Accordingly the site was selected for the preparation of an application.

The resource is currently available and able to be extracted at reasonable costs, however there is always pressure for rural residential settlement and if the resource is not extracted and utilised when it can be there is the potential for the resource to be sterilised and be not available for use. This would also have resulted in the loss of jobs.

The site offers Jasminco Resources Pty Ltd a safe and secure environmental location with good supporting infrastructure and reasonable isolation from other incompatible development.

To not carry out the proposed development would result in –

1. The loss of a resource that can be utilised for the continued support of development in the locality and region.
2. An inability to meet the demand of product from the operation and the increasing demand of product and new products which are increasingly being called for.
3. The potential for the resource, if not otherwise made available in the locality, to be transported into the locality and region involving transport costs and increasing the cost of the resource to the locality and region. This places the locality and region at a disadvantage and need to make further financial contributions to the supply of the resource.
4. A potential for slowing or stagnation of growth as a result of a higher cost of the resource in the resource needs to be supplied from outside the area.
5. The loss of jobs and a business within the local area.
6. No traffic or the potential for environmental impacts as assessed in this study.

The development proposal applies over a ground resource which limits consideration of alternative sites. The only alternative would be to not proceed at the location. The appropriateness of the selected material and site and its impact on the surrounding area have been assessed in the application and found suitable.

Having regard to the assessment of the proposal for noise, air quality and water quality, and visual aspects, and the now Hume Highway access it is considered that there would be little difference to the views in the locality if the development was to not proceed. The only effect might be considered to be the loss of a valuable resource and the availability of that resource from a local land owner offering an alternative to other operations, maintaining competitiveness, and the loss of employment achieved with the development. This is a small resource probably not large enough for large companies to consider of value, but it is a valuable resource and one which a local landowner can feasibly extract and make available before it is lost to further rural or rural residential development.

The Site

The site is situated on the eastern side of Tiyces Lane and south of the Hume Highway. The land is surrounded by rural settlement and rural activity and the keeping and training of horses including trotting tracks. The Hume Highway is 1 kilometre north of the site. The location of residences is shown on the aerial photograph and topographic maps below.

The subject site comprises Lot 1 Deposited Plan 1094055 (and a part of Lot 2 DP 1094055 which contains the easement for access), 63 Curlewin Lane, Boxer's Creek. The lot for the quarry is generally triangular in shape and has an area of 44.08 Hectares. The property through Lot 2 DP 1094055 has direct road frontage to the Hume Highway, and to Tiyces Lane and Curlewin Lane. The land is currently occupied and used for agricultural purposes. An aerial photograph of the site (including Lot 2 DP 1094055 for display purposes) and a topographic map are shown on the following pages (images taken from SixMaps April 2017).

There were no signs of salinity at the site and it is not expected to be an issue for this small development.

Boxers Creek has a temperate climate, with warm summers and temperatures below 15°C in winter. Mean annual rainfall is 666 mm and evaporation is 1,277 mm (Australian Bureau of Meteorology, Goulburn (TAFE) data). Rainfall is fairly consistent throughout the year but highest in summer.

Telephone services and electricity is available to the land.

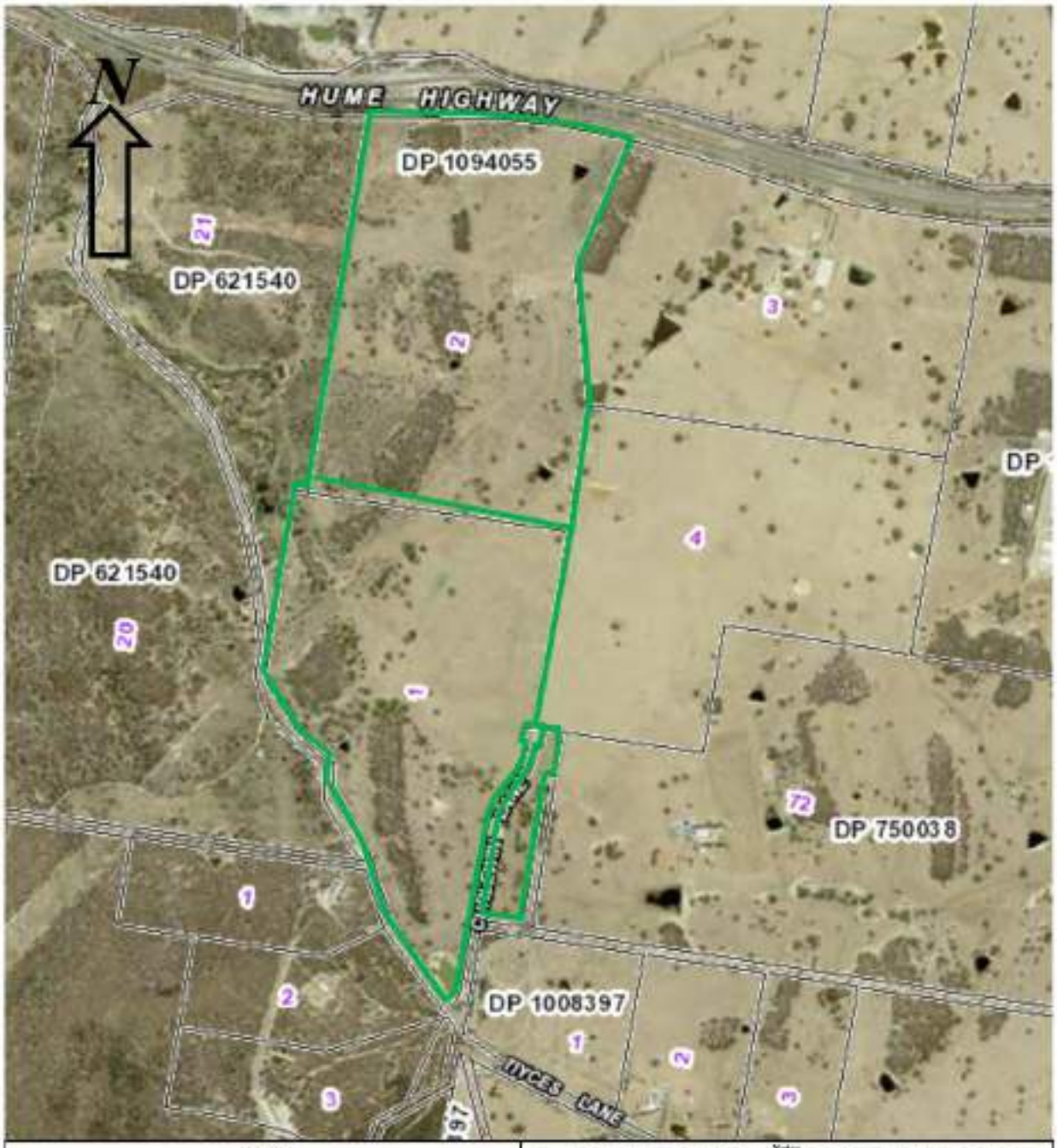
The site has a radial slope pattern but mostly slopes to the west as shown on the topographic map on page 20. Stormwater moves generally across land over the site towards open drainage swales to the west and through existing dams to enter a waterway that flows to the north. The waterway is seen as a thin blue line on the topographic map on page 21 directly to the west of the quarry area. The access road from the Hume Highway passes to the east on cleared land upstream of the dams to the west and across the top of an existing farm pad. Currently stormwater from upstream of the quarry site and from the undeveloped portions of the site is allowed to sheet flow across the land until it reaches the waterways, with the development site stormwater being conveyed to water quality management ponds in accordance with recommendations from SEEC in their reports before discharging to the continuing waterways on site.

The site is partially vegetated and uncleared except for stands of trees shown on the aerial photograph on page 20.

The site is currently serviced by sealed roads (Hume Highway and Tiyces Lane) and electricity and transmission lines cross the site.

The entry to the site is shown on the Site Development & Landscape Plans in pages 72 to 75.

The site does not contain any dwelling houses and no dwelling houses are proposed with this application.



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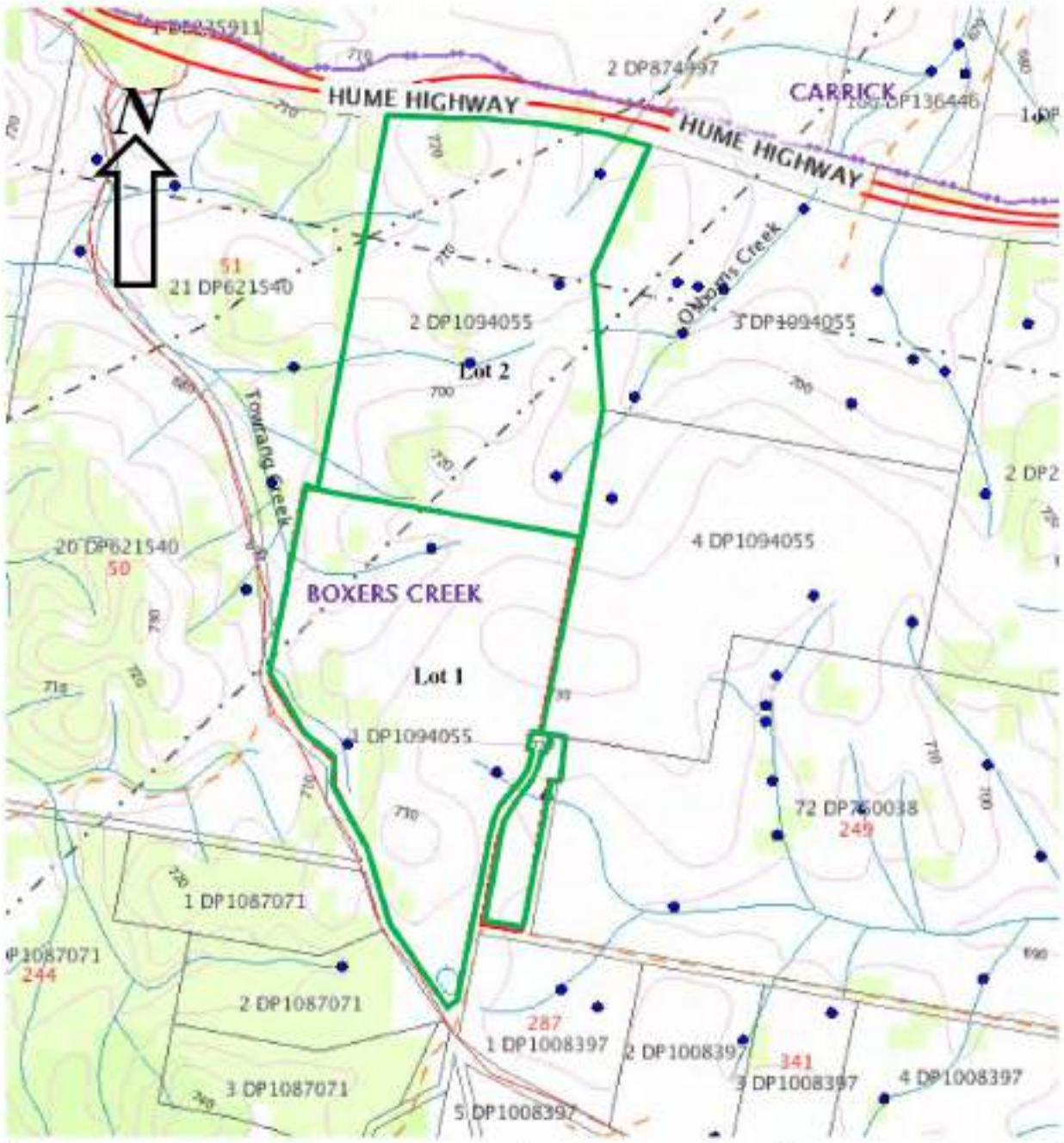
SITE PLAN – AERIAL PHOTOGRAPH
Proposed Basalt Quarry on
Lots 1 & 2 DP 1094055
63 Curlewin Lane, Boxers Creek
17033 Hume Highway, Boxers Creek

Base map source: NSW Department of Lands SixViewer web site. Used with permission.

Scale: Not calculated



KEY

Property boundary lines

Lot 2 DP 1094055 is shown for the provision of the right of way from The Hume Highway for the provision is access to Lot 1 DP 1094055.

Laterals Reference: 1707

Notes

1. This plan has been prepared for a development application to Council and should not be used for any other purpose.
2. Dimensions and areas are subject to survey and to Council requirements.
3. Every lot may be subject to existing restrictions on the use of land and as required by future Development Application consent conditions, utility providers, Council and developer.
4. Where there has been no title searches undertaken with the Land & Property Information of NSW in relation to the subject lands.
5. No reliance should be placed on this plan for any financial dealing involving the land.
6. Where notes form an integral part of the plan.

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SITE PLAN – TOPOGRAPHIC MAP
Proposed Basalt Quarry on
Lots 1 & 2 DP 1094055
63 Curlewin Lane, Boxers Creek
17033 Hume Highway, Boxers Creek

Based on topographic map from the Department of lands Six Viewer web site. Used with permission.

Scale: Not calculated

Ground Conditions and Basalt Resource Details

The development site consists of cleared land. The land drains towards the west to a waterway running south to north. The area of the proposed water quality dam is to the south and drains to waterway towards the east. The ground cover consists of grasses which appear to have been grazed.

The area seems to be generally devoid of noxious weeds. The development would affect approximately 4.5 Hectares of land representing 10% of the area of the lot. The remainder of the site is substantially clear as shown in the aerial photograph on page 20 above except for patches or protected vegetation mostly along the western moiety of the lots.

The land has generally been unaffected by any significant development other than the formation of internal land use tracks and a shed located centrally in the south on Lot 1 and several sheds and containers on Lot 2. The sheds and containers are used for the agricultural activity on the land and do not form part of the quarry application.

The flora and fauna assessment records that vegetation on the land is dominated by a mixture of native and exotic pasture grasses and forbs with several stands of remnant forest persisting over the western portion of the property. A variety of common pasture weeds such as thistles have also been introduced to the site as a result of previous landuses and clearing. The site is moderately diverse in terms of the variety of species which form the grassy ground layer however no highly significant or threatened species were recorded on site.

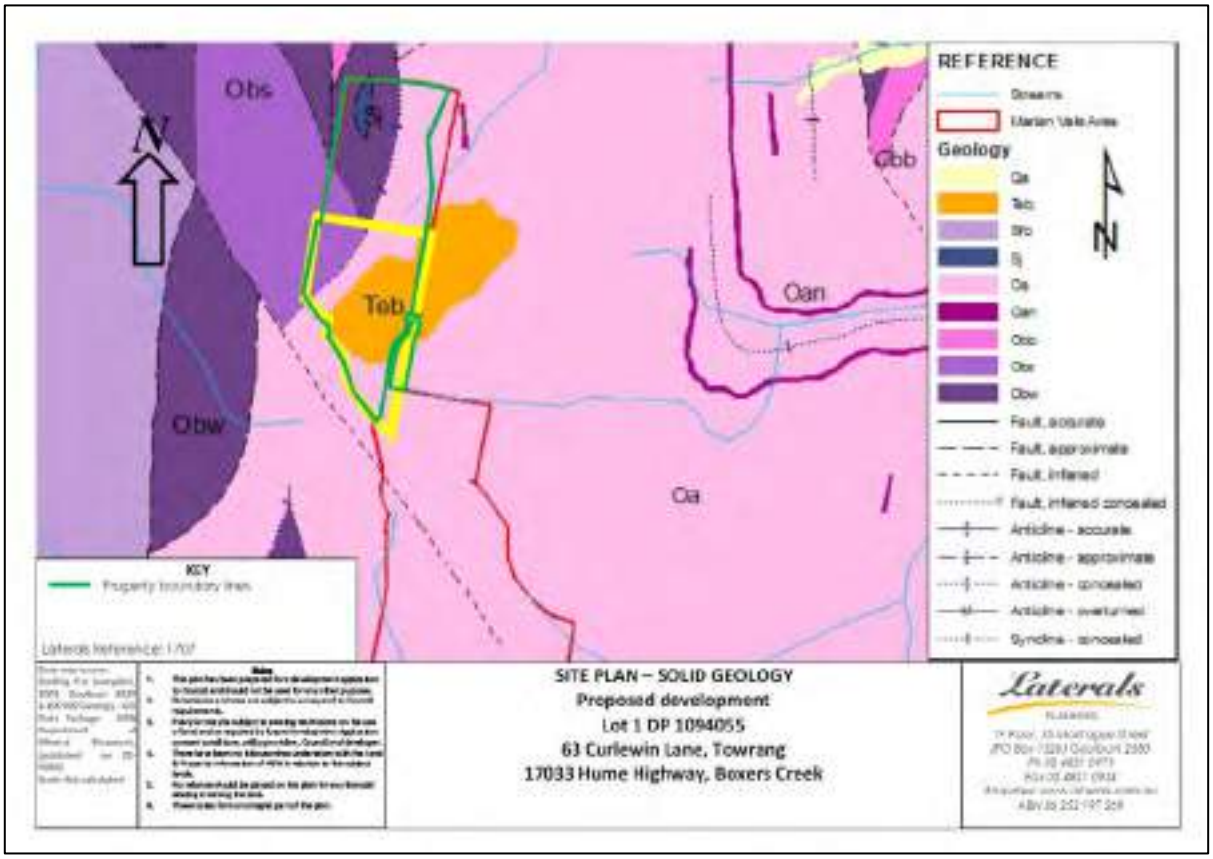
The flora and fauna assessment records that very few species of fauna were detected using this site however habitats present are considered suitable for a range of locally common birds, amphibians and reptiles. No mammals were recorded on the site during the assessment however a variety of at least locally common species, some of which are introduced, are considered likely to use the site on a regular basis. No species of significance were recorded however two bird species are considered potential users of the site.

There are 4 dams on Lot 1 DP 1094055. One dam is located on the western waterway, two dams on the south eastern waterway and one on the north of the site which contain runoff from the land in its current state. Further dams are located on Lot 2 DP 1094055. This property is surrounded by land with scattered timber in the west and cleared agricultural land in the north, east and south containing rural residences.

The quarry resource is shown on the following solid geology plan from the Geos Mining Report. The resource is located within the Teb area being a Tertiary alkali basalt flow (Teb) overlying Ordovician rocks in the northern part of Marian Vale. This unit is up to about 25 m thick.

The site contains 3 boreholes which have been used for assessment of the nature of the resource and most appropriate method of extraction. The 3 boreholes are identified in the memorandum from Geos Mining Mineral consultants dated 12/11/2015. The boreholes are identified as MCDDH6 (also identified as BH1 on the extent of basalt resource plan included in the list of documents as item 15), BH2 and BH3 and shown on the aerial photograph on page 3 of the Geos Ripability memorandum.
The details of the bores and the assessment are contained within the memorandum attached to the application.

Solid Geology Plan



The quarry material has been further tested as documented in the attached reports on the resource and found to be suitable for extraction and use. The fractured nature of the material is such that rock breaking and blasting is not necessary and neither process is proposed as part of the quarry operation.

The material was further tested by drilling by Geos Mining (MVDDH6) and they reported that this drillhole was drilled on a basalt hill known as Curlewin. The sequence intersected consisted of 19.55m of basalt and is underlain by 6.95m of clay. The basalt exhibits well developed horizontal joints as well as less common vertical to subvertical joints. The basalt appears to be uniform in lithology throughout the drillhole. Below the basalt laminated carbonaceous clay (4m) is underlain by pale to mid grey massive clay (3m).

Further drilling to basement (i.e. Palaeozoic sequence) is recommended to assess the basalt and clay as well as determining whether other lithologies (e.g., sand and gravel) underlie the clay.

The proposal is to contain the depth of quarrying to 15 metres so no further drilling was conducted.

The basalt was subjected to further petrographic testing (Geochempet Services) which resulted in advice that -

"For engineering purposes, the rock represented in the supplied aggregate sample (labelled 75061) from Curlewin Quarry is considered to be holocrystalline olivine basalt, a basic volcanic rock. It was originally altered to green clay of smectite style (nontronite) by deuteric processes (i.e. by processes operating during cooling of the original lava) but is now partly oxidized. More recently the rock has been slightly and superficially weathered.

For engineering purposes, the rock represented in the supplied aggregate sample may be summarised as:

- *olivine basalt (a basic volcanic igneous rock type)*
- *holocrystalline and characterised by a tough, subophitic texture*
- *non-porous*
- *largely unweathered (only slight and essentially superficial weathering observed)*
- *lightly altered (the average secondary mineral content is about 15%, comprising green to brown smectite clay occurring mainly in interstitial patches and iddingsite as a slight to moderate alteration of disseminated olivine grains)*
- *hard*
- *strong*

The basalt is predicted to be durable.

The basalt lacks free silica: consequently, it is predicted to be innocuous in relation to alkali-silica reactivity in concrete.

Thus, basalt of the type represented in the supplied sample is predicted to be a suitable for use in concrete aggregate."

In general the results of preliminary investigations and further testing of the basalt material indicates the suitability of the material for intended construction material purposes.

Subsequent to the above further testing by Geos in May 2016 established the ripability of the basalt material concluding that:

"Assessment of the RQD of the two drill cores from the proposed quarry at Curlewin Lane Marian Vale indicates that the basalt has a very poor rock mass quality. There has been no significant deterioration in the physical state of the core since it was drilled so the measurements taken are representative. It is therefore considered that the basalt has high potential for extraction by ripping throughout its full thickness as proposed, negating the need for any blasting."

Domestic and On-site Water Uses and Management

Assessment and Impacts

It is intended that the development will provide for the following water usage –

1. Domestic water for office and staff from a rainwater tank adjacent to the office. This supply would be supplemented from bore water.
2. The installation of a toilet and on-site waste water management facility.
3. The provision of a 20,000L water tank trailer for firefighting purposes (already purchased). Water for the tank can be taken from the dams on site and bore supply (10ML of WAL 35518 - 50 ML license).
4. Due to the location of the quarry below ground it is not anticipated that water will be needed for dust control but if necessary a mobile water cart can be used for areas within the quarry and storage mounds. The average usage rate is calculated to be approximately 0.75Ml per annum which would be sourced from the water quality dam and other dams as necessary and bore as a backup supply.
5. The supply of water for the crushing operation at the rate of 180kL per annum which would be obtained from the water quality dam and bore as a backup supply.

It is estimated that the water use for the office and toilets over a 10 day operating period would be 3,000 litres, necessitating a tank of approximately 5,000 litres for installation. On-site waste water assessment installations would be carried out in accordance with the report by SEEC. A water cart and trailer fire unit would contain approximately 1,500 litres which would be sourced from dams on site and bore as a backup supply.

The site does not contain any managed gardens.

It is concluded that there would be sufficient water for the domestic operations, fire and dust suppression.

Mitigation Measures

The AWTS and irrigation area require professional quarterly maintenance by a qualified wastewater contractor. In addition:

1. The vegetation in the EMA requires periodic slashing/mowing
2. Ensure only “septic friendly” cleaners are used in the office and ablutions
3. Ensure there are no leaking taps or cisterns in the office.

Surface Water Assessment

Assessment and Impacts

The surface water has been considered by SEEC in the attached report and plans incorporated into the Operational Environmental Management Plan and prior assessments.

The quarry itself occupies the western side of a knoll and is away from any watercourses. The radial drainage develops into depressions once the flow leaves land underlain by the basaltic material. Most of these depressions have a small farm dam near their head.

The ingress road from the Hume Highway passes to the east of waterways and dams. The exit road passes alongside a waterway as outlined in the SEEC report.

The ingress and exit roads will be built with compacted road base but would remain unsealed. This will become essentially impermeable surfaces on land that is currently moderately permeable but poorly vegetated.

Based on a development which included slightly more quarry land area but less overall area (excluding the additional impact area which would be immediately rehabilitate following construction) the following results were achieved with measures proposed by SEEC. The resulting pre and post development pollutant load assessment was as follows:

MUSIC Mean Annual Load Results

SEEC have determined that there is a potential that the proposed future land use at this site will lead to an increase in stormwater discharge and pollutant production. Section 5 of the SEEC report contains a Water Cycle Management Plan that shows how a neutral or beneficial effect on water quality can be achieved. Section 6 of the SEEC report contains modelling (Table above) using a computer tool known as MUSIC to justify the effectiveness of that plan. From the assessment of the current proposal SEEC has incorporated water cycle management planning into the Operational Environmental Management Plan.

The assessment of surface water by SEEC identified works that are proposed to be carried out during construction and operation. These are specified on plans with accompanying schedules in the Operational Environmental Management Plan as drawings.

Full details of the further assessment with soil and water management measures are now as outlined

by SEEC in the Operational Environmental Management Plan.

Irrigation for agricultural purposes would become secondary to the quarry operation on the property and would be carried out only as possible with available water supply through dam capture and bore water as a backup with the remaining available supply from the bores on both Lots 1 and 2.

The areas of new native vegetation will be regularly inspected to ensure the trees are successfully established. In the short term they may be irrigated from the WQCP with bore water being available for watering should the quarry use and poor rainfall result in less water from the WQCP be available. Vegetation management details would be in accordance with the Operational Environmental Management Plan.

The monitoring and maintenance of water management measures are outlined in detail in Appendix 1 of the Operational Environmental Management Plan.

Conclusion

The results of the MUSIC modelling demonstrate that a beneficial effect can be achieved, providing that the proposed Water Cycle Management Plan (Section 5 of the original SEEC report and subsequent report) is implemented as amended by the further SEEC assessment and reports and plans incorporated in the Operational Environmental Management Plan.

Without these specific measures, the development could potentially have a negative impact on water quality in the local watercourses. This Plan includes a set of long-term maintenance strategies to ensure that the effectiveness of the proposed measures provides ongoing benefits for water quality.

Section 5 of the original SEEC report details the measures required to achieve a neutral or beneficial Effect. Subsequent SEEC assessment and report and plans in the Operational Environmental Management Plan provide measures for implementation during construction and operation of the development and would be followed for the development. Appendix 1 of the OEMP provides detailed checklists.

Provided the design and measures contain in the Operational Environmental Management Plan are followed, water quality would not be detrimentally affected by the development. Details of the concept plan will need to be incorporated into the construction certificate for the proposed development.

Noise

Assessment and Impacts

A revised Noise Impact Assessment was prepared by Benbow Environmental in May 2016 to assess the development as now proposed with the new ingress road from the Hume Highway.

The site is located in the Southern Highlands about 1 km south of the Hume Highway on Tiyces Lane, Boxers Creek NSW 2580. The population of Towrang has just exceeded the mark of 400, where 90% of the population lived in the northern direction from the site, divided by Hume Highway. The site is surrounded by rural land and occupying residences. The receptors considered in the study were listed in the following table from the Benbow report -

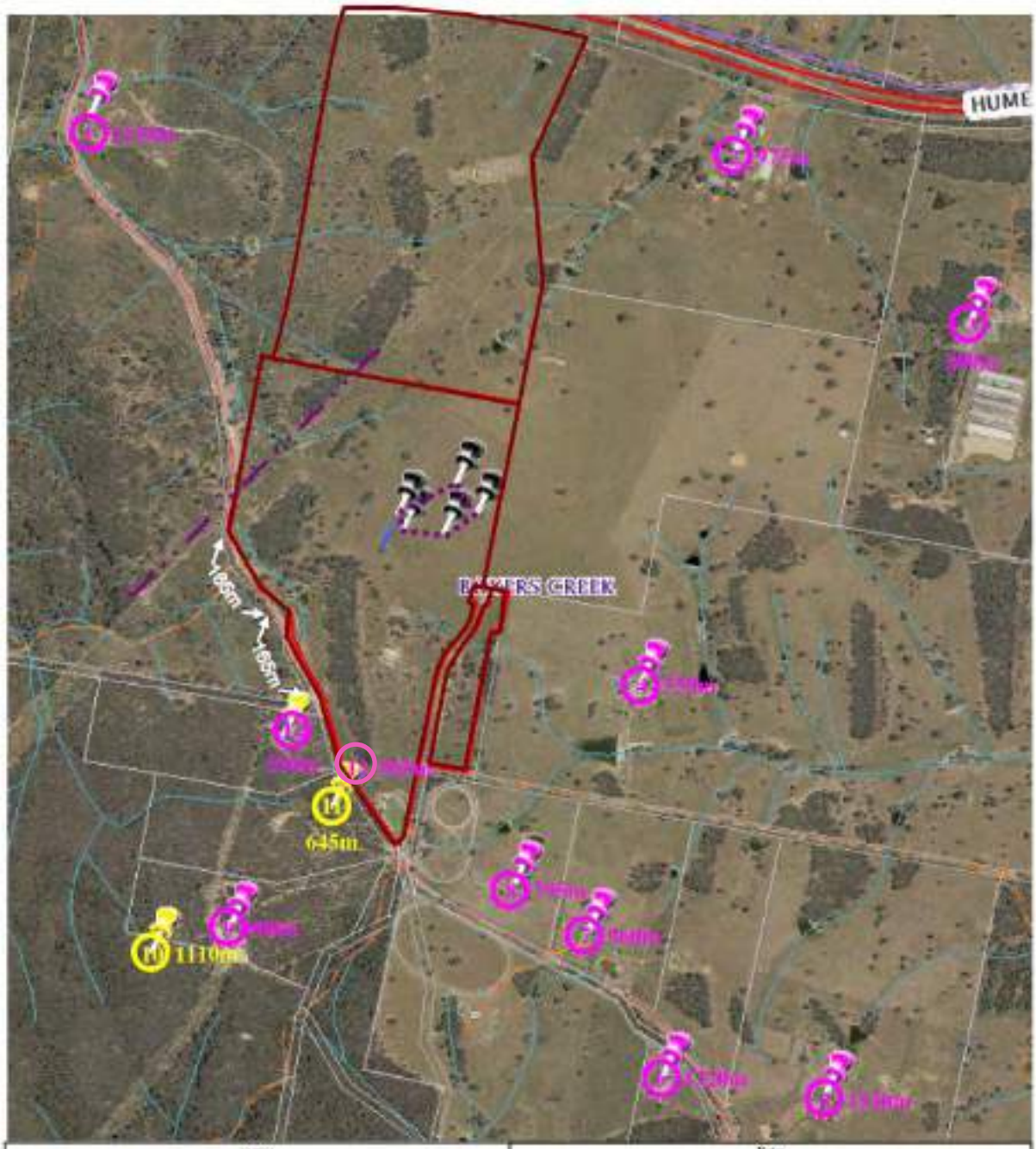
Potentially Sensitive Receptors

Receptors	Address	Direction	Distance from Site Boundary (m)
1	51 Tiyces Lane, Boxers Creek 2580 Lot 21 DP 621540	NW	1140
2	Hume Highway, Boxers Creek 2580 Lot 3 DP 10904055	NE	1000
3	Boxers Creek 2580 Lot 2 DP 247200	ENE	1240
4	249 Tiyces Lane, Boxers Creek 2580 Lot 72 DP 750038	SE	610
5	Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	1600
6	328 Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	1400
7	Boxers Creek 2580 Lot 2 DP 1008397	SE	1040
8	287 Tiyces Lane, Boxers Creek 2580 Lot 1 DP 1008397	SE	900
9	244 Tiyces Lane, Towrang 2580 Lot 3 DP 1087071	SW	1070
10	244 Tiyces Lane, Towrang 2580 Lot 4 DP 1087071	SW	1220
11	Tiyces Lane, Towrang 2580 Lot 2 DP 1087071	SW	730
12	Tiyces Lane, Towrang 2580 Lot 1 DP 1087071	SW	640
Not Defined (13)	Tiyces Lane, Towrang 2580 Lot 4 DP 1094055	E	220

The location of receptors and distance from source is shown in the report and the plan on the following page.

The application for a proposed dwelling on Lot 4 DP 1094055 (R13) has not identified a particular location for the dwelling. Thus the highest point (which is quite close to the quarry) has been chosen for worst case purposes during the modelling process in order to ensure compliance. However, as this application has not been confirmed the best way to view the noise impact for this land owner is to look at the whole of Lot 4 DP 1094055. Once the construction phase is complete (and thus the noise controls are in place) the Benbow report shows the noise isopleths that are indicative of the noise impact for the local area as well as for Lot 4 DP 1094055 in particular. It must be noted that the limit line shown in these figures are only for R5 - R12.

Jasminco Resources Pty Ltd will only be operating during the day time period. Hence this is the only period for which the project-specific criteria have been set.



KEY

- Property boundary lines
- Existing house Receptor
- Proposed house
- Quarry site

Laterals Reference: 1707

Note

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3. Title may be subject to existing restrictions on the use of land and as required by future Development Applications consent conditions, utility providers, Council and developer.
4. There have been no title searches undertaken with the Land & Property Information of NSW in relation to the subject lands.
5. No reliance should be placed on this plan for any financial dealing involving the land.
6. These notes form an integral part of the plan.

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SITE PLAN – NEARBY RESIDENCES
Proposed Quarry
Lots 1 & 2 DP 1094055
63 Tiyces lane, Boxers Creek
17033 Hume Highway, Boxers Creek

Based on photograph from Department of lands SixViewer web site.

Scale: Not calculated

Predicted Noise Levels

Initial modelling showed that the quarry would not comply with the project-specific noise levels. Thus noise controls were investigated and modelled. After many model runs it was seen that 3 earth berms, each 4m in height were needed to the NE, SE and SW in order to reduce the noise levels. In reality these 4m noise barriers will consist of a 4m earth berm. However even with these noise controls it was found that the criteria were still not met. The cause of the exceedance is associated with the crusher operations during the early stage of the development.

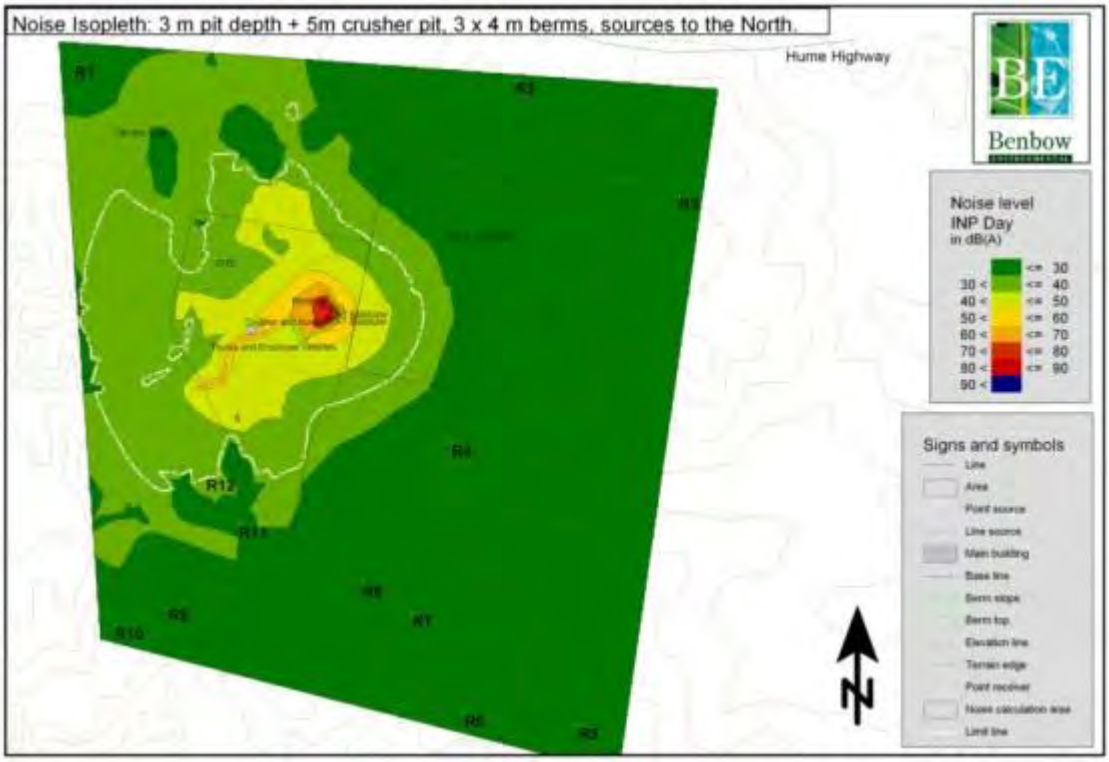
The local topography of the area poses particular problems. It is undulating in all directions and produces a particular noise impact to the west being a location on the side of a hill and not quite behind it.

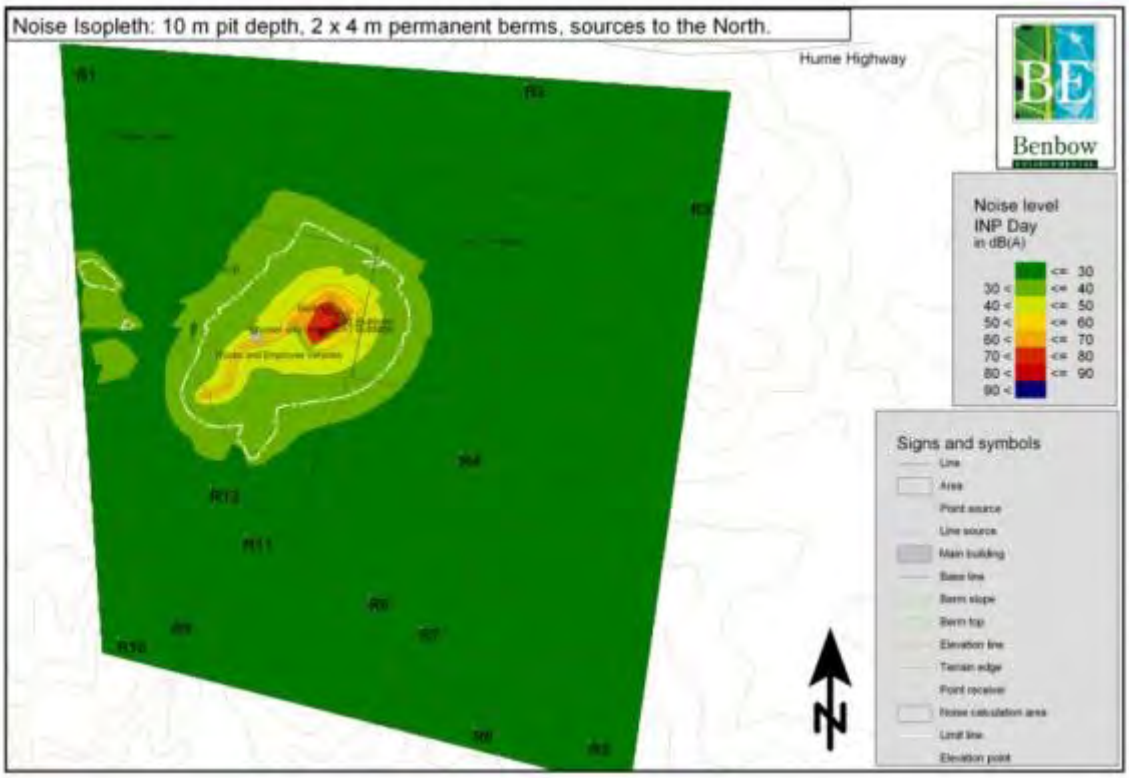
Thus it was decided to delay the operating of the crusher screen until the pit reached a depth at which the noise impact would be screened by the walls of the pit. As a result, the crusher screen was removed as a noise source from the construction noise modelling and for the 1st stage of pit excavation. The crusher was then added as a noise source at different pit depths until acceptable noise levels were predicted to be achieved at the residential receivers. Operation is considered to begin once the earth berms have reached a height of 4m. At this berm height, the depth of the pit has been assumed to be between 2 - 3m.

Operating within these conditions gives the predicted noise levels shown in the models that follow from the Benbow report below.

With the crusher in a 5m pit below a pit depth of 3m and with two 4m earth berms compliance is achieved with the crusher operating. The noise reduction achieved can be seen visually by comparing Figure 5-10 and Figure 5-11 of the Benbow report below.

The crusher will not operate until the temporary and permanent noise barriers reach a height 4m. Therefore the crusher is not considered in the construction noise prediction. An excavator has been added as a noise source to the construction scenario only.





Traffic Noise

It is expected that an average of 120m^3 will be extracted per day (assuming 250days of operation per annum). This quantity is expected to be exported with 37 tonne trucks or trucks with trailers no longer than 19m. Thus it has been estimated that there will be 7 truckloads per day leaving the site. Employee and delivery vehicles have been assumed at 4 vehicles per day. Thus, the total vehicle movements per day are estimated at 22 movements. The vehicles have a speed limit of 60km/hr on the off-site road. It has been assumed that 4 truck movements in 1hr will predict the worst case noise levels for the respective receivers.

Mitigation Measures

Construction of the southern half (50%) of the access road must not occur at the same time as construction of the quarry site itself. Construction noise levels are predicted to comply with project specific noise levels at all other considered residential receptors.

Compliance has been predicted to be expected during normal quarrying operations under the following operating conditions:

- Operations can begin when the noise barrier/ earth berm height reaches 4m and the pit depth is 3m, as long as the crusher is not operating. These conditions result in predicted noise compliance at all locations.

- The crusher can begin operating under the following conditions:
  - The permanent noise barrier / earth berm has reached a height of 4 m;
  - The floor of the pit is at least 3m in depth from the highest elevation on the original surface; and
  - The crusher is placed in a hole 5m deep (below the 3m pit depth) and positioned in the middle of the south-eastern berm.

If these operating conditions are followed the site is predicted to comply at all locations under full quarrying operations.

With the above noise controls implemented during the construction and operational stages of the quarry development, it is predicted that the noise impact on the local environment will be minimal and in line with what is currently experienced.

Conclusion

In the compilation of this update, Benbow consultants modelled only the noise impact of the construction and operation of the access road, and the results of these calculations were added to the results of the 2009 modelling of the other aspects of the development.

The locations of nearby noise sensitive receivers have been identified with their approximate distance from the pit.

Detailed predictive noise modelling showed that by developing a 4m permanent noise berm on the SW and SE and NE sides of the quarry (as shown in Figure 5-9) during construction; combined with specific operating conditions for the crusher, will result in minimal noise impact on the local noise environment.

Air Quality

Assessment and Impacts

A revised Air Assessment was prepared by Benbow Environmental in May 2016 to assess the development as now proposed with the new ingress road from the Hume Highway. Benbow advises:

The quantitative air assessment prepared in October 2009 has been updated to show the changes in the predicted levels of particulates and dust from a proposed change in the access roadway.

The remainder of the original report has not been altered and the findings are based on the original air dispersion modelling.

The 2009 site plan showed the access road according to Figure 1 Site Plan – Aerial Photograph, shown over page (for reference this is Figure 2-2 from the 2009 report).

The nearest receptor to the original access road was Residence R1 as shown on Figure 2 Site Location (for reference this is Figure 2-5 Site Location from the 2009 Report). Residence R1 is immediately adjacent to the original as proposed access road.

The other residences, R11 and R12, are also adjacent to the original access road.

The contribution of the use of the roadway to the predicted particulate and dust levels was considered as an unpaved road surface.

The contribution from the roadway was included in the modelling and at the receptors nearest the roadway, compliance with the particulates PM 10 and TSP were well below the criteria.

A similar finding exists for dust deposition. The proposed change in the location of the access road is shown on Figure 3 of the report.

The new access road is well distant from Receivers 1 and 2. Although the predicted level of particulate and dust complied with the criteria, the relocation of the road is an improvement that is strongly supported.

The relocation of the access road would not remove the need for reasonable control of roadway generated dust.

The usual controls adopted by quarries are the following:

- *Speed restriction to 40 km/hr;*
- *Maintain road surface in good condition; and*
- *Use suitable roadbase and routinely maintain the aggregate content of the roadbase.*

The predicted levels of particulates and dust would not increase at any of the receivers from the relocation of the access road and this change to the proposed quarry is strongly supported.

From the 2009 assessment the report remains unchanged as previously documented.

Table 2-1 of the Benbow report (below) lists the nearby receptors that might be affected with the proposed development. The locations of the residences are shown as aerial photo of the Benbow report (below).

Table 2-1: Potentially Sensitive Receptors

Receptors	Address	Direction	Distance from Site Boundary (m)
1	51 Tiyces Lane, Boxers Creek 2580 Lot 21 DP 621540	NW	700
2	Hume Highway, Boxers Creek 2580 Lot 3 DP 10904055	NE	723
3	Boxers Creek 2580 Lot 2 DP 247200	E	968
4	249 Tiyces Lane, Boxers Creek 2580 Lot 72 DP 750038	E	358
5	Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	1,143
6	328 Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	807
7	Boxers Creek 2580 Lot 2 DP 1008397	SE	486
8	287 Tiyces Lane, Boxers Creek 2580 Lot 1 DP 1008397	SE	268
9	244 Tiyces Lane, Towrang 2580 Lot 3 DP 1087071	SW	448
10	244 Tiyces Lane, Towrang 2580 Lot 4 DP 1087071	SW	622
11	Tiyces Lane, Towrang 2580 Lot 2 DP 1087071	SW	97
12	Tiyces Lane, Towrang 2580 Lot 1 DP 1087071	W	132

See map on page 29 for the location and distances to nearby residences.

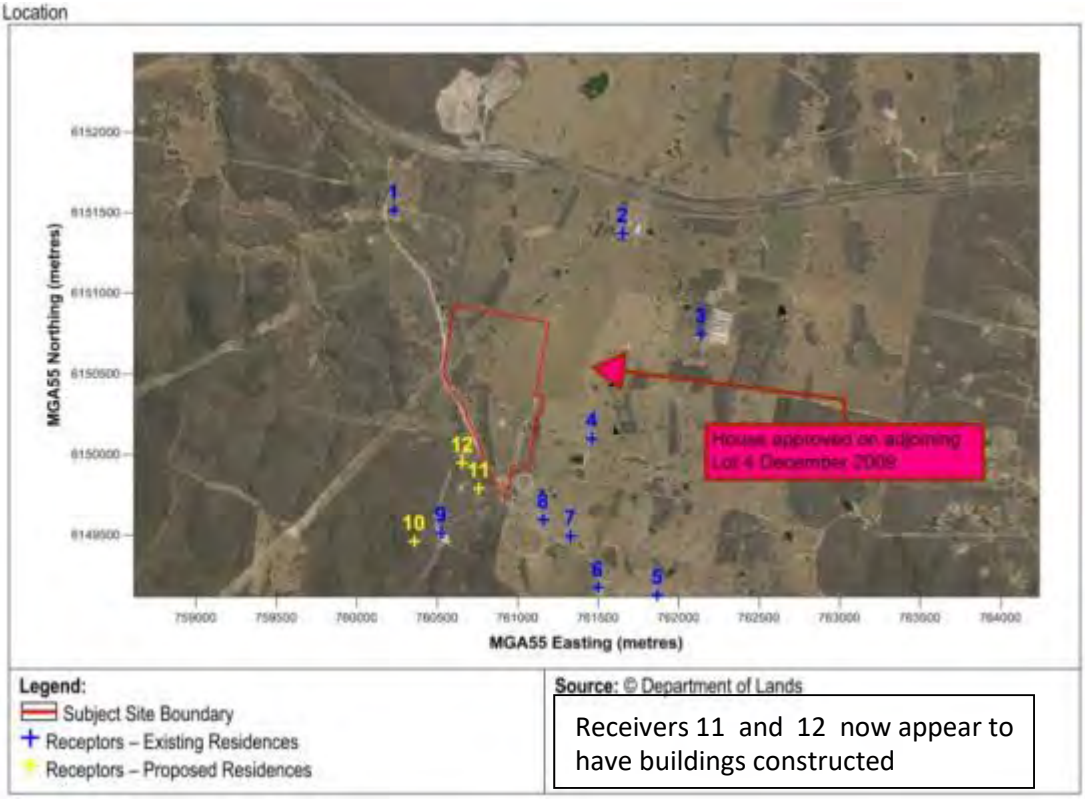
The area surrounding the proposed site has several rural residences. The only available access road is Tiyces Lane which connects to the Hume Highway.

Due to the nature of the area, the existing sources of air pollution would come from motor vehicle emissions, dust from non-grassed areas, residential activity and the horse training facility. These sources would mainly consist of combustion gasses, such as oxides of nitrogen, carbon and sulphur, and dust from unsealed roads or areas and would be considered to be minimal due to the size and frequency of each of these activities.

An assessment of the 1:25,000 topographic map for the region indicates the subject site and surrounding landscapes are subject to minor changes in elevation. The elevation of the area ranges between 670 metres to approximately 830 metres within the regional area of the site location. The terrain of the subject site location is approximately 720 to 730 metres in Australian Height Datum (AHD) Elevation and is seen to decrease towards the north-west and south-east section of the subject boundary. The terrain further decreases towards this direction, outside the indicated site boundary. A further decrease in elevation is seen towards the north-east whilst the south-east region shows an increase in elevation of approximately 100 metres compared to the subject site elevation.

A terrain information file was consequently constructed by digitising the 1:25,000 topographic contour map with 10m contour intervals for the region of interest. This was incorporated into the air dispersion modelling to take into account the terrain effects on the emissions from the subject site. Two 3-dimensional views of the site have been provided in the Benbow report.

Figure 2-5: Site Location



Receivers 11 and 12 now appear to have buildings constructed

Local Background Air quality

No monitoring station has been found to provide representative background air quality measurements for the subject site. However, the local background air quality can be defined based on the surrounding land use.

The region of subject site location is predominantly occupied by heavy vegetation (i.e. forests) with residential homes scattered across the regional area. These homes are expected to increase in the near future. No major sources of emissions such as industrial facilities are found to be within the region of interest. Emissions from road vehicle travel and activities from the nearby horse training facility are expected to provide minor contribution to the background air quality. With these, it is expected that the levels of PM_{10}, TSP and Dust Deposition are low to negligible.

For this assessment, it has then been considered and assumed that background levels of PM_{10}, TSP and Dust Deposition are negligible.

Emission Sources and Emission Rates

The following emission sources were considered in the assessment:

- Vehicle Travel Emissions;
- Loading, Unloading and Material Handling Emissions;
- Wind Erosion from Stockpiles;
- Crushing and Screening Emissions; and
- Excavation Emissions.

Modelling Results

The Ground Level Concentration (GLC) results from CALPUFF are summarised in Table 5-12 in the Benbow report. Concentration isopleths for have been provided as Figure 5-6, Figure 5-7, and Figure 5-8 from the Benbow report (below).

Figure 5-6: Isopleth for PM_{10} Impacts Under 1-Year Averaging Time (Scenario 2)

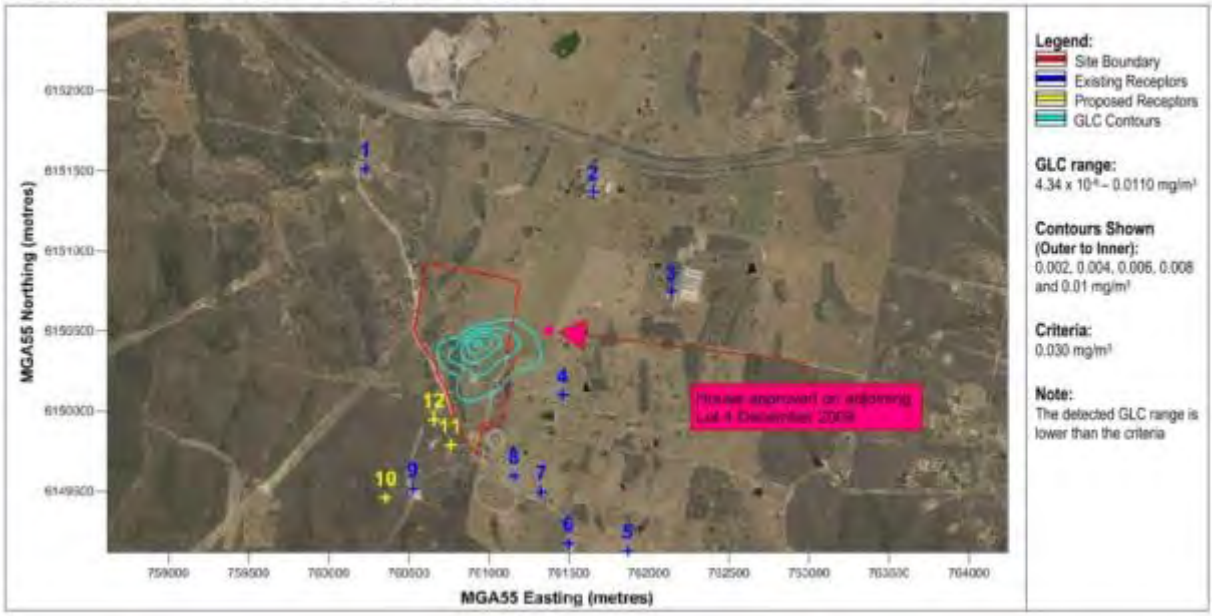
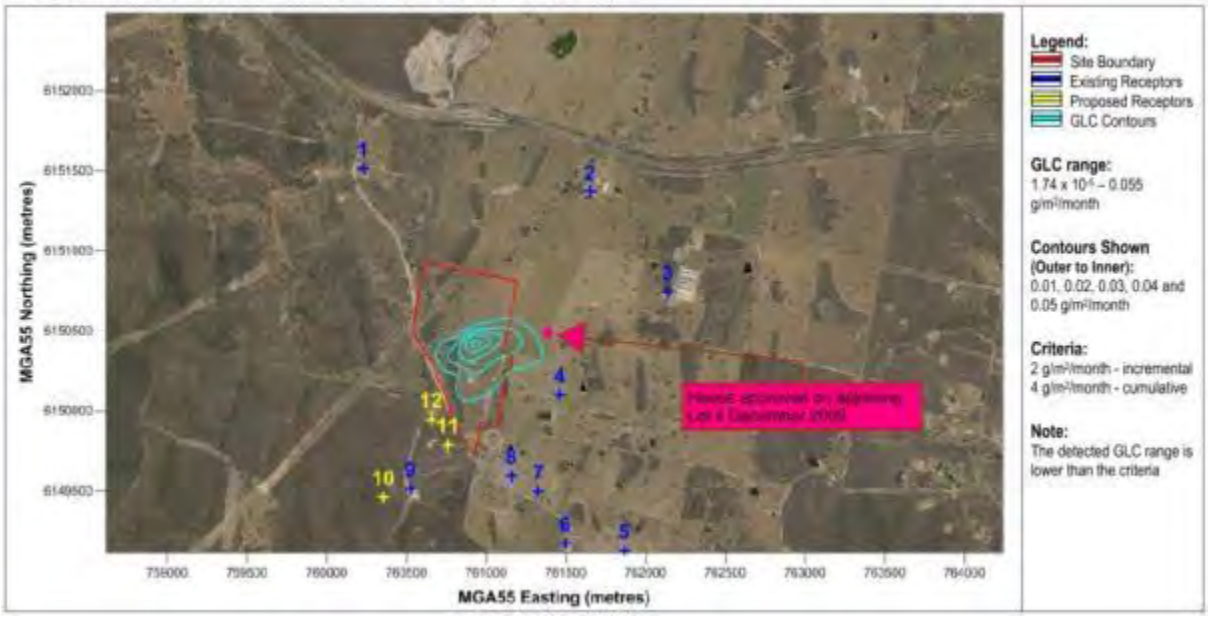


Figure 5-7: Isopleth for TSP Impacts Under 1-Year Averaging Time (Scenario 2)

Figure 5-8: Isopleth for Dust Deposition Impacts Under 1-Year Averaging Time (Scenario 2)



No exceedances were found for both scenarios except for the PM_{10} 24-hour averaging time impacts under Scenario 1. However, it has been found that the implementation of controls for the excavation, crushing, screening, loading, unloading and material handling eliminates the exceedances measured from Scenario 1.

The outcomes suggest that controls are compulsory in order to satisfy the assessment criteria. Other than this, it is expected that the proposed development would comply with the requirements listed in the DECC NSW approved guidelines.

Conclusion

The document "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales" has been closely followed in preparing and conducting this quantitative air assessment. The assessment also involved the review and analysis of the site-specific operational parameters and activities relevant in assessing the environmental dust impacts that the subject site can potentially establish, especially upon the nearest receptors – may it be existing or proposed.

Air dispersion modelling outcomes suggest that controls are required in order to minimise the dust particulate impacts. It is suggested that controls, which are water sprays for dust suppression, be applied during excavation, crushing, screening, loading, unloading and material handling activities on site.

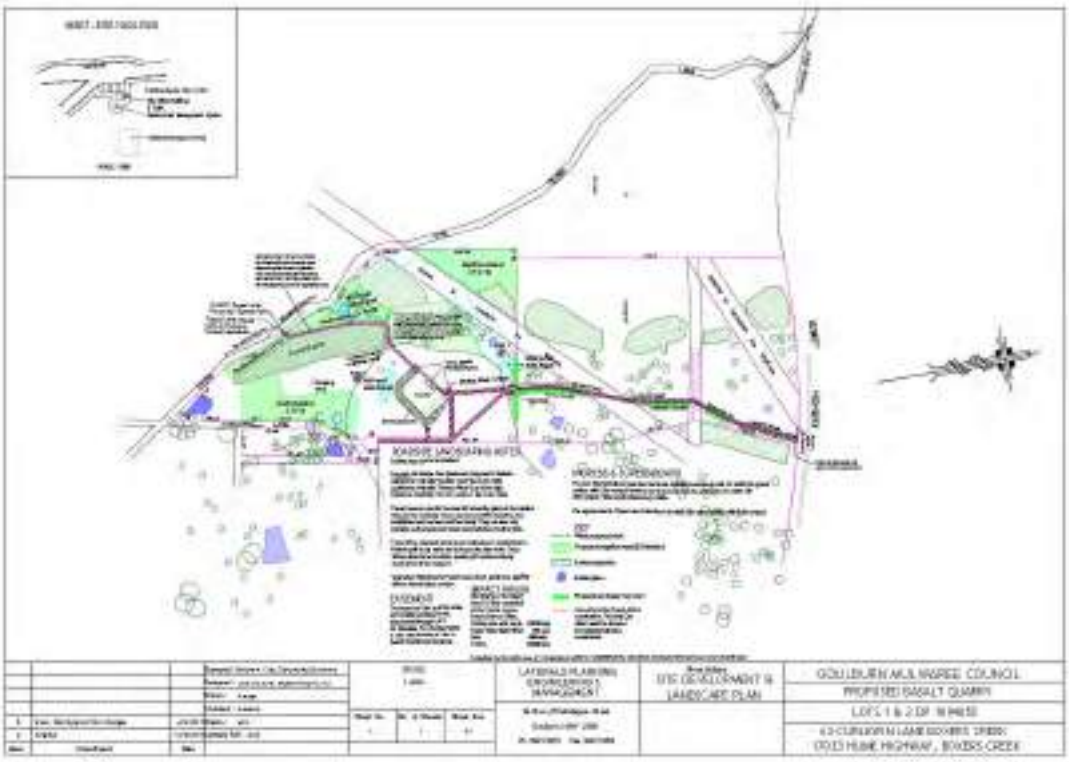
Provided that these controls are established, it is the opinion of Benbow Environmental that the proposed development satisfies the requirements of air quality compliance.

Traffic

Introduction

An original Traffic and Parking Impact Assessment in 2014 relating to Tiyces Lane only and a revised Traffic and Parking Impact Assessment relating to the Hume Highway has been carried out by Motion Traffic Engineering in June 2016 to assess the development. Access to the site is now proposed from the Hume Highway with exit now proposed to Tiyces Lane. In this situation the Motion Traffic report and a new report by Laterals Engineering & Management are applicable to the assessment.

The location of the access points are shown below.



A revised Traffic and Parking Impact Assessment (the report) has been carried out by Laterals Engineering & Management in April 2017 to assess the development with access from the Hume Highway and egress to Tiyces Lane as indicated on the Site Development & Landscape Plan.

Tiyces Lane is a sealed rural with one lane each way with a centre/barrier line to distinguish between the opposing traffic. The road does not state a speed limit. Tiyces Lane runs from the Hume Highway and is a dead end road some 5km in length.

The Hume Highway is a national highway from Melbourne to Sydney. The Hume Highway immediately adjacent to Tiyces Lane is two lanes each way with a speed limit of 110km/hr. The capacity of the Hume Highway has been assessed in the Motion Traffic Report included in the Laterals report.

The process of the development over the past 5 years has resulted in the receipt of concurrence from the RMS for the proposed deceleration lane and acceleration lane at the Hume Highway.

Proposed Development

The proposed development is displayed in the report providing an ingress road from the Hume Highway and an exit road to Tiyces Lane leading then to the Hume Highway. The plan shows the construction of a new deceleration lane from the Hume Highway to Lot 2 DP 1094055 and the

construction of a new acceleration lane from Tiyces Lane to the Hume Highway. Details are shown in the Traffic report.

Environmental Assessment

Road Capacity – Tiyces Lane

The capacity of Tiyces Lane is calculated to be 658 vehicles per hour, in one direction. As such it is determined that there is adequate capacity in Tiyces Lane for the expected additional traffic of 11 vehicle movements per day in one direction.

Route Structural Adequacy – Tiyces Lane

A Pavement Condition Report was prepared for Tiyces Lane by Pavement Management Services on the 30 March 2009. A copy is separately attached.

This report indicated a pavement life of at least 20 years from this date i.e. pavement life until at least 30 March 2029.

The expected life of this proposed extractive industry is approx. 5.9 years and assuming site operations will commence by the 30 March, 2018 the end of the life of the quarry is expected to be 30 September, 2023.

Contributions

Council's s94 Development Contributions Plan 2009 Amendment No. 1 Extractive industries, mines and like development road maintenance levy will apply based on the following formula:

Road maintenance / reconstruction
contribution per tonne (cents) = 4(L1 x P1 + L2 x P2 ……Ln x Pn)

Where: L1 = Length of road route 1 used by the development
P1 = Estimated percentage of material trucked along route 1
= 4 cents per tonne as the contribution towards pavement maintenance, repair, rehabilitation and reconstruction.
L2 = Length of road route 2
P2 = Estimated percentage of material trucked along route 2

The affected section of Tiyces Lane is approx. 2km long and the applicable contribution will therefore be:

Contribution = $0.0468 x 2 (2016/17 rate)
= $0.0936 per tonne.

Based on 60,000 tonnes per year, this contribution would be $5,616 per year.

Conclusions and Recommendations

There are no traffic engineering reasons why a planning permit for the proposed quarry should be refused.

The traffic assessment recommends the following works:

1. Construction of a deceleration lane to RMS requirements.
2. Construction of an acceleration lane to RMS requirements.
3. Construction of access onto Tiyces Lane to Council requirements.
4. Widening of the northbound travel lane on Tiyces Lane to Council requirements.
5. Rehabilitation of sections of the northbound travel lane on Tiyces Lane as identified in the Pavement Management Services Report.

Flora and Fauna

The following flora and fauna assessment has been subject to 2 Addendums which are now included in the application.

The January 2010 was an addendum to a Flora and Fauna Assessment prepared in January 2008 that assesses the potential ecological impacts of a proposal to develop a quarry on Tiyces Lane, Boxers Creek. The addendum has been prepared as a result of changes to the proposed development since the preparation of the original flora and fauna assessment. The change to the original proposal is limited to minor realignment of the exit track compared to the original access track location.

The 2010 Addendum concluded that no changes are required to the safeguards and conclusions of the original report.

The June 2016 was an addendum to a Flora and Fauna Assessment prepared in January 2008 and Addendum prepared in January 2010 that assesses the potential ecological impacts of a proposal to develop a quarry on Curlewin Lane (previously identified as accessing from Tiyces Lane) Boxers Creek. The addendum has been prepared as a result of changes to the proposed development since the preparation of the original flora and fauna assessment.

The change to the original proposal is now limited to the provision of an entry directly from the Hume Highway and provision of an exit directly to Tiyces lane in close proximity to the original entry road. There are no trees or hollow bearing trees along the alignment of the new roads.

The 2016 Addendum concluded that no changes are required to the safeguards and conclusions of the original report.

The site assessments have been conducted by Gina Guinane (in 2008) (B Env Sc (Management)) and subsequently Pat Guinane (B Env Sc (Management)).

The study area is located in the Goulburn Mulwaree Local Government Area on a site that has a long history of agricultural use. It has been cleared of most native vegetation and is now dominated by introduced pasture species and weeds. Parts of the site are better preserved and to support stands of native low open forest and native understorey species. The aerial photographs of the site in this report demonstrate the extent of present vegetation communities.

This assessment has surveyed flora and fauna components of the site and considered the potential impacts of the proposal on any Commonwealth and State listed threatened species, populations and ecological communities with potential to occur on this site. Assessments of Significance have been prepared for all species and ecological communities listed under the NSW Threatened Species Conservation Act 1995 with potential to occur in the area. Safeguards have been provided to mitigate any potential negative impact of the proposal on flora and fauna associated with this site.

The study area occurs in a predominantly cleared landscape with a long history of agricultural use although some patches of remnant forest and woodland remain. The topography is gently undulating and surface water occurs in three minor drainage lines and several small dams.

The site fronts Tiyces Lane and access is currently obtained from Curlewin Lane off Tiyces Lane. The site currently supports one machinery shed, several farm dams, fences and no other development.

The proposal is to operate a basalt quarry pit of approximately 1 ha on the site. A new ingress road

from the Hume Highway and exit road to Tiyces Lane will need to be constructed to provide suitable access to and from the site which will avoid the need for vegetation clearing.

Ecological Communities and Habitats

Ecosystems on this site are largely typical of an agricultural landscape. The land has been extensively cleared of native vegetation in the past, sown with exotic pasture species and grazed for commercial production. As a result, the ecological condition of the site has been degraded. Good quality, native grassland habitat is limited however the site continues to support several stands of native forest to the west and south of the proposed development area. Brittle Gum Eucalyptus mannifera, Silvertop Ash E. sieberi, Cabbage Gum Eucalyptus amplifolia and Argyle Apple Eucalyptus cinerea are common overstorey species on site

Fallen timber, hollow bearing trees and surface rock are limited on site while several small farm dams provide some simple aquatic habitats.

Remnants of the endangered ecological community Box/Gum Woodland as listed under the NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 persist over some sections of the site although these areas have undergone considerable disturbances in the past which has reduced the ecological integrity of the community to some extent.

Understorey components of this EEC are now dominated by exotic pasture species and common pasture weeds although scattered occurrences of significant native forbs and grasses were also observed. This community was self-regenerating at the time of this assessment and includes trees from seedling to mature age classes.

Flora

Most of the eastern and southern portions of this site have been cleared in the past of native forest and those areas sown to pasture or progressively invaded by exotic pasture species and weeds. Isolated paddock trees are scattered through these areas.

In the northern and south-western sections of the property stands of native forest remain – dominated by Brittle Gum Eucalyptus mannifera, Yellow Box E. melliodora and Red Stringy Bark E. macrorhyncha with a reasonably diverse but sparse shrubby understorey component.

Areas of native grassland on site have generally been degraded by the gradual invasion of exotic pasture grasses and weeds but continue to persist in some areas in moderately good condition. The presence of a variety of sensitive forbs and grasses on site indicates this area is still worthy of some conservation measures to retain the ecological integrity of the site.

No individual species of state conservation significance were recorded on site during this assessment.

The threatened species assessment table in Appendix C provides a summary of threatened flora occurring in the district. Where it is considered that one of these species has potential to occur on the site an Assessment of Significance for that species has been prepared.

Fauna

Few species of fauna were detected using this site. Several locally common birds were observed using the scattered vegetation and no mammals were recorded. A full list of fauna occurring on site and considered likely to use the site is provided in Appendix B of the Laterals report.

No species of significance were recorded on site although several are considered potential users of the site.

The threatened species assessment table in Appendix C provides a summary of threatened fauna identified as occurring in the district by the NSW DECC. This list, as well as known local observations and habitat have been used to determine which species have been considered with an Assessment of Significance.

Endangered Populations

Endangered populations are covered by the NSW TSC Act 1995. No endangered populations occur on or near this site and none are likely to be significantly impacted by the proposal.

State Environmental Planning Policy No. 44 – Koala Habitat Protection

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP44) applies to the land.

SEPP 44 provides for koala habitat protection in NSW and aims to help conserve populations of this species. The policy defines potential Koala habitat as areas of native vegetation where the tree species listed in Schedule 2 of the policy constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. Schedule 2 tree species include -

- Eucalyptus tereticornis (Forest Red Gum)
- Eucalyptus microcorys (Tallowwood)
- Eucalyptus punctata (Grey Gum)
- Eucalyptus viminalis (Ribbon Gum)
- Eucalyptus camaldulensis (River Red Gum)
- Eucalyptus haemastoma (Broad-leaved Scribbly Gum)
- Eucalyptus signata (Scribbly Gum)
- Eucalyptus albens (White Box)
- Eucalyptus populnea (Bimble Box or Poplar Box)
- Eucalyptus robusta (Swamp Mahogany)

While Koalas may occur occasionally in the district, this site and adjoining lands do not support likely Koala habitat and despite searches no signs of Koala occupation were observed in the area during site visits. No further consideration under this SEPP is necessary.

Potential Impacts on Flora and Fauna, Ecological Communities and habitats

A variety of common native and exotic plants were recorded on this site. No individual species of recognised national, state or local significance were recorded on the site.

This site lacks the diversity of habitat that would allow a wide range of animals to use the site. It does provide however suitable habitat to support common local animals that will still be able to use retained habitat and new habitats that will result from the proposed subdivision. No species of recognised national, state or local significance were recorded on the site and it is considered that any impact on fauna will be negligible.

The site of the proposed development is largely cleared grazing land, including mixed native and exotic pasture. Native grasses occur frequently and in large patches but are equally as common as exotic forbs and grasses over the property. Habitat types are limited by the scarcity of fallen timber and debris and rocky outcrops on the site however forest and woodland remnants provide some quality habitat for arboreal and avian fauna. Aquatic habitats are limited to several small farm dams with some aquatic vegetation.

Scattered remnants of the endangered ecological community (Box/Gum Woodland) occur on site and will be altered to a minor extent to provide suitable access to the main works area on the property. The impact of alterations to this EEC on site has been assessed as negligible and unlikely to result in any significant short or long-term impacts.

All direct impacts of the proposed subdivision are confined to areas that have already suffered significant disturbance in the past and as such are not considered likely to have a significant impact on the ecological communities and habitats present on the site.

NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Assessments of Significance have been prepared for species protected by this act in relation to the proposed development.

Environment Protection and Biodiversity Conservation ACT 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance". The Act identifies nine matters of national environmental significance being:

1) World Heritage properties
2) National heritage places
3) Wetlands of international importance (Ramsar wetlands)
4) Threatened species and ecological communities
5) Migratory species
6) Commonwealth marine areas
7) Nuclear actions (including uranium mining)
8) Great Barrier Reef Marine Park
9) Water impacts from coal seam gas and large coal mining actions

Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

No threatened species listed under this Act were recorded on site at the time of this assessment or considered likely to occur on the site. The Department of Sustainability Environment Water Population and Communities protected matters search tool was used to highlight any maters of national environmental significance that could be of concern. This report is attached to the Flora and Fauna Assessment. No matters were considered likely to be impacted by the proposal.

The endangered ecological community White Box – Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland is protected by the EPBC Act however the community on the site does not fall into the definition of the commonwealth listed community and further assessment is not necessary.

In addition to threatened species and ecological communities, the Environment Protection and Biodiversity Conservation Act 1999 allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat.

Environmental Management and Mitigation Measures

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on the flora and fauna associated with this site both in the short and long term.

1. Existing vegetation occurring outside the footprint of this development shall not be degraded. This includes removal of trees (dead and alive), shrubs and fallen timber.

Clearing of Native Vegetation is listed as a Key Threatening Process in Schedule 3 of the TSC Act.

Removal of dead wood and dead trees is listed as a Key Threatening Process under Schedule 3 of the TSC Act 1995.

2. Clearing of some trees will be required as part of the proposal. For each hollow bearing tree removed the developer must install 2 suitable nest boxes for native fauna in the vicinity.

In order to achieve this, the developer will need to engage suitably experienced people to identify hollow bearing trees to be removed and install the nest boxes.

This safeguard has been recommended as the proposed access track will have an impact on native fauna habitat, including trees which form an overstorey component of an endangered ecological community without this management action.

Conclusions

This report has assessed the proposed development of Lots 1 & 2 DP 1094055. It has considered the impact the proposal could have on any local flora and fauna as well as species and ecological communities protected by the NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Following these investigations, it has been concluded that there will be no significant impact on any local flora or fauna, endangered species or ecological communities if the development proceeds as proposed. The implementation of this report's recommendations will add to ensure that the proposed development has a neutral impact on the ecological values of the landscape.

Views and Visual

The site of the quarry is not clearly visible from any location being screened by low hills or trees. The view to the site from Tiyces lane is shown in the following photograph, but it is not visible being located behind trees.

The earthen mounds surrounding the south and east of the quarry may be partially visible from Curlewin Lane and the land to the east but the quarry and its activity would not be visible as that activity is below the level of the mounds.

Furthermore, comment is provided that the rural landscape and scenic value is one which contains development from human activity that is normally carried out in the rural locality which in my opinion includes quarry activities.

The above view is across a valley with trees that would prevent view of the quarry. In addition it is proposed that the area of the valley with scattered trees be allowed to naturally regenerate which would eventually provide additional tree screening in the direction of the quarry.

The proponent has now provided additional photography to display the visibility of the development.

The following photographs show views from the south east and south. We note that there is no additional landscaping associated with the bund which would be grassed. The bund wall would be 4m in height with no solid panel timber fence on top.

Existing view from south east

View from south east with bund walls (yellow line shows existing ground level)

Existing view from south

View from south with bund walls (yellow line shows existing ground level)

In the above photographs the level of the natural ground has been highlighted with a yellow line to display better the height screening effect of the bund. There is no structure or development infrastructure that would be visible.

The photographs above confirm that there would be partial visibility from Curlewin Lane to the south and south east but that the mounds would replace these views with the same natural grassland view that is currently experienced from these directions resulting in a rural landscape or scenic value which would in this instance not display any of the quarry activity. The view from the south would also be screened by the planned revegetation area providing trees that would eventually grow to the height of the tree on the LHS.

In addition the following photographs show views from the Hume Highway and from properties located further from the site along Tiyces Lane/Curlewin Lane.

View from the Hume Highway towards the Quarry Site at the location where the new entry road is located

The internal access road will incorporate additional landscaping along the eastern line of the road except within electricity transmission easements (LHS of view). The road would be partially visible but broken with the landscaping (as outlined on the Site Development and Landscaping Plan) giving the road an appearance of noting more than a standard rural property road not uncommon in the vicinity or rural area.

For the quarry to be visible from the Hume Highway a driver or passenger would need to be looking more than 90° around from the line of sight along the highway. The elevation of the Hume Highway is 701m whilst the elevation of the quarry at its highest point is 736m. In between the Hume Highway and the quarry is a hill which is 710m height. The following plan shows that the quarry would potentially be visible in a straight line of sight view; however that view is hindered by grasses and trees along a line of sight which is 1.1km in length. The line of sight passes 7.2m above the natural ground at the hill in between the highway and quarry. The trees and shrubs that are currently on the paddock next to the highway and the line of trees at a curve in the entry road would be higher than 7.2m thus screening any possible view of the quarry. In addition a line of trees is proposed along the boundary between Lots 1 & 2 which would provide additional screening.

The following plan displays the lines of sight of the above photographs and ground levels at the point of photography as well as ground levels of the quarry at 3 corners and a hill between the Hume Highway and Quarry.

The view between the Hume Highway and quarry is discussed above.

The view from the south as shown above is also taken from an elevation which is 19m below the highest point of the quarry and a berm 4m high is provided in the line of sight.

The view from the south east as shown above is taken from an elevation which is 36m below the

highest point of the quarry and a berm 4m high is provided in the line of sight.

View from 328 Tiyces Lane

From 328 Tiyces lane the Quarry Site is 1.5km distant and is not visible being hidden by vegetation to the right hand side of the photograph. The elevation of the dwelling at this address is approximately 735m such that the view to the quarry would be approximately level with the quarry.

View from 343 Tiyces Lane

From 343 Tiyces lane the Quarry Site is 1.6km distant and is not visible being hidden by vegetation to in the gap between the trees. The elevation of the dwelling at this address is approximately 725m such that the view to the quarry would be slightly upslope to the quarry.

It is considered that the site of the proposed quarry will appear as natural grassland and trees (and with the faces of the bunds being vegetated with native grass) from all directions from which it is visible. The site office is proposed to have dimensions of 3m x 6m, being the size of a small farm shed. This will be visible from the east through south east where not obscured by existing vegetation. A structure of this size and type is smaller than most buildings in the rural character of the area and would not have any significant negative impact on the amenity of the locality. The extraction activities of the quarry itself will be below ground or hidden by the bund walls and it is considered that they will have no adverse visual impact on the locality.

The land on the east would potentially view the quarry however there is a temporary bund wall along the north east and a bund wall along the south east which would hide the quarry from view with these lots being approximately the same height of or less than the quarry and the bund wall being 4m high. When the temporary bund wall is removed the quarry activity would be below the level of the ground. One owner to the east has also indicated no objection to the quarry; which owner holds land equal in level and directly east of the quarry. The other eastern landowner has land which has a dwelling 580m from dwelling to quarry and is at an elevation of approximately 715m being 16m lower than the quarry and having a view at the eastern corner of the 4m high grassed bund such that a view of the quarry activity would not be possible.

Infrastructure & Services

Emergency Services

The site is located 630m at the end of the cul-de-sac of Curlewin lane. A new ingress would exist on the Hume Highway and a new exit would exist on Tiyces Lane.

The emergency services already available to support the proposed development include:

- Ambulance – located at Goulburn and Marulan.
- Police – located at Goulburn and Marulan.
- Rural Fire Service - located at Boxers Creek.
- Hazmat/Goulburn Fire Brigade – located at Goulburn.
- Hospital – located at Goulburn.

Electricity Supply

Power is available to the proposed development from Essential Energy. The supply is available from the NE corner of Lot 1 DP 1094055.

Other Infrastructure and Services

Gas is not available to the site. Telephone services are not specifically required and will not be connected for a land line, a service provided by mobile telephone which can be diverted from the owner/operators office. Should a service be later connected the work would be conducted in accordance 'Planning for Bushfire Protection 2006', section 4.1.3 *Standards for bushfire protection measures for residential and rural residential subdivisions*, as a guide for this development.

Waste

This Section summarises the main findings of a Waste Study conducted as part of this assessment. All office waste at the site would be collected in bins and disposed to the normal Council collection service.

The quarry process does not involve any chemical additives.

All machinery is to be brought to the site for operations only and not stored on site. As such oil and fuel is not to be stored on site, but brought by operators and taken away by operators with operators containing all storage in vehicles. Any spilt fuel or oil would require immediate collection and removal by the contractors.

As such waste management is fully managed and contained by contractors, other than the provision and use of waste collection bins for normal office waste.

In view of the minor quantity of waste and it transfer off site a waste management plan under the POEO Act is not further developed other than the provision of an Action Plan outline for management to follow to ensure good waste management and waste minimisation continues.

All waste at the site is collected fortnightly by a garbage service by Remondis. Remondis conduct the full waste management process from waste material collected from the site as advised on their web site www.remondis.com.au. All metals (i.e. steel, aluminium and copper are sent to local recyclers.

The manufacturing process does not involve any chemical additives. Waste oil from machinery is fully recycled. Any spilt production material from the process is collected and put back in to the process.

A brief waste audit report has been conducted as a part of this assessment for the proposed quarry.

All waste outputs from the manufacturing operations are transferred to Remondis except spilt product which is recycled in the factory. With implementation of waste management plan and waste minimisation action plan, Jasminco Resources Pty Ltd can ensure continued future good waste management and waste minimisation.

Mitigation Measures

In view of the minor quantity of waste and its transfer off site a waste management plan under the POEO Act is not further developed other than the provision of an Action Plan outline for management to follow to ensure good waste management and waste minimisation continues.

A typical format of a waste minimisation action plan is provided below.

Item	Action Required	Priority	Responsible Personnel	Start Date	To be completed by
1	Establish site waste monitoring on a monthly basis				
2	Identify site waste composition				
3	Research and identify any areas where waste can be further recycled				
4	Identify possibilities for greater segregation (and subsequent recycling) of wastes in the area				
5	Establish paper/cardboard recycling program and obtain service provider to take materials off site				
6	Establish plans to minimise chemical waste powder				
7	Materials that are being recycled-provide estimate of annual quantity				
8	Materials that are being reused provide estimate of annual quantity				

Archaeological features

A study was conducted by Stedinger Associates Pty Ltd in March 2009. The report details the existing environment, topography and vegetation, soils and geology, cultural background including European Settlement, previous archaeological works including a search of the Aboriginal heritage Information Management System Aboriginal Context which are not reiterated here.

The area is substantially cleared and largely used in the past grazing. A shed has been erected on the land to provide storage for machinery associated with the farming activity.

The future works for the development include quarrying and earthworks in preparation for construction of the access road and office/amenities area. The revegetation area will also involve tree planting. These works will involve ground disturbance that will directly impact heritage site, if present, with the specified location resulting in their disturbance and/or destruction.

Based on discussions with Aboriginal community representative, previous land-use history, and previous studies that indicate site types, their location, and density in similar environmental settings, the most likely to occur throughout the study area are open campsites and isolated finds.

The survey area had been variously disturbed from previous and current landuse, but most of the land had been cleared for farming use.

The lack of Aboriginal sites may be a consequence of a lack of resourced in the immediate environment, such as sandstone outcrops suitable for grinding purposes, rock shelters suitable for occupation, permanent water sources and the varied food resources associated with a riverine environment. Instead, it is likely that people passed through rather than camped in the area as they made their way to the richer resources of the Wollondilly River and the prominent landmark Mount Towrang.

The lack of sites may also be partially due to land clearance, grazing and other activities during the nineteenth and twentieth centuries resulting in the burial, displacement and/or destruction of heritage sites. Likewise, reduced surface visibility may have resulted in the lack of Aboriginal sites being located. It is possible that additional Aboriginal sites may be been obscured by grass, soil and leaf cover.

Cultural Significance

Sites of cultural significance are those that define Aboriginal values, provide links with the past and are a symbol of Aboriginal identity. They may be natural landscape features or archaeological evidence of past human activity.

Within the present survey area there is no material evidence of occupation and activities. In the wider area however, some artefact scatters and isolated finds represent tangible and meaningful links with the lives of the community ancestors. As such the local Aboriginal community has interest in the identification and preservation of sites in the region. In previous site surveys of the wider area, the Pejar Local Aboriginal Land Council and other community representatives have indicated that open campsites and isolated finds are considered to be of cultural significance. Indeed, in their identification of isolated finds as being significant, the Pejar Local Aboriginal Land Council appears to indicate that all Aboriginal objects or sites are considered to be significant by local Aboriginal people. Many Aboriginal sites have been destroyed or disturbed with increasing quarrying, infrastructure projects and development in the area. They are ‘non-renewable’ in what is already a depleted heritage resource.

Archaeological Significance

Scientific or archaeological significance refers to research potential of the artefactual material occurring within a place of site. Several criteria are commonly used by consultants when assessing the archaeological significance of Aboriginal sites. These criteria are:

- The potential of a site and its artefacts to provide information on questions relevant to archaeology and Aboriginal heritage;
- The potential of a site and it artefacts to provide information not available from other sources or sites previously known from an area;
- The potential of a site to provide an example of a site type that is not already being conserved in a similar landscape in the general area;
- The intactness or state of preservation of a site relative to other sites of the same type previously known from the area; and
- The inclusion of the site within a complex of the other sites that may give a greater potential for answering research questions.

The lack of archaeological sites in the specific landscape is itself valuable information contributing to a view of the occupation of sites in the Goulburn area and the movement of Aboriginal people across the landscape.

The field study noted that visibility was very poor in places with some areas already fully disturbed. During the field survey no Aboriginal archaeological material was found.

Environmental Management and Mitigation Measures

The following recommendations are made by the Stedinger study based on discussions in the report, consultation with the Pejar Local Aboriginal Land Council and other community representatives, background research, site survey and statutory requirements of the National parks & Wildlife Act 1974. It is recommended that:

- Aboriginal heritage sites should not prevent the proposed quarry and revegetation program in the specified study area. No archaeological sites were found during the recent survey of the area and no sites are known to be located in the specific study area;
- No further archaeological survey work for Aboriginal heritage sites is required prior to the excavation of the quarry and implementation of the revegetation program.
- Section 91 of the NPW Act 1974 requires that the accidental discovery of Aboriginal relics should be reported to the Director-General of the NSW Department of Environment & Conservation (National Parks & Wildlife Service). As such, during any works in the area surveyed the accidental discovery of Aboriginal objects or sites should be reported immediately to the Depart of Environment & climate change (NPWS). Representatives of the Local Aboriginal community should also be informed of any such discovery and management strategies formulated and implemented.
- Although no Aboriginal archaeological sites were found during the recent survey of the area or are known to be located in the specified survey area, during any works in the survey area, contractors and project personnel should be requested to work with caution and informed of the requirements outlined in Section 91 (1) of the NPW Act 1974.

The above recommendations are also those contained in the Pejar Local Aboriginal Land Council report provided to Stedinger Associates.

Conclusion

During this survey of the proposed area for the excavation of a quarry and implementation of a

revegetation program at Towrang, no Aboriginal archaeological sites were found within the survey area and no previously recorded sites have been registered by the NSW Department of Environmental and Climate change. However, dense ground cover may have obscured surface artefacts in some parts of the survey area.

It is concluded that;

- The present archaeological survey indicates that Aboriginal heritage sites are not likely to exist in the subject survey area;
- Dense ground cover may have obscured archaeological sites or isolated artefacts in some parts of the survey area.

Since the original study updated AHIMS searches were carried out on Lots 1 & 2 DP 1094055 noting no Aboriginal site recorded in or near the site and no Aboriginal places declared in or near the site. Pejar Local Aboriginal Land Council subsequently carried out an inspection and reported that no Aboriginal sites were located but did not rule out that artefacts could be located under the ground.

Pejar Local Aboriginal Land Council recommended:

- If any previously undetected Aboriginal site or relic is uncovered or unearthed during any activity, work at the location must cease immediately and advice on appropriate actin be obtained from the Pejar LALC in conjunction with NSW Office of Environment and Heritage;
- A representative from Pejar LALC should be present during the initial earthworks.

Relationship with Adjoining land

The proposed development has a relationship with the adjoining land:

- Adjoining land contains a mixture of rural settlement, a horse training track and a poultry farm.
- Also on adjoining land there are residential dwellings as indicated in the above reports and on the aerial photograph.
- The proposal will increase traffic along Tiyces lane the impact of which has been assessed above.
- The proposal will have a minimal impact on native vegetation and provide for significant rehabilitation of part of the site with tree planting.
- The development is sufficiently isolated and screened from other development to not create any privacy issues. Attempts were made to view the site from surrounding roads (Tiyces Lane and Curlewin Lane but the site was virtually unable to be seen).

It is submitted that –

1. the proposal will not create a visible scar from the surrounding ground levels;
2. the proposal will increase native vegetation including screening;
3. Despite not requiring separate approval, [under the Native Vegetation Act 2003] the aims and objectives to maintain and approve the quality and quantity of vegetation within the site is considered to be satisfied.
4. The variation based on the quantitative Air and Noise Assessments is considered acceptable based on the EPA conditions proposed which will ameliorate the potential impacts to an acceptable standard.
5. In relation to the 'motor racing tracks example in the DCP the Council similarly applies to the extractive industry that "Based on this example it should be acceptable that in the case of Extractive Industries (Tiyces quarry) with dwellings proposed closer than the recommended buffer distance, the quarry at a minimum should comply with industry best noise insulation standards and any EPA requirement."

Privacy and Security

The proposed development has limited potential to affect the privacy of adjoining land. As discussed above the area is currently developed with a mixture of rural settlement and activity. The development is sufficiently isolated and screened from other development to not create any privacy issues. There is no further development closer to any existing residence and it is noted that the additional earth mounds around the quarry would provide additional visual screening.

The development is proposed to be fully fenced around the operational area with cyclone fencing for security and safety purposes.

Social and Economic

The proposed development will involve a number of benefits that are entitled to be considered. These include:

- The provision of a service to the community in the provision of a basalt resource for the various uses such as material used for roads and concrete.
- The provision of employment or employee establishment within the area.
- The development will provide for the continued viability of the City of Goulburn in the need for social and community services.
- The development will provide for the continued viability of the City of Goulburn in the demand for goods and services to service the industry and employees.

Future Use of Quarry

The quarry may expand to utilise the extent of basalt resource on the land, in which case the base of the quarry will continue in use for full extraction of that resource. This would be the subject of further applications.

Should the quarry not continue the rehabilitation process has been outlined in detail in the Operational Environmental Management Plan.

Environmental Justification

The establishment of the above facilities have been determined by Jasminco Resources Pty Ltd to enable the relatively small scale supply of basalt for local and regional industry.

The facility would -

- Provide for the establishment of a resource extraction before the resource becomes too constrained from future development.
- Have minimal impact in relation to all potential environmental impacts.
- Provide for the employment of people in the district.
- Supply the ongoing needs for the industries that calls for the product that would be extracted at the facility.
- Develop the facility in accordance with current best practices for safety and operation.
- Develop the facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural environment.
- Carry out works within the existing natural environment that will provide for a beneficial impact on the water cycle, including the extensive planting of trees.
- Provide a development that will not be visually imposing given the extent of surrounding vegetation and general topography.

In terms of the above assessment of the existing environment, environmental management and mitigation measures, conclusions and summary of environmental mitigation measures the proposed development can be carried out with minimal, nil, or beneficial, impact on the environment.

The development can achieve reasonable objectives and overcome the consequences of no development with the completion of the proposal in and manner discussed above provided the environmental mitigation measures are carried through.

The development has been assessed in terms of ecologically sustainable development in the reaching of general conclusions based upon the environmental analysis.

1. INTRODUCTION

1.1 INTRODUCTION

This statement accompanies a development application to the Goulburn Mulwaree Council for the development of a quarry (to be known as Argyle Quarry) on Lot 1 DP 1094055, Curlewin Lane Boxers Creek, with access over Lot 2 DP 1094055 and along Tiyces Lane. The lot with the quarry contains an area of 44.08 hectares and which with the access over Lot 2 DP 1094055 an estimated 4.6 hectares will be disturbed to establish the quarry as a whole (some of which is construction impact area which would be rehabilitated – 1.16ha).

In the preparation of the development proposal Laterals acted under instruction to plan and seek approval for the development of the quarry on the property. The proposal has previously been considered by Council and has now been amended to include a separate entry from the Hume Highway, and alter the exit to Tiyces lane with the provision of a new acceleration lane to the Hume Highway from Tiyces lane and make provision for an office, parking, and infrastructure facilities.

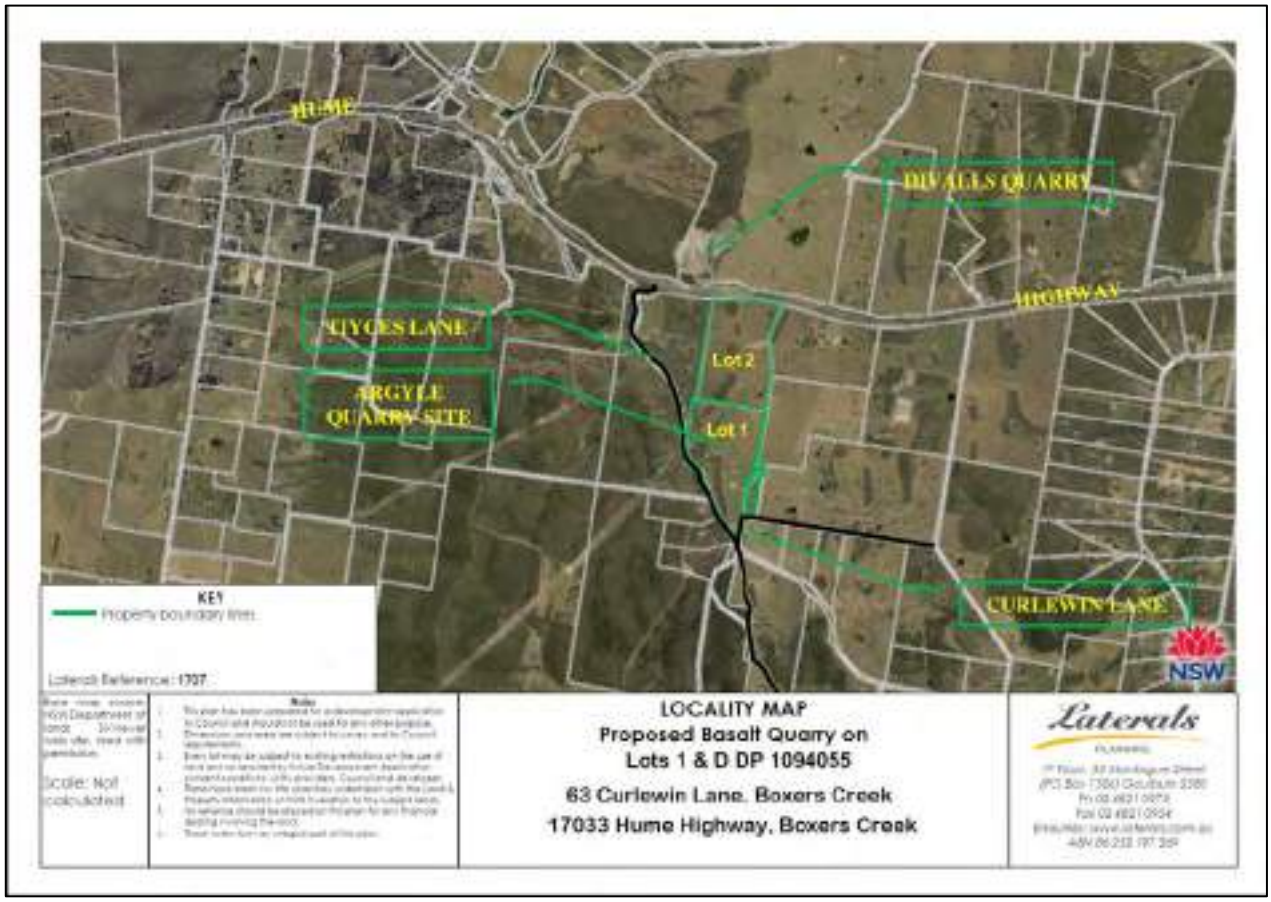
The existing entry to the site is 630m along Curlewin Lane from its intersection with Tiyces Lane which emanates from the Hume Highway. Curlewin Lane is not sealed and Tiyces Lane is a sealed road. The site contains a farm, 2 bores and rural sheds and installations used in association with the agricultural use of the property for grazing. The entry to the quarry development is proposed to be from the Hume Highway (at 17033 – measured) and is located 975m east of Tiyces Lane. The exit from the quarry is proposed to be to Tiyces Lane to the Hume Highway incorporating the construction of a new acceleration lane to the Hume highway.

An initial concept was prepared and discussed with the Council for a proposed quarry under Part 4 of the Environmental Planning and Assessment Act 1979. Council provided a response that provided advice on matters to consider in the preparation of the development proposal. Subsequently the application has been the subject of a court appeal which was discontinued but during which process the application has been amended to what is now incorporated into this EIS and accompanying reports.

Considerable investigation has been carried out over the land which included the whole of Marian Vale for the utilization of geological resources available on the land. Geological reports are attached that indicate the most significant value of the basalt resource on land at and adjacent to the site. This site is now proposed for a quarry of limited size to supply local and regional demand.

The reports and plans attached to or referenced in this statement and now submitted with the development application and consolidates the information pertaining to the land and proposed development. The area is rural in character and is predominantly undulating with patches of rural activity and patches of timber. This statement and the reports and plans included as attachments provide detailed information and assessment of the site and the amended proposed development. Key planning issues are discussed which, in accordance with the provisions of clauses 72 and 73 of the Environmental Planning and Assessment Regulation 2000, environmental planning instruments and requirements for the Environmental Impact Statement from government agencies, in combination with a summary assessment of the environmental management and mitigation measures, represents the required Environmental Impact Statement.

The locality of the site is shown below.



1.2 OBJECTIVES OF DEVELOPMENT

Jasminco Resources Pty Ltd seeks to achieve the following objectives in proposing a quarry on Lot 1 DP 1094055, and access over Lot 2 DP 1094055, 63 Curlewin Lane, Boxers Creek -

1. Provide a basalt resource for use within the local and regional area.
2. Develop the quarry and utilise the resource and further prove the suitability of the resource. Only limited data can be obtained of an underground resource from drilling and tests.
3. Develop the quarry and extract the resource before any further rural development results in the sterilisation of the resource.
4. Provide for the continuing employment of 6 people.
5. Supply the ongoing needs for basalt to industry.
6. Develop the facility in accordance with current best practices for safety and operation.
7. Develop the facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural environment.
8. Carry out works within the existing natural environment that will provide for a neutral or beneficial impact on the water cycle.
9. Provide for the installation of the following infrastructure and facilities at the site–
   - The construction of an ingress road from the Hume Highway with associated drainage, and an exit road to Tiyces Lane;
   - The construction of an acceleration lane from Tiyces Lane to the Hume Highway.
   - The construction emergency access roads from Curlewin Lane to the quarry and office facilities for emergency access for bushfire and other emergency egress;
   - The installation of an office, parking for 5 vehicles and a truck along with on-site waste water management facilities;

- The installation of water management ponds per reports by SEEC and as outlined in the Operational Environmental Management Plan;
- The installation of grassed sound control bunds around parts of the quarry sides; and
- The placement of a transportable rock crusher inside the quarry.

The details of the quarry are shown in the Operational Environmental management Plan prepared by SEEC.

The facilities will also enable -

- The safe operation of the business;
- The operation of the quarry with a minimal impact on the surrounding environment;
- The Provision of an efficient operation of the facility;
- The provision for the employment of people in this new operation;
- The supply of ongoing needs for the industries and agriculture that calls for the products produced at the facility;
- The development of a facility in accordance with current best practices for safety and operation;
- The development of a new facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural or living environment;
- Provision of a development that will not be visually imposing given the extent of surrounding vegetation and general topography;
- The planting of trees as shown on the attached plan and the report prepared by SEEC; and
- It is proposed to utilise part of an existing bore license (10ML of WAL 35518 - 50 Megalitres) for quarry purposes as a backup and additional supply source.

1.3 LEGISLATIVE REQUIREMENTS

he proposed development is included in the generic definition of an "Industry" and more specifically defined as an "Extractive Industry" under *Goulburn Mulwaree Local Environmental Plan 2009* where the land is within an E3 Environmental Management zone in which an "Extractive Industry" is prohibited. The use however is identified as permissible pursuant to Clause 7 (3) (a) under *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industry)* 2007 where the development is proposed "on land on which development for the purposes of agriculture or industry may be carried out (with or without consent)".

In that the activity is proposed to process 30,000 cubic metres per annum of material the use is identified as a "Designated Development" (Clause 19 of Schedule 3 of the *Environmental Planning and Assessment Regulations 2000*) requiring the preparation of an Environmental Impact Statement, and also due to the Council advising that the E3 zone is identified as an "environmentally sensitive area". As designated development the application for development requires the preparation of an Environmental Impact Statement in accordance with the requirements of the Director-General of the Department of Planning and Infrastructure and other relevant government authorities **(Copies of Director-General's requirements and responses from other government authorities are provided in Appendix 1)**.

The development also requires assessment under the following environmental planning instruments, policies, strategies and guidelines:

- *State Environmental Planning Policy (Mining, petroleum Production and Extractive Industries) 2007.*

The use is permissible pursuant to clause 7 (3) (a) of the Policy where the development is proposed "on land on which development for the purposes of agriculture or industry may be carried out (with or without consent)".

15 Resource recovery

(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.

(2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.

(3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.

In terms of clause 15 it is submitted that –

(1) The recovery of the basalt resource is efficient considering that the material can be extracted by ripping and crushing, involving no need for blasting. In this regard the extraction is also capable of being carried out in a location confined by encroaching rural settlement with controls that provide for noise and air quality measures to be satisfactorily implemented and within manageable environmental parameters such as water management and visual impacts.

The resource is also capable of direct access to and from the Hume Highway for efficient management or transport and giving direct access to transport routes to users with no interference to other rural roads that might otherwise need traffic management measures imposed.

(2) The Council has referrals from government authorities that provide for the conditioning of the consent to ensure environmental standards are adhered to; such as noise and air quality measures, and the installation of landscaping and visual impact measures that are proposed.It is not considered that there would be any waste from the operation other than materials generated from the site office. On-site waste water is managed as assessed in the report prepared by SEEC and attached.

(3) Having regard to the ability to condition the development in accordance with government authority advices and any measures Council considers appropriate for the removal of office waste to an approved waste management and recovery facility managed by Council in Goulburn.

- *State Environmental Planning Policy (Rural Lands) 2008*

Under State Environmental Planning Policy (Rural lands) 2008 the proposed use is not inconsistent with 'the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas' in that it recognises the significance of the economic geological resource that is proposed to be

extracted, the resource is in a location where it can be extracted without significant impact on the environment (and in relation to assessment within the Sydney Catchment area will result in a neutral or beneficial impact) as a balance to 'social, economic and environmental interests of the community'. The resource can be extracted at a time prior to the potential development of the land for other purposes in close proximity to Goulburn that could sterilise the resource.

- *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011.*
  The development is located within the Hawkesbury Nepean catchment and requires notification to the Sydney Catchment Authority.

- *State Environmental Planning Policy No 33 – Hazardous and Offensive Development.*

- *State Environmental Planning Policy No 44 – Koala Habitat Protection.*

- *State Environmental Planning Policy No 55- Remediation of Land*

- State Environmental Planning Policy (infrastructure) 2007

- *State Environmental Planning Policy (State & Regional Development) 2011*

- *Goulburn Mulwaree Local Environmental Plan 2009*
  The site is zoned E3 Environmental Management. The proposed development is prohibited except as becoming permissible as described above under *State Environmental Planning Policy (Mining, Petroleum production and Extractive industries) 2007*. Consideration should be given to the *Aims of the Plan*, the *Objectives of the zone* and *Clauses 5.9, 5.9AA, 5.11, 7.1A, and 7.2*. There are no known foreshadowed changes to zoning in the area.

- *Sydney - Canberra Corridor Strategy*

- *National Parks and Wildlife Act (NSW) 1974* (as amended)
  Aboriginal sites and objects are protected in NSW by the National Parks and Wildlife Act (NSW) 1974 (as amended) – of which Section 90 states that "it is an offence to knowingly destroy, deface or otherwise disturb an Aboriginal object without the prior consent of the Director General" of the NSW NPWS (now Parks Service Division of the NSW Department of Environment and Conservation). The consideration of Aboriginal Heritage in development planning is provided for in the *Environment Planning and Assessment Act 1979* (EPA Act). This latter act identifies consent authorities – for example local government, and determining authorities – for example NSW NPWS. Aboriginal sites and places are explicitly identified in the EPA Act as requiring assessment as part of planning studies.

- *Protection of the Environment Operations Act 1997 (as amended)*
  The use is identified as scheduled premises under section 43 requiring a license

After the full assessment of the site constraints and legislative requirements the development would require the following consents at development application stage:

1. Development consent from Goulburn the Joint Regional Planning Panel in accordance with *State Environmental Planning Policy (Mining, Petroleum production and Extractive industries)* 2007 and *Goulburn Mulwaree Local Environmental Plan 2009* and relevant provisions of the *Environmental Planning and Assessment Act*

2. *1979* and *Environmental Planning and Assessment Regulations 2000.*
3. A license under the *Protection of the Environment Operations Act 1997* (Schedule 1).
4. Concurrence of the Roads & Maritime Service for the highway deceleration and acceleration lanes.
5. Concurrence of Water NSW for water quality and Neutral or Beneficial Impact Assessment.

An application was previously refused by the Joint Regional Planning Panel. The application was subject to an appeal to the Land & Environment Court which was discontinued for the lodgement of a new development application.

Compliance is addressed in detail in Chapter 20.

1.4 COMMUNITY CONSULTATION

Prior to the commencement of the preparation of the original Environmental Impact Statement a letter was forwarded to Goulburn Mulwaree Council for forwarding to adjoining and nearby landowners advising them that the application was for designated development and will require licensing under the Protection of the Environment Operations Act and requesting "*your advice of any matters of concern you may have about the proposed development*". Subsequently the application has been subject to a appeal in the Land & Environment Court whereby the community has been involved in an extensive manner including the provision of full details of the development.

Following the lodgement and public exhibition of the initial application 16 submissions were received from objectors. In the process of the original application and court appeal the proponent provided a response to those submissions. A full record of submissions and the proponent's response are maintained in the Council record. In response to submissions and the Council consideration of the original application amendments were made to the proposal which are now included in this new application. The subsequent court appeal process involved 4 people making verbal submissions at a conciliation conference. In this regard the community has been substantially involved in the final proposed development.

The application is substantially unchanged except for the proposal now to provide for incoming traffic to enter direct from the Hume Highway and outgoing traffic to exit via Tiyces Lane and to enter the Hume Highway via a proposed new acceleration lane.

2. ALTERNATIVES AND CONSEQUENCES OF NO DEVELOPMENT

The proponent previously considered a number of alternative sites within the area of Marian Vale and Curlewin and has established the proposed site as most suitable resource available for extraction due to geological investigations. It is noted that Marian Vale is not now in the ownership of the proponent. The geological investigations clearly pointed to the value of the basalt resource and recommended its development. Whilst other resources are available the basalt resource is the most confined and compact of the resources and involves little establishment for the extraction of the resource. The area provides good long term security without potential for urban or rural residential encroachment and is on land that is available and can be developed at a reasonable cost enabling the maximum utilisation of financial resources for the development of the industry.

The location is in reasonable proximity of Goulburn and has a direct connection to the Hume Highway through Lot 2 DP 1094055 and Tiyces Lane for the resource to be transported north and south along the highway. Accordingly the site was selected for the preparation of an application.

The resource is currently available and able to be extracted at reasonable costs, however there is always pressure for rural residential settlement and if the resource is not extracted and utilised when it can be there is the potential for the resource to be sterilised and be not available for use. This would also have resulted in the loss of jobs.

The site offers Jasminco Resources Pty Ltd a safe and secure environmental location with good supporting infrastructure and reasonable isolation from other incompatible development.

To not carry out the proposed development would result in –

1. The loss of a resource that can be utilised for the continued support of development in the locality and region.
2. An inability to meet the demand of product from the operation and the increasing demand of product and new products which are increasingly being called for.
3. The potential for the resource, if not otherwise made available in the locality, to be transported into the locality and region involving transport costs and increasing the cost of the resource to the locality and region. This places the locality and region at a disadvantage and need to make further financial contributions to the supply of the resource.
4. A potential for slowing or stagnation of growth as a result of a higher cost of the resource in the resource needs to be supplied from outside the area.
5. The loss of jobs and a business within the local area.
6. No traffic or the potential for environmental impacts as assessed in this study.

The development proposal applies over a ground resource which limits consideration of alternative sites. The only alternative would be to not proceed at the location. The appropriateness of the selected material and site and its impact on the surrounding area have been assessed in the application and found suitable.

Having regard to the assessment of the proposal for noise, air quality and water quality, and visual aspects, and the now Hume Highway access it is considered that there would be little difference to the views in locality if the development was to not proceed. The only effect might be considered to be the loss of a valuable resource and the availability of that resource from a local land owner offering an alternative to other operations, maintaining competitiveness, and the loss of

employment achieved with the development. This is a small resource probably not large enough for large companies to consider of value, but it is a valuable resource and one which a local landowner can feasibly extract and make available before it is lost to further rural or rural residential development.

The entry point to the Hume Highway would be fenced with gates at the intersection point of the entry and exit lanes and then splayed back to the boundary fence along the highway. The gate would be stock proof with a stock grate to prevent stock from entering the highway. The fencing standard would be stock proof fencing as required by RMS.

3. PROPOSED DEVELOPMENT

3.1 DEVELOPMENT PROPOSAL

3.1.1 General Overview

The development involves providing for the installation of the following facilities at the existing site

1. A basalt quarry (1.04 Ha) for the extraction of up to 30,000 cubic metres of basalt per annum. The operation of the quarry by the extraction of the resource (Non-blasting), crushing using a mobile crusher, screening to size the materials, stockpiling within the quarry area and transport from the site.
2. The construction of an ingress road from the Hume Highway with associated drainage. The entry point from the Hume Highway would be fenced with gates at the intersection point of the entry lane and then splayed back to the boundary fence along the highway. The gate would be stock proof with a stock grate to prevent stock from entering the highway. The fencing standard would be stock proof fencing as required by RMS.
3. The construction of an exit road to Tiyces Lane with associated drainage and gateway;
4. The construction of a new acceleration lane from Tiyces Lane to the Hume Highway;
5. The construction emergency access roads from Curlewin Lane to the quarry and office facilities for emergency access for bushfire and other emergency egress;
6. The installation of an office, parking for 5 vehicles and a truck along with on-site waste water management facilities;
7. The installation of water management ponds per reports by SEEC and as outlined in the Operational Environmental Management Plan;
8. The planting of trees as shown in the report by SEEC in the Operational Environmental management Plan;
9. The installation of grassed sound control bunds around parts of the quarry sides;
10. The construction of a security fence around the quarry 2.1m high. Quarry pit gates will similarly be made of two panels of 2.1m high x 2.4m wide galvanised construction/security fencing (giving a vehicular entry opening to the pit itself of about 4.4m wide). They will also be sign-posted with "No Unauthorised Access" signs. The fencing would be permanently fixed to the property and contain 1 strand of barb wire over the top. One strand of electric fencing may also be inserted at 1.2m height around the fence to keep any cattle or deer from rubbing/pushing against the quarry pit security fence. The electric fencing will be powered by an approved Gallagher solar energizer (uncomfortable if touched but generally safe for humans). The electric fencing will be adequately signposted with "Electric Fence" signs/warnings and the security fencing sign-posted with "No Trespassing" signs and "Danger - Keep Out" signs.
11. The placement of a transportable rock crusher inside the quarry.
12. The use of the following machinery during operations -
    - Crusher (mobile) (1)
    - Material sizing screen (1)
    - Bulldozer (1)
    - Front end loader (1)
    - Backhoe (1)
    - Trucks (estimate average of 3)
    - Water truck (1)
13. Utilise an existing bore license for quarry purposes as a backup and additional water supply source.

14. The installation of the following site infrastructure for the quarry operations:
    - Office and staff amenities;
    - Security compound fencing around the quarry (including lockable access gate to Hume Highway);
    - Electricity extension to office compound;
    - Telephone extension to office compound;
    - Water supply – existing dams on site and to be constructed and the bore (10 Ml of WAL 35518 - 50 ML license)

The following calculations have been carried out to identify the extent of quarrying that would be carried out on the land.

Area of basalt resource	1.04 ha
Depth of basalt quarry resource	17 m
Maximum extraction per annum	30,000 m^3

IMPACT AREA

Allowing for 3m impact area (1.16Ha) around all development during construction and including quarry area, access roads, berms, Office & Parking areas and effluent Management system	(4.1ha) 40988 m^2
Waste Water Effluent Management Area	200 m^2
Installation of water management ponds per reports by SEEC, (including the area of the existing dam adjacent to Tiyces Lane)	4900 m^2
CONSTRUCTION TOTAL	**(4.61) 46,088m^2**
DEVELOPED SITE TOTAL (after 3m impact area is rehabilitated) Excluding the 3m buffer area of 1.16Ha (which would be rehabilitated following construction) the completed development impact area covers	**(3.45 ha) 34,488 m^2**

Volume of Basalt within basalt quarry area (17m x 10,400m^2)	176,800 m^3
Annual extraction limit	30,000 m^3

Average daily extraction rate (assuming 250 days of operation per annum)

Average daily extraction rate (30,000 over 250 days)	120m^3

Volume of quarry material at basalt quarry site

Total volume estimated to extract within quarry area	176,800 m^3
Time period for extraction (176,800 / 30,000)	5.9 years

Planned extraction rate – year 1

Overburden (7,620m^3)	15,240 tonnes
Basalt (22,380m^3)	44,760 tonnes
Totals (30,000m^3)	**60,000 tonnes**

Planned extraction rate – year 2 onwards

Basalt (30,000m^3)	60,000 tonnes

Stockpile area for crushed material– year 2 onwards

Monthly rate of extraction of basalt	2,500m^3

At up to 4m height and with 1:3 battered sides a base area of 1400m^2 is provided for the quarry stockpile. As the depth of the quarry increases the stockpile can be contained within a smaller area within the quarry and located elsewhere in the quarry basalt quarry area to allow for a

rotation of the quarry operation.

Crushing would occur over a 10 working day period (excluding weekends and public holidays).

3.1.2 Site Development Plan and Process

The site development plan and quarry detailed plan are shown in the following figures.

The process for the quarry would be as follows –

1. The installation of and erosion and sediment controls in accordance with the SEEC Plan in the Operational Environmental Management Plan and the construction of the quarry area, the ingress and exit roads and emergency access roads, water management facilities, office and parking areas and waste water facilities.
2. The berms around the quarry would be built with the overburden from the basalt quarry. The overburden was calculated to contain up to 7,620cm which would be used for the berm construction. The upper volume of overburden is a conservative estimation of overburden material from a couple of test pits however the depth varies in the lower levels to as little as 300mm. As such the overburden amount may vary from 4,480cm to 7,620cm. The berm would utilise approximately 3500cm of material, with excess being utilised for the establishment of the temporary berm within the quarry area along the eastern edge utilising approximately a further 1500cm. Any excess overburden would then be stored within the quarry area and some used for the vegetation of the dam wall (200cm). The temporary berm material would later be removed as the depth of the quarry increases, and the crusher can be lowered, with the material being stored within the quarry area.
3. The installation of security and access fencing and gates and installation of visual landscaping.
4. The initial quarry floor contains a calculated volume of 9,000 cm of material which would be stored within the quarry area as shown as the stockpile area which has a capacity of 11,000cm. This enables the initial extracted material to be processed and stored within the quarry area for sale and transport.
5. The ramp to the quarry would be constructed of quarry material to a depth initially of 2m below the north western ground surface ramping down to the initial quarry floor. The ramp would be extended as the quarry expands to an additional depth of 15m.
6. Overall the quarry floor varies from 15m to 25m below natural surface from west to east. 16.At the end of quarrying rehabilitation would be conducted as outlined in the SEEC Operational Environmental Management Plan.

17. All machinery would be contained within the quarry which would be contained within the security fencing.
18. The planting of reafforestation areas.

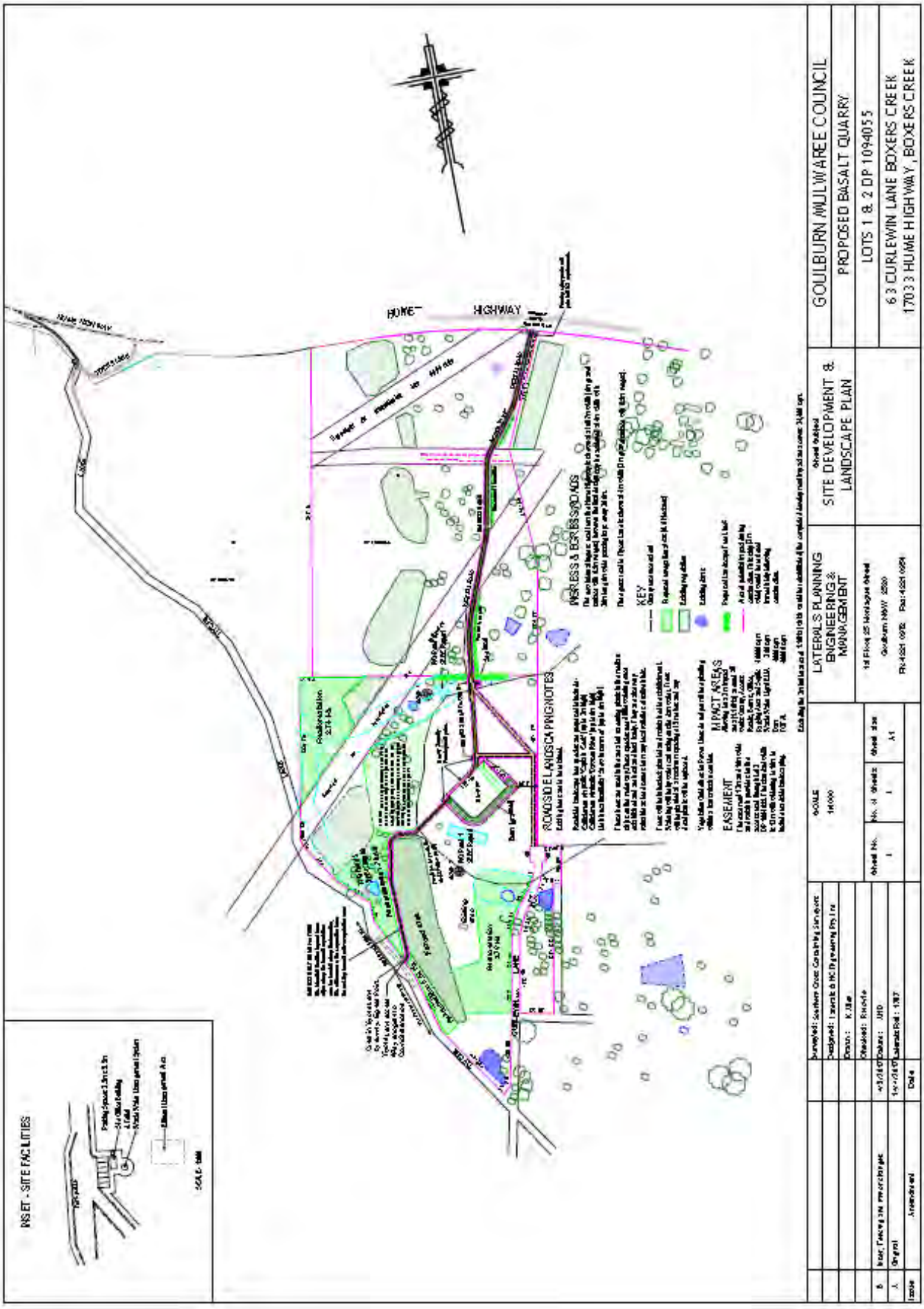
All material would be loaded within the quarry and transport will leave from the quarry.

Crushing would take place over a 10 working day (excluding weekends and public holidays) period to enable a month's supply to be stockpiled within the quarry.

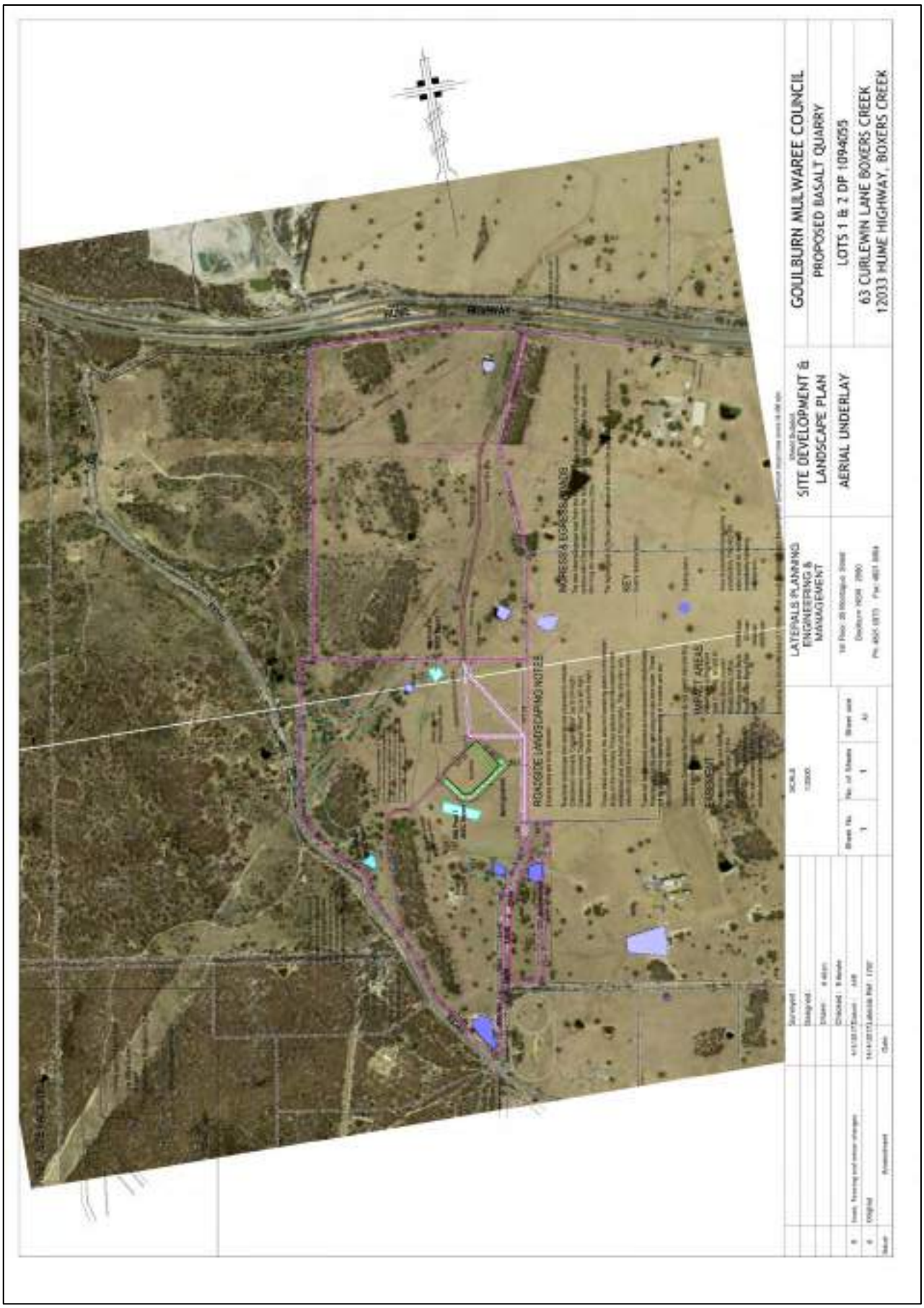
It is not proposed that the development be carried out in stages as defined by section 83B of the *Environmental Planning and Assessment Act 1979*.

Access to the site is to be from the Hume Highway and Tiyces Lane in the locations shown on the Site Development & Landscape Plan prepared by Laterals.

Site Development and Landscape Plan

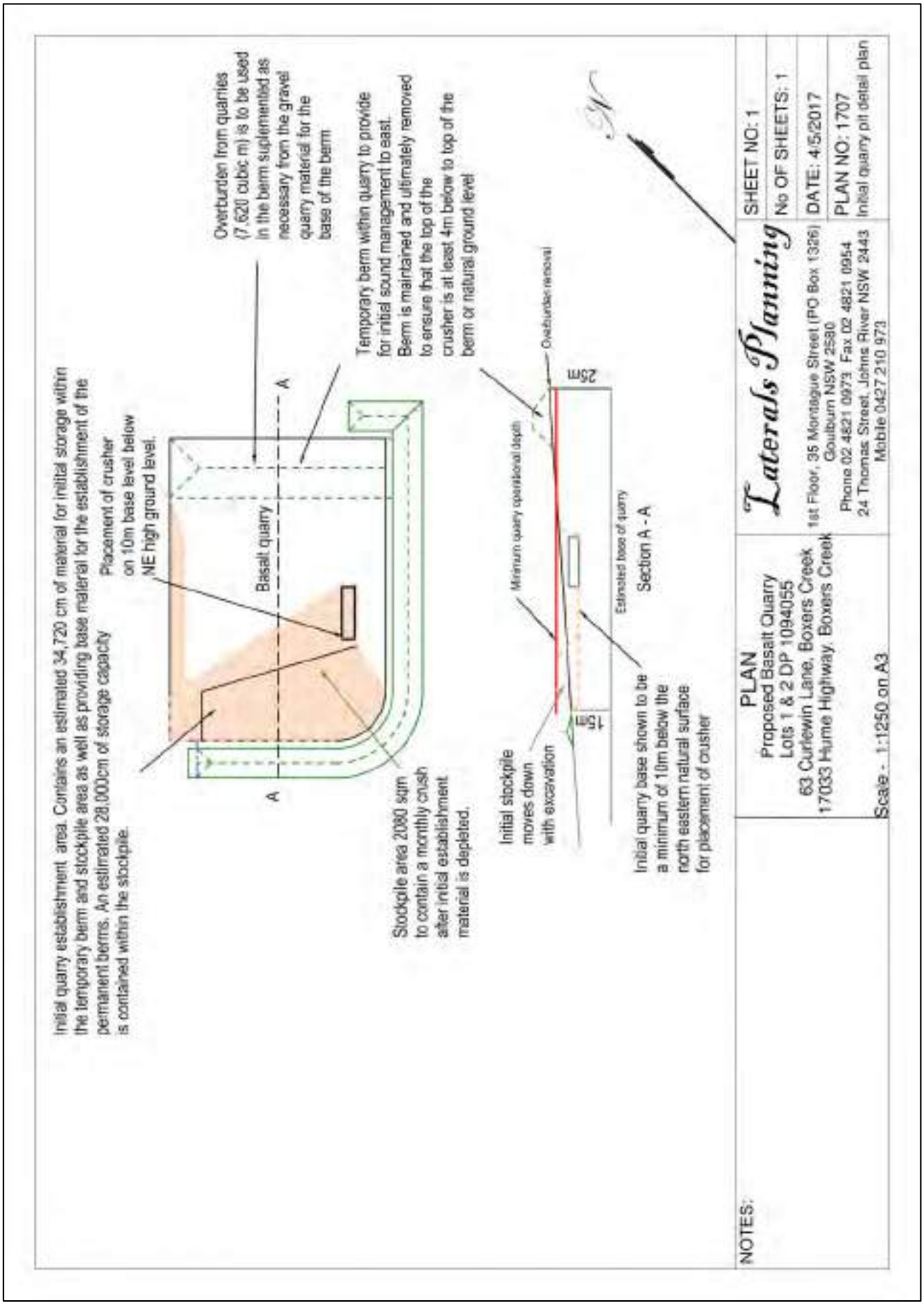


Site Development and Landscape Plan – Aerial underlay



Site Development and Landscape Plan – Topographic map underlay

Quarry Detail Plan



3.1.3 Access

The proposed entry driveway is located on the Hume Highway and exit is located at a crest on Tiyces Lane where there is adequate sight distance in both directions. The entry at the Hume Highway is proposed to be constructed to RMS Standards (AUSTROADS as amended by RMS standards).The access is proposed to be constructed in gravel to Council's required standards beyond the Hume Highway boundary and from Tiyces Lane.

3.1.4 Hours of Operation

Crushing would take place over a 10 working day period (excluding weekends and public holidays) to enable a month's supply to be stockpiled within the quarry.

The proposed hours of operation of the site would extend to 7:00am to 5:00pm Monday to Friday and 7:00am to 1:00pm Saturdays, with no operations on Sundays and Public Holidays.

3.1.5 Transport

Assuming 37 tonne capacity trucks and $1m^3$ of basalt weighing approximately 2 tonnes movements over the 10 day period are estimated to be -

$120m^3$ x 2 = 240 tonnes / 37 = 6.5 (say 7) truck loads x 2 movements	14 movements per day
Workers and deliveries assumed at 4 vehicles per day	8 movements per day
Total estimated vehicle movements per day	22 movements per day

It is anticipated that the transport vehicle will comprise a truck and trailer configuration not exceeding 19m in length.

4. DESIGN STATEMENT

The quarry has been designed to utilise the central section of the resource that is located on the land. The access roads to and from the quarry are located where suitable sight distance is available in both directions and passes along the edge of a stand of trees on the land.

Facilities for the quarry are to be contained within an office to be installed on site.

The site of the quarry is located on the southern side of natural ridges and spurs providing separation and existing natural screening from residences to the north, east, south and west and hiding the quarry from view from the majority of locations. This location also means that the water management facilities necessary for the quarry are within the top of a small catchment which already contains two dams providing additional water quality safety to downstream waterways. There are three proposed water quality management dams to be constructed within the top of this catchment as shown on the plans prepared by SEEC in the Operational Environmental management Plan.

The location below the brow of the hill and the planting of trees as shown also aids in the management of dust, while the cutting of the quarry into the hill will aid with the management of noise that could be generated from operations. This action aids in addressing the needs for noise and air quality controls outlined in the report by Benbow Environmental.

These design features provide for greater safety and less potential for impact on surrounding neighbours.

The title to Lot 2 DP 1094055 contains several restrictions-as-to-user, an easement, a right of carriageway and a covenant. It is intended that the right of carriageway along the eastern boundary will not be impacted by the proposed bund works shown on the Quarry site plan. The development will not impact the easement for electricity transmission lines. The covenant pertains to fencing which will not be affected by the proposal. The restrictions pertaining to the protection of vegetation and fauna habitat will not be affected and in fact it is proposed that significant vegetation be planted that will compliment that protected by the restriction-as-to-user. Basalt is not identified as minerals under the mining regulation 2003.

Disturbance to the ground surface would occur mainly through quarry, dam and road construction, and preparation of the site facilities pad. The complex would be surrounded by security fencing to meet both workplace health and safety and security purposes and standard erosion and sediment controls are to be employed during construction until the disturbed areas are rejuvenated.

The entry is proposed from the Hume Highway and exit to Tiyces Lane as shown on the site Development & Landscape Plans above.

The site is already well screened from view from all roads and the proposed infrastructure would not be highly visible from any road.

4.1 AMENDMENTS TO EXISTING CONSENT

The proposal will not involve the amendment of any existing development consent.

4.2 STAGING

It is not proposed that the development be carried out in stages as defined by section 83B of the *Environmental Planning and Assessment Act 1979*.

5. ENVIRONMENTAL ASSESSMENT

5.1 THE SITE

5.1.1 Existing site appraisal

The site is situated on the eastern side of Tiyces Lane and south of the Hume Highway. The land is surrounded by rural settlement and rural activity and the keeping and training of horses including trotting tracks. The Hume Highway is 1 kilometre north of the site. The location of residences is shown on the aerial photograph and topographic maps below.

The subject site comprises Lot 1 Deposited Plan 1094055 (and a part of Lot 2 DP 1094055 which contains the easement for access), 63 Curlewin Lane, Boxer's Creek. The lot for the quarry is generally triangular in shape and has an area of 44.08 Hectares. The property through Lot 2 DP 1094055 has direct road frontage to the Hume Highway, and to Tiyces Lane and Curlewin Lane. The land is currently occupied and used for agricultural purposes. An aerial photograph of the site (including Lot 2 DP 1094055 for display purposes) and a topographic map are shown on the following pages (images taken from SixMaps April 2017).

There were no signs of salinity at the site and it is not expected to be an issue for this small development.

Boxers Creek has a temperate climate, with warm summers and temperatures below 15°C in winter. Mean annual rainfall is 666 mm and evaporation is 1,277 mm (Australian Bureau of Meteorology, Goulburn (TAFE) data). Rainfall is fairly consistent throughout the year but highest in summer.

Telephone services and electricity is available to the land.

The site has a radial slope pattern but mostly slopes to the west as shown on the topographic map on page 20. Stormwater moves generally across land over the site towards open drainage swales to the west and through existing dams to enter a waterway that flows to the north. The waterway is seen as a thin blue line on the topographic maps on page 21 directly to the west of the quarry area. The access road from the Hume Highway passes to the east on cleared land upstream of the dams to the west and across the top of an existing farm pad. Currently stormwater from upstream of the quarry site and from the undeveloped portions of the site is allowed to sheet flow across the land until it reaches the waterways, with the development site stormwater being conveyed to water quality management ponds in accordance with recommendations from SEEC in their reports before discharging to the continuing waterways on site.

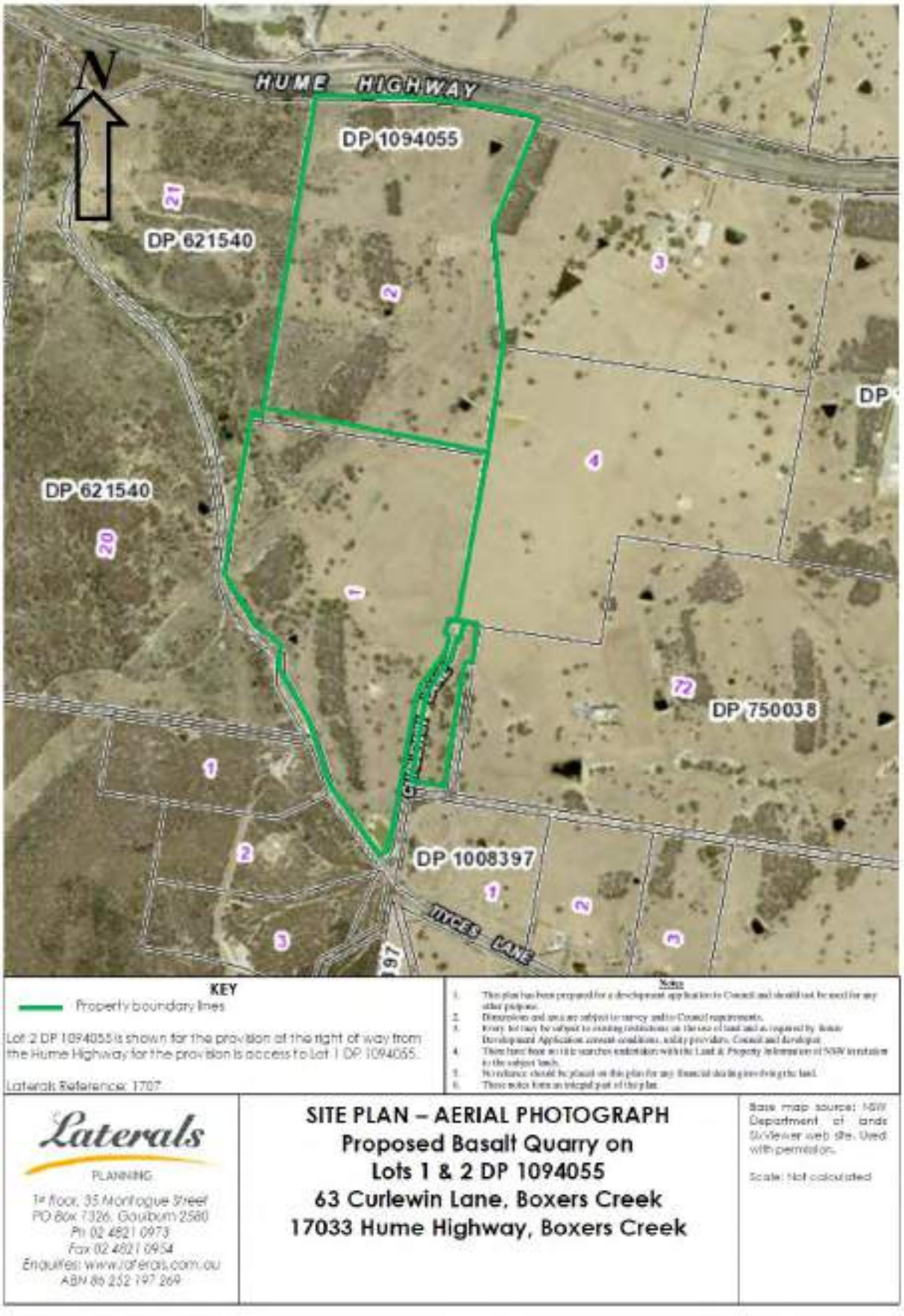
The site is partially vegetated and uncleared except for stands of trees shown on the aerial photograph on page 20.

The site is currently serviced by sealed roads(Hume Highway and Tiyces Lane) Lane and electricity and transmission lines cross the site.

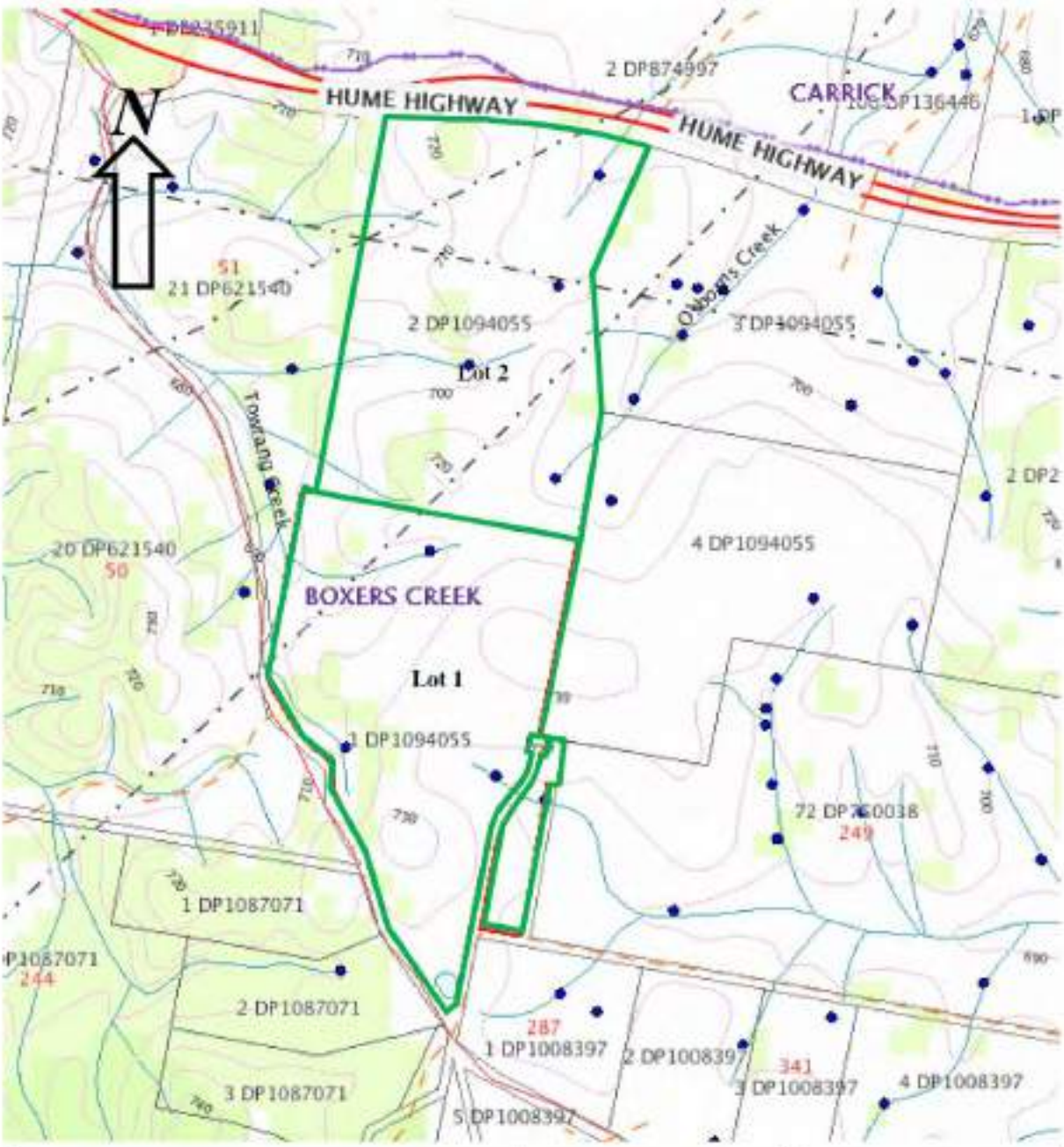
The entry to the site is shown on the Site Development & Landscape Plans in pages 71 to 74.

The site does not contain any dwelling houses and no dwelling houses are proposed with this application.

Aerial Photograph of the Existing Site



Topographic Map of the Existing Site



KEY

Property boundary lines

Lot 2 DP 1094055 is shown for the provision of the right of way from The Hume Highway for the provision is access to Lot 1 DP 1094055.

Laterals Reference: 1707

Notes

1. This plan has been prepared for a development application to Council and should not be used for any other purpose.
2. Dimensions and area are subject to survey and to Council requirements.
3. Property may be subject to existing restrictions on the use of land and as required by future Development Application consent conditions, utility providers, Council and developer.
4. There have been no title searches undertaken with the Land & Property Information of NSW in relation to the subject lands.
5. No reliance should be placed on this plan for any financial dealing involving the land.
6. These notes form an integral part of the plan.

Laterals
PLANNING
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SITE PLAN – TOPOGRAPHIC MAP
Proposed Basalt Quarry on
Lots 1 & 2 DP 1094055
63 Curlewin Lane, Boxers Creek
17033 Hume Highway, Boxers Creek

Based on topographic map from the Department of lands Six Viewer web site. Used with permission.

Scale: Not calculated

Entry Location from Hume Highway

Exit Site to Tiyces Lane

5.1.2 Ground conditions and basalt resource

The development site consists of cleared land. The land drains towards the west to a waterway running south to north. The area of the proposed water quality dam is to the south and drains to waterway towards the east. The ground cover consists of grasses which appear to have been grazed.

The area seems to be generally devoid of noxious weeds. The development would affect approximately 4.5 Hectares of land representing 10% of the area of the lot. The remainder of the site is substantially clear as shown in the aerial photograph on page 72 above except for patches or protected vegetation mostly along the western moiety of the lots.

The land has generally been unaffected by any significant development other than the formation of internal land use tracks and a shed located centrally in the south on Lot 1 and several sheds and containers on Lot 2. The sheds and containers are used for the agricultural activity on the land and do not form part of the quarry application.

The flora and fauna assessment records that vegetation on the land is dominated by a mixture of native and exotic pasture grasses and forbs with several stands of remnant forest persisting over the western portion of the property. A variety of common pasture weeds such as thistles have also been introduced to the site as a result of previous landuses and clearing. The site is moderately diverse in terms of the variety of species which form the grassy ground layer however no highly significant or threatened species were recorded on site.

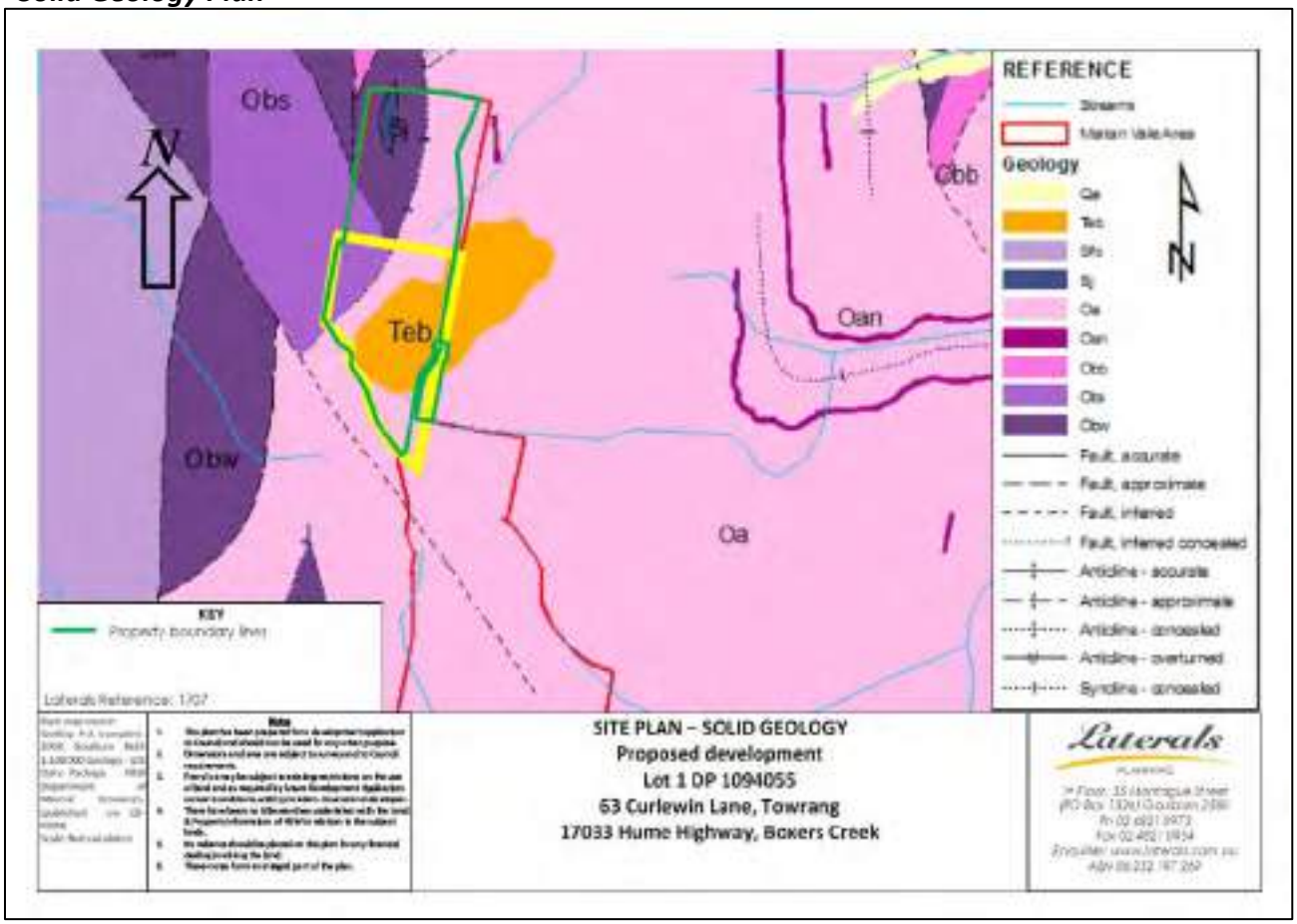
The flora and fauna assessment records that very few species of fauna were detected using this site however habitats present are considered suitable for a range of locally common birds, amphibians and reptiles. No mammals were recorded on the site during the assessment however a variety of at least locally common species, some of which are introduced, are considered likely to use the site on a regular basis. No species of significance were recorded however two bird species are considered potential users of the site.

There are 4 dams on Lot 1 DP 1094055. One dam is located on the western waterway, two dams on the south eastern waterway and one on the north of the site which contain runoff from the land in its current state. Further dams are located on Lot 2 DP 1094055. This property is surrounded by land with scattered timber in the west and cleared agricultural land in the north, east and south containing rural residences.

The quarry resource is shown on the following solid geology plan from the Geos Mining Report. The resource is located within the Teb area being a Tertiary alkali basalt flow (Teb) overlying Ordovician rocks in the northern part of Marian Vale. This unit is up to about 25 m thick. There is potential to develop this basalt as a source of coarse aggregate which has potential as a source of coarse aggregate.

The site contains 3 boreholes which have been used for assessment of the nature of the resource and most appropriate method of extraction. The 3 boreholes are identified in the memorandum from Geos Mining Mineral consultants dated 12/11/2015. The boreholes are identified as MCDDH6 (also identified as BH1 on the extent of basalt resource plan included in the list of documents as item 15), BH2 and BH3 and shown on the aerial photograph on page 3 of the Geos Ripability memorandum. The details of the bores and the assessment are contained within the memorandum attached to the application.

Solid Geology Plan



Geos Mining report that the Tertiary basalt unit has been suggested as a possible alternative coarse aggregate quarry site rather than the silicified sandstone of the Adaminaby Group. However, the proximity of the basalt to the Hume Highway and to a number of residences means that quarry development may be hampered by external constraints due to its location. No work has been undertaken on the basalt for this report.

The quarry material has been further tested as documented in the attached reports on the resource and found to be suitable for extraction and use. The fractured nature of the material is such that rock breaking and blasting is not considered necessary and neither process is proposed as part of the quarry operation.

Several investigations have been carried out which assessed the suitability of the material for construction purposes. An investigation by Groundwater Imaging over the entire area of Marian Vale and Curlewin properties identifies the basalt deposit on what is identified as the "northern" part of Marian Vale at the time and reports that -

"A backhoe pit was dug in the Tertiary Basalt at sample site 36. Geological Survey of NSW mapping has suggested that the rock is an alkali basalt flow, however, some weathered gabbro was found in the backhoe pit. The Gabbro may be of dykes that intruded the basalt after it was deposited suggesting that the basalt is at its source and overlies a basalt plug that could be quarried deeply. The top 500mm of the pit encountered topsoil and basalt floaters. The next 1.9 metres encountered basalt pillars, subsoil and weathered gabbro. It is suspected that the subsoil is primarily the remnants of gabbro dykes. The basalt pillars are made up of horizontally layered basalt boulders and are about 700mm in diameter. They showed little sign of weathering below 500mm from the surface. Photos of the pit are included."

Photograph 2

Photograph 3

Basalt pits on Lot 1 DP 1094055

"The Basalt partly on the northern part of the Marian Vale property extension under contract is potentially of great value as a source of coarse aggregate. Other sources of coarse aggregate on the property could only be mined with large stripping ratios as they exist only in near vertical bands typically less than 3m thick. The best concentrations of such bands are on the east side of Marian Vale. On the west side, fractured bands containing numerous quartz vienlets, chert bands and rock hardening caused by faulting all exist. Aggregate sources on the west side are likely to be complicated to mine and utilize."

"Testing of the Basalt sample obtained is recommended and, should the sample prove to be good for coarse aggregate production, further investigation and quarrying of the basalt. Further investigation could involve drilling, EM surveying and more backhoe pits located using the EM surveying. Presence of gabbro among the basalt is both good and bad news – good because it suggests that the Basalt is at its source and is likely to extend to great depth, and bad because the gabbro will need to be crushed and sieved out of the basalt before it is suitable for use as coarse aggregate."

The material was further tested by drilling by Geos Mining (MVDDH6) and they reported that this drillhole was drilled on a basalt hill known as Curlewin. The sequence intersected consisted of 19.55m of basalt and is underlain by 6.95m of clay. The basalt exhibits well developed horizontal joints as well as less common vertical to subvertical joints. The basalt appears to be uniform in lithology throughout the drillhole. Below the basalt laminated carbonaceous clay (4m) is underlain by pale to mid grey massive clay (3m). Both the basalt and clay should be tested.

Further drilling to basement (i.e. Palaeozoic sequence) is recommended to assess the basalt and clay as well as determining whether other lithologies (e.g., sand and gravel) underlie the clay. Extraction from south commencing at the base of the basalt unit would enable access to both the basalt and clay. The proposal is to contain the depth of quarrying to 15 metres so no further drilling was conducted.

The basalt was subjected to further petrographic testing (Geochempet Services) which resulted in advice that -

"For engineering purposes, the rock represented in the supplied aggregate sample (labelled 75061) from Curlewin Quarry is considered to be holocrystalline olivine basalt, a basic volcanic rock. It was originally altered to green clay of smectite style (nontronite) by deuteric processes (i.e. by processes operating during cooling of the original lava) but is now partly oxidized. More recently the rock has been slightly and superficially weathered.

For engineering purposes, the rock represented in the supplied aggregate sample may be summarised as:

- *olivine basalt (a basic volcanic igneous rock type)*
- *holocrystalline and characterised by a tough, subophitic texture*
- *non-porous*
- *largely unweathered (only slight and essentially superficial weathering observed)*
- *lightly altered (the average secondary mineral content is about 15%, comprising green to brown smectite clay occurring mainly in interstitial patches and iddingsite as a slight to moderate alteration of disseminated olivine grains)*
- *hard*
- *strong*

The basalt is predicted to be durable.

The basalt lacks free silica: consequently, it is predicted to be innocuous in relation to alkali-silica reactivity in concrete.

Thus, basalt of the type represented in the supplied sample is predicted to be a suitable for use in concrete aggregate."

In general the results of preliminary investigations and further testing of the basalt material indicates the suitability of the material for intended construction material purposes.

Subsequent to the above further testing by Geos in May 2016 established the ripability of the basalt material concluding that:

Assessment of the RQD of the two drill cores from the proposed quarry at Curlewin Lane Marian Vale indicates that the basalt has a very poor rock mass quality. There has been no significant deterioration in the physical state of the core since it was drilled so the measurements taken are representative. It is therefore considered that the basalt has high potential for extraction by ripping throughout its full thickness as proposed, negating the need for any blasting.

5.1.3 Site context

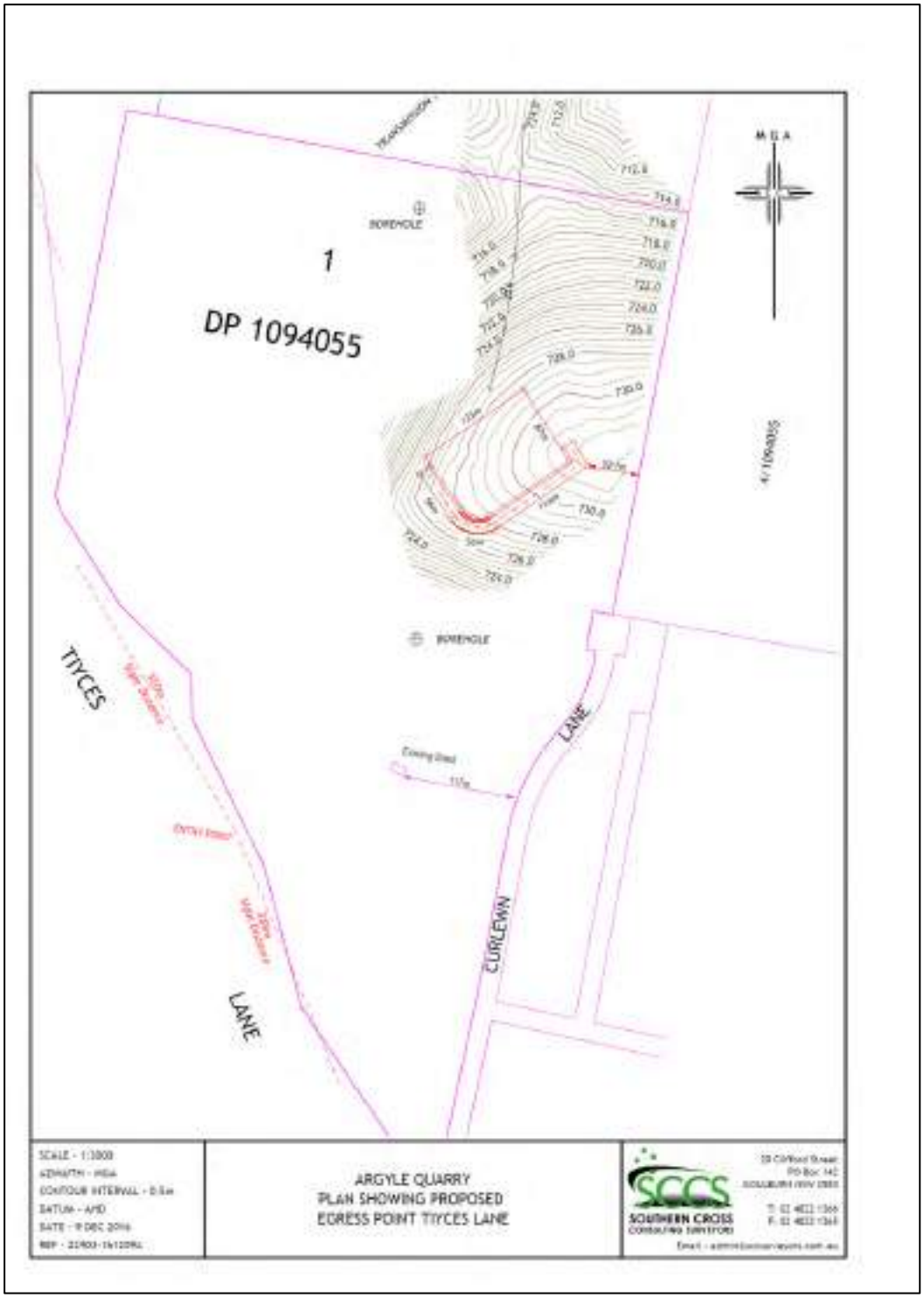
The context of the site is featured by:

- Tiyces Lane to the west/south west extending to Curlewin Lane which abuts part of the eastern boundary. Tiyces Lane is sealed for about 4.5 km and the access point to the development site is located approximately 2km along the lane.
- The proponent owns a vacant rural lot that adjoins the northern boundary which is used for agricultural purposes.
- The land to the east and north east is rural land used for agricultural purposes with an equestrian facility near the Hume Highway. This land is generally cleared with scattered trees and patches of trees.
- There is another rural property to the east containing a residence.
- A poultry farm is located approximately 1.2km to the north east.

- There several residential properties located on rural land to the south/south east some of which contain horse tracks.
- There are several parcels of land to the west which contain extensive areas of trees with dwellings located within the treed areas.

The location of the above closest residential properties is shown graphically in the Noise Assessment Report.

Within this site context the proposed extraction area is shown on the survey plan below. Note that the access to Tiyces Lane is located slightly further to the south at the crest in Tiyces Lane.



6. BIO-PHYSICAL

6.1 DOMESTIC AND ON-SITE WATER USES AND MANAGEMENT

It is intended that the development will provide for the following water usage –

1. Domestic water for office and staff from a rainwater tank (5,000 litres) adjacent to the office. This supply would be supplemented from bore water.
2. The installation of a toilet and on-site waste water management facility.
3. The provision of a 1,500L water tank trailer for firefighting purposes (already purchased). Water for the tank can be taken from the dams on site and bore supply (10ML of WAL 35518 - 50 ML license).
4. Due to the location of the quarry below ground it is not anticipated that water will be needed for dust control but if necessary a mobile water cart can be used for areas within the quarry and storage mounds. The average usage rate is calculated to be approximately 0.75M per annum which would be sourced from the water quality dam and other dams as necessary and bore as a backup supply.
5. The supply of water for the crushing operation at the rate of 180kL per annum which would be obtained from the water quality dam and bore as a backup supply.

It is estimated that the water use for the office and toilets over a 10 day operating period would be 3,000 litres, necessitating a tank of approximately 5,000 litres for installation. On-site waste water assessment installations would be carried out in accordance with the report by SEEC. A water cart and trailer fire unit would contain approximately 1,500 litres which would be sourced from dams on site and bore as a backup supply.

The site does not contain any managed gardens.

It is concluded that there would be sufficient water for the domestic operations, fire and dust suppression.

The AWTS and irrigation area require professional quarterly maintenance by a qualified wastewater contractor. In addition:

a. The vegetation in the EMA requires periodic slashing/mowing
b. Ensure only “septic friendly” cleaners are used in the office and ablutions
c. Ensure there are no leaking taps or cisterns in the office.

6.2 SURFACE WATER ASSESSMENT

6.2.1 Existing Environment

Boxers Creek has a temperate climate, with warm summers and temperatures below 15°C in winter. Mean annual rainfall is 666 mm and evaporation is 1,277 mm (Australian Bureau of Meteorology, Goulburn (TAFE) data). Rainfall is fairly consistent throughout the year but highest in summer.

The site is currently occupied with four water management ponds used to maintain water quality from the existing agricultural uses and to supply water for stock. There is no reticulated water supply available for the site.

The general water conditions of the site are described by SEEC in their report attached as “a radial surface (sheet) drainage pattern exists in the quarry site. It develops into depressions off the basalt area. Some of these depressions follow the perimeter of the basalt. There are several small farm dams at the heads of the depressions. The knoll itself is a recharge area and seepage was noted in some locations at the edge of the basalt.

The proposed ingress road crosses the upper reaches of a depression, just west of a proposed WQCP, which will be utilised to contain the drainage from the ingress road. The proposed exit road passes along a waterway which contains a dam that would be utilised as a WQCP to contain drainage from the exit road.

There were no signs of salinity at the site and it is not expected to be an issue for this small development.

Acid sulphate soil risk mapping by the Department of Land and Water Conservation (DLWC, now part of DECC) did not identify this area as being at risk due to its elevation and topographic conditions. Site inspections by SEEC staff confirm that acid sulphate soils are not present at this site.

Dams on the property are shown on the Site Development & Landscaping Plan aerial underlay and SEEC plans.

6.2.2 Environmental Assessment and Impact

The surface water has been considered by SEEC in the attached report and plans incorporated into the Operational Environmental Management Plan and prior assessments.

The quarry itself occupies the western side of a knoll and is away from any watercourses. The radial drainage develops into depressions once the flow leaves land underlain by the basaltic material. Most of these depressions have a small farm dam near their head.

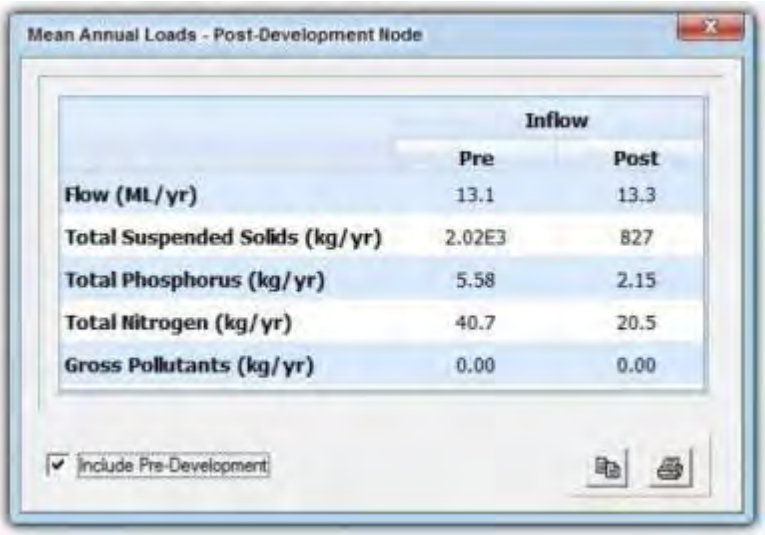
The ingress road from the Hume Highway passes to the east of waterways and dams. The exit road passes alongside a waterway as outlined in the SEEC report.

A quarry area of 1.04 ha is proposed. With a potential impact area of 3m around the quarry which could be affected during construction the area of potential impact at construction stage would be 4.6 ha. At the moment this land has a well vegetated surface and moderately permeable topsoils.

The ingress and exit roads will be built with compacted road base but would remain unsealed. This will become essentially impermeable surfaces on land that is currently moderately permeable but poorly vegetated. An earlier access track is not now proposed as the shed to which it gives access will not now be part of the quarry operation with all items for storage brought to the site during operational periods.

Based on a development which included slightly more quarry land area but less overall area (excluding the additional impact area which would be immediately rehabilitate following construction) the following results were achieved with measures proposed by SEEC. The resulting pre and post development pollutant load assessment was as follows:

Table 1 - MUSIC Mean Annual Load Results



SEEC have determined that there is a potential that the proposed future land use at this site will lead to an increase in stormwater discharge and pollutant production. Section 5 of the SEEC report contains a Water Cycle Management Plan that shows how a neutral or beneficial effect on water quality can be achieved given the assumptions in Section 4 of the original SEEC report. Section 6 of the SEEC report contains modelling (Table above) using a computer tool known as MUSIC to justify the effectiveness of that plan. From the assessment of the current proposal SEEC has incorporated water cycle management planning into the Operational Environmental Management Plan.

The assessment of surface water by SEEC identified works that are proposed to be carried out during construction and operation. These are specified on plans with accompanying schedules in the Operational Environmental Management Plan as drawings ESCP00 to 05 in Appendix 3 of the report 2.

Full details of the further assessment with soil and water management measures are now as outlined by SEEC in the Operational Environmental Management Plan.

Irrigation for agricultural purposes would become secondary to the quarry operation on the property and would be carried out only as possible with available water supply through dam capture. In this regard the use of water for irrigation for agriculture is not now factored into the use of the land.

The areas of new native vegetation will be regularly inspected to ensure the trees are successfully established. In the short term they may be irrigated from the WQCP with bore water being available for watering should the quarry use and poor rainfall result in less water from the WQCP be available. Vegetation management details would be in accordance with the Operational Environmental Management Plan.

6.2.3 Environmental Management and Mitigation Measures

SEEC have determined that there is a potential that the proposed future land use at this site will lead to an increase in stormwater discharge and pollutant production. Section 5 of the SEEC report contains a Water Cycle Management Plan that shows how a neutral or beneficial effect on water quality can be achieved given the assumptions in Section 4 of the original SEEC report. Section 6 of the SEEC report contains modelling (Table above) using a computer tool known as MUSIC to justify the effectiveness of that plan. From the assessment of the current proposal SEEC has incorporated water cycle management planning into the Operational Environmental Management Plan.

The assessment of surface water by SEEC identified works that are proposed to be carried out during construction and operation. These are specified on plans with accompanying schedules in the Operational Environmental Management Plan as drawings ESCP00 to 05 in Appendix 3 of the report.

Full details of the further assessment with soil and water management measures are now as outlined by SEEC in the Operational Environmental Management Plan.

Irrigation for agricultural purposes would become secondary to the quarry operation on the property and would be carried out only as possible with available water supply through dam capture. In this regard the use of water for irrigation for agriculture is not now factored into the use of the land.

The areas of new native vegetation will be regularly inspected to ensure the trees are successfully established. In the short term they may be irrigated from the WQCP with bore water being available for watering should the quarry use and poor rainfall result in less water from the WQCP be available. Vegetation management details would be in accordance with the Operational Environmental Management Plan.

The monitoring and maintenance of water management measures are outlined in detail in Appendix 1 of the Operational Environmental Management Plan.

6.2.4 Conclusion

The results of the MUSIC modelling demonstrate that a beneficial effect can be achieved, providing that the proposed Water Cycle Management Plan (Section 5 of the original SEEC report and subsequent report) is implemented as amended by the further SEEC assessment and reports and plans incorporated in the Operational Environmental Management Plan.

Without these specific measures, the development could potentially have a negative impact on water quality in the local watercourses. This Plan includes a set of long-term maintenance strategies to ensure that the effectiveness of the proposed measures provides ongoing benefits for water quality.

Section 5 of the original SEEC report details the measures required to achieve a neutral or beneficial effect. Subsequent SEEC assessment and report and plans in the Operational Environmental Management Plan provide measures for implementation during construction and operation of the development and would be followed for the development. Appendix 1 of the OEMP provides detailed checklists.

Provided the design and measures contain in the Operational Environmental Management Plan are followed, water quality would not be detrimentally affected by the development. Details of the concept plan will need to be incorporated into the construction certificate for the proposed development.

7. NOISE

7.1 REGULATION

The NSW Interim Construction Noise Guideline specifies Residential criteria and Table 4-1 sets out management levels for noise at residences and how they are to be applied. Restrictions to the hours of construction may apply to activities that generate noise at residences above the 'highly noise affected' noise management level

Table 4-1: Management Levels at Residences Using Quantitative Assessment

Time of Day	Management Level $L_{Aeq(15\ minute)}$	How to Apply
Recommended standard hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays	Noise Affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15\ minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. • The proponent should also inform all potentially affected residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school, or mid-morning or mid-afternoon for works near residents. 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise Affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2 (RNP)

Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m from the residence.

NSW Industrial Noise Policy

The NSW Industrial Noise Policy was developed by the NSW EPA primarily for the assessment of noise emissions from industrial sites regulated by the NSW EPA. However, the policy can also be used by NSW Planning and Infrastructure and local government to assist in their assessment of potential noise issues.

An important point to note in the policy is presented in Section 1.4.1. This section states:

> *"The industrial noise source criteria set down in Section 2 are best regarded as planning tools. They are not mandatory, and an application for a noise-producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development."*

The policy sets out two criteria that are used to assess potential site-related noise impacts. The first criterion aims at controlling intrusive noise impacts in the short-term for residences. This criterion is therefore called the intrusiveness criterion.

The second criterion aims at maintaining a suitable amenity for particular land uses including residences in the long-term. This criterion is called the amenity criterion.

Intrusive Criterion

The intrusiveness criterion can be summarised as:

L Aeq,(15minute) rating background level + 5 dB(A)

Where the L Aeq,(15minute) is the predicted or measured L Aeq from noise generated within the project site over a fifteen minute interval at the receptor.

This is to be assessed at the most affected point on or within the residential property boundary or if that is more than 30 m from the residence, at the most affected point within 30 m of the residence.

Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the NSW INP, the applicable parts of which are reproduced in Table 4-2.

Table 4-2: NSW EPA Amenity Criteria – Recommended L Aeq noise levels from industrial noise sources

Type of Receptor	Indicative Noise Amenity Area	Period	Recommended L_{Aeq} noise level (dB(A))	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45

The existing industrial noise levels are compared to the acceptable level and Table 4-3 is then used to derive the applicable amenity criteria.

Table 4-3: Modification to Acceptable Noise Level (ANL 1) to Account for Existing Levels of Stationary Noise

Total Existing L_{Aeq} Noise Level From Industrial Sources	Maximum L_{Aeq} Noise Level for Noise from New Sources Alone
≥ ANL + 2	If existing noise level is likely to decrease in future: ANL – 10 If existing noise level is unlikely to decrease in the future: Existing level – 10
ANL + 1	ANL – 8
ANL	ANL – 8
ANL –1	ANL – 6
ANL – 2	ANL – 4
ANL – 3	ANL – 3
ANL – 4	ANL – 2
ANL – 5	ANL –2
ANL – 6	ANL – 1
< ANL - 6	ANL

Source: Table 2.2 NSW EPA INP
Note: [1]ANL is the recommended acceptable L_{Aeq} noise level for the specific receptor, area and time of day.

NSW EPA Road Noise Policy

The NSW Road Noise Policy has been adopted to establish the noise criteria for the potential noise impact associated with the off-site road traffic generated by the proposed development. The NSW Road Noise Policy was developed by the NSW EPA primarily to identify the strategies that address the issue of road traffic noise from:

- Existing roads;
- New road projects;
- Road redevelopment projects; and
- New traffic-generating developments.

Based on the RNP road classification description, Hume Hwy would be classified as a Freeway or motorways/arterial road.

Section 2.3 of the RNP outlines the criteria for assessing road traffic noise. The relevant sections of Table 3 of the RNP are shown in Table 4-4.

Table 4-4: Road Traffic Noise Assessment Criteria For Residential Land Uses, dB(A)

Road Category	Type of Project/Land Use	Assessment Criteria, dB(A)*	
		Day (7 am-10 pm)	Night (10 pm-7 am)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors.	$L_{Aeq\ (15\ hour)}$ 55 dB	$L_{Aeq\ (9\ hour)}$ 50 dB
	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/subarterial roads 3. Existing residences affected by additional traffic on existing freeways/arterial /sub-arterial roads generated by land use developments	$L_{Aeq\ (15\ hour)}$ 60 dB	$L_{Aeq\ (9\ hour)}$ 55 dB

* measured at 1 m from a building façade

Vibration Criteria

The extraction operations will not employ blasting of the rock. Therefore blasting criteria will not be considered.

The Department of Environment and Climate Change's "Assessing Vibration: A Technical Guideline" provides guidance for acceptable levels of vibration. The guide indicates that intermittent vibration should have a different criterion to continuous and impulsive vibration and the vibration should be measured on three axes – vertical, transverse and longitudinal. The criteria are in terms of m/s 2 for continuous vibration and m/s 1.75 for intermittent vibration. The criteria also have preferred and maximum values.

The day time preferred and maximum weighted vibration values are presented in Table 4-5.

Table 4-5: Vibration Criteria for Residences During Day Time

Vibration	Preferred		Maximum	
	Z	X and Y	Z	Z and Y
Continuous (m/s^2)	0.010	0.0071	0.020	0.04
Impulsive (m/s^2)	0.3	0.21	0.6	0.42
Intermittent ($m/s^{1.75}$)	0.20 (vector sum)		0.40 (vector sum)	

7.2 PROPOSED OPERATIONS

The operating hours are from 7am to 5pm Monday-Friday and 7am to 1pm Saturday. The quarry will not operate on Sundays or Public Holidays.

The equipment list for the site is presented below and site layout presented in the following figures.

- Machinery List For Extractive Activity
  - Mobile Crusher (1);
  - Material sizing screen (1);
  - Bulldozer (1);
  - Front end loader (1);
  - Backhoe (1);
  - Trucks; and
  - Water truck (1).

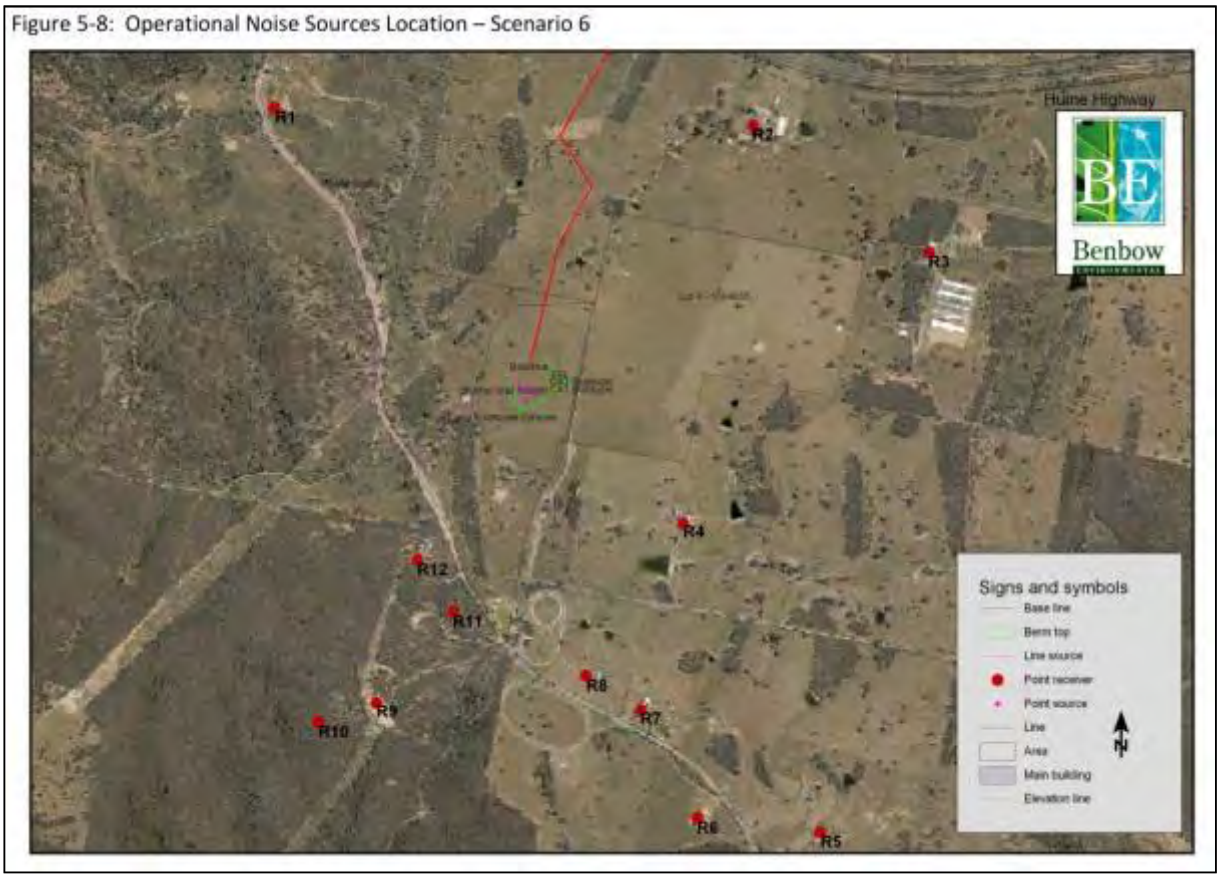
- Site Infrastructure
- Office (including staff amenities) (1);
- Machinery shed (1);
- Equipment shed;
- On site waste water management facility;
- Access roads to office site (@ 6m width) and central quarry (@ 4m width);
- Security compound fencing around infrastructure (including lockable access gate to Tiyces Lane);
- Electricity extension to security compound;
- Telephone extension to security compound;
- Water supply – existing dams on site; and
- Bore.

7.3 EXISTING ENVIRONEMENT

The site is located in the Southern Highlands about 1 km south of the Hume Highway on Tiyces Lane, Towrang, NSW, 2580. The population of Towrang has just exceeded the mark of 400, where 90% of the population lived in the Northern direction from the site, divided by Hume Highway. The site is surrounded by rural land and occupying residences.

The location of receptors is shown below in Figure 5-8 of the Benbow report which were the receptors considered in the study.

Figure 5-8: Operational Noise Sources Location – Scenario 6



The application for a proposed dwelling on Lot 4 DP 1094055 (R13) has not identified a particular location for the dwelling. Thus the highest point (which is quite close to the quarry) has been chosen for worst case purposes during the modelling process in order to ensure compliance. The best way to view the noise impact for this land owner is to look at the whole of Lot 4 DP 1094055.

Once the construction phase is complete (and thus the noise controls are in place) Figure 4-7 and Figure 4-8 show the noise isopleths that are indicative of the noise impact for the local area as well as for Lot 4 DP 1094055 in particular. It must be noted that the limit line shown in these figures are only for R5–R12. The limit for this proposed dwelling on Lot 4 DP 1094055 is 43 dB(A), the reasoning for which is shown in Section 4.5.

7.3.1 Existing Acoustic Environment

The level of background noise varies over the course of any 24 hour period, typically from a minimum at 3.00am to a maximum during morning and afternoon traffic peak hours. Therefore the NSW EPA Industrial Noise Policy (INP) requires that the level of background and ambient

noise be assessed separately for the daytime, evening and night time periods. The INP defines these periods as follows:

- Day is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays;
- Evening is defined as 6.00pm to 10.00pm, Monday to Sunday and Public Holidays; and
- Night is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

Unattended long-term noise monitoring was undertaken from 2nd May 2016 to 7th May 2016 at three (3) residential locations. Additional attended noise monitoring was undertaken on 2nd May 2016. The noise logger locations are listed in Table 3-1 and shown in Figure 3-1. Noise Logger Charts are presented in Attachment 3.

Table 3-1: Noise Monitoring Locations

Monitoring Location	Address
A	51 Tiyces Lane, Boxers Creek
B	16987 Hume Hwy, Boxers Creek
C	287 Tiyces Lane, Boxers Creek

Figure 3-1: Noise Monitoring Locations

Table 3-2 identifies the various considered receptor locations that have been associated with the three (3) noise logger locations and will therefore utilise the noise criteria derived from the measurement data obtained from the respective noise logger.

Table 3-2: Associated Residential Receptors

Monitoring Location	Associated Residential Receptor Locations
A	R1
B	R2, R3, R13
C	R4-R12

Detailed results of the unattended noise monitoring are presented in Table 3-3 to Table 3-5 of the Revised Benbow report. Details of attended noise monitoring results are presented in Table 3-6 of the Revised Benbow report.

7.3.2 Intrusive Noise Impacts

According to the NSW INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous A-weighted level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level measured in the absence of the source by more the 5 dB.

The intrusiveness criterion is summarised as follows:

L_{Aeq}, 15 minute ≤ L A90 background noise level plus 5 dB(A)

The intrusiveness criteria for each assessment location are identified as in **Table 5** below. Only the day time period will be used in this assessment as per the proposed operating times of the proposed quarry.

Table 5 Intrusive Criteria – Determined at Each Assessment Location

Table 3-6: Intrusiveness Criteria – Determined at Each Assessment Location

Period		Intrusiveness Criteria at Each Location, dB(A)		
		R1	R4	R7
Day[1]	L_{Aeq} 15 min	36 + 5 = 41	37 + 5 = 42	29 + 5 = 34
Evening[2]	L_{Aeq} 15 min	36 + 5 = 41	39 + 5 = 44	29 + 5 = 34
Night[3]	L_{Aeq} 15 min	35 + 5 = 41	38 + 5 = 43	30 + 5 = 35

Notes: [1]Day is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays.
[2]Evening is defined as 6.00pm to 10.00pm Monday to Sunday and Public Holidays.
[3]Night time is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

7.3.3 Protect Specific Noise Levels

Construction Noise

Table 4-6: Site Project Specific Noise Limits (PSNL) for Construction noise, dB(A)

Receiver Location	Period	RBL $L_{Aeq(15\ minute)}$	Noise Affected $L_{Aeq(period)}$	Highly Noise Affected	Site PSNL $L_{Aeq(15\ minute)}$
R1	Day	35	45	75	45
R2, R3, R13	Day	38	48	75	48
R4-R12	Day	31	41	75	41

Operational Noise

Noise limits for the site have been established in accordance with the principles and methodologies of the NSW INP, the measured background noise levels and the existing industrial operational noise levels of the area.

According to the NSW INP, it is recommended that the more stringent noise limits be applied to protect the existing acoustic amenity from deteriorating.

The selected On-Site Project Specific Noise Limits associated with operational activities are presented in Table 4-7 below.

Table 4-7: Site Project Specific Noise Limits (PSNL) for Operational Activities, dB(A)

Receiver Location	Period	Intrusive Criterion $L_{Aeq(15\ minute)}$	Amenity Criterion $L_{Aeq(period)}$	Site PSNL $L_{Aeq(15\ minute)}$
R1	Day	40	50	40
R2, R3, R13	Day	43	50	43
R4-R12	Day	36	50	36

Note: - indicates not applicable

In all, 13 receivers were chosen as noise assessment locations for modelling. As a means to achieve a conservative result, the assessment locations that were not monitored were assigned the lowest criteria based on their proximity to the nearest monitoring site.

It should be noted that different time periods apply for the above criteria as the intrusive criterion considers a 15 minute assessment period while the amenity criterion requires assessment over the total length of time that a site is operational within each day, evening or night period.

The most stringent criterion between intrusive and amenity criterion has been selected.

Road Traffic Noise

The traffic produced by the site is minimal and this is expected to have negligible impact on the noise generated by Hume Hwy. An assessment of road traffic noise is not considered warranted.

7.4 NOISE SOURCES

Table 5-1: A-weighted Sound Power Levels Associated with Road Construction Noise, dB(A)

Noise Source	Overall
Tip Truck	**107**
Vibratory Roller	**103**
Grader	**110**
Excavator	**107**
Water Cart	**110**
Chain Saw	**107**
Rock Hammer	**117**
Reversing Alarm	**105**

Table 5-2: A-weighted Sound Power Levels Associated with Operational Activities, dB(A)

Noise Source	Overall
Komatsu Bulldozer (DA55A)	104
Front End Loader Cat 966C	104
Crusher and Screen	111
Articulated Dump Truck	104
Excavator	109
Backhoe	105

7.5 ASSUMPTIONS MADE FROM NOISE MODELLING

The relevant assessment period for operational noise emissions is 15 minutes when assessing noise levels against the Intrusive Criterion; therefore noise source durations detailed throughout the following assumptions section should be considered per 15 minute period in view of potential noise impacts under worst-case scenarios. Each assessment-specific assumption has been detailed below:

- Off-site topographical information has been obtained from Land and Property Information topographic map and implemented in SoundPLAN v.7.3.
- On-site topography has been obtained from the site survey plans provided by the client.
- All ground areas surrounding the subject site and the nearest nominated occupancies have been modelled considering different ground factors ranging from 0 to 1.
- All residential receivers were modelled at 1.5 m above ground level at the most noise-affected point within 30 m of the residence and also at the residence façade.
- The proposed facility will operate from 7.00am to 5.00pm, therefore only the day time period has been assessed.

For construction noise:

- All equipment have been modelled as operating simultaneously over the assessment period.
- Reverse beeper has been considered to be audible 25% of the time over a 15 minute period from operating vehicles.
- All road construction sources have been model at 1m operating 100% of the time.

For Operational noise:

- Pit depth is measured from the highest point on the original surface level within the pit;
- Mobile plant sources have been modelled as point sources and road trucks have been modelled as line sources;
- All equipment associated with the operations of the quarry have been considered to be operating 100% of the time over any 15 minute assessment period

7.6 PREDICTED NOISE LEVELS

7.6.1 Construction

The construction is modelled at the existing ground level with no earth berms. These are built during the construction phase.

The crusher will not operate until the temporary and permanent noise barriers reach a height 4 m. Therefore the crusher is not considered in the construction noise prediction. An excavator has been added as a noise source to the construction scenarios only.

Predicted noise levels were conducted for scenarios the results of which are presented in Tables 5-4, 5-5, 5-6, 5-7, and 5-8 of the report.

Exceedance of 2dB(A) was predicted for Scenario 2 at receptor R12. Therefore construction of the southern half (50%) of the access road must not occur at the same time as construction of the quarry. Construction noise levels are predicted to comply with project specific noise levels at all other considered residential receptors.

7.6.2 Operational

Initial modelling showed that the quarry would not comply with the project-specific noise levels. Thus noise controls were investigated and modelled. After many model runs it was seen that 3 earth berms, each 4 m in height were needed to the NE, SE and SW in order to reduce the noise levels. In reality these 4 m noise barriers will consist of a 4 metre earth berm. However even with these noise controls it was found that the criteria were still not met. The cause of the exceedance is associated with the crusher operations during the early stage of the development. Thus it was decided to delay the operating of the crusher screen until the pit reached a depth at which the noise impact would be screened by the walls of the pit. As a result, the crusher screen was removed as a noise source from the construction noise modelling and for the 1st stage of pit excavation. The crusher was then added as a noise source at different pit depths until acceptable noise levels were predicted to be achieved at the residential receivers.

The predicted noise levels at the receivers when the berms are 4 m in height, with the pit 2 m deep and with the crusher operating are shown in Table 5-9 of the report.

The criterion is not met by between 3 dB at this pit depth and berm height for Location 12. Therefore the major noise contributors were identified at these locations and controls investigated. A scenario was run with the crusher not operating at this depth, shown in Section 5.4.1.1.1. Non-compliance has been reduced to within 1 dB of the criteria for Location R12. This is considered to be a negligible exceedance.

In order for the site to comply with the project-specific noise limits, the crusher can only begin operating when:

- The 3 berms have reached a height of 4m;
- The floor of the pit is at least 3 m in depth from the highest elevation on the surface; and
- The crusher is placed in a hole 5m deep (below the 3m pit depth) and positioned in the middle of the south-eastern berm.

Operating within these conditions gives the predicted noise levels shown in Table 5-11 of the report.

With the crusher in a 5m pit below a pit depth of 3m and with two 4m earth berms compliance is achieved with the crusher operating.

Table 5-12 of the report shows the mid-point noise levels that are predicted at each of the nearest receivers. This assumes a pit depth of 10 m, no crusher pit and the two permanent berms at a height of 4m above the original ground level. The temporary berm has been modelled to be below the pit walls at this depth and is therefore considered to be removed.

The construction is modelled at the existing ground level with no earth berms. These are built during the construction phase.

The crusher will not operate until the temporary and permanent noise barriers reach a height 4 m. Therefore the crusher is not considered in the construction noise prediction. An excavator has been added as a noise source to the construction scenario only.

7.6.3 Vibration

The level of vibration would not be perceptible at site boundaries based on numerous observations at similar operating quarries studied by Benbow Environmental. Thus, further assessment is not considered warranted.

7.6.4 Traffic Noise

It is expected that an average of 120m^3 will be extracted per day (assuming 250 days of operation per annum). This quantity is expected to be exported with 37 tonne trucks. Thus it has been estimated that there will be 7 truck loads per day leaving the site. Employee and delivery vehicles have been assumed at 4 vehicles per day. Thus, the total vehicle movements per day are estimated at 22 movements. The vehicles have a speed limit of 60km/hr on the off-site road. It has been assumed that 4 truck movements in 1hr will predict the worst case noise levels for the respective receivers.

7.7 NOISE IMPACT AND RECOMMENDATIONS

Construction of the southern half (50%) of the access road must not occur at the same time as construction of the quarry site itself. Construction noise levels are predicted to comply with project specific noise levels at all other considered residential receptors.

Compliance has been predicted to be expected during normal quarrying operations under the following operating conditions:

- Operations can begin when the noise barrier/ earth berm height reaches 4m and the pit depth is 3m, as long as the crusher is not operating. These conditions result in predicted noise compliance at all locations.

- The crusher can begin operating under the following conditions:
  - The permanent noise barrier / earth berm has reached a height of 4 m;
  - The floor of the pit is at least 3m in depth from the highest elevation on the original surface; and
  - The crusher is placed in a hole 5m deep (below the 3m pit depth) and positioned in the middle of the south-eastern berm.

If these operating conditions are followed the site is predicted to comply at all locations under full quarrying operations.

With the above noise controls implemented during the construction and operational stages of the quarry development, it is predicted that the noise impact on the local environment will be minimal and in line with what is currently experienced.

7.8 CONCLUSIONS

A noise impact assessment was prepared in 2009 by Benbow Environmental and did not account for the construction or operation of the ingress road. This report updates the previous assessment to

include the construction of an access road in the noise impact analysis.

Long-term background noise monitoring was undertaken at the proposed site for the purpose of this update, as the data collected in 2009 was considered obsolete.

In the compilation of this update, Benbow consultants modelled only the noise impact of the construction and operation of the access road, and the results of these calculations were added to the results of the 2009 modelling of the other aspects of the development.

The locations of nearby noise sensitive receivers have been identified with their approximate distance from the pit.

Detailed predictive noise modelling showed that by developing a 4 m permanent noise berm on the SW and SE and NE sides of the quarry (as shown in Figure 5-9) during construction; combined with specific operating conditions for the crusher, will result in minimal noise impact on the local noise environment.

Final proposed measures for implementation of the development have been incorporated into the Operational Environmental Management Plan.

8. AIR QUALITY

This Section summarises the main findings of the Air Quality Study conducted by Benbow Environmental.

A revised Air Assessment has been conducted by Benbow Environmental in May 2016 to assess the development as now proposed with the new ingress road from the Hume Highway. Benbow advises:

The quantitative air assessment prepared in October 2009 has been updated to show the changes in the predicted levels of particulates and dust from a proposed change in the access roadway.

The remainder of the original report has not been altered and the findings are based on the original air dispersion modelling.

The 2009 site plan showed the access road according to Figure 1 Site Plan – Aerial Photograph, shown over page (for reference this is Figure 2-2 from the 2009 report).

The nearest receptor to the original access road was Residence R1 as shown on Figure 2 Site Location (for reference this is Figure 2-5 Site Location from the 2009 Report). Residence R1 is immediately adjacent to the original as proposed access road.

The other residences, R11 and R12, are also adjacent to the original access road.

The contribution of the use of the roadway to the predicted particulate and dust levels was considered as an unpaved road surface.

The contribution from the roadway was included in the modelling and at the receptors nearest the roadway, compliance with the particulates PM 10 and TSP were well below the criteria.

A similar finding exists for dust deposition. The proposed change in the location of the access road is shown on Figure 3 of the report.

The new access road is well distant from Receivers 1 and 2. Although the predicted level of particulate and dust complied with the criteria, the relocation of the road is an improvement that is strongly supported.

The relocation of the access road would not remove the need for reasonable control of roadway generated dust.

The usual controls adopted by quarries are the following:

- *Speed restriction to 40 km/hr;*
- *Maintain road surface in good condition; and*
- *Use suitable roadbase and routinely maintain the aggregate content of the roadbase.*

The predicted levels of particulates and dust would not increase at any of the receivers from the relocation of the access road and this change to the proposed quarry is strongly supported.

From the 2009 assessment the report remains unchanged as previously documented:

8.1 REGULATION

Protection of the Environmental Operations Act 1997

The Protection of the Environment Operations Act, 1997 (POEO Act) applies the following definitions relating to air pollution.

"Air pollution" *means the emission into the air of any air impurity.*
While "air impurity" includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.

The following clauses of this Act have most relevance to the site.

- *Clause 124 (Operation of Plant)*
  The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:
  a) to maintain the plant in an efficient condition, or
  b) to operate the plant in a proper and efficient manner.
  where premises is defined within the POEO Act as including: (a) a building or structure, or (b) land or a place (whether enclosed or built or not), or a mobile plant, vehicle, vessel or aircraft.
- *Clause 126 (Dealing with Materials)*
  (1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.
  (2) In this section:
  a) deal with materials means process, handle, move, store or dispose of the materials.
  b) materials includes raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.
- *Clause 127 Proof of causing pollution*
  To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.
- *Clause 128 Standards of air impurities not to be exceeded*
  (1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:
  b) The standard of concentration and the rate, or
  c) The standard of concentration or the rate.
  Prescribed by the regulations in respect of any such activity or any such plant.
  (2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.

NSW EPA Criteria

The NSW Environment Protection Authority (NSW EPA) "*Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales" (August 2005)*" were referenced for the assessment methodology and the applicable criteria from these NSW EPA modelling guidelines are shown in the following **Table 17**.

Table 17 - Applicable Air Assessment Criteria from the NSW EPA Guidelines

Pollutant	Averaging Period	Concentration		Source
		pphm	µg/m³	
PM_{10}	24 hours		50	NEPC (1998)
	Annual		30	EPA (1998)
Total Suspended Particulates (TSP)	Annual		90	NHMRC (1996)
		g/m²/month[a]	g/m²/month[b]	
Deposited Dust	Annual	2	4	NERDDC (1988)

a - maximum increase in deposited dust
level b - maximum total deposited dust level

These criteria are consistent with the NEPM (National Environment Protection Measure) Ambient Air Quality criteria, which are set as the national health-based air quality standards.

The following **Table 18** has been sourced from the information outlined by the National Environment Protection Council (NEPC), published as the relevant and applicable ambient air quality standards.

Table 18 - National Environment Protection Measure Ambient Air Quality Standards

	Pollutant	Averaging period	Maximum concentration	Goal within 10 years maximum allowable exceedences
1	Carbon monoxide	8 hours	9.0ppm	1 day a year
2	Nitrogen dioxide	1 hour 1 year	0.12ppm 0.03ppm	1 day a year none
3	Photochemical oxidants (as ozone)	1 hour 4 hours	0.10ppm 0.08ppm	1 day a year 1 day a year
4	Sulfur dioxide	1 hour 1 day 1 year	0.20ppm 0.08ppm 0.02ppm	1 day a year 1 day a year none
5	Lead	1 year	0.50µg/m³	none
6	Particles as PM_{10}	1 day	50µg/m³	5 days a year

8.2 EXISTING ENVIRONMENT

The subject site is located in a rural setting about 1 km south of the Hume Highway at Tiyces Lane, Boxers Creek NSW, in the Southern Highlands. The resource for extraction covers an area of approximately 1.04ha on a 44ha site. The population of Towrang has just exceeded 400 people, where 90% of the population lived in the northern direction from the site, divided by Hume Highway. The site is predominantly surrounded by undeveloped land. A few rural residences exist within the vicinity of the site.

The road that veers from the Hume Highway leading to the start of Tiyces Lane is partly graveled. Access from the site is from Tiyces Lane which is being sealed up to the entry point of the site.

Figure 2-1 and Figure 2-2 in the Benbow report provides the topographical and aerial site plan (respectively) outlining the details of the proposed quarry. The proposal is to develop a basalt quarry (area of total impact of 4.6 ha).

The site is surrounded in all directions by undeveloped land. The proposed site would require construction of access road, connecting to Tiyces Lane, for approximately 250 m. The site is located south of ridge line, thus minimising dust emission impact on residences in a northern direction from the site.

On the western direction of the proposed site, lies the forest region of Mount Towrang and Mount Towrang itself, while to the immediate east, the lands are cleared for approximately 2 km, followed by the forest region.

To the west, there is Towrang Creek, parallel with the western site border together with an un-named drainage depression commencing at and perpendicular with the eastern boundary.

To the north, lies Osborne Creek, running at a perpendicular axis to the northern site border. Further to the south is an un-named drainage depression.

8.3 SENSITIVE RECEVIERS

Table 19 lists the nearby receptors that might be affected with the proposed development. The locations of the residences are shown as aerial photo in **Figure 11** and above on page 27.

Table 19 – Potentially Sensitive Receptors – Air Assessment

Table 2-1: Potentially Sensitive Receptors

Receptors	Address	Direction	Distance from Site Boundary (m)
1	51 Tiyces Lane, Boxers Creek 2580 Lot 21 DP 621540	NW	700
2	Hume Highway, Boxers Creek 2580 Lot 3 DP 10904055	NE	723
3	Boxers Creek 2580 Lot 2 DP 247200	E	968
4	249 Tiyces Lane, Boxers Creek 2580 Lot 72 DP 750038	E	358
5	Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	1,143
6	328 Tiyces Lane, Boxers Creek 2580 Lot 16 DP 1018643	SE	807
7	Boxers Creek 2580 Lot 2 DP 1008397	SE	486
8	287 Tiyces Lane, Boxers Creek 2580 Lot 1 DP 1008397	SE	268
9	244 Tiyces Lane, Towrang 2580 Lot 3 DP 1087071	SW	448
10	244 Tiyces Lane, Towrang 2580 Lot 4 DP 1087071	SW	622
11	Tiyces Lane, Towrang 2580 Lot 2 DP 1087071	SW	97
12	Tiyces Lane, Towrang 2580 Lot 1 DP 1087071	W	132

Figure 11 Site Location – Air Assessment

Figure 2-5: Site Location

The area surrounding the proposed site is undeveloped land with several rural settlements to the east, and south-east direction. The only available access road is Tiyces Lane, which connected to the Hume Highway from a Southern direction.

Due to the nature of the area, the existing sources of air pollution would come from motor vehicle emissions, dust from non-grassed areas, residential activity and the horse training facility. These sources would mainly consist of combustion gasses, such as oxides of nitrogen, carbon and sulphur, and dust from unsealed roads or areas and would be considered to be minimal due to the size and frequency of each of these activities.

8.4 PROPOSED DEVELOPMENT

The proposed development has one quarry pit. The final location of the quarry will depend on the exposed nature of the resources. The proposed development would involve installation of vans and the use of the site to quarry construction materials and provide a stockpile area for loading onto trucks to transport the materials. The proposal would require construction of an access roadway, parking areas, landscaping, storage areas and security fencing.

The preliminary equipment list for the site is presented below.

Machinery List for Extractive Activity

- Crusher (mobile) (1);
- Material sizing screen (1);
- Bulldozer (1);
- Front end loader (1);
- Backhoe (1);
- Trucks (estimate average of 3); and
- Water truck (1).

Site Infrastructure

- Office/staff amenities vans (2);
- Access road to office site (@ 6m width) and central quarry (@4m width);
- Security compound fencing around infrastructure (including lockable access gate to Tiyces lane);
- Electricity extension to security compound;
- Telephone extension to security compound;
- Water supply – existing dams on site; and
- Bore.

8.5 ENVIRONMENTAL ASSESSMENT AND IMPACTS

8.5.1 Vibration

The quantitative air impact assessment comprised of the analysis of the following aspects:

- Meteorology and suitable site-representative meteorological data;
- Terrain elevation within proximity to the subject site;
- Local background air quality;
- Site representative emission sources and emission factors; and
- Air dispersion modelling methodology utilised for the assessment.

These aspects are discussed in further detail in the Benbow report.

8.5.2 Terrain

An assessment of the 1:25,000 topographic map for the region indicates the subject site and surrounding landscapes are subject to minor changes in elevation. The elevation of the area ranges between 670 metres to approximately 830 metres within the regional area of the site location. The terrain of the subject site location is approximately 720 to 730 metres in Australian Height Datum (AHD) Elevation and is seen to decrease towards the north-west and south-east section of the subject boundary. The terrain further decreases towards this direction, outside the indicated site boundary. A further decrease in elevation is seen towards the north-east whilst the south-east region shows an increase in elevation of approximately 100 metres compared to the subject site elevation.

A terrain information file was consequently constructed by digitising the 1:25,000 topographic contour map with 10 m contour intervals for the region of interest. This was incorporated into the air dispersion modelling to take into account the terrain effects on the emissions from the subject site. Two 3-dimensional views of the site have been provided in the Benbow report.

8.5.3 Local Background Air quality

No monitoring station has been found to provide representative background air quality measurements for the subject site. However, the local background air quality can be defined based on the surrounding land use.

The region of subject site location is predominantly occupied by heavy vegetation (i.e. forests) with residential homes scattered across the regional area. These homes are expected to increase in the near future. No major sources of emissions such as industrial facilities are found to be within the region of interest. Emissions from road vehicle travel and activities from the nearby horse training facility are expected to provide minor contribution to the background air quality. With these, it is expected that the levels of PM_{10}, TSP and Dust Deposition are low to negligible.

For this assessment, it has then been considered and assumed that background levels of PM_{10}, TSP and Dust Deposition are negligible.

8.5.4 Emission Sources and Emission Rates

The following emission sources were considered in the assessment:

- Vehicle Travel Emissions;
- Loading, Unloading and Material Handling Emissions;
- Wind Erosion from Stockpiles;
- Crushing and Screening Emissions; and
- Excavation Emissions.

8.5.5 Vehicle Travel Emissions

"Dust Emissions " written by F.W. Parrett (Parrett 1992) contains a methodology of calculating dust emission rates from vehicle travel on paved roads based on the dust suspension, exhaust emissions and tyre usage. A formula in the Benbow report (page 26) was utilised.

8.5.6 Loading, Unloading and material handling Emissions

Particulate emission rates for loading, unloading and material handling activities were estimated based on correlations listed in the National Pollutant Inventory (NPI) guidelines "Emission Estimation Technique Manual (EETM) for Mining" (NPI DEH 2001).

8.5.7 Wind Erosion Emissions

"Dust Emissions" written by F.W. Parrett (Parrett 1992) contains a methodology of calculating dust emission rates from wind eroded stockpiles based on the parameters of silt content, wind speed and moisture. A formula in the Benbow report (page 27) was utilised.

8.5.8 Excavation Emissions

Emissions from loading, unloading and material handling were estimated based on methodology listed in the National Pollutant Inventory (NPI) guidelines "Emission Estimation Technique Manual (EETM) for Mining" (NPI DEH December 2001). A formula in the Benbow report (page 28) was utilised.

Table 5-9 in the Benbow report (below) summarises the air emission sources and emission rates to be utilised for the air dispersion modelling.

Table 5-9: Summary of Air Emission Sources and Emission Rates

Emission Sources	Emission Rates (g/s)		Reference Source for the Emission Factor Used in Air Dispersion Modelling
	PM_{10}	TSP	
Vehicle Travel Emissions • Truck Travel • Staff Vehicle Travel	 6.56×10^{-2} 9.84×10^{-2}	 1.29×10^{-2} 1.93×10^{-2}	Parrett 1992
Loading, Unloading and Material Handling	1.12×10^{-1}	6.17×10^{-1}	NPI Database
Wind Erosion Emissions From Stockpiles	3.08×10^{-6}	6.04×10^{-6}	Parrett 1992
Crushing Process Screening Process	2.08×10^{-2} 1.19×10^{-2}	5.42×10^{-2} 3.47×10^{-2}	USEPA AP42
Excavation Process	1.57×10^{-3}	3.31×10^{-3}	NPI Database

8.6 MODELLING RESULTS

The Ground Level Concentration (GLC) results from CALPUFF are summarised in Table 5-12 in the Benbow report. Concentration isopleths for have been provided as **Figure 12**, **Figure 13**, and **Figure 14**.

Figure 12 Isopleth for PM_{10} Impacts Under 1-Year Averaging Time (Scenario 2)

Figure 5-6: Isopleth for PM_{10} Impacts Under 1-Year Averaging Time (Scenario 2)

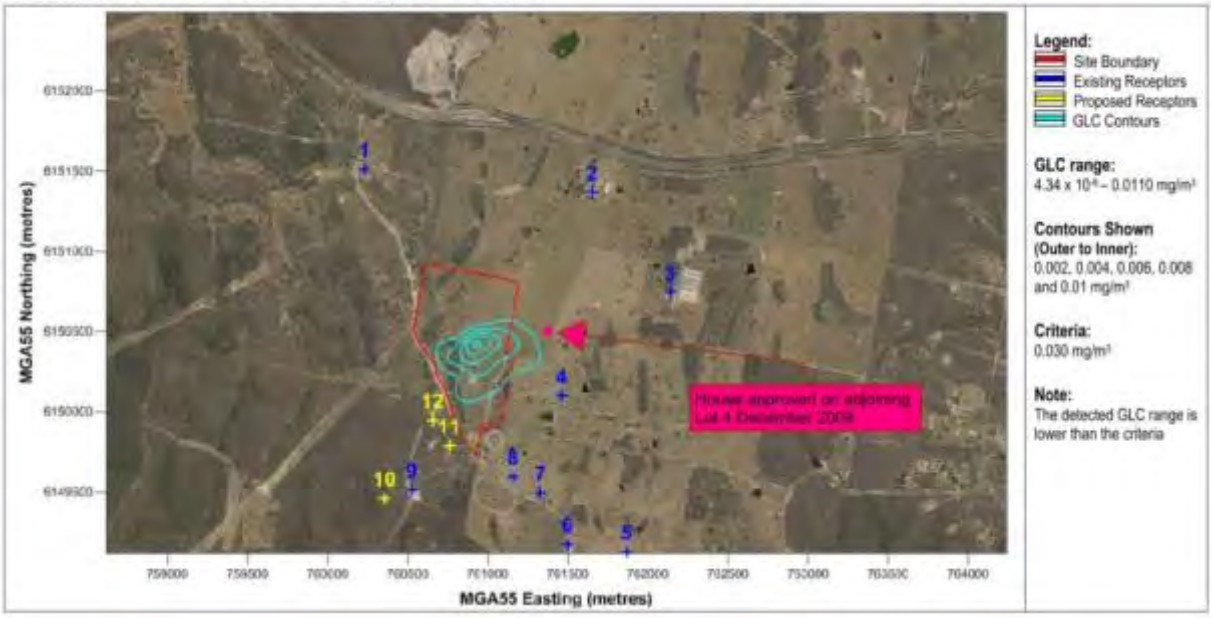
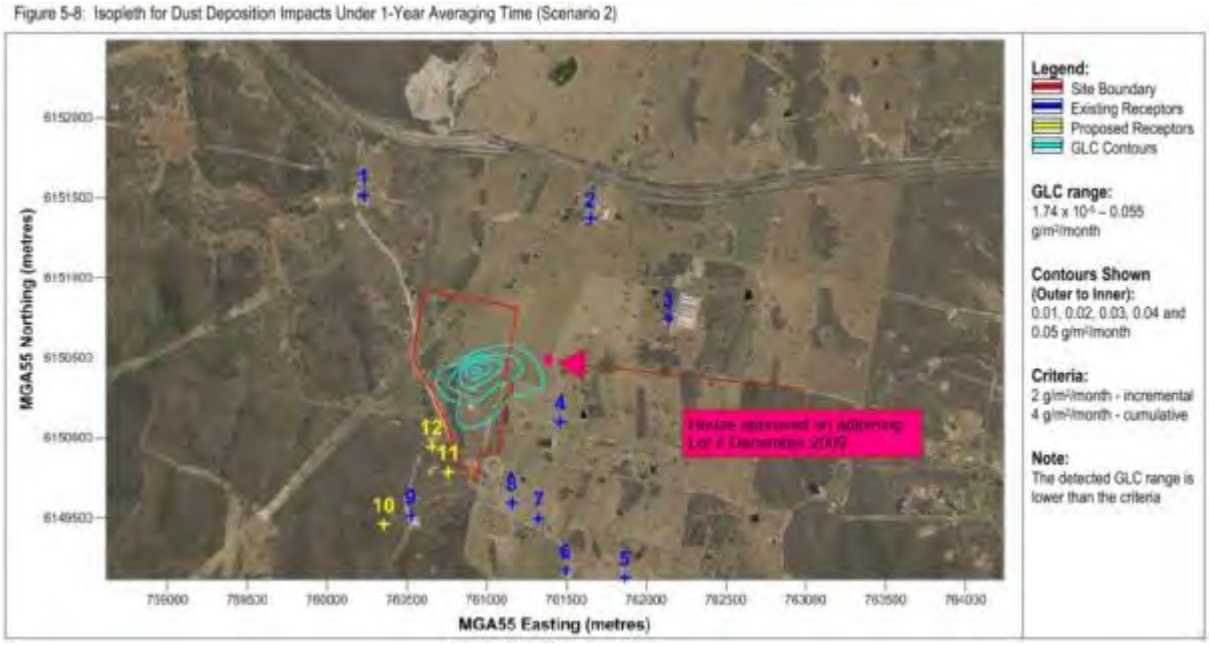


Figure 13 Isopleth for TSP Impacts Under 1-Year Averaging Time (Scenario 2)

Figure 5-7: Isopleth for TSP Impacts Under 1-Year Averaging Time (Scenario 2)

Figure 14 Isopleth for Dust Deposition Impacts Under 1-Year Averaging Time (Scenario 2)



No exceedances were found for both scenarios except for the PM_{10} 24-hour averaging time impacts under Scenario 1. However, it has been found that the implementation of controls for the excavation, crushing, screening, loading, unloading and material handling eliminates the exceedances measured from Scenario 1.

The outcomes suggest that controls are compulsory in order to satisfy the assessment criteria. Other than this, it is expected that the proposed development would comply with the requirements listed in the DECC NSW approved guidelines.

8.7 CONCLUSION

The document "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales" has been closely followed in preparing and conducting this quantitative air assessment. The assessment also involved the review and analysis of the site-specific operational parameters and activities relevant in assessing the environmental dust impacts that the subject site can potentially establish, especially upon the nearest receptors – may it be existing or proposed.

Air dispersion modelling outcomes suggest that controls are required in order to minimise the dust particulate impacts. It is suggested that controls, which are water sprays for dust suppression, be applied during excavation, crushing, screening, loading, unloading and material handling activities on site.

Provided that these controls are established, it is the opinion of Benbow Environmental that the proposed development satisfies the requirements of air quality compliance.

Final proposed measures for implementation of the development have been incorporated into the Operational Environmental Management Plan.

9. TRAFFIC

9.1 EXISTING ENVIRONMENT

A revised Traffic and Parking Impact Assessment (the report) has been carried out by Laterals Engineering & Management in April 2017 to assess the development with access from the Hume Highway and egress to Tiyces Lane as indicated on the Site Development & Landscape Plan.

Tiyces Lane is a sealed rural with one lane each way (see Figure 3) with a centre/barrier line to distinguish between the opposing traffic. The road does not state a speed limit. Tiyces Lane emanates from the Hume Highway and is a dead end road some 5km in length. The Hume Highway is a national highway from Melbourne to Sydney. Hume Highway immediately adjacent to Tiyces Lane is two lanes each way with a speed limit of 110km/hr. the capacity of the Hume Highway has been assessed in the Motion Traffic Report included in the Laterals report.

The process of the development over the past 5 years has resulted in the receipt of concurrence from the RMS for the proposed deceleration lane and acceleration lane at the Hume Highway.

9.2 PROPOSED DEVELOPMENT

The proposed development is displayed in the report providing an ingress road from the Hume Highway and an exit road to Tiyces Lane leading then to the Hume Highway. The plan shows the construction of a new deceleration lane from the Hume Highway to Lot 2 DP 1094055 and the construction of a new acceleration lane from Tiyces Lane to the Hume Highway. Details are shown in the Traffic report.

9.3 ENVIRONMENTAL ASSESSMENT

Road Capacity – Tiyces Lane

The capacity of Tiyces Lane is calculated to be 658 vehicles per hour, in one direction. As such it is determined that there is adequate capacity in Tiyces Lane for the expected additional traffic.

Route Structural Adequacy – Tiyces Lane

A Pavement Condition Report was prepared for Tiyces Lane by Pavement Management Services on the 30 March 2009. A copy is separately attached.

This report indicated a pavement life of at least 20 years from this date i.e. pavement life until at least 30 March 2029.

The expected life of this proposed extractive industry is approx. 5.9 years and assuming site operations will commence by the 30 March, 2018 the end of the life of the quarry is expected to be 30 September, 2023.

Contributions

Council's s94 Development Contributions Plan 2009 Amendment No. 1 Extractive industries, mines and like development road maintenance levy will apply based on the following formula:

Road maintenance / reconstruction contribution per tonne (cents) = 4(L1 x P1 + L2 x P2 ……Ln x Pn)

Where: L1 = Length of road route 1 used by the development
P1 = Estimated percentage of material trucked along route 1
= 4 cents per tonne as the contribution towards pavement maintenance, repair, rehabilitation and reconstruction.
L2 = Length of road route 2
P2 = Estimated percentage of material trucked along route 2

The affected section of Tiyces Lane is approx. 2km long and the applicable contribution will therefore be:

Contribution = $0.0468 x 2 (2016/17 rate)
= $0.0936 per tonne.

Based on 60,000 tonnes per year, this contribution would be $5,616 per year.

9.4 CONCLUSIONS AND RECOMMENDATIONS

There are no traffic engineering reasons why a planning permit for the proposed quarry should be refused.

The traffic assessment recommends the following works:

6. Construction of a deceleration lane to RMS requirements.
7. Construction of an acceleration lane to RMS requirements.
8. Construction of access onto Tiyces Lane to Council requirements.
9. Widening of the northbound travel lane on Tiyces Lane to Council requirements.
10. Rehabilitation of sections of the northbound travel lane on Tiyces Lane as identified in the Pavement Management Services Report.

10. FLORA AND FAUNA

The following flora and fauna assessment has been subject to 2 Addendums which are now included in the application.

The January 2010 was an addendum to a Flora and Fauna Assessment prepared in January 2008 that assesses the potential ecological impacts of a proposal to develop a quarry on Tiyces Lane Towrang. The addendum has been prepared as a result of changes to the proposed development since the preparation of the original flora and fauna assessment. The change to the original proposal is limited to minor realignment of the exit track compared to the original access track location.

The 2010 Addendum concluded that no changes are required to the safeguards and conclusions of the original report.

The June 2016 was an addendum to a Flora and Fauna Assessment prepared in January 2008 and Addendum prepared in January 2010 that assesses the potential ecological impacts of a proposal to develop a quarry on Curlewin Lane (previously identified as accessing from Tiyces Lane) Boxers Creek. The addendum has been prepared as a result of changes to the proposed development since the preparation of the original flora and fauna assessment.

The change to the original proposal is now limited to the provision of an entry directly from the Hume Highway and provision of an exit directly to Tiyces lane in close proximity to the original entry road. There are no trees or hollow bearing trees along the alignment of the new roads.

The 2016 Addendum concluded that no changes are required to the safeguards and conclusions of the original report.

The site assessments have been conducted by Gina Guinane (in 2008) (B Env Sc (Management)) and subsequently Pat Guinane (B Env Sc (Management)).

10.1 EXISTING ENVIRONMENT

The study area is located in the Goulburn Mulwaree Local Government Area on a site that has a long history of agricultural use. It has been cleared of most native vegetation and is now dominated by introduced pasture species and weeds. Parts of the site are better preserved and to support stands of native low open forest and native understorey species. The aerial photographs of the site in this report demonstrate the extent of present vegetation communities.

This assessment has surveyed flora and fauna components of the site and considered the potential impacts of the proposal on any Commonwealth and State listed threatened species, populations and ecological communities with potential to occur on this site. Assessments of Significance have been prepared for all species and ecological communities listed under the NSW Threatened Species Conservation Act 1995 with potential to occur in the area. Safeguards have been provided to mitigate any potential negative impact of the proposal on flora and fauna associated with this site.

The study area occurs in a predominantly cleared landscape with a long history of agricultural use although some patches of remnant forest and woodland remain. The topography is gently undulating and surface water occurs in three minor drainage lines and several small dams.

The site fronts Tiyces lane and access is currently obtained from Curlewin Lane off Tiyces Lane. The site currently supports one machinery shed, several farm dams, fences and no other development.

The proposal is to operate a basalt quarry pit of approximately 1.04ha on the site. A new ingress road from the Hume Highway and exit road to Tiyces Lane will need to be constructed to provide suitable access to and from the site which will avoid the need for vegetation clearing.

10.2 ENVIRONMENTAL ASSESSMENT AND IMPACTS

10.2.1 Ecological Communities and Habitats

Ecosystems on this site are largely typical of an agricultural landscape. The land has been extensively cleared of native vegetation in the past, sown with exotic pasture species and grazed for commercial production. As a result, the ecological condition of the site has been degraded. Good quality, native grassland habitat is limited however the site continues to support several stands of native forest to the west and south of the proposed development area. Brittle Gum Eucalyptus mannifera, Silvertop Ash E. sieberi, Cabbage Gum Eucalyptus amplifolia and Argyle Apple Eucalyptus cinerea are common overstorey species on site

Fallen timber, hollow bearing trees and surface rock are limited on site while several small farm dams provide some simple aquatic habitats.

Remnants of the endangered ecological community Box/Gum Woodland as listed under the NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 persist over some sections of the site although these areas have undergone considerable disturbances in the past which has reduced the ecological integrity of the community to some extent.

Understorey components of this EEC are now dominated by exotic pasture species and common pasture weeds although scattered occurrences of significant native forbs and grasses were also observed. This community was self-regenerating at the time of this assessment and includes trees from seedling to mature age classes.

10.2.2 Flora

Most of the eastern and southern portions of this site have been cleared in the past of native forest and those areas sown to pasture or progressively invaded by exotic pasture species and weeds. Isolated paddock trees are scattered through these areas.

In the northern and south-western sections of the property stands of native forest remain – dominated by Brittle Gum Eucalyptus mannifera, Yellow Box E. melliodora and Red Stringy Bark E. macrorhyncha with a reasonably diverse but sparse shrubby understorey component.

Areas of native grassland on site have generally been degraded by the gradual invasion of exotic pasture grasses and weeds but continue to persist in some areas in moderately good condition. The presence of a variety of sensitive forbs and grasses on site indicates this area is still worthy of some conservation measures to retain the ecological integrity of the site.

No individual species of state conservation significance were recorded on site during this assessment.

The threatened species assessment table in Appendix C provides a summary of threatened flora occurring in the district. Where it is considered that one of these species has potential to occur on the site an Assessment of Significance for that species has been prepared.

10.2.3 Fauna

Few species of fauna were detected using this site. Several locally common birds were observed using the scattered vegetation and no mammals were recorded. A full list of fauna occurring on site and considered likely to use the site is provided in Appendix B of the Laterals report. No species of significance were recorded on site although several are considered potential users of the site.

The threatened species assessment table in Appendix C provides a summary of threatened fauna identified as occurring in the district by the NSW DECC. This list, as well as known local observations and habitat have been used to determine which species have been considered with an Assessment of Significance.

10.2.4 Endangered Populations

Endangered populations are covered by the NSW TSC Act 1995. No endangered populations occur on or near this site and none are likely to be significantly impacted by the proposal.

10.3 STATE ENVIRONMENTAL PLANNING POLICY NO. 44 – KOALA HABITIAT

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP44) applies to the land.

SEPP 44 provides for koala habitat protection in NSW and aims to help conserve populations of this species. The policy defines potential Koala habitat as areas of native vegetation where the tree species listed in Schedule 2 of the policy constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. Schedule 2 tree species include -

- Eucalyptus tereticornis (Forest Red Gum)
- Eucalyptus microcorys (Tallowwood)
- Eucalyptus punctata (Grey Gum)
- Eucalyptus viminalis (Ribbon Gum)
- Eucalyptus camaldulensis (River Red Gum)
- Eucalyptus haemastoma (Broad-leaved Scribbly Gum)
- Eucalyptus signata (Scribbly Gum)
- Eucalyptus albens (White Box)
- Eucalyptus populnea (Bimble Box or Poplar Box)
- Eucalyptus robusta (Swamp Mahogany)

While Koalas may occur occasionally in the district, this site and adjoining lands do not support likely Koala habitat and despite searches no signs of Koala occupation were observed in the area during site visits. No further consideration under this SEPP is necessary.

10.4 POTENTIAL IMPACTS ON FLORA

A variety of common native and exotic plants were recorded on this site. No individual species of recognised national, state or local significance were recorded on the site.

10.5 POTENTIAL IMPACTS ON FAUNA

This site lacks the diversity of habitat that would allow a wide range of animals to use the site. It does provide however suitable habitat to support common local animals that will still be able to use retained habitat and new habitats that will result from the proposed subdivision. No species of recognised national, state or local significance were recorded on the site and it is considered that any impact on fauna will be negligible.

10.6 POTENTIAL IMPACTS ON ECOLOGICAL COMMUNITIES AND HABITATS

The site of the proposed development is largely cleared grazing land, including mixed native and exotic pasture. Native grasses occur frequently and in large patches but are equally as common as exotic forbs and grasses over the property. Habitat types are limited by the scarcity of fallen timber and debris and rocky outcrops on the site however forest and woodland remnants provide some quality habitat for arboreal and avian fauna. Aquatic habitats are limited to several small farm dams with some aquatic vegetation.

Scattered remnants of the endangered ecological community (Box/Gum Woodland) occur on site and will be altered to a minor extent to provide suitable access to the main works area on the property. The impact of alterations to this EEC on site has been assessed as negligible and unlikely to result in any significant short or long-term impacts.

All direct impacts of the proposed subdivision are confined to areas that have already suffered significant disturbance in the past and as such are not considered likely to have a significant impact on the ecological communities and habitats present on the site.

10.7 NSW FISHERIS LMANAGEMENT ACT 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Assessments of Significance have been prepared for species protected by this act in relation to the proposed development.

10.8 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance". The Act identifies nine matters of national environmental significance being:

1) World Heritage properties
2) National heritage places
3) Wetlands of international importance (Ramsar wetlands)
4) Threatened species and ecological communities
5) Migratory species
6) Commonwealth marine areas
7) Nuclear actions (including uranium mining)
8) Great Barrier Reef Marine Park
9) Water impacts from coal seam gas and large coal mining actions

Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

10.9 THREATENED SPECIES AND ECOLOGICAL COMMUNITIES

No threatened species listed under this Act were recorded on site at the time of this assessment or considered likely to occur on the site. The Department of Sustainability Environment Water Population and Communities protected matters search tool was used to highlight any maters of national environmental significance that could be of concern. This report is attached to the Flora and Fauna Assessment. No matters were considered likely to be impacted by the proposal.

The endangered ecological community White Box – Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland is protected by the EPBC Act however the community on the site does not fall into the definition of the commonwealth listed community and further assessment is not necessary.

10.10 MIGRATORY SPECIES

In addition to threatened species and ecological communities, the Environment Protection and Biodiversity Conservation Act 1999 allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat.

10.11 ENVIRONMENT MANAGEMENT AND MITIGATION

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on the flora and fauna associated with this site both in the short and long term.

- Existing vegetation occurring outside the footprint of this development shall not be degraded. This includes removal of trees (dead and alive), shrubs and fallen timber.

Clearing of Native Vegetation is listed as a Key Threatening Process in Schedule 3 of the TSC Act.

Removal of dead wood and dead trees is listed as a Key Threatening Process under Schedule 3 of the TSC Act 1995.

- Clearing of some trees will be required as part of the proposal. For each hollow bearing tree removed the developer must install 2 suitable nest boxes for native fauna in the vicinity.

In order to achieve this, the developer will need to engage suitably experienced people to identify hollow bearing trees to be removed and install the nest boxes.

This safeguard has been recommended as the proposed access track will have an impact on native fauna habitat, including trees which form an overstorey component of an endangered ecological community without this management action.

10.12 CONCLUSIONS

This report has assessed the proposed development of Lots 1 & 2 DP 1094055, Tiyces Lane, Boxers Creek. It has considered the impact the proposal could have on any local flora and fauna as well as species and ecological communities protected by the NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Following these investigations, it has been concluded that there will be no significant impact on any local flora or fauna, endangered species or ecological communities if the development proceeds as proposed. The implementation of this report's recommendations will add to ensure that the proposed development has a neutral impact on the ecological values of the landscape.

Final proposed measures for implementation of the development have been incorporated into the Operational Environmental Management Plan.

11. VIEWS AND VISUAL

The site of the quarry is not clearly visible from any location being screened by low hills or trees. The view to the site from Tiyces lane is shown in the following photograph, but it is not visible being located behind trees.

The earthen mounds surrounding the south and east of the quarry may be partially visible from Curlewin Lane and the land to the east but the quarry and its activity would not be visible as that activity is below the level of the mounds.

Furthermore comment is provided that the rural landscape and scenic value is one which contains development from human activity that is normally carried out in the rural locality which in my opinion includes quarry activities.

The above view is across a valley with trees that would prevent view of the quarry. In addition it is proposed that the area of the valley with scattered trees be allowed to naturally regenerate which would eventually provide additional tree screening in the direction of the quarry.

The proponent has now provided additional photography to display the visibility of the development.

The following photographs show views from the south east and south. We note that there is no additional landscaping associated with the bund which would be grassed. The bund wall would be 4m in height with no solid panel timber fence on top.

Existing view from south east

View from south east with bund walls (yellow line shows existing ground level)

Existing view from south

View from south with bund walls (yellow line shows existing ground level)

In the above photographs the level of the natural ground has been highlighted with a yellow line to display better the height screening effect of the bund. There is no structure or development infrastructure that would be visible.

The photographs above confirm that there would be partial visibility from Curlewin Lane to the south and south east but that the mounds would replace these views with the same natural grassland view that is currently experienced from these directions resulting in a rural landscape or scenic value which would in this instance not display any of the quarry activity. The view from the south would also be screened by the planned revegetation area providing trees that would eventually grow to the height of the tree on the LHS.

In addition the following photographs show views from the Hume Highway and from properties located further from the site along Tiyces Lane/Curlewin Lane.

View from the Hume Highway towards the Quarry Site at the location where the new entry road is located

The internal access road will incorporate additional landscaping along the eastern line of the road except within electricity transmission easements (LHS of view). The road would be partially visible but broken with the landscaping (as outlined on the Site Development and Landscaping Plan) giving the road an appearance of noting more than a standard rural property road not uncommon in the vicinity or rural area.

For the quarry to be visible from the Hume Highway a driver or passenger would need to be looking more than 90^{o} around from the line of sight along the highway. The elevation of the Hume Highway is 701m whilst the elevation of the quarry at its highest point is 736m. In between the Hume Highway and the quarry is a hill which is 710m height. The following plan shows that the quarry would potentially be visible in a straight line of sight view; however that view is hindered by grasses and trees along a line of sight which is 1.1km in length. The line of sight passes 7.2m above the natural ground at the hill in between the highway and quarry. The trees and shrubs that are currently on the paddock next to the highway and the line of trees at a curve in the entry road would be higher than 7.2m thus screening any possible view of the quarry. In addition a line of trees is proposed along the boundary between Lots 1 & 2 which would provide additional screening.

The following plan displays the lines of sight of the above photographs and ground levels at the point of photography as well as ground levels of the quarry at 3 corners and a hill between the Hume Highway and Quarry.

The view between the Hume Highway and quarry is discussed above.

The view from the south as shown above is also taken from an elevation which is 19m below the highest point of the quarry and a berm 4m high is provided in the line of sight.

The view from the south east as shown above is taken from an elevation which is 36m below the highest point of the quarry and a berm 4m high is provided in the line of sight.

View from 328 Tiyces Lane

From 328 Tiyces lane the Quarry Site is 1.5km distant and is not visible being hidden by vegetation to the right hand side of the photograph. The elevation of the dwelling at this address is approximately 735m such that the view to the quarry would be approximately level with the quarry.

View from 343 Tiyces Lane

From 343 Tiyces lane the Quarry Site is 1.6km distant and is not visible being hidden by vegetation to in the gap between the trees. The elevation of the dwelling at this address is approximately 725m such that the view to the quarry would be slightly upslope to the quarry.

It is considered that the site of the proposed quarry will appear as natural grassland and trees (and with the faces of the bunds being vegetated with native grass) from all directions from which it is visible. The site office is proposed to have dimensions of 3m x 6m, being the size of a small farm shed. This will be visible from the East through South East where not obscured by existing vegetation. A structure of this size and type is smaller than most buildings in the rural character of the area and would not have any significant negative impact on the amenity of the locality. The extraction activities of the quarry itself will be below ground or hidden by the bund walls and it is considered that they will have no adverse visual impact on the locality.

The land on the east would potentially view the quarry however there is a temporary bund wall along the north east and a bund wall along the south east which would hide the quarry from view with these lots being approximately the same height of or less than the quarry and the bund wall being 4m high. When the temporary bund wall is removed the quarry activity would be below the level of the ground. One owner to the east has also indicated no objection to the quarry; which owner holds land equal in level and directly east of the quarry. The other eastern landowner has land which has a dwelling 580m from dwelling to quarry and is at an elevation of approximately 715m being 16m lower than the quarry and having a view at the eastern corner of the 4m high grassed bund such that a view of the quarry activity would not be possible.

12. INFRASTRUCTURE AND SERVICES

12.1 EMERGENCY SERVICES

The site is located 630m at the end of the cul-de-sac of Curlewin lane. A new ingress would exist on the Hume Highway and a new exit would exist on Tiyces Lane.

The emergency services already available to support the proposed development include:

- Ambulance – located at Goulburn and Marulan
- Police – located at Goulburn and Marulan
- Rural Fire Service - located at Towrang
- Hazmat/Goulburn Fire Brigade – located at Goulburn
- Hospital – located at Goulburn

12.2 ELECTRICITY SUPPLY

Power is available to the proposed development from a pole located the NE corner of Lot 1 DP 1094055.

12.3 OTHER INFRASTRUCTURE AND SERVICES

Gas is not available to the site. Telephone services are not specifically required and will not be connected for a land line, a service provided by mobile telephone which can be diverted from the owner/operators office. Should a service be later connected the work would be conducted in accordance 'Planning for Bushfire Protection 2006', section 4.1.3 *Standards for bushfire protection measures for residential and rural residential subdivisions*, as a guide for this development.

12.4 WASTE

This Section summarises the main findings of a Waste Study conducted as part of this assessment. All office waste at the site would be collected in bins and disposed to the normal Council collection service.

The quarry process does not involve any chemical additives.

All machinery is to be brought to the site for operations only and not stored on site. As such oil and fuel is not to be stored on site, but brought by operators and taken away by operators with operators containing all storage in vehicles. Any spilt fuel or oil would require immediate collection and removal by the contractors.

As such waste management is fully managed and contained by contractors, other than the provision and use of waste collection bins for normal office waste.

In view of the minor quantity of waste and it transfer off site a waste management plan under the POEO Act is not further developed other than the provision of an Action Plan outline for management to follow to ensure good waste management and waste minimisation continues.

12.4.1 Action Plan

A typical format of a waste minimisation action plan is provided below in **Table 20**.

Table 20: Waste minimisation action plan

Item	Action Required	Priority	Responsible Personnel	Start Date	To be completed by
1	Establish site waste monitoring on a monthly basis				
2	Identify site waste composition				
3	Research and identify any areas where waste can be further recycled				
4	Identify possibilities for greater segregation (and subsequent recycling) of wastes in the area				
5	Establish paper/cardboard recycling program and obtain service provider to take materials off site				
6	Establish plans to minimise any chemical waste				
7	Materials that are being recycled-provide estimate of annual quantity				
8	Materials that are being reused provide estimate of annual quantity				

12.5 CONCLUSIONS

A brief waste audit report has been conducted as a part of this assessment for the proposed quarry. All waste outputs from the operations are transferred off site by contractors or the normal Council collection system. With implementation of waste management plan and waste minimisation action plan, Jasminco Resources Pty Ltd can ensure continued future good waste management and waste minimisation.

Final proposed measures for implementation of the development have been incorporated into the Operational Environmental Management Plan.

13. ARCHAEOLOGICAL ASSESSMENT

Aboriginal sites and objects are protected in NSW by the *National Parks and Wildlife Act (NSW) 1974* (as amended) – of which Section 90 states that "it is an offence to knowingly destroy, deface or otherwise disturb an Aboriginal object without the prior consent of the Director General" of the NSW NPWS (now part of the Office of Heritage and Environment) consideration of Aboriginal Heritage in development determining authorities – for example NSW NPWS. Aboriginal sites and places are explicitly identified in the EPA Act as requiring assessment as part of planning studies.

A study was conducted by Stedinger Associates Pty Ltd in March 2009. The report details the existing environment, topography and vegetation, soils and geology, cultural background including European Settlement, previous archaeological works including a search of the Aboriginal heritage Information Management System Aboriginal Context which are not reiterated here.

13.1 LANDUSE AND IMPACT POTENTIAL

The area is substantially cleared and largely used in the past grazing. A shed has been erected on the land to provide storage for machinery associated with the farming activity.

The future works for the development include quarrying and earthworks in preparation for construction of the access road and office/amenities area. The revegetation area will also involve tree planting. These works will involve ground disturbance that will directly impact heritage site, if present, with the specified location resulting in their disturbance and/or destruction.

Based on discussions with Aboriginal community representative, previous land-use history, and previous studies that indicate site types, their location, and density in similar environmental settings, the most likely to occur throughout the study area are open campsites and isolated finds.

The surrounding area contains several creeks and, hence, a relatively high number of smaller campsites. According to regional models, if present, archaeological sites in the study area would be small and less dense occurring within 10 to 20 metres of the portion of Towrang Creek to the northwest. Isolated find may occur further from the creek.

13.2 SITE SURVEY

A site survey was conducted by Stedinger Associates Pty ltd together with a representative from the Pejar Local Aboriginal Land Council on 26th February 2009. Visibility was generally moderate to high during the survey, however levels of exposure varied according to landform units and other variables and 50% of the surface area was examined during the survey. The survey area had been variously disturbed from previous and current landuse, but most of the land had been cleared for farming use.

The lack of Aboriginal sites may be a consequence of a lack of resourced in the immediate environment, such as sandstone outcrops suitable for grinding purposes, rock shelters suitable for occupation, permanent water sources and the varied food resources associated with a riverine environment. Instead, it is likely that people passed through rather than camped in the area as they made their way to the richer resources of the Wollondilly River and the prominent landmark Mount Towrang.

The lack of sites may also be partially due to land clearance, grazing and other activities during the nineteenth and twentieth centuries resulting in the burial, displacement and/or destruction of heritage sites. Likewise, reduced surface visibility may have resulted in the lack of Aboriginal sites being located. It is possible that additional Aboriginal sites may be been obscured by grass, soil and leaf cover.

13.3 ENVIRONMENTAL ASSESSMENT AND IMPACTS

13.3.1 Cultural Significance

Sites of cultural significance are those that define Aboriginal values, provide links with the past and are a symbol of Aboriginal identity. They may be natural landscape features or archaeological evidence of past human activity.

Within the present survey area there is no material evidence of occupation and activities. In the wider area however, some artefact scatters and isolated finds represent tangible and meaningful links with the lives of the community ancestors. As such the local Aboriginal community has interest in the identification and preservation of sites in the region. In previous site surveys of the wider area, the Pejar Local Aboriginal Land Council and other community representatives have indicated that open campsites and isolated finds are considered to be of cultural significance. Indeed, in their identification of isolated finds as being significant, the Pejar Local Aboriginal Land Council appears to indicate that all Aboriginal objects or sites are considered to be significant by local Aboriginal people. Many Aboriginal sites have been destroyed or disturbed with increasing quarrying, infrastructure projects and development in the area. They are 'non-renewable' in what is already a depleted heritage resource.

13.3.2 *Archaeological Significance*

Scientific or archaeological significance refers to research potential of the artefactual material occurring within a place of site. Several criteria are commonly used by consultants when assessing the archaeological significance of Aboriginal sites. These criteria are:

- The potential of a site and its artefacts to provide information on questions relevant to archaeology and Aboriginal heritage;
- The potential of a site and it artefacts to provide information not available from other sources or sites previously known from an are;
- The potential of a site to provide an example of a site type that is not already being conserved in a similar landscape in the general area;
- The intactness or state of preservation of a site relative to other sites of the same type previously known from the area; and
- The inclusion of the site within a complex of the other sites that may give a greater potential for answering research questions.

The lack of archaeological sites in the specific landscape is itself valuable information contributing to a view of the occupation of sites in the Goulburn area and the movement of Aboriginal people across the landscape.

The field study noted that visibility was very poor in places with some areas already fully disturbed. During the field survey no Aboriginal archaeological material was found.

14.4 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

The following recommendations are made by the Stedinger study based on discussions in the report, consultation with the Pejar Local Aboriginal Land Council and other community representatives, background research, site survey and statutory requirements of the National parks & Wildlife Act 1974. It is recommended that:

- Aboriginal heritage sites should not prevent the proposed quarry and revegetation program in the specified study area. No archaeological sites were found during the recent survey of the area and no sites are known to be located in the specific study area;

- No further archaeological survey work for Aboriginal heritage sites is required prior to the excavation of the quarry and implementation of the revegetation program.
- Section 91 of the NPW Act 1974 requires that the accidental discovery of Aboriginal relics should be reported to the Director-General of the NSW Department of Environment & Conservation (National Parks & Wildlife Service). As such, during any works in the area surveyed the accidental discovery of Aboriginal objects or sites should be reported immediately to the Depart of Environment & climate change (NPWS). Representatives of the Local Aboriginal community should also be informed of any such discovery and management strategies formulated and implemented.
- Although no Aboriginal archaeological sites were found during the recent survey of the area or are known to be located in the specified survey area, during any works in the survey area, contractors and project personnel should be requested to work with caution and informed of the requirements outlined in Section 91 (1) of the NPW Act 1974.

The above recommendations are also those contained in the Pejar Local Aboriginal Land Council report provided to Stedinger Associates.

14.5 CONCLUSION

During this survey of the proposed area for the excavation of a quarry and implementation of a revegetation program at Towrang, no Aboriginal archaeological sites were found within the survey area and no previously recorded sites have been registered by the NSW Department of Environmental and Climate change. However, dense ground cover may have obscured surface artefacts in some parts of the survey area.

It is concluded that;

- The present archaeological survey indicates that Aboriginal heritage sites are not likely to exist in the subject survey area;
- Dense ground cover may have obscured archaeological sites or isolated artefacts in some parts of the survey area.

Since the original study updated AHIMS searches were carried out on Lots 1 & 2 DP 1094055 noting no Aboriginal site recorded in or near the site and no Aboriginal places declared in or near the site. Pejar Local Aboriginal Land Council subsequently carried out an inspection and reported that no Aboriginal sites were located but did not rule out that artefacts could be located under the ground.

Pejar Local Aboriginal Land Council recommended:

- If any previously undetected Aboriginal site or relic is uncovered or unearthed during any activity, work at the location must cease immediately and advice on appropriate actin be obtained from the Pejar LALC in conjunction with NSW Office of Environment and Heritage;
- A representative from Pejar LALC should be present during the initial earthworks.

14. RELATIONSHIP WITH ADJOINING LAND

The proposed development has a relationship with the adjoining land:

- Adjoining land contains a mixture of rural settlement, a horse training track and a poultry farm.

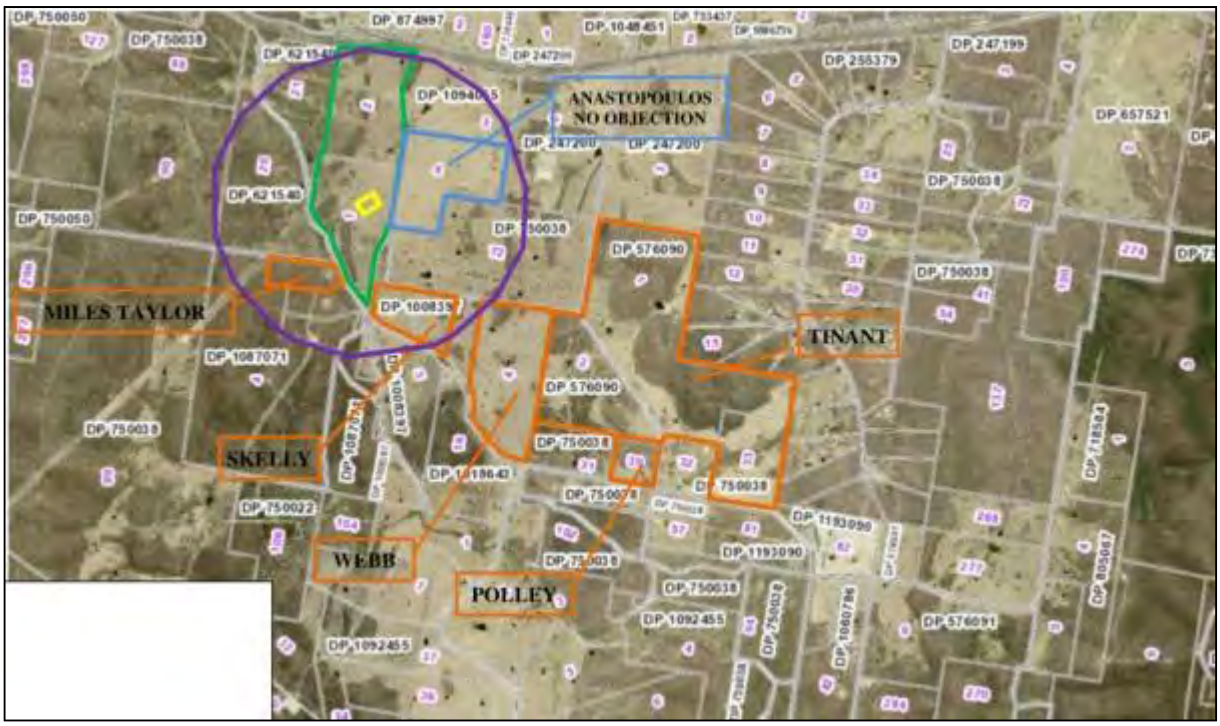
- Also on adjoining land there are residential dwellings as indicated in the above reports and on the aerial photograph.

- The proposal will increase traffic along Tiyces lane the impact of which has been assessed above in a generally satisfactory manner.

- The proposal will have a minimal impact on native vegetation and provide for significant rehabilitation of part of the site with tree planting.

- The development is sufficiently isolated and screened from other development to not create any privacy issues. Attempts were made to view the site from surrounding roads (Tiyces Lane and Curlewin Lane but the site was virtually unable to be seen).

The development has been subjected to public exhibition with several submissions. the location of submitters who have continued to express an interest in the quarry are shown on the following aerial photograph. Also shown on the aerial photograph is a circle which is 100m in radius from the quarry being the distance that Goulburn Mulwaree DCP 2009 indicates as a distance for setback from the quarry for blasting activity.



Clause 6.11(b) of the Goulburn Mulwaree Development Control Plan 2009 (DCP) is viewed as a precautionary guideline and the 1000m setback is understood to be a figure based on a safe setback for quarries. There is no justification within section 6.11 as to the reason for a 1000m buffer but, as Council has referenced in the JRPP report, the Council obtains guidance as outlined in section 5.8.1.1

of the DCP in relation to the consideration of dwelling houses in the rural area being affected by dust, fumes, odour, spray drift, light and noise. Section 5.8.1.2 goes further to review the variation of buffers considering matters including –

- the extent, nature and intensity of the adjoining land use;
- the operational characteristics of the adjoining land use;
- the external effects likely to be generated by the adjoining land use (i.e. dust, fumes, odour, spray drift, light and noise) and their potential to cause conflict;
- the potential of adjoining land to be used for various commercial activities including agriculture, quarries, rural industries, etc.;
- any topographical features or vegetation which may act to reduce the likely impacts of an adjoining land use;
- prevailing wind conditions and any other climatic characteristics;
- any other mitigating circumstances.

Whilst section 5.8.1.2 provides support for other rural development the above matters appear to relate to dwelling houses as a secondary development in the rural area and matters to be considered when approving a dwelling house. In this regard the visual treatment of the development as discussed above, and the assessment of the development for noise and air quality would satisfactorily seat the development as having an acceptable visual impact and having acceptable impact standards in relation to noise and air quality thus providing an acceptable impact in relation to existing development whilst leaving the ability for any additional dwelling houses to be suitable considered and approved in the future.

Section 1.7 of the DCP also provides guidance to the variation of buffers in the DCP and gives consideration to departures in relation to –

(a) whether there will be any detrimental impact on the amenity of the existing and future residents
(b) whether there will be any detrimental impact on the amenity of the area
(c) the nature and size of the departure
(d) the degree of compliance with other relevant requirements
(e) the circumstances of the case, including whether the particular provision is unreasonable and/or necessary
(f) priorities identified in a site analysis of being of more importance than what is being departed from
(g) whether non-compliance will prejudice the objectives of the zone and the aims of this plan

Having regard to visual impact and the landscape as discussed above, considerations under section 5.8.1.2, and the quantitative noise and air quality assessments carried out by experts it is my opinion that the development would not detrimentally affect the amenity of existing and future residents. Having regard to the expert quantitative noise and air quality assessments and the consideration of those assessments by the Environment Protection Authority (EPA) including the imposition of relevant conditions, that the size and nature of the departure is not unreasonable, and would not prejudice the zone objectives having regard to the nature of the land including existing uses such as general agricultural activity, poultry farming and horse training activities.

In general -

(i) Views have been considered above and seem to be quite manageable and reasonable.
(ii) Existing and future residents have been considered and found to be located and capable of being located around the proposed quarry;
(iii) Noise has been assessed by experts and found to meet acceptable standards;
(iv) Air quality has been assessed by experts and found to meet acceptable standards.

As such it is my opinion that the 1000m has been satisfactorily considered and that a variation would be suitable.

It is submitted that –

1. the proposal will not create a visible scar from the surrounding ground levels;
2. the proposal will increase native vegetation including screening;
3. Despite not requiring separate approval, [under the Native Vegetation Act 2003] the aims and objectives to maintain and approve the quality and quantity of vegetation within the site is considered to be satisfied.
4. The variation based on the quantitative Air and Noise Assessments is considered acceptable based on the EPA conditions proposed which will ameliorate the potential impacts to an acceptable standard.
5. In relation to the 'motor racing tracks example in the DCP the Council similarly applies to the extractive industry that "Based on this example it should be acceptable that in the case of Extractive Industries (Argyle quarry) with dwellings proposed closer than the recommended buffer distance, the quarry at a minimum should comply with industry best noise insulation standards and any EPA requirement."

14.1 PRIVACY AND SECURITY

The proposed development has limited potential to affect the privacy of adjoining land. As discussed above the area is currently developed with a mixture of rural settlement and activity. The development is sufficiently isolated and screened from other development to not create any privacy issues. There is no further development closer to any existing residence and it is noted that the additional earth mounds around the quarry would provide additional visual screening.

The development is proposed to be fully fenced around the operational area with cyclone fencing for security and safety purposes.

14.2 SOCIAL AND ECONOMIC

The proposed development will involve a number of benefits that are entitled to be considered. These include:

- The provision of a service to the community in the provision of a basalt resource for the various uses such as material used for roads and concrete.
- The provision of employment or employee establishment within the area.
- The development will provide for the continued viability of the City of Goulburn in the need for social and community services.
- The development will provide for the continued viability of the City of Goulburn in the demand for goods and services to service the industry and employees.

15. FUTURE USE OF THE QUARRY

The quarry may be expanded to utilise the extent of basalt resource on the land, in which case the base of the quarry will continue in use for full extraction of that resource. This would be the subject of further applications.

Should the quarry not continue the rehabilitation process has been outlined in detail in the Operational Environmental Management Plan.

16. PRELIMINARY CONTAMINATED LAND ASSESSMENT

This report provides information from preliminary investigations pertinent to the development about the potential for the site to contain contamination from previous activities. The assessment is carried out in accordance with the '*Planning Guidelines for Contaminated Land*' prepared by the Department of Urban Affairs and Planning and Environment Protection Authority in 1995. The report forms a key assessment in accordance with the heads of consideration in s79C of the *Environmental Planning and Assessment Act 1979*.

Previous land uses

The land has been used for agricultural involving grazing.

Adjoining Land Uses

Adjoining land uses are recorded under site context above. There is no information that would indicate that there has been any activity on those lands that would result in the contamination of the land which is the subject of this development.

Site Inspection

A site inspection was carried out in January 2016. A visual inspection was carried out to identify the presence of any rubbish tips, mounds, holes or bare ground that could possibly indicate landfill or materials that may or may not contain contaminants. No obvious contamination on the land within the development was identified.

Potentially Contaminating Activities

Potentially contaminating activities and main contaminants are listed in Table 1 of Chapter 2 of the '*Planning Guidelines for Contaminated Land*' published by the Department of Urban Affairs and Planning and Environment Protection Authority in 1995. The list of rural activities and main contaminants are provided below.

POTENTIALLY CONTAMINATING ACTIVITIES AND MAIN CONTAMINANTS

From "Planning Guidelines for Contaminated Land" 1995 Chapter 2

TABLE 1. - SOME POTENTIALLY CONTAMINATING ACTIVITIES AND MAIN CONTAMINANTS

Agriculture: *land heavily treated with persistent chemicals such as arsenic and organochlorine based chemicals (e.g. banana plantations, cotton and sugar cane fields, local orchards and horticultural plantations and market gardens) and organophosphate-based chemicals.*

Stock dipping e.g. activities on cattle tick and sheep dip sites: *chemicals (mainly tickicides) disposed of in the 1960s and 1970s such as DDT, arsenic, BHC, delnev, carbaryl and ethion; current chemicals in use (e.g. taktic, amitraz, cypermethrin, bendiocarb, deltamethrin, flumethrin, bayticol, diazinon, chlorfenvinfos and barricade 's').*

Mining and extractive industries e.g. Handling and storage of ores and carbonaceous materials.

Pesticide storage areas where vehicles used for the transport and storage of pesticides are washed and area where tanks are used to store pesticides; insecticides, fungicides and herbicides.

None of the activities or main contaminants listed in the guideline has affected the land based on the information available at the time of this preliminary assessment.

Remediation Activities

There is no information that the land has been subject to any notices concerning the need for remediation of the site. There is no information to indicate that the land has been subject to voluntary remediation by any prior landowner.

Contaminated Land Assessment Summary

From this assessment there appears to be no contamination or potential contamination of the land which is the subject of the proposed development. Based on this preliminary assessment it is considered that the site is presently suitable for the activity proposed. Notwithstanding this should any construction works unearth any suspect material works in the locality should cease until the material has been determined to be safe or removed safely.

This assessment also relates to the provisions of State Environmental Planning Policy No 55 – Remediation of Land and provides an assessment indicating no need for any remediation action.

17. HZARDOUS AND OFFENSIVE DEVELOPMENT

The State Policy would initially identify the proposed development as potentially hazardous or offensive as follows -

> ***potentially hazardous industry*** *means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:*
>
> *(a) to human health, life or property, or*
> *(b) to the biophysical environment,*
>
> *and includes a hazardous industry and a hazardous storage establishment.*
>
> ***potentially offensive industry*** *means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment.*

In consideration that the proposed development is "Extractive Industry" the use is identified as an industry to which the State Policy would apply. Notwithstanding this it is noted that the development proposal incorporates measures to manage potential pollution or effects on other land.

The Department of Planning and Infrastructure publication entitled Applying SEPP 33 Guidelines dated January 2011, this development may fall under the definition "potentially offensive development" due to it being Designated Development. Furthermore, the Director-Generals Requirements for the EIS issued by the Department of Planning and Infrastructure (including input from Council and State Government agencies) requires that an assessment be made against SEPP 33.

The proposed development could be considered a potentially offensive industry because if the development were to operate without measures (including, for example, the earth berm and location of the crusher below the existing ground level and noise control limit of 35dB(A)) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, it would pose a risk in relation to the locality.

Given that the development is an Extractive Industry, which will process up to 30,000 cubic metres and the common threshold requiring an Environment Protection Licence (EPL) is 30,000 cubic metres the development is close to the EPL volume threshold. This development is caught under the EPL by its location within an Environmental Sensitivity Area (Biodiversity on the Terrestrial Biodiversity Map to the Goulburn Mulwaree Local Environmental Plan 2009). Clause 13 of SEPP 33 states that:

In determining an application to carry out development to which this Part applies, the consent authority must consider (in addition to any other matters specified in the Act or in an environmental planning instrument applying to the development):

(a) current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, and
(b) whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply, and

(c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant, and

(d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and

(e) any likely future use of the land surrounding the development.

This clause is addressed as follows:

a) As stated above, the current Department of Planning guidelines relating to hazardous or offensive development are entitled "Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines" and dated January 2011. These guidelines state that SEPP 33 aims to ensure that only proposals which are suitably located, and able to demonstrate that they can be built and operated with an adequate level of safety and pollution control, can proceed. The relevant matters regarding this statement have been addressed in that the EPA has issued GTA's for the development. As such the development would not subsequently be hazardous or offensive.

b) The Office of Environment and Heritage (OEH EPA,) were consulted during the preparation of the application and the public exhibition of the original application. The POEO Act 1997, prohibits any person from causing pollution of waters or air, and provides penalties for offences. The proposal is characterised within Schedule 1 'Extractive Industry' and must be licensed (Environmental Protection Licence) by the EPA for construction and operation in accordance with the provisions of Section 48 of the POEO Act 1997. The Environmental Protection Licence (EPL) is required for all scheduled activities and would be issued separately. General Terms of Approval (GTA) have been issued by the EPA and can be incorporated into conditions of consent. As such the development would not subsequently be hazardous or offensive.

c) Water NSW (Sydney Catchment Authority (SCA)) was consulted during the preparation of the original application and the public exhibition of the original application. It is anticipated that the authority will similarly respond with General Terms of Approval which can be incorporated into conditions of consent. As such the development would not subsequently be hazardous or offensive.

d) The development proposal applies over a ground resource which limits consideration of alternative sites. The only alternative would be to not proceed at the location. The appropriateness of the selected material and site and its impact on the surrounding area have been assessed in the application and found suitable with all authorities issuing recommended conditions for consent.

It is considered that the above consideration addresses this aspect and that appropriate statutory controls would be applied to any consent to ensure that the development is not hazardous or offensive. Controls in this regard would be the EPA and SCA conditions for development and operation of the proposal and are outlined in the Operational Environmental Management Plan.

18. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

As discussed below, the development meets the justification measures of ESD and satisfies object (a) (vii) of section 5 of the Environmental Planning and Assessment Act 1979

Ecologically Sustainable Development (ESD) is defined under the Protection of the Environment Administration Act 1991 to "require the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) The precautionary principle – namely, that if there are threats or serious or irreversible, environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

(i) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) An assessment of the risk-weighted consequences of various options,

(b) Inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) Conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) Improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) Polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

In relation to the above definition:

(a) <u>The precautionary principle</u>

The development has been designed to utilise land that will not result in the loss of threatened species or communities. The development has been designed to appropriately manage stormwater, and provide effluent disposal.

(b) <u>Inter-generational equity</u>

The management of the development as discussed above indicates the ability for the development to maintain environmental health, diversity and productivity. In relation to the protection of vegetation, the planting of vegetation around the development will significantly enhance the flora and fauna components of the locality whilst at the same time providing for the landscape screening of the development.

(c) Conservation of biological diversity and ecological integrity

The planting of trees and vegetation with the development will provide for the conservation of biological diversity and ecological integrity as much as is practicable having regard to other constraints. The development will not adversely impact on any ecological community on the land.

(d) Improved valuation, pricing and incentive mechanisms

The design of the development to manage and treat potential pollutants that will be generated from the development and its construction amounts to the costs associated with protecting the environment being borne by the developer. This assessment is the first step in that process.

The establishment of the development within the Goulburn Mulwaree Council area places the development under the continuing management of Goulburn Mulwaree Council, which will, through rates and charges continue to manage relevant infrastructure for environment protection.

The development design has achieved a cost-effective design for environmental management.

19. SUMMARY OF ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

19.1 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

All environmental management measures recommended by the studies of the various environmental components of the proposed development have been or can be, subject to variations that may occur during further assessment of the development and as may be required by conditions of consent or authorities general terms of approval (and any subsequent approval from an authority), incorporated into the Operational Environmental Management Plan.

19.2 PUBLIC INTEREST

The development as proposed has now received public scrutiny and consideration has been given to all submissions from public authorities and the public in general as a result of substantial public exhibition of the prior original and amended applications. The revised development and measures now proposed have addressed substantially the concerns of authorities and the public. Details of reimplementation of the development are now incorporated into this EIS and all accompanying reports and the Operational Environmental Management Plan.

In general the proposal is for a small local quarry to service local and some limited regional needs. The site and its area of impact is very small in comparison to the other large developments noted above and having regard to the EIS industry guidelines –

a. Consulted with relevant authorities,
b. Considered air quality, noise and vibration, transport and water quality issues.
c. Has identified ongoing commitments and those commitments are subsequently contained within authority general terms of approvals.

The guideline also states that the analysis of individual issues would reflect the level of significance of their impacts. In this regard the level of impacts is relatively small and all manageable as is evidenced in responses from authorities and details now incorporated into this EIS and all accompanying reports and the Operational Environmental Management Plan.

In general the development will support local industry provide employment for local people and contractors with the economic benefits extending to the local community as well whilst providing for the best and highest use of land in a rural area from which resources such as basalt can only be obtained prior to sterilization from other encroaching development.

20. COMPLIANCE CHECK

The following table summarises the compliance of the proposed development with the relevant provisions of Environmental legislation, and planning instruments. As this EIS considers and reports on a development previously proposed and assessed by authorities I have incorporated some statements relating to those authorities' comments in consideration that the development is substantially the same as previously proposed.

PROVISION	REQUIRED	PROPOSED	COMPLIANCE
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007			
Clause 2 Aims	The aims of this Policy are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries: (a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and (b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and (b1) to promote the development of significant mineral resources, and (c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources. (d) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development: (i) to recognise the importance of agricultural resources, and (ii) to ensure protection of strategic agricultural land and water resources, and (iii) to ensure a balanced use of land by potentially competing industries, and (iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.	The Argyle Quarry facility utilises a resource from land to produce a product in demand for many purposes promoting the social and economic welfare of the state. The proposal is for the establishment of a new small scale quarry to meet demand and in effect to utilise an extractive resource in an orderly and economic manner. The activity would provide for improvements in the environment of the land. This assessment provides for the determination and placement of controls for proper management of the activity for the orderly and economic development of the quarry. The proposal does not require rezoning although the existing zoning of the land would not appear to be justifiable in terms of environmental qualities of the land and land to the north. In addition the resource is more extensive than is proposed to be quarried in this proposal and should be considered for protection for extraction. This however is not the purpose of this application.	YES
Clause 7 Development permissible with consent	**Clause 7 (3) (a)** **Mining** Development for any of the following purposes may be carried out with development consent: (a) extractive industry on land on which development for the purposes of agriculture or industry may be carried out (with or without development consent), (b) extractive industry in any part of a waterway, an estuary in the coastal zone or coastal waters of the State	The facility is located on land which development for the purposes of agriculture can be carried out.	YES

	that is not in an environmental conservation zone.		
Clause 12AA Significance of resource	(1) In determining an application for consent for development for the purposes of mining, the consent authority must consider the significance of the resource that is the subject of the application, having regard to: (c) the economic benefits, both to the State and the region in which the development is proposed to be carried out, of developing the resource, and (d) any advice by the Director-General of the Department of Trade and Investment, Regional Infrastructure and Services as to the relative significance of the resource in comparison with other mineral resources across the State. (2) The following matters are (without limitation) taken to be relevant for the purposes of subclause (1) (a): (a) employment generation, (b) expenditure, including capital investment, (c) the payment of royalties to the State. (3) The Director-General of the Department of Trade and Investment, Regional Infrastructure and Services is, in providing advice under subclause (1) (b), to have regard to such matters as that Director-General considers relevant, including (without limitation): (a) the size, quality and availability of the resource that is the subject of the application, and (b) the proximity and access of the land to which the application relates to existing or proposed infrastructure, and (c) the relationship of the resource to any existing mine, and (d) whether other industries or projects are dependent on the development of the resource. (4) In determining whether to grant consent to the proposed development, the significance of the resource is to be the consent authority's principal consideration under this Part. (5) Accordingly, the weight to be given by the consent authority to any other matter for consideration under this Part is to be proportionate to the importance of that other matter in comparison with the significance of the resource. (e) (6) To avoid doubt, the obligations of a consent authority under this clause extend to any application to modify a development consent.	The overall extent of the resource is identified as significant and valuable following preliminary testing carried out for this development. The proposal does not represent the full extent of the resource as the use of the material is intended for local and regional use. The Department of Trade & Investment advises that Basalt is not a prescribed mineral and as such it has "*no statutory role in authorising or regulating the extraction of this commodity*". The facility will generate employment for 6 people. Capital investment is expected to be in the vicinity of $166,250. No royalty payments are anticipated to be required. As advised above the Department of Trade & Investment advises that Basalt is not a prescribed mineral and as such it has "*no statutory role in authorising or regulating the extraction of this commodity*". The Department will however require the proponent to submit reports of extraction. No other form of assessment of advice has been provided by the Department at this stage. Should the small extraction carried out under this application prove satisfactory and successful options exist for the further extraction of the available resource. In general the operation can be carried out with minimal impact on any other activity or land use in the vicinity.	

Clause 12AB Non-discretionary development standards for mining.	(1) The object of this clause is to identify development standards on particular matters relating to mining that, if complied with, prevents the consent authority from requiring more onerous standards for those matters (but that does not prevent the consent authority granting consent even though any such standard is not complied with). (2) The matters set out in this clause are identified as non-discretionary development standards for the purposes of section 79C (2) and (3) of the Act in relation to the carrying out of development for the purposes of mining. **Note.** The development standards do not prevent a consent authority from imposing conditions to regulate project-related noise, air quality, blasting or ground vibration impacts that are not the subject of the development standards.	We would consider that the development is not of the type referred to in the Policy as it is not carrying out the act of mining but is a extractive industry. As such we submit that the measures referred to in the state policy are not specifically relating to the development. If however Council and authorities do consider the matters in the amended Policy apply we comment as follows –	
	(3) Cumulative noise level The development does not result in a cumulative amenity noise level greater than the acceptable noise levels, as determined in accordance with Table 2.1 of the Industrial Noise Policy, for residences that are private dwellings.	**a. On cumulative noise level** – With the crusher operating and controls in place the prediction is that the facility would operate with minimal noise impact on the local noise environment and not exceed criteria.	
	(4) Cumulative air quality level The development does not result in a cumulative annual average level greater than 30 µg/m3 of PM10 for private dwellings.	**b. On cumulative air quality level** – the cumulative annual average PM_{10} for private dwellings not owned by a mine are identified as all receivers around the site is 0 to 15. Irrespective of ownership R4 has a predicted cumulative annual average PM_{10} level of 1-2.	
	(5) Airblast overpressure Airblast overpressure caused by the development does not exceed: (a) 120 dB (Lin Peak) at any time, and (b) 115 dB (Lin Peak) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	**c. On airblast overpressure** – the development does not involve blasting.	
	(6) Ground vibration Ground vibration caused by the development does not exceed: (a) 10 mm/sec (peak particle velocity) at any time, and (b) 5 mm/sec (peak particle velocity) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	**d. On ground vibration** – The level of vibration would not be perceptible at site boundaries based on numerous observations at similar operating quarries studied by Benbow Environmental. Thus, further assessment is not considered warranted.	
	(7) Aquifer interference Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure	**e. On aquifer interference** – the development is not anticipated to extend to the depth of any aquifer.	

	and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the Aquifer Interference Policy for each relevant water source listed in column 1 of that Table. **Note.** The taking of water from all water sources must be authorised by way of licences or exemptions under the relevant water legislation. (8) The Minister is to review a non-discretionary development standard under this clause if a government policy on which the standard is based is changed.		
Clause 12 Compatibility of proposed mine, petroleum production or extractive industry with other land uses	Before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must: (a) Consider: (i) the existing uses and approved uses of land in the vicinity of the development, and (ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and (iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and (b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and (c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).	The uses in the vicinity of the land are identified above as residential, rural activities. The area in general has established as a rural and rural residential location. Any incompatibility with adjoining uses has been assessed in terms of noise and air quality and transport and measures are proposed to aid in reducing any impact to acceptable levels. The facility would provide public benefits to industry in the local and regional context with the supply of a resource suitable for road surfacing and concrete industry.	YES
Clause 14 Natural resource management and environmental management	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following: (a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable, (b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest	This Environmental Impact Statement has assessed the potential for impacts and measures that can be undertaken to ensure the development is carried out in an environmentally responsible manner. The Council and Joint Regional Planning Panel will consider these measures and apply conditions as necessary or appropriate.	YES

	extent practicable, (c) that greenhouse gas emissions are minimised to the greatest extent practicable. (2) Without limiting subclause (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.		
Clause 15 Resource recovery	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery. (2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material. (3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.	It is submitted for consideration that the facility is ideally located to enable excellent resource recovery by being located on land containing the resource. In terms of clause 15 it is submitted that – 1. The recovery of the basalt resource is efficient considering that the material can be extracted by ripping and crushing, involving no need for blasting. In this regard the extraction is also capable of being carried out in a location confined by encroaching rural settlement with controls that provide for noise and air quality measures to be satisfactorily implemented and within manageable environmental parameters such as water management and visual impacts. The resource is also capable of direct access to and from the Hume Highway for efficient management or transport and giving direct access to transport routes to users with no interference to other rural roads that might otherwise need traffic management measures imposed. 2. The Council has referrals from government authorities that provide for the conditioning of the consent to ensure environmental standards are adhered to; such as noise and air quality measures, and the installation of landscaping and visual impact measures that are proposed. It is not considered that there would be any waste from the operation other than materials generated from the site office. On-site waste water is managed as assessed in the report prepared by SEEC and attached.	YES

		3. Having regard to the ability to condition the development in accordance with government authority advices and any measures Council considers appropriate for the removal of office waste to an approved waste management and recovery facility managed by Council in Goulburn.	
Clause 16 Transport	(1) Before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following: (e) require that some or all of the transport of materials in connection with the development is not to be by public road, (f) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools, (g) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads. (2) If the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within 7 days after receiving the development application, provide a copy of the application to: (a) each roads authority for the road, and (b) the Roads and Traffic Authority (if it is not a roads authority for the road). **Note.** Section 7 of the *Roads Act 1993* specifies who the roads authority is for different types of roads. Some roads have more than one roads authority. (3) The consent authority: (a) must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application, and (b) must provide them with a copy of the determination. (4) In circumstances where the consent authority is a roads authority for a public road to which subclause (2) applies, the references in subclauses (2) and (3) to a roads authority for that road do not include the consent	The facility has access to road transport only. Once material is processed transport to end users varies, including farm, construction industry and road uses. Tiyces lane from the Hume highway to the site does not have any residential areas or schools. A traffic assessment has been carried out addressing the existing road and transport volumes from the operation.	YES

	authority.		
Clause 17 Rehabilitation	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development. (2) In particular, the consent authority must consider whether conditions of the consent should: (a) require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or (b) require waste generated by the development or the rehabilitation to be dealt with appropriately, or (c) require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the *Contaminated Land Management Act 1997*), or (d) require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.	Full details of the rehabilitation of the quarry are incorporated into the Operational Environmental Management Plan.	YES
Environmental Planning and Assessment Act 1979			
Section 5 Objects	The objects of this Act are: (a) to encourage: (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment, (ii) the promotion and co-ordination of the orderly and economic use and development of land, (iii) the protection, provision and co-ordination of communication and utility services, (iv) the provision of land for public purposes, (v) the provision and co-ordination of community services and facilities, and (vi) the protection of the environment, including the protection and conservation of native animals and plants,	The development is designed to conserve natural and artificial resources existing at the site by planning around such parameters and containing the development to the current area of impact whilst retaining 95% of the site in an existing or natural state, and proposing the extension of vegetation planting. The objectives of the development intend to provide for the orderly and economic provision of the industry and service offered by Jasminco Resources Pty Ltd. Having regard to the process of assessment, consideration and determination of the proposal and the ability for the development to be conducted in a satisfactory manner in the locality it is submitted that the development is an orderly and economic use and development of the land and more particularly of a resource under the land before it is sterilised by encroaching development that is occurring in general in a large majority	YES

	including threatened species, populations and ecological communities, and their habitats, and (vii) ecologically sustainable development, and (viii) the provision and maintenance of affordable housing, and (b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and (c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.	of the rural area. The development can be operated within the existing infrastructure of the site and locality. The assessment of the development and the intended environmental management and mitigation measures will ensure the protection of the environment and provide for an ecologically sustainable development. The exhibition of this proposal will provide the opportunity for the public to have input.	
Section 5A Significant effect on threatened species, populations or ecological communities, or their habitats	(1) For the purposes of this Act and, in particular, in the administration of sections 78A, 79B, 79C, 111 and 112, the following must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats: (a) each of the factors listed in subsection (2), (b) any assessment guidelines (2) The following factors must be taken into account in making a determination under this section: (a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction, (b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction, (c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction, (d) in relation to the habitat of a threatened species, population or	The Ecological Assessment carried out for the site having regard to the proposed development establishes that the proposal will not adversely impact threatened species, endangered population or ecological community or critically endangered ecological community, or the habitat of any threatened species, population or ecological community. It is submitted that the proposal does not constitute or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	YES

	ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality, (e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly), (f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan, (g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		
Section 5B Planning authorities to have regard to register of critical habitat	(1) Each planning authority must have regard to the register of critical habitat kept by the Director-General of National Parks and Wildlife under the *Threatened Species Conservation Act 1995* when exercising its functions under this Act. (2) In this section, ***planning authority*** in relation to a function under this Act means: (a) in the case of a function relating to a development application—the consent authority (or a person or body taken to be a consent authority), and (3) (b) in the case of any other function—the public authority or other person responsible for exercising the function.	There is no declared critical habitat within the area of Goulburn Mulwaree Council. Notwithstanding this the Ecological Assessment study has fully assessed flora and fauna.	YES
Section 78A(8) Application	(8) A development application (other than an application in respect of State significant development) must be accompanied by: (a) if the application is in respect of designated development—an environmental impact statement prepared by or on behalf of the applicant in the form prescribed by the regulations, or (b) if the application is in respect of development on land that is, or is a part of, critical habitat or is likely to significantly affect threatened species, populations or ecological communities, or their	This Environmental Impact Statement provides the required statement. The application has been prepared in accordance with the specifications issued by Planning & Environment. The format is not similar to prior traditional Environmental Impact Statement layouts due to the now more detailed analysis of specific environmental factors necessary. However the traditional format has been followed within each section. The Ecological Assessment identifies that the development will not have a	YES

	habitats—a species impact statement prepared in accordance with Division 2 of Part 6 of the *Threatened Species Conservation Act 1995*. (9) **Note.** Part 7A of the *Threatened Species Conservation Act 1995* provides for certain circumstances in which development is taken not to significantly affect threatened species, populations or ecological communities, or their habitats.	significant effect on threatened species, populations or ecological communities, or their habitats.	
Environmental Planning and Assessment Regulations 2000			
Schedule 2 Environmental impact statements	**1 Summary** A summary of the environmental impact statement. **2 Statement of objectives** A statement of the objectives of the development, activity or infrastructure. **3 Analysis of alternatives.** An analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure, **4 Environmental assessment** An analysis of the development, activity or infrastructure, including: (i) a full description of the development, activity or infrastructure, and (ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected, and (iii) the likely impact on the environment of the development, activity or infrastructure, and (iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and (v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out, **5 Compilation of measures to mitigate adverse effects** A compilation (in a single section of the environmental impact statement) of the measures referred to in item 4 (iv). **6 Justification of development**	The Environmental Impact Statement has provided for a statement of objectives, and analysis of alternatives and an environmental assessment as required. The project has been justified in accordance with section 79C of the Environmental Planning and Assessment Act 1979 and ecologically sustainable development. Conclusions have been drawn in the assessment of sustainability based upon the preceding environmental analysis and subsequent revised analyses and the benefit of considerations of government authority matters and public submissions.	YES

	The reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the following principles of ecologically sustainable development: The principles of ecologically sustainable development are as follows: (a) the ***precautionary principle***, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and (ii) an assessment of the risk-weighted consequences of various options, (b) ***inter-generational equity***, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations, (c) ***conservation of biological diversity and ecological integrity***, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration, (d) ***improved valuation, pricing and incentive mechanisms***, namely, that environmental factors should be included in the valuation of assets and services, such as: (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste, (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.		

Threatened Species Conservation Act 1995			
	The New South Wales *Threatened Species Conservation Act 1995* requires that the following matters be taken into account when considering whether a proposal is likely to have a significant effect on threatened species, populations or ecological communities.	The Ecological Assessment has made an assessment of these matters and concluded that the proposal will have negligible impact on biodiversity components. No significant species were observed on the site, were found to be recorded nearby nor was habitat important for rare or threatened species of the area recorded in the study area. The potential of this proposal to impact on threatened species has been addressed by way of Assessments of Significance and it has been found that no significant impact is likely. Implementation of best practice impact mitigation measures as discussed in this report will further help to manage any potential impact of the proposal. There are no other issues concerning biodiversity components associated with this site the overall impact of this proposal on these aspects will be negligible	Yes.
Environment Protection and Biodiversity Conservation Act 1999			
	The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance". The Act identifies nine matters of national environmental significance being: 1) World Heritage properties 2) National heritage places 3) Wetlands of international importance (Ramsar wetlands) 4) Threatened species and ecological communities 5) Migratory species 6) Commonwealth marine areas 7) Nuclear actions (including uranium mining) 8) Great Barrier Reef Marine Park 9) Water impacts from coal seam gas and large coal mining actions	The Ecological Assessment has made an assessment of these matters and concluded – 1) Matters 4 and 5 only are relevant to the proposal. 2) The endangered ecological community White Box – Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland is protected by the EPBC Act however the community on the site does not fall into the definition of the commonwealth listed community and further assessment is not necessary. 3) No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat.	YES
Goulburn Mulwaree Local Environmental Plan 2009			
Land Use Table **Zone E3 Environmental Management**	**1 Objectives of zone** • To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values. • To provide for a limited range of development that does not have an adverse effect on those values. • To facilitate the management of water catchment areas,	The does not appear to contain any areas with special ecological, scientific, cultural or aesthetic values, having been developed and managed for agricultural activity in the past. The proposal would be developed within part of the agricultural area of the lot and can be carried out without significantly affecting the agricultural	YES

	environmentally sensitive land and areas of high conservation value. **2 Permitted without consent** Environmental protection works; Extensive agriculture; Home occupations **3 Permitted with consent** Agriculture; Air strips; Animal boarding or training establishments; Camping grounds; Caravan parks; Cemeteries; Child care centres; Community facilities; Depots; Dwelling houses; Eco-tourist facilities; Emergency services facilities; Entertainment facilities; Environmental facilities; Farm buildings; Forestry; Home-based child care; Home businesses; Home industries; Information and education facilities; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Research stations; Roads; Rural workers' dwellings; Secondary dwellings; Signage; Stock and sale yards; Tourist and visitor accommodation; Water recycling facilities **4 Prohibited** Industries; Intensive livestock agriculture; Multi dwelling housing; Residential flat buildings; Retail premises; Rural industries; Seniors housing; Service stations; Serviced apartments; Warehouse or distribution centres; Any other development not specified in item 2 or 3	values. The proposal has been assessed in environmental terms and can be carried out without affecting those values. The proposal does not impact on any environmentally sensitive land or area of high conservation value. The development currently and following the extensions is not generally visible from nearby roads. The use is identified as permissible as discussed above in section 1.3.	
Clause 4.3 Height of Buildings	**4.3 Height of buildings** (1) The objectives of this clause are as follows: (a) to ensure the height of buildings complements the streetscape or the rural character of the area in which the buildings are located, (b) to protect the heritage character and significance of buildings and avoid an adverse effect on the integrity of heritage items, (c) to ensure the height of buildings protects the amenity of neighbouring properties in terms of visual bulk, access to sunlight, privacy and views. (2) The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.	The land is not affected by a height of building limitation. The development would generally not be visible in terms of streetscape and is not located in the vicinity of a heritage item, is not bulky or affect access to sunlight, privacy or views.	YES
Clause 4.4 Floor space ratio	**4.4 Floor space ratio** (1) The objectives of this clause are as follows:	The land is not affected by a floor space ratio limitation.	N.A.

	(a) to ensure the bulk and scale of development does not have an unacceptable impact on the streetscape and character of the area in which the development is located. (2) The maximum floor space ratio for a building on any land is not to exceed the floor space ratio shown for the land on the Floor Space Ratio Map.		
Clause 4.6 Exceptions to development standards	(1) The objectives of this clause are as follows: (a) to provide an appropriate degree of flexibility in applying certain development standards to particular development, (b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances.	The proposal does not involve any exceptions to development standards.	N.A.
Clause 5.9 Preservation of trees or vegetation	(1) The objective of this clause is to preserve the amenity of the area, including biodiversity values, through the preservation of trees and other vegetation. (2) This clause applies to species or kinds of trees or other vegetation that are prescribed for the purposes of this clause by a development control plan made by the Council. **Note.** A development control plan may prescribe the trees or other vegetation to which this clause applies by reference to species, size, location or other manner.	None of the trees on site are identified in a Development Control Plan.	N.A.
Clause 5.9AA Trees or vegetation not prescribed by development control plan.	(1) This clause applies to any tree or other vegetation that is not of a species or kind prescribed for the purposes of clause 5.9 by a development control plan made by the Council. (2) The ringbarking, cutting down, topping, lopping, removal, injuring or destruction of any tree or other vegetation to which this clause applies is permitted without development consent.	It is noted that development consent is not required for the removal of trees for the development. In any instance no trees will require removal for the development.	YES
Clause 5.10 Heritage conservation	**(1) Objectives** The objectives of this clause are as follows: (a) to conserve the environmental heritage of Goulburn Mulwaree, (b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views, (c) to conserve archaeological sites, (d) to conserve Aboriginal objects and Aboriginal places of heritage significance.	The site is not within a heritage conservation area and is not identified as a heritage item.	YES
Clause 7.1 Flood planning	(1) The objectives of this clause are as follows:	The site is not identified as being affected by flood planning.	N.A.

	(a) to maintain the existing flood regime and flow conveyance capacity, (b) to enable safe occupation and evacuation of land subject to flooding, (c) to avoid significant adverse impacts on flood behaviour, (d) to avoid significant effects on the environment that would cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, (e) to limit uses to those compatible with flow conveyance function and flood hazard.		
Clause 7.1A Earthworks	(1) The objectives of this clause are as follows: (a) to ensure that any earthworks will not have a detrimental impact on environmental functions and processes, neighbouring uses or heritage items and features of the surrounding land, (b) to allow earthworks of a minor nature without separate development consent. (2) Development consent is required for earthworks, unless: (a) the work is exempt development under this Plan or *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*, or (b) the consent authority is satisfied the earthworks are of a minor nature. (3) Before granting development consent for earthworks, the consent authority must consider the following matters: (a) the likely disruption of, or any detrimental effect on, existing drainage patterns and soil stability in the locality, (b) the effect of the proposed development on the likely future use or redevelopment of the land, (c) the quality of the fill or of the soil to be excavated, or both, (d) the effect of the proposed development on the existing and likely amenity of adjoining properties, (e) the source of any fill material or the destination of any excavated material, (f) the likelihood of disturbing Aboriginal objects or other relics, (g) proximity to and potential for adverse impacts on any watercourse, drinking water catchment or environmentally sensitive area.	Earthworks proposed are shown on the overall and detailed site development plan for the quarry. The aspects of the development have been incorporated into the water cycle management assessment and soil and water management planning by SEEC. All aspects of impact have been incorporated into the several reports for the proposed development. It is proposed that clean fill only be used on site. Measures to be taken in areas to be disturbed for engineering works has been addressed by SEEC in the assessments.	YES
Clause 7.2	(1) The objectives of this clause are to	The site is within an area of terrestrial	YES

Terrestrial biodiversity	protect, maintain or improve the diversity of the native vegetation, including: (a) protecting biological diversity of native flora and fauna, and (b) protecting the ecological processes necessary for their continued existence, and (c) encouraging the recovery of threatened species, communities or populations and their habitats. (2) This clause applies to development on land that is identified as "Biodiversity" on the Terrestrial Biodiversity Map. (3) Development consent must not be granted to development on land to which this clause applies unless the consent authority has considered a report that addresses the following matters: (a) identification of any potential adverse impact of the proposed development on any of the following: (i) a native vegetation community, (ii) the habitat of any threatened species, population or ecological community, (iii) a regionally significant species of plant, animal or habitat, (iv) a habitat corridor, (v) a wetland, (vi) the biodiversity values within a reserve, including a road reserve or a stock route, and (b) a description of any proposed measures to be undertaken to ameliorate any such potential adverse impact. (4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is consistent with the objectives of this clause and: (a) the development is designed, sited and managed to avoid the potential adverse environmental impact, or (b) if a potential adverse impact cannot be avoided, the development: (h) is designed and sited so as to have minimum adverse impact, and 1. incorporates effective measures so as to have minimal adverse impact, and 2. mitigates any residual adverse impact through the restoration of any existing disturbed or modified area on the site.	biodiversity. Ecological Assessments was carried out over the land concluding that the proposal will have negligible impact on biodiversity components. No significant species were observed on the site, were found to be recorded nearby nor was habitat important for rare or threatened species of the area recorded in the study area. The potential of this proposal to impact on threatened species has been addressed by way of Assessments of Significance and it has been found that no significant impact is likely. Implementation of best practice impact mitigation measures as discussed in the Assessment will further help to manage any potential impact of the proposal. There is no other issues concerning biodiversity components associated with this site the overall impact of this proposal on these aspects will be negligible. It is submitted that the development is designed and utilises only sufficient land for its activity whilst leaving 95% of the land untouched and in a natural state or existing agricultural use state. As such the development is consistent with the objectives of the clause, is managed to avoid adverse impacts and will be managed to not adversely impact, but in fact improve the environmental qualities of the site with extensive tree planting.	

Protection of the Environment Operations Act 1997			
	The act requires that a person must hold a license for a scheduled activity.	The Environmental Impact Statement provides for the assessment of the development for the purposes of an integrated development application to obtain the required license.	YES
State Environmental Planning Policy No. 44 – Koala Habitat Protection 1995			
Clause 3 Aims, objectives etc.	1. This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline: (a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat; and (b) by encouraging the identification of areas of core koala habitat; and (c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.	The Ecological Assessment has established that while Koalas may occur occasionally in the district, this site and adjoining lands do not support likely Koala habitat and despite searches no signs of Koala occupation were observed in the area during site visits. No further consideration under this SEPP is necessary.	YES
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011			
Clause 3 Aims of policy	The aims of this Policy are: (a) to provide for healthy water catchments that will deliver high quality water while permitting development that is compatible with that goal, and (b) to provide that a consent authority must not grant consent to a proposed development unless it is satisfied that the proposed development will have a neutral or beneficial effect on water quality, and (c) to support the maintenance or achievement of the water quality objectives for the Sydney drinking water catchment. **Note.** The water quality objectives for the Sydney drinking water catchment can been found in the Annual Water Quality Monitoring Reports published by the Authority. For example, see Table 5.1 in the *Annual Water Quality Monitoring Report 2008–2009*	The development has been assessed against the matter for consideration, especially in the Water Cycle management by SEEC.	YES
Clause 10 Development consent cannot be granted unless neutral or beneficial effect on water quality.	**Clause 10 states:** (1) A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality. (2) For the purposes of determining		

	whether the carrying out of the proposed development on land in the Sydney drinking water catchment would have a neutral or beneficial effect on water quality, the consent authority must, if the proposed development is one to which the NorBE Tool applies, undertake an assessment using that Tool. **Note.** The NorBE Guideline provides information and guidance for consent authorities in the use of the NorBE Tool.		
State Environmental Planning Policy (Rural Lands) 2008			
Clause 2 Aims of Policy	The aims of this Policy are as follows: (a) to facilitate the orderly and economic use and development of rural lands for rural and related purposes, (b) to identify the Rural Planning Principles and the Rural Subdivision Principles so as to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State, (c) to implement measures designed to reduce land use conflicts, (d) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations, (e) to amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.	The development does not involve a rural subdivision or dwelling house and as such Part 3 is not applicable. The land is not identified as State Significant Agricultural Land and as such Part 4 is not applicable.	
Clause 7 Rural Planning principles	The Rural Planning Principles are as follows: (a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas, (b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State, (c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development, (d) in planning for rural lands, to balance the social, economic and environmental interests of the community, (e) the identification and protection	In terms of the rural planning principles the proposed facility – 1. Provides for the establishment of an economic activity that is based on material sourced from the rural area. 2. Does not utilise more land than is necessary leaving approximately 95% of the land untouched and unaffected for any future rural or agricultural use. 3. The site is located in closed proximity to the Hume Highway and can be easily transported along the highway and serve needs within the local area and region, particularly Goulburn. 4. The use provides for the protection of a large proportion of agricultural and natural resource by not utilising 90% of the land. 5. Would not adversely impact adjoining properties or activities as	

	of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land, (f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities, (g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing, (h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General. **Note.** Under section 117 of the Act, the Minister has directed that councils exercise their functions relating to local environmental plans in accordance with the Rural Planning Principles. Under section 55 of the Act, the Minister may also direct a council to prepare a local environmental plan.	assessed in several studies provided management recommendations are followed. 6. In general it is considered that the proposed development is consistent with the rural planning objectives.	
Goulburn Mulwaree Development Control Plan 2009			
Clause 5 Principal development controls - Rural			
Clause 5.8 Rural land use conflict **Clause 5.8.1.1 Buffer distances**	This control relates to the location of dwellings in the rural area recognising the significant of rural activity and resources. *Rural dwellings and proposed dwelling envelopes are to be separated from other rural landuses in accordance with Table 5-1 below. This is to minimise negative impacts on rural dwellings from agriculture and rural industry by way of dust, fumes, odour, spray drift, light and noise. Failure to ensure adequate setbacks can lead to landuse conflict which has the potential to significantly impact on rural production, with resultant adverse effects on local employment and economic activity. As a general principle, all required buffers are to be provided on the land subject of the development proposal.* *Agriculture, forestry and associated rural industry are significant sources of economic activity and employment. Because of this, rural dwelling*	Whilst the clause applies to the consideration of dwelling houses it is included in reverse for this proposed development. The studies applied to the development have established that all relevant noise and air qualities aspects can be conducted for the quarry without exceeding standards applicable to the industry. As such it is not seen that the development cannot be co-located in the area containing dwelling houses. The principle espoused in the DCP clause is also consistent with the advice attached to the section 149 certificate on the sale of the land the subject of this application in 2005 (included as schedule E of the Certificate). Further consideration of this clause is given above.	YES

	development is a secondary, or ancillary, use of rural land and should not adversely impact on the continuing viability of these industries, including their ability to adapt to changing market and environmental circumstances, through new techniques, approaches and crops. On this basis, Council will not accept the imposition of restrictions on the use of adjoining rural lots in lieu of appropriate buffers within the designated large lot residential areas.		
Clause 5.8.1.2 Variation to buffers	The required buffers may be reduced if, in the opinion of Council, the development will not be adversely affected by the use of adjoining land. In assessing whether reduced buffers are acceptable in a particular case, Council will consider the following variation criteria: • the extent, nature and intensity of the adjoining land use • the operational characteristics of the adjoining land use • the external effects likely to be generated by the adjoining land use (i.e. dust, fumes, odour, spray drift, light and noise) and their potential to cause conflict • the potential of adjoining land to be used for various commercial activities including agriculture, quarries, rural industries etc. • any topographical features or vegetation which may act to reduce the likely impacts of an adjoining land use • prevailing wind conditions and any other climatic characteristics • any other mitigating circumstances Table 5.1 of the clauses states that a dwelling should be 1000 metres from an extractive industry.		
		The Schedule to the Section 149 Certificate stated as follows –	

SCHEDULE E

NOTICE TO PURCHASERS OF RURAL LAND IN THE MULWAREE LOCAL GOVERNMENT AREA

1. Mulwaree Shire Council supports the rights of persons to carry out legitimate rural and agricultural uses and practices on rural land.

2. Mulwaree Shire Council will not support any action to interfere with the legitimate rural and agricultural use of rural land, where such activities or uses are carried out in accordance with industry standards relevant regulations or approvals. Council wishes to point out that some of the activities listed in Point 3 will have required formal consent of Council and/or Government agencies.

3. Intending purchasers are advised that legitimate rural and agricultural uses of land may include:

   - Aerial spraying
   - Animal husbandry and animal husbandry practices (castration, dehorning etc)
   - Bush Fire hazard reduction burning
   - Clearing and cultivation of land
   - Construction of access roads and tracks
   - Construction of dams, drains, landfill and contour banks
   - Construction of fire breaks
   - Dairies
   - Driving livestock on roads
   - Fencing and stock yards
   - Intensive livestock waste disposal systems and ponds
   - Livestock feed lots
   - Logging and milling of timber
   - Machinery sheds and rural outbuildings
   - Pesticide spraying
   - Piggeries, poultry farms and mushroom farms
   - Planting of woodlots
   - Pumping and irrigation
   - Extractive industries, mines and ancillary works
   - Rural industries (eg. olive and rabbit processing plants)
   - Tourist facilities
   - Silage production
   - Slashing and mowing vegetation
   - Traffic on unsealed roads
   - Use and repair of agricultural machinery tractors, chainsaws, motor bikes etc
   - Weedicide spraying

4. Intending purchasers of rural land who consider they may have difficulty in living with the above practices being carried out on adjacent land should seriously consider their position with respect to purchasing in a rural area. Many rural and agricultural practices, by necessity, are carried out very early in the morning or late into the evening.

Adopted by Council at a meeting on 23 May 2002.

Clause 6.11 Extractive industries	(1) Community consultation Applicants are encouraged to interact with local residents and local community groups during the full lifecycle of the development… (2) Setbacks Extraction operations should be setback no less than: • 1,000 metres from a residence not associated with extractive operations	Neighbours were contacted through Goulburn Mulwaree Council prior to the commencement of the preparation of this EIS. No submissions were received. As discussed above in reverse in relation to dwelling house locations. No other information is available to indicate a reason for the identified separation distance. The studies applied to the development have established that all relevant noise and air qualities aspects can be conducted for the quarry without exceeding standards applicable to the industry. As such it is not seen that the development cannot be co-located in the area containing dwelling houses.	

Subject to the consideration by Council it is submitted that the proposal complies with the relevant statutory provisions.

21. ENVIRONMENTAL JUSTIFICATION

The establishment of the above facilities have been determined by Jasminco Resources Pty Ltd to enable the relatively small scale supply of basalt for local and regional industry.

The facility would -

a. Provide for the establishment of a resource extraction before the resource becomes any more constrained from future development.
b. Have minimal impact in relation to all potential environmental impacts.
c. Provide for the employment of people in the district.
d. Supply the ongoing needs for the industries that calls for the product that would be extracted at the facility.
e. Develop the facility in accordance with current best practices for safety and operation.
f. Develop the facility having regard to all environmental constraints and ensuring that an adverse impact is not caused to the existing natural environment.
g. Carry out works within the existing natural environment that will provide for a beneficial impact on the water cycle, including the extensive planting of trees.
h. Provide a development that will not be visually imposing given the extent of surrounding vegetation and general topography.

Having regard to the need for the resource Goulburn Mulwaree is proving to play an important part in providing natural resources from mines and quarries. A quick review over the internet revealed the following large quarry approvals for the Goulburn Mulwaree area include (but not limited to):

Pepper Tree Marulan South – Granodiorite Products generated from the Boral Peppertree Quarry include a range of aggregates, shaped and sized for different purposes. The main production items are concrete and asphalt aggregates, although larger aggregates for 'armour' or 'gabion baskets' can be produced, along with railway ballast.

Boral Marulan South – Limestone The mine is located in Marulan South, 10 kilometres (km) southeast of Marulan village and 35 km east of Goulburn, within the Goulburn Mulwaree Local Government Area.

The Boral Marulan South Limestone Plant and Mine is formerly part of the Blue Circle Southern Cement folio of works. The site is renowned for its high quality limestone deposit, with its products being used in iconic structures such as the Sydney Opera House. Today's operations produce a range of raw materials used in construction, manufacturing and agriculture. As one example, lime products from Marulan South are transported by rail to the Berrima Cement Works where they are used in the production of around 60 percent of all cement used in NSW. Boral Marulan South Limestone is the employer of around 120 local people. In current market conditions, the site generates around 3 million tonnes per annum (Mtpa) of 'run-ofmine' limestone and 130 000 tonnes of shale per annum.

Council approved a manufactured sand plant in 2012 further widening the potential use of the resources to manufactured sand within the existing production volumes. Boral have been issued SEAR's for a proposed 30 year mine plan seeking extension and continued operation up to 3.5Mtpa and clay shale at 200,000 tpa.

Ardmore Park – Bungonia (Multiquip Quarries sand and basalt). "Ardmore Park" Quarry situated at Bungonia 25km southeast of Goulburn NSW. The property contains a vast resource of both basalt rock and river sand. Multiquip has approval to produce up to 400,000tpa of sand and hard rock products per year.

Gunlake Quarries - Resource material is tuffaceous rhyodacite Located on a rural property approximately eight kilometres north west of Marulan, 30 km east of Goulburn and about 160 km south west of Sydney. NSW to service Sydney and the Southern Highlands. This newly-built quarry produces a wide variety of premium bulk aggregates for concrete, construction and asphalt and specified and non-specified road base.

SEAR's have been issued for an expansion to Gunlake Quarry. Gunlake seeks a new development consent that allows: 2 million tonnes per annum (Mtpa) of saleable products to be produced; an increase in truck movements to an average of 440 movements per day; extension of the quarry pit footprint by 150 percent to approximately 63 ha; 24 hour per day primary crushing; additional overburden emplacement to accommodate the increase in production; and blasting twice weekly.

Lynwood Quarry - ignibrite resource Holcim Australia operate a quarry which has consent for 5 Mtpa (approximately 30 year supply). Lynwood Quarry is a hard rock quarry currently being constructed by Holcim (Australia) Pty Ltd to the west of Marulan.

A SEAR's request has been lodged for a new pit 500m west of the approved pit to extract a granite resource within the current approved volumes. Holcim have identified the variability of the approved ignibrite resource will make it challenging to produce in-specification products.

Woodlawn Mine - located on the Great Dividing Range 10 km west of Tarago in the Goulburn Mulwaree local government area. TriAusMin Limited proposed to re-establish mining operations on part of the former mine. The development has two stages - the recovery of resources from the existing tailings dams and the reopening of the underground mine. TriAusMin would extract up to 1.5 million tonnes of tailings and underground ore per year to produce a maximum of 150,000 tonnes of copper, lead and zinc ore concentrate per year, for up to 21 years. This concentrate would be trucked to Port Kembla, Port Botany or the Port of Newcastle (or a combination of all three) for export. Approval has been obtained.

Laterals notes that Ardmore Park, with the only specifically identified basalt resource, has not commenced development following an approval some years ago. As such there is no quarry specifically dedicated to the supply of basalt and one which is proposed to be commenced by the proponent immediately upon approval.

In terms of the above assessment of the existing environment, environmental management and mitigation measures, conclusions and summary of environmental mitigation measures the proposed development can be carried out with minimal, nil, or beneficial, impact on the environment.

The development can achieve reasonable objectives and overcome the consequences of no development with the completion of the proposal in and manner discussed above provided the environmental mitigation measures are carried through.

The development has been assessed in terms of ecologically sustainable development in the reaching of general conclusions based upon the environmental analysis.The development has been assessed in terms of ecologically sustainable development in the reaching of general conclusions based upon the environmental analysis. In terms of identification and prioritisation of issues the proposal is for a small local quarry to service local and some limited regional needs. The site and its area of impact is very small in comparison to the other large developments noted above and having regard to the EIs industry guidelines. The guideline also states that the analysis of individual issues would reflect the level of significance of their impacts. In this regard the level of impacts is relatively small and all manageable as is evidenced in responses from authorities.

The following is a summary assessment of the proposed development under the heads of consideration contained in Section 79C (1) of the Environmental Planning and Assessment Act.

Section 79C (1) (a) (i) - The provisions of any environmental planning instrument
The proposal is permissible with consent and conforms with the relevant provisions of the environmental planning instruments applying to this.

Section 79C (1) (a) (ii) - The provisions of any draft environmental planning instrument
There are no known relevant draft environmental planning instruments applicable to this proposal.

Section 79C (1) (a) (iii) - The provisions of any development control plans
The provision of Goulburn Mulwaree Development Control Plan 2010 have been considered.

Section 79C (1) (a) (iv) - Matters prescribed by the Regulations
The relevant matters prescribed by the Regulations applicable to this matter have been taken into consideration and the development satisfactorily addresses those matters.

Section 79C (1) (b) - Likely impacts of the development
The proposal will have no adverse or identifiable impact in terms of:

- context and setting;
- access, transport and traffic;
- the public domain;
- utilities;
- heritage;
- other land resources;
- water;
- soils;
- air and microclimate;
- flora and fauna;
- waste;
- energy;
- noise and vibration;
- natural hazards;
- technological hazards;
- safety, security and crime prevention;
- social impact;
- economic impact;
- site design and internal design;
- construction; or
- cumulative impacts.

Section 79C (1) (c) - Suitability of the site for the development
The proposal is suitable for the site in accordance with the requirements of State Environmental Planning Policy (Mining, Petroleum Products, Extractive Industries) 2007 and Goulburn Mulwaree Local Environmental Plan 2009 and other relevant legislation and assessed as suitable for the site.

Section 79C (1) (d) - Submissions
The development was referred to Council with copies of a letter and outline of the proposal for referral to neighbouring properties. No submissions have been received from neighbours either directly or through the Council.

Section 79C (1) (e) - Public interest
There is no issue of public interest that should preclude the approval of this proposal.

APPENDIX 1 – Director-Generals Requirements and Requirements of Government Agencies

APPENDIX 2 – Review of Director-Generals Requirements and Requirements of Government Agencies

ENVIRONMENTAL IMPACT STATEMENT
ARGYLE QUARRY

APPENDIX 2
Secretary's Environmental Assessment Curlewin Quarry (EAR 1139)
Review of Government Agency Submissions

PROPOSAL BASALT QUARRY

LOTS 1 &2 DP 1094055

63 CURLEWIN LANE, BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK

Reference No. 1707 May 2017

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CONTENTS

1. REVIEW OF SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The following table summarises the requirements of the Department of Planning and Government Agencies for the preparation of the Environmental Assessment. A reference to 's' or 'Ss' is a reference to the EIS section or sections.

MATTER	ASSESSMENT	WHERE MATTER ADDRESSED and COMMENTS
NSW PLANNING & ENVIRONMENT		
General Requirements	The Environmental Impact Statement (EIS) for the development must comply with the requirements in Clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. In particular, the EIS must include: • an executive summary; • a comprehensive description of the development, including: - a detailed site description and history of any previous quarrying on the site, including a current survey plan; - identification of the resource, including the amount, type, composition; - the layout of the proposed works and components (including any existing infrastructure that would be used for the development); - an assessment of the potential impacts of the development, as well as any cumulative impacts, including the measures that would be used to minimise, manage or offset these impacts; - a detailed rehabilitation plan for the site; - any likely interactions between the development and any existing/approved developments and land uses in the area, paying particular attention to potential land use conflicts with nearby residential development; - a list of any other approvals that must be obtained before the development may commence; - the permissibility of the development, including identification of the land use zoning of the site; - identification of sensitive receivers likely to be affected by the development using clear maps/plans, including key landform areas, such as conservation areas and waterways; • a conclusion justifying why the development should be approved, taking into consideration: - alternatives; - the suitability of the site; - the biophysical, economic and social impacts of the project, having regard to the principles of ecologically sustainable development; and - whether the project is consistent with the objects of the Environmental Planning and Assessment Act 1979; and • a signed declaration from the author of the EIS, certifying that the information contained within the document is neither false nor misleading.	 EIS pp 9-57 No prior quarrying EIS s5.1.2 EIS s3.1 EIS Ss5-15 OEMP s11 EIS s15 & 19 EIS s 1.3 EIs s 1.3 EIs s7 EIS s20 EIS s 19 EIS p8
Consultation	In preparing the EIS for the development, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers and any surrounding landowners that may be impacted by the development. The EIS must describe the consultation that was carried out, identify the issues raised during this consultation, and explain how these issues have been addressed in the EIS.	Consultation has been through the DEP and prior DA processes.
Key Issues	The EIS must assess the potential impacts of the proposal at all stages of the development, including the establishment, operation and decommissioning of the development. The EIS must address the following specific issues: • **Noise** – including a quantitative assessment of potential: - construction and operational noise and off-site transport noise impacts of the development in accordance with the Interim Construction Noise Guideline, NSW Industrial Noise Policy and NSW Road Noise Policy respectively; - reasonable and feasible mitigation measures to minimise noise emissions; and - monitoring and management measures; • **Air** – including an assessment of the likely air quality impacts of the development in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW. The assessment is to give particular attention to potential dust impacts on any nearby private receivers due to construction activities, the operation of the quarry and/or road haulage; • **Water** – including: - a detailed site water balance and an assessment of any volumetric water licensing	 EIS s7 and attached reports EIS s8 and attached reports EIS s6 and attached WCMS, SWMP and

	requirements, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures; - identification of any licensing requirements or other approvals required under the Water Act 1912 and/or Water Management Act 2000; - demonstration that water for the construction and operation of the development can be obtained from an appropriately authorised and reliable supply in accordance with the operating rules of any relevant Water Sharing Plan (WSP) - a description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant Water Sharing Plan or water source embargo; - an assessment of activities that could cause erosion or sedimentation issues, and the proposed measures to prevent or control these impacts; - an assessment of any likely flooding impacts of the development; - an assessment of potential impacts on the quality and quantity of existing surface and ground water resources including a detailed assessment of proposed water discharge quantities and quality against receiving water quality and flow objectives, which demonstrates that the development will have a Neutral or Beneficial Effect on Water Quality (NorBE); and - a detailed description of the proposed water management system, water monitoring program and other measures to mitigate surface and groundwater impacts;	Waste Water Assessment and Water NSW advice letter
	• **Biodiversity** – including: - accurate predictions of any vegetation clearing on site; - a detailed assessment of the potential biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities and groundwater dependent ecosystems; - a detailed description of the proposed measures to maintain or improve the biodiversity values of the site in the medium to long term, as relevant; and - an assessment of whether a Species Impact Statement is required;	EIS s10 and attached reports
	• **Heritage** – including: - an assessment of the potential impacts on Aboriginal heritage (cultural and archaeological), including evidence of appropriate consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage; and - identification of Historic heritage in the vicinity of the development and an assessment of the likelihood and significance of impacts on heritage items, having regard to the relevant policies and guidelines listed in Attachment 1;	EIS s14 and attached reports
	• **Traffic &Transport** – including: - accurate predictions of the road traffic generated by the construction and operation of the development, including a description of the types of vehicles likely to be used for transportation of quarry products; - an assessment of potential traffic impacts on the capacity, condition, safety and efficiency of the local and State road networks, detailing the nature of the traffic generated, transport routes, traffic volumes and potential impacts on local and regional roads; - a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network (particularly the proposed transport routes) over the life of the development; - evidence of any consultation with relevant roads authorities, regarding the establishment of agreed contributions towards road upgrades or maintenance; and - a description of access roads, specifically in relation to nearby Crown roads and fire trails;	EIS s9 and attached reports
	• **Land Resources**– including an assessment of: - potential impacts on soils and land capability(including potential erosion and land contamination) and the proposed mitigation, management and remedial measures (as appropriate); - potential impacts on landforms (topography), paying particular attention to the long-term geotechnical stability of any new landforms (such as overburden dumps, bunds etc.); and - the compatibility of the development with other land uses in the vicinity of the development, in accordance with the requirements of Clause 12 of State *Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*;	EIs s6 and attached reports
	• **Waste** – including estimates of the quantity and nature of the waste streams that would be generated or received by the development and any measures that would be implemented to minimise, manage or dispose of these waste streams;	OEMP s8
	• **Hazards** – including an assessment of the likely risks to public safety, paying particular attention to potential bushfire risks and the transport, storage, handling and use of any hazardous or dangerous goods;	EIS s18
	• **Visual** – including an assessment of the likely visual impacts of the development on private landowners in the vicinity of the development and key vantage points in the public domain, including with respect to any new landforms;	EIS s11
	• **Social & Economic** – an assessment of the likely social and economic impacts of the development, including consideration of both the significance of the resource and the costs and benefits of the project; and	EIS s15

	• **Rehabilitation** – including: - a detailed description of the proposed rehabilitation measures that would be undertaken throughout the development and during quarry closure; - a detailed rehabilitation strategy, including justification for the proposed final landform and consideration of the objectives of any relevant strategic land use plans or policies; and - the measures that would be undertaken to ensure sufficient financial resources are available to implement the proposed rehabilitation strategy, recognising that a rehabilitation bond will likely be required as a condition of any future development consent.	OEMP s11
Environmental Planning Instruments	The EIS must take into account all relevant State Government environmental planning instruments, guidelines, policies, and plans. While not exhaustive, Attachment 1 contains a list of some of the environmental planning instruments, guidelines, policies and plans that may be relevant to the environmental assessment of this development. During the preparation of the EIS you must also consult the Department's EIS Guideline – Extractive Industries – Quarries. This guideline is available at http://www.planning.nsw.gov.au/~/media/Files/DPE/Guidelines/extractive-industries-quarries-eis-guideline-1996-10.ashx. In addition, the EIS must assess the development against the Goulburn Mulwaree Local Environmental Plan 2009 and any relevant development control plans/strategies.	EIS 1 & 19 EIS s19
GOULBURN MULWAREE COUNCIL		
Property Description	There may be some confusion as to the proposed site location as Council's property information lists the site as part 288 Tiyces Lane however the rural address at the gate off Curlewin Lane identifies the site as 63 Curlewin Lane. The previous Development Application had the site listed as part 288 Tiyces Lane.	**The site is identified as 63 Curlewin Lane.**
Cost of Development	Cost of development prepared by a suitably qualified expert that includes an accurate estimate of the capital investment value (as defined in Clause 3 of the Environmental Planning and Assessment Regulation 2000) of the development, including details of all the assumptions and components from which the capital investment value calculation is derived and jobs that would be created during each stage of the development.	DA cost Assessment 3/3/2017 prepared by K Allen (Planning) and R Mowle (Qualified Engineer) and submitted to Council for DA fee determination.
Goulburn Mulwaree LEP & DCP	The proposed development site is currently zoned E3 Environmental Management under Goulburn Mulwaree Local Environmental Plan 2009 (as amended). The Environmental Assessment should address the objectives of the zone. It is understood that the proponent intends to use the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (SEPP Mining, Petroleum Production and Extractive Industries 2007) which permits "extractive industries" where "agriculture" is permissible. It is noted in the Landuse Table to E3 Environmental Management zone under Goulburn Mulwaree Local Environmental Plan 2009 (as amended) that not all definitions under "Agriculture" are permitted with consent. Namely "Intensive Livestock Agriculture" as well as "Industries" and "Rural Industries" are listed as Prohibited in the Landuse Table to the zone. This issue of permissibility should be addressed in detail in the Environmental Assessment. The "matters for consideration" under Part 3 of SEPP (Mining, Petroleum Production and Extractive Industries) 2007 are also required to be addressed as part of the Environmental Assessment as well as the reasons why the development should be approved having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development. The following SEPPs Acts and Planning guidelines should be addressed in the EA/EIS: • *Environmental Planning and Assessment Act 1979* Comment: It would be beneficial if the application could identify how the development is using environmentally friendly/green technology or could be adapted to use such technology in the future – i.e. what are its environmental impacts beyond the obvious noise, dust, roads etc. (e.g. greenhouse gas emissions, life cycle costs etc.). • *Threatened Species Conservation Act 1995* Comment: Including an assessment of significance in relation for all the threatened species that are known or likely to occur on the Site and meet OEH guidelines Threatened Biodiversity Survey and Assessment Guidelines (DEC 2004); the NSW Guide to Surveying Plants (OEH 2016); Field Survey Methods for Fauna, Amphibians (DECC 2009) or as amended Native Vegetation Act 2003 • *Goulburn Mulwaree Local Environmental Plan 2009 (as amended)*	EIS s1.3 EIS s19 Table pp 138-144 EIS s19 Table pp144-148 EIS s19 Table p149 and attached reports EIS s19 Table

	Comment: The majority of the Site is identified as "environmentally sensitive land – biodiversity" on the Natural Resources Sensitivity Map – Biodiversity referenced in Clause 7.2 of the GLEP 2009.	pp149-153 and attached reports
	The EA is required to address the Heavy Haulage requirements under the DCP including: • Impact on the road network: - Existing traffic movements along the haulage route. - Estimated increase in traffic movements resulting from the proposed development. This includes detail of any staging proposal, truck / car ratio and the life of the project / development. - Foreseeable increases in traffic movements resulting from other known development (i.e. subdivision of land etc.). - Heavy vehicle type and volume (i.e. rigid or articulated, covered or uncovered). Anticipated tonnage of material to be transported. - Type of material transported. - Hours of operation and frequency of movements.	EIS s9 and attached Traffic Report and Studies
	• Impact on amenity and the environment – Rural, Village Zones and generally: - Proximity of haulage route to residence, community land (bus stops) etc. Community expectation including ambience and enjoyment of life. - Community assets including accessibility to parks by residents and visitors - Noise generation - Vibration generation - Visual impact - Pedestrian safety and safety of other road uses (including bus routes and bus stops) - Impact on roadside habitat resulting from road upgrade works - Consistency with the objectives of all zones that the haulage route passes through	EIS s15 & 19 EIS Ss7, 8 & 9 and associated reports N.A. EIS s7 EIS s7 EIS s11 EIS s7 and Traffic Report Pt IV only EIS s19 Table
	• *Environmental Planning and Assessment Regulation 2000* • *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007,* • *State Environmental Planning Policy (Rural Lands) 2008* • *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011.* • *State Environmental Planning Policy No 33 – Hazardous and Offensive Development.* • *State Environmental Planning Policy No 44 – Koala Habitat Protection.* • *State Environmental Planning Policy No 55- Remediation of Land;* • *State Environmental Planning Policy (infrastructure) 2007* • *State Environmental Planning Policy (State & Regional Development) 2011* • *Sydney - Canberra Corridor Strategy* • *Draft South East and Tablelands Regional Plan* • *National Parks and Wildlife Act (NSW) 1974 (as amended)* • *Protection of the Environment Operations Act 1997 (as amended)* • *Contaminated Land Management Act 1997*	EIS s19 pp147-148 EIS s19 pp138-144 EIS s1.19 pp155-156 EIS s1.19 pp154-155 EIS s18 EIS s10 EIs s17 N.A. Considered generally Not considered EIS s1.3 EIS s1.3 & 1.19p149 EIS s17
	An applicant may also wish to include details of voluntary measures that are proposed to be undertaken during the operational phase of the development to address any of the considerations outlined in this section. This could include a heavy vehicle code of practice whereby drivers of heavy vehicles agree not to exceed a particular speed limit on a haulage route for safety reasons. Selection of such measures can be informed through discussion with Council staff and/or the responses generated from any consultation undertaken by the applicant prior to submitting an application. Should a Code of Practice be proposed please identify how the code will be enforced.	OEMP s3
	Haulage Route standards for heavy vehicle haulage developments o The following minimum road standard for haulage routes is required: o 7m wide sealed carriageways in rural areas o In addition to the carriageway, 1m wide shoulders on each side with a 500mm seal o 80km/h design standard o 9m wide culverts and bridges (i.e. from barrier to barrier). o Minimum remaining pavement life of 10 years at the time of commencement of operations o Asphaltic concrete surface in village areas.	EIS s7 and Traffic Report
	Note: Intersection upgrades may also be required to accommodate turning paths for heavy vehicles. Information to accompany an application for development involving heavy vehicle haulage should establish the existing road condition and include an assessment of the remaining pavement life. This assessment should be undertaken by an appropriately qualified professional and should factor in the estimated additional load to be generated by the heavy vehicle haulage development and the resulting impact on the existing road.	EIS s7 and Traffic Report

	Design traffic should be calculated in equivalent standard axles (ESAs). The following information should be submitted with an application for heavy vehicle haulage development: o Pavement testing results for the intended haulage route/s; o An estimation of the remaining pavement life of all intended haulage routes given the anticipated additional load from the proposed development; and o A plan and/or schedule identifying any upgrades required to the pavement to ensure that the road has a minimum pavement life of 10 years taking into account the additional load. With regard the 10 year minimum remaining life, the roads will require testing to ensure their capability of handling the increased heavy vehicle movements. The arrangements for developer contributions to fund the ongoing maintenance of heavy vehicle haulage routes (once the upgrades required for the development are in place) is provided for in the Goulburn Mulwaree Section 94 Plan. The proposed new intersection from the bend in Tiyces Lane to the Hume Highway contains existing vegetation and is at a different existing ground level to the Hume Highway. Despite "roads" being listed in the landuse table as permitted without consent a Part V assessment under the EPA Act should be undertaken to consider the potential environmental impacts (including Flora and Fauna, stormwater and potential for contamination) and any mitigating measures. Please refer to attached photographs as evidence for Flora and Fauna Assessment and potential for contamination. • *Goulburn Mulwaree Development Control Plan 2009 (as amended)* Comment: It is noted the land is located approximately 650m to Biodiversity Hotspots identified in the DCP. • Council Engineering Standards • NSW EPA Industrial Noise Guideline/s • Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW • Goulburn Mulwaree Section 94A/94 Development Contributions Plan 2009 • Interim Construction Noise Guideline • NSW Road Noise Policy	EIS s7 and Traffic Report and studies attached Attached Traffic Report and attached studies Traffic Report Conducted as part of Part V assessment with RMS. EIS s19 pp156-159 Considered in the preparation of the various studies.
The Proposal	Further to the details provided with the proposal, a detailed description of all components of the proposal need to be included in the Environmental Assessment including: o Need for the proposal o Alternatives Considered o Various components and stages of the proposal o Details of any separate licences and approval required o Details of hours of operation o Number of employees o Details of proposed cut and fill, final ground and finished levels and cross sections to AHD. Proposed excavation methods, staging and stock handling process o Details of the calculation on the proposed area of disturbance and construction (including breakup figures) o Details on security of the site including fencing, landscaping and lighting o Plans and elevations of proposed buildings works, colours and materials of external finishes o Location of lot boundaries, easements, existing services and proposed services on the site plan o Views of the structure/s from public places and nearby dwellings will allow assessment on the visual impact of the proposal on existing dwellings and public places o Screening of any storage areas o Location of staff facilities o Disability (Access to Premises – Buildings) Standards for people with a disability o Traffic Impacts both to and from the site as well as within the development site. o Social and Economic impact including: - an assessment of the likely social impacts of the development; and - an assessment of the likely economic impacts of the development, - paying particular attention to: ▪ the significance of the resource ▪ economic benefits of the project for the State and region; and ▪ the demand for the provision of local infrastructure and services.	 EIS Ss1, 2 & 20 EIS s2 EIS Ss3 & 4.2 EIS s1.3 p63 EIS s3.1.4 EIS s19 p139 EIS s3.1.2 & Quarry Detail Plan Site Dev. & Landscape Plan EIS s3.1.1 Site Office Plan Site Dev. & Landscape Plan EIS s11 Site Dev & Landscape Plan Site Office Plan EIS s7 EIs s14 and 21.
Proposed Assessment and Plans	It is noted that you have included proposed reports and assessments to be submitted with the application. Council would request that you also address: • Construction noise assessment and off-site road noise impacts as part of the Noise Assessment • Construction and operation assessment as part of the Air Quality Assessment • Flora and Fauna Assessment against the NSW Threatened Species Conservation	See Revised Noise Assessment, updated Flora and fauna assessment, new Traffic Assessment, Site Development &

	Act 1995 and Commonwealth Environment Protection Biodiversity Conservation Act 1999 • Construction and operation assessment as part of the Traffic Impact Assessment • Landscaping plan and details • Waste management including how waste would be reduced, reused, recycled or disposed; • Locality Plan showing existing and approved dwellings • Visual Impact Assessment of all components of the proposal • Buffer and Amenity Assessment • Although the proposal is not subject to assessment under REP 1 Drinking Water Catchments, the development should ensure the development achieves a Neutral or Beneficial Effect on Water Quality. • A worst case scenario cross section plan showing floor pit depth prior to crushing with sufficient area to store extracted material (max volume estimated) and use of the portable crusher, screeners, machinery and vehicle manoeuvring area/s.	Landscape Plan, OEMP (waste management measures), Visual Aspects Plan, Design Statement, Ss 11 & 14, WCMS and Quarry Pit Detail Plan.
Contributions	Developer Contributions or other proposed assistance with community development in Goulburn Mulwaree. Council would like outlined what mechanism/s the proponents are going to rely on to record and validate their extraction rates and environmental impacts.	See Traffic Assessment for s94 contributions assessment. The Site Development & Landscape Plan shows provision for a weighbridge on the exit road to record material transport. See OEMP for environmental monitoring measures proposed.
Community Consultation	The Environmental Assessment should ensure community consultation with local residents and community groups during project planning, pre-lodgement, development assessment, construction and operation and management. The report should examine the potential impact the development will have on retaining existing landscapes and amenity of the area. This assessment may form the basis of a social impact assessment. In addition the report should address any issues raised during the court review process. It is noted that a previous Development Application on the site received a number of submissions. It recommended that the proponent address all the matters raised in these submissions as part of the Environmental Assessment a copy of the facts and contentions are included to assist. It may also be beneficial to address differences between the proposals to aid community understanding of the "new" Development Application. It is requested that the Environmental Assessment have a summary section which identifies the properties affected by the proposal and measures to mitigate any social, economic or environmental impacts which can be reviewed as part of the neighbour notification process.	Community consultation has been extensive through the earlier application. This new application is substantially unchanged except for the provision of an exit road only to Tiyces Lane and a new acceleration lane from Tiyces Lane to the Hume Highway. The matters raised in submissions have been previously incorporated and maintained in the new application.
NSW DEPARTMENT OF PRIMARY INDUSTRIES - AGRICULTURE		
Site Suitable for development	• Detail that the quarry is consistent with strategic plans and zone requirements • Complete a Landuse Conflict Risk Assessment (LUCRA) to identify potential landuse conflicts, in particular relating to separation distances and management practices to minimise odour, dust and noise from sensitive receptors. LUCRA is described in the DPI Land Use Conflict Risk Assessment Guide (reference in attachment 2). • Include a map to scale showing the above operational and infrastructure details including separation distances from sensitive receptors.	The development has avoided native vegetation and maintains stock access for waterways and dams as well as providing for erosion and sediment control. See Site Development & Landscape Plan and s6 and WCMS
Consideration for impacts to agricultural resources and land	• Describe the current and potential *Important Agriculture Land* on the proposed development site and surrounding locality including the land capability and agricultural productivity. • Demonstrate that all significant impacts on current and potential agricultural developments (particularly poultry) and resources can be reasonably avoided or adequately mitigated. • Consider possible cumulative effects to agricultural enterprises and landholders. • Detail the expected life span of the proposed development	The proponent proposes to continue agricultural activity and is currently improving sheds (per a separate development application) for farm machinery and equipment.

Suitable and secure water supply	• Estimated water demand and water availability should be clearly outlined in the proposal. The source of water and any sanitisation methods to be detailed in the application. • Outline any impacts to water use from agriculture and mitigation measures.	See WCMS. Water supply of 1oML p.a. from a 50ML+ bore supply. Excess is maintained for agricultural use.
Surface & Groundwater protected	• Proposed development design, operation and by-product management should be undertaken to avoid nutrient and sediment build up and minimise erosion, off site surface water movement and groundwater accession. • The proposal should detail operational aspects of the proposal in relation to by-product management in accordance with best practice to prevent excess build-up of nutrients and salts in the soil profile and increase the risk of leaching. A monitoring program should be developed.	See WCMS and OEMP.
Biosecurity Standards met	• Include a biosecurity (pests and weeds) risk assessment outlining the likely plant, animal and community risks. • Develop a biosecurity response plan to deal with identified risks as well as contingency plans for any failures. Including monitoring and mitigation measures in weed and pest management plans.	See Flora & Fauna Assessment and OEMP
Suitable traffic movements	• Consideration of the route for movements so that impacts on sensitive receptors are minimised (e.g. noise, dust, volume of traffic). This should include consideration of any Travelling Stock Reserves (TSR) and the movement of livestock or farm vehicles along / across the affected roads	See Noise Assessment and Traffic Assessment
Visual amenity achieved	• Amenity impacts are assessed and any necessary response to mitigate visual impacts is described and illustrated.	See s11
Land stewardship met	• Develop Rehabilitation and Decommissioning/Closure Plans that describes the design criteria of the final land use and landform along with the expected timeline for the rehabilitation program. • Outline monitoring and mitigation measures to be adopted for rehabilitation remedial actions.	See OEMP
Adequate consultation with community	• Consult with the owners / managers of affected and adjoining neighbours and agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation. • Establish a complaints register that includes reporting and investigating procedures and timelines, and liaison with Council in relation to complaint issues.	See OEMP and s19
Contingency land Environmental management Plan developed	• Contingency plans should be developed to enable the operation to deal with emergency situations. This should include: o Undertaking a risk assessment to address bush fire risk and o Commitment to the preparation of an Emergency Management plan that outlines procedures and responsibilities for responding to threats i.e. bushfire.	Bushfire assessment not necessary, but owner has existing farm facilities for bushfire fighting. Owner referred to Farm FireWise planning
NSW DEPARTMENT OF PRIMARY INDUSTRIES - FISHERIES		
	• Location of works (including detailed site map and photos). • Location of quarry pit, spoil sites, processing equipment and associated infrastructure. • Name of adjacent waterway(s) and position in relation to all proposed development components. • Description of all development components and works to be undertaken. • Timing and duration of works. • Description of any aquatic and riparian habitat at or adjacent to the development site. • Analysis of any interactions of the proposed development with any aquatic and riparian environments, including downstream, and predictions of any impacts upon aquatic and riparian environments. • Safeguards to mitigate any impacts upon adjacent aquatic environments and riparian habitats, including impacts downstream. • Distances of buffer zones to drainage lines and proposed improvements and management of these zones into the future. • Proposed water quality management for the proposal detailing stormwater and water quality management for the site and safeguards to mitigate any impacts upon water quality, including impacts downstream. This should include full details of proposed erosion and sediment controls during construction phase and stormwater and water quality management for the site during ongoing operation of the proposal. • Location and design of water quality treatment ponds showing proximity to site drainage lines.	See Site Development and Landscape Plans, S 3, WCMS and OEMP
WATER NSW – WATER REGULATION		
	• Annual volumes of surface water and groundwater proposed to be taken by the activity (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan. • Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project). • The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.	See WCMS and OEMP and s6

	• A detailed and consolidated site water balance. • Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts. • Full technical details and data of all surface and groundwater modelling. • Proposed surface and groundwater monitoring activities and methodologies. • Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts. • Consideration of relevant policies and guidelines. • A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).	
NSW DEPARTMENT OF PRIMARY INDUSTRIES- RESOURCES & ENERGY		
	• Documents the size and quality of the resource and demonstrates that both have been adequately assessed; and • · Documents the methods used to assess the resource and its suitability for the intended applications.	See s5 and attachments
EPA		
	1. Air pollution, especially dust impacts	See s8 and Air quality assessment and monitoring plan
	2. The potential for water pollution	See WCMS and OEMP
	3. Noise impact	See s7 and Noise Assessment and monitoring plan
	4. Actions that will be taken to avoid or mitigate impacts, or compensate unavoidable impacts identified above	Discussed in above sections and studies
	EIS recommended layout	The EIS has incorporated the various inclusions referred to. Consultants have given consideration to the various guidelines.
OFFICE OF ENVIRONMENT & HERITAGE		
The Proposal		Refer to Ss 1, 3, 4, and 21.
Aboriginal Cultural Heritage		Refer to s13. An updated assessment has not been conducted as discussed in s13 due to the recent further inspection and investigations by Pejar LALC.
Biodiversity		Refer to s10. The proposal does not propose BioBanking. Refer to Flora & Fauna Assessment.
Flooding		The site is not identified as flood liable and the development is not located in any waterway nor passes over any waterway.
NSW RURAL FIRE SERVICE		
		The land is not bushfire prone land as advised by the Service. The owner has been directed otherwise to Farm FireWise for farm planning.
NSW ROADS & MARITIME SERVICES		
	Traffic Impact Study	Refer to s8 and Traffic Assessment and related attachments

		including a recent traffic volume study.
	Modelling – Intersections	Refer to Motion Traffic study attached to Traffic Assessment.
	Designs	See attached deceleration and acceleration designs.
	Consultation	Consultation has been conducted with a concurrence for the prior application received.
WATER NSW – CATCHMENT PROTECTION		
	The proposal should be accompanied by a Water Cycle Management study which should include, but not be limited to: • **Description of the proposed quarry** - A description of all processes of the proposed quarry. Detailed site plans at suitable scales showing the location of all structures shall be provided.. • **Water balance** - for the whole quarry operation. • **Stormwater management** - A key consideration of water cycle management should be the separation of clean and dirty stormwater runoff to decrease the generation of water requiring treatment, and the optimisation of reuse so as to prevent offsite impacts on receiving waters (surface and groundwater). Detail should be provided on: o proposed stormwater management for the site including collection, detention treatment, reuse and/or discharge o the nature of any stormwater treatment, including an identification of the location of proposed stormwater management or treatment structures that can capture runoff from the site for treatment before reuse or discharge o estimated pre and post development stormwater flows without and with stormwater treatment both for a range of average and wet weather conditions o a site stormwater management plan for the site that identifies the proposed stormwater management or treatment structures, and details the nature and location of any stormwater discharge points. • **On-site human wastewater management** - this will need to address the number of staff during both the construction and operational phase. • **Conceptual Construction and Operational Environmental Management Plans(OEMP)** - for construction and operational phases of the quarry. The conceptual Construction Environmental Management Plan should include a Soil and Water Management Plan as per the "Blue Book".	Refer to s6 and attached WCMS and OEMP. Refer to attach On-site Waste Water Assessment and review conducted by SEEC.

Goulburn Mulwaree Council
Quote Estimate

RELEASED FROM STEPHANIE MOORE @ GMC. 2-20pm on 21/4/17

Quote No: EST/0701/1617

Applicant:

Property: LOT 5 DP 1006397 LOTS 1 2 DP 1094055 Enclosure Permit 324437

Details:

Date Issued: 21/04/2017
Expiry Date: 21/05/2017
Stage/Decision: Issued
Status: Current

Group: Development Application
Category: Industrial Development

Estimated Cost: $577,647.00

Description	Quantity	Amount	GST	Total
Advertising Designated Development Fee	1.00	$2,220.00		$2,220.00
Designated Development	1.00	$920.00		$920.00
Development Application Fee	577,647.00	$1,503.00		$1,503.00
File Storage	1.00	$36.00		$36.00
Integrated DA Processing Fee	2.00	$280.00		$280.00
Plan First Admin	577,647.00	$5.00		$5.00
Plan First Fee	577,647.00	$365.00		$365.00
	Sub Total:	$5,329.00		$5,329.00

Group: Section 68 Applications
Category: Stormwater Drainage

Estimated Cost:

Description	Quantity	Amount	GST	Total
S68 Application DA Process	1.00	$100.00		$100.00
	Sub Total:	$100.00		$100.00

Total:	$5,429.00	$5,429.00

Please note that this quote is based on the information provided and may change once the development application and supporting documents are reviewed. Please note: Development contributions are not included.

NOTE: I HAVE GIVEN COUNCIL/STEPHANIE MOORE 1 COMPLETE SET OF PLANS + 1 USB DRIVE WITH INFO.

B. Appendix 1 to EIS – SEARS and Agency requirements.

ENVIRONMENTAL IMPACT STATEMENT
ARGYLE QUARRY

APPENDIX 1
Secretary's Environmental Assessment Curlewin Quarry (EAR 1139)
Government Agency Submissions

PROPOSAL BASALT QUARRY

LOTS 1 &2 DP 1094055

63 CURLEWIN LANE, BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK

Reference No. 1707 April 2017

Laterals Planning
1st Floor, 35 Montague Street
(PO Box 1326) Goulburn NSW 2580
Tel: (02) 4821 0973 * Fax: (02) 4821 0954
24 Thomas Street Johns River NSW 2443
Mobile 4027 210 973
Email: keith@laterals.com.au

CONTENTS

The requirements for each agency listed below are copied and attached following this page.

1 DEPARTMENT OF PLANNING & ENVIRONMENT Secretary's Environmental Assessment Requirements – Curlewin Quarry (EAR 1139)

2 GOULBURN MULWAREE COUNCIL

3 DEPARTMENT OF PRIMARY INDUSTRIES - AGRICULTURE

4 DEPARTMENT OF PRIMARY INDUSTRIES - FISHERIES

5 WATER NSW – WATER REGULATION COASTAL

6 DEPARTMENT OF PRIMARY INDUSTRIES – RESOURCES & ENERGY

7 NSW EPA

8 OFFICE OF ENVIRONMENT & HERITAGE

9 NSW RURAL FIRE SERVICE

10 TRANSPORT – ROADS & MARITIME SERVICES

11 WATER NSW – CATCHMETN PROTECTION

C. Owners consent to easement 20/4/2017.

'C'

Peter F. Miller
Managing Director & Sole Secretary
for Argyle Gravel & Concrete Pty. Limited
as Trustee for the Figtree Reserve Superannuation Fund
P.O. Box 4
Mittagong, NSW 2575

Ph: 0419 242 866

20 April. 2017

Jasminco Resources Pty Limited
288 Tyces Lane
Boxers Creek. NSW. 2580

Att: The Director

Re: Agreement to provide an easement allowing access to a proposed quarry at 63 Tyces Lane, Boxers Creek.

Dear Sir,

The Trustee, on behalf of the owner of the property, the Figtree Reserve Superannuation Fund, has resolved to grant consent for an easement to be created over Lot 2 in D.P. 1094055 in favour of Lot in D.P. 1094055; such easement to permit an access road to be constructed through Lot 2 which provides a direct highway access for the quarry's heavy transport vehicles and for the installation and maintenance of landscaping along the constructed roadway and any necessary water management structures and such easement to be created for the exclusive benefit of the proposed quarry operation, which is to be situated upon Lot 1 in D.P. 1094055.

This agreement does not give the quarry operator consent to allow any public vehicles coming from Tyces Lane or Curlewin Lane, to use the right of carriageway to access the Hume Highway via our property, except in the operation and maintenance of the quarry.

Yours faithfully,

.....
Peter Francis Miller
Managing Director for Argyle Gravel & Concrete Pty. Limited
as Trustee for the Figtree Reserve Superannuation Fund.

.....
James Miller - Director

D. Operational Environmental Management Plan prepared by SEEC April 2017.

SEEC

Strategic Environmental & Engineering Consulting

Operational Environmental Management Plan

for Argyle Quarry
Lot 1 DP1094055, Curlewin Lane, Boxers Creek

Prepared by: Mark Passfield

SEEC reference 16000080-OEMP-05

13th April 2017

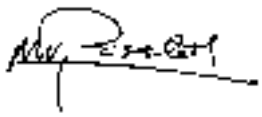
Strategic Environmental and Engineering Consulting

PO Box 1098, Bowral NSW 2576
phone: (02) 4862 1633 • fax: (02) 4862 3088 • email: reception@seec.com.au

Document Certification

This report has been developed based on agreed requirements as understood by SEEC at the time of investigation. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects.

Any recommendations contained in this report are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this report does not contain any incomplete or misleading information.



Mark Passfield
Director, SEEC
13th April 2017

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Document Table

Version	Author	Reviewer	Date
00	MP	AM	10/05/2016
01 DRAFT	MP	MP	21/06/2016
01 Final	MP	Laterals/Client	23/06/2016
02	MP	Laterals/Client	11/07/2016
03	MP	Laterals/Client	04/08/2016
04	MP	Laterals/Client	02/12/2016
05	MP	Laterals/Client	13/04/2017

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1 INTRODUCTION

1.1 Background Information

This Operational Environmental Management Plan (OEMP) relates to a basalt and gravel quarry ("the Quarry") at Curlewin Lane, Boxers Creek which is owned and operated by Jasminco Resources Pty Ltd. The Extraction Area is located on a hilltop in Lot 1 DP 1094055.

The Quarry will extract basalt and gravel from 1.4 ha of land within a total resource area of 12.62 ha. The Quarry will extract 30,000 m^3 of product per year and, ultimately, the quarry floor will vary from 15m to 25m below natural surface from west to east. The Facilities Area and Extraction Area are accessed by a new ingress road from the Hume Highway. An egress road connects the Extraction Area to Tiyces Lane.

1.2 Reference Documents

The following documents have been referenced in the preparation of this Plan:

- SEEC (2016). *Water Cycle Management Study for Proposed Argyle Quarry, Lot 1 DP1094055, 63 Curlewin Lane, Boxers Creek.* Strategic Environmental & Engineering Consulting Pty Ltd.
- Laterals Planning (2008). *Environmental Impact Statement. Proposed Quarry, Lot 1 DP1094055, 63 Curlewin Lane, Boxers Creek*
- Laterals Planning (2008). *Flora and Fauna Assessment for Proposed Gravel and Basalt Quarry, Lot 1 DP 1094055, Tiyces Lane, Towrang.*
- Laterals Planning (2008b). *On-site Wastewater Management Study for Proposed Gravel and Basalt Quarry, Lot 1 DP 1094055, Tiyces Lane, Towrang*.
- Laterals Planning (2010). *Addendum to Flora and Fauna Assessment for Proposed Gravel and Basalt Quarry, Lot 1 DP 1094055, Tiyces Lane, Towrang (2008).*
- Benbow Environmental (2016a). *Noise Monitoring Plan for Argyle (NSW) Pty Ltd, Tiyces Lane, Boxers Creek*
- Benbow Environmental (2016b). *Air Quality Monitoring Plan for Argyle (NSW) Pty Ltd Tiyces Lane, Boxers Creek*
- Landcom (2004). *Managing Urban Stormwater. Volume 1: Soils and Construction*
- DECC (2008). *Managing Urban Stormwater. Volume 2e; Mines and Quarries*

1.3 Purpose of the OEMP

The purpose of this OEMP is to ensure that appropriate environmental practices are followed during operation of the Quarry. Those objectives are:

- To implement and maintain effective environmental management systems;
- To ensure adequate management, monitoring and mitigation regimes are in place to protect the surrounding environment;
- To provide details of environmental protection infrastructure or controls and discuss their operation and reporting procedures; and

1.4 Overview

The Quarry consists of a number of separate features which are all shown in Appendix 2:

- An ingress road from the Hume Highway to the Facilities Area and the Extraction Area.
- An egress road from the Extraction Area to Tiyces Lane.
- The Extraction Area
- Noise Control Berms
- The Facilities Area and associated emergency exit tracks
- Water Quality Control Pond 1 (WQCP1)
- Water Quality Pond Control 2 (WQCP2)
- Water Quality Pond Control 2 (WQCP3)
- Areas of existing protected native vegetation
- Areas of new native vegetation (8.8 ha) and landscaping
- An irrigation area (2 ha) for the management of stormwater in WQCP1
- Two water supply bores

1.5 General Setting

The Quarry is accessed from the Hume Highway via an ingress road to the Facilities Area. The Extraction Area is located on a hilltop in Lot 1 DP 1094055 at approximate -34.754864° , 149.851222°. It occupies a broad knoll with moderately graded side slopes (about 8 percent). The knoll is about 350 m in diameter and has a total relief of about 15 m.

The ingress road from the Hume Highway is mostly orientated along ridge lines so there is little run-on. Where there is minor run-on it is drained under the road by piped culverts. The ingress road climbs from the Facilities Area to the Extraction Area and here it is built on a slope of about 8% and has some run-on which is collected and diverted to WQCP2.

Product is removed from site via an egress road that joins Tiyces Lane. It is mostly orientated along a gentle, west-facing side slope with minor run-on. Water from approximately half of it is diverted to WQCP3.

1.6 Staffing

The Quarry is operated by one on-site Quarry Manager who doubles as a night watchman/security. There can be one extra staff for driving a truck for local deliveries only. Machine operators in the extraction area are contract staff, as are all other truck drivers.

1.7 Operation Overview

- The main Extraction Area is a basalt quarry (1.4 ha) for the extraction of up to 30,000 cubic metres of basalt per annum.
- The basalt is excavated by machinery (no blasting) and crushed in the Extraction Area by a mobile crusher that screens the materials to different product sizes.
- The expected machinery is:
  - Crusher (mobile) (1)
  - Material sizing screen (1)
  - Bulldozer (1)
  - Front end loader (1)
  - Backhoe (1)
  - On-site trucks (estimate average of 3)
  - Water truck (1)
- The product is stockpiled within the Extraction Area for sale and transport off the site by truck (up to 14 truck movements a day).
- Water for dust suppression is preferentially sourced from the Water Quality Control Ponds with bore water used when those ponds are empty.

1.8 Operation Hours

The permissible operating hours are given in **Table 1**.

Table 1 - Operating Hours

Activity	Monday to Friday	Saturday	Sunday and Public Holidays
Construction	0700 - 1700	0700 – 1300	None
Crushing	0700 - 1700	None	None
Other Activities	0700 - 1700	0700 – 1300	None

This condition does not apply to the delivery of material outside the hours of operation 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 should be provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency. The hours of operation 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. Security will be provided by the Quarry-Manager who will be on-site and aided by closed circuit television.

2 ENVIRONMENTAL MANAGEMENT

2.1 Soil Management

2.1.1 Introduction

Topsoil is a valuable resource but the manner in which it is collected and stored can affect soil characteristics and reduce its revegetation value. Soil seeds, nutrients and microbes rely on oxygen to survive. If topsoil is stockpiled for long periods, these qualities can gradually deteriorate over time, but simple measures can be taken to minimise this.

Soil structure is important for drainage and air flow through the soil. It can be reduced or even destroyed if topsoil is collected when saturated or if the soil is compacted during handling and stockpiling.

Subsoil and overburden material are of lower value for revegetation than topsoil but they may still be required for rehabilitation. They must be stored separately from the topsoil. The costs of re-spreading stockpiled materials can be reduced through the careful positioning of stockpiles.

2.1.2 Stripping

- If weeds are present, spray them with selective herbicide at least six weeks before stripping.
- Strip the topsoil layer separately from the subsoil.
- Avoid stripping topsoil when it is either very wet or very dry.
- Minimise handling of topsoil; move it once only if possible.
- Keep topsoil separate from subsoil, overburden, gravel and other materials.

2.1.3 Stockpiling

- Protect topsoil stockpiles from erosion; grow vegetation on stockpiles (shrubs and grasses).
- Install drainage measures to allow drainage through or around stockpile areas.
- Do not bury topsoil; the maximum permissible height of a topsoil stockpile is 2m.
- As much as possible, stockpile topsoil above or beside the Excavation Areas, depending on which direction the deposit is being worked, to allow for easier re-spreading.
- Avoid long term stockpiling of topsoil by using it to rehabilitate worked-out areas as soon as practicable.
- If weeds become evident, spray them with a selective herbicide before they seed.
- Keep traffic away from stockpiles.
- Align stockpiles parallel to the slope contour as much as possible.
- Subsoil and/or overburden stockpiles may be greater than 2m in height but must be stabilised with vegetation; this might require a topsoil veneer.

- For longer-term stockpiles, consider strategically using them as noise or visual barriers.
- Stockpile batters shall be no more than 1V:2H

2.2 Erosion and Sediment Control During Establishment

2.2.1 Relevant Background Document

An Erosion and Sediment Control Plan (ESCP) is prepared for the establishment works, SEEC Drawings 16000080-P02-ESCP-00 to 05 (Appendix 3). This plan details the measures to be adopted during construction to minimise sediment loss from the site.

2.3 Stormwater Management During Operations

2.3.1 Relevant Background Document

The issue of stormwater management during operations is discussed in SEEC (2016); refer also to Appendix 2.

2.3.2 Stormwater Storage and Discharge Control

(i) Ingress road

The first part of the ingress road is the road from the Hume Highway to the Facilities Area. Its alignment generally follows a ridge and so surface runoff is shed onto surrounding pervious lands by mitre drains. Periodically (twice per year) the mitre drains will be inspection to ensure they are functioning as intended (they are not being short-cutted).

Where it crosses minor depressions, water is conveyed under the road by pipes and associated stabilised headwalls. After significant rainfall (>12 mm/day) the pipe and headwalls must be inspected to ensure they are stable against erosion.

The second Part of the ingress road is from the Facilities Area to the Extraction Area and is on land that slopes approximately 8% and is subject to some run-on. Run-on is collected in rock-lined table drains and delivered to a pipe to transfer the water to the west and deliver it to WQCP2, which acts as a settlement pond. WQCP2 is 525 m^2, 250 m^3 and has a 300 mm extended detention depth. The emergency spillway is 2 m wide and stabilised with rock. After significant rainfall (>10 mm/day) WQCP2 must be inspected to ensure it is stable against erosion.

Water in WQCP2 does not have to be actively managed but it will be used for dust suppression as necessary. Periodically (twice per year) trapped sediment must be removed and placed in the Extraction Area.

(ii) Egress Road

The Egress Road joins the Extraction Area to Tiyces Lane. The first part of the road from the Extraction Area is built on a gentle side slope and surface runoff is shed onto surrounding pervious lands either by sheet flow or by mitre drains. Periodically (twice per year) the mitre drains will be inspection to ensure they are functioning as intended (they are not being short-cutted). The second part of the road drains to WQCP3; water in WQCP3 is used for dust suppression as required. The emergency spillway is 2 m wide and stabilised with rock. After significant rainfall (>10 mm/day) WQCP2 must be inspected to ensure it is stable against erosion.

(iii) The Extraction Area

- All stormwater that falls on the extraction area is collected in a sediment basin/sump (SB1) having a minimum volume of 500 m^3.
- Within five days after rainfall, water trapped in SB1 must be pumped to WQCP1 which acts as a 3.9 ML holding pond. The capacity of SB1 must be quickly re-gained ready for the next rainfall event.
- Sediment must be periodically removed from SB1 if the storage volume is compromised. Move it to a stable area that drains back to SB1 but away from any concentrated flow.
- WQCP1 does not have an external catchment; it only collects incident rainfall and stormwater pumped from the Extraction Areas.
- Water in WQCP1 will be allowed to settle naturally.
- Water from WQCP1 **must** be used for:
  - Dust suppression via the sprays at the processing plant (crushers and conveyors); and
  - For irrigation on at least 2 ha of pasture (refer to **(iv)** below).
- WQCP1 is designed to not overflow; all trapped water must be used so there is volume available to temporarily store sediment-laden water.
- A 300 mm (or more) freeboard would always be made available at WQCP1 to contain very high rainfall events. This is in addition to a 500 mm freeboard required for stability purposes.
- WQCP will rarely be full – only in extreme rainfall events.

(iv) The Irrigation Area

If not used for dust suppression or other site purposes, water from WQCP1 **must** be used to irrigate 2 ha of pasture (Appendix 2). The use of water for irrigation will ensure WQCP1 has sufficient capacity to store runoff from the Extraction Areas. The interval between irrigation, and the amount of water to apply when irrigating, depends on how much water is held in the root zone and how fast it is used by the vegetation. This is determined by:

- soil texture;
- soil structure/water penetration;
- depth of effective root zone of the soil;

- the vegetation grown; and
- the stage of development of the vegetation.

A simple spreadsheet tool is used to enable appropriate scheduling. An example is given in **Table 2**. As experience with irrigation develops, the Quarry Manager will monitor the irrigation practices and make adjustments to the crop factor and allowable soil water storage assumed in **Table 2** as necessary.

Table 2 – EXAMPLE Irrigation Schedule Spreadsheet

Date	Evaporation[1] (mm)	Crop Factor[2]	Crop water Use (mm) = Evap x Crop factor	Effective Rainfall[3] (mm)	Soil Water Storage (mm)
				Irrigated	70[4]
Day 1	3	0.9	2.7	0	67.3
Day 2	2.3	0.9	2.07	0	65.23
Day 3	5	0.9	4.5	0	60.73
Day 4	8	0.9	7.2	0	53.53
Day 5	6	0.9	5.4	0	48.13
Day 6	5.5	0.9	4.95	0	43.18
Day 7	7.5	0.9	6.75	0	36.43
Day 8	8.5	0.9	7.65	0	28.78
Day 9	0	0.9	0	5	33.78
Day 10	0	0.9	0	5	38.78
Day 11	9	0.9	8.1	0	30.68
Day 12	5	0.9	4.5	0	26.18
Day 13	3	0.9	2.7	0	23.48
Day 14	0	0.9	0	5	28.48
Day 15	5	0.9	4.5	0	23.98
Day 16	8	0.9	7.2	0	16.78
Day 17	3	0.9	2.7	0	14.08
Day 18	2.3	0.9	2.07	0	12.01
Day 19	5	0.9	4.5	0	7.51
Day 20	8	0.9	7.2	0	0.31
Day 21	6	0.9	5.4	irrigate	
Day 22				Repeat above	

1 Evaporation may be obtained from the Bureau of Meteorology's weather station at Goulburn TAFE (Station 070263)
2 Use 0.9 for December to February, 0.8 for October, November, March and April, 0.7 for September and May, and 0.6 for June, July and August.
3 Daily rainfall is measured on site. The "effective" rainfall is set assuming the first 5 mm of any rainfall event in spring, summer and autumn is ignored.
4 The estimated allowable water depletion (70 mm for silty clay).

Operation rules for the spreadsheet are summarised as follows.

- The spreadsheet is started following a rainfall that produces runoff or after irrigation (i.e. the soil is saturated). On this date the soil water storage is set to the maximum permissible (70 mm).
- Evaporation and rainfall are recorded on a daily basis and entered into the relevant cells.
- When the soil water storage reaches zero, irrigation can commence to re-fill the soil (up to 70 mm/m^2, 70L/m^2)[5].
- The amount of water applied would be recorded.
- The soil water storage is re-set.
- Periodic, slightly higher, irrigation rates can be used to flush salts from the topsoil.
- Site monitoring must concentrate on the wetter areas to minimise waterlogging.

NOTE: Modelling suggests that in dry years there will not be sufficient water to meet the calculated irrigation demand but that is not problematic; the primary aim is to use all the water so there are no uncontrolled discharges from the pond.

2.3.3 Stormwater Quality Monitoring

- The Extraction Areas and associated WQCP1 are designed to be *no-discharge*. In very wet periods it might be necessary to contain stormwater within the Extraction Area until there is sufficient time for WQCP1 to receive it.
- If there is any release of stormwater from the Extraction Areas or WQCP1 it must be documented and reported (Section 2.3.4).
- Overflows from WQCP2 and WQCP3 are permissible and do not have to be documented.
- The pro-forma soil and water management checklist in Appendix 1 must be used to document the condition of the site and ensure water quality structures are functional and maintained. Completed forms must be stored and included in the Quarry's Annual Environmental Management Plan. The checklist may be augmented and/or amended as the Project continues.
- There is no requirement for water quality monitoring in receiving waters, unless otherwise directed to do so by the relevant Authorities.

2.3.4 Water Quality Responses

- If there is release of sediment-laden water from the Extraction Areas or WQCP1 it will be documented noting date, time and duration of flow, and

[5] So the maximum irrigation volume for 2 ha will be 1.4 ML

an estimate of flow volume. The release would be reported to GMSC, the EPA and WaterNSW.

- The soil and water management checklist in Appendix 1 must be completed:
  - **Prior** to forecast (>50% chance) of rainfall of more than 12mm in 24 hours; and
  - After significant rainfall (>12 mm/24 hours)
- Any actions identified must be addressed within seven days assuming it is safe to do so. Action close-outs must be documented by the Quarry Manager.

2.4 Noise

2.4.1 Relevant Background Document

The issue of noise is discussed in Benbow Environmental (2016a).

2.4.2 Introduction

Quarry activities have the potential to produce significant noise. Where residences or other sensitive land-users are located near to quarries precautions should be taken to reduce its impact. The Quarry uses bund walls and topographical features to provide the most effective reduction of sound levels along the line of sight from the source of noise to neighbours.

2.4.3 Noise Mitigation

(i) Site Layout

- Three four metre high earth berms must be built on the northeast, southeast and southwest perimeter of the quarry (Appendix 2). The bunds must be built as early works – before crushing begins.
- The ingress road is orientated to:
  - Reduce the direct sight (and thus noise) line to neighbouring properties;
  - Reduce the grades.
- Heavy trucks must not leave the formed roads.

(ii) Operational Controls

- First operations (but not crushing) may begin when the noise barrier height reaches 4 m and the pit depth is 3 m.
- Explosives must not be used in the Extraction Area.
- The crusher can begin operating under the following conditions:
  - The permanent noise barrier has reached a height of 4 m;

  - The floor of the Extraction Area is at least 3 m in depth from the highest elevation on the original surface; and
  - The crusher is placed in a hole 5 m deep (below the 3 m Extraction Area depth) and positioned in the middle of the south-eastern berm.
- Operating hours must be limited to 0700 and 1700 hours on Mondays to Fridays and from 0700 to 1300 hours on Saturdays, with no work on Sundays or public holidays.
- Maintain the access and haul roads to prevent corrugations which can contribute to truck road noise.
- Plant and equipment must be maintained and lubricated to manufacturer's specifications; mufflers and silencers will be maintained.
- Multi-frequency broadband reversing beepers must be fitted to mobile equipment.

2.4.4 Monitoring

- General, daily, noise monitoring will be in the form of informal audible checks carried out throughout the day by the Quarry Manager. If the Quarry Manager is concerned noise might be elevated above allowable levels he/she will take action as described in Section 2.4.5 and will contact the acoustic consultant.
- Formal noise measurements:
  - Noise will be measured by an acoustic consultant in accordance with Benbow Environmental (2016a).
  - Noise will be measured every two weeks during construction hours at the four locations shown in Benbow Environmental (2016a) and Appendix 2.
  - Noise will be measured every three-months during operational hours[6] at the four locations shown in Benbow Environmental (2016a) and Appendix 2. This will continue until the Extraction Area is more than 3 m deep. At that point the requirement for noise monitoring will be re-assessed and negotiated with the EPA.
- Table 3 gives the noise limits at the four monitoring locations during construction and operation.

Table 3 - Noise Limits

Location (Appendix 2)	Construction Noise limit ($L_{AEeq15min}$)	Operation Noise limit ($L_{AEeq15min}$)
1	53	47
2	56	45
3	52	47
4	44	39

[6] At a time when noise generation is a maximum.

2.4.5 Actions and Responses

- Following receipt of all noise monitoring results, the data must be compared against the maximum permissible values. In the event one or more is exceeded, then immediately:
  - Arrange for further check sampling to be undertaken to confirm the initial monitoring result; and
  - Contact the relevant government agencies (EPA and GMSC) and verbally advise them of the preliminary results and timeframes for completion of further check sampling and reporting.
- Should the check sampling indicate that noise still exceeds the maximum permissible limit, immediately contact the above agencies to advise them of the result of the check sampling and determine, in consultation with the above agencies, appropriate management actions. These would include but not be limited to:
  - Immediate implementation of appropriate management measures; and
  - Engagement of a suitably qualified and experienced expert in consultation with the above agencies to further investigate and report on the exceedance(s), provide advice in relation to the significance of the exceedance(s) and recommended amelioration measures to be implemented. A copy of any resulting expert's report must be provided to relevant government agencies.
- In the event that the initial noise results indicate a significant (>30%) exceedance, then:
  - Implement the above measures immediately – do not wait for check sampling to confirm the initial result; and
  - Immediately inform the relevant Government Agencies.
- Written confirmation of any exceedances must be submitted within seven days.

2.4.6 Annual Reporting:

- The results of the noise monitoring, a statement of compliance and a summary of any noise-related complaints must all be documented in the Quarry's Annual Environmental Management Report.
- A copy of the report must be submitted to EPA and Goulburn-Mulwaree Shire Council. Annual reports must be kept for a minimum of four years.

2.5 Air Quality

2.5.1 Background Document

The issue of air quality is discussed in Benbow Environmental (2016b).

2.5.2 Introduction

Dust and particulates can impact on nearby residences and sensitive land-users; whenever possible they should be confined to the designated work areas. Dust and particulates can also have health impacts on quarry staff. Quarrying, crushing, screening and the access and haul roads area all sources of dust and particulates.

2.5.3 Dust and Particulates Mitigation

- Vegetate stockpiles (or provide alternative ground cover) within 10 working days of their completion. This also applies to stockpile faces that will not be re-worked within 20 days.
- Minimise vehicle movements and reduce their speeds during particularly dry or windy conditions.
- Apply water to all roads to minimise the risk of raised dust.
- If necessary, use dust suppressants to augment the use of water.
- Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading Plant Operations
- Service and maintain plant and equipment so that it is in proper operating condition.
- The plant and equipment must be fitted with appropriate dust suppression devices (water sprays). Ensure they are maintained.
- In particularly dry and/or windy conditions it might be necessary to:
  - increase the use of the watering systems (triggered by wind >15km/h)
  - cease excavation and crushing if there is a strong wind (>40 km/h)
  - stop work in some areas of the site if there is a strong wind (>40 km/h)
- Spray stockpiles at the end of the day.
- An adequate water supply for dust suppression must be available at all times. If water is not available in either of the WQCPs then use bore water.

2.5.4 Air Quality Monitoring

(i) Daily Monitoring

- Daily air quality monitoring must be in the form of visual checks carried out throughout the day. These checks must be undertaken by the Quarry

Manager. If excessive dust is visually identified, implement one or more of the measures listed at Section 2.5.3.

(ii) Formal air quality measurements:

- Air quality must be measured by an air quality consultant in accordance with Benbow Environmental (2016b).
- Three air quality monitoring sites must be used at Locations 2, 3 and 4 as shown in Benbow Environmental (2016b) and Appendix 2.
- There must be two, permanent, Dust Deposition Gauges at Locations 1 and 4. The gauges must be measured every three months
- Initially, High Volume Air Samplers to measure PM_{10}[7] must be used at Locations 2, 3 and 4 but, after the first year's sampling, the results may be analysed and a decision made in agreement with the Authorities as to where a single, permanent, sampler can be located.

(iii) Reporting

- The adopted air quality criteria are given in Table 4.
- The results of all air quality monitoring and a summary of any dust-related complaints must all be documented in the Quarry's Annual Environmental Management Report. A copy of the report will be submitted to EPA and Goulburn-Mulwaree Shire Council. Annual reports must be kept for a minimum of four years.

Table 4 - Adopted Dust Criteria

Pollutant	Descriptor	Standard	Averaging Time
Particulate Matter <10µm (PM_{10})	Concentration	30 µg/m^3 50 µg/m^3	Annual 24-Hour
Total Suspended Particulates (TSP)	Concentration	90 µg/m^3	Annual
Deposited Dust	Deposition	2 g/m^2/month[8] 4g/m^2/month[9]	Annual

NOTES:

- Background levels are to be considered when reporting potential impacts.
- Total impact (incremental impact plus background) may require reporting and comparison with the impact assessment criteria.

(iv) Actions and Responses

- Following receipt of all dust monitoring results, the data must be compared against the maximum permissible values. In the event one or more is exceeded, then immediately:
  - Arrange for further check sampling to be undertaken to confirm the initial monitoring result; and

[7] 10 micron or less particulate matter
[8] maximum increase in deposited dust level
[9] maximum total deposited dust level

- Contact the relevant government agencies (EPA and GMSC) and verbally advise them of the preliminary results and timeframes for completion of further check sampling and reporting.

- Should the check sampling indicate that dust still exceeds the maximum permissible limits, immediately contact the above agencies to advise them of the result of the check sampling and determine, in consultation with the above agencies, appropriate management actions. These would include but not be limited to:
  - Immediate implementation of appropriate management measures; and
  - Engagement of a suitably qualified and experienced expert in consultation with the above agencies to further investigate and report on the exceedance(s), provide advice in relation to the significance of the exceedance(s) and recommended amelioration measures to be implemented. A copy of any resulting expert's report must be provided to relevant government agencies.
- In the event that the initial results indicate a significant (>6g/m^2/m for deposited dust) exceedance, then:
  - Implement the above measures immediately – do not wait for check sampling to confirm the initial result; and
  - Immediately inform the relevant Government Agencies.
- Written confirmation of any exceedances must be submitted within seven days.

2.6 Hazardous Materials

2.6.1 Introduction

Hazardous materials can pose serious risks if released to the environment. Hazardous materials must be appropriately handled and stored with specific management practices put in place in case there are any leaks and/or spills.

2.6.2 Mitigation Measures

(i) Hazardous materials storage areas

- If fuel is kept on site (other than in 20 L drums) it must be kept in either dual-walled, self-bunded tanks or on a sealed surface with impervious bunding designed to trap at least 125% of the tank's volume.
- Any fuel tanks must be located away from waterways or areas prone to flooding.
- Install bund walls or diversion drains to divert surface water away from areas dedicated for the storage of hazardous materials.

- Bunded areas should drain to a sump if the volume of the stored hydrocarbons exceeds 1,200 litres.
- Provide high-performance grease traps and oil traps near workshops and places where vehicles and machinery are parked.

2.6.3 Spill and Leak Response

- Minimise the amount of hazardous substances kept onsite.
- Develop contingency plans to address spills and leaks and provide adequate training to onsite staff.
- Install trays, thick plastic mats or similar beneath stationary machinery to protect the soil from oil or fuel spills and leaks.
- Install spill trays immediately if there is any potential for, or evidence of, leakage.
- Ensure that appropriate clean-up equipment is readily accessible.
- Maintain a supply of oil-absorbent material in a spill kit.
- Contain and treat spills and leaks.
- Ensure that drainage from areas where spills could occur is diverted through a sump or interceptor trap to remove hydrocarbon contamination.

2.6.4 Reporting

- If a spill/leak has the potential to cause environmental harm it must be immediately verbally notified to the EPA (phone 131 555) with a subsequent written report within seven days. The report must detail:
  - Date, time and duration of the event
  - Type, volume and concentration of the pollutant
  - Name, address, telephone number of any witness to the event (staff or public)
  - Actions taken
  - Details of preventative methods adopted to minimise the risk of it happening again.
  - Any other relevant details.

2.7 Vegetation Management

2.7.1 Existing Vegetation

The site is dominated by a mixture of native and exotic pasture grasses and forbs with several stands of remnant forest persisting over the western portion of the property. A variety of common pasture weeds such as thistles have also been introduced to the site as a result of previous land uses and clearing.

The site is moderately diverse in terms of the variety of species which form the grassy ground layer. One threatened flora species was recorded nearby and remnants of the Box/Gum Woodland endangered ecological community are present on site.

- No existing native vegetation outside of the Quarry's footprint will be degraded or removed, including all timber (alive or dead) and shrubs.
- Appendix 2 identifies the areas of existing significant native vegetation and the Quarry's footprint which includes the Extraction Areas, Haul Road, Ingress road, office area and hardstand and the Effluent Management Area.
- The areas of existing native vegetation must be identified as no-go areas by suitable durable pegs.
- Areas outside the Quarry's footprint and the existing and proposed native vegetation areas, land must be maintained as existing limited-grazing agricultural use.
- Weeds must be managed in all areas; refer to Section 2.8.

2.7.2 New Native Vegetation

- 8.8 ha of new native vegetation must be planted as a water quality offset (Appendix 2). The plants will be selected from those below[10]:
  - *Eucalyptus rossi* (scribbly gum),
  - *E. mannifera* (brittle gum),
  - *E. dives* (broad-leaved peppermint),
  - *E. macrorrhyncha* (red stringybark),
  - *E. sieberi* (sivertopped ash).
  - *Exocarpus cuppressiformis* (native cherry),
  - *Leptospermum sp* (tea tree),
  - *Allocasuarina littoralis* (black she-oak) and
  - *Acacia mearnsii* (black wattle)
  - *Allocasuarina nana* (stunted she-oak)
  - *Lomandra* (matt rush)
  - *Banksia spinulosa* (hairpin banksia)
- The areas for re-vegetation must be identified by suitable durable pegs by a surveyor.
- Stock must be prevented from entering re-vegetation areas until plants are very well established; use electric fencing or similar.
- Plants must be planted as tubestock at the rate of approximately one per 10 m^2 (i.e. on a roughly 3m x 3m grid).

[10] Species list obtained from SCA/DLWC (2002) for the Tarrawarra Soil Landscape

- Reduce weed competition before planting.
- Use wind breaks around each tubstock.
- Choose a 50/50 blend of trees and understory plants.
- Newly planted trees and shrubs must be inspected every six months until ensure adequate growth is ensured. If less than 90% survive new plants must be planted to replace them.
- Water may be drawn from the water quality control ponds or from the bore for irrigation of newly-planted tubestock.

2.8 Weed Management

2.8.1 Introduction

A weed is a plant that is or has the potential to become a pest or unwanted species due to its potential impacts on land use activities. These impacts may be to the ecosystem/ biodiversity, agricultural or other land uses or economic value of natural resources including land. The development area has been used primarily for agriculture in the past and apart from minor boundary fencing, small farm dams and various buildings, it remains undeveloped.

This section:

- Provides a description of the current state of the site;
- Identifies current weed threats;
- Provides a weed management program designed to reduce the weed management risk associated with the change of use of the site.

It is proposed to change the use of part of the site from agricultural operations to a quarry and ingress road. This change of land use will cause changes to the ecology of the site. Grazing may be less frequent and vegetation is likely to be actively managed through activities such as mowing or slashing of grasses, however it is also likely that stock exclusion may occur.

The change in the dynamics of vegetation management while invasive weed species occur nearby may result in those invasive species becoming more prolific on the site. Managing these species before they become a problem will significantly reduce the cost of the weed management and the damage these species will have on the environment and nearby agricultural operations.

2.8.2 Weed Species Identified as Potential Issues

These species are known to occur in the area and to be weeds of environmental and/or economic significance.

Grass weeds

Name	Common Name
Nassela tricotoma	Serrated Tussock
Phalaris Aquatica	Phalaris

Herbaceous weeds

Name	Common Name
Plantago lanceolata	Plantain
Acetosella vulgaris	Sorrel
Taraxacum officinale	Dandelion
Hypericum perforatum	St Johns Wart
Conyza albida	Fleabane
Carduus nutans	Nodding Thistle
Onopordum acanthium	Scotch Thistle

2.8.3 General Weed Management Actions

It is essential in any weed management plan to implement an integrated approach to reducing weed plant numbers and minimising opportunities for establishment of weeds on a site. This involves using a range of techniques for controlling the weed issue and may include grazing, competition with desirable species, chemical controls and manual removal.

For this site, maintaining good competition to weeds will be a key component of managing the weed issue. The site is currently relatively free of weeds as it has a very good cover of desirable grasses.

2.8.4 Weed Management Plan

The following list summarises the weed management actions that will need to be applied to this site:

- Maintain good ground cover of desirable species. The site is currently largely occupied by grassland composed of native and valuable pasture species, this cover should be maintained by;
  - Avoiding disturbance to vegetation
  - Actively regenerating vegetation on bare ground
  - Allowing the Weeping Grass and other native grasses to grow to seed – do not mow or slash before seed has been able to mature except in accordance with proper bush fire maintenance in and around the proposed cemetery and associated infrastructure.

- Regularly (every six months) monitor site for weed species. The site must be monitored for weeds by the Quarry Manager or a local weed contractor or other suitably experienced person in early spring every year and at other times when weed threats may become an issue as advised by an ecologist. The Quarry Manager must familiarise himself with notified weeds on an annual basis from information available from Goulburn Mulwaree Council.

A formal Weed Management Plan following the guidelines presented in Goulburn Mulwaree Shire Council's weed management template must be prepared before operations commence and reviewed at least every three years. This would document weed species occurring or threatening the property in terms of species, spatial distribution and abundance. If any weed issues are identified they must be suitably managed by a local weed contractor or other suitably experienced person under the guidance of the Weed Management Plan. Document any measures taken.

2.9 Pest Animal Management

Pest animals are not currently an issue on this site however they could become so. The Quarry Manager would at least annually investigate the need to address pest animals on this site. In doing this the Quarry Manager would liaise with the Local Land Services.

2.10 Onsite Wastewater Management

2.10.1 Relevant Background Document

Refer to Laterals Planning (2008b): *On-site Wastewater Management Study,* with the exception that the irrigation area is near the revised location of the site offices (Appendix 2).

2.10.2 System Summary

The wastewater system consists of an Aerated Wastewater Treatment System (AWTS) which treats and disinfects wastewater so it may be disposed by irrigation in a dedicated Effluent Management Area (EMA).

2.10.3 Ongoing Maintenance

The AWTS and irrigation area require professional quarterly maintenance by a qualified wastewater contractor. In addition:

- The vegetation in the EMA requires periodic slashing/mowing
- Ensure only "septic friendly" cleaners are used in the office and ablutions
- Ensure there are no leaking taps or cisterns in the office.

3 DRIVER CODE OF CONDUCT

3.1 General Requirements

All but one haulage driver will be contracted and might operate under their own code of conduct. However, all drivers hauling from the Quarry must:

- Have undertaken a site induction carried out by the Quarry Manager;
- Hold a valid driver's licence for the class of vehicle that they operate;
- Operate the vehicle in a safe manner within and external to the quarry site;
- Comply with the direction of authorised site personnel when within the site; and
- Comply with the Australian Road Rules external to the site.

3.2 Truck Routes

All drivers are to be informed of the approved truck routes operating at the Quarry. Adherence to this will be verified by the Quarry Manager through random observations.

3.3 Speed

3.3.1 Internal

The speed limit in the Extraction Area and the Facilities Area is 20 km/h which is to be strictly maintained. The speed limit on the remainder of the Ingress and Egress roads is limited to 40 km/h up to any sealed section where trucks may safely achieve a speed limit of 60 km/h. Speed is limited to reduce noise, dust and improve safety.

3.3.2 External

Drivers are to observe the posted speed limits, with speed adjusted appropriately to suit the road environment and prevailing weather conditions, to comply with the Australian Road Rules. The vehicle speed must be appropriate to ensure the safe movements of the vehicle based on the vehicle configuration.

Drivers and truck operators are to be aware of the "Three Strikes Scheme" introduced by the RMS which applies to all vehicles over 4.5 tonnes. When a heavy vehicle is detected travelling at 15 km/h or more over the posted or relevant heavy vehicle speed limit by a mobile Police unit or fixed speed camera, the RMS will record a strike against that vehicle. If three strikes are recorded within a three year period, the RMS will act to suspend the registration of that vehicle (up to three months).

3.4 Fatigue

The National Heavy Vehicle Accreditation Scheme allows heavy vehicle operators the choice of operating under three fatigue management schemes:

- Standard Hours of Operation;

- Basic Fatigue Management (BFM); and
- Advanced Fatigue Management (AFM).

All heavy vehicle drivers operating out of the Quarry are to be aware of their adopted fatigue management scheme and operate within its requirements. Fatigue includes (but is not limited to) the following:

- Feeling sleepy
- Feeling physically or mentally tired, weary or drowsy
- Feeling exhausted of lacking energy
- Behaving in a way consistent with any of the above

3.5 Vehicle Control

In order to minimise the impact of noise from truck transport, the following controls apply to truck operators at the Quarry:

- Tailgates must be locked and secured to avoid noise or spillage;
- Always observe the posted speed on site and the local road network;
- No tail-gaiting is permitted; a three-second gap is to be observed at all times;
- Equipment to be used must be fit for purpose.
- No over-taking is permitted on site.

3.6 Load Covering

- All loaded vehicles entering or leaving the site must be effectively covered for the duration of the trip. The load cover can only be removed upon arrival at the delivery site.
- Loose debris from the vehicle body and wheels is to be removed prior to leaving the site.
- Drivers must ensure the tailgate is locked before leaving the site.
- Quarry management is to monitor loose material on the side of the haulage route from quarry operations and take appropriate action (removal or suppression).

3.7 Operating Hours

All drivers must adhere to the operating hours given in Table 2.

3.8 Vehicle Departure and Arrival

To alleviate public concern and increase road safety, heavy vehicles leaving or arriving at the quarry should be separated by an adequate interval, no less than 40 seconds.

4 RESPONSIBILITIES

Responsibilities of Quarry staff and contractors under this OEMP are set out in the Responsibilities Table (Appendix 2). There is a single Quarry Manager who is responsible for the entire operation of the Quarry including vegetation management (including weeds), stormwater management, dust and noise control, day-to-day operations (including rehabilitation).

Machinery operators and haulage drivers are contractors but they will be inducted in the relevant requirements of this OEMP.

5 TRAINING

- The Quarry Manager must undertake suitable training in:
  - Health and Safety (including bushfire and other emergency)
  - Spill response
  - Traffic management
  - Erosion and sediment control
  - Noxious weed management
  - Vegetation management
  - Irrigation management
- Note some training might require updating during the life of the Quarry.
- The training program and any updates must be documented.
- Employees and contractors must be briefed on the OEMP as part of their site induction and training.
- Contracted employees must hold relevant qualifications for their job (e.g. suitable licenses for operating large equipment, "a White Card" etc.). The Quarry Manager must ensure the qualifications are always current.

6 COMMUNITY CONSULTATION

6.1 Telephone Pollution Complaints Line

During operation hours a telephone complaints line must be manned by the Quarry Manager to receive any complaints from members of the public in relation to quarry activities (including transportation). Nearby properties must be advised of that number.

6.2 Recording of Pollution Complaints

- All complaints received must be documented and must include:
  - The date and time

- The method of complaint
- Personal details of the complainant
- The nature of the complaint
- The action taken, or an explanation of why no action was taken.

- All complaint records must be kept for a period of four years. A summary of all complaints must be documented in the Quarry's Annual Environmental Report.
- The complaint records must be available for EPA or Council Staff if requested.

7 EPA LICENSE AND REPORTING

7.1 License

A copy of the Environment Protection License (EPL) to operate must be displayed at the site office.

7.2 Reporting

The Company's Annual Environmental Management Report will guide and contain the EPA "Annual Return". The Annual Return must be completed on the EPA's form which is supplied by the EPA through the life of the project. The Annual Return must:

- Contain a statement of compliance
- Contain a summary of all monitoring and complaints
- Be provided to the EPA by registered post within 60 days of the end of the reporting period
- Be signed by the license holder or an EPA-approved signatory
- Be kept for at least four years.

8 WASTE MINIMISATION

By implementing a Waste Minimisation Action Plan, Argyle (NSW) Pty Ltd can ensure continued future good waste management and waste minimisation. An initial format of the Waste Minimisation Action Plan is given in **Table 5.** It may be adapted as the project continues.

Table 5 - Waste Minimisation Action plan

Item	Action Required	Priority	Responsible Personnel	Start Date	To be completed by
1	Establish site waste monitoring on a monthly basis				
2	Identify site waste composition				
3	Research and identify any areas where waste can be further recycled				
4	Identify possibilities for greater segregation (and subsequent recycling) of wastes in the area				
5	Establish paper/cardboard recycling program and obtain service provider to take materials off site				
6	Establish plans to minimise chemical waste powder				
7	Materials that are being recycled-provide estimate of annual quantity				
8	Materials that are being reused provide estimate of annual quantity				

9 ACCIDENTAL ABORIGINAL FINDS

Accidental Aboriginal finds in the work areas must be reported immediately to the NSW Office of Environment and Heritage (National Parks and Wildlife Service) and to Goulburn Mulwaree Shire Council. If there are accidental finds, a management plan must be developed in consultation with these authorities.

10 EXTRACTION VERIFICATION

The movement of trucks taking product from site must be documented daily. Each truck will be filled to the same volume previously calibrated to give the typical tonnage. A yearly summary of total tonnage must be prepared for submission to the regulators.

11 REHABILITATION

11.1 Introduction

Rehabilitation means measures taken to repair disturbed and/or degraded land and return it to a stable and non-polluting state, one suited to the proposed future use. Where possible, quarried areas must be progressively rehabilitated, although given the relatively small quarry size opportunities to do this might be limited.

11.2 The Extraction Area

The goal of rehabilitation is to return the Extraction Area to an internally-draining, safe and stable landform. To do that:

- The noise mounds will be removed and the fill gained from them used to form slopes inside the excavation area grading at no more than 2.5H:1V.
- The slopes will grade to a pond formed in the former excavation area.
- To form the slopes:
  - Use contour banks or reverse incline benches if the slope length is greater than 25m.
  - Once the landform is created, spread topsoil uniformly over the area at no less than 100 mm.
  - Leave topsoil with a rough surface.
  - Do not spread soil when too dry or too wet as compaction and other damage to the soil structure will occur.
  - Deep-rip any compacted areas along the contour; either before or after spreading topsoil.
  - Ripping the subsoil before topsoil spreading will help to 'key' in the soil to the underlying material.
  - To assist ripping do it when the soil is relatively dry.
  - Fertilize and/or ameliorate soils to promote revegetation. Undertake soil testing as necessary to determine appropriate requirements and rates.
  - Finished landforms must be stabilised with adequate ground cover. Within 20 days of final formation achieve at least 50% ground cover using hydro-mulch or compost blanket containing adequate and suitable seed so that a plan is in motion to achieve at least 70% permanent ground cover within 60 days of completion. Refer also to Section 2.7.2. Irrigate rehabilitated areas as necessary to encourage good growth.

11.3 Access and Egress Roads

- These roads will be maintained as future farm tracks.

11.4 Water Quality Ponds

WQCP 1 will be drained and removed. Fill from the embankment will be used as fill in the former pond. Finished landforms must be stabilised with vegetation to achieve 70% ground cover within 60 days. Consider using hydro-mulch or compost blanket to encourage quick re-vegetation. Refer to recommendations in Section 3.2 regarding soil placement and revegetation. WQCP2 and WQCP3 will remain.

11.5 Monitoring and Maintenance

Monitoring of the rehabilitation will be required for at least 24 months to ensure it is successful. Areas that are not successfully rehabilitating will be repaired and further rehabilitated until they are stable. This includes areas of erosion, slumping, and/or noxious weeds. Final sign-off on the rehabilitation will be done in consultation with the relevant Government Authorities.

11.6 Final Closure

- Remove all fixed and mobile plant.
- Remove all temporary and permanent structures unless required for an agreed future use.
- Level off any noise-control bunds and overburden stockpiles, or shape to an appropriate form for the site's final land-use requirements.
- Identify and dispose of all waste materials including hazardous and contaminated materials to appropriately licensed landfills.
- Break up and remove concrete slabs, unless required for future use.
- Remove surplus roads, office sites and hardstand areas where necessary.
- Dispose of all waste materials to appropriately licensed landfills.

12 BUSHFIRES AND EMERGENCIES

12.1 In case of bushfire emergency

- Information on bushfires can be obtained from the Bush Fire Information Line - 1800 679 737
- In case of a bushfire risk, the Quarry Manager must inform all site staff by radio contact to gather at one of the two muster areas shown in Figure 1.

- If the fire is on the property the Quarry Manager must call the Rural Fire Service (RFS) on 000 and inform them of the exact location of the fire.
- All staff must remain at the muster areas until the RFS indicate it is safe to leave.
- Staff may only leave the site entirely if all staff are accounted for *and* only if directed to do so by the RFS.

12.2 Other Emergencies

- Depending on the nature of the emergency call 000 and ask for the appropriate emergency agency.
- First aid kits will be maintained at the site office and in a prominent position.
- All site staff will be inducted in standard first aid (this does not include transient truck drivers)
- Emergency evacuation procedures are incorporated onto a sheet for placement on the front of the office.

13 REFERENCES

- Benbow and Associates (2016a) *Noise Monitoring Plan For Argyle (NSW) Pty Ltd Tiyces Lane, Boxers Creek.*
- Benbow and Associates (2016b). *Air Quality Monitoring Plan For Argyle (Nsw) Pty Ltd Tiyces Lane, Boxers Creek*
- DECC (2008). *Managing Urban Stormwater. Volume 2e Mines and Quarries.* NSW Department of Environment and Climate Change.
- Gunlake Quarry (2016). Traffic Management Plan.
- Landcom (2004) *Managing Urban Stormwater. Volume 1 Soils and Construction* (The Blue Book)
- SEEC (2016). *Water Cycle Management Study for proposed hard rock quarry Lot 1 DP 1094055 Tiyces Lane Towrang*. Strategic Environmental and Engineering Consulting.
- Victorian State Government (2016). Code of Practice for Small Quarries. *http://www.energyandresources.vic.gov.au/earth-resources-regulation/licensing-and-approvals/sand-stone-and-clay/guidelines-and-codes-of-practice/code-of-practice-small-quarries*.

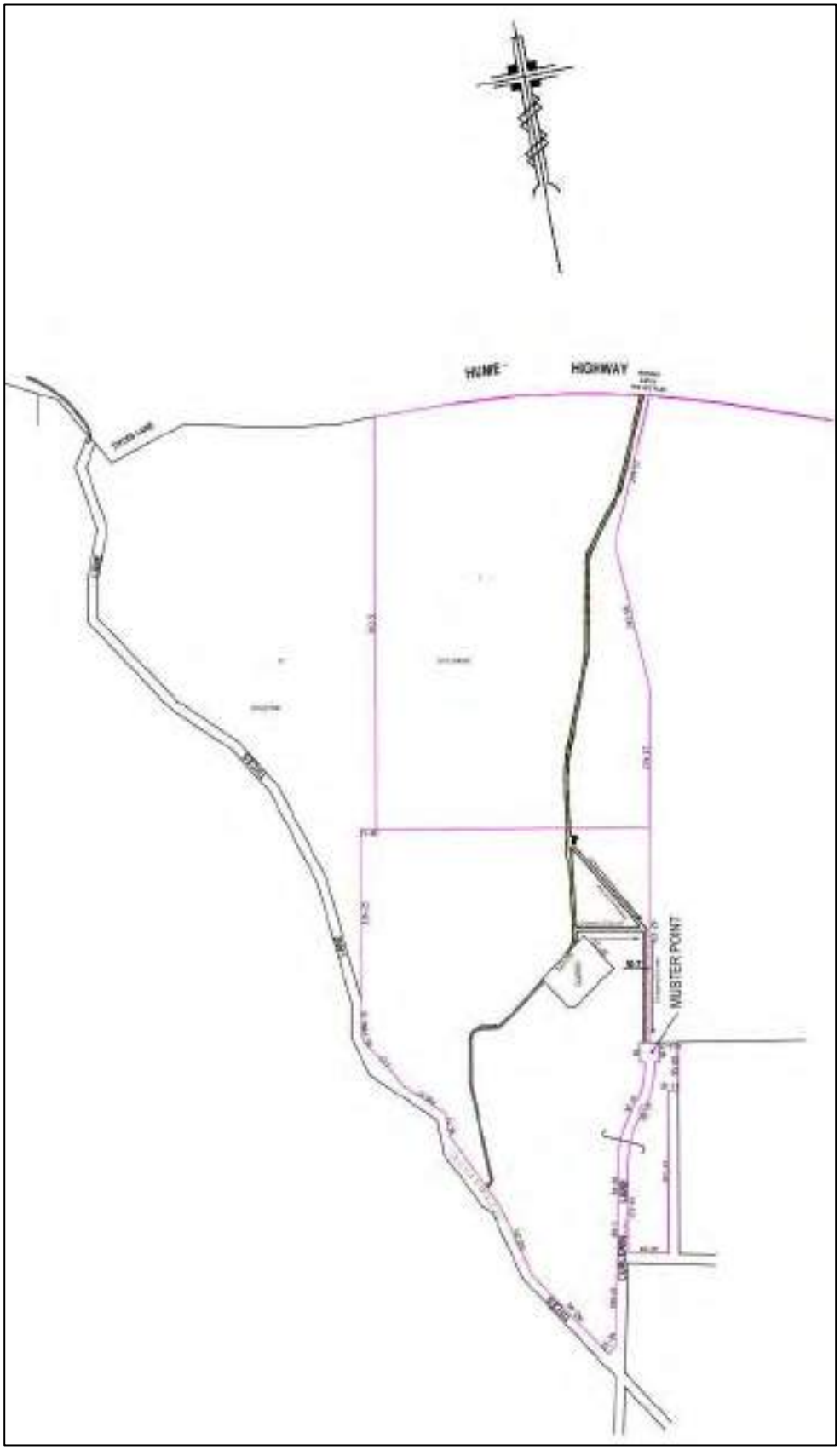


Figure 1 - Evacuation Routes and Muster Areas

14 APPENDICES

14.1 Appendix 1 – Soil and Water Management Checklist (Pro-forma)

Curlewin Quarry	**Date:**
Inspected by:	
Signature:	

Instructions:

- This checklist is to be completed by the Quarry Manager (or approved representative) at the time of making the site inspection.
- A tick (✓) should be placed in the applicable **Yes/No** box as appropriate.
- Where an item is not applicable, the notation **N/A** should be placed in the **Comments and Actions** box.
- Where a non-conformance is identified (a tick in a shaded box), a brief explanation is to be provided in the corresponding **Comments and Actions** box.
- The completed checklist and details of any corrective actions must be placed in the project file.

	Yes	**No**	**Comments & Actions**
General			
Is the site is in a generally tidy condition?			
Is all equipment, materials, etc. contained within work area boundary?			
Are there any obvious signs of disturbance outside of approved work area(s)?			
Is the weather station active and is data recorded since last inspection?			
Soil Disturbance and Erosion Control			
Have required erosion control measures been correctly installed and are they functional? Check that there are/is: ▪ no gaps in silt fences/barriers ▪ correct ground cover to achieve required C-Factors ▪ any areas of concentrated flow that do not flow to sediment basins/traps?			

	Yes	No	Comments & Actions
Are there any obvious signs of uncontrolled drainage leaving the site?			
Are any materials, temporary structures/works in drainage lines?			
Are drainage outlets provided with energy dissipaters to minimise erosion? Are they stable?			
Are areas where quarrying activities have ceased being stabilised and rehabilitated? Are these areas being rehabilitated in a timely manner? (Refer to the SWMP)			
Is there dirt on adjacent public roads?			
Are any diversion banks/drains stable?			
Sediment Control			
Are dirty water diversion drains functional, unblocked, and connected to their correct storages (refer to the SWMP)?			
Are any sediment fences in place and intact? Do they conform to SD 6-8 (refer to the SWMP)			
Are all other sediment traps operational and below capacity?			
Stockpile Management			
Are non-active stockpiles stabilised with vegetation or other suitable cover?			
Are there separate stockpiles for different materials (topsoil and subsoil)?			
Are topsoil stockpiles less than 2 m in height?			
Are stockpiles located at least 20m from concentrated water flow and on slopes less than 10%?			
Are there are diversion banks on the upper sides of stockpiles?			
Extraction Area Sump			
Is there sufficient volume in the Extraction Area Sump? (0.5 ML)			
Is the pump operational (to pump to WQCP1)?			
Has, or does, any dirty water leave the confines of			

	Yes	No	Comments & Actions
the extraction area?			
Water Quality Pond 1			
Is the top water level at or above the maximum permissible water storage level?			
If yes, are the irrigation pumps operational?			
Are the inlets and outlets stable?			
Are pump (irrigation) records being kept and up to date?			
Have there been any discharges from the pond?			The pond should not discharge – ensure that surplus water is held in the excavation area until volume in the WQCP1 is available. Report the discharge
Water Quality Ponds 2 & 3			
Are the inlets and outlets stable?			
Is all water from the processing area and the Haul Road being diverted to the pond?			
Is the sediment level above the maximum sediment storage level?			Remove the sediment
The Irrigation Area			
Is the irrigation infrastructure operational?			
Is the irrigation spreadsheet up to date?			
Is the rate of irrigation (L/m^2) being recorded?			
Are there signs of waterlogging in the lowest part of the irrigation area?			
Has the vegetation been cropped (manually or by stock)			
Is the vegetation healthy?			
Onsite Wastewater Management			
Are there any foul odours at the septic tank or absorption bed?			
Is there water at the surface around the tank or absorption bed?			
Is the outlet filter blocked on the septic tank?			

	Yes	No	Comments & Actions
Air Quality (Dust)			
Are there any obvious signs of dust deposition outside of approved work areas?			
Is spoil evident on public roads?			
Are the Access and Haul roads being kept damp?			
Is the air quality monitoring equipment installed and operating correctly?			
Are the dust monitoring results being recorded?			
Is there adequate spraying for dust control at the crusher?			
Is there adequate stabilisation of stockpiles?			
Do trucks entering and leaving the site have their loads covered?			
Are dust-related complaints being documented?			
Noise			
Is the noise quality monitoring equipment installed and operating correctly?			
Are the noise monitoring results being recorded?			
Are noise-related complaints being documented?			
Waste Management and Minimisation			
Are waste receptacles accessible and clearly marked with regard to waste type?			
Is all recyclable material separated as per the waste management plan (records available)?			
Are records of the type, amounts, date, transport, and disposal site of waste kept in a Waste Management Register?			

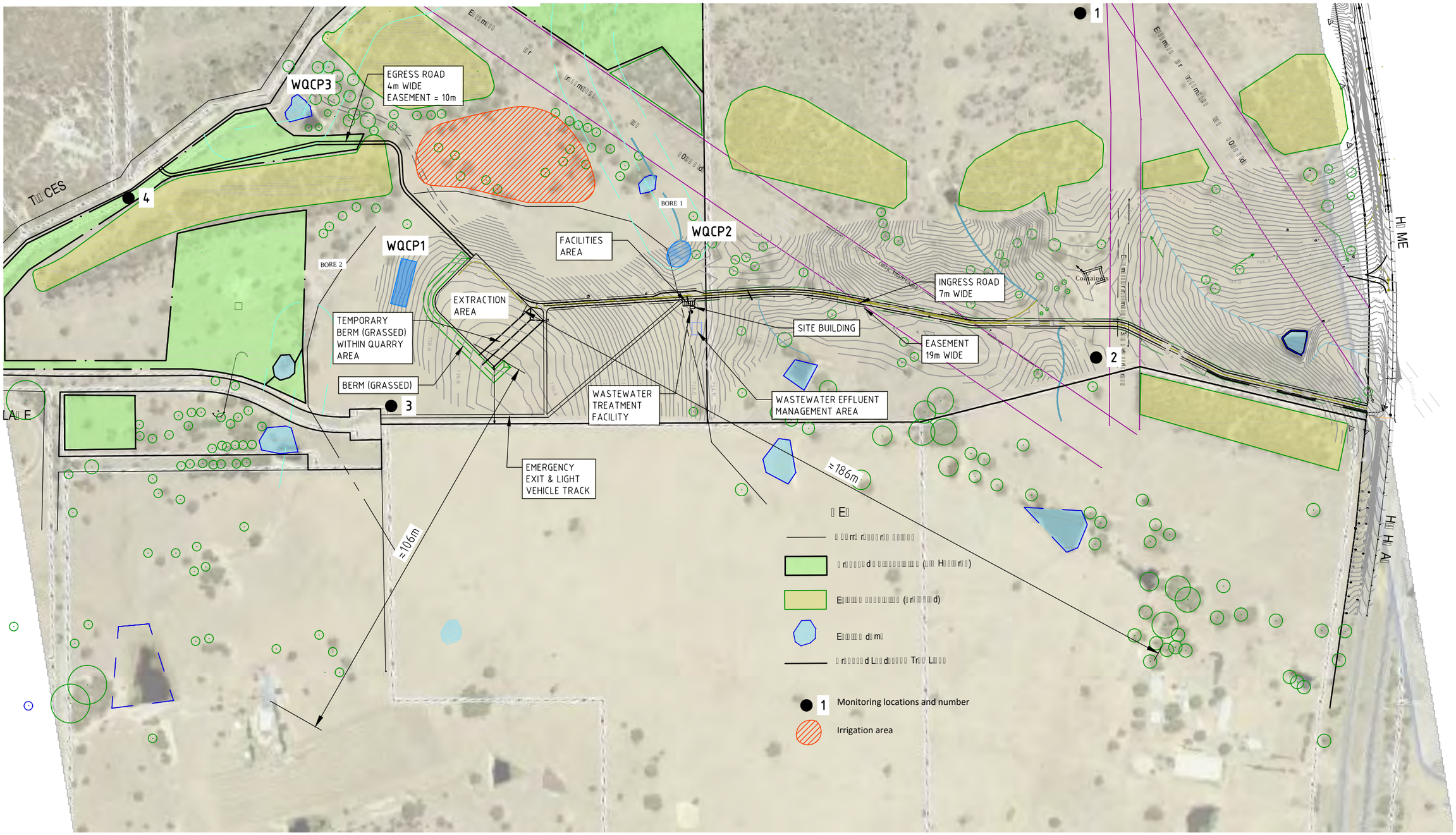
	HAZARDS IDENTIFIED	Signed off and Date

- Attached copies of any Site Instructions issued.
- Results of the Inspection must be discussed at Site Meetings.
- Results of the Inspections must be discussed with the Quarry Manager.
- Provide a copy of this page (with "Corrective Actions Required", including NIL Actions) to the Office. If required send further copy of page once all corrective actions have been signed off.

Quarry Manager _____ Signature & Date __/__/__

14.2 Appendix 2 – The Quarry Plan

Over-page



REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
04	14/04/17	M.P.	M.R.	M.P.	EGRESS ROAD LOCATION ADDED
03	04/10/16	M.P.	A.B.	M.P.	REVISED ACCESS ROAD LOCATION
2	11/07/16	M.P.	M.R.	M.P.	MODIFIED FOR UPDATED BASE PLAN
1	23/06/16	M.P.	M.R.	M.P.	IRRIGATION AREA AMENDED
0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
A	03/05/16	M.P.	M.R.	M.P.	DRAFT

DRAWING STATUS

DESIGN BY	M. PASSFIELD
DRAWN BY	M.R.
FINAL APPROVAL	M. PASSFIELD
SCALE: (on A3 Original)	1:5000

FOR APPROVAL

North

CLIENT

JASMINCO RESOURCES

445

SEEC
P.O.Box 1098, Bowral, NSW. 2576
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PROJECT TITLE

PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
CURLEWIN LANE
BOXERS CREEK NSW

DRAWING TITLE

SITE LAYOUT

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	Appendix	04

Plot Date: Thursday, 13 April 2017 1:01:32 PM CAD File Name: N:\16000080 Quarry at Tiyces Lane\Drawings\16000080_P01_Appendix_REV04.dwg

14.3 Appendix 3 - Erosion and Sediment Control Plan (conceptual)

PROPOSED BASALT QUARRY

CONSTRUCTION PHASE
EROSION AND SEDIMENT CONTROL PLANS

CONCEPTUAL

APRIL 2017

DRAWING SCHEDUE

DRAWING NUMBER	DRAWING TITLE
16000080_P01_ESCP000	ESCP - COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
16000080_P01_ESCP001	ESCP - GENERAL NOTES
16000080_P01_ESCP002	ESCP - ESCP - BACKGROUND DATA & CALCULATIONS
16000080_P01_ESCP003	ESCP - SHEET 1 OF 2 (SOUTH)
16000080_P01_ESCP004	ESCP - SHEET 2 OF 2 (NORTH)
16000080_P01_ESCP005	ESCP - STANDARD DRAWINGS

LOCALITY PLAN
N.T.S.

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
05	13/04/17	M.P.	M.R.	M.P.	FOR REVISED DA
04	01/12/16	M.P.	A.T.	M.P.	REVISED FOR EGRESS ROAD
03	04/10/16	M.P.	A.B.	M.P.	REVISED ACCESS ROAD LOCATION
2	08/08/16	M.P.	M.R.	M.P.	ADDED DRAINS
0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
A	03/05/16	M.P.	M.R.	M.P.	DRAFT

DRAWING STATUS	
DESIGN BY	M. PASSFIELD
DRAWN BY	M.R.
FINAL APPROVAL	M. PASSFIELD
SCALE: (on A3 Original)	N.T.S
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DRAWING TITLE

EROSION AND SEDIMENT CONTROL
GENERAL NOTES

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	ESCP00	05

Plot Date: Thursday, 13 April 2017 12:57:01 PM CAD File Name: N:\16000080 Quarry at Tiyces Lane\Drawings\16000080_P01_ESCP_REV05.dwg

GENERAL NOTES

Background information
There are three major parts to the works:
Stage 1
- The Ingress Road (706 m x 19 m = 13,400 m2)
- The Ingress Road (where steeper); (210 m x 19 m = 4,000 m2);
- The Egress Road; (467 m x 10 m = 4670m2); and

Stage 2
- The Extraction Areas (12,000 m2)

EROSION AND SEDIMENT CONTROL DESIGN
- The details shown within this plan are for construction stage erosion and sediment control requirements only.
- This Erosion and Sediment Control Plan (ESCP) has been prepared in accordance with Blue Book Volume 1 (Landcom, 2004) and project approval conditions.
- An erosion hazard assessment has been completed for all areas within the proposed works. The predicted soil loss across all site areas has been determined in accordance with the following:

A = R x K x LS x C x P
Where:
A = Annual soil loss due to erosion (t/ha/yr)
R = Rainfall erosivity factor (R-Factor)
K = Soil erodibility factor (K-Factor)
LS = Topographic factor derived from slope length (L) and slope gradient (S)
C = Cover and management factor (C-Factor)
P = Erosion control practice factor (P-Factor)

Table 3 - Soil Loss Calculations

Soil Erodability (K-Factor)	0.018 for Extraction Area and Ingress Road New Excavation 0.044 for Ingress Road
Rainfall Factor (R-Factor)	1370
Maximum slope length	80 m (Extraction Area), 40 m (All Roads
Slope gradients	Extraction area = 5% Ingress Road = 8% Ingress Road = 3% Egress Road = 5% (assumed)
Volumetric Runoff Coefficient (Cv)	0.39 for Ingress Road
C- Factor for cleared land	1
P-Factor for disturbed lands	1.3
Calculated potential soil losses	38 t/ha/y for Extraction Areas 42 t/ha/y for Ingress Road - where steeper 37 t/ha/y for Ingress Road 63 t/ha/y for Egress Road
Soil Loss Class	Class 1 (very low)
Total potential site soil loss	Stage 1 = 95 t/y, Stage 2 = 35 t/y

SEDIMENT BASINS
The potential soil loss is less than 150 m3/year for each stage and so technically sediment basin(s) are not required. However, as there is a requirement for water quality control ponds, they will be installed as early works (before clearing the Extraction Areas and the Road alignments) and used to settle and/or contain dirty water (refer to dirty water treatment and discharge notes). Note that the Extraction Areas will quickly become internally-draining with a (min) 0.5 ML sump formed in the base.

IMPLEMENTATION OF EROSION AND SEDIMENT CONTROLS
1. Works are to be undertaken in two stages (Stage 1 = road construction, Stage 2 = Extraction Area). Works are to be staged in the following order with the relevant erosion and sediment controls implemented prior to and during each section/stage of works as specified. Note: Stage 2 must not commence until Stage 1 is complete.
2. Before commencement of clearing, topsoil stripping and earthworks in each area/section of works, the site is to be secured and the following erosion and sediment control measures installed in order except for Items 12 to 17 which are to be undertaken progressively as required throughout all stages of works. Stripping and earthworks necessary to install the erosion and sediment controls are permitted but must be kept to a minimum.
3. Barrier fencing (or alternative measures) should be in place around the edge of the construction boundary to restrict access and in any additional locations as required to minimise unnecessary disturbance - Refer to the 'Access Control' notes below.
4. Establish stabilised site entry/exit points (Standard Drawing SD 6-14) in the locations shown and anywhere where construction vehicles exit a work area onto a public road - Refer to the 'Site Entry and Exit Points' notes below.
5. Establish a temporary site office, toilet and parking area.
6. Install sediment fencing in the locations shown and following Standard Drawing SD 6-8 (Refer to the 'Sediment Fencing notes below).
7. Offsite (clean) water diversions are to be constructed and stabilised - refer to plans for locations. Sizing to future detail.
8. Stockpile areas are to be established in locations as shown or as specified by the site manager and in accordance with the 'Soil Stripping and Stockpiling' notes below.
9. Once all of the above measures are complete and stable, construction works can commence in accordance with the engineering plans. Topsoil stripping is to be undertaken in accordance with the 'Soil Stripping and Stockpiling' notes.
10. Build WQCP1 and WQCP2 before clearing the Extraction Areas and the Ingress Road footprints respectively. Refer to Table 3. WQCP3 is an existing dam.
11. Build dirty water drains DD1 to DD7 to divert all dirty water from those disturbed areas to the WQCPs. Stabilise the drains with geotextile matting (SD 5-7) or rock pitching for DD03 & DD04.
12. Slope lengths across disturbed lands are to be maintained at the required intervals during all rainfall events (Refer to the 'Slope Lengths' notes).
13. Dust suppression to be carried out when required (Refer to the 'Dust Suppression' notes).
14. Treatment of dirty water is to be carried out as necessary in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes.
15. Monitoring, maintenance and inspections are to be carried out regularly as required, in accordance with the 'Site Inspection and Monitoring' notes.
16. Undertake progressive stabilisation of lands as final earthworks are complete in each area (rather than waiting until the completion of works).
17. Final stabilisation is to be completed in accordance with the 'Stabilisation' notes and Table 1.
18. When the excavation area is internally draining remove DD01 & DD02 & stabilise the ground.
19. When the Egress Road is stabilised remove DD06 & DD07.

ACCESS CONTROL
- Install barrier fences or suitable administrative controls to define the project works and clearing limits.
- Barrier fencing can simply be made from tape wound around star pickets or stakes. Alternatively, sediment fence, site fence or chain wire fences can be used for this purpose if so desired. Existing site fences can also be used where they are present in the relevant locations.
- Barrier and sediment fencing are to be used to ensure that all vehicles entering and leaving the site pass over a stable access point to minimise bogginess in these areas and minimise sediment tracking onto public roads.
- Barrier fencing is to be used to delineate all 'no go' areas.
- Barrier fencing is to be used at the discretion of the site manager to delineate other 'no go' areas.
- The soil erosion hazard on the site will be kept as low as practicable by minimising land disturbance. Some ways of doing this are outlined in Table 2.

SITE ENTRY AND EXIT POINTS
- Establish stabilised site access points anywhere where construction vehicles enter or exit a work area from a sealed public road. Refer to Standard Drawing SD 6-14 from Landcom (2004).
- Ensure that all vehicles entering and leaving work areas from a sealed public road pass over a stable access point to minimise bogginess in these areas and to minimise mud tracking onto public roads.
- Refer to the notes on Site Inspection, Monitoring and Maintenance regarding street sweeping.

SOIL STRIPPING AND STOCKPILING
- Ideally, strip topsoil when it is moist, not too wet or too dry.
- Take care when stripping topsoil not to strip subsoil with the topsoil profile. Topsoil and subsoils should be managed separately.
- Stockpile areas are to be established within approved locations and as specified by the site manager.
- Wherever possible, stockpiles are to be established and maintained in accordance with Standard Drawing SD 4-1 (Landcom, 2004).
- As much as is feasible, mulched vegetation, topsoil and subsoil (if applicable) are to be stockpiled separately.
- Sediment fencing is to be installed around the lower edge of stockpiles as per Standard Drawing SD 4-1, unless the stockpile is immediately adjacent to a suitable alternative control such as a mulch bund or sediment basin.
- A diversion drain/bund is to be installed on the high side of stockpiles if run-on from upslope lands could impact on the stockpile.
- Stockpiles are not to be positioned within 5m of possible concentrated water flow (includes road gutters and table drains).
- Stockpiles are to be sited at least 50m from any watercourse, natural drainage line or creek and at least 2m from any trees to be retained.
- Stockpiles will not be located on flood prone lands below the 2year flood level.
- Stockpiles will be positioned within the approved project construction boundary and away from protected areas (e.g. native vegetation).
- Wherever possible, site stockpiles on gently-sloped lands.
- Inactive stockpile faces are to be provided with at least 60% cover (i.e. RUSLE C-factor of 0.1) within 10 days of formation. Stabilisation measures on stockpiles must be employed as per the requirements set out in Table 1.
- Stabilisation of stockpiles can be achieved by seeding and spraying with a soil stabiliser (e.g. Vital P47), covering with geotextile or matting or equivalent (note seeding is not required for stockpiles if they will be in place for less than 3 months or if they have an existing seedbank).
- Stockpiles of topsoil or mulch should be constructed to no more than 2 meters in height wherever possible (note this only applies to topsoil and mulch).
- Stockpiles should be formed to be no steeper than 2:1 (H:V) wherever possible.

DUST SUPPRESSION
- Dust suppression should be carried out whenever necessary to minimise sediment becoming air borne due to wind erosion.
- An appropriate water source for dust suppression and/or dust suppressant management system must be identified prior to starting construction works.
- Temporary stabilisers (e.g. Vital Bon-Matt P47), geotextile, jute matting or equivalent can be used in non-trafficked areas to assist with dust control.

STABILISATION
- Undertake progressive stabilisation of disturbed ground surfaces as they are completed rather than at the end of the works program (Refer to Table 1).
- Final stabilisation is to achieve the C-factors (ground cover) detailed in Table 1.
- Areas to be revegetated are to be topsoiled first. Refer to Standard Drawing (SD 4-2) for instructions regarding topsoil replacement.
- Appropriate seedbed preparation should be carried out when revegetating lands (See Standard Drawing (SD 7-1)).
- Permanent drains are to be stabilised in accordance with engineering design but must achieve the C-factors (ground cover) detailed in Table 1.
- Temporary diversion drains are to be stabilised to achieve the C-factors as detailed in Table 1, using seeding + Vital P47 + jute mesh/matting or alternatively geotextile fabric, rock or TRM. Refer to the plans for specific details. Also refer to Standard Drawings (SD 5-6 and SD 5-7).
- Refer to the 'Soil Stripping and Stockpiling' notes for stabilisation requirements on stockpiles. Also refer to Table 1 and Standard Drawing (SD 4-1).
- Sediment basin inlets/outlets are to be stabilised in accordance with Table 1 and as detailed on the plan and within the 'Sediment Basin Sizing Table'.
- Laydown/storage areas, access tracks and will be stabilised where necessary and as much as practicable with suitable trafficable measures (e.g. with aggregate, crushed rock, road base or a heavy duty trafficable soil stabiliser).
- As surfaces are stabilised and permanent drainage measures are installed, temporary water management structures can be removed (e.g. diversion drains).
- Wherever possible, re-use cleared/mulched vegetation for either temporary or permanent stabilisation of disturbed areas.

SLOPE LENGTHS
Slope lengths are to be maintained at maximum 40m intervals for the roadworks and at maximum 80m intervals for the extraction area across all disturbed lands prior to rainfall (unless specified otherwise). To achieve this, diversion bunds/drains, low flow earth banks (Standard Drawing SD 5-5) or sandbags/equivalent should be installed prior to forecast rainfall.

SEDIMENT FENCING
- Install sediment fences in the locations shown.
- Install all sediment fencing in accordance with Standard Drawing SD 6-8.
- Sediment fences must be firmly trenched into the ground for their entire length.
- Sediment fences must include small 'returns' at maximum 20m intervals (see Standard Drawing 6-8) to minimise the risk of water flowing along them rather than through them.

DIRTY WATER TREATMENT AND DISCHARGE REQUIREMENTS
- Water accumulating in the WQCPs or any other excavations or low points may be either:
  - Re-used for dust suppression or construction purposes; or
  - Spread out and infiltrated onto well vegetated lands within the site boundary at least 50m away from any waterway, swale or drainage line. Ensure water is applied slowly and in a manner to avoid concentrated surface runoff and/or erosion.

SITE INSPECTION, MONITORING AND MAINTENANCE
- Prior to forecast rainfall of 12mm or more over 24 hours, the following will occur:
  - The site environment manager (or their representative) is to inspect the condition of all erosion and sediment controls and action any urgent repair, maintenance or improvement works. They are to keep a record all findings (including details of actions and their close outs); and
  - Slope breaks will be pushed up or cut in across large, exposed areas to slow down flows and minimise erosion.
- Regular site inspections are to be conducted by the site environment manager (or their representative):
  - At least weekly during normal construction hours; and
  - Prior to forecast rainfall (see above); and
  - Daily during rain events (if safe to do so); and
  - Within 24 hours of the cessation of a rain event that causes runoff.
  - Additional erosion and sediment controls will be installed as necessary to ensure satisfactory outcomes in keeping with the project conditions and best-practice Blue Book guidelines.
- Progressive ESCPs will be updated and/or prepared as required.
- Sediment or rocks tracked from the site will be removed from public roads as soon as possible (e.g. with street sweepers).
- After rainfall, sediment accumulated in trapping devices (e.g. basin, sediment fence) will be removed to a secure location where it can't wash or blow offsite (preferably to an active stockpile).
- Weather conditions will be monitored onsite and daily rainfall will be recorded. A rainfall gauge will be installed at the site compound.
- Safe storage areas for wastes, fuels, excess concrete and other potential contaminants are to be delineated by the site manager.
- Adequate supplies of erosion control measures (e.g. geotextile rolls, jute matting, hydraulic soil binders) are to be maintained in the site compound for rapid deployment as required.
- If required water treatment chemical(s) and equipment are to be maintained onsite.
- Dust suppression is to be undertaken as required to minimise the risk of offsite dust impacts. Refer to the Dust Suppression notes for details.

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0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
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DRAWING STATUS

DESIGN BY	M. PASSFIELD
DRAWN BY	M.R.
FINAL APPROVAL	M. PASSFIELD
SCALE: (on A3 Original)	N.T.S

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DRAWING TITLE
EROSION AND SEDIMENT CONTROL
GENERAL NOTES

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	ESCP01	05

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TABLE 1 - STABILISATION REQUIREMENTS AND TREATMENT METHODS

DURING CONSTRUCTION - TEMPORARY STABILISATION
(Includes periods of inactivity when works are on hold)

LANDS	STABILISATION REQUIREMENT	TIMEFRAMES	TREATMENT METHODS - PRODUCTS	REMARKS
High Risk Areas: - Batters, steep slopes (> 30%), works in and/around waterways, surfaces around culvert headwalls	C-factor = 0.1 (60% grass cover or equivalent ground cover [1])	Applies after 10 working days of inactivity (even though works might continue later)	Soil binder (i.e. Vital P47/stonewall or equivalent [1])	- Stabilise all exposed soils by spraying surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary to ensure the required cover is provided.
			Geotextile, jute matting, black plastic or equivalent [1]	- Cover all exposed soils. - Re-apply/maintain as necessary to ensure the required cover is provided.
All lands (including waterways and stockpiles)	C-factor = 0.15 (50% grass cover or equivalent ground cover [1])	Applies after 20 working days of inactivity (even though works might continue later)	Soil binder (i.e. Vital P47/stonewall or equivalent [1])	- Spray all stockpile surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary (approx. every 3-6 months without suitable vegetation cover) to ensure the required cover is provided.
			Geotextile, jute matting, black plastic or equivalent [1]	- Cover all exposed soils. - Re-apply/maintain as necessary to ensure the required cover is provided.
Disturbed lands on southern visibility barrier that do not drain to SB1	C-factor = 0.1 (60% grass cover or equivalent ground cover [1])	Before rainfall	Soil binder (i.e. Vital P47/stonewall or equivalent [1])	- Spray all stockpile surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary (approx. every 3-6 months without suitable vegetation cover) to ensure the required cover is provided.

TABLE 2 LIMITATIONS TO ACCESS DURING CONSTRUCTION

LAND USE	LIMITATION	REMARKS
Construction areas	Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans	All site workers should clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope) or similar materials.
Access areas	Limited to a maximum width of 5 metres	The site manager will determine and mark the location of these zones on site. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries
Remaining lands, including revegetation areas	Entry prohibited except for essential management works	Thinning of growth might be necessary, for example, for fire reduction or weed removal. All thinning activities additional to the agreed scope must be approved by RMS prior to commencement.

TABLE 3 - WQCPs

	Area	Volume	Freeboard	Re Use
WQCP1	4000m²	3.9ML	0.8m	Dust supression irrigation
WQCP2	250m²	0.1ML	0.5m	Dust supression
WQCP3	Existing Dam			Dust supression

TABLE 1 - STABILISATION REQUIREMENTS AND TREATMENT METHODS CONTINUED

POST CONSTRUCTION - PERMANENT STABILISATION

LANDS	STABILISATION REQUIREMENT	TIMEFRAMES	TREATMENT METHODS - PRODUCTS	REMARKS
Waterways, drainage lines and concentrated flow areas	C-factor = 0.05 (70% grass cover or equivalent ground cover [1])	Applies after 10 working days from completion of formation and before they are allowed to carry concentrated flows	Refer to the drain specifications detailed on the plan for specific lining/stabilisation requirements. Example treatment methods are shown below.	
			Temporary lining - Geotextile (i.e. Bidim A24 or equivalent [1]) - Low flows	- Complete any subsoil treatment before laying the matting. - Install matting in accordance with SD 5-7. - Re-apply/maintain as necessary to ensure the required cover is provided.
			Jute mesh, seeding and soil binder (i.e. Vital P47/stonewall or equivalent [1]) - Low flows to moderate	- Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Place topsoil to a depth of at least 75mm. - Complete any fertilisation and seeding before laying the matting. - Install matting in accordance with SD 5-7. - Spray all surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.
			Jute matting (~350gsm) and seeding or equivalent [1] - Low to moderate flows	- Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Place topsoil to a depth of at least 75mm. - Complete any fertilisation and seeding before laying the matting. - Install matting in accordance with SD 5-7. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.
			Turf reinforcement matting (TRM) (e.g. TerraMat or equivalent [1]) - Moderate flows	- Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Place topsoil to a depth of at least 75mm. - Complete any fertilisation and seeding before laying the matting. - Install matting in accordance with SD 5-7. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.
			Rock lining - High flows	- Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Install geotextile underlay (if specified) in accordance with SD 5-7. - Install rock armouring (to the depth and size as specified on the plan). - Re-apply/maintain as necessary to ensure the required cover is provided.
Stockpiles	C-factor = 0.10 (60% grass cover or equivalent ground cover [1])	Applies after 10 working days from completion of formation	Seeding and soil binder (i.e. Vital P47/stonewall or equivalent [1])	- Apply seed to all stockpile surfaces (Note: seeding may not be required if existing seedbed is present). - Spray all stockpile surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.
			Geotextile, jute matting, black plastic or equivalent [1]	- Cover all exposed soils. - Re-apply/maintain as necessary to ensure the required cover is provided.
General Surfaces	C-factor = 0.10 / 0.05 (60% / 70% grass cover or equivalent ground cover [1])	C-factor = 0.1 applies after 10 working days from completion of formation and C-factor = 0.05 applies within a further 60 days	Topsoil, seeding and soil binder (i.e. Vital P47/stonewall or equivalent [1])	- Refer to SD 7-1. - Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Place gypsum treated topsoil to a depth of at least 75mm. - Apply any fertilisers required. - Apply seed to all surfaces (Note: seeding may not be required if existing seedbed is present). - Spray all surfaces with Vital P47/stonewall or equivalent [1]. - Vital dilution rate = 1:10 (Vital:Water). - Application rate = 1L / m^2 of diluted Vital mixture. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.
			Hydromulch or equivalent [1]	- Refer to SD 7-1. - Complete subsoil treatment (i.e. gypsum lightly ripped into surgrade at a rate of 5tonnes/ha). - Place topsoil to a depth of at least 75mm. - Apply hydromulch to soil surfaces. - Re-apply/maintain as necessary to ensure the required cover is permanently maintained.

[1] - Equivalent cover/product must achieve the equivalent C-factor with proven reasearch/documentation to verify this.

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DRAWN BY	M.R.
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SCALE: (on A3 Original)	N.T.S

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PROJECT TITLE: PROPOSED BASALT QUARRY
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DRAWING TITLE: ESCP BACKGROUND DATA AND CALCULATIONS

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	ESCP02	05

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LEGEND

- SEDIMENT FENCE (SD 6-8)
- BARRIER FENCE
- STABILISED SITE ACCESS (SD 4-14)
- CD01 — CLEAN WATER DIVERSION
- DD01 — DIRTY WATER DIVERSION
- TOP SOIL STOCKPILE (SD 4-1)
- WATER STORAGES
- WATER FLOW
- DEPRESSION
- LEVEL SPREADER
- EXISTING SURFACE CONTOURS
- SITE SHED
- ROCK DISSIPATER
- TEMPORARY WATERWAY CROSSING (SD 5-1)

REFER TO DRAWING ESCP05 FOR ALL STANDARD DRAWINGS (SD)

LANE
CURLEWIN LANE
TIYCES
BORE 1
BORE 2
USE EXISTING DAM AS A SEDIMENT BASIN DURING ROAD WORKS AND THEN AS WQCP2
BUILD WQCP2 BEFORE BUILDING INGRESS ROAD. DIRECT DIRTY WATER FROM THE INGRESS ROAD TO IT.
BUILD WQCP1 BEFORE CLEARING EXTRACTION AREAS AND USE TO TRAP DIRTY WATER. IRRIGATE WATER PER OEMP
DD01
DD02
DD03
DD04
DD05
DD06
DD07
EGRESS ROAD
PIPE DRAIN UNDER EGRESS ROAD
PIPE DRAIN UNDER INGRESS ROAD
Berm (grassed)
DIRTY RUNOFF TO SEDIMENT TRAP FORMED AS A U-SHAPED SEDIMENT FENCE (MIN. 8m X 5m).
USE AS CONSTRUCTION ACCESS ROAD.
JOINS ESCP04

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
05	13/04/17	M.P.	M.R.	M.P.	FOR REVISED DA
04	01/12/16	M.P.	A.T.	M.P.	REVISED FOR EGRESS ROAD
03	04/10/16	M.P.	A.B.	M.P.	REVISED ACCESS ROAD LOCATION
2	08/08/16	M.P.	M.R.	M.P.	ADDED DRAINS
0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
A	03/05/16	M.P.	M.R.	M.P.	DRAFT

DRAWING STATUS

DESIGN BY	M. PASSFIELD
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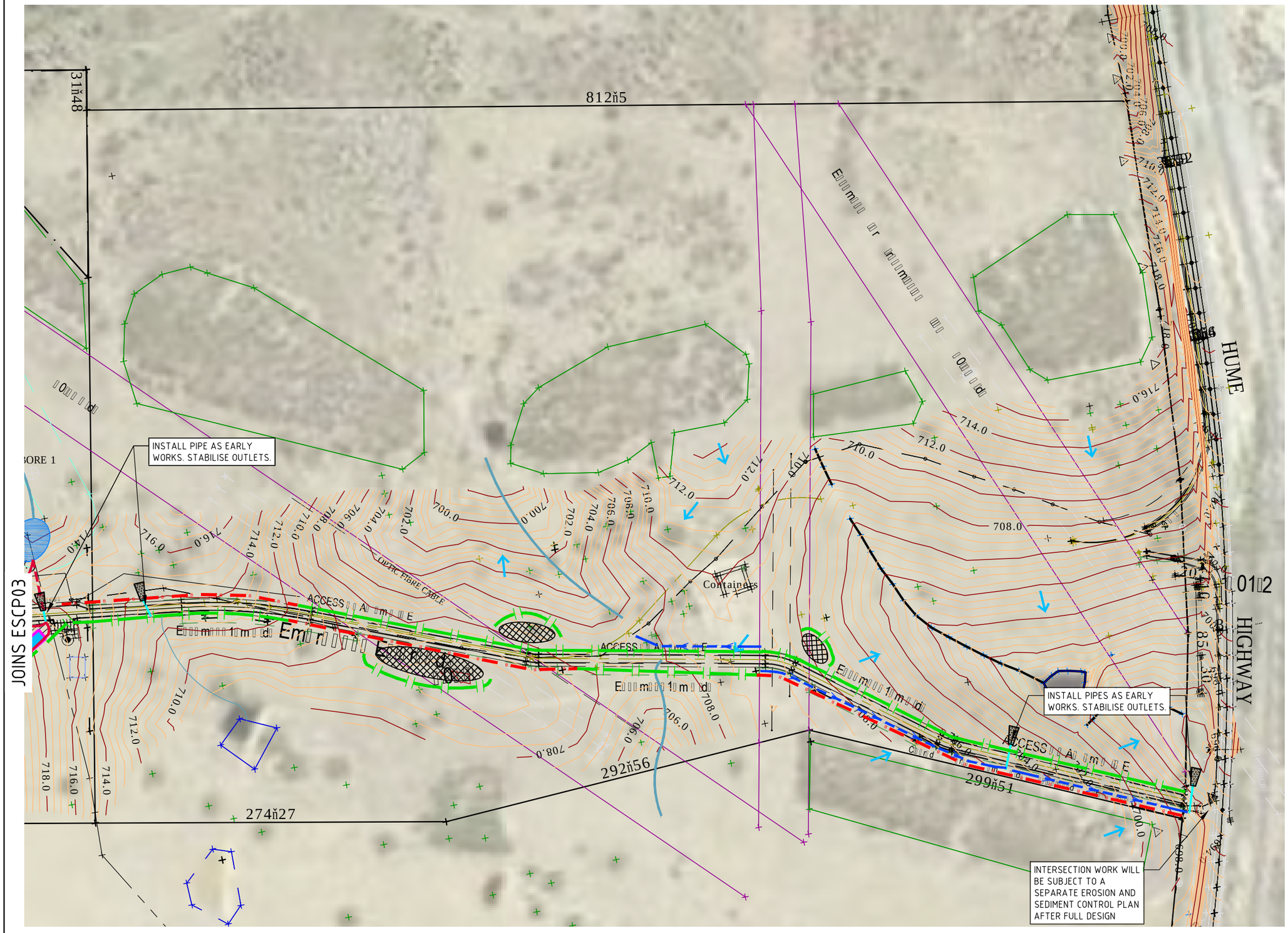
PROJECT TITLE: PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
CURLEWIN LANE
BOXERS CREEK NSW

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN
SHEET 1 OF 2 (SOUTH)

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	ESCP03	05

Plot Date: Thursday, 13 April 2017 12:57:19 PM CAD File Name: N:\16000080 Quarry at Tiyces Lane\Drawings\16000080_P01_ESCP_REV05.dwg



LEGEND

- SEDIMENT FENCE (SD 6-8)
- BARRIER FENCE
- STABILISED SITE ACCESS (SD 4-14)
- CD01 — CLEAN WATER DIVERSION
- DD01 — DIRTY WATER DIVERSION
- TOP SOIL STOCKPILE (SD 4-1)
- WATER STORAGES
- WATER FLOW
- DEPRESSION
- LEVEL SPREADER
- EXISTING SURFACE CONTOURS
- SITE SHED
- ROCK DISSIPATER
- TEMPORARY WATERWAY CROSSING (SD 5-1)

REFER TO DRAWING ESCP05 FOR ALL STANDARD DRAWINGS (SD)

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
05	13/04/17	M.P.	M.R.	M.P.	FOR REVISED DA
04	01/12/16	M.P.	A.T.	M.P.	REVISED FOR EGRESS ROAD
03	04/10/16	M.P.	A.B.	M.P.	REVISED ACCESS ROAD LOCATION
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0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
A	03/05/16	M.P.	M.R.	M.P.	DRAFT

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LOTS 1 & 2 DP 1094055
CURLEWIN LANE
BOXERS CREEK NSW

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN
SHEET 2 OF 2 (NORTH)

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
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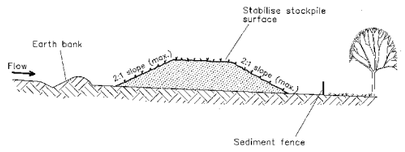
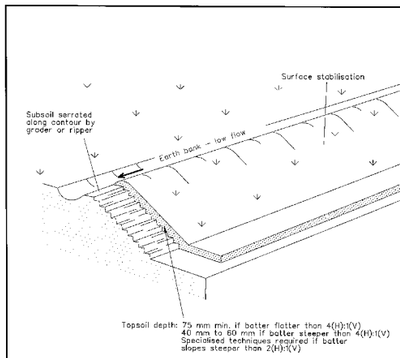
Plot Date: Thursday, 13 April 2017 12:57:23 PM CAD File Name: N:\16000080 Quarry at Tyces Lane\Drawings\16000080_P01_ESCP_REV05.dwg



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

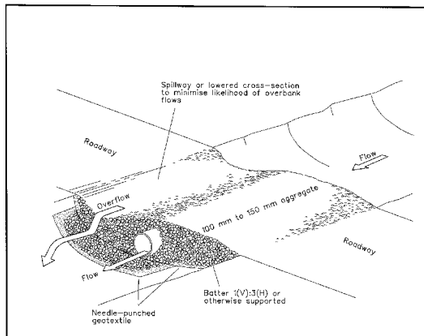
STOCKPILES **SD 4-1**



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 80 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

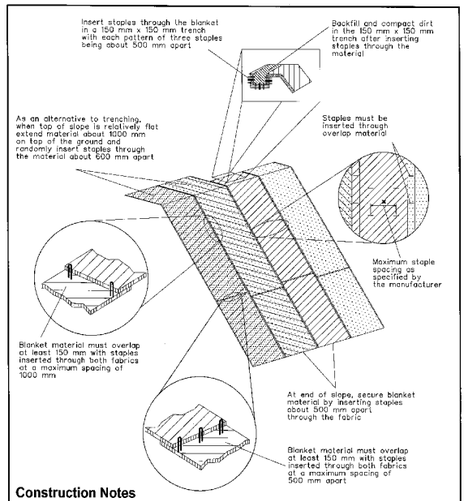
REPLACING TOPSOIL **SD 4-2**



Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched textile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.
5. Install a lower section to act as an emergency spillway in greater than design storm events.
6. Ensure that culvert outlets extend beyond the toe of fill embankments.

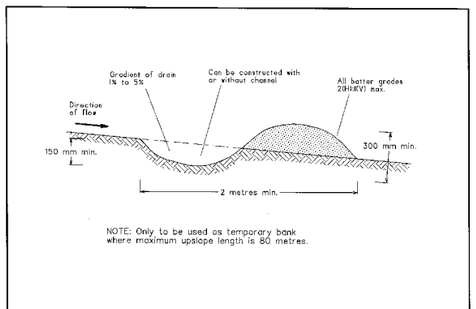
TEMPORARY WATERWAY CROSSING **SD 5-1**



Construction Notes

1. Remove any rocks, clods, sticks or grass from the ground surface before laying the matting.
2. Spread topsoil to at least 75 mm depth.
3. Where appropriate, complete fertilising and seeding on a properly prepared seedbed (Standard Drawing 7-1) before laying the matting.
4. Ensure the fabric can be continuously in contact with the soil by grading the surface carefully first.
5. Lay the matting in "shingle-fashion" with the ends of each upstream roll overlapping the next roll downslope.
6. Ensure sufficient staples are used to maintain a good contact between the soil and the matting.

RECP : SHEET FLOW **SD 5-2**

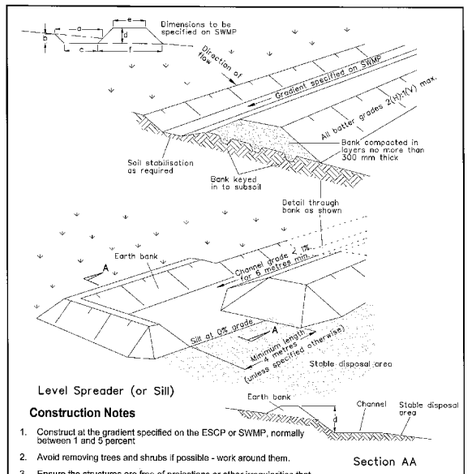


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

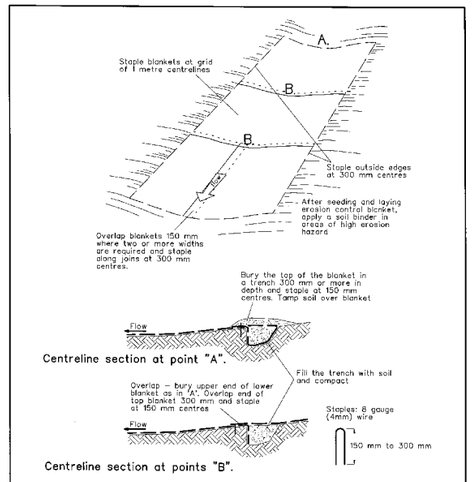
EARTH BANK (LOW FLOW) **SD 5-5**



Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

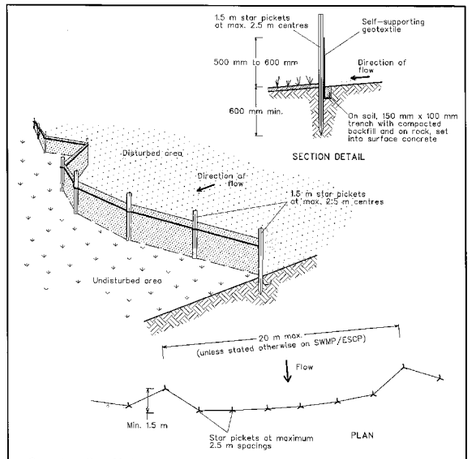
EARTH BANK (HIGH FLOWS) **SD 5-6**



Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting
2. Ensure that topsoil is at least 75 mm deep.
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b).
6. Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event.
7. Divert water from the structure until vegetation is stabilised properly.

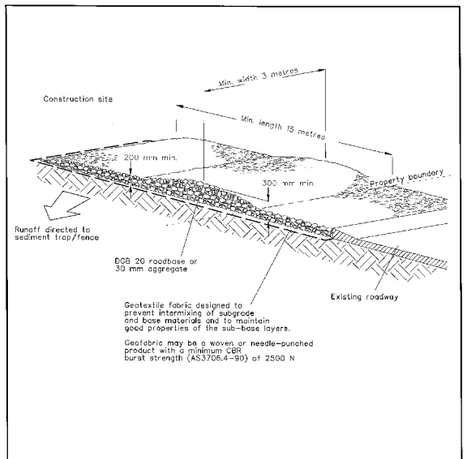
RECP : CONCENTRATED FLOW **SD 5-7**



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

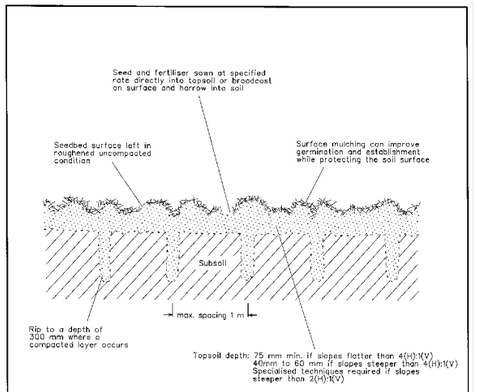
SEDIMENT FENCE **SD 6-8**



Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS **SD 6-14**



Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

SEEDBED PREPARATION **SD 7-1**

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
05	13/04/17	M.P.	M.R.	M.P.	FOR REVISED DA
04	01/12/16	M.P.	A.T.	M.P.	REVISED FOR EGRESS ROAD
03	04/10/16	M.P.	A.B.	M.P.	REVISED ACCESS ROAD LOCATION
2	08/08/16	M.P.	M.R.	M.P.	ADDED DRAINS
0	10/05/16	M.P.	M.R.	M.P.	CONSTRUCTION ISSUE
A	03/05/16	M.P.	M.R.	M.P.	DRAFT

DRAWING STATUS

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PROJECT TITLE

PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
CURLEWIN LANE
BOXERS CREEK NSW

DRAWING TITLE

EROSION AND SEDIMENT CONTROL STANDARD DRAWINGS

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
16000080	P01	ESCP05	05

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14.4 Appendix 4 – Noise Monitoring Plan

NOISE MONITORING PLAN
FOR ARGYLE (NSW) PTY LTD
TIYCES LANE, BOXERS CREEK

Prepared for: Argyle (NSW) Pty Ltd
Peter Miller – Director and Secretary

Prepared by: Emma Hansma, Acoustical Engineer
Daniele Albanese, Senior Acoustical Consultant
R T Benbow, Principal Consultant

Report No: 161048-03_NMP_REV2
May 2016
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R T Benbow	Principal Consultant		09 May 2016

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Contents

Tables

Figures

1. INTRODUCTION

Benbow Environmental (BE) was commissioned by Laterals Planning to prepare a Noise Monitoring Plan for the construction and operational phase of a proposed quarry in Tiyces Lane, Towrang.

The proposed development includes construction an office building and machinery storage shed, and operation of an extractive area, access road off Hume Hwy and on-going rehabilitative and site screening involving tree planting. The site is used to perform open pit excavation of material which is to be transported off-site on demand. The extracted material is crushed and screened to provide a range of products for use in construction.

This noise monitoring plan outlines the methodologies for the undertaking of noise compliance monitoring in order to review the noise performance of construction and operational activities at the site.

This noise monitoring plan will be revised to reflect any requirement of the Development Conditions of Consent.

1.1 SCOPE OF WORKS

The following scope of work has been adopted:

- Identify the noise monitoring location;
- Outline the noise monitoring methodology;
- Determine criteria at sample locations; and
- Provide guidance on noise monitoring timing and procedures.

2. NOISE MONITORING LOCATIONS

The EPA Proposed Draft Condition L3.2 states the follows:

"Noise from the premises is to be measured at the nearest sensitive receiver to determine compliance with this condition"

Given the nature of the site's operations, Benbow Environmental considers more appropriate to undertake noise monitoring at four locations.

Based on Benbow Environmental's experience at the subject site it is concluded that access to residential properties is not always possible during daytime.

The ambient noise is dominated by road traffic at several locations and this would result in difficulties in determine the noise contribution from the construction and operations of the quarry.

Based on the reasons above, a number of monitoring locations have been strategically selected at the site's boundary and conservative noise limits at these locations were determined.

Results of monitoring at these key locations can be utilised also to determine the noise levels back at the nearest residences. This methodology is also presented in the NSW EPA Industrial Noise Policy and it is often utilised for assessment of noise from quarries and mining sites.

The monitoring locations are presented in the figure below:

Figure 2-1: Noise Monitoring Locations Site Map

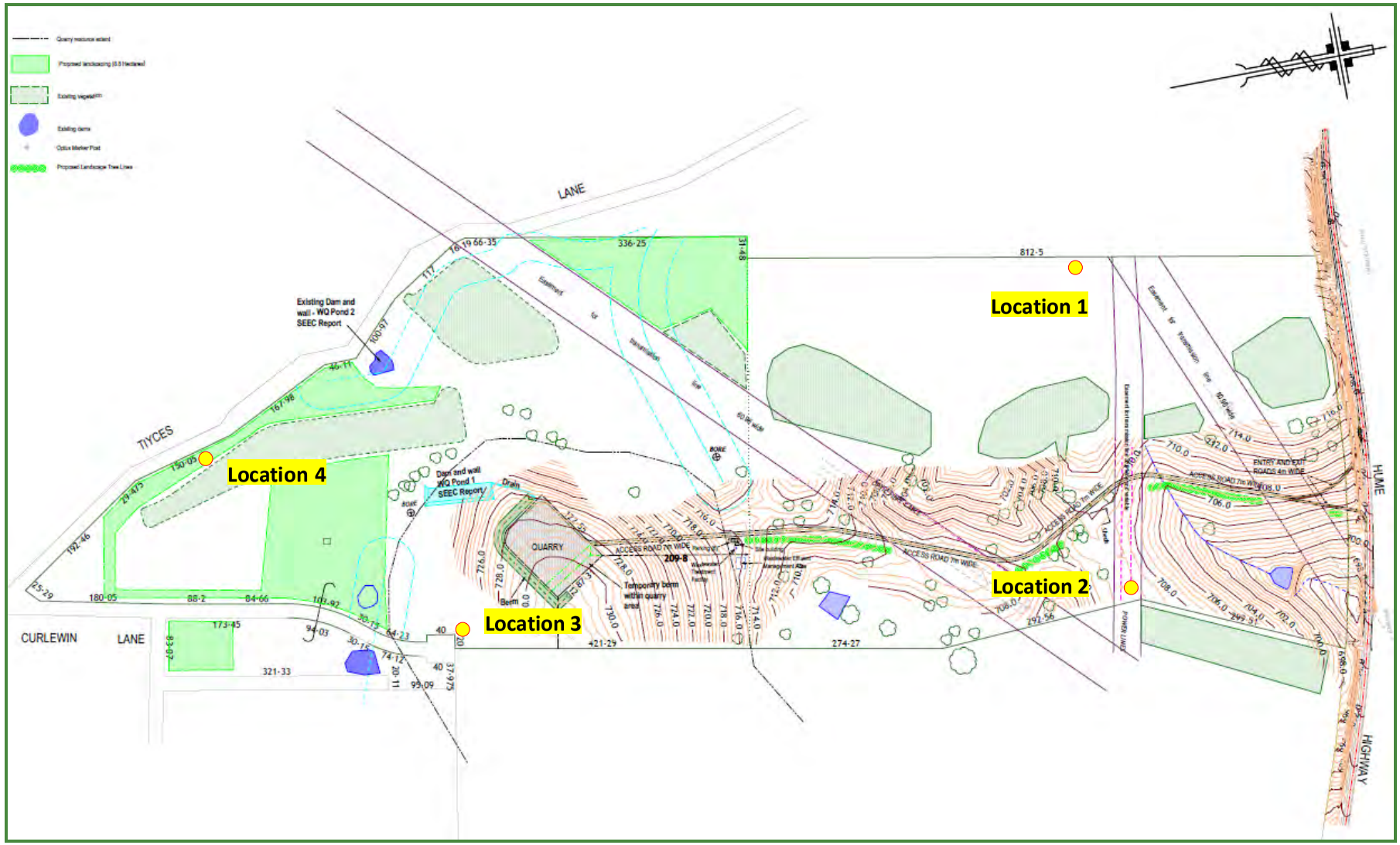
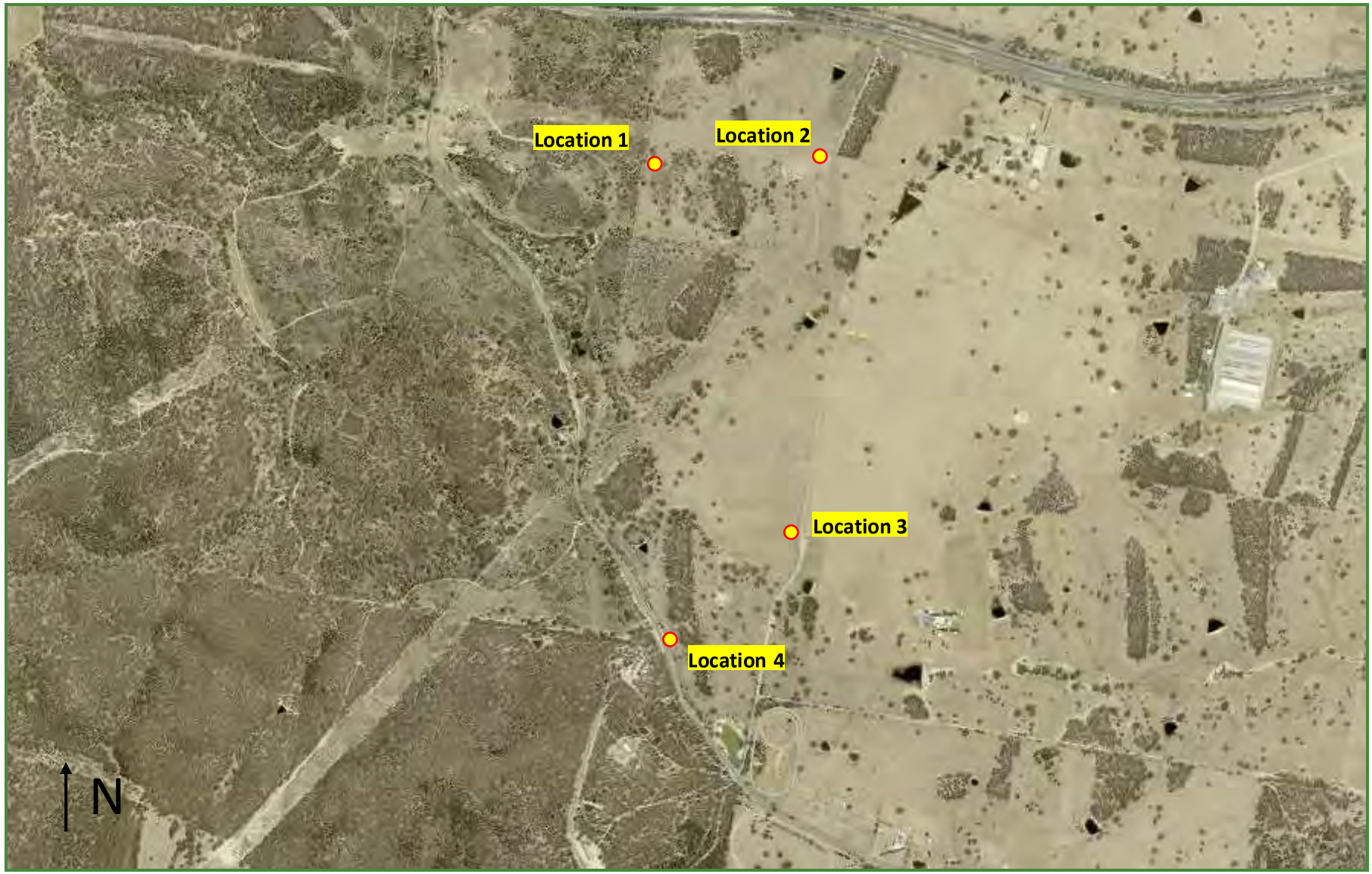


Figure 2-2: Noise Monitoring Locations Aerial



3. NOISE MONITORING CRITERIA

Based on the Noise Impact Assessment conducted by Benbow Environmental for the subject site the following noise limits are required to ensure there are no exceedances at residential locations.

The limits have been calculated based on the expected worst case noise impact that is when the construction works are at their closest to the monitoring locations.

Table 3-1: Noise Limits

Location	Construction Noise Limit ($L_{AEeq15min}$)	Operational Noise Limit ($L_{Aeq15min}$)
Location 1	53	47
Location 2	56	45
Location 3	52	47
Location 4	44	39

The achievement of compliance with the above limits at the key boundary locations would ensure compliance with the noise criteria derived for each residence and presented in the Noise Impact Assessment 161048_NIA_rev1. The project specific noise levels were derived in accordance with the NSW EPA Industrial Noise Policy and based on the recent long-term background noise monitoring carried out in May 2016.

Note the $L_{Aeq\ 15\ min}$ applies to site operations, not total background noise. In the case where measured $L_{Aqe\ 15\ min}$ exceeds the values in the above table the $L_{Aeq\ 15\ min}$ may be an exceedance due to background noise rather than site-specific noise.

4. NOISE MONITORING TIMING AND MAIN NOISE SOURCES

As the nature of the noise generated at the site would vary significantly for different operations it is important to coordinate with the site manager to measure noise during those operations which generate the most noise.

4.1 FREQUENCY OF NOISE MONITORING

During construction operations fortnightly noise monitoring is recommended.

During operations of the quarry noise monitoring is recommended every 3 months during the initial phase of the quarry lifetime. This would end once a pit depth of 3 metre is reached.
From this point onwards annual performance review is recommended.

4.2 CONSTRUCTION NOISE MONITORING

A summary of equipment likely to be used during the construction phase is presented below:

Table 4-1: Construction Noise Sources dB(A) Sound Power Levels

Noise Source	Overall
Rock Hammer	**117**
Grader	**110**
Water Cart	**110**
Chain Saw	**107**
Excavator	**107**
Tip Truck	**107**
Reversing Alarm	**105**
Vibratory Roller	**103**

The equipment in the table above is listed from most noise generating to least. The acoustic consultant responsible for noise compliance monitoring must coordinate with the site manager such that the measurements are taken when the noisiest equipment is operating. Due to the mobile nature of operations noise monitoring is to be taken at the location (chosen from noise monitoring locations) closest to the noisiest equipment. If the operations are fairly consistent for some time, it is recommended that measurements are taken at as many different locations as possible, starting from the most affected location to the least affected.

4.3 OPERATIONAL NOISE MONITORING

A summary of equipment likely to be used during the operation phase is presented in Table 4-2.

Table 4-2: Operational Noise Sources dB(A) Sound Power Levels

Noise Source	Overall
Crusher and Screen	**111**
Excavator	**109**
Backhoe	**105**
Articulated Dump Truck	**104**
Front End Loader Cat 966C	**104**
Komatsu Bulldozer (DA55A)	**104**

The equipment in the table above is listed from most noise generating to least. The acoustic consultant responsible for noise compliance monitoring must co-ordinate with the site manager such that the measurements are taken when the noisiest equipment is operating. The location most affected by operational noise is location 4, so this measurement location should be given priority. If the operations are fairly consistent for some time, it is recommended that measurements are taken at as many different locations as possible, starting from the most affected location to the least affected.

4.4 NOISE COMPLAINTS RESPONSE

Where a noise complaint from a resident is received, noise monitoring shall be undertaken at the complainant residence.

A suitably qualified acoustic consultant shall carry out the monitoring and must identify the following:

- Date/time of noise complaint;
- Nature and description of the noise complaint;
- Determine noise contribution from construction and/or operational activities;
- Compare results with relevant noise criteria and determine status of compliance;
- Identify the cause of the exceedance (if any is found); and
- Recommend noise management strategies in order to mitigate the noise impacts.

5. NOISE MONITORING INSTRUMENTATION AND PROCEDURE

All noise monitoring must be conducted by a suitably qualified acoustic consultant.

Monitoring shall be carried out in accordance with the NSW EPA Industrial Noise Policy – Chapter 11 – Reviewing Performance and the Australian Standard AS 1055-1997 - "Acoustics – Description and Measurement of Environmental Noise".

5.1 ATTENDED NOISE MONITORING

All attended measurements must be undertaken with a Class 1 Sound Level Meter. The instrument must have been calibrated by a NATA accredited laboratory within two years of the measurement period. The instrument settings must comply with AS IEC 61672.1-2004 and shall be configured for A-weighted, fast response measured over 15-minute statistical intervals. The microphones shall be fitted with windsocks and positioned between 1.2 metres and 1.5 meters above ground level.

To ensure accuracy and reliability in the results, field reference checks must be both before and after the measurement period with an acoustic calibrator. There must be no excessive variances observed in the reference signal between the pre-measurement and post-measurement calibration for a measurement to be considered valid. This difference shall not exceed 0.5 dB.

The attended noise measurements must be carried out in accordance with Australian Standard AS 1055–1997 "Acoustics – Description and Measurement of Environmental Noise".

The noise emission limit applies for prevailing meteorological conditions (winds up to 3m/s), except under conditions of temperature inversions.

5.2 INVESTIGATION PROCEDURES

All investigative procedures must be conducted in accordance with AS 1055.1-1997 *Acoustics – "Description and Measurement of Environmental Noise (Part 1: General Procedures)"*.

The following information must be recorded and kept for reference purposes:

- Type of instrumentation used and measurement procedure conducted;
- Description of the time aspect of the measurements, ie. measurement time intervals; and
- Positions of measurements.

As per AS 1055.1-1997, all measurements must be carried out at least 3.5 m from any reflecting structure other than the ground. A measurement height of 1.2 m above the ground is recommended. A sketch of the area should be provided by the consultant identifying positions of measurement and the approximate direction and distance of noise sources.

Modifying factor corrections would need to be applied for tonal or impulsive noise in accordance with the NSW EPA Industrial Noise Policy requirements.

5.3 REPORTING

The following items shall be included in the report showing the noise monitoring results:

- Type of monitoring methodology and scope of work;
- Details of instruments and calibration certificated;
- Applicable noise criteria;
- Monitoring locations;
- Weather conditions during monitoring;
- Time, date and duration of monitoring;
- Results of noise monitoring and site noise contribution;
- Statement of compliance with noise limits; and
- Where exceedances are found, reasons for the exceedances and strategies to manage the noise.

5.4 MANAGEMENT OF NOISE EXCEEDANCES

Where exceedances of the noise levels are found, further investigation will be necessary. This would include measurement or calculation of noise levels at the affected residences and comparison with relevant noise criteria being made.

Where exceedance at the residential location is found, a noise mitigation strategy shall be implemented in order to minimize and mitigate the noise impacts.

6. CONCLUDING REMARKS

Benbow Environmental prepared a Noise Monitoring Plan for the construction and operational phase of the Argyle Quarry located at in Tiyces Lane, Towrang.

This noise monitoring plan outlines the methodologies for the undertaking of noise compliance monitoring in order to review the noise performance of construction and operational activities at the site.

The objectives of the Noise Monitoring Plan are as follows:

- Identify the noise monitoring location;
- Outline the noise monitoring methodology;
- Determine criteria at sample locations; and
- Provide guidance on noise monitoring timing and procedures.

This concludes the report.

Emma Hansma	Daniele Albanese	R T Benbow
Acoustic Engineer	Senior Acoustical Consultant	Principal Consultant

7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Argyle (NSW) Pty Ltd, as per our agreement for providing environmental services. Only Argyle (NSW) Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Argyle (NSW) Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

14.5 Appendix 5 – Dust Monitoring Plan

AIR QUALITY MONITORING PLAN
FOR ARGYLE (NSW) PTY LTD
TIYCES LANE, BOXERS CREEK

Prepared for: Argyle (NSW) Pty Ltd
Peter Miller – Director and Secretary

Prepared by: Katie Trahair, Environmental Scientist
R T Benbow, Principal Consultant

Report No: 161048-02_AQ-Rev2
May 2016
(Released: 10 May 2016)

Benbow

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Approved by:	Position:	Signature:	Date:
R T Benbow	Principal Consultant		10 May 2016

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Contents

Tables

Figures

1. INTRODUCTION

Benbow Environmental has been commissioned by Argyle (NSW) Pty Ltd to prepare an air quality monitoring plan for the proposed quarry situated at Curlewin Lane, Boxers Creek NSW.

Condition P1.1 of the Deferred Commencement Conditions states,

> *'the licensee must prepare and implement an Air Quality Monitoring Plan and submit this to the EPA prior to commencement of operations at the premises. This plan must detail air quality monitoring locations (for at least two dust deposition gauges and one high volume air sampler (HVAS)) and provide justification of the locations'*

The objective of this report is to develop a dust monitoring plan to be implemented as a mechanism to assess ongoing compliance with the relevant criteria to ensure the health of the local environment is maintained with particular consideration for adjacent sensitive land uses including residential dwellings.

1.1 SCOPE OF WORKS

The scope of this report is limited to the following:

- Outline relevant legislation and guidelines;
- Identification of potential sources of dust emissions from associated site activities;
- Review relevant air quality standards to be achieved;
- Detail selection of monitoring locations;
- Provide dust sampling and analysis methods; and
- Outline general strategies to control dust and mitigate air quality impacts of site activities on surrounding land uses.

2. SITE LOCATION OF THE PROPOSED DEVELOPMENT

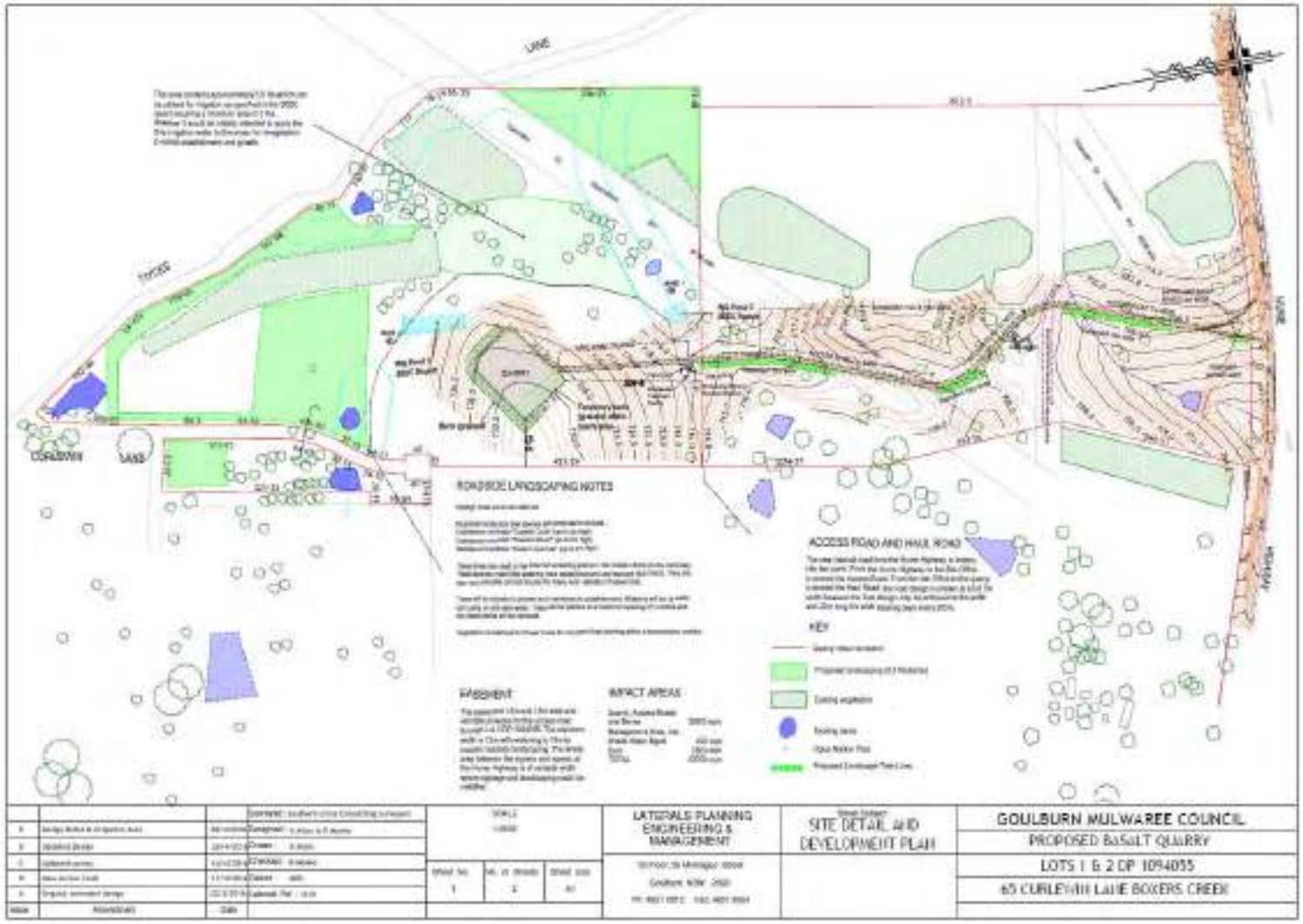
The subject site is located at 288 Tiyces Lane, Boxers Creek, NSW (Figure 2-1). The site plan is shown in Figure 2-2.

Figure 2-1: Aerial View of Site

Source: www.maps.six.nsw.gov.au

↑N	LEGEND: Site Boundary	Benbow Environmental 13 Daking Street, North Parramatta NSW 2151

Figure 2-2: Site Plan



2.1 LOCALITY AND SURROUNDING LAND USE

The site is currently vacant and mostly cleared of vegetation. The area immediately west of the site is mostly unoccupied and vegetated. There are scattered rural premises within the vicinity of the subject site. The Hume Highway is adjacent to the northern site perimeter. The land directly north west of the site is currently occupied by Divall's Earthmoving & Bulk Haulage.

2.2 RELEVANT LEGISLATION AND PLANNING INSTRUMENTS

Key environmental legislation relating to air quality management includes:

- *NSW Environment Planning and Assessment Act1979* (EP&A Act).
- *NSW Protection of the Environment Operations Act 1997* (POEO Act).
- *NSW Protection of the Environment Operations (Clean Air) Regulation 2010.*

The following guidelines provided by the NSW EPA have been considered in the development of this monitoring plan:

- Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2006).
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2005).

3. SOURCES OF DUST

There are a number of potential emission sources of dust related to quarry activities. Particulate matter or 'dust' emitted can range in composition and size. Emissions from particular sources may only occur during certain stages of operation of the facility, while emissions from other sources may occur continuously or at regular intervals throughout the operational period. It is important to note that local meteorological conditions play a significant role in the liberation of particles into the air.

Typical sources of dust relating to quarry sites include:

- General site wind erosion – liberation of surface dusts into the air;
- Earthworks and excavation (stripping of overburden) involving the removal of vegetation and disturbance of soils increases potential for particles to become airborne;
- Fugitive dust emissions from stockpiled materials on site;
- Wheel generated and diesel exhaust emissions from on-site vehicle traffic on un-sealed roads/ haul routes;
- Mechanical processing including blasting, drilling, crushing, screening; and
- Transport of materials via hoppers, chutes, conveyors.

4. LOCAL WIND TRENDS

Wind rose plots show the direction from which the wind is coming from with triangles known as "petals". The petals of the plots in the figure summarise wind direction data into 8 compass directions i.e. north, north-east, east, south-east, etc. The length of the triangles, or "petals", indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class. The proportion of time, for which wind speed is less than speeds in the first class (i.e. 0.5 $m.s^{-1}$), when speed is negligible, is referred to as calm hours or "calms". Calms are not shown on a wind rose as they have no direction, but the proportion of time that form part of the period under consideration is noted under each wind rose.

The concentric circles in each wind rose are the axis, which denote frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are the similar in size. The frequencies denoted on the axes of the wind rose are indicated beneath each wind rose.

The nearest BoM monitoring station found within proximity to the subject site is the Goulburn Automatic Weather Station (AWS) (Station No. 070330). This was used as a basis of comparison with the TAPM-generated meteorological file.

Wind Rose Plots for Goulburn AWS Dataset and the 2007 TAPM-Generated Towrang Meteorological File are shown in Figure 4-1 and Figure 4-2.

Figure 4-1: Annual Wind Rose Plots from the 2004-2008 Goulburn BoM Station Dataset

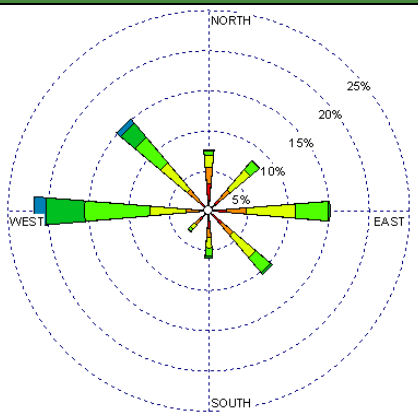
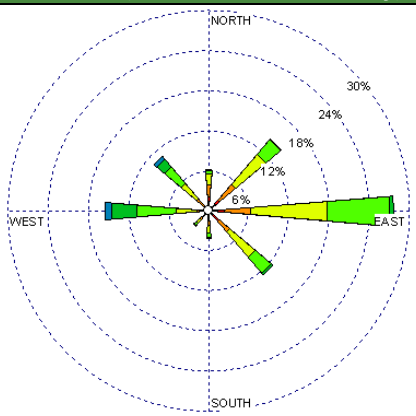
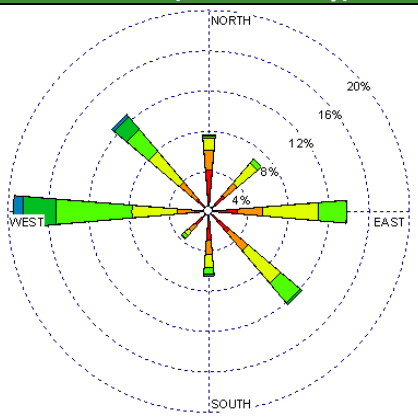
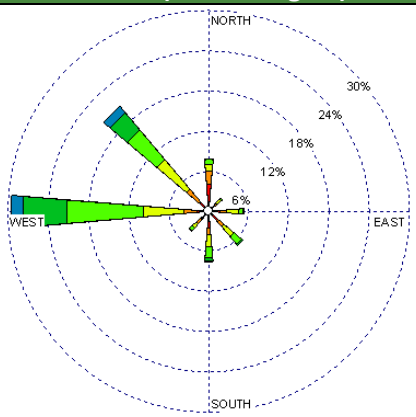
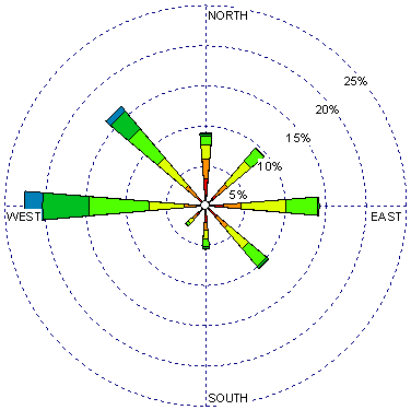
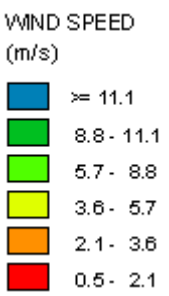
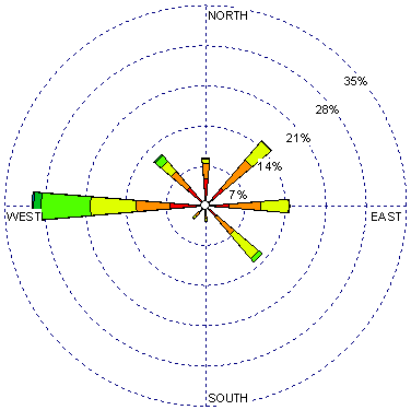
All Seasons	Summer (December – February)
	
Average Wind Speed: 4.43 m/s Calms Frequency: 12.07 % Axis Frequencies: 5%, 10%, 15%, 20%, 25%	Average Wind Speed: 4.69 m/s Calms Frequency: 5.97 % Axis Frequencies: 6%, 12%, 18%, 24%, 30%
Autumn (March – May)	**Winter (June – August)**
	
Average Wind Speed: 3.71 m/s Calms Frequency: 17.32 % Axis Frequencies: 4%, 8%, 12%, 16%, 20%	Average Wind Speed: 4.52 m/s Calms Frequency: 15.72 % Axis Frequencies: 6%, 12%, 18%, 24%, 30%
Spring (September – November)	**Legend**
	
Average Wind Speed: 4.78 m/s Calms Frequency: 9.12 % Axis Frequencies: 5%, 10%, 15%, 20%, 25%	

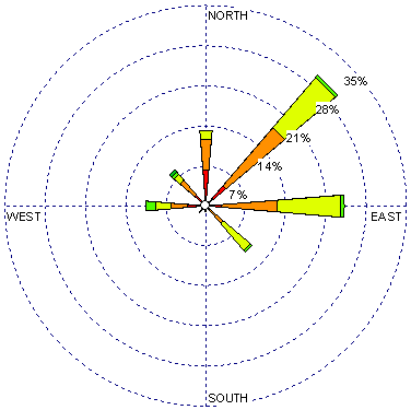
Figure 4-2: Annual Wind Rose Plots from the 2007 TAPM-Generated Meteorological File

All Seasons



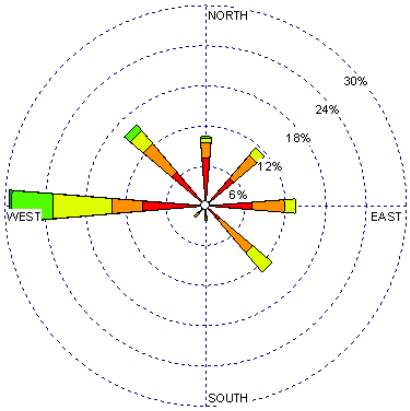
Average Wind Speed: 3.48 m/s
Calms Frequency: 0.87%
Axis Frequencies: 7%, 14%, 21%, 28%, 35%

Summer (December – February)



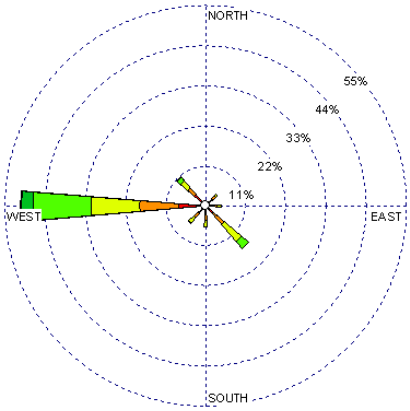
Average Wind Speed: 3.34 m/s
Calms Frequency: 0.32 %
Axis Frequencies: 7%, 14%, 21%, 28%, 35%

Autumn (March – May)



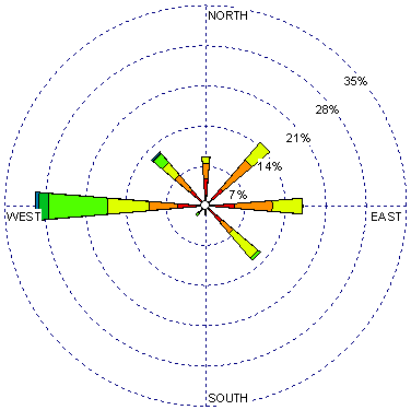
Average Wind Speed: 2.88 m/s
Calms Frequency: 1.54 %
Axis Frequencies: 6%, 12%, 18%, 24%, 30%

Winter (June – August)



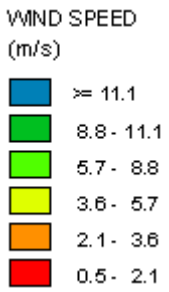
Average Wind Speed: 4.06 m/s
Calms Frequency: 0.59 %
Axis Frequencies: 11%, 22%, 33%, 44%, 55%

Spring (September – November)



Average Wind Speed: 3.62 m/s
Calms Frequency: 1.01 %
Axis Frequencies: 7%, 14%, 21%, 28%, 35%

Legend



5. DUST MONITORING PROGRAM

This section details the proposed dust monitoring program.

5.1 ADOPTED AIR QUALITY STANDARDS

As per the Deferred Commencement Conditions dust is to be assessed as deposited dust and PM_{10}. The Clean Air Regulations do not specify concentration limits for deposited dust or PM_{10} from diffuse plant sources.

Note PM_{10} is defined as particulate matter having a diameter of 10 micrometres or less.

The EPA technical document document '*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*' provides the following impact assessment for deposited dust[1] and PM_{10}. This criteria is to be applied at the **nearest existing or likely future off-site sensitive receptor**. Where monitoring locations are situated on site, it is not appropriate to apply this criteria.

Table 5-1: AMMAAP Assessment Criteria

Pollutant	Averaging Period	Percentile	Concentration	
			pphm	µg/m³
			pphm	**µg/m³**
PM_{10}	24 hours	100th	-	50
	Annual	100th	-	30
			g/m²/month[a]	**g/m²/month[b]**
Deposited Dust	Annual	100th	2	4

[a] Maximum Increase in Deposited Dust Level

[b] Maximum Total Deposited Dust Level

[1] Dust is assessed as insoluble solids as defined by AS 3580.10.1–1991. It should be noted that the current version of this Australian Standard is AS 3580.10.1–2003.

5.2 MONITORING LOCATIONS

Monitoring sites are classified into three types: peak, neighbourhood and background. For long term routine monitoring, it is not typically feasible to place monitors at sensitive receptors. As such all routine dust monitoring will be conducted within the boundary of the subject site, considered peak monitoring locations and thus the AMMAAP criteria is not applicable but rather monitoring results will be recorded used for inclusion within the Annual Return documents detailed in the Deferred Commencement Conditions.

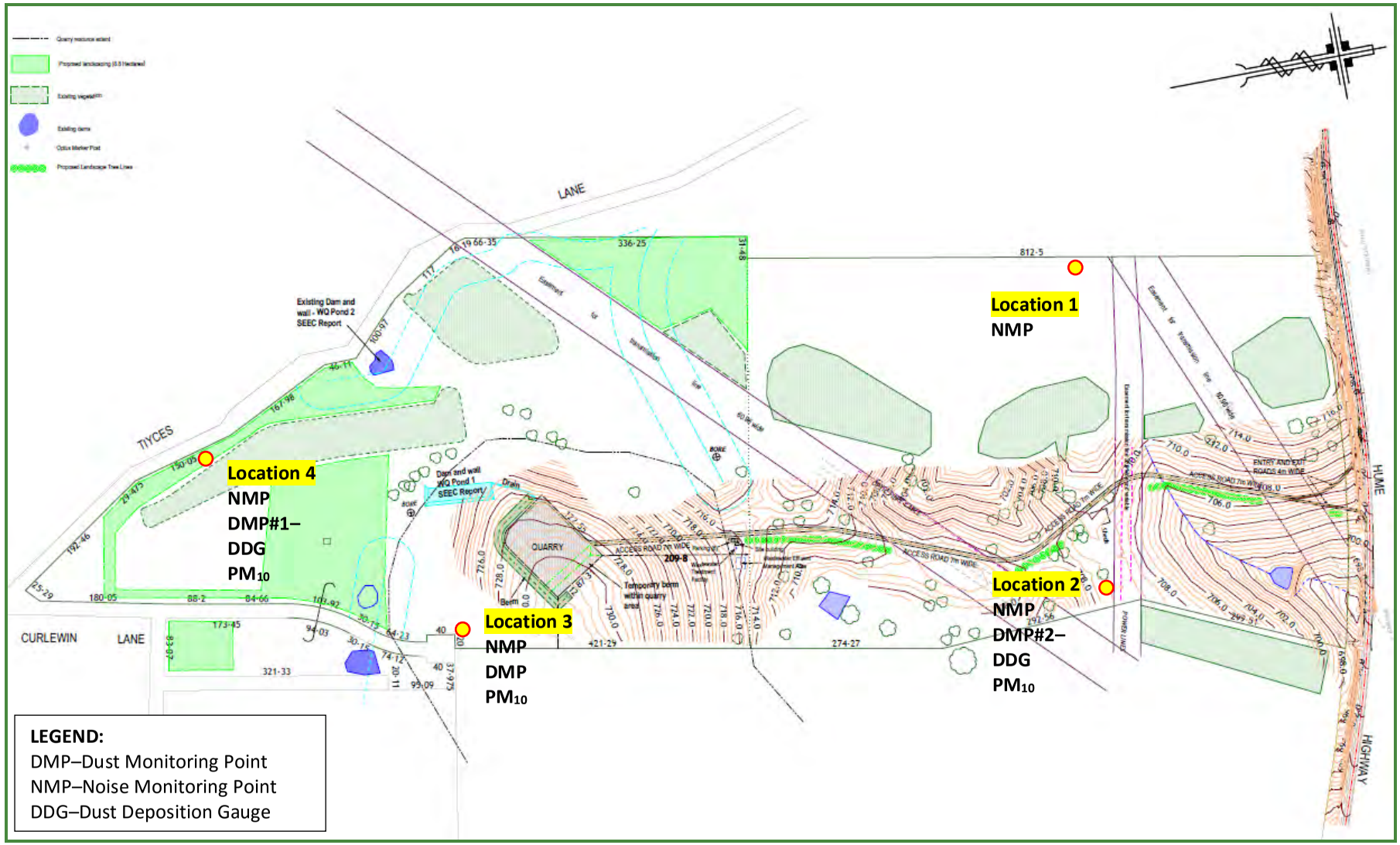
5.2.1 Selection of Monitoring Locations

The approach adopted is to have fixed locations for the two dust deposit gauges (DDG) and three locations used throughout the year for PM_{10}. After the first year's sampling the results would be analysed and a decision made as to a permanent location of the PM_{10} monitoring point is justifiable. The locations of the Dust Deposit Gauges are based on the wind roses. These show a predominance of highest strength winds either from the westerly sectors or the easterly sectors. The locations selected are also in the directions of the nearest receptors in the wind directions.

Wind is the predominant factor as wind provides the mechanism to cause the travel of dust or particulates that may be released from the predominant sources.

The proposed monitoring locations are shown in Figure 5-1.

Figure 5-1: Noise and Dust Monitoring Locations Site Map



5.3 DUST MONITORING METHODS

This section summarises the relevant Australian Standard testing methods to be used. It is recommended that the proponent obtain a copy of the referenced standards to assist in the undertaking of the monitoring. Records of all monitoring shall be kept and as required, the results of the monitoring plan should be formatted and prepared for inclusion in the Annual Return documents as per the specified reporting conditions.

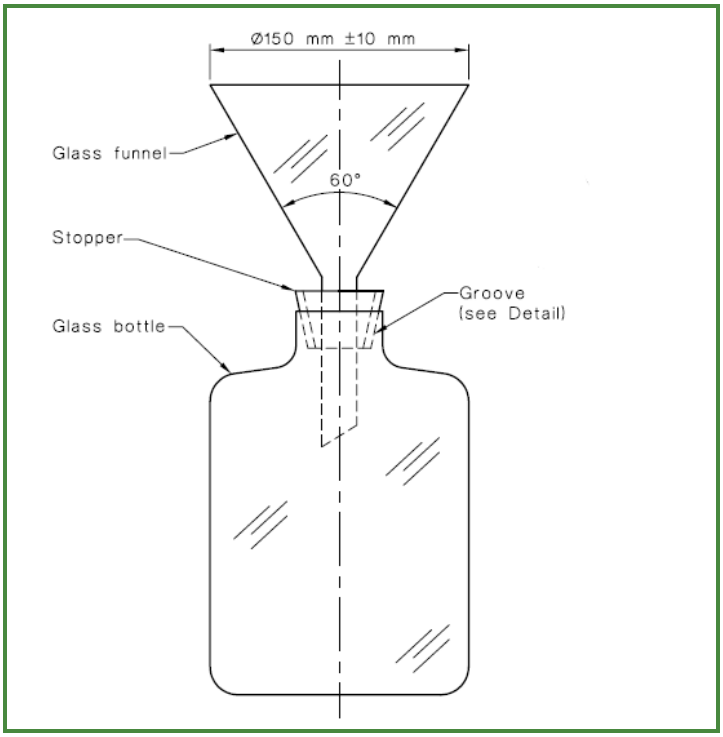
5.3.1 Deposited Dust

Dust monitoring is to be performed using dust gauges conforming to Australian Standard AS 3580.10.1–2003. Over a given sampling period, particles that settle from the ambient air are collected in a vessel and retained together with any rainwater. The sample is passed through a sieve to remove any extraneous matter (e.g. leaves, insects) and the sieved sample containing the deposited matter is transferred to a filtration apparatus. The insoluble and soluble materials are separated by filtration and the mass of the dried insoluble solids is gravimetrically determined.

Equipment:

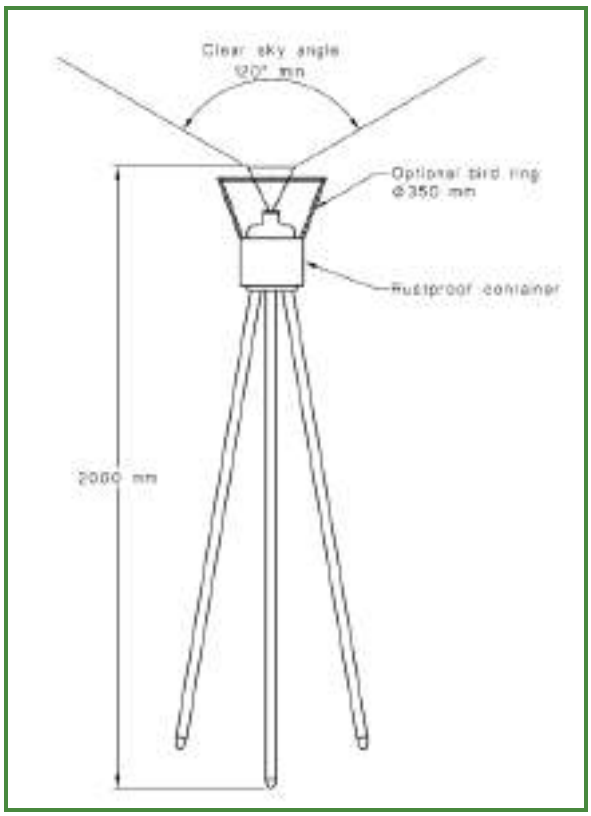
- Grade A volumetric glass bottle (minimum 4L volume capacity) containing amount of copper sulfate solution (as prepared by NATA accredited laboratory). Bottle to be fitted with tight sealing lid during transport. Lid to be mad of an impermeable material that does not react with the expected constituents of the collected deposited matter.
- Glass funnel of 150 ±10mm diameter (nominal angle of cone sides 60 degrees). The internal diameter of the funnel stem needs to be sufficient to permit a passage of particulate matter during washing. The funnel is to be supported firmly in the neck of the glass bottle with a rubber or plastic stopper.
- A stand which supports the dust gauge such that the horizontal plane of the funnel is approximately 2 ±0.2m above ground level. The stand is to be sufficiently sturdy to prevent any noticeable sway and ensure the funnel aperture is maintained in a horizontal position. The stand should incorporate a container to protect the bottle contents from sunlight. This container should be provided with a drainage hole at the base to prevent rainwater build-up.

Figure 5-2: Typical Deposit Gauge



Positioning:
The height of the funnel aperture above the surface of the immediately surrounding area is to be 2 ± 0.2m. The funnel aperture plane must be horizontal. The funnel is to be positioned away from nearest higher obstacles so as to achieve a recommended 120^{o} clear sky angle.

Figure 5-3: Typical Stand with Deposit Gauge



Procedure:

- For routine monitoring programs, the period of exposure is typically 30 ±2 days.
- At the end of the exposure period wash any deposited matter adhering to the inside of the funnel into the deposit gauge bottle using a minimum volume of distilled water from a wash bottle.
- Remove the funnel and stopper and seal the bottle with a lid.
- Identify the bottle with a label detailing the site location, period of exposure and funnel diameter to the nearest mm.
- Return bottled samples to a NATA accredited laboratory as soon as possible (laboratory analysis for insoluble solids must be completed within 30 days of collection). During storage/transport to laboratory, deposit bottles to be tightly sealed, and kept in a cool dark environment to prevent the growth of algae, fungi and other microorganisms. Results of laboratory analysis to be provided as g/m^2/month.
- Insert the clean funnel with attached stopper into a fresh bottle containing copper sulfate solution and leave exposed for the next sampling period. Ensure that the funnel is firmly held in the neck of the bottle and that the funnel aperture plane is horizontal.

Where there are likely existing high background concentrations of dust deposition, Benbow Environmental recommends monitoring to occur prior to the operation of the site in order to gauge the incremental dust impacts of the sites activities.

5.3.2 PM_{10}

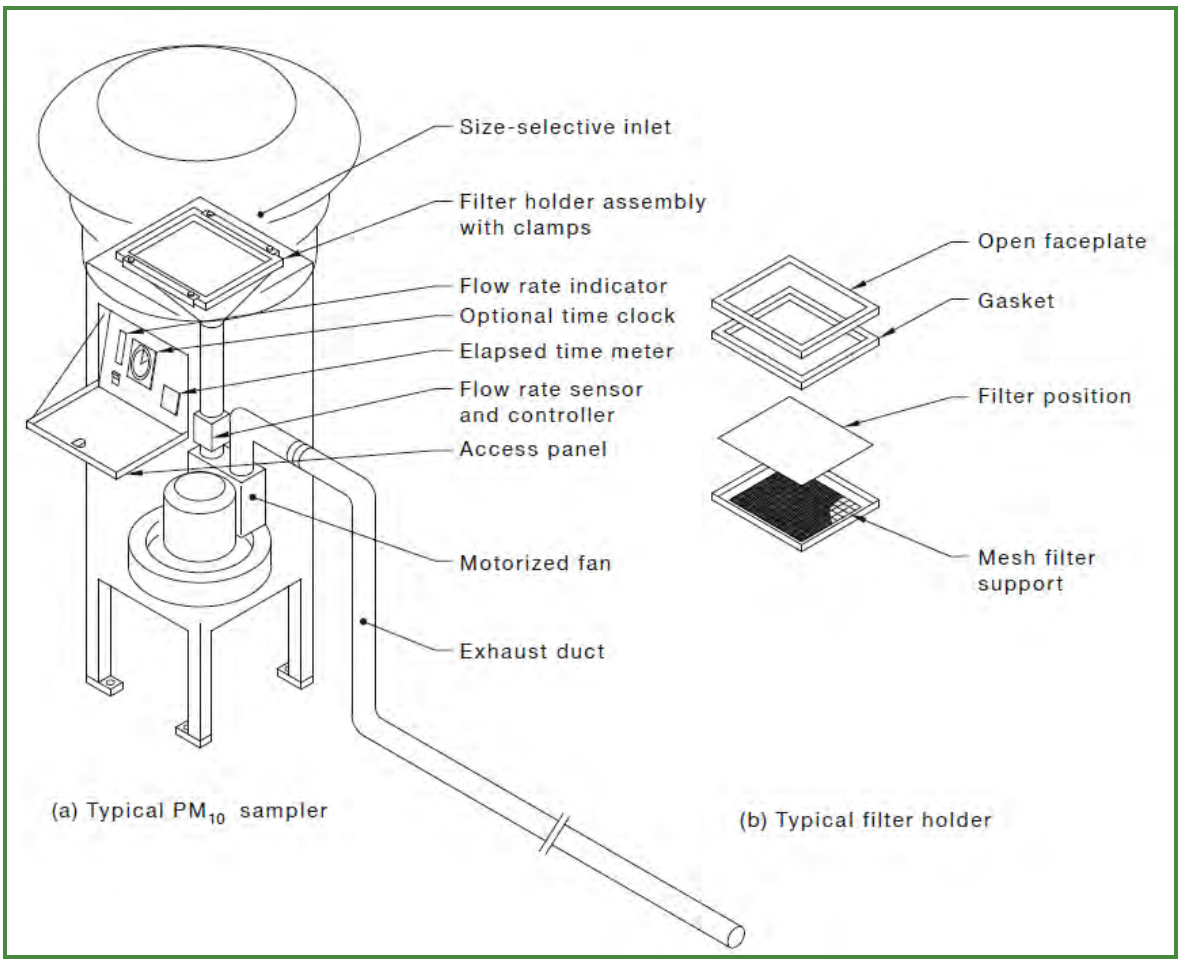
PM_{10} monitoring is to be performed using a high volume sampler conforming to Australian Standard AS 3580.9.6–2015. Ambient air is drawn at a constant flow rate through a prepared filter via a PM_{10} size-selective inlet where the suspended particulate matter is inertially separated, with particles larger than PM_{10} being retained on a layer of grease. The PM_{10} fraction of the suspended particulate matter is collected on a prepared filter mounted in the high volume sampler filter holder and subsequently weighed (gravimetric method). The PM_{10} concentration is determined by dividing the mass of collected particulate matter by the sample volume, which is calculates from the sample duration and either the average or totalised flow rate.

Equipment:

The PM_{10} sampler is to consist of a PM_{10} size-selective inlet fitted to a high volume sampler. Performance compliance required as per the US Code of Federal Regulations.

- The PM_{10} size-selective inlet to be designed to collect particles of equivalent aerodynamic diameter (EAD) 10 ±0.5 µm at a 50% efficiency, on a mass basis, at a flow rate of 1.13 m^3/min ±10%.
- The high volume sampler to consist of a filter holder, a motorised fan, a shelter, an air flow measuring device and an elapsed time meter that measure the actual sampling duration to within ±1% U95 (uncertainty at a confidence interval of 95% according to ISO/IEC Guide 98). Samplers to have a programmable time clock capable of controlling operation of the sampler to within 2% of the selected time period.
- Sampler must be capable of passing ambient air at all times during the sampling period at a constant flow rate within the 1.13 m^3/min ±10% range.
- The motor must be capable of continuous operation over the range of expected environmental conditions for periods of at least 24 hours. The shelter and size-selective inlet to be constructed of materials capable of withstanding extremes of temperature, relative humidity and the air pollutants to which they will be exposed.
- The filter holder to be horizontally mounted in the high volume sampler so that the sample air is drawn downwards through the filter. The filter holder to be clamped firmly to provide an airtight seal against the high volume sampler.
- Filters made from quartz, glass, PTFE or PTFE-coated glass fibre filters of approximately 200mm × 250 mm to be used. The filters to have a specified collection efficiency of at least 99% for particles 0.3µm EAD and permit an air flow rate of 1.24 m^3/min. Filters to be free from pinholes or other defects.
- The high volume sampler and its installation to comply with relevant statutory electrical requirements.
- An exhaust muffler or other noise reducing technique should be used where noise pollution is of concern.
- The exhaust from the sampler to be dispersed to minimise re-entertainment of filtered air and stirring up dust from the ground.
- The high volume sampler to be firmly secured to prevent it from being blown over.
- The high volume sampler's air flow measuring device must be capable of being calibrated.

Figure 5-4: PM_{10} Sampler Apparatus



Procedure:

All equipment is to be fully calibrated prior to use.

Filter preparation –
A laboratory environment with a controlled atmosphere is required for conditioning and weighing filters for the entire conditi0oning period with a mean temperature between 15°C and 30°C controlled within the limits of ±3°C from the mean, and a mean relative humidity (RH) between 20% and 50% controlled within the limits of ±5% RH from the mean. Filters are to be weighed to the nearest 0.1mg using a calibrated microbalance and record the initial filter mass along with filter identification number. Store each weighed filter in separate, labelled, dustproof container.

Sampling –
- Set up sampler according to manufacturer's instructions.
- Remove a pre weighed filter from its container and place in filter holder. Filters only top be handled using clean, non-serrated forceps or by hand using clean non-powdered gloves.
- Set sampler flow rate. Operate the sampler for 5 minutes and record the initial flow rate as indicated on the sampler flow rate indicator.

- Set the high volume sampler time clock to commence running at a predetermined time and for a predetermined period. For routine monitoring, sampling is carried out every sixth day for 24 hours from midnight to midnight.
- Return to collect the exposed filter within three days of the sample period. Before removing the exposed filter, operate the sampler for 5 minutes and record the final flow rate. If the final flow rate differs from the initial flow rate by more than 10%, the sample obtained is to be rejected.
- Carefully remove the filter from the holder, touching only the outer edges. Reject the sample if there is evidence of misalignment, blockage or breakthrough. The filter shall be folded so that only surfaces with collected particulate matter are in contact. Replace the filter in its suitably labelled dustproof container. The sample should not be exposed to extremes if temperature that could result in loss of semi-volatile compounds o the filter. The period between sampling and final weighing shall not exceed 20 days (or 30 days at <4°C).
- Record all relevant details in a log book including date sample was taken, date exposed filter was removed, filter identification number, site location, sampler model and serial number, elapsed sampling time, any relevant comments including meteorological conditions, local construction activity, fire or dust storms that may affect PM_{10} concentration.
- Before final weighing equilibrate the exposed filter and any blank filters in the conditioning environment for at least 24 hours under the same temperature and humidity conditions used for pre-sampling filter equilibrium.
- Weigh each filter to the nearest 0.1 mg. Record the mass of each filter.

Analysis–
The PM_{10} concentration can be calculated as a

$$C = \frac{(M_f - M_i) \times 10^3}{V}$$

Where
C = concentration of PM_{10} in micrograms per cubic metre
M_f = final mass of filter in milligrams
M_i = initial mass of filter in milligrams
V = volume of air sampled, in cubic metres, corrected to reference conditions of 0°C and 101.3kPa

Note: if the site does not have a suitable laboratory, filters can be prepared and analysed by an external laboratory.

6. CONTROL MEASURES

Dust generating activities from quarry sites should be reasonably and practicably managed so as to minimise / negate potential environmental impacts and risk to human health. Control strategies may involve prevention, suppression or containment measures in order to limit the potential for dust particles to become airborne.

Table 6-1 provides a range of control measures for consideration. These are provided as suggestions only and may be implemented where appropriate. Local weather conditions should be taken into account in determining the level and suitability of controls required.

Continual visual observation of dust levels is required by site workers in order to determine the appropriate measure of dust control necessary for the particular site activities being undertaken under the prevailing meteorological conditions. If results of the dust monitoring indicate unacceptable levels of dust being generated and emitted from the site, more stringent controls should be enforced.

Table 6-1: Dust Control Measures for Typical Quarry Site Activities

Source	Control Measures
General Site	• Install a wind vane and a wind speed monitor so that the Quarry Manager or his supervisor is aware of wind gusts or wind conditions that exceed 15 km/hr. Under these conditions increased use of water sprays at stockpiles and increased use of the water truck would be needed. • Towards the end of the day shift, ensure stockpiles have water sprays activated to promote the formation of a crust. • Retain existing vegetation where possible and through the use of overburden, form berms and vegetate these as a windbreak where practicable around the perimeter of the quarry. • Stage works to minimise areas of disturbance at any one time. • Stabilise access point/s– to be installed and maintained at ingress/egress to prevent dust, dirt and mud being transported by vehicles from the site • Further encourage the growth of dense vegetation consisting of native species with a dense vegetation to 3 m in height and then trees around the perimeter of the site.
Earthworks and Excavation (stripping of overburden)	• Minimise area of soil disturbance. • Suppression using water sprays or dust suppression surfactants to ensure no visible dust emissions. • Ensure that earthmoving vehicles do not operate at excessive speeds. • Minimise drop heights of materials. • Stabilise disturbed areas as soon as practicable.

Table 6-1: Dust Control Measures for Typical Quarry Site Activities

Source	Control Measures
Stockpiling	• Minimise the time materials are stockpiled on site. • Limit stockpile height and size e.g. 6 m height. • Locate stockpiles away from sensitive receptors, drainage paths, easement, kerb or road surface. • Position stockpiles near existing wind breaks such as trees, and vegetated earth berms. • Wet suppression of stockpiled materials as needed to ensure no visible dust emissions. • At the end of each day shift, ensure that stockpile surfaces are sprayed with water and surfactant to form a crust.
On-site Vehicle Traffic	• Minimise movement of traffic around the site by restricting vehicles to specific routes. • Enforce appropriate speed limits for vehicle on site. Recommended speed limit is <15km/hr. • Avoid unpaved haul routes where possible in favour of existing hard surface routes. • Apply gravel or bitumen seal to unsealed trafficable areas of the site. • Regular use of the quarry water truck. This will aid in preventing the build-up of fine particulate matter on site road surfaces. • Ensure proper maintenance of vehicle engines. • Limit idling time of vehicles – engines should be switched off.
Mechanical Processing	• Use of dust extraction hoods and cyclones and/or bag filters for drilling rigs, crushers etc. • Locate processing activities so as to shelter from prevailing wind conditions • Use of water / chemical suppression systems on materials processed by equipment. • Enclosure of screens.
Transport of Materials	• Cover all loads leaving the site. • Vehicles leaving the site to be cleaned of dirt and other materials to avoid tracking these materials onto public roads. • Enclosure of conveyors and chutes to transfer materials where possible.

7. CONCLUDING REMARKS

This monitoring plan outlines the monitoring location selection, sampling methodologies and analysis for dust deposition and PM_{10} to be undertaken in line with the relevant Australian Standards in accordance with the requirements of the Deferred Commencement Condition P1.1.

Results of the monitoring should be recorded, formatted and prepared for inclusion in the Annual Return documents as per the specified reporting conditions.

To assist with site dust management, Benbow Environmental has provided a list of general dust control measures that may be implemented where appropriate at the discretion of the proponent. It is the intention of Benbow Environmental that this adequately provides the proponent with the appropriate guidance required to ensure the health of the local environment is maintained and to minimise any potential risks to human health.

This concludes the report.

Katie Trahair
Environmental Scientist

R T Benbow
Principal Consultant

8. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Argyle (NSW) Pty Ltd, as per our agreement for providing environmental services. Only Argyle (NSW) Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Argyle (NSW) Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

14.6 Appendix 6 – Responsibility Table

Item	Test	Responsible	Frequency[11]	Reference
Airborne Dust	HI Volume	Specialist Consultant	Three monthly or after complaint	Section 2.5.4 Appendix 2 Appendix 5
Deposited Dust	Dust Deposition Gauges	Specialist Consultant	Continuous but measured monthly	Section 2.5.4 Appendix 2 And Appendix 5
Visual dust	Visually excessive dust	Quarry manager	Daily	Section 2.5.4 Appendix 1
Operating Noise	Hand-Held Gauges	Specialist Consultant	Three monthly or after complaint	Section 2.4.4 Appendix 2 Appendix 4
Operating Noise	Anecdotally high noise	Quarry Manager	Daily	Section 2.4.4 Appendix 1
Soil and Water Management	Erosion	Quarry Manager	After significant (>12 mm) rainfall	Section 2.3 Appendix 1
Soil and Water Management	Dust	Quarry Manager	Daily (visual)	Section 2.3 Appendix 1
Soil and Water Management	Irrigation	Quarry Manager	Monthly	Section 2.3.2 Appendix 1
Existing Native Vegetation	Visual	Quarry Manager	Six-monthly	Section 2.7
Native Re-vegetation	Visual	Quarry Manager	Six-monthly	Section 2.7
Weed Infestations	Visual	Quarry Manager	Six-monthly	Section 2.8
Traffic Management	Visual	Quarry Manager	Daily	Section 3
Complaints Line	Phone Log	Quarry Manager	As occur	Section 4.1.1
Aboriginal Finds	Visual	Quarry Manager	As occur	Section 9
Weather Recording Rain, Wind	Automatic Station	Quarry Manager	Daily	Section 2.3.2
Evaporation Data	BOM Weather station	Quarry Manager	Daily	Section 2.3.2 Table 3 (example)
Wastewater System	Quarterly Inspections	Wastewater Contractor	Quarterly	Section 2.10
Annual EPA Reporting		Quarry Manager	Annual	Section 7
Security		Quarry Manager		Section 1.9

[11] Frequency of some items may reduce as data is collected, at the discretion of the regulating authorities.

14.7 Appendix 7 – NSW EPA General Terms of Approval

TBA

E. Quarry Site Plans (A3 copies) incorporating:

a. SCCS survey report 9/1/2016 – Proposed Egress Point Tiyces Lane.

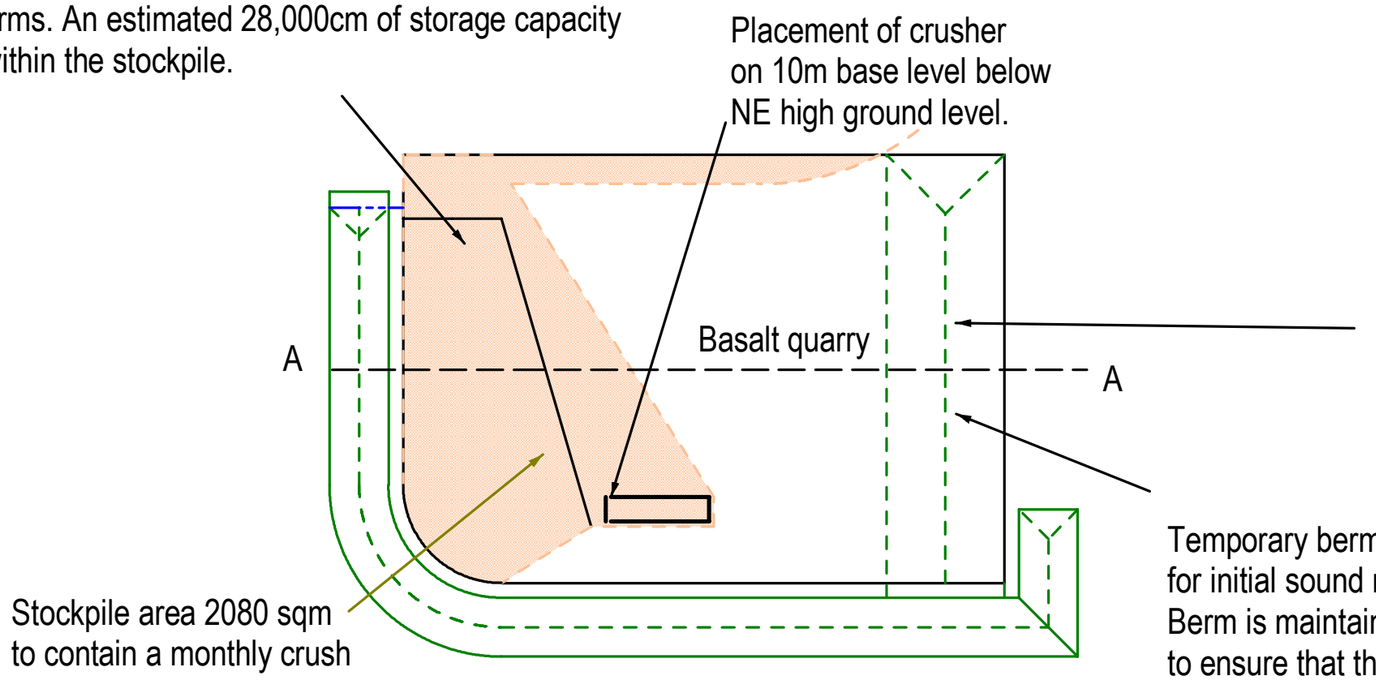
b. Site Development & Landscape Plan 4/5/2017.

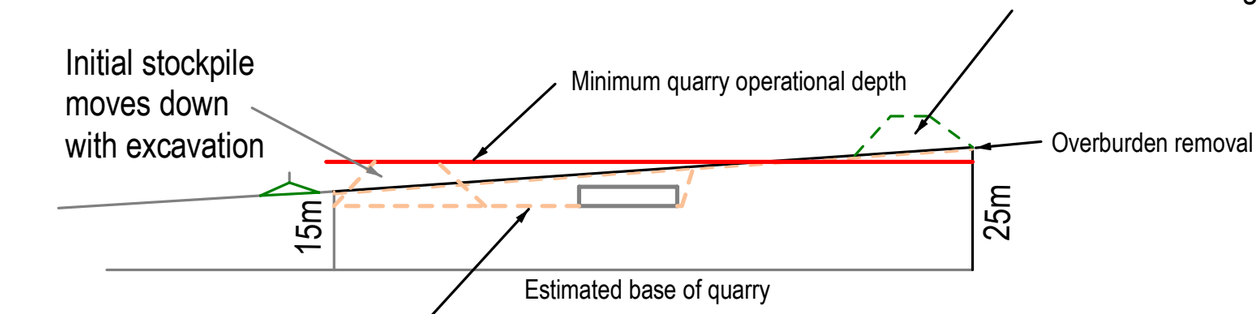
c. Site Development & Landscape Plan Aerial 4/5/2017.

d. Site Development & Landscape Plan Topographic 4/5/2017.

e. Initial Quarry Pit Detail Plan 4/5/17.

Initial quarry establishment area. Contains an estimated 34,720 cm of material for initital storage within the temporary berm and stockpile area as well as providing base material for the establishment of the permanent berms. An estimated 28,000cm of storage capacity is contained within the stockpile.



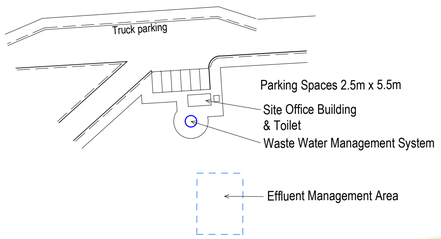


Section A - A

N

NOTES:	PLAN Proposed Basalt Quarry Lots 1 & 2 DP 1094055 63 Curlewin Lane, Boxers Creek 17033 Hume Highway, Boxers Creek Scale - 1:1250 on A3	Laterals Planning 1st Floor, 35 Montague Street (PO Box 1326) Goulburn NSW 2580 Phone 02 4821 0973 Fax 02 4821 0954 24 Thomas Street, Johns River NSW 2443 Mobile 0427 210 973	SHEET NO: 1 No OF SHEETS: 1 DATE: 4/5/2017 PLAN NO: 1707 Initial quarry pit detail plan

INSET - SITE FACILITIES



SCALE - 1:800

EGRESS ONLY ROAD 4m WIDE
It is intended that the Impact Area edge along the fenced vegetation area be located along the fenceline. this will ensure a 3m separation from the existing fenced native vegetation area

Crest in Tiyces Lane by survey. Egress Point.

Tiyces Lane access splay and gate to Council standards

WQ Pond 3 SEEC Report

WQ Pond 2 SEEC Report

WQ Pond 1 SEEC Report

BORE 1

BORE 2

Provision for portable weighbridge facility

Quarry Security Fencing and gates

Existing shed

QUARRY

Berm (grassed)

See Inset

This area contains approximately 3.1 Ha which can be utilised for irrigation as specified in the SEEC report requiring a minimum area of 2 Ha. However it would be initially intended to apply the 2Ha irrigation water to the areas for revegetation to assist establishment and growth.

INGRESS ROAD 7m WIDE

INGRESS ROAD

Easement 19m wide

Easement for transmission line 60.96 wide

Easement

Transmission line

TIYCES LANE

LANE

CURLEWIN LANE

TOWRANG CREEK

BOXERS CREEK

HUME HIGHWAY

HIGHWAY SERVICE CENTRE ENTRY PER RMS PLAN

Fencing splay grate and gate to RMS requirements

1 DP1087077

2 DP1087077

1 DP1008397

4 DP1094055

2 DP1094055

3 DP?

DP 621540

DP 1094055

ROADSIDE LANDSCAPING NOTES

Existing trees are to be retained.

Roadside landscape tree species are proposed to include -
Callistemon viminalis "Captain Cook" (up to 2m high)
Callistemon viminalis "Dawson River" (up to 6m high)
Melaleuca linariifolia "Snow in summer" (up to 6m high)

These trees are used in the area forf screening plants in the median strips on the motorway.These species need little watering once established and are heat and frost hardy. They are also very valuable as food soures for many local vatieties of native birds.

Trees will be tubestock planted and maintained to establishment. Watering will be by water cart using on site dam water. Trees will be planted at a maximum spacing of 5 metres and any dead plants will be replaced.

Vegetation Guidelines for Power Lines do not permit tree planting within a transmission corridor.

EASEMENT

The easement 13m and 19m wide and variable provides for the access road through Lot 2 DP 1094055. The standard width is 13m with widening to 19m to include roadside landscaping.

INGRESS & EGRESS ROADS

The new internal ingress road from the Hume Highway is shown at a full 7m width (6m gravel surface with 0.5m verges) however the final design may be achieved at 4m width with 20m long 6m wide passing bays every 200m.

The egress road to Tiyces Lane is shown at 4m width (3m gravel surface with 0.5m verges).

KEY

Quarry resource extent

Existing dams

Area of potential impact during construction. This strip (3m wide) would be restored immediately following construction.

IMPACT AREAS

Allowing for a 3m impact area (1.16Ha) around all works Quarry, Access Roads, Berms, Office, Parking Area and Septic 40988 sqm
Waste Water Mgmt EMA 200 sqm
Dam 4900sqm
TOTAL 46088 sqm

Excluding the 3m buffer area of 1.16Ha (which would be rehabilitated) the completed development impact area covers 34,488 sqm.

Issue	Amendment	Date
B	Inset, Fencing and minor changes	4/5/2017
A	Original	14/4/2017

Surveyed :
Designed :
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 1707

SCALE
1:2500

Sheet No.	No. of Sheets	Sheet size
1	1	A1

LATERALS PLANNING ENGINEERING & MANAGEMENT
1st Floor, 35 Montague Street
Goulburn NSW 2580
Ph: 4821 0973 Fax: 4821 0954

Sheet Subject
SITE DEVELOPMENT & LANDSCAPE PLAN

TOPOGRAPHCI MAP UNDERLAY

GOULBURN MULWAREE COUNCIL

PROPOSED BASALT QUARRY

LOTS 1 & 2 DP 1094055

63 CURLEWIN LANE BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK

INSET - SITE FACILITIES

Truck parking

Parking Spaces 2.5m x 5.5m

Site Office Building & Toilet

Waste Water Management System

Effluent Management Area

SCALE : 1:800

LANE

TYCES LANE

TYCES

LANE

HUME HIGHWAY

HIGHWAY SERVICE CENTRE ENTRY PER INSET PLAN

Fencing splay grate and gate to RMS requirements

EGRESS ONLY ROAD 4m WIDE
It is intended that the Impact Area edge along the fenced vegetation area be located along the fenceline, this will ensure a 3m separation from the existing fenced native vegetation area

Crest in Tyces Lane by survey. Egress Point.

Tiyces Lane access splay and gate to Council standards

Site distance 220m (R)

Site distance 250m (L)

WQ Pond 3 SEEC Report

This area contains approximately 3.1 Ha which can be utilised for irrigation as specified in the SEEC report requiring a minimum area of 2 Ha. However it would be initially intended to apply the 2Ha irrigation water to the areas for revegetation to assist establishment and growth.

Easement for transmission line 60.96 wide

BORE 1

WQ Pond 2 SEEC Report

Provision for portable weighbridge facility

BORE 2

WQ Pond 1 SEEC Report

Quarry Security Fencing and gates

Existing shed

INGRESS ROAD 7m WIDE

INGRESS ROAD

Easement 19m wide

See Inset

QUARRY

Berm (grassed)

CURLEWIN LANE

DP 621540

DP 1094055

ROADSIDE LANDSCAPING NOTES

Existing trees are to be retained.

Roadside landscape tree species are proposed to include -
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Vegetation Guidelines for Power Lines do not permit tree planting within a transmission corridor.

EASEMENT

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Drawn : K Allen
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SCALE
1:2500

Sheet No.	No. of Sheets	Sheet size
1	1	A1

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Goulburn NSW 2580
Ph: 4821 0973 Fax: 4821 0954

Sheet Subject
SITE DEVELOPMENT & LANDSCAPE PLAN

AERIAL UNDERLAY

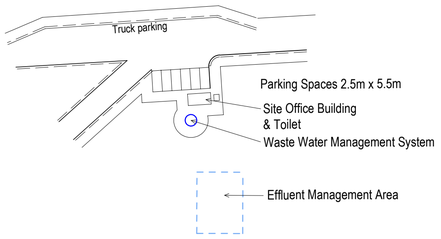
GOULBURN MULWAREE COUNCIL

PROPOSED BASALT QUARRY

LOTS 1 & 2 DP 1094055

63 CURLEWIN LANE BOXERS CREEK
12033 HUME HIGHWAY, BOXERS CREEK

INSET - SITE FACILITIES



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Crest in Tiyces Lane by survey. Egress Point.

Tiyces Lane access splay and gate to Council standards

Site distance 220m svy

Site distance 285m svy

Reafforestation 0.54 Ha

Fenced area

Reafforestation 1.76 Ha

WQ Pond 3 SEEC Report

Reafforestation 2.74 Ha

Easement for transmission line

This area contains approximately 3.1 Ha which can be utilised for irrigation as specified in the SEEC report requiring a minimum area of 2 Ha. However it would be initially intended to apply the 2Ha irrigation water to the areas for revegetation to assist establishment and growth.

BORE 1

BORE 2

WQ Pond 2 SEEC Report

WQ Pond 1 SEEC Report

Provision for portable weighbridge facility

Quarry Security Fencing and gates

Existing shed

Reafforestation 3.76 Ha

QUARRY

Berm (grassed)

INGRESS ROAD 7m WIDE

INGRESS ROAD

Easement 19m wide

See Inset

Easement for transmission line 60.96 wide

TIYCES LANE

HUME HIGHWAY

LANE

TIYCES

CURLEWIN LANE

DP 621540

DP 1094055

HIGHWAY

HIGHWAY ENTRY PER RMS PLAN

Fencing splay grate and gate to RMS requirements

ROADSIDE LANDSCAPING NOTES

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The egress road to Tiyces Lane is shown at 4m width (3m gravel surface with 0.5m verges).

KEY

- Quarry resource extent
- Proposed revegation areas (8.8 Hectares)
- Existing vegetation
- Existing dams
- Proposed Landscape Tree Lines
- Area of potential impact during construction. This strip (3m wide) would be restored immediately following construction.

Excluding the 3m buffer area of 1.16Ha (which would be rehabilitated) the completed development impact area covers 34,488 sqm.

Issue	Amendment	Date
B	Inset, Fencing and minor changes	4/5/2017
A	Original	14/4/2017

Surveyed : Southern Cross Consultilng Surveyors
Designed : Laterals & NC Engineering Pty Ltd
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 1707

SCALE 1:4000

Sheet No.	No. of Sheets	Sheet size
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LATERALS PLANNING ENGINEERING & MANAGEMENT
1st Floor, 35 Montague Street
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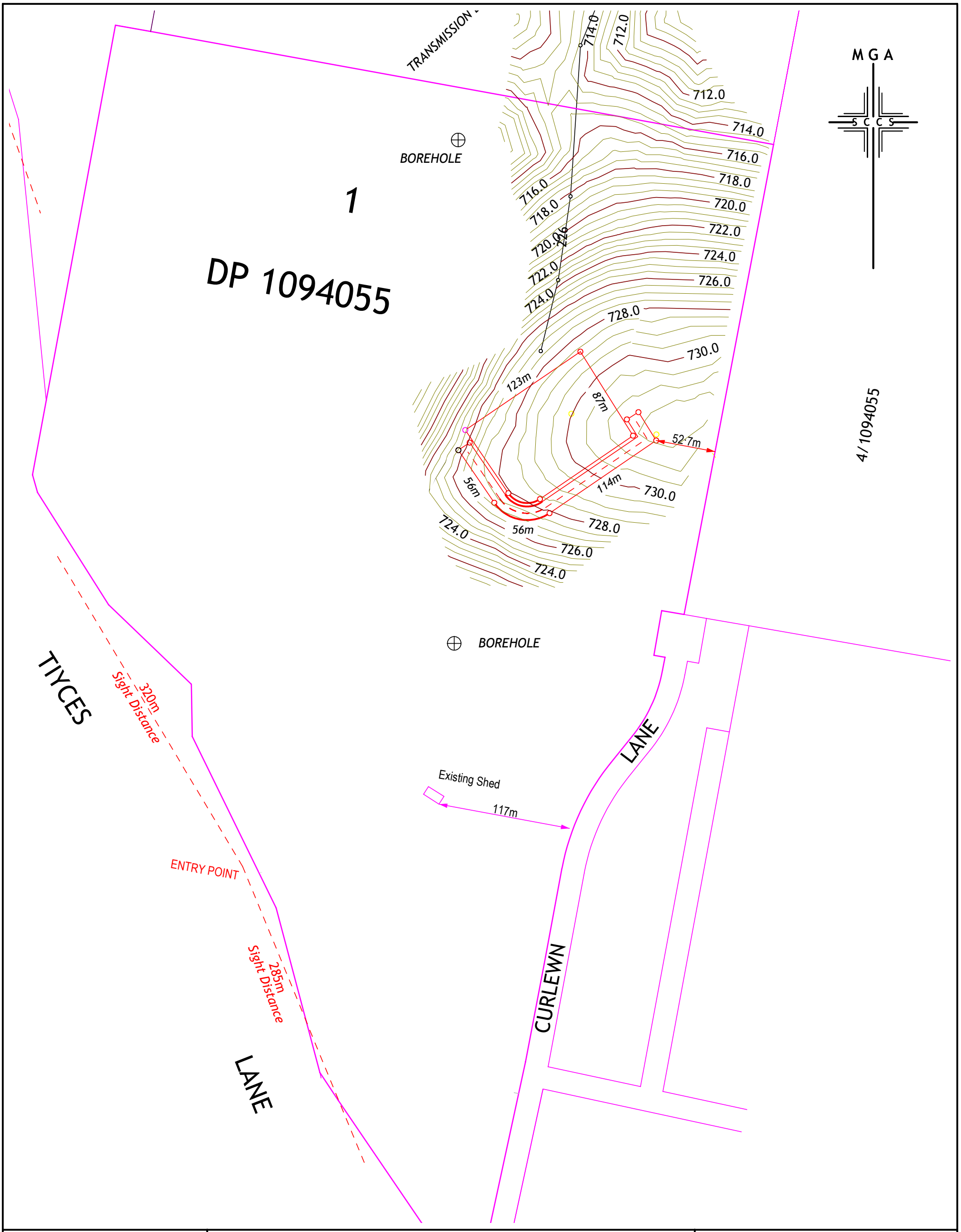
Sheet Subject
SITE DEVELOPMENT & LANDSCAPE PLAN

GOULBURN MULWAREE COUNCIL
PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
63 CURLEWIN LANE BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK



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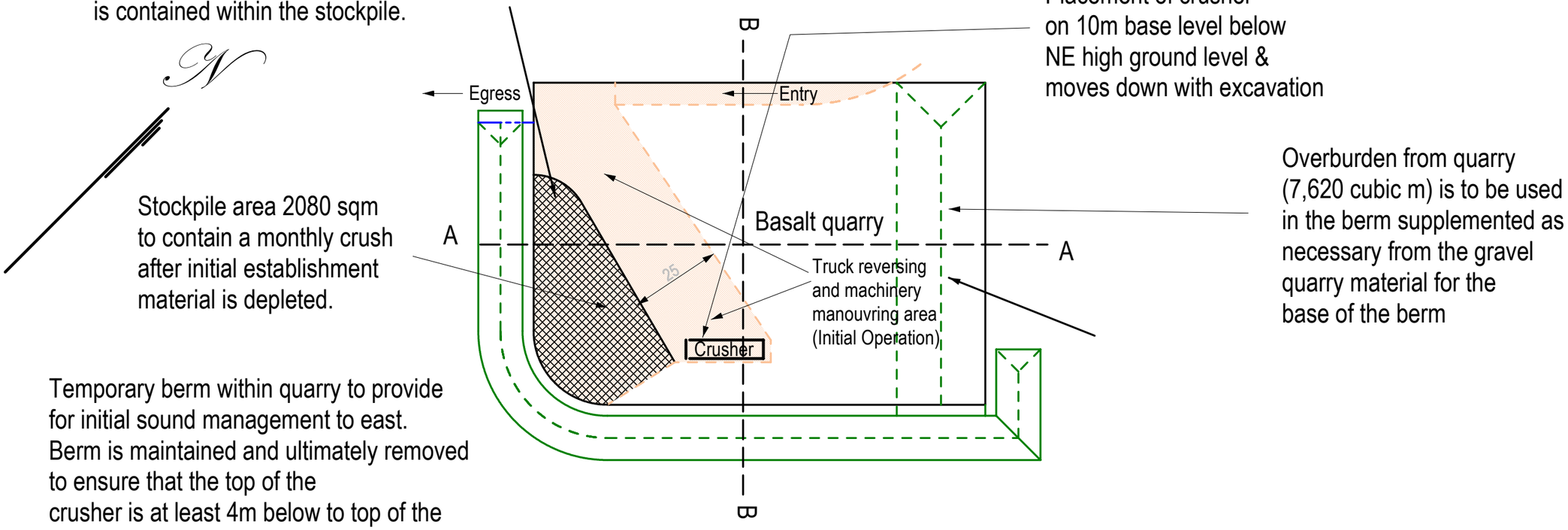
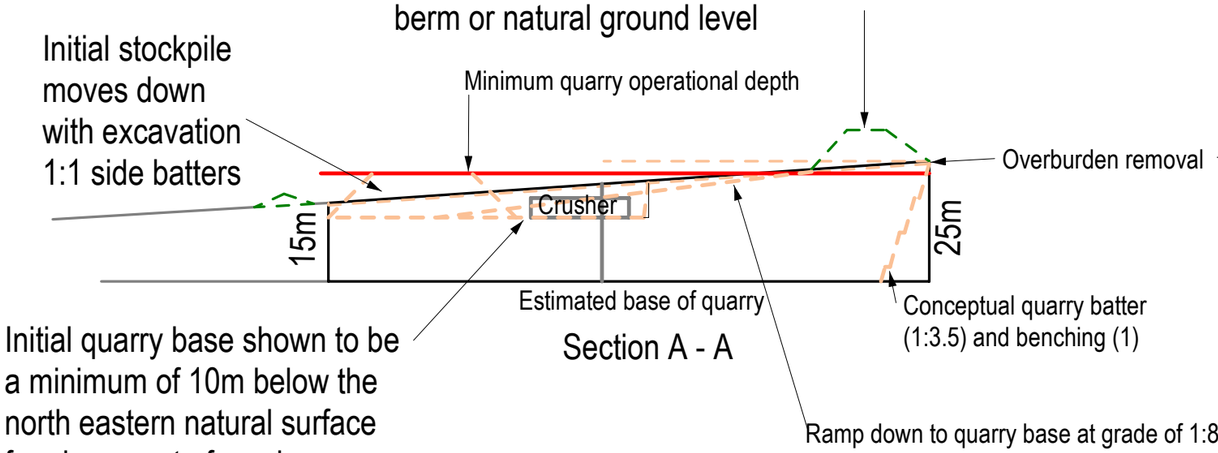
CONTOUR INTERVAL - 0.5m
DATUM - AHD
DATE - 9 DEC 2016
REF - 22903-161209A

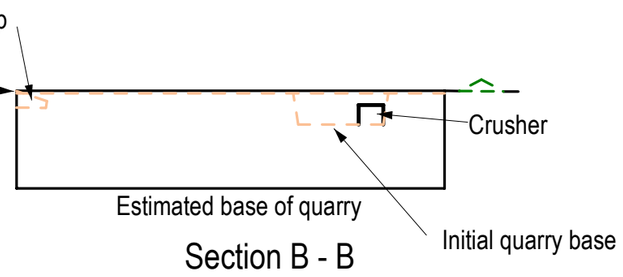
ARGYLE QUARRY
PLAN SHOWING PROPOSED
EGRESS POINT TIYCES LANE

SOUTHERN CROSS
CONSULTING SURVEYORS
20 Clifford Street
PO Box 142
GOULBURN NSW 2580
T: 02 4822 1366
F: 02 4822 1365
Email : admin@sccsurveyors.com.au

Initial quarry establishment area. Contains an estimated 34,720 cm of material for initital storage within the temporary berm and stockpile area as well as providing base material for the establishment of the permanent berms. An estimated 28,000cm of storage capacity is contained within the stockpile.







NOTES:

PLAN
Proposed Basalt Quarry
Lots 1 & 2 DP 1094055
63 Curlewin Lane, Boxers Creek
17033 Hume Highway, Boxers Creek

Scale - 1:1250 on A3

Laterals Planning
1st Floor, 35 Montague Street (PO Box 1326)
Goulburn NSW 2580
Phone 02 4821 0973 Fax 02 4821 0954
24 Thomas Street, Johns River NSW 2443
Mobile 0427 210 973

SHEET NO: 1
No OF SHEETS: 1
DATE: 2/11/2017
PLAN NO: 1707
Initial quarry pit detail plan

F. Flora and Fauna Assessment 2008 prepared by Laterals Environmental updated 2017.

FLORA AND FAUNA ASSESSMENT

For the proposed Argyle Quarry

Lots 1 & 2 Deposited Plan 1094055
63 Curlewin Lane, Boxers Creek,
accessed by 17033 Hume Highway

Prepared by:
Pat Guinane, Environmental Consultant
B. Env Sci. Dip. Nat. Res. Mgt.
ABN 37 902 748 749
PO Box 1405, Goulburn, 2580
pat@zaccess.com.au

May 2017 **Ref. 140017_1**

Contents

1. Summary

This flora and fauna assessment accompanies a development application to the Goulburn Mulwaree Council for the development of a quarry (to be known as Argyle Quarry) on Lot 1 DP 1094055, Curlewin Lane Boxers Creek, with access over Lot 2 DP 1094055 and along Tiyces Lane. The lot with the quarry contains an area of 44.08 hectares and which with the access over Lot 2 DP 1094055 an estimated 4.6 hectares will be disturbed to establish the quarry as a whole (some of which is construction impact area which would be rehabilitated – 1.16ha).

The site occurs in a rural district that has supported agriculture for many years and much of the landscape is cleared. The study area is currently used for agricultural grazing and is mostly cleared and occupied by exotic pasture species, however several stands of intact native vegetation occur offering valuable habitat for native flora and fauna.

This report presents the findings of an assessment of potential impacts the proposed development may have on the flora and fauna components associated with the study area.

No threatened fauna or flora species listed under the *NSW Threatened Species Conservation Act 1995* were found to potentially occur on this site. No protected migratory species were recorded on site. No threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* were observed on site or found to be likely visitors to this site.

One endangered ecological community listed under the *NSW Threatened Species Conservation Act 1995, White Box, Yellow Box, Blakely's Red Gum Woodland* was found to occur on the site. Impacts to this endangered ecological community have been assessed through an Assessment of Significance provided in Appendix 4 of this report that found it is unlikely to be impacted by the proposal.

Appendix 3 provides a thorough threatened species evaluation.

The overall impact of the proposed development on flora, fauna and habitats associated with this site is considered to be insignificant.

A glossary of terms used throughout this report has been included in Appendix 7.

2. Introduction

This report has been prepared by Environmental Consultant Pat Guinane for Lots 1 & 2 DP 1094055, 63 Curlewin Lane, Boxers Creek, also accessed from 17033 Hume Highway. The report accompanies a development application to Goulburn Mulwaree Council (Council) to develop a basalt quarry on this land.

This document assesses the potential impact on flora and fauna of the proposed development, the impact assessment is based on the disturbance of 4.6ha of land for the establishment of the quarry and associated infrastructure including access tracks, alterations to access-ways including an acceleration lane on the Hume Highway, parking and associated buildings.

The site is currently operating as a grazing farm. Sheds, fencing, dams and tracks are existing developments on the site.

The study site is located in the Southern Tablelands of NSW halfway between the City of Goulburn and the Village of Marulan, on the south side of the Hume Highway. The area is characterised by a rural landscape typically used for grazing enterprises.

The study area referred to in this report includes Lots 1 & 2 of DP 1094055 on which the development occurs as well as immediately adjoining lands with a close ecological influence.

Parts of the study area are well vegetated, particularly less fertile ridges, as is common in this landscape. Some lower slopes support regenerating native vegetation however these areas are generally cleared and have been used for grazing both in the study area and in the surrounding landscape. Most of the native vegetation on the site has been protected through a section 88B Conveyancing Act conservation covenant that has been applied to this site as an offset applied as part of a previous subdivision development. An extract of this instrument is attached at Appendix 5.

Direct impacts of the proposal are restricted to areas that have been cleared of native vegetation in the past and currently occupied by exotic pasture grassland. All areas of remnant native vegetation have been avoided

This assessment:

- Provides a description of the study site;
- Describes the methods used to assess biodiversity;
- Identifies the flora and fauna species & habitats present on the site;
- Assesses the habitat value including continuity & corridor potential of the site;
- Identifies the threatened species, populations and ecological communities with potential to occur on site;
- Assesses the significance of the potential impacts on identified threatened species, populations and ecological communities and migratory species.

Details of the study area are illustrated by the map on the following page.

Map 1; Study area and proposed development

3. Methods

3.1. Site Inspection

This site was surveyed on May 22nd 2017 by two ecologists for 6 hours. The weather was cool and fogy in the morning clearing to a warm sunny day by early afternoon. It was considered appropriate for fauna surveys given the nature of the proposal. During site visits the study area was identified and all areas impacted directly traversed on foot. All flora and fauna species identified were recorded and mapped along with ecological communities and habitat components occurring on the site.

Methods employed to survey fauna on this site included:

Mammals – tracks, scats and scratch marks were observed to gain an understanding of mammals using the site. The presence of any locally occurring mammal has also been considered with appreciation of the habitats available on the site.

Reptiles – searches were undertaken during visits to this site. Key habitat areas were surveyed thoroughly by turning over loose rocks and timber where possible to determine their presence.

Amphibians – searches were undertaken for these species during the day, under debris such as timber and rocks where present in the vicinity of suitable habitat types. Calls were also used to identify species present in some areas.

Avifauna - were surveyed during site inspections in the morning as the day warmed. Calls were useful in determining species present where a visual sighting was not possible. The use of binoculars assisted in the accurate identification of some species.

Methods employed to survey flora on this site:

Flora was surveyed using the random meander technique focusing on individual vegetation communities. Notes were made of individual plant species present and key habitat types occurring within the proposed development area.

3.2. Desktop Research

Desktop research was undertaken using the NSW Office of Environment and Heritage's Bio Net database (Atlas of NSW Wildlife) and threatened species profile databases for the district and the Commonwealth's *Environment Protection and Biodiversity Conservation Act* protected matters search tool, in order to attain information relating to threatened species, populations and ecological communities and their potential to occur within the study area. Local knowledge and recorded sightings of flora and fauna also contributed to threatened species considered to have potential to occur in the locality.

Nomenclature

The species names in this report are from the *Flora of New South Wales* (Harden, Vol 1 and 3 Revised Edition, 2002), the *Flora of New South Wales* (Harden, Reprinted Vol 2 and 4), *The Mammals of Australia* (Strahan, 1995), *Field Guide to Australian Birds* (Morecombe, 2000), and *Reptiles and Amphibians of Australia* (Cogger, 1992).

4. Results

4.1. Flora

Most of the study area is cleared of native vegetation and is occupied by introduced pasture grasses. Scattered paddock trees appear, particularly on lower slopes where Yellow-box (*Eucalyptus meliodora*), Brittle Gum (*E. mannifera*), Cabbage Gum (*E. amplifolia*) and Long Leaved Box (*E. goniocalyx*) occur occasionally. Photo 4-1 below shows this pasture grassland and scattered paddock trees.

Several stands of remnant native vegetation occur on upper slopes on the western side of the site. Seven distinct stands in this area are spread between the southern and northern extents of the study area providing a valuable ecological link across the landscape. This link is improving in value as much of the grazed valleys between is regenerating beginning to support understory and pioneer species. Photo 4-2 below shows this regeneration in the foreground and a remnant stand of low open forest in the background.

Remnants indicate upper slopes naturally supported South East Dry Sclerophyll Forest on ridges, grading into Southern Tableland Dry Sclerophyll Forest on slopes and Southern Tableland Grassy Woodlands on mid-slopes and valleys.

No flora species or habitat for flora species that is of conservation significance was identified on this site. Remnants of the Endangered Ecological Community White Box Yellow Box Blakely's Red Gum Woodland do occur on the site.

A representative list of the flora species identified on site has been included in Appendix 1.

Photo 4-1; Pasture grassland and scattered paddock trees.

Photo 4-2; Regeneration of pioneering species in the foreground and stand of remnant low open forest in the background

4.2. Fauna

Several locally common native bird species were recorded during site surveys along with signs of common native mammals. Several additional fauna species are likely to use the site based on the reasonably intact habitat on the site.

No fauna of conservation significance were recorded or, based on habitat, considered likely to occur on the site.

Appendix 2 of this report provides a representative list of fauna observed on the site and considered to have potential to occur on the site.

4.3. Habitat Value of the Site

The study area occurs in a landscape where agricultural grazing has occurred for many years including the use of practices such as clearing vegetation, sowing pasture species, removal surface rock and construction of infrastructure such as roads. These practices have significantly reduced habitat available in the landscape. Despite this, the landscape has retained patches of native vegetation particularly on ridge tops and upper slopes where soils have been unproductive for agriculture. These refuges of habitat have been vital for the persistence of many native species in the landscape.

This pattern of vegetation distribution is consistent in the study area where stands of ridge top vegetation extend in a chain along the western side of the site, this offers fantastic continuity of habitat within the site enabling fauna to move around and across the site. These areas of low open forest generally have trees of a good range of species and age classes including some hollow bearing trees which are valuable to several species of birds and mammals. Understory species are sparse but do occur and ground covers are uncommon. Corse woody debris and rocky habitats are plentiful offering terrestrial habitat for reptiles and mammals.

Aquatic habitat occurs in the form of farm dams and intermittent creek lines. Several common aquatic plants occur as well as common frogs. These dams perform an important function for biodiversity on this site offering water and food sources for plants and animals.

5. Threatened Species, Populations and Ecological Communities

Section 5A of the Environmental Planning and Assessment Act 1979 specifies seven factors to be taken into account to determine whether an action is likely to have a significant impact to threatened species, populations or ecological communities, or their habitats, listed under the Threatened Species Conservation Act 1995 (TSC Act). This Assessment of Significance is applied to species, populations and ecological communities listed on Schedules 1, 1A and 2 of the Threatened Species Conservation Act 1995 (TSC Act) and s220 of the Fisheries Management Act 1994 (FM Act). Completing an Assessment of Significance is the first step in considering potential impacts of development on threatened species. When a significant effect on a species is likely, preparation of a Species Impact Statement is required.

The Assessment of Significance should not be considered a “pass or fail” test but a structure allowing the undertaking of a qualitative analysis of the likely impacts and ultimately whether further assessment needs to be undertaken through a Species Impact Statement. All factors as described in the ‘factors of assessment’ below must be considered and an overall conclusion must be drawn from all factors in combination. Where there is any doubt regarding the likely impacts, or where detailed information is not available, a Species Impact Statement may be prepared.

A list of threatened entities that may occur in the district has been prepared based on online threatened species databases, habitats on and in the vicinity of the study area, results of field investigations and other available records of species recordings. This list of threatened species and communities has been presented in Appendix 3 of this report along with an assessment of the likelihood of that species or community occurring on the site based on habitats available and the biology of the species, and the risk of each species being impacted.

5.1. Threatened species

Following the above assessment no species listed under the *NSW Threatened Species Conservation Act 1995* have been considered to be at risk of impact by the proposal.

5.2. Endangered Populations

No Endangered Populations listed under the *NSW Threatened Species Conservation Act 1995* have been considered likely to be at risk of impact by the proposal.

5.3. Endangered Ecological Communities

Following the above assessment one Endangered Ecological Community *White Box Yellow Box Blakely's Red Gum Woodland* listed under the *NSW Threatened Species Conservation Act 1995* has been considered to be at risk of impact by the proposal.

An Assessment of significance for the Endangered Ecological community White Box Yellow Box Blakely's Red Gum Woodland has been included in Appendix 4 of this report.

6. Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance".

The Act identifies nine matters of national environmental significance being:

1) World Heritage properties
2) National heritage places
3) Wetlands of international importance (Ramsar wetlands)
4) Threatened species and ecological communities
5) Migratory species
6) Commonwealth marine areas
7) Nuclear actions (including uranium mining)
8) Great Barrier Reef Marine Park
9) Water impacts from coal seam gas and large coal mining actions

Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

6.1. Threatened Species & Ecological Communities:

EPBC listed threatened species and communities have been considered along with the NSW listed species and communities in the threatened species table provided in Appendix 3.

No threatened species or communities listed under the EPBC Act were recorded on site at the time of this assessment or considered likely to occur on the site.

The boxgum woodland that occurs on the site does not meet the criteria of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, listed under the EPBC Act as these areas do not have a *predominately native understory*.

Migratory Species:

In addition to threatened species and ecological communities, the *Environment Protection and Biodiversity Conservation Act 1999* allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat.

7. State Environmental Planning Policy No. 44 – Koala Habitat Protection

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP44) applies to the land.

SEPP 44 provides for koala habitat protection in NSW and aims to help conserve populations of this species. The policy defines potential Koala habitat as areas of native vegetation where the tree species listed in Schedule 2 of the policy constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

Schedule 2 tree species include:

- *Eucalyptus tereticornis* (Forest Red Gum)
- *Eucalyptus microcorys* (Tallowwood)
- *Eucalyptus punctata* (Grey Gum)
- *Eucalyptus viminalis* (Ribbon Gum)
- *Eucalyptus camaldulensis* (River Red Gum)
- *Eucalyptus haemastoma* (Broad-leaved Scribbly Gum)
- *Eucalyptus signata* (Scribbly Gum)
- *Eucalyptus albens* (White Box)
- *Eucalyptus populnea* (Bimble Box or Poplar Box)
- *Eucalyptus robusta* (Swamp Mahogany)

No potential habitat for the Koala exists on site or in close proximity. No further consideration under this SEPP is necessary.

8. NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Assessments of Significance have been prepared for species protected by this act in relation to the proposed development.

9. Assessment of the Ecological Impact

Considering the information provided above that has been summarised from material collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

9.1. Potential Impacts on flora:

The proposal will not involve the removal of any significant vegetation or significantly degrade the ecological value of the study area. The proposal will not have a significant impact on flora.

No flora species or ecological communities are considered likely to be significantly impacted by this proposal. *White Box Yellow Box Blakely's Red Gum Woodland* listed under the *NSW Threatened Species Conservation Act 1995* occurs on the study area however these areas are sufficiently far from direct impacts of the proposal that they are considered unlikely to be at risk of impact by the proposal.

9.2. Potential impacts on fauna and habitat:

No areas of important habitat will be removed as a result of this development; any impacts have been limited to the areas where it will cause the least impact to biodiversity. The proposal will not significantly alter habitat availability, fragment habitat or significantly disrupt fauna populations in the area.

The impact of the proposal on fauna and fauna populations and their habitat is considered likely to be insignificant.

10. Impact Mitigation Measures

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on flora and fauna associated with this development both in the short and long term.

10.1 A weed management plan must be prepared and implemented by a suitably qualified person that achieves the following;

a) Identifies invasive and noxious weed species that could become an environmental risk on these lands during the life of the quarry development and operation.
b) prescribes a weed management regime for these weeds including an implementation schedule.
c) provides a mechanism for the regular review and modification of the plan as necessary to ensure weed invasion does not become an environmental issue on the quarry land.

10.2 The quarry facilities area and access tracks will be landscaped using locally indigenous species that complement the biodiversity of the landscape.

These habitat conservation measures will help to ensure the proposal does not have a negative impact on biodiversity.

11. Conclusion

This flora and fauna assessment has considered the flora, fauna and habitats occurring on this site and on adjoining lands, the likelihood of threatened species and communities occurring on the site and being impacted by the proposal as well as the proposal construction, associated infrastructure and operation.

It concludes that the proposal will have no significant impact on any biodiversity values. No species of conservation significance were observed on the site. The potential of this proposal to impact on threatened species and communities has been addressed by way of Assessments of Significance and it has been found that no significant impact is likely.

Implementation of this report's impact mitigation measures provided in section 10 will assist in ensuring potential long term impacts to biodiversity are managed effectively. As no threatened species or communities are at risk of impact no biodiversity offsets are required.

12. References

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Appendix 1 – Flora recorded on this site

Family	Botanic Name	Common Name	'Ex'?	Comments
Asteraceae	*Arctotheca calendula*	Cape Weed	Ex	Common
Asteraceae	*Brachyscome rigidula*	Leafy Daisy		Scattered
Asteraceae	*Cassinia arcuata*	Sifton Bush		Common
Asteraceae	*Chrysocephalum apiculatum*	Yellow Buttons		Scattered
Asteraceae	*Cymbonotus lawsonianus*	Bear's Ear		Scattered
Asteraceae	*Hypochoeris radicata*	Flatweed	Ex	Common
Asteraceae	*Plantago lanceolata*	Ribwort Plantain	Ex	Common
Asteraceae	*Plantago varia*	Variable Plantain		Common
Asteraceae	*Onopordum acanthium*	Scotch Thistle	Ex	Common
Asteraceae	*Cassinia aculeata*	Dolly Bush		Common
Asphodelaceae	*Xanthorrhoea sp.*	Grass tree		Common in forest
Campanulaceae	*Wahlenbergia spp.*	Native Bluebell		Scattered
Casuarinaceae	*Allocasuarina littoralis*	Black She Oak		Scattered
Clusiaceae	*Hypericum perforatum*	St John's Wort	Ex	Scattered
Convolvulacea	*Convolvulus erubescens*	Australian Bindweed		Scattered
Dilleniaceae	*Hibbertia obtusifolia*	Grey Guinea Flower		Scattered
Epacridaceae	*Brachyloma daphnoides*	Daphne Heath		Scattered
Epacridaceae	*Melichrus urceolatus*	Urn Heath		Scattered
Ericaceae	*Astroloma humifusum*	Cranberry Heath		Scattered
Fabaceae	*Gompholobium sp.*	Pea		Scattered
Fabaceae	*Acacia terminalis*	Sunshine Wattle		Scattered
Fabaceae	*Acacia genistifolia*	Prickly Moses		Common
Gentianaceae	*Centaurium tenuiflorum*	Centaury	Ex	Scattered
Goodeniaceae	*Goodenia hederacea*	Ivy Goodenia		Scattered
Haloragaceae	*Gonocarpus tetragynus*	Common Raspwort		Common
Lomandraceae	*Lomandra filliformis*	Wattle Mat-rush		Common
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum		Common
Myrtaceae	*Eucalyptus melliodora*	Yellow Box		Scattered
Myrtaceae	*Eucalyptus amplifolia*	Cabbage Gum		Scattered
Myrtaceae	*Eucalyptus macrorhyncha*	Red Stringy Bark		Common
Myrtaceae	*Eucalyptus divies*	Board leaf peppermint		Isolated trees
Myrtaceae	*Leptospermum multicaule*	Dog Tangle		Scattered
Oxalidaceae	*Oxalis perennans*	Grassland Wood Sorrel	Ex	Common
Poaceae	*Aira sp.*	Hairgrass	Ex	Common
Poaceae	*Aristida ramosa*	Purple Wiregrass		Common
Poaceae	*Austrodanthonia spp.*	Wallaby Grasses		Common
Poaceae	*Austrostipa scabra*	Corkscrew Grass		Common
Poaceae	*Dichelachene sp.*	Plume Grass		Common
Poaceae	*Microlaena stipoides*	Weeping Grass		Common
Poaceae	*Holcus lanatus*	Yorkshire Fog	Ex	Common
Poaceae	*Nassella trichotoma*	Serrated tussock	Ex	Widespread
Poaceae	*Themeda australis*	Kangaroo Grass		Common
Poaceae	*Phalaris aquatica*	Phalaris	Ex	Widespread
Poaceae	*Hordeum leporinum*	Barley Grass	Ex	Common
Poaceae	*Poa sieberiana*	Poa Tussock		Common
Polygonaceae	*Rumex acetocella*	Sorrell	Ex	Common
Rosaceae	*Rubus fruticosus agg.*	Blackberry	Ex	Widespread
Stylidiaceae	*Stylidium graminifolium*	Grass Trigger Plant		Scattered

Appendix 2 – Fauna recorded on this site & likely to occur

**Introduced Species*

Avifauna	Common Name	Scientific Name	Comments
	Grey fantail	*Rhipidura albiscapa*	Seen and Heard
	Australian magpie	*Gymnorhina tibicen*	Seen
	Australian raven	*Corvus coronoides*	Heard
	Laughing kookaburra	*Dacelo novaeguineae*	Seen and heard
	Scarlet robin	*Petroica boodang*	Seen
	Buff rumped thornbill	*Acanthiza reguloides*	Seen and heard
	White-throated treecreeper	*Cormobates leucophaea*	Seen
	Grey thrikethrush	*Colluricincla harmonica*	Seen
	Crimson rosella	*Platycercus elegans*	Seen
	Pied currawong	*Strepera graculina*	Seen
	White-winged chough	*Corcorax melanorhamphos*	Seen and heard
	Glossy black cockatoo	*Calyptorhynchus lathami*	May use site on occasion
Mammals	Common Name	Scientific Name	Comments
	Red necked wallaby	*Macropus rufogriseus*	Seen
	Swamp wallaby	*Wallabia bicolor*	Seen
	Common wombat	*Vombatus ursinus*	Scats recorded
	Common brushtail possum	*Trichosurus vulpecula*	Likely to occur
	Common ringtail possum	*Pseudocheirus peregrinus*	Likely to occur
	Cat*	*Felis catus*	Likely to occur
	Fox*	*Vulpes vulpes*	Likely to occur
	Domestic dog*	*Canis familiaris*	Likely to occur
Reptiles	Common Name	Scientific Name	Comments
	Various common local snakes and lizards		Likely to occur
Amphibians	Common Name	Scientific Name	Comments
	Spotted grass frog	*Limnodynastes tasmaniensis*	Heard
	Common eastern froglet	*Crinnia signifera*	Heard in dams and depressions

Appendix 3 – Threatened Species Evaluations

Threatened Species Evaluations

The tables present the evaluations for threatened species, ecological communities and endangered populations found either

1. Within 10 km of the study site in the Atlas of NSW Wildlife (Bionet),
2. Identified as potentially occurring in the Bungonia sub region of the Hawkesbury-Nepean Catchment Management Authority by the NSW Office of Environment and Heritage Threatened Species Profile Search,
3. Identified as potentially occurring in the area by the Commonwealth EPBC Protected Matters Search Tool.

The assessment of potential for impact to the species or ecological community is based on the nature of the proposal, it's direct and indirect impacts and the ecology of the species. Where a potential impact to a threatened species, ecological community or endangered populations has been identified, an Assessment of Significance (AoS) has been completed. The AoS is in Appendix 4.

Abbreviations

E: listed as endangered under either Schedule 1 of the NSW Threatened Species Conservation Act 1995 (TSC Act) or under the Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act) (depending on the table column E is placed in).

V: listed as vulnerable under either Schedule 2 of the TSC Act or under the EPBC Act (depending on the table column V is placed in).

EEC: listed as an Endangered Ecological Community under Schedule 1 of the TSC Act.

CE: listed as Critically Endangered under the EPBC Act.

M: Marine or Migratory Species under the EPBC Act.

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Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Fauna						
Birds						
Anthochaera Phrygia Regent Honeyeater	The regent honeyeater inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Also utilises *E. microcarpa, E. punctata, E. polyanthemos, E. moluccana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E. mckieana, E. macrorhyncha, E. laevopinea*, and *Angophora floribunda*. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula and A. cambagei* are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet.	CE	CE	Present, feed trees and mistletoe present.	Possible	No - unlikely to be impacted. Potential impacts will not be to habitat present.
Botaurus poiciloptilus Australasian Bittern	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.		E	Absent	Unlikely	No
Calidris ferruginea Curlew Sandpiper	The curlew sandpiper generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.		CE, Migratory	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Callocephalon fimbriatum Gang-gang Cockatoo	In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Feed mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	V		Present, few hollow bearing trees present	Possible	No – Potential impacts will not be to habitat present.
Calyptorhynchus lathami Glossy Black-Cockatoo	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah (*Casuarina cristata*) is also utilised and may be a critical food source for some populations. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	V		Few (<5) feed trees and few hollow bearing trees present in study area.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Chthonicola sagittata Speckled Warbler	The Speckled Warbler lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.	V		Present	Possible, habitat present.	No - Potential impacts will not be to habitat present.
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	V		Present	Possible, habitat present.	No - Potential impacts will not be to habitat present.
Daphoenositta chrysoptera Varied Sittella	The varied sitella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	V		Present	Possible, habitat present.	No - Potential impacts will not be to habitat present.
Glossopsitta pusilla Little Lorikeet	Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable	V		Present	Possible, habitat present.	No - Potential impacts will not be to habitat

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). Riparian trees often chosen, including species like *Allocasuarina*.					present.
Grantiella picta Painted Honeyeater	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	V	V	Present, woodland habitat and mistletoe present	Possible	No - Potential impacts will not be to habitat present.
Hieraaetus morphnoides Little Eagle	Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	V		Present	Possible, habitat present.	No - Potential impacts will not be to habitat present.
Lathamus discolour Swift Parrot	On the Australian mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. Return to some foraging sites on a cyclic basis depending on food availability.	E	CE	Absent	Unlikely, favoured feed trees absent.	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.	V		Some present, though lack of structurally diverse habitat.	Possible	No - Potential impacts will not be to habitat present.
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Feeding territories are large making the species locally nomadic. The Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.	V		Present, though woodland patches in study area are small (~1 ha).	Possible	No - Potential impacts will not be to habitat present.
Myotis macropus Southern Myotis	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	V		Absent	Unlikely	No
Neophema pulchella Turquoise Parrot	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Nests in tree hollows, logs or posts, from August to December.	V		Present, eucalypt woodland and food source present.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Ninox connivens Barking Owl	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.	V		Present, large remnant woodland/forest nearby.	Possible	No - Potential impacts will not be to habitat present.
Ninox strenua Powerful Owl	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. In good habitats 400 ha can support a pair of Powerful Owls; where hollow trees and prey have been depleted the owls need up to 4000 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	V		Present, tree hollows present and large remnant woodland/forest nearby.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Numenius madagascariensis Eastern Curlew	In Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass.		CE, Migratory	Absent	Unlikely	No
Petroica phoenicea Flame Robin	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees.	V		Present, wide range of habitat present.	Possible	No - Potential impacts will not be to habitat present.
Polytelis swainsonii Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.		V	Present, nesting hollow trees and food source present.	Possible	No - Potential impacts will not be to habitat present.
Rostratula australis Australian Painted Snipe	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	E	E	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Stagonopleura guttata Diamond Firetail	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).	V		Present, eucalypt woodland and grassland habitat and food source present.	Possible	No - Potential impacts will not be to habitat present.
Tyto novaehollandiae Masked Owl	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	V		Some present, though breeding habitat absent.	Unlikely	No
Mammals						
Cercartetus nanus Eastern Pygmy-possum	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; soft fruits are eaten when flowers are unavailable. Also feeds on insects throughout the year; this feed source may be more important in habitats where flowers are less abundant such as wet forests. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts).	V		Present, food source and shelter sites present.	Possible	No - Potential impacts will not be to habitat present.
Chalinolobus dwyeri Large-eared Pied Bat	It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features.	V	V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	Found in well-timbered areas containing gullies. This species probably forages for small, flying insects below the forest canopy.					
Dasyurus maculatus Spotted-tailed Quoll	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	V	E	Present, though no caves, rock outcrops or densely vegetated creeklines.	Unlikely, this species requires a very large home range and while it may occur on the site from time to time this would be very rare.	No, no habitat affected.
Falsistrellus tasmaniensis Eastern False Pipistrelle	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	V		Absent, trees taller than 20 m absent.	Unlikely	No
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. Hunt in forested areas, catching moths and other flying insects above the tree top.	V		Absent, roosting habitat absent.	Unlikely	No
Petauroides volans Greater Glider	The Greater Glider occurs in eucalypt forests and woodlands. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha.		V	Present, habitat association and food source present.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Petaurus australis Yellow-bellied Glider	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. It inhabits a wide range of forest types but prefers resource rich forests where mature trees provide nesting hollows and tree species composition provides year-round continuity of food resources. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha.	V		Absent, study area is dry eucalypt forest and woodland.	Unlikely	No
Petaurus norfolcensis Squirrel Glider	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of *Acacia* gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	V		Present, mixed eucalyptus species and shrubs present.	Possible	No - Potential impacts will not be to habitat present.
Petrogale penicillata Brush-tailed Rock-wallaby	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. Highly territorial and have strong site fidelity with an average home range size of about 15 ha.	E	V	Absent, no rock escarpments in study area.	Unlikely	No
Phascolarctos cinereus Koala	Inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but	V	V	Present, some feed trees present.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.					
Pteropus poliocephalus Grey-headed Flying-fox	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. Feed on the nectar and pollen of native trees, in particular *Eucalyptus, Melaleuca* and *Banksia*, and fruits of rainforest trees and vines.	V	V	Absent, suitable habitat absent.	Unlikely	No
Scoteanax rueppellii Greater Broad-nosed Bat	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	V		Present, woodland habitat present.	Possible	No - Potential impacts will not be to habitat present.
Amphibians						
Heleioporus australiacus Giant Burrowing Frog	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individuals move into the breeding site either immediately before or following heavy rain and occupy these sites for up to 10 days. When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form. The Giant Burrowing Frog has a generalist diet; they eat mainly invertebrates including ants, beetles, cockroaches, spiders, centipedes and scorpions.	V	V	Present, breeding and non-breeding habitat present.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Litoria aurea Green and Golden Bell Frog	There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.		V	Present, dams containing rushes present.	Possible	No - Potential impacts will not be to habitat present.
Litoria booroolongensis Booroolong Frog	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge.	E	E	Absent, no permanent streams.	Unlikely	No
Litoria littlejohni Littlejohn's Tree Frog, Health Frog	The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.		V	Absent, no breeding habitat (permanent streams).	Unlikely	No
Mixophyes balbus Stuttering Frog	In recent surveys it has only been recorded at three locations south of Sydney. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Breed in streams during summer after heavy rain.	E	V	Absent, suitable habitat absent.	Unlikely	No
Reptiles						
Aprasia parapulchella Pink-tailed	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered,	V	V	Absent, areas with rocks	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Legless Lizard	partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.			contained exotic grass.		
Delma impar Striped Legless Lizard	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and poa tussocks *Poa* spp., and occasionally wallaby grasses *Austrodanthonia*spp. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.		V	Absent, dense tussock forming grasses absent.	Unlikely	No
Varanus rosenbergi Rosenberg's Goanna	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Generally slow moving; on the tablelands likely only to be seen on the hottest days.	V		Present, termite mounds present, though small area of habitat (<5 ha).	Unlikely	No
Fish						
Macquaria australasica Macquarie Perch	While extant populations are still found across the Murray-Darling Basin and in an east coast catchment, populations are often small and geographically separated. In New South Wales, extant populations are known to occur in the upper reaches of the Lachlan, Murrumbidgee and Murray catchments in the Murray-Darling Basin, and in the Hawkesbury/Nepean catchment on the east coast. Macquarie perch spawn at sites located at the downstream end of pools, with eggs then drifting downstream to lodge amongst gravel in riffles.	E	E	Absent, no permanent waterways in study area.	No	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Flora						
Acacia bynoeana Bynoe's Wattle	Bynoe's wattle is found in central eastern NSW, from the Hunter District south to the Southern Highlands and west to the Blue Mountains. The species is currently known from about 30 locations, with the size of the populations at most locations being very small (1-5 plants). Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	E	V	Absent	Not detected during field surveys – unlikely to occur	No
Acacia flocktoniae Flockton Wattle	The Flockton Wattle is found only in the Southern Blue Mountains (at Mt Victoria, Megalong Valley and Yerranderie). Grows in dry sclerophyll forest on sandstone.	V	V	Absent, sandstone bedrock absent.	Not detected during field surveys – unlikely to occur	No
Bossiaea oligosperma Few-seeded Bossiaea	The Few-seeded Bossiaea is known from two disjunct areas - the lower Blue Mountains in the Warragamba area and the Windellama area in Goulburn Mulwaree Shire, where it is locally abundant. Occurs on stony slopes or ridges on sandstone in the Yerranderie area. Occurs in low woodland on loamy soil in the Windellama area.	V	V	Present, low woodland on loamy soil present.	Not detected during field surveys – unlikely to occur	No - Potential impacts will not be to habitat present.
Caladenia tessellate Thick-lipped Spider-orchid	The Thick Lip Spider Orchid is known from the Sydney area, Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November.		V	Present, grassy sclerophyll woodland present.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Diuris aequalis Buttercup Doubletail	The Buttercup Doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Leaves die back each year and resprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.	E	V	Present, grassy woodland present.	Possible	No - Potential impacts will not be to habitat present.
Diuris tricolor Pine Donkey Orchid	The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (*Callitris* spp.). The species is usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and *Acacia* shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species. Usually flowers between early September to late October. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent. It is found in sandy soils, either on flats or small rises.	V		Present, grassy sclerophyll forest present.	Possible	No - Potential impacts will not be to habitat present.
Eucalyptus aggregata Black Gum	Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts. Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum (*Eucalyptus pauciflora*), Ribbon Gum (*E. viminalis*), Candlebark (*E. rubida*), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (*Poa labillardierei*) or Kangaroo Grass (*Themeda australis*), but with few shrubs.		V	Present, suitable topographic position and associated species.	Not detected during field surveys – unlikely to occur	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt	Paddys River Box is currently recorded from the Moss Vale District to Kanangra Boyd National Park. In the Southern Highlands it occurs often as isolated individuals in, or on the edges, of paddocks. Occurs on grassy woodland on relatively fertile soils on broad cold flats.	E	E	Present, grassy woodlands, fertile soils and broad flats present.	Not detected during field surveys – unlikely to occur	No
Lepidium hyssopifolium Basalt Pepper-cress	In NSW, there is a small population near Bathurst, one populations at Bungendore, and one near Crookwell. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. The species may be a disturbance opportunist. The cryptic and non-descript nature (appearing like several weed species) of the species makes it hard to detect.		E	Present, grassy woodland and grassland present.	Possible	No - Potential impacts will not be to habitat present.
Leucochrysum albicans var. tricolor Hoary Sunray	In NSW and ACT, Hoary Sunray occurs in grasslands, grassy areas in woodlands and dry open forests, and modified habitats, on a variety of soil types including clays, clay loams, stony and gravely soil. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. The Hoary Sunray is a low tufted to mounding perennial straw daisy. It grows to 15 cm tall and flowers in spring and summer. After flowering it dries out to rootstock.		E	Present, grassy woodland and grassland present.	Possible	No - Potential impacts will not be to habitat present.
Pelargonium sp. Striatellum (G.W. Carr 10345) Omeo Stork's Bill	Known from only 4 locations in NSW. It has a narrow habitat that is usually just above the high-water level of irregularly inundated or ephemeral lakes, in the transition zone between surrounding grasslands or pasture and the wetland or aquatic communities.		E	Absent, ephemeral lakes absent.	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Prasophyllum petilum Tarengo Leek Orchid	Natural populations are known from five sites in NSW (Boorowa, Captains Flat, Ilford, Delegate, Muswellbrook, and Hall in the ACT). Grows in open sites within Natural Temperate Grassland and in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. and within the grassy groundlayer dominated by Kangaroo Grass under Box-Gum Woodland. Apparently highly susceptible to grazing. Plants retreat into subterranean tubers after fruiting, so are not visible above-ground.		E	Present, grassy woodland and grassland present.	Possible	No - Potential impacts will not be to habitat present.
Prosyphyllum sp. Wybong (C.Phelps ORG 5269) = *P. petilum* A Leek-orchid	The Tarengo Leek Orchid occurs on relatively fertile soils in grassy woodland or natural grassland. The woodland sites originally contained grassy woodland, dominated by Snow Gum *(Eucalyptus pauciflora)*, Black Gum *(E. aggregata)*, Blakely's Red Gum *(E. blakelyi)* and Yellow Box *(E. melliodora)*.		CE	Present, grassy woodland and grassland present.	Possible	No - Potential impacts will not be to habitat present.
Solanum amourense Solanum amourense	Known from four locations, three of which occur within Blue Mountains National Park. Occurs in eucalypt woodland, in shallow soil on steep rocky hillsides.	E		Absent, steep rocky hillsides absent.	Unlikely	No
Swainsona sericea Silky Swainson-pea	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. Found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines *Callitris* spp.	V		Present, box-gum woodland present.	Possible	No - Potential impacts will not be to habitat present.
Thesium austral Austral Toadflax	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).		V	Present, grassy woodland and grassland present.		No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Ecological Communities						
Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory	The ecological community is characterised by a dominance of native perennial tussock grasses. There is usually a second, lower stratum of shorter perennial and annual grasses and forbs growing between the taller tussocks, and there may be a third discontinuous stratum of even smaller forbs, grasses and cryptogams. Sedges and rushes may also occur, particularly in seasonally wet areas. A tree and shrub stratum may be present, but with only up to 10% projective foliage cover of each being present. Variation in the composition and structure of the ecological community occurs as a result of intrinsic site factors (e.g. drainage patterns, soil characteristics) and agricultural practices applied since post-1788 settlement. The major dominant or co-dominant grass species are: *Themeda triandra* (kangaroo grass), *Poa sieberiana* (snowgrass), *Poa labillardierei* (river tussock grass), *Austrostipa bigeniculata* (kneed speargrass), *Austrostipa scabra* (slender speargrass), *Bothriochloa macra* (red grass), various *Rytidosperma* species syn. *Austrodanthonia* species (wallaby grasses), *Lachnagrostis filiformis* (blowngrass) and *Sorghum leiocladum* (wild sorghum).		CE	Absent	No	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Commonwealth) *White Box* *Yellow Box* *Blakely's Red*	Box – Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated. Associated and occasionally co-dominant trees include, but are not restricted to: Grey Box (*Eucalyptus microcarpa*), Fuzzy Box (*E. conica*), Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Red Stringybark (*E. macrorhyncha*), White Cypress Pine (*Callitris glaucophylla*), Black Cypress Pine (*C. enderlicheri*), Long-leaved Box (*E. gonicalyx*), New England Stringybark (*E. calignosa*), Brittle Gum (*E. mannifera*), Candlebark (*E.	EEC	CE	Present	Present	Yes – Assessment of Significance undertaken. See Appendix 4.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Gum Woodland (NSW)	*rubida*), Argyle Apple (*E. cinerea*), Kurrajong (*Brachychiton populneus*) and Drooping She-oak (*Allocasuarina verticillata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*), Poa Tussock (*Poa sieberiana*), wallaby grasses (*Austrodanthonia* spp.), spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and blue-bells (*Wahlenbergia* spp.). This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils where resources such as water and nutrients are abundant.					
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Characterised by the presence or prior occurrence of Snow Gum, Candlebark, Ribbon Gum and/or Black Sallee trees. The trees may occur as pure stands, mixtures of the four species or in mixtures with other trees, including wattles. Commonly co-occurring eucalypts include Apple Box (*Eucalyptus bridgesiana*), Swamp Gum (*E. ovata*), Black Gum (*E. aggregata*), Mountain Gum (*E. dalrympleana*), Broad-leaved Peppermint (*E. dives*) and Narrow-leaved Peppermint (*E. radiata*) and commonly occurring tree-layer or mid-layer wattles include Blackwood (*Acacia melanoxylon*) and Silver Wattle (*A. dealbata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; commonly encountered include Kangaroo Grass (*Themeda australis*), Common Snow-grass (*Poa sieberiana*), River Tussock (*Poa labillardierei*), Short Snow-grass (*Poa meionectes*), various wallaby-grasses (*Rytidosperma* spp.), various spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scaly-buttons (*Leptorhynchos squamatus*), Common Woodruff (*Asperula conferta*), Wattle Mat-rush (*Lomandra filiformis*), St John's Wort (*Hypericum*	EEC		Absent	No	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	gramineum), Stinking Pennywort (*Hydrocotyle laxiflora*) and Slender Tick-trefoil (*Desmodium varians*). Shrubs are generally sparse or absent, though they may be locally common. Sub-shrubs (woody species <0.5 m tall) may be common. The most common shrubs and sub-shrubs include Gruggly-bush (*Melicytus* sp. 'Snowfields'), Urn Heath (*Melichrus urceolatus*), Sweet Bursaria (*Bursaria spinosa*) and Mountain Mirbelia (*Mirbelia oxylobioides*).					
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	Tableland Basalt Forest is dominated by an open eucalypt canopy of variable composition. *Eucalyptus viminalis, E. radiata, E. dalrympleana* subsp. *dalrympleana* and *E. pauciflora* may occur in the community in pure stands or in varying combinations. The community typically has an open canopy of eucalypts with sparse mid-story shrubs (e.g. *Acacia melanoxylon* and *A. dealbata*) and understory shrubs (e.g. *Rubus parvifolius*) and a dense groundcover of herbs and grasses, although disturbed stands may lack either or both of the woody strata. The structure of the community varies depending on past and current disturbances, particularly fire history, clearing and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. At some sites, mature trees may exceed 30 m tall, although regrowth stands may be shorter than 10 m tall. Tableland Basalt Forest typically occurs on loam or clay soils associated with basalt or, less commonly, alluvium, fine-grained sedimentary rocks, granites and similar substrates that produce relatively fertile soils. Its distribution spans altitudes from approximately 600 m to 900 m above sea level, usually on undulating or hilly terrain. Mean annual rainfall varies from approximately 750 mm up to 1100 mm.	EEC		Absent	No	No
Migratory Species						
Hirundapus caudacutus	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground.		M	Absent	Unlikely, aerial	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
White-throated Needletail	Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.				species, rarely lands in Australia.	
Monarcha melanopsis Black-faced Monarch	In NSW and the ACT, the species occurs around the eastern slopes and tablelands of the Great Dividing Range. The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/ shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest.		M	Absent, suitable ecosystems absent.	Unlikely	No
Motacilla flava Yellow Wagtail	This insectivorous bird inhabits open country near water, such as wet grassland. Has been recorded in short grass, bare ground, swamp margins, sewage ponds, saltmarshes, ploughed land, town lawns. It picks small invertebrates from the ground or water surface, but may also make short flights to take prey from the air or follow grazing livestock to take insects stirred up as they feed.		M	Absent, large water bodies absent.	Unlikely	No
Myiagra cyanoleuca Satin Flycatcher	Satin Flycatchers are mainly recorded in eucalypt forests, especially wet tall sclerophyll forest, often dominated by eucalypts such as Brown Barrel, *Eucalypt fastigata*, Mountain Gum, *E. dalrympleana*, Mountain Grey Gum, Narrow-leaved Peppermint, Ribbon Gum, or occasionally Mountain Ash, *E. regnans*. Such forests usually have a tall shrubby understorey of tall acacia. In higher altitude Black Sallee, *E. stellulata*, woodlands, they are often associated with tea-trees and tree-ferns. They sometimes also occur in dry sclerophyll forests and woodlands, usually dominated by eucalypts such as Blakely's Red Gum, *E. blakelyi*, Mugga Ironbark, *E. sideroxylon*, Yellow Box, White Box, *E. albens*, Manna Gum or		M	Present, dry sclerophyll forests and woodlands containing preferred species occur.	Possible	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	stringybarks, including Red Stringybark, *E.macrorhyncha* and Broad-leaved Stringybark, usually with open grassy understorey					
Rhipidura rufifrons Rufous Fantail	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (*Eucalyptus microcorys*), Mountain Grey Gum (*E. cypellocarpa*), Narrow-leaved Peppermint (*E. radiata*), Mountain Ash (*E. regnans*), Alpine Ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red Mahogany (*E. resinifera*); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; where they are recorded in temperate Lilly Pilly (*Acmena smithi*) rainforest, with Grey Myrtle (*Backhousia myrtifolia*), Sassafras (*Doryphora sassafras*) and Sweet Pittosporum (*Pittosporum undulatum*) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. Sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (*Eucalyptus maculata*), Yellow Box (*E. melliodora*), ironbarks or stringybarks, often with a shrubby or heath understorey.		M	Absent	Unlikely	No
Actitis hypoleucos Common Sandpiper	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands.		M	Absent	Unlikely	No
Calidris acuminata Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry.		M	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Calidris melanotos Pectoral Sandpiper	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire.		M	Absent	Unlikely	No
Gallinago hardwickii Latham's Snipe	Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. They may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herbfields and open forest.		M	Absent	Unlikely	No
Pandion haliaetus Osprey	Eastern Ospreys occur in coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites.		M	Absent	Unlikely	No

Appendix 4 – Assessment of Significance

White Box, Yellow Box, Blakely's Red Gum Woodland

Assessment of Significance

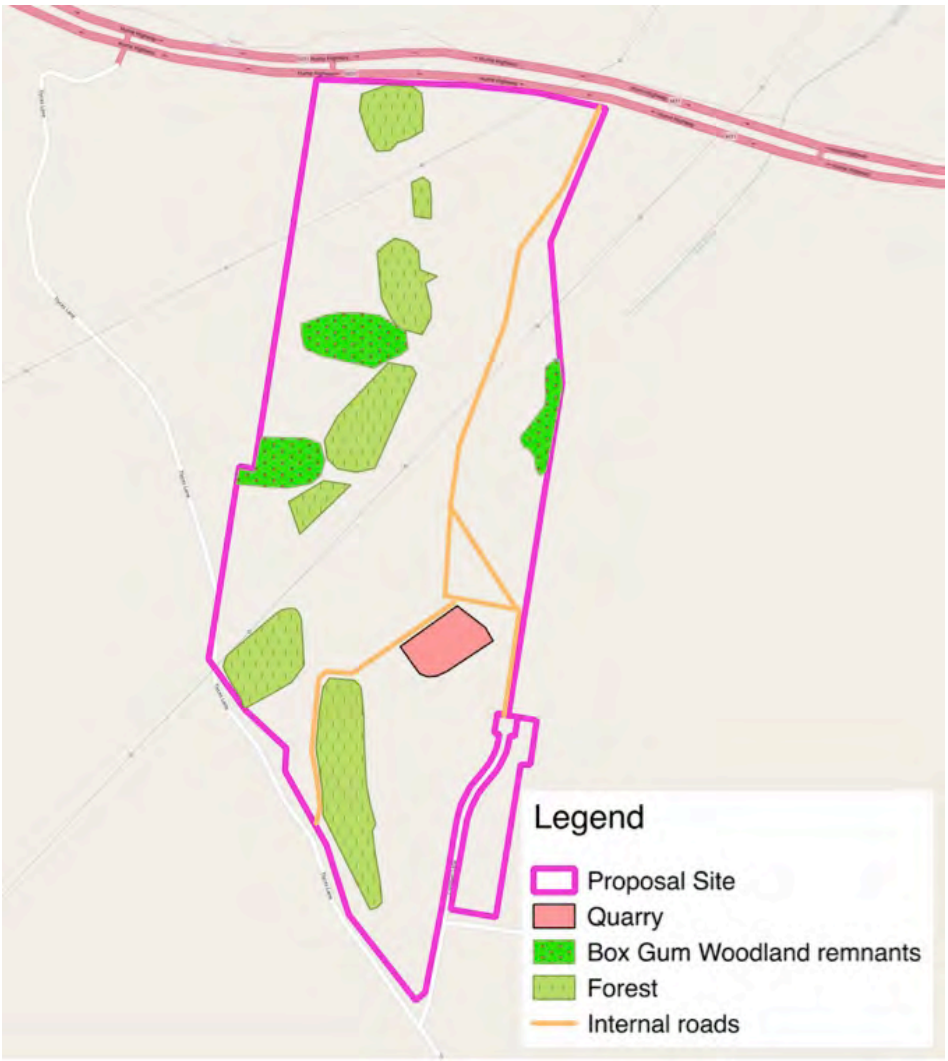
White Box, Yellow Box, Blakely's Red Gum Woodland

Section 5A of the Environmental Planning and Assessment Act 1979 (EP&A Act) specifies the following seven factors to be taken into consideration in deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats listed under the Threatened Species Conservation Act 1995.

Following onsite investigations and considering habitats present, scale of the proposal and threatened species and communities recorded in the area the only threatened entity considered at risk of impact by this project is White Box, Yellow Box, Blakely's Red Gum Woodland.

White Box Yellow Box Blakely's Red Gum Woodland (commonly referred to as Box-Gum Woodland) is an open woodland community (sometimes occurring as a forest formation), in which the tree species are or were dominated by one or more of the following: White Box (*Eucalyptus albens*), Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*).

The area of White Box Yellow Box Blakely's Red Gum Woodland occurring on the site is shown on the map below, no Boxgum woodland is impacted by any of the proposal.



Assessment of Significance;

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable, White Box Yellow Box Blakely's Red Gum Woodland is not a threatened species.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable, White Box Yellow Box Blakely's Red Gum Woodland is not an endangered population.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The proposal will not reduce the extent of this community. This will not place the local occurrence of White Box Yellow Box Blakely's Red Gum Woodland at risk of extinction.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The proposal will not modify the composition of the local occurrence of White Box Yellow Box Blakely's Red Gum Woodland.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The proposal will remove no habitat available locally for this community.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action.

No habitat will become fragmented or isolated from other areas of habitat as part of this proposal. Internal access roads are proposed however they do not contribute any further to fragmentation than is currently the case on the site.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

No habitat for White Box Yellow Box Blakely's Red Gum Woodland will be removed.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat, either directly or indirectly.

No critical habitat will be impacted by this proposal.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

A national recovery plan has been prepared for this community; *Department of*

Environment, Climate Change and Water NSW. 2010. National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Department of Environment, Climate Change and Water NSW, Sydney.

The objectives of this plan are as follows;

- achieving no net loss in extent and condition of the ecological community throughout its geographic distribution;
- increasing protection of sites with high recovery potential;
- increasing landscape functionality of the ecological community through management and restoration of degraded sites;
- increasing transitional areas around remnants and linkages between remnants; and
- bringing about enduring changes in participating land manager attitudes and behaviours towards environmental protection and sustainable land management practices to increase extent, integrity and function of Box-Gum Grassy Woodland.

The proposal is not inconsistent with the objectives of this plan

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The action proposed involves no key threatening processes;

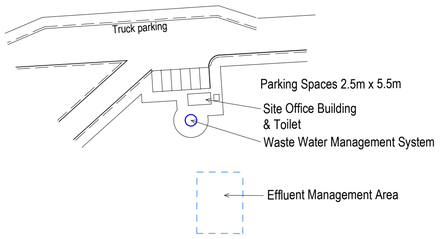
Conclusion:

A significant impact on the White Box Yellow Box Blakely's Red Gum Woodland is not considered likely for the following reasons;

- The proposal will have no direct impact on White Box Yellow Box Blakely's Red Gum Woodland.
- The direct impacts of the proposal are not close enough to White Box Yellow Box Blakely's Red Gum Woodland remnants to have any more than a negligible indirect impact
- The vast majority of White Box Yellow Box Blakely's Red Gum Woodland occurring in the study area is currently and will remain ecologically viable and requires no modification or rehabilitation.

Appendix 5 – Proposal Plans

INSET - SITE FACILITIES



SCALE - 1:800

EGRESS ONLY ROAD 4m WIDE
It is intended that the Impact Area edge along the fenced vegetation area be located along the fenceline. this will ensure a 3m separation from the existing fenced native vegetation area

Crest in Tiyces Lane by survey. Egress Point.

Tiyces Lane access splay and gate to Council standards

Site distance 220m svy

Site distance 285m svy

Reafforestation 2.74 Ha

Reafforestation 1.76 Ha

Reafforestation 0.54 Ha

Fenced area

Reafforestation 3.76 Ha

Existing shed

WQ Pond 3 SEEC Report

WQ Pond 1 SEEC Report

WQ Pond 2 SEEC Report

BORE 1

BORE 2

Provision for portable weighbridge facility

Quarry Security Fencing and gates

QUARRY

Berm (grassed)

INGRESS ROAD 7m WIDE

INGRESS ROAD

Easement 19m wide

See Inset

Easement for transmission line

This area contains approximately 3.1 Ha which can be utilised for irrigation as specified in the SEEC report requiring a minimum area of 2 Ha. However it would be initially intended to apply the 2Ha irrigation water to the areas for revegetation to assist establishment and growth.

TIYCES LANE

LANE

TIYCES

CURLEWIN LANE

HUME HIGHWAY

HIGHWAY

DP 621540

DP 1094055

Fencing splay grate and gate to RMS requirements

ROADSIDE LANDSCAPING NOTES

Existing trees are to be retained.

Roadside landscape tree species are proposed to include -
Callistemon viminalis "Captain Cook" (up to 2m high)
Callistemon viminalis "Dawson River" (up to 6m high)
Melaleuca linariifolia "Snow in summer" (up to 6m high)

These trees are used in the area forf screening plants in the median strips on the motorway.These species need little watering once established and are heat and frost hardy. They are also very valuable as food soures for many local vatieties of native birds.

Trees will be tubestock planted and maintained to establishment. Watering will be by water cart using on site dam water. Trees will be planted at a maximum spacing of 5 metres and any dead plants will be replaced.

Vegetation Guidelines for Power Lines do not permit tree planting within a transmission corridor.

EASEMENT

The easement 13m and 19m wide and variable provides for the access road through Lot 2 DP 1094055. The standard width is 13m with widening to 19m to include roadside landscaping.

IMPACT AREAS

Allowing for a 3m impact area (1.16Ha) around all works Quarry, Access Roads, Berms, Office, Parking Area and Septic 40988 sqm
Waste Water Mgmt EMA 200 sqm
Dam 4900sqm
TOTAL 46088 sqm

INGRESS & EGRESS ROADS

The new internal ingress road from the Hume Highway is shown at a full 7m width (6m gravel surface with 0.5m verges) however the final design may be achieved at 4m width with 20m long 6m wide passing bays every 200m.

The egress road to Tiyces Lane is shown at 4m width (3m gravel surface with 0.5m verges).

KEY

- Quarry resource extent
- Proposed revegation areas (8.8 Hectares)
- Existing vegetation
- Existing dams
- Proposed Landscape Tree Lines
- Area of potential impact during construction. This strip (3m wide) would be restored immediately following construction.

Excluding the 3m buffer area of 1.16Ha (which would be rehabilitated) the completed development impact area covers 34,488 sqm.

Issue	Amendment	Date
B	Inset, Fencing and minor changes	4/5/2017
A	Original	14/4/2017

Surveyed : Southern Cross Consultilng Surveyors
Designed : Laterals & NC Engineering Pty Ltd
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 1707

SCALE 1:4000

Sheet No.	No. of Sheets	Sheet size
1	1	A1

LATERALS PLANNING ENGINEERING & MANAGEMENT
1st Floor, 35 Montague Street
Goulburn NSW 2580
Ph: 4821 0973 Fax: 4821 0954

Sheet Subject
SITE DEVELOPMENT & LANDSCAPE PLAN

GOULBURN MULWAREE COUNCIL
PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
63 CURLEWIN LANE BOXERS CREEK
17033 HUME HIGHWAY, BOXERS CREEK

Appendix 6 – Section 88b instrument applying to the land

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTION AS TO USER INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919

(Sheet 1 of 4 Sheets)

DP1094055

Plan of subdivision of Lot 7, 42 & 86 D.P. 750038, Lot 2 D.P. 247198, Lot 1 & 2 D.P. 1043931 in Goulburn Mulwaree Council DA No. 2003/0518/DA covered by Subdivision Certificate no.

Full name and address of Registered Proprietor of the land

Anne Jannett Lawson &
Robert Austin Lawson
49 Wilson St
NEWTON NSW 2042

PART 1

1. Identity of Easement Firstly referred to in the abovementioned plan: Right of Carriageway 20 wide

Schedule of lots etc. affected

Lot(s) Burdened:	Lot(s), name of road, or Authority Benefited:
1	2

2. Identity of Easement Secondly referred to in the abovementioned plan: Easement for Overhead Power Lines 20 Wide

Schedule of lots etc. affected

Lot(s) Burdened:	Lot(s), name of road, or Authority Benefited:
1, 3 & 4	Country Energy ABN 37 428 185 226

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTION AS TO USER INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919

(Sheet 2 of 4 Sheets)

PLAN:

DP1094055

Plan of subdivision of Lot 7, 42 & 86 D.P. 750038, Lot 2 D.P. 247198, Lot 1 & 2 D.P. 1043931 in Goulburn Mulwaree Council DA No. 2003/0518/DA covered by Subdivision Certificate no.

3 Identity of Easement Thirdly referred to in the abovementioned plan: Easement for Overhead Power Lines 38.6 Wide & Variable Width

Schedule of lots etc. affected

Lot(s) Burdened:	Lot(s), name of road, or Authority Benefited:
2 & 3	Country Energy ABN 37 428 185 226

4. Identity of Restriction Fourthly referred to in the abovementioned plan: Restriction As To User

Schedule of lots etc. affected

Lot(s) Burdened:	Lot(s), name of road, or Authority Benefited
2	Goulburn Mulwaree Council

5. Identity of Restriction Fifthly referred to in the abovementioned plan: Restriction As To User

Schedule of lots etc. affected

Lot(s) Burdened:	Lot(s), name of road, or Authority Benefited:
All lots.	Goulburn Mulwaree Council

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTION AS TO USER INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919

(Sheet 3 of 4 Sheets)

PLAN:

Plan of subdivision of Lot 7, 42 & 86 D.P. 750038, Lot 2 D.P. 247198, Lot 1 & 2 D.P. 1043931 in Goulburn Mulwaree Council DA No. 2003/0518/DA covered by Subdivision Certificate no.

DP1094055

PART 2

1. Identity of easement firstly referred to in abovementioned plan.	Refer to Part A of Memorandum AA 26009 currently registered at LPI
2. Identity of easement second referred to in abovementioned plan.	Refer to Part A of Memorandum AA 26009 currently registered at LPI
3. Identity of Restriction as to User fourthly referred to in abovementioned plan	Restriction as to User, namely, that access to and from the lot burdened by and for all mechanized and horse drawn vehicles including motor cars, trucks and tractors is prohibited to and from the Hume Highway
4. Identity of easement fifthly referred to in abovementioned plan.	Restriction as to user, namely

(i) stock-proof fencing must be constructed and maintained to enclose areas of remnant vegetation as identified on the plan held at Goulburn Mulwarree Council quoting file D A. no. 2003/0518/DA condition no.28 Pt. B (ii) in order to exclude cattle, sheep, horses and other livestock. The fence should be erected no closer than 3m to any existing tree;

(ii) within the identified areas referred to in (i) above, the cutting of living or dead trees for firewood, the removal of fallen timber, inappropriate hazard reduction burning, the grazing of livestock, the construction of roads or any activities that will result in the clearance or disturbance of native vegetation and habitat are prohibited; and

INSTRUMENT SETTING OUT TERMS OF EASEMENTS AND RESTRICTION AS TO USER INTENDED TO BE CREATED PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919

(Sheet 4 of 4 Sheets)

DP1094055

Plan of subdivision of Lot 7, 42 & 86 D.P. 750038, Lot 2 D.P. 247198, Lot 1 & 2 D.P. 1043931 in Goulburn Mulwaree Council DA No. 2003/0518/DA covered by Subdivision Certificate no.

(iii) for the purpose of providing fauna habitat, mature, senescent or dead hollow-bearing Eucalypts may be not be removed from within the said identified areas.

Name of Authority empowered to release vary or modify the easements fourthly and fifthly referred to in the abovementinned plan:

Goulburn Mulwaree Council

SIGNED by ANNE JANNETT LAWSON in the presence of:

.....
ROBERT S MINTER

SIGNED by ROBERT AUSTIN LAWSON in the presence of:

.....
ROBERT S MINTER
12749 MARKET ST
WORDEN NSW 2650

.....
FOR ROBERT AUSTIN LAWSON BY HER ATTORNEY ANNE JANNETT LAWSON UNDER POWER OF ATTORNEY REGISTERED BOOK 4372 NO. 254

Approved by the Council of the Goulburn Mulwaree

.....
~~General Manager/Authorised Person~~
Authorised Person

Date: 30 Nov 2005

I certify that the attorney for the Bank..... to whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: ANDREW BUDD

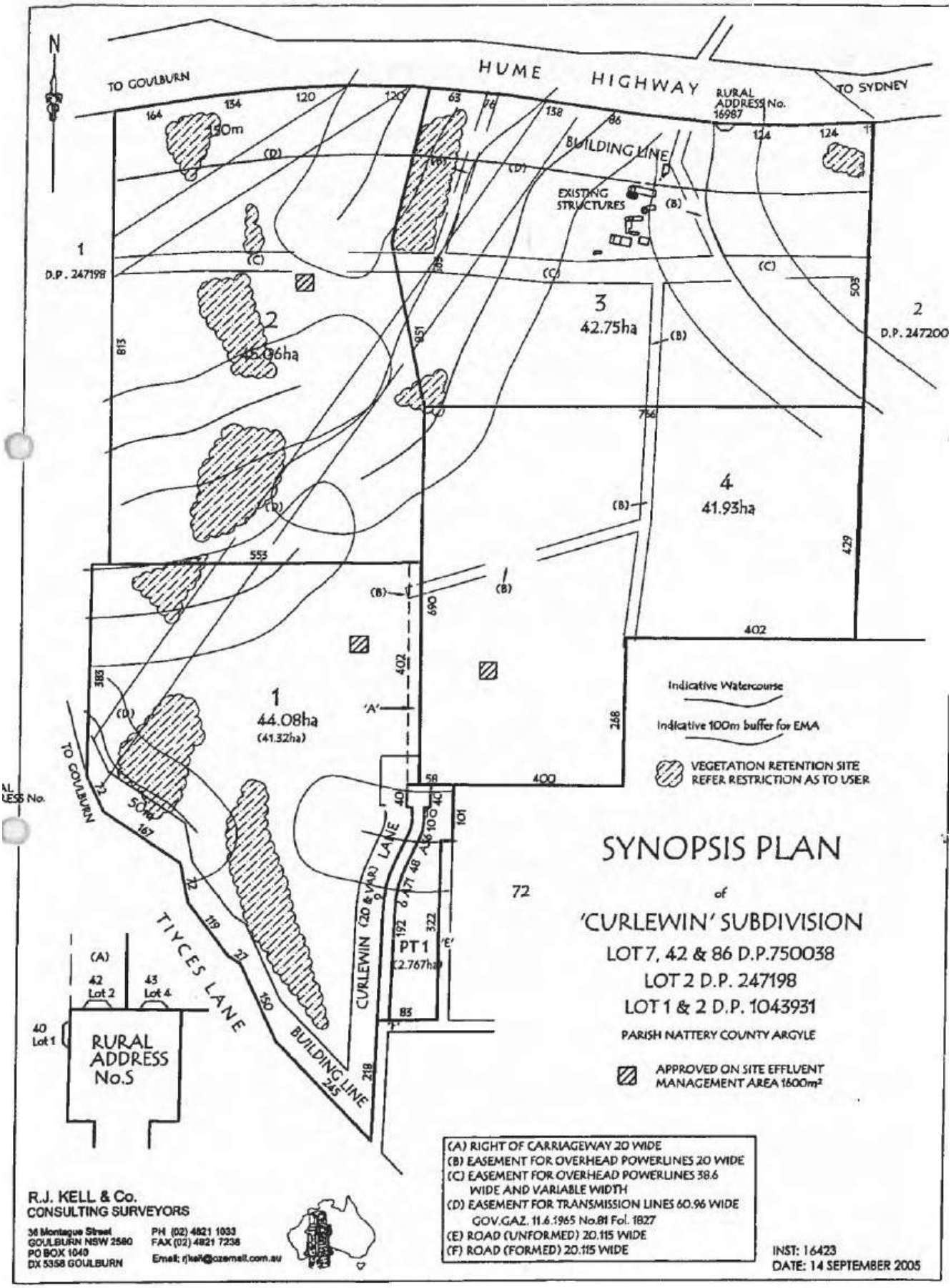
Address of witness: 1 King Street
Concord West NSW

Certified correct for the purposes of the Real Property Act 1900 by the .....
SIGNED by BRIAN HOLT..... as attorney for Westpac Banking Corporation under power of attorney Book No. 332

.....
(Signature) Tier Three Attorney

By executing this instrument the attorney states that the attorney has received no notice of the revocation of the power of attorney.

REGISTERED 21.3.2006


N
TO GOULBURN
HUME HIGHWAY
TO SYDNEY
RURAL ADDRESS No. 16987
BUILDING LINE
EXISTING STRUCTURES
1
D.P. 247198
2
45.06ha
3
42.75ha
2
D.P. 247200
4
41.93ha
1
44.08ha
(41.32ha)
Indicative Watercourse
Indicative 100m buffer for EMA
VEGETATION RETENTION SITE
REFER RESTRICTION AS TO USER
SYNOPSIS PLAN
of
'CURLEWIN' SUBDIVISION
LOT 7, 42 & 86 D.P.750038
LOT 2 D.P. 247198
LOT 1 & 2 D.P. 1043931
PARISH NATTERY COUNTY ARGYLE
APPROVED ON SITE EFFLUENT MANAGEMENT AREA 1600m²
TYCES LANE
CURLEWIN (20 & VAR) LANE
PT 1
(2.767ha)
RURAL ADDRESS No.S
72
(A) RIGHT OF CARRIAGEWAY 20 WIDE
(B) EASEMENT FOR OVERHEAD POWERLINES 20 WIDE
(C) EASEMENT FOR OVERHEAD POWERLINES 38.6 WIDE AND VARIABLE WIDTH
(D) EASEMENT FOR TRANSMISSION LINES 60.96 WIDE GOV.GAZ. 11.6.1965 No.81 Fol. 1827
(E) ROAD (UNFORMED) 20.115 WIDE
(F) ROAD (FORMED) 20.115 WIDE
INST: 16423
DATE: 14 SEPTEMBER 2005
R.J. KELL & Co.
CONSULTING SURVEYORS
36 Montague Street
GOULBURN NSW 2580
PO BOX 1040
DX 5358 GOULBURN
PH (02) 4821 1033
FAX (02) 4821 7238
Email: rjkell@ozemail.com.au

Appendix 7 – Glossary of terms

Biodiversity:	The biological diversity of life is commonly regarded as being made up of the following three components: Genetic Diversity – the variety of genes in any population; Species Diversity – the variety of species; and Ecosystem Diversity – the variety of communities or ecosystems.
Critical habitat:	Habitat declared to be critical habitat under Part 3 of the TSC Act 1995. For the purposes of the TSC Act and other Acts amended by the TSC Act, critical habitat is the whole or any part or parts of an area of land comprising the habitat of an endangered species, an endangered population or an endangered ecological community that is critical to the survival of the species, population or ecological community.
Ecological community:	An assemblage of species occupying a particular area.
Endangered ecological community:	An ecological community specified in Part 3 of Schedule 1 of the TSC Act 1995.
Endangered population:	A population specified in Part 2 of Schedule 1 of the TSC Act 1995.
Endangered species:	A species specified in Part 1 of Schedule 1 of the TSC Act 1995.
Environmental Weed:	Any plant that is not native to the local area that has invaded the native vegetation.
Habitat:	An area or areas occupied, or periodically or occasionally occupied by a species, population or ecological community and includes any biotic or abiotic components.
Hollow-bearing tree:	A tree where the base, trunk or limbs contain hollows, holes and cavities that have formed as a result of decay, injury or other damage.
Isolated trees:	Individual of scattered small clumps (1-5) of trees that occur in a highly modified landscape, where there are no

	understorey plants and the groundcover typically comprises non-native species.
Key threatening process:	A threatening process specified in Schedule 3 of the TSC Act 1995.
Life cycle:	The sequence of events from the origin as a zygote, to the death of an individual.
Likely:	Taken to be a real chance or possibility.
Local population:	The population that occurs within the study area, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary can be demonstrated.
Native vegetation:	Any of the following types of indigenous vegetation: trees, understorey plants, groundcover and plants occurring in a wetland.
Population:	A group of organisms, all of the same species, occupying a particular area.
Protected species:	Those species defines as protected under the NPW Act. It includes all native animals, and all native plants listed on Schedule 13 of the NPW Act.
Recovery plan:	A plan prepared and approved under Part 4 of the TSC Act 1995.
Region:	For the purposes of the provision in which it is used, a bioregion defined in a national system of bioregionalisation that is determined to be appropriate for those purposes. If the bioregion occurs partly within and partly outside NSW, the region consists only of such much of the bioregion of occurs within NSW.
Risk of extinction:	A species is at risk of extinction if its numbers are reduced to such a critical level, or its habitats have been so drastically reduced, that it is in danger of becoming extinct.

Rocky outcrop:	An area where rocks or exposed boulders cover more than 70% of any 0.1 ha area; and/or areas with skeletal soils, supporting heath or scrub.
Significant:	Important, weighty or more than ordinary.
Species impact statement:	A statement referred to in Division 2 of Part 5 of the TSC Act 1995 and includes an environmental impact statement, prepared under the EP&A Act 1999; that contains a Species Impact Statement.
Study area:	The subject site and any additional areas which are likely to be affected by the proposal, either directly of indirectly.
Study site:	The area to be directly affected by the proposal.
Threat abatement plan:	Plan prepared and approved under Part 5 of the TSC Act 1995.
Threatened species:	A species specified in Schedule 1 Part 1 (endangered species), Part 4 (presumed extinct) and Schedule 2 (vulnerable species) of the TSC Act 1995.
Threatened species, populations or ecological communities	A species, population or ecological community identified in either Schedule 1 or Schedule 2 of the TSC Act 1995.
Threatening Process:	A process that threatens, or may have the capability to threaten, the survival or evolutionary development of the species, population or ecological community.
Viable Local Population:	A population that has the capacity to live, develop and reproduce under normal conditions, unless the contrary can be conclusively demonstrated through analysis of records and references.
Vulnerable	

species: A species specified in Schedule 2 of the TSC Act 1995.

G. Traffic Report prepared by Laterals Engineering and Management May 2017.

Laterals

Planning
Engineering & Management
Environmental

TRAFFIC IMPACT STATEMENT

PROPOSED EXTRACTIVE INDUSTRY

JASMINCO RESOURCES PTY LTD

LOTS 1 and 2 DP 1094055 (63 CURLEWIN LANE, BOXERS CREEK)

May 2017 **Laterals Reference: 1707**

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21 Station Street Johns River NSW 2443
Phone: 02 6556 5194 Mobile: 0427 210 973 Email: keith@laterals.com.au
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EXECUTIVE SUMMARY

- This report has been prepared to support a development application by Jasminco Resources Pty Ltd for the development of an extractive industry at 63 Curlewin Lane, Boxers Creek.

- The proposed extractive industry will have an upper production limit of 30,000m^3 per annum and an expected life of 5.9 years.

- Traffic generation is calculated to be an average of 14 truck movements and 8 light vehicle movements per day.

- Access to the site will be via a left hand deceleration lane from the Hume Highway and egress from the site will be via Tiyces Lane and a left hand acceleration lane onto the Hume Highway.

- The access, loading / unloading area and parking and turning areas on the site have been designed to accommodate the proposed traffic.

- The existing road network has ample capacity to cater for the additional traffic generated by the development.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Background

Laterals Engineering and Management has been retained by Jasminco Resources Pty Ltd to undertake a traffic assessment to support a development application for a proposed extractive industry at Tiyces Lane, Towrang.

The proposed extractive industry will have an upper production limit of 30,000m^3 per annum and an expected life of 5.9 years.

The development is located at 63 Curlewin Lane, Boxers Creek (Lots 1 and 2 DP 1094055) approx. 12km east of Goulburn on vacant rural land having an area of approx. 80 ha which was previously used for agricultural purposes.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, preliminary discussions held with the Goulburn Mulwaree Council.

Advice has also been received from the Roads and Maritime Services and a copy of advice received is attached at Appendix 1.

This report examines the internal and external traffic implications of the proposed development in the following sections;

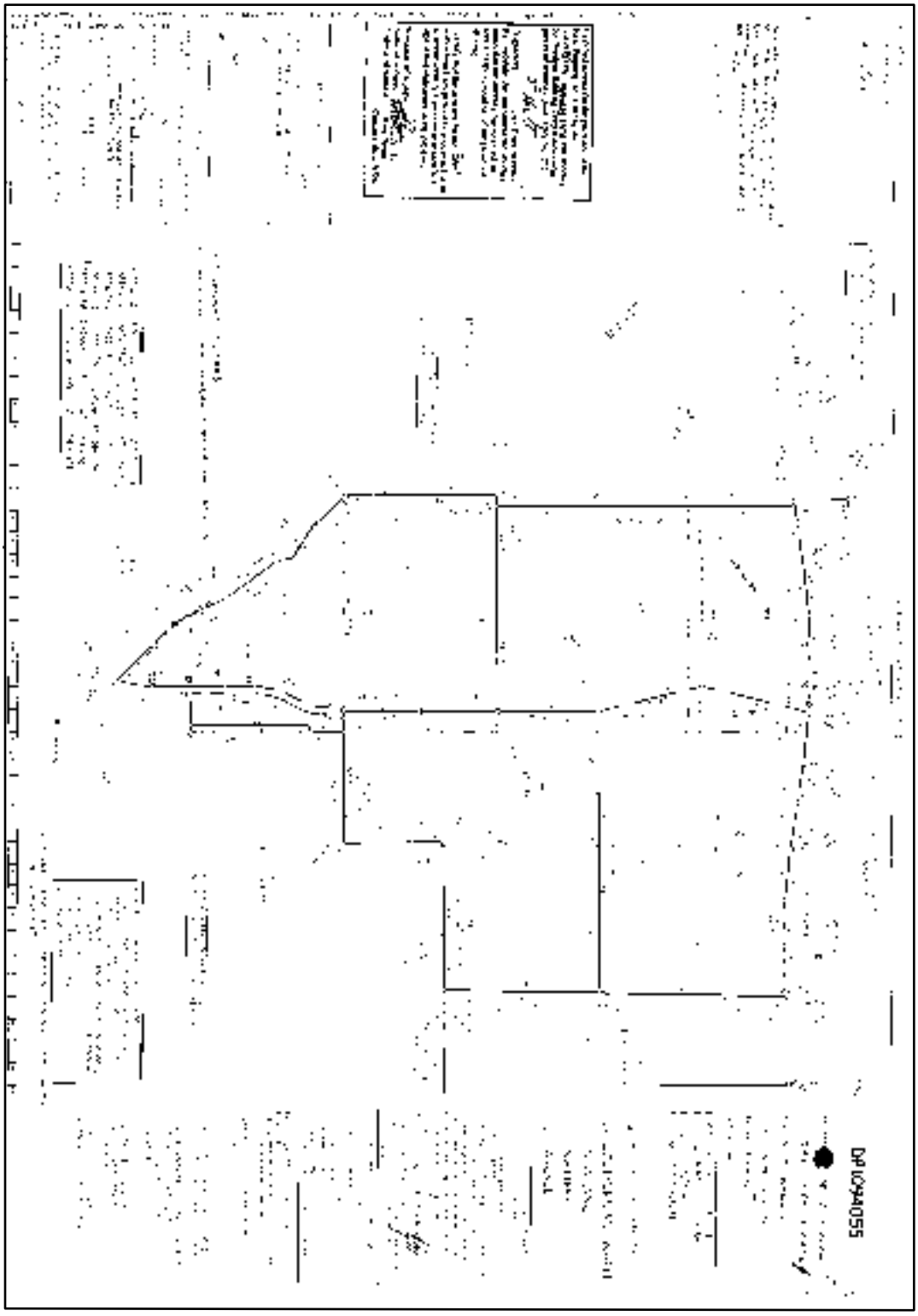
- Section 2 – Existing conditions.
- Section 3 - The proposed development and implications.
- Section 4 - Recommended works.
- Section 5 - Conclusion.

The key objective of this report is to provide Council and the Roads and Maritime Services with relevant information concerning traffic aspects of the proposed development.

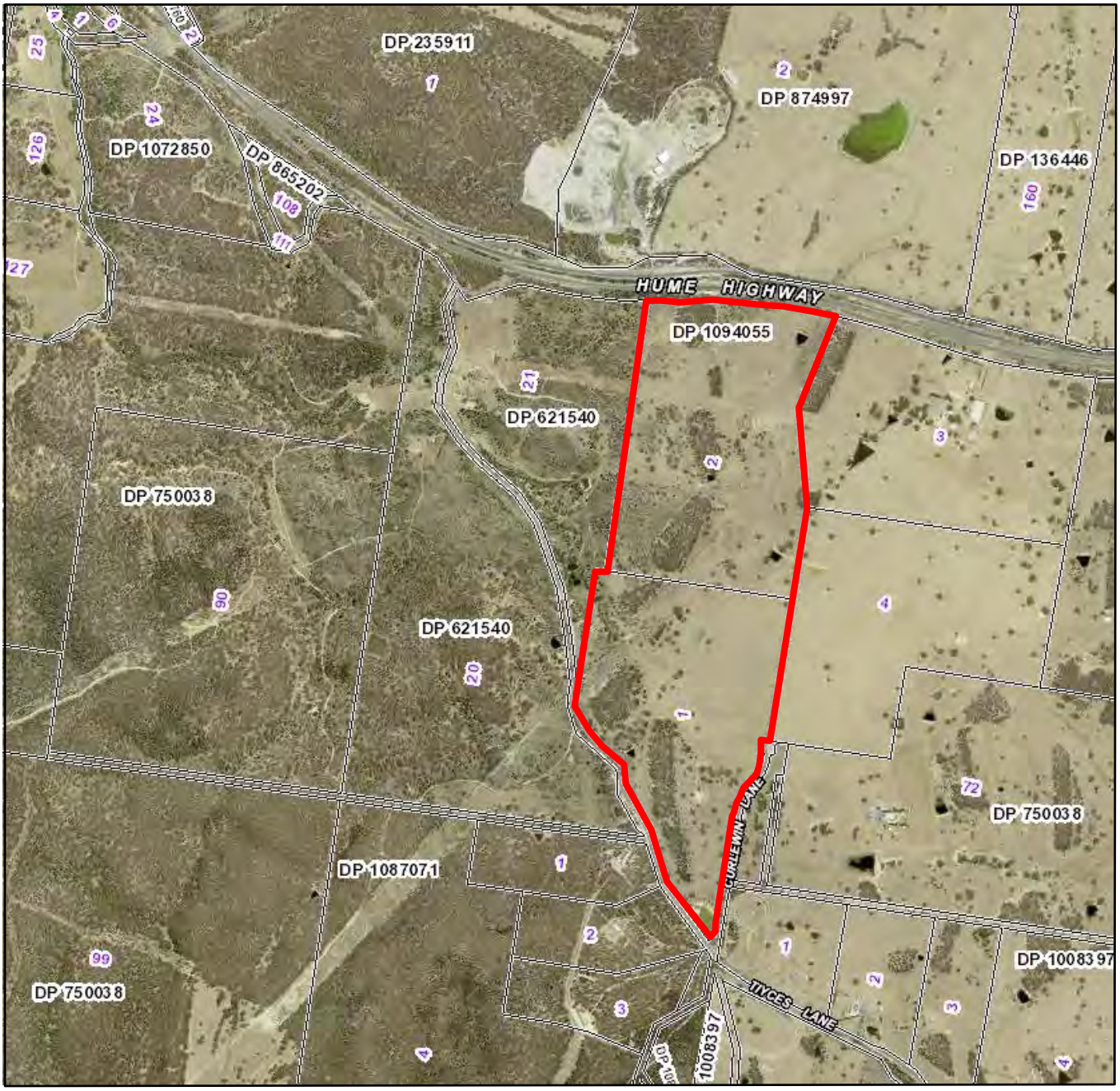
2. EXISTING CONDITIONS

2.1 Location

The subject site (Lots 1 and 2 DP 1094055) is rectangular in shape and located approx. 12 km east of Goulburn at 63 Curlewin Lane, Boxers Creek – see figures below on pages 5 and 6.



DP 1094055



Proposed Site: 63 Curlewin Lane

2.2 Hume Highway

The subject site has frontage to the southbound lane of the Hume Highway – see photographs below. The Hume Highway is a dual carriageway with travel lanes 3.5m wide and access to the site is proposed from the Hume Highway – see Site Development Plan on page 10.

Existing Access

View North

View South

2.3 Tiyces Lane

The subject site has frontage to Tiyces Lane and Curlewin Lane – see photographs below. Tiyces Lane is a two-way bitumen sealed local road lane having a pavement width generally of 6.0m and egress from the site proposes to use Tiyces Lane – see Site Development Plan on page 10.

Tiyces Lane

Tiyces Lane

3. PROPOSED DEVELOPMENT and IMPLICATIONS

3.1 Description

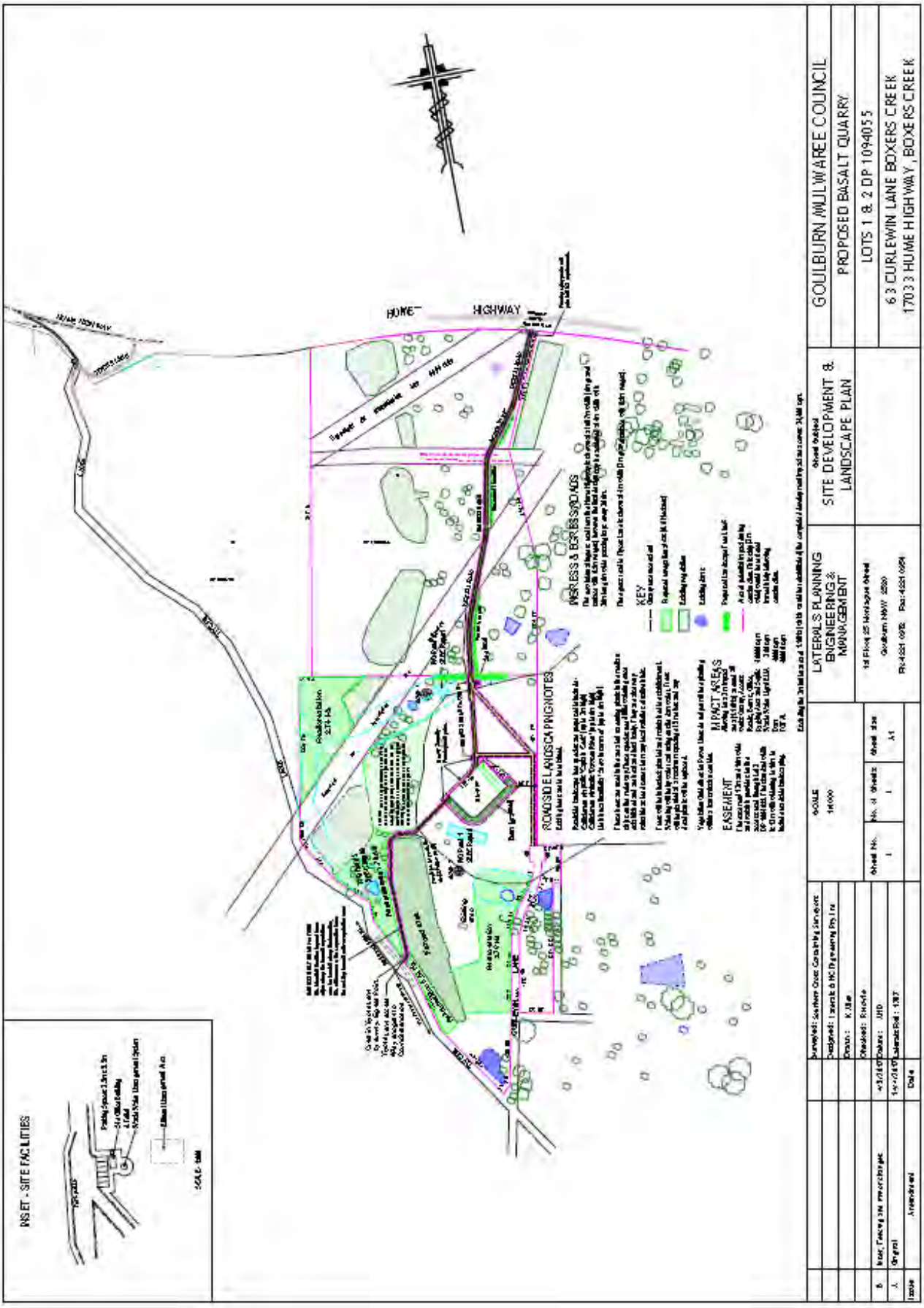
The extractive industry development proposes a basalt quarry for the extraction of up to 30,000m^3 of basalt per annum. The development includes the extraction of the resource by non-blasting, crushing using a mobile crusher, screening to size the materials, stockpiling within the quarry area and transport from the site.

Crushing will take place over a 10 working day period (excluding weekends and public holidays) to enable a month's supply to be stockpiled within the quarry. The proposed hours of operation on the site would extend to 7:00am to 5:00pm Monday to Friday and 7:00am to 1:00pm Saturdays, with no operations on Sundays and Public Holidays. Additionally, transport of product should not occur during periods when Tiyces Lane is being used by parents to drop-off or collect school children from the bus stop at the junction with the Hume Highway.

The following calculations have been carried out to identify the extent of quarrying that can be carried out on the land:

Area of identified basalt resource	1.04 ha
Depth of basalt quarry resource	17 m
Maximum extraction per annum	30,000m^3
Quarry area (including access from entry road to quarry)	10,400 m^2
Volume of Basalt within basalt quarry area (17m x 10,400m^2)	176,800m^3
Average daily extraction rate (assuming 250 days of operation per annum) (30,000m^3 over 250 days)	120m^3
Time period for extraction (176,800 / 30,000)	5.9 years
Planned extraction rate – year 1	
Overburden (7,620m^3)	15,240 tonnes
Basalt (22,380m^3)	44,760 tonnes
Totals (30,000m^3)	60,000 tonnes
Planned extraction rate – year 2 onwards	
Basalt (30,000m^3)	60,000 tonnes
Stockpile area for crushed material– year 2 onwards	
Monthly rate of extraction of basalt	2,500m^3

See Site Development Plan below on page 10.



Site Development Plan

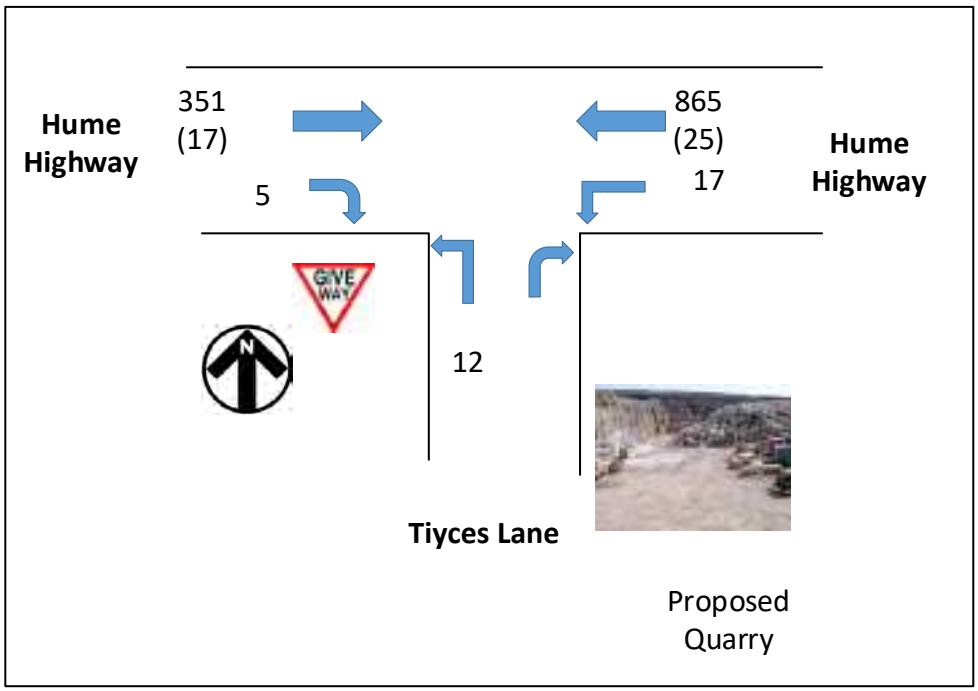
Assuming 37 tonne capacity trucks and 1m^3 of basalt weighing approximately 2 tonnes, expected maximum traffic movements are estimated to be:

- 30,000m^3 x 2 = 60,000 tonnes per annum / 45.5 weeks = 1,320 tonnes per week / 5.5 days = 240 tonnes per day / 37 tonne payload = 6.49 truck loads = Say 7 truck loads per day x 2 movements = 14 movements per day.
- Workers and deliveries assumed at 4 vehicles per day = 8 movements per day.
- Total estimated vehicle movements per day = 22 movements per day

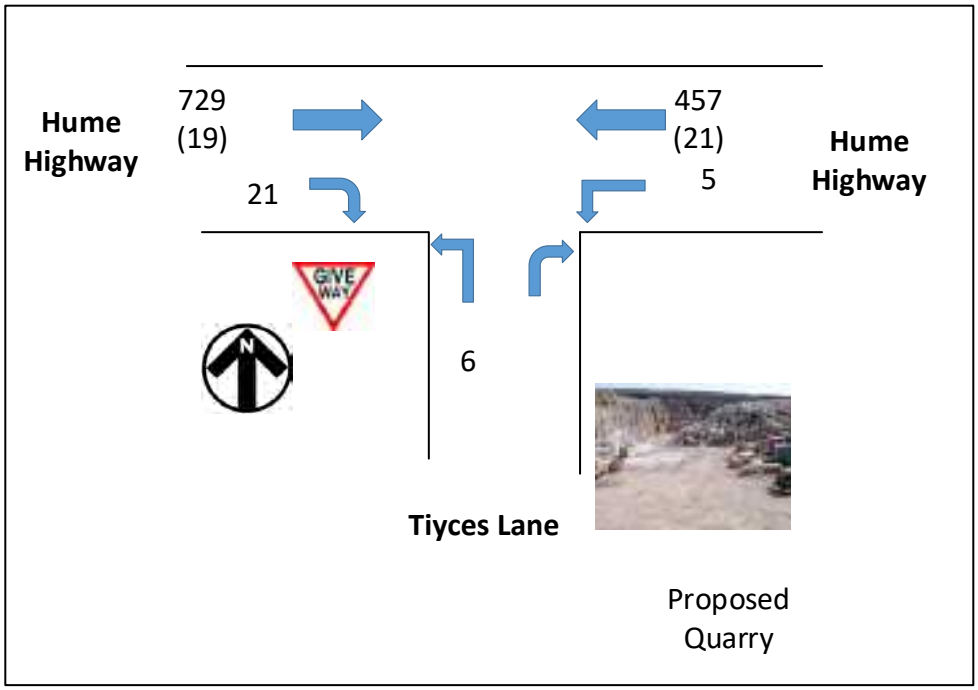
3.2 Traffic Volumes

(i) Hume Highway

A Traffic and Parking Impact Report prepared by Motion Traffic Engineers Pty Ltd dated May 2016 has assessed the impact of traffic on the Hume Highway – see Appendix 2. *Traffic volumes were collected at the intersection of Hume Highway with Tiyces Lane as part of this project for the weekday AM (7:00am to 8:45am) and PM commuter periods (4pm to 6pm). The peak hours were 7:30am to 8:30am, and 5:30pm to 6:30pm for the AM and PM peak hours respective. The traffic counts were undertaken in April 2016. The figures below present the weekday AM and PM peak hour traffic volumes respectively. The un-bracketed numbers are cars and the bracketed ones are trucks or buses. The traffic volumes to and from Tiyces Lane is very low and reflects that the properties on Tiyces Lane are rural dwellings.*



Weekday AM Peak Hour Traffic Volumes
(Source: Motion Traffic Engineers Pty Ltd)



Weekday PM Peak Hour Traffic Volumes
(Source: Motion Traffic Engineers Pty Ltd)

(ii) Tiyces Lane

A traffic count was undertaken by Austraffic during the period 7 March 2017 to the 13 March 2017 with a copy of the results included at Appendix 3.

This count indicates a weekday average of 105 traffic movements per day (i.e. two way traffic) and peak hourly northbound am of 11 traffic movements and peak hourly pm of 9 traffic movements.

3.3 Road Capacity – Tiyces Lane

The total service flow rate in one direction and hence the total road capacity for existing roadway conditions and any selected level of service can be determined by the following equation (*Ausroads Guide to Traffic Engineering Practice, Part 2, Section 4*);

SFi = Cj. (v/c)i. N. fw. fHV. fe. fp

where:

SFi = total service flow rate in one direction under prevailing roadway and traffic conditions for the level of service i in vehicles per hour.

Cj = capacity per lane under ideal conditions. For a design speed of 80kph, Cj = 1900

(v/c)i = maximum volume/capacity ratio. For Level of Service A or B this factor is 0.45.
(Level of Service A is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds

and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent. Level of Service B is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than with level of service A).

N = number of lanes in one direction. One lane in this case.

Fw = adjustment factor for lane width. 1 in this case.

fHV = adjustment factor for heavy vehicles
= 1/(1+Pt(Et-1)+Pb(Eb-1))
= 1/(1+0.0425(1.7-1)+0.0185(1.5-1))
= 0.962

fe = adjustment factor for development environment. 0.8 in this case.

fp = adjustment factor driver population. 1 in this case.

Therefore, SFi = 1900x0.45x1.0x1.0x0.962x0.8x1.0

= 658 vehicles per hour, in one direction.

There is adequate capacity in Tiyces Lane for the expected additional traffic of 11 vehicle movements per day in one direction.

3.4 Route Structural Adequacy – Tiyces Lane

A Pavement Condition Report was prepared for Tiyces Lane by Pavement Management Services on the 30 March 2009. A copy is included at Appendix 4.

This report indicated a pavement life of at least 20 years from this date i.e. pavement life until at least 30 March 2029.

The expected life of this proposed extractive industry is approx. 5.5 years and assuming site operations will commence by the 30 March, 2018 the end of the life of the quarry is expected to be 30 September, 2023.

Council's s94 Development Contributions Plan 2009 Amendment No. 1 Extractive industries, mines and like development road maintenance levy will apply based on the following formula:

Road maintenance / reconstruction
contribution per tonne (cents) = 4(L1 x P1 + L2 x P2 ……Ln x Pn)

Where:	L1	=	Length of road route 1 used by the development
	P1	=	Estimated percentage of material trucked along route 1
		=	4 cents per tonne as the contribution towards pavement maintenance, repair, rehabilitation and reconstruction.
	L2	=	Length of road route 2
	P2	=	Estimated percentage of material trucked along route 2

The affected section of Tiyces Lane is approx. 2km long and the applicable contribution will therefore be:

Contribution = $0.0468 x 2 (2016/17 rate)
= $0.0936 per tonne.

Based on 60,000 tonnes per year, this contribution would be $5,616 per year.

3.5 Tiyces Lane

Tiyces Lane is proposed to be used for egress from the development site with a junction located as detailed on the site development plan on page 10. Tiyces Lane is a rural road providing access to rural properties, rural residential development at 'Marianvale' and industrial development (fish farm) also at Marianvale

The junction with Tiyces Lane is located approx. 2km from the Hume Highway. Sight distance available at this location is 350m south and 294m north as determined by survey by Southern Cross Consulting Surveyors – see plan at Appendix 5. Austroads *Guide To Road Design Part 4a: Unsignalised And Signalised Intersections* (Table 3.2 – copy at Appendix 6) specifies a minimum safe intersection sight distance of 181m for a design speed of 80kph which is considered appropriate for this rural road. The traffic count undertaken by Austraffic (see Appendix 4) indicates an average speed of 68.5kph and an 85%ile of 82kph. The sight distance available at the intersection is appropriate for a design speed of approx. 110kph. See photographs below:

Sight Distance North

Sight Distance South

In respect to the property access, Austroads *Guide to Road Design Part 4: Intersections and Crossings – General* at clause 7.2.3 includes the following statements:

> ***7.2.3 Rural Roads***
> *Although rural roads are usually characterised by relatively low turning traffic volumes to and from widely spaced access points, high-speed crashes occur due to low driver expectation of turning vehicles.*
> *Treatment of access to rural properties is dependent on several factors including:*
> - *through traffic volume*
> - *turning volume*
> - *vehicle type*
> - *single or divided carriageway*
> - *land use*
> - *general topography.*
>
> *To enhance safety for the turning vehicle and minimise interference to through traffic it is common to widen the shoulder or provide an auxiliary lane. This is usually achieved by providing indented turning lanes on divided roads or a basic (BA) or channelised (CH) treatment on a two-lane twoway road (Section 4 of the Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (Austroads 2009b)).*
> *The location for the point of access will be governed by the following:*
> - *sight distance (Section 3 of the Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (Austroads 2009b))*
> - *median width/storage space*
> - *largest design vehicle to utilise the facility*
> - *distance to intersection*
> - *possible confusion with intersections*
> - *deceleration/acceleration movements*
> - *drainage*
> - *topography.*
>
> *The number of access points off a high-speed road should be reduced either by consolidating them or by using existing side roads and service roads.*
> *The minimum design vehicle for a rural access should be the single unit truck. However, accesses should be designed for the largest vehicle likely to use them (e.g. milk tanker, semi-trailer, B-double).*
> *The minimum layout for a rural property access is shown in Figure 7.2. The layout caters for a single unit truck to undertake left turns without crossing the centreline of the road. It will allow for turns by articulated vehicles (providing they use two lanes of a carriageway). This minimum layout is suitable for the following conditions:*
> - *accesses not used by articulated vehicles on single carriageway roads (e.g. two-lane two-way roads)*
> - *left-in, left-out accesses not used by articulated vehicles on dual carriageway roads*
> - *dedicated commercial vehicle accesses with infrequent use by articulated vehicles (no more than about one turning articulated vehicle per day) on single carriageway roads with an AADT of less than 2000, provided that the access is not associated with other minimum design criteria (e.g. sight distance restrictions or tight horizontal curves).*

Any dedicated commercial vehicle access used by articulated vehicles that does not meet the conditions in the third dot point must be designed to allow for a 19 m semi-trailer to undertake left turns without crossing the centreline, as shown in the layouts in Figure 7.3 and Figure 7.4. At locations where there is a high demand for articulated vehicles (e.g. timber mill, quarry, transport facility) a road intersection layout should be adopted.

In this instance, the layout shown at Figure 7.4 *Example of a rural property access specifically designed for articulated vehicles on a two-lane road* is considered appropriate. See below:

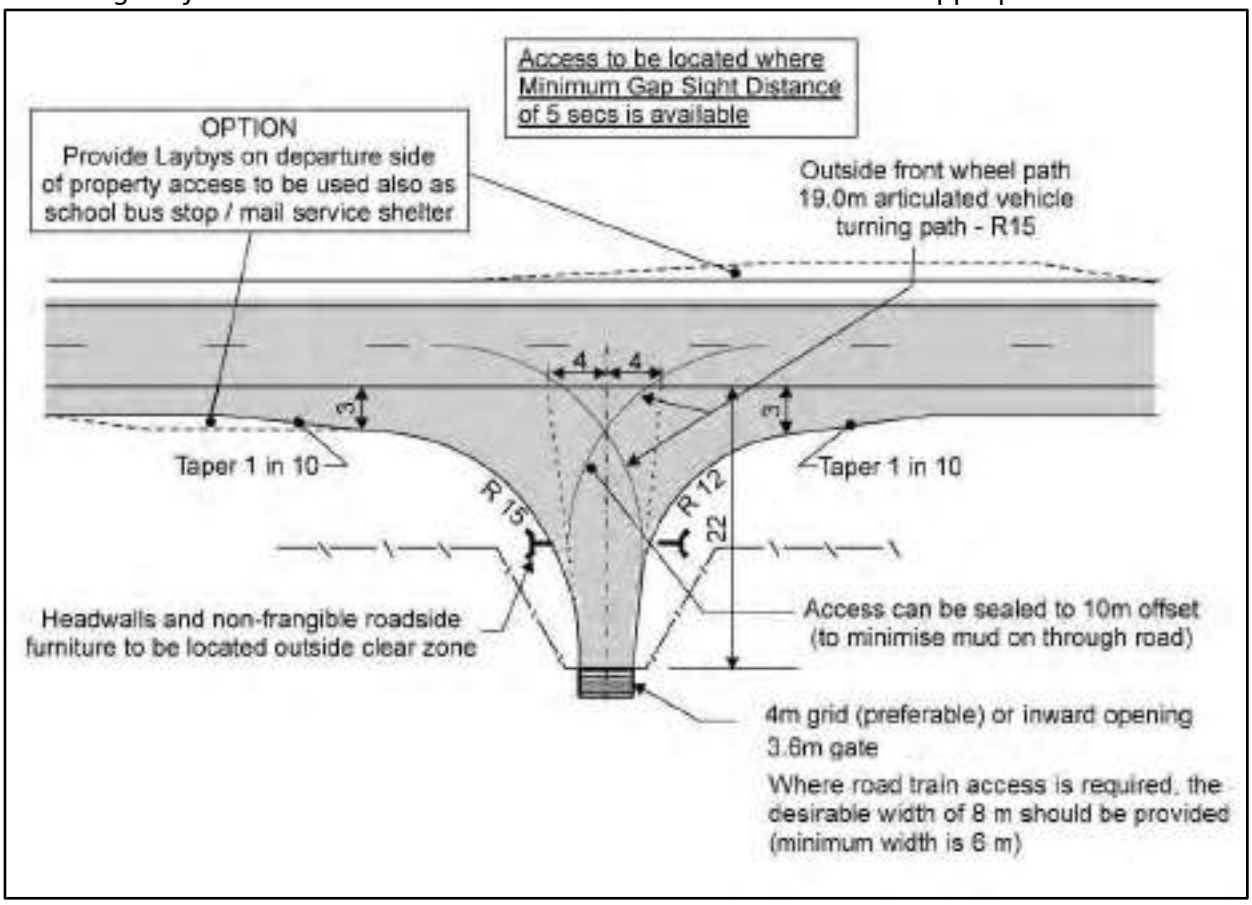


Figure 7.4: Example of a rural property access specifically designed for articulated vehicles on a two-lane two-way road

Tiyces Lane is currently bitumen sealed with a pavement width of approx. 6m and formation width of approx. 8m. The Goulburn Mulwaree DCP 2009 includes the following statements in respect to haulage routes:

7.2.3 Heavy vehicle haulage development routes

Objectives

- *To set out the matters to be considered for selection of haulage routes for heavy vehicle haulage developments to address rural and village amenity and safety*
- *To set out road standards for heavy vehicle haulage routes*
- *To identify the road standard and haulage route information required to be submitted with an application for heavy vehicle haulage development.*

Haulage Route standards for heavy vehicle haulage developments

The following road standard for haulage routes is required:

- *7m wide sealed carriageways in rural areas*
- *In addition to the carriageway, 1m wide shoulders on each side with a 500mm seal*
- *80km/h design standard*
- *9m wide culverts and bridges (i.e. from barrier to barrier).*
- *Minimum remaining pavement life of 10 years at the time of commencement of operations*
- *Asphaltic concrete surface in village areas.*

The following information should be submitted with an application for heavy vehicle haulage development:

- *Pavement testing results for the intended haulage route/s;*
- *An estimation of the remaining pavement life of all intended haulage routes given the anticipated additional load from the proposed development; and*
- *A plan and/or schedule identifying any upgrades required to the pavement to ensure that the road has a minimum pavement life of 10 years taking into account the additional load.*

In respect to this DCP, the required information comprises part of this Traffic Assessment Report and the applicant will undertake works required on the northbound travel lane to comply with the DCP.

3.6 Hume Highway Intersections

Discussions have been held with Roads and Maritime Services (RMS) regarding a deceleration lane for access to the site from the Hume Highway and an acceleration lane onto the Hume Highway at the Tiyces Lane intersection. Advice received from RMS dated 13 February 2017 (copy at Appendix 1) includes the following comments and preliminary intersection design plans are shown on pages 20, 21 and 22.

"RMS has reviewed the information provided and notes the following:

- *The developer proposes access to the subject development via a deceleration lane from the Hume Highway, direct to the development via a Right of Carriageway over adjoining Lot 2 DP 1094055 (see attached plan) and access from the development to the Hume Highway via Tiyces Lane, to be facilitated by construction of an acceleration lane (see attached plan).*
- *The proposed access arrangements, supported by a code of conduct for all heavy vehicle drivers, restrict all heavy vehicle manoeuvres to/from the Hume Highway to left in/left out.*
- *RMS has reviewed the provided information and is generally satisfied that the proposed deceleration and acceleration lanes can be constructed, to AUSTROADS standards (for light vehicles) and generally in accordance with the attached plans.*

RMS will not object to the development application subject to the following comments being included in the conditions of development consent:

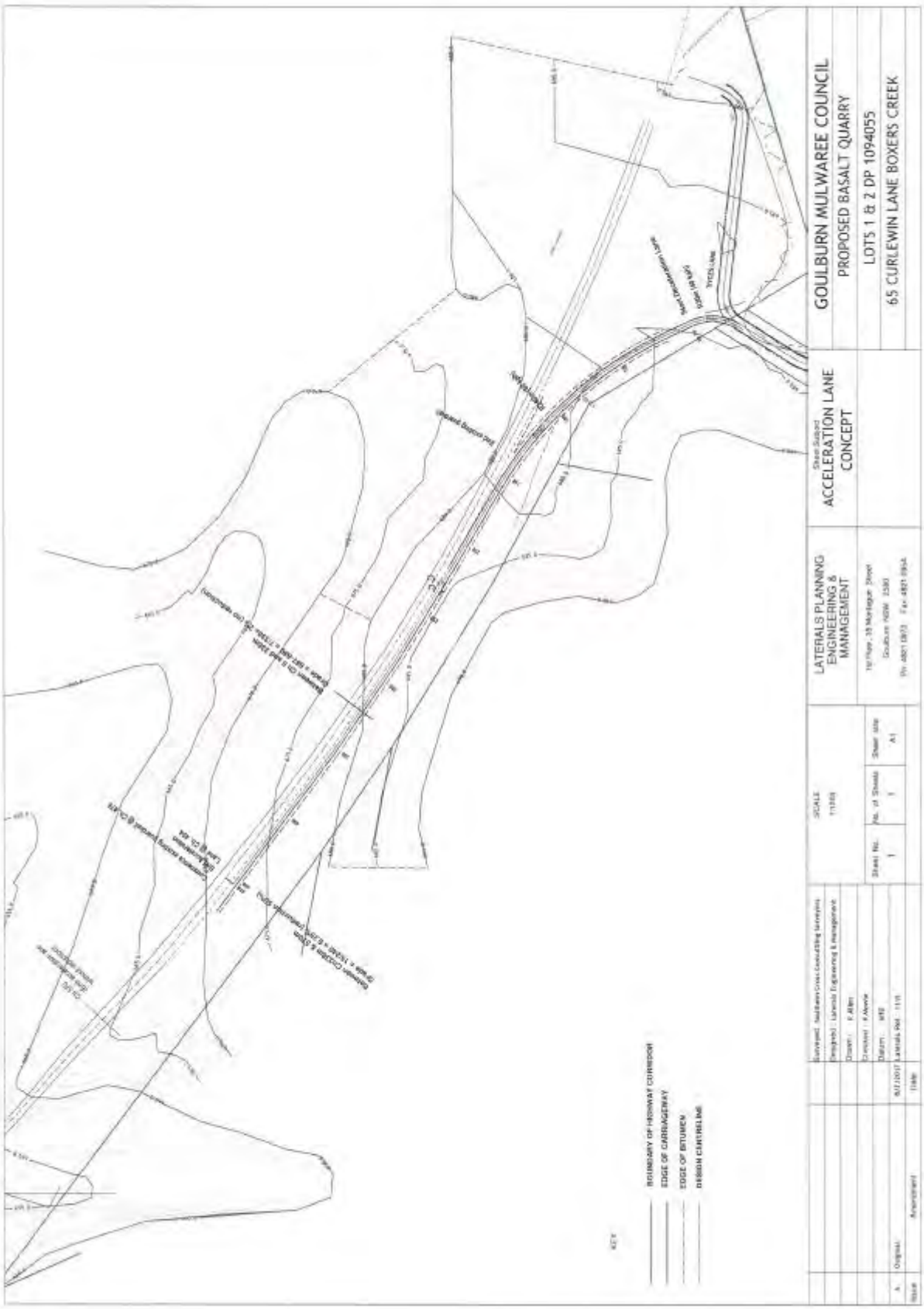
- *Prior to the issuing of the construction certificate, the developer must enter into a Works Authorisation Deed (WAD) with the RMS for all works on the Hume Highway.*
- *Prior to any operations, the developer must provide a southbound left turn deceleration lane on the Hume Highway, at the location shown in the attached plans. The deceleration lane must be designed as a sealed Rural Auxiliary Left Turn Treatment (AUL) in accordance with Section 8.2.3 of Austroads Guide to Road Design Part 4a: Unsignalised and Signalised Intersections.*
- *Prior to any operations, the developer must provide a southbound left turn acceleration lane from Tiyces Lane, onto the Hume Highway, generally as shown in the attached concept. The acceleration lane must be designed to comply with Austroads Guide to Road Design Part 4a: Unsignalised and signalised intersections and the relevant RMS Supplement for a design speed of 11Okm/h, for light vehicles.*
- *Quarry trucks must not undertake any right turn movements between Tiyces Lane and the Hume Highway. Instead, all vehicles wishing to exit Tiyces Lane and travel north must do so by travelling south along the Hume Highway and undertaking a U-turn at the Southern Goulburn Interchange. Similarly, all heavy vehicles northbound wishing to enter the development must travel north along the Hume Highway and undertake a U-turn at the interchange south of Marulan and enter via the deceleration lane. The developer must implement and enforce a code of conduct for all drivers which require heavy vehicles to use this route.*
- *Access arrangements to/from the Hume Highway to Lot 2 DP 1094055 must be maintained.*
- *All access to Lots 1 & 2 DP 1094055 must be via a "Right of Way" legally certified on the titles of the burdened lots prior to an occupation certificate being issued by way of a Section 888 Instrument under the Conveyancing Act, 1919.*
- *All pavement design on the State road network must be in accordance with Austroads standards. It should be noted that pavement investigations need to consider the suitability of the existing shoulder to accommodate new loadings and if necessary, the developer must upgrade the existing shoulder.*
- *Where required, the developer must upgraded/provided lighting in accordance with Australian Standard AS/NZS 1158.*
- *Any new services or modifications to existing services associated with this development application that involve works on, over or under the Hume Highway must be incorporated into, and managed under, the Works Authorisation Deed for the project. Note: It is the developer's responsibility to identify these works to RMS project manager.*
- *All roadworks, traffic control facilities and other works associated with this development, including any modifications required to meet RMS standards, will be at no cost to RMS. All works must be completed prior to occupation.*
- *All roadworks and traffic control facilities must be undertaken by a pre-qualified contractor. A copy of pre-qualified contractors can be found on the RMS website at:*

http://www.rta.nsw.gov.au/doingbusinesswithus/tenderscontracts/prequalifiedcontractors.html

- *RMS will be exercising its powers under Section 64 of the Roads Act, 1993 to become the roads authority for works on the Hume Highway. Given this, Section 138 consent under the Roads Act, 1993 must be obtained from the RMS prior to construction.*

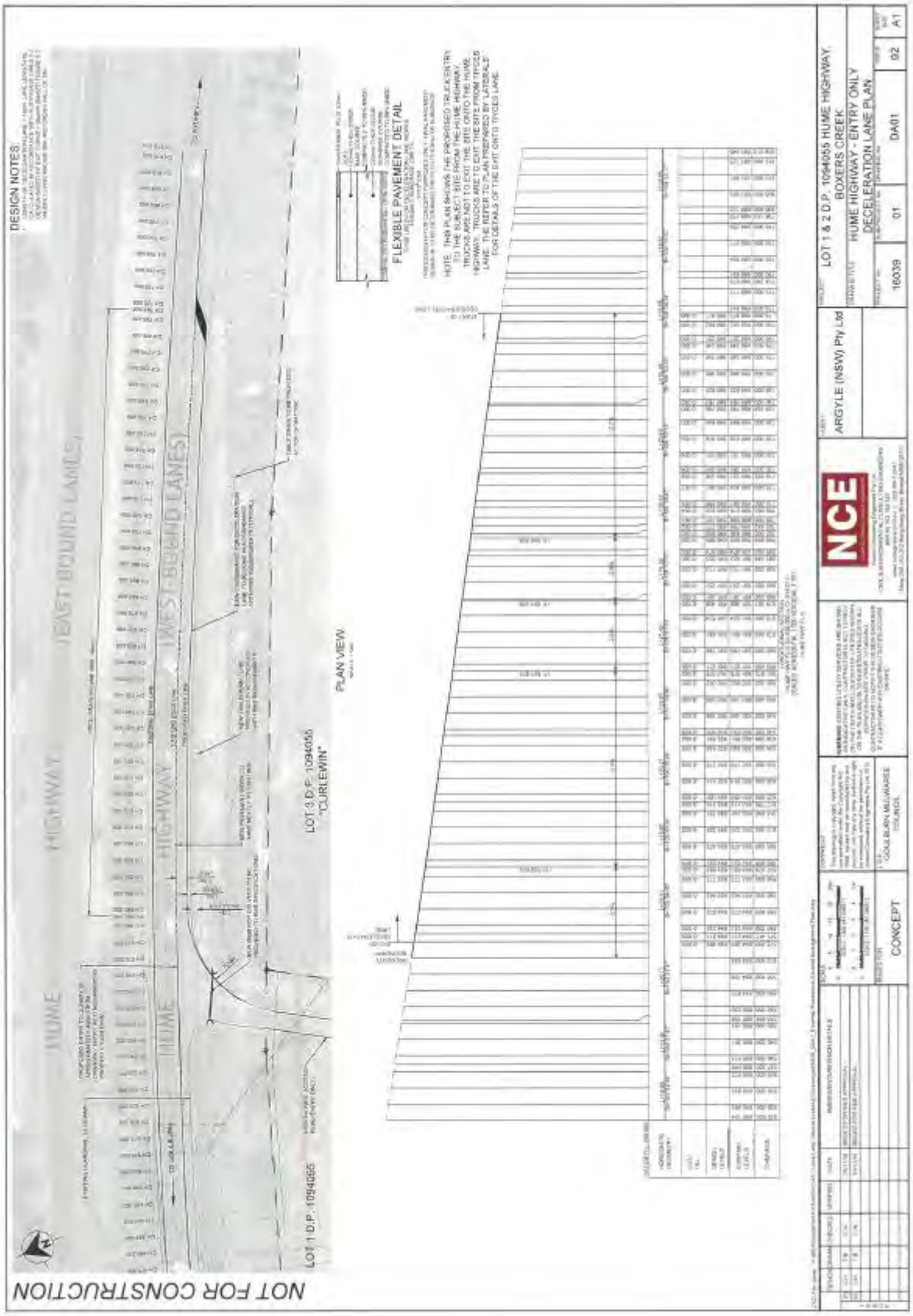
  Note: It is requested that the consent authority advise the applicant that conditions of development consent do not guarantee RMS final consent to the specific road work, traffic control facilities and other structures and works on the classified road network. In this regard, prior to undertaking any such work, the applicant is required to submit detailed design plans and all relevant additional information prior to commencing work on the State road network. The developer will need to pay all RMS fees and charges associated with works. In the first instance, to progress the post consent process, the applicant should email the conditions of development consent to: WAD.southern@rms.nsw.gov.au

- *The developer must apply for, and obtain a Road Occupancy Licence (ROL) from the RMS Traffic Operations Unit (TOU) prior to commencing roadworks on a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on any road. The application will require a Traffic Management Plan (TMP) to be prepared by a person who is certified to prepare Traffic Control Plans. Should the TMP require a reduction of the speed limit, a Speed Zone Authorisation will also be required from the TOU. The developer must submit the ROL application 10 business days prior to commencing work. It should be noted that receiving an approval for the ROL within this 10 business day period is dependent upon RMS receiving an accurate and compliant TMP."*



Proposed Acceleration Lane - Topographic

Proposed Acceleration Lane – Aerial



Proposed Deceleration Lane

4. RECOMMENDED WORKS

The above traffic assessment includes the following works:

- Construction of a deceleration lane to RMS requirements.
- Construction of an acceleration lane to RMS requirements.
- Construction of access onto Tiyces Lane to Council requirements.
- Widening of the northbound travel lane on Tiyces Lane to Council requirements.
- Rehabilitation of sections of the northbound travel lane on Tiyces Lane as identified in the Pavement Management Services report.

5. CONCLUSIONS

This report details an assessment of the traffic generation and access considerations associated with a proposed extractive industry and indicates that the road network in the locality has traffic volumes well below the theoretical practical capacity.

Having regard to this report, the following conclusions may be made;

- the existing road network has ample capacity to cater for the additional traffic generated by the proposed development.

- the proposed access, internal parking and manoeuvring areas will provide for safe and efficient vehicular movements during all times.

Based upon the contents of this report, the above conclusions and the incorporation of the recommended works, there are no traffic related issues associated with the proposed development which would prevent Council approving the proposed development.

APPENDIX 1

Advice from Roads and Maritime Services

13 February 2017

Our Ref: STH05/00270/25&26
Contact: Melissa Steep 4221 2771
Your Ref: DA/0350/1314

Transport Roads & Maritime Services

13 February 2017

Keith Allen
Laterals Planning
keith@laterals.com.au

Cc: council@goulburn.nsw.gov.au
cnovati@ncengineers.com.au

DEVELOPMENT APPLICATION DA/0350/1314 – LOT 1 DP 1094055, 288 TIYCES LANE, GOULBURN, ARGYLE QUARRY

Dear Keith,

Roads and Maritime Services (RMS) refers to correspondence from Claudia Novati of Novati Consulting Engineers dated 6 February 2017 (referring to the attached concept deceleration lane plans, Project no: 16039, DA01, 02, dated 21/12/16) and correspondence from yourself, dated 8 February 2017 (referring to the attached concept acceleration lane plans, Ref: 1315, dated 8/2/17), regarding the subject development application.

RMS has reviewed the information provided and notes the following:

- The developer proposes access to the subject development via a deceleration lane from the Hume Highway, direct to the development via a Right of Carriageway over adjoining Lot 2 DP 1094055 (see attached plan) and access from the development to the Hume Highway via Tiyces Lane, to be facilitated by construction of an acceleration lane (see attached plan).
- The proposed access arrangements, supported by a code of conduct for all heavy vehicle drivers, restrict all heavy vehicle manoeuvres to/from the Hume Highway to left in/left out.
- RMS has reviewed the provided information and is generally satisfied that the proposed deceleration and acceleration lanes can be constructed, to AUSTROADS standards (for light vehicles) and generally in accordance with the attached plans.

RMS will not object to the development application subject to the following comments being included in the conditions of development consent:

- Prior to the issuing of the construction certificate, the developer must enter into a Works Authorisation Deed (WAD) with the RMS for all works on the Hume Highway.
- Prior to any operations, the developer must provide a southbound left turn deceleration lane on the Hume Highway, at the location shown in the attached plans. The deceleration lane must be designed as a sealed Rural Auxiliary Left Turn Treatment (AUL) in accordance with Section 8.2.3 of Austroads Guide to Road Design Part 4a: Unsignalised and Signalised Intersections.

Roads & Maritime Services

Level 4, Southern Regional Office, 90 Crown Street, Wollongong NSW 2500 | PO Box 477 Wollongong East NSW 2520
T 02 4221 2460 | F 02 4221 2777 | **www.rmservices.nsw.gov.au** |

- Prior to any operations, the developer must provide a southbound left turn acceleration lane from Tiyces Lane, onto the Hume Highway, generally as shown in the attached concept. The acceleration lane must be designed to comply with Austroads Guide to Road Design Part 4a: Unsignalised and signalised intersections and the relevant RMS Supplement for a design speed of 110km/h, for light vehicles.
- Quarry trucks must not undertake any right turn movements between Tiyces Lane and the Hume Highway. Instead, all vehicles wishing to exit Tiyces Lane and travel north must do so by travelling south along the Hume Highway and undertaking a U-turn at the Southern Goulburn Interchange. Similarly, all heavy vehicles northbound wishing to enter the development must travel north along the Hume Highway and undertake a U-turn at the interchange south of Marulan and enter via the deceleration lane. The developer must implement and enforce a code of conduct for all drivers which require heavy vehicles to use this route.
- Access arrangements to/from the Hume Highway to Lot 2 DP 1094055 must be maintained.
- All access to Lots 1 & 2 DP 1094055 must be via a "Right of Way" legally certified on the titles of the burdened lots prior to an occupation certificate being issued by way of a Section 88B Instrument under the Conveyancing Act, 1919.
- All pavement design on the State road network must be in accordance with Austroads standards. **It should be noted that pavement investigations need to consider the suitability of the existing shoulder to accommodate new loadings and if necessary, the developer must upgrade the existing shoulder.**
- Where required, the developer must upgraded/provided lighting in accordance with Australian Standard AS/NZS1158.
- Any new services or modifications to existing services associated with this development application that involve works on, over or under the Hume Highway must be incorporated into, and managed under, the Works Authorisation Deed for the project. Note: It is the developer's responsibility to identify these works to RMS project manager.
- All roadworks, traffic control facilities and other works associated with this development, including any modifications required to meet RMS standards, will be at no cost to RMS. All works must be completed prior to occupation.
- All roadworks and traffic control facilities must be undertaken by a pre-qualified contractor. A copy of pre-qualified contractors can be found on the RMS website at:

  http://www.rta.nsw.gov.au/doingbusinesswithus/tenderscontracts/prequalifiedcontractors.html
- RMS will be exercising its powers under Section 64 of the Roads Act, 1993 to become the roads authority for works on the Hume Highway. Given this, Section 138 consent under the Roads Act, 1993 must be obtained from the RMS prior to construction.

  Note: It is requested that the consent authority advise the applicant that conditions of development consent do not guarantee RMS final consent to the specific road work, traffic control facilities and other structures and works on the classified road network. In this regard, prior to undertaking any such work, the applicant is required to submit detailed design plans and all relevant additional information prior to commencing work on the State road network. The developer will need to pay all RMS fees and charges associated with works. In the first instance, to progress the post consent process, the applicant should email the conditions of development consent to: WAD.southern@rms.nsw.gov.au
- The developer must apply for, and obtain a Road Occupancy Licence (ROL) from the RMS Traffic Operations Unit (TOU) prior to commencing roadworks on a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on

any road. The application will require a Traffic Management Plan (TMP) to be prepared by a person who is certified to prepare Traffic Control Plans. Should the TMP require a reduction of the speed limit, a Speed Zone Authorisation will also be required from the TOU. The developer must submit the ROL application 10 business days prior to commencing work. It should be noted that receiving an approval for the ROL within this 10 business day period is dependent upon RMS receiving an accurate and compliant TMP.

Notes: An approved ROL does not constitute an approval to commence works until an authorisation letter for the works has been issued by RMS Project Manager.

Conditions of development consent relating to road work, traffic control facilities and other structures on the classified road network contrary to those outlined above are unlikely to receive RMS consent under the Roads Act, 1993.

RMS highlights that in determining the application under Part 4 of the Environmental Planning and Assessment Act, 1979, it is the consent authority's responsibility to consider the environmental impacts of any road works which are ancillary to the development. This includes any works which form part of the proposal and/or any works which are deemed necessary to include as requirements in the conditions of development consent. Depending on the level of environmental assessment undertaken to date and nature of the works, the consent authority may require the developer to undertake further environmental assessment for any ancillary road works.

Upon determination of this matter, it would be appreciated if Council could email a copy of the Notice of Determination to RMS via development.southern@rms.nsw.gov.au.

Yours faithfully,

Chris Millet
A/Network & Safety Manager
Network Management, Southern Region

Roads & Maritime Services

Level 4, Southern Regional Office, 90 Crown Street, Wollongong NSW 2500 | PO Box 477 Wollongong East NSW 2520
T 02 4221 2480 | F 02 4221 2777 | **www.rmservices.nsw.gov.au** |

KEY
BOUNDARY OF HIGHWAY CORRIDOR
EDGE OF CARRIAGEWAY
EDGE OF BITUMEN
DESIGN CENTRELINE
GOULBURN MULWAREE COUNCIL
PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
65 CURLEWIN LANE BOXERS CREEK
ACCELERATION LANE CONCEPT
LATERALS PLANNING ENGINEERING & MANAGEMENT
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Drawn: K Allen
Checked: K Allen
Datum: AHD
Original
Amendment
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			Surveyed : Southern Cross Consulting Surveyors
			Designed : Laterals Engineering & Management
			Drawn : K.Allen
			Checked : R.Mowle
			Datum : MHD
A	Original	8/11/2017	Laterals Ref : 1315
Issue	Amendment	Date	

SCALE
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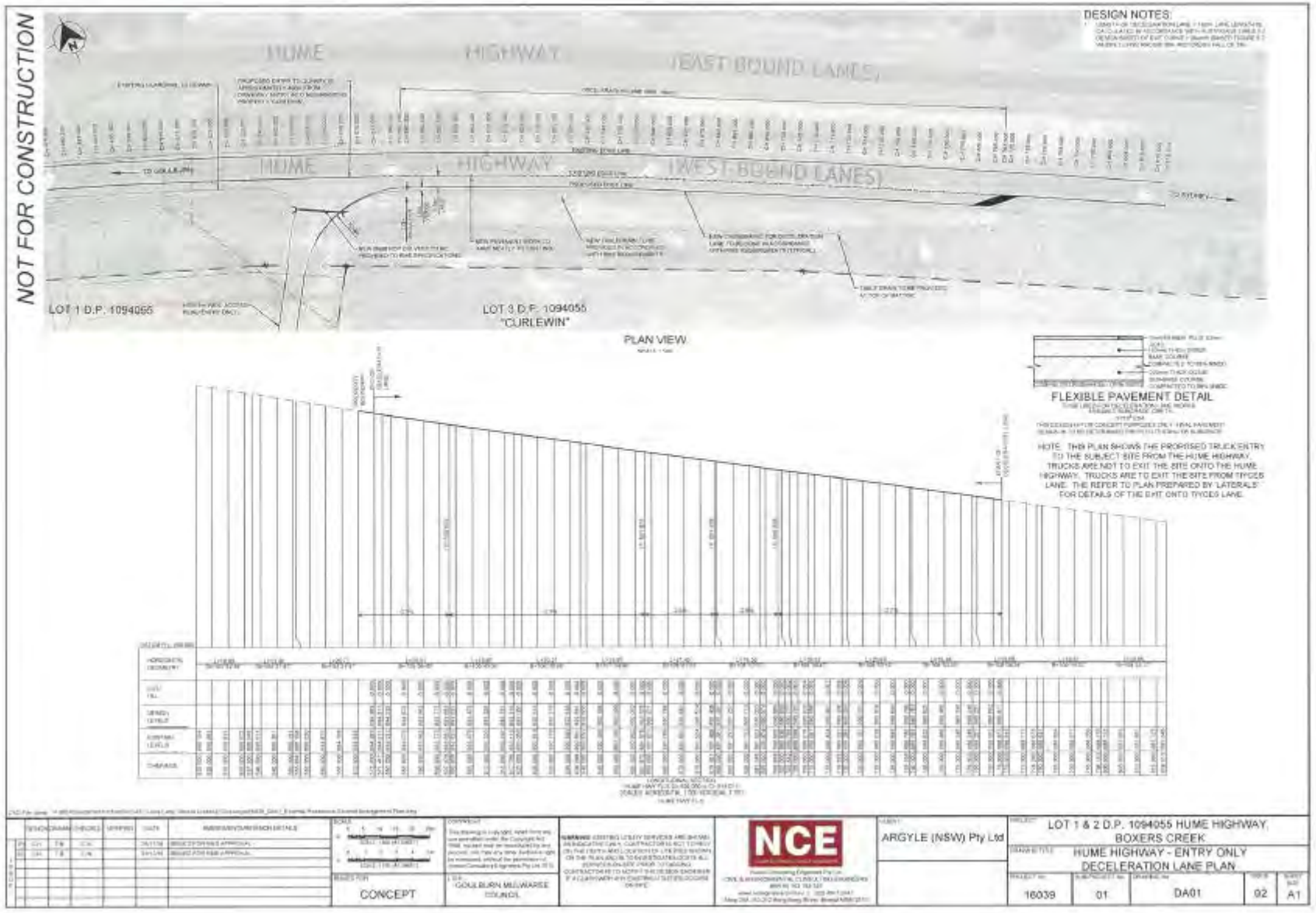
Sheet No.	No. of Sheets	Sheet size
1	1	A1

LATERALS PLANNING ENGINEERING & MANAGEMENT

1st Floor, 35 Montague Street
Goulburn NSW 2580
Ph: 4821 0975 Fax: 4821 0954

Sheet Subject
ACCELERATION LANE CONCEPT

GOULBURN MULWAREE COUNCIL
PROPOSED BASALT QUARRY
LOTS 1 & 2 DP 1094055
65 CURLEWIN LANE BOXERS CREEK


NOT FOR CONSTRUCTION
DESIGN NOTES:
HUME HIGHWAY (EAST BOUND LANES)
HUME HIGHWAY (WEST BOUND LANES)
LOT 1 D.P. 1094055
LOT 3 D.P. 1094055
"CURLEWIN"
PLAN VIEW
FLEXIBLE PAVEMENT DETAIL
HOTE: THIS PLAN SHOWS THE PROPOSED TRUCK ENTRY TO THE SUBJECT SITE FROM THE HUME HIGHWAY. TRUCKS ARE NOT TO EXIT THE SITE ONTO THE HUME HIGHWAY. TRUCKS ARE TO EXIT THE SITE FROM TYCOS LANE. THE REFER TO PLAN PREPARED BY 'LATERALS' FOR DETAILS OF THE EXIT ONTO TYCOS LANE.
NCE
ARGYLE (NSW) Pty Ltd
LOT 1 & 2 D.P. 1094055 HUME HIGHWAY, BOXERS CREEK
HUME HIGHWAY - ENTRY ONLY DECELERATION LANE PLAN
CONCEPT
GOULBURN MULWAREE COUNCIL
16039
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APPENDIX 2

Traffic and Parking Impact Report

Motion Traffic Engineers Pty Ltd - May 2016

PROPOSED QUARRY

63 Curlewin Lane in Boxers Creek

Lots 1 and 2 DP1094055

Traffic and Parking Impact Report

Prepared for: Argyle Quarries Pty Ltd

A1012135N (Version 1f)

May 2016

Mtion Traffic Engineers Pty Ltd
Telephone:
890 13898
sydney@motiontraffic.com.au

ACN 600201583

1. INTRODUCTION

Motion Traffic Engineers was commissioned by Argyle Quarries Pty Ltd to undertake a traffic and parking impact assessment of a proposed quarry at the 63 Curlewin Lane in Boxers Creek. Currently the site is undeveloped bushland.

This report is an update of the report initially written in 2010. The author of the 2016 report is also the principal author of the 2010 report.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

A site visit was undertaken on the 7th April 2016 of the proposed quarry truck entrance and exits.

The report and all included intellectual material has been provided for use by the Figtree Reserve Superannuation Fund (the property owner) and all associates, grantees and assigns of the fund.

Benny Chen, Principal Traffic Engineer, MEngSc, MPublicPolicy.

Benny has significant experience (16 years) with traffic impact assessments and transport planning, having previously worked for multi-disciplinary firms in Sydney, Canberra and London. He has skills in traffic engineering and carpark and driveway design and certification. He is very familiar with AS2890 series on car and vehicle parking. He has also extensive experience in preparing traffic impact assessment for Development Application approval to Council. Of significance to this project is his recent/current involvement with school related assessments associated with the federal government's Nation Building economic stimulus plan in Sydney.

Yours sincerely,

Benny Chen
Principal

2. BACKGROUND AND EXISTING CONDITIONS

2.1 Location and Land Use

The subject site is located at 63 Curlewin Lane in Boxers Creek in the rural area south of Hume Highway. The property is located at the northern end of Curlewin Lane. There are two proposed vehicle entrance/exit

- The entrance and exit on Curlewin Lane will be used by cars only
- Trucks will enter the site via separate and dedicated left turn entrance and a left turn exit on the Hume Highway.
    - The truck entrance and exit is to the north west of Tiyces Lane with the entrance approximately 280 metres to the north west
    - Cars relating to the Quarry business will also be able to utilise this entrance and exit

The details of the separate left entry and left exit lanes are as follows:

- Deceleration and acceleration lanes are provided in accordance to Austroads Guide to Road Design (Part 4a: Unsignalised and Signalised intersections)
- The design speed is 110km/hr and is the speed limit of 110km/hr
- The internal road has been designed to design speed of 60km/hr
- The exit lane is located on a section of Hume Highway with a low gradient to allow for trucks to merge with the Hume Highway

The truck entrance is a left in and left out. Truck drivers from the south -west will not be able to turn right into the Quarry entrance and exit and will need to travel to Marulan and travel on George Street and enter Hume Highway south west bound via Brayton Road at the Hume Highway with Brayton Road.

Truck drivers leaving the quarry will turn left into Hume Highway. The truck drivers with a destination to the north east will need to turn around by turning off Hume Highway at the interchange of Hume Highway with Hume Street and undertake a u-turn at the roundabout of Hume Street with Ducks Lane and enter Hume Highway at the north east bound on ramp at the interchange of Hume Highway with Hume Street.

Tiyces Lane is sealed and is approximately 5.7 wide for one lane each way. Curlewin Lane is not sealed although the quarry truck traffic will not travel on this road.
Figure 1 present an aerial photograph and shows the industrial properties as well as the railway line. Figure 2 presents a street map view.

Figure 3 shows a photograph of the site.

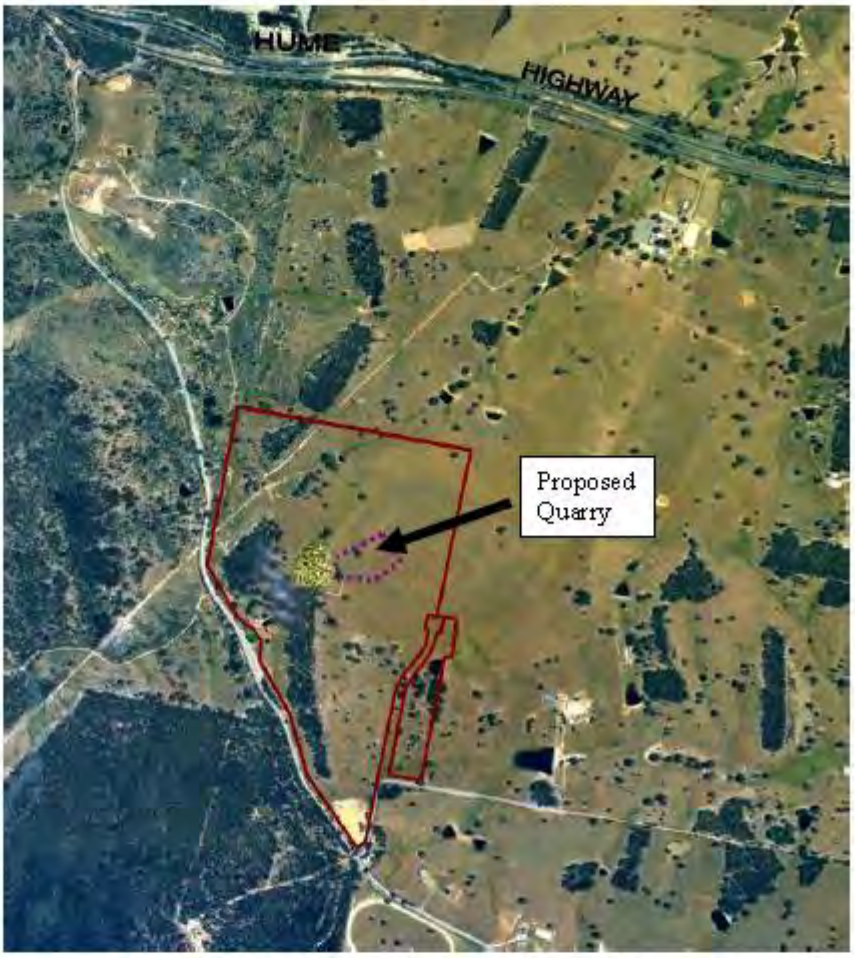


Figure 1: Location of the Subject Site on Aerial Photography

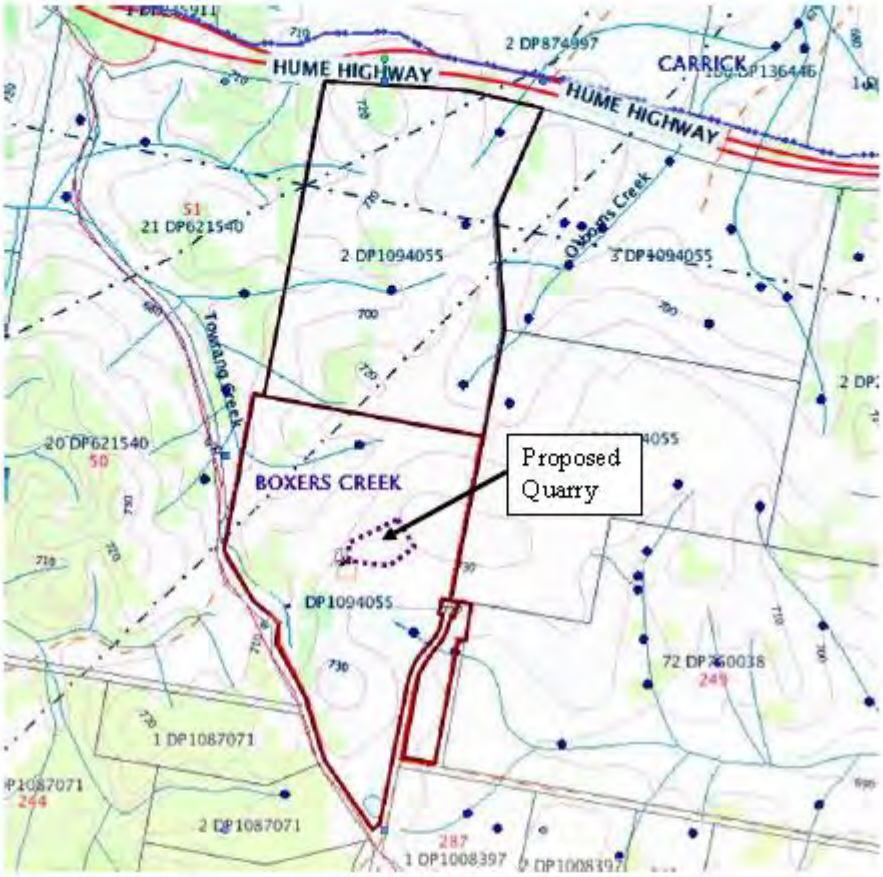


Figure 2: Location of the Subject Site on Street Map

2.2 Road Network

This section describes the roads adjacent to the proposed quarry.

Tiyces Lane is a sealed rural with one lane each way (see Figure 3) with a centre/barrier line to distinguish between the opposing traffic. There is a road shoulder on Tiyces Lane near the proposed quarry vehicle entrance. The road does not state a speed limit and hence the default speed limit of 50km/hr applies. Tiyces Lane runs from Hume Highway to Towrang.

Traffic will travel on the Hume Highway to access Tiyces Lane. Hume Highway is a national highway from Melbourne to Sydney. Hume Highway immediately adjacent to Tiyces Lane is two lanes each way with a speed limit of 110km/hr. Figure 5 shows Hume Highway looking west from Tiyces Lane.

Figure 5: Hume Highway looking west from Tiyces Lane

2.3 Intersection Description of Hume Highway with Tiyces Lane

As part of this traffic impact assessment the intersection of Hume Highway with Tiyces Lane is assessed since it is the nearest cross intersection where there are

turn movements. Moreover, car drivers to the site (such as staff and visitors) may enter and leave the site via Tiyces lane.

The subject intersection is a T junction with traffic from Tiyces Lane needing to give way to traffic on the Hume Highway. The Hume Highway is on two carriageways for each direction and there is a storage median between the two carriageways to allow for right turn vehicles into Tiyces Lane, and the right turn from Tiyces Lane can store in the median and hence undertake the turn movement in two stages. The storage median has a length of approximately 19 metres and an articulated truck is able to store in the central median safely while waiting to turn right into Tiyces Lane or from Tiyces Lane. The layout of this intersection is shown in Figure 6 using SIDRA – an industry standard intersection software. The number on the lane is the length of a short lane in metres.

There is a deceleration lane for the right turn into Tiyces Lane from Hume Highway.

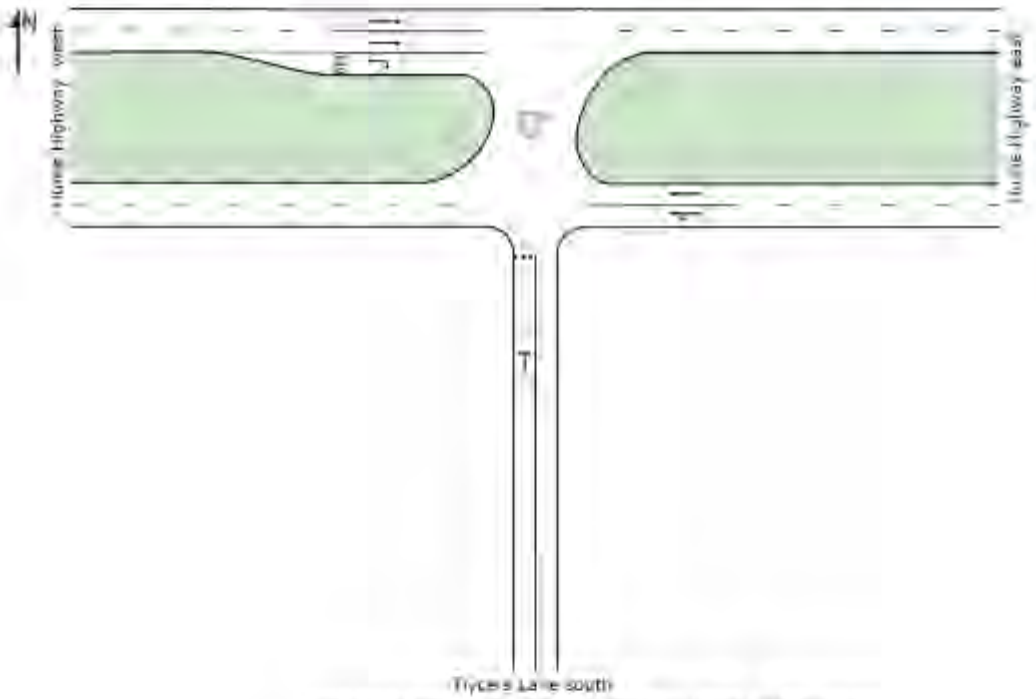


Figure 6: Intersection Hume Highway with Tiyces Lane

The new truck only entrance and exit is assessed on Hume highway is assessed as well for the development conditions.

2.4 Existing Public Parking Situation

There is no public parking near the quarry. All parking demand from the proposed quarry will be met on site.

2.5 Traffic Volumes

Traffic volumes were collected at the intersection of Hume Highway with Tiyces Lane as part of this project for the weekday AM (7:00am to 8:45am) and PM commuter periods (4pm to 6pm). The peak hours were 7:30am to 8:30am, and 5:30pm to 6:30pm for the AM and PM peak hours respective. The traffic counts were undertaken in April 2016.

Figures 6 and 7 present the weekday AM and PM peak hour traffic volumes respectively. The un-bracketed numbers are cars and the bracketed ones are trucks or buses. The traffic volumes to and from Tiyces Lane is very low and reflects that the properties on Tiyces Lane are rural dwellings.

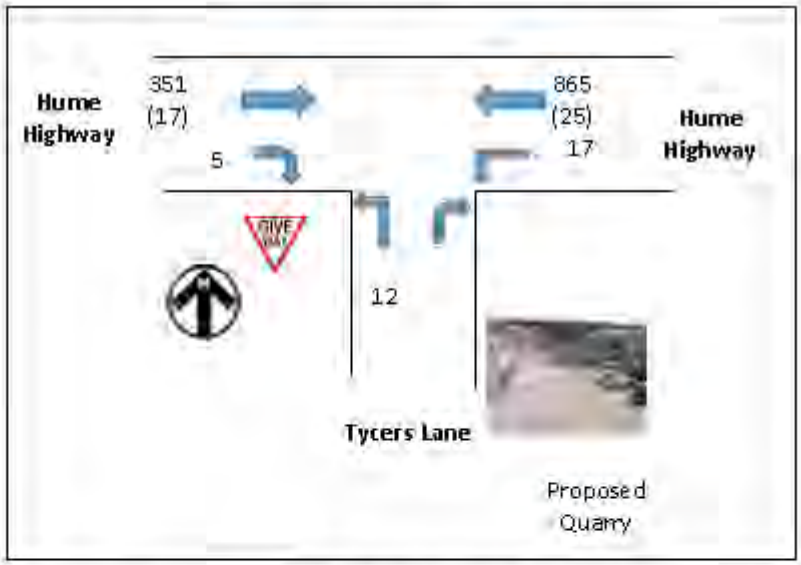


Figure 6: Weekday AM Peak Hour Traffic Volumes

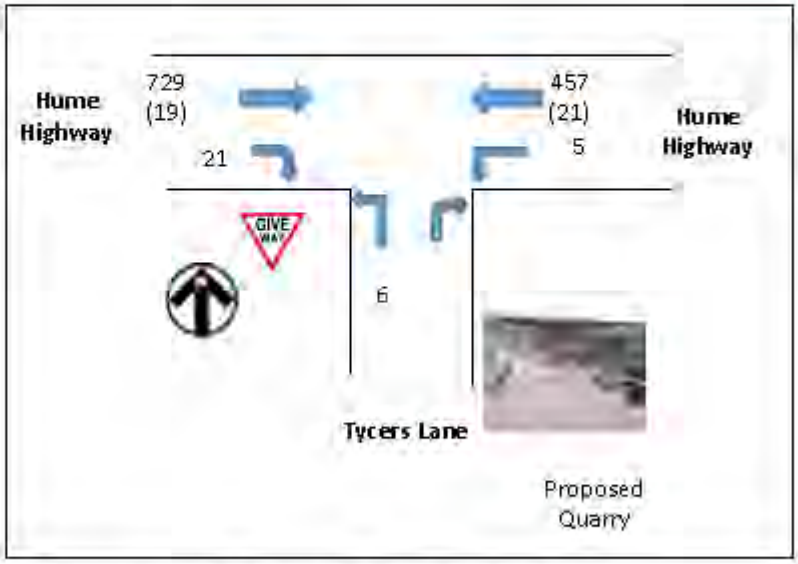


Figure 7: Weekday PM Peak Hour Traffic Volumes

2.6 Intersection Assessment

An intersection assessment has been undertaken for the weekday AM and PM hours for the intersections of Hume Highway with Tiyces Lane.

The existing intersection operating performance was assessed using the SIDRA software package to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally

represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection assessment are as follows:

- The intersection overall performs well with all turn movements having an acceptable Level of Service in the weekday AM and PM peak hour

There is spare capacity at Hume Highway with Tiyces Lane with to accommodate additional trips from the proposed redevelopment.

The full details of the SIDRA results for the existing conditions are presented in Appendix A.

2.7 Midblock Traffic Volumes

The traffic volumes on Tiyces Lane are less than ten vehicles per direction in the peak hour. The capacity of Tiyces lane per direction is 500 cars per hour. The existing traffic volumes are well within the capacity of Tiyces Lane with hourly directional traffic volumes of less than ten vehicles.

2.8 Conclusions

An assessment of the existing conditions showed the following:

- There is spare capacity for additional trips from the proposed quarry at the nearby intersection of Hume Highway with Tiyces Lane.
- There is spare capacity on Tiyces Lane to accommodate additional traffic from the proposed quarry.

3. PROPOSED QUARRY DEVELOPMENT

The proposal is to establish a quarry with four employees on site and trucks (typically articulated trucks) picking up the material and delivering the product to the clients in the wider area. The quarry will operate from 7am to 5pm with staff arrivals outside of the commuter peak hour in the morning. Staff departures will occur after 5pm. Truck arrivals and departures will be no more than one truck per hour. The proposed quarry is a low traffic generator.

Figure 8 shows the site layout. In the Development Application a scaled drawing is provided and detailed assessment should refer to the larger drawing.

Figure 8: Proposed Site Layout

As discussed previously, a left turn into the quarry and a left turn out of the site will be provided.

The details of the separate left entry and left exit lanes are as follows:

- Deceleration and acceleration lanes are provided in accordance to Austroads Guide to Road Design (Part 4a: Unsignalised and Signalised intersections)
    - The deceleration lane will need to be approved by Roads and Maritime Service
    - The acceleration lane will need to be be approved by Roads and Maritime Service
- The design speed is 110km/hr and is the speed limit of 110km/hr
- The internal road has been designed to design speed of 60km/hr
- The exit lane is located on a section of Hume Highway with a low gradient to allow for trucks to merge with the Hume Highway
- The vehicle sight distance for a truck will be met

4. PARKING ASSESSMENT

4.1 Parking Considerations using Development Control Plan Rates of Goulburn Mulwaree Council

Neither the Goulburn Mulwaree Council nor the NSW Roads and Traffic Authority publish parking rates for a quarry. Hence a first principles parking assessment has been undertaken. It should also be said that the quarry is not constrained in terms of area to allocate parking. There is ample room to provide sufficient number of car spaces.

4.2 First Principles Assessment of Parking Demand

The proposed quarry has four employees with an average arrival and departure rate of one articulated truck per hour. Based on these characteristics, the following parking would be required:

- Four staff car spaces
- One visitor car space
- One parking area for an articulated truck not engaged in the loading of quarry products.

The proposed quarry provides 5 car spaces, and on parking area for an articulated truck.

5. TRAFFIC IMPACT CONSIDERATIONS

5.1 Trip Generation

Neither the RTA nor Council provides trip generation rates for a quarry. Hence a first principle assessment of the trips to be generated has been undertaken. As discussed previously staff will arrive to the quarry before the AM peak hour. Based on the operation characteristics of the quarry, the following trip generation numbers have been estimated

- In the AM peak hour one articulated truck arriving and departing the quarry
- In the PM peak hour 4 (staff) trips leaving the quarry
- On a typical day there would be 5 inbound and 5 outbound car trips, and 10 inbound and 10 outbound articulated truck trips

The quarry is a low trip generator for the geographical size of the development.

5.2 Traffic Volumes

Figures 9 and 10 show the existing traffic volumes with the development traffic as estimated in the previous section. The additional quarry traffic is in red for origin traffic and blue for destination traffic. The traffic of the proposed quarry is low compared to the existing background traffic.

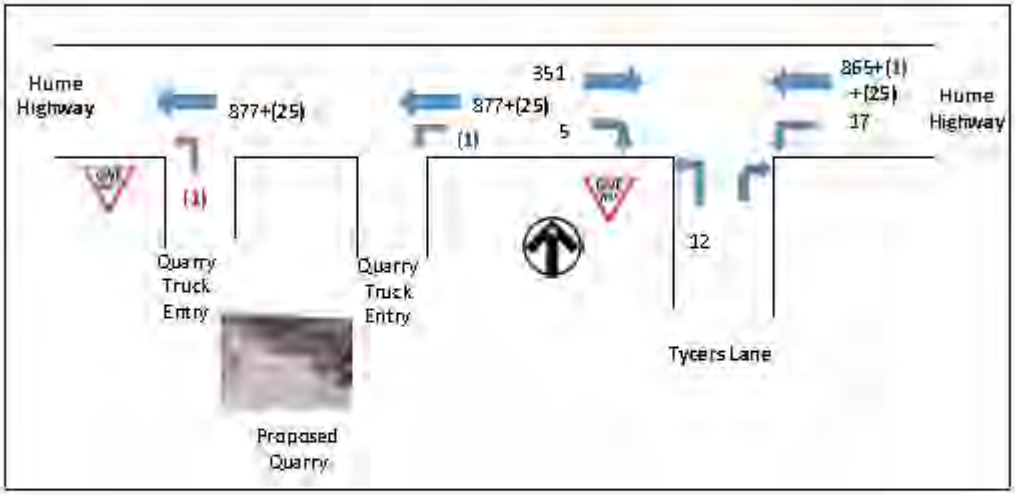


Figure 9: Weekday AM Peak Hour Traffic Volumes with Additional Quarry Traffic

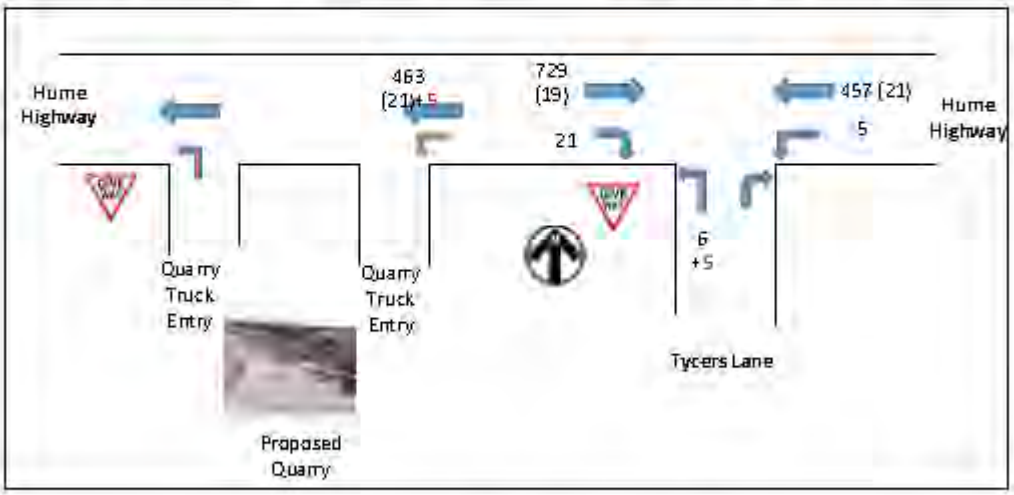


Figure 10: Weekday PM Peak Hour Traffic Volumes with Additional Quarry Traffic

5.3 Intersection Assessment

An intersection assessment has been undertaken for the weekday AM and PM hours for the intersections of Hume Highway with Tiyces Lane and the truck entrance and exit with the development traffic and the existing conditions.

The following Figures present the layout of the Quarry Driveways for entrance and exit using SIDRA.

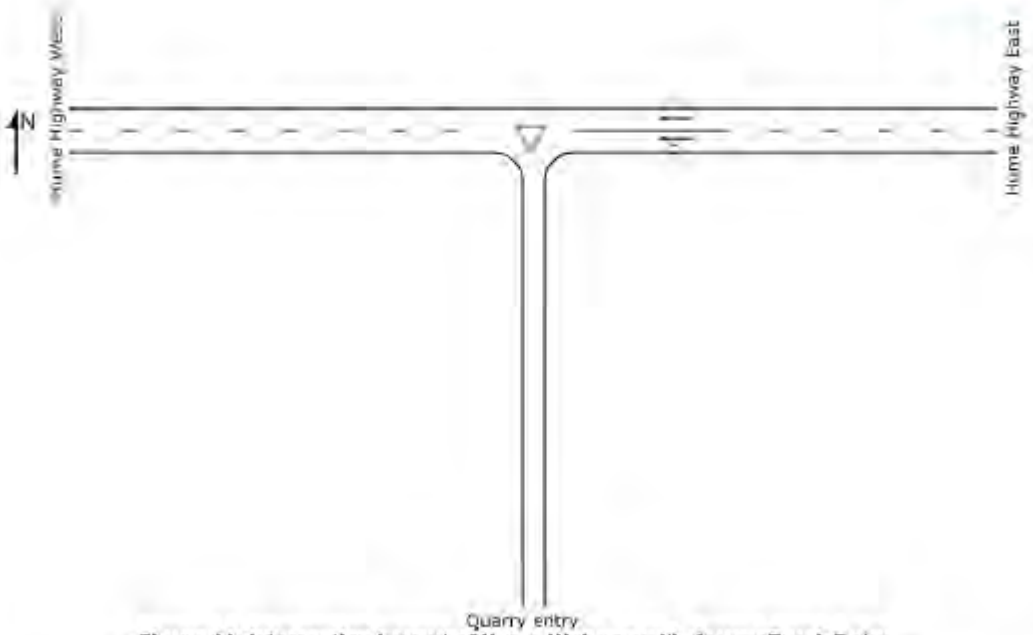


Figure 11: Intersection Layout of Hume Highway with Quarry Truck Entry

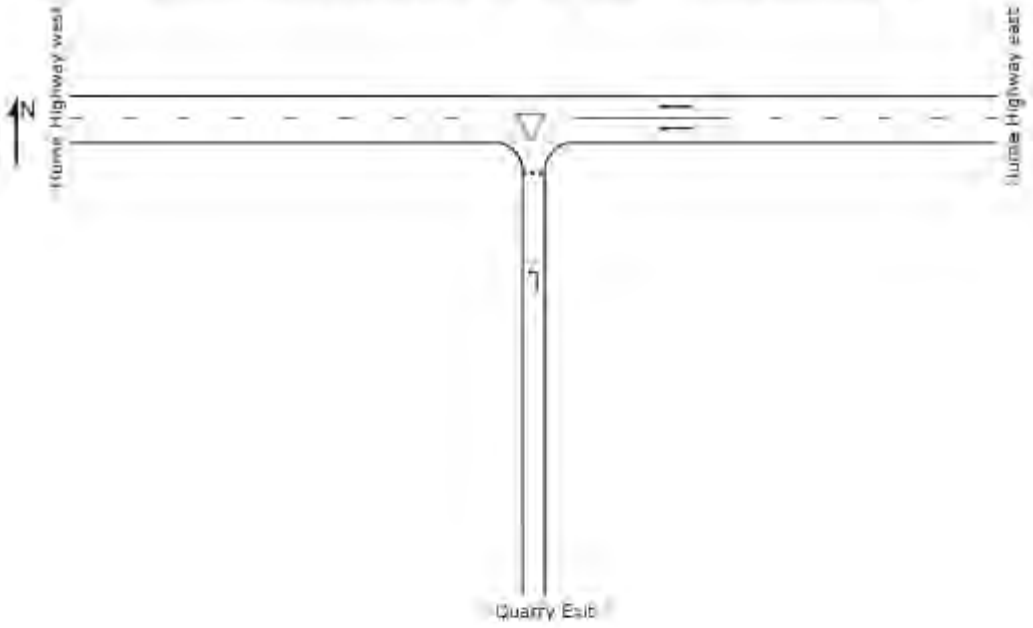


Figure 12: Intersection Layout of Hume Highway with Quarry Truck Exit

The results of the intersection assessment are as follows:

Hume Highway with Tyces Lane

- The intersection overall performs well with all turn movements having an acceptable Level of Service in the weekday AM and PM peak hour

Hume Highway with Quarry Entrance

- The intersection overall performs well with all turn movements having an acceptable Level of Service in the weekday AM and PM peak hour

Hume Highway with Quarry Exit

- The intersection overall performs well with all turn movements having an acceptable Level of Service in the weekday AM and PM peak hour

The full details of the SIDRA results for the existing conditions plus the development traffic are presented in Appendix B.

6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

- All parking demand from the quarry is contained on site.
- The trip generation of the proposed quarry in the weekday commuter hour is modest and can be accommodated at the intersection of Hume Highway with Tiyces Lane, and at the quarry entrance and exit on Hume Highway
- The location of the quarry vehicle entrance/exit has sufficient sight distance for vehicles entering and leaving the quarry.
- There are no traffic engineering reasons why a planning permit for the proposed quarry should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tiyces Lane south (Stage 1)											
1	L2	12	0.0	0.038	13.3	LOS A	0.1	0.8	0.71	0.84	51.3
3	R2	1	0.0	0.038	12.8	LOS A	0.1	0.8	0.71	0.84	51.2
Approach		13	0.0	0.038	13.3	LOS A	0.1	0.8	0.71	0.84	51.3
East: Hume Highway east											
4	L2	17	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	0.03	75.1
5	T1	890	2.8	0.237	0.0	LOS A	0.0	0.0	0.00	0.01	109.3
Approach		907	2.8	0.237	0.2	NA	0.0	0.0	0.00	0.01	108.4
West: Hume Highway west											
11	T1	368	4.6	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	109.9
12	R2	5	0.0	0.010	13.6	LOS A	0.0	0.2	0.66	0.77	54.0
Approach		373	4.6	0.097	0.2	NA	0.0	0.2	0.01	0.01	108.4
SouthWest: Median (RT Stage 2)											
32a	R1	1	0.0	0.013	43.4	LOS D	0.0	0.2	0.91	0.91	27.5
Approach		1	0.0	0.013	43.4	LOS D	0.0	0.2	0.91	0.91	27.5
All Vehicles		1294	3.2	0.237	0.3	NA	0.1	0.8	0.01	0.02	107.1

Table A1: Intersection Assessment of Hume Highway with Tiyces Lane Weekday AM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tiyces Lane south (Stage 1)											
1	L2	6	0.0	0.019	12.0	LOS A	0.1	0.4	0.61	0.67	52.3
3	R2	1	0.0	0.019	11.5	LOS A	0.1	0.4	0.61	0.67	52.2
Approach		7	0.0	0.019	12.0	LOS A	0.1	0.4	0.61	0.67	52.3
East: Hume Highway east											
4	L2	5	0.0	0.127	8.2	LOS A	0.0	0.0	0.00	0.01	75.3
5	T1	478	4.4	0.127	0.0	LOS A	0.0	0.0	0.00	0.01	109.6
Approach		483	4.3	0.127	0.1	NA	0.0	0.0	0.00	0.01	109.1
West: Hume Highway west											
11	T1	746	2.6	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	109.9
12	R2	21	0.0	0.024	10.2	LOS A	0.1	0.6	0.48	0.70	57.0
Approach		766	2.5	0.194	0.3	NA	0.1	0.6	0.01	0.02	107.1
SouthWest: Median (RT Stage 2)											
32a	R1	1	0.0	0.012	38.8	LOS C	0.0	0.2	0.90	0.90	29.5
Approach		1	0.0	0.012	38.8	LOS C	0.0	0.2	0.90	0.90	29.5
All Vehicles		1257	3.2	0.194	0.3	NA	0.1	0.6	0.01	0.02	107.1

Table A2: Intersection Assessment of Hume Highway with Tiyces Lane Weekday

APPENDIX B

SIDRA Intersection Results for Existing Traffic Conditions with Quarry Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tiyces Lane south (Stage 1)											
1	L2	12	0.0	0.038	13.2	LOS A	0.1	0.8	0.71	0.84	51.4
3	R2	1	0.0	0.038	12.6	LOS A	0.1	0.8	0.71	0.84	51.3
Approach		13	0.0	0.038	13.1	LOS A	0.1	0.8	0.71	0.84	51.4
East: Hume Highway east											
4	L2	17	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	0.03	75.1
5	T1	891	2.8	0.237	0.0	LOS A	0.0	0.0	0.00	0.01	109.3
Approach		908	2.8	0.237	0.2	NA	0.0	0.0	0.00	0.01	108.4
West: Hume Highway west											
11	T1	351	0.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	109.9
12	R2	5	0.0	0.010	13.7	LOS A	0.0	0.2	0.66	0.77	54.0
Approach		356	0.0	0.090	0.2	NA	0.0	0.2	0.01	0.01	108.4
SouthWest: Median (RT Stage 2)											
32a	R1	1	0.0	0.013	41.1	LOS C	0.0	0.2	0.91	0.91	28.5
Approach		1	0.0	0.013	41.1	LOS C	0.0	0.2	0.91	0.91	28.5
All Vehicles		1278	2.0	0.237	0.3	NA	0.1	0.8	0.01	0.02	107.1

Table B1: Intersection Assessment of Hume Highway with Tiyces Lane Weekday AM Peak Hour with Quarry Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tiyces Lane south (Stage 1)											
1	L2	11	0.0	0.024	9.7	LOS A	0.1	0.5	0.56	0.66	54.1
3	R2	1	0.0	0.024	9.1	LOS A	0.1	0.5	0.56	0.66	54.0
Approach		12	0.0	0.024	9.6	LOS A	0.1	0.5	0.56	0.66	54.1
East: Hume Highway east											
4	L2	5	0.0	0.127	8.2	LOS A	0.0	0.0	0.00	0.01	75.3
5	T1	478	4.4	0.127	0.0	LOS A	0.0	0.0	0.00	0.01	109.6
Approach		483	4.3	0.127	0.1	NA	0.0	0.0	0.00	0.01	109.1
West: Hume Highway west											
11	T1	726	0.0	0.186	0.0	LOS A	0.0	0.0	0.00	0.00	109.9
12	R2	21	0.0	0.024	10.2	LOS A	0.1	0.6	0.48	0.70	57.0
Approach		747	0.0	0.186	0.3	NA	0.1	0.6	0.01	0.02	107.1
SouthWest: Median (RT Stage 2)											
32a	R1	1	0.0	0.011	36.5	LOS C	0.0	0.2	0.90	0.90	30.6
Approach		1	0.0	0.011	36.5	LOS C	0.0	0.2	0.90	0.90	30.6
All Vehicles		1243	1.7	0.186	0.3	NA	0.1	0.6	0.01	0.02	106.7

Table B2: Intersection Assessment of Hume Highway with Tiyces Lane Weekday PM Peak Hour with Quarry Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway East											
4	L2	1	100.0	0.236	9.7	LOS A	0.0	0.0	0.00	0.00	72.3
5	T1	902	2.8	0.236	0.0	LOS A	0.0	0.0	0.00	0.00	109.8
Approach		903	2.9	0.236	0.0	NA	0.0	0.0	0.00	0.00	109.7
All Vehicles		903	2.9	0.236	0.0	NA	0.0	0.0	0.00	0.00	109.7

Table B3: Intersection Assessment of Hume Highway with Quarry Entrance Weekday AM Peak Hour with Quarry Traffic

Table B4: Intersection Assessment of Hume Highway with Quarry Entrance Weekday PM Peak Hour with Quarry Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Quarry Exit											
1	L2	1	100.0	0.002	9.0	LOS A	0.0	0.1	0.53	0.57	43.7
Approach		1	100.0	0.002	9.0	LOS A	0.0	0.1	0.53	0.57	43.7
East: Hume Highway east											
5	T1	902	2.8	0.235	0.0	LOS A	0.0	0.0	0.00	0.00	109.8
Approach		902	2.8	0.235	0.0	NA	0.0	0.0	0.00	0.00	109.8
All Vehicles		903	2.9	0.235	0.0	NA	0.0	0.1	0.00	0.00	109.6

Table B5: Intersection Assessment of Hume Highway with Quarry Exit Weekday AM Peak Hour with Quarry Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Quarry Exit											
1	L2	1	100.0	0.001	6.7	LOS A	0.0	0.1	0.39	0.50	44.9
Approach		1	100.0	0.001	6.7	LOS A	0.0	0.1	0.39	0.50	44.9
East: Hume Highway east											
5	T1	489	4.3	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	109.9
Approach		489	4.3	0.129	0.0	NA	0.0	0.0	0.00	0.00	109.9
All Vehicles		490	4.5	0.129	0.0	NA	0.0	0.1	0.00	0.00	109.6

Table B6: Intersection Assessment of Hume Highway with Quarry Exit Weekday PM Peak Hour with Quarry Traffic

APPENDIX 3

Austraffic Traffic Count

Tiyces Lane – 13 March 2017

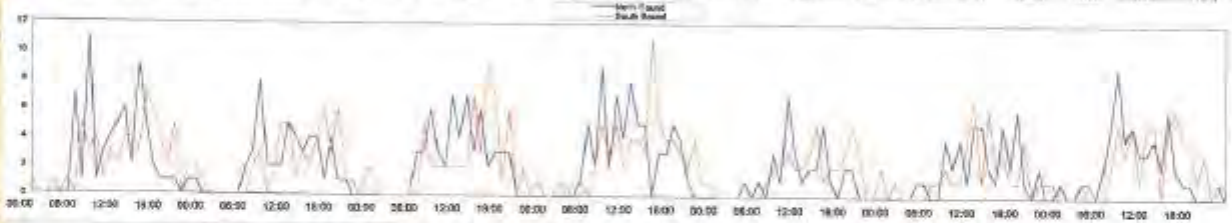
austraffic

Data, Speed & Class Overview

Job#	7764	**Location**	Tyson Lane Egress Point
Client	Latewis Engineering a	**Street**	Tyson Lane
Ref	Tyson LN south of Hun	**Suburb**	Bowen Creek
Speed Limit	60	**Shield**	1_N
Map Ref			

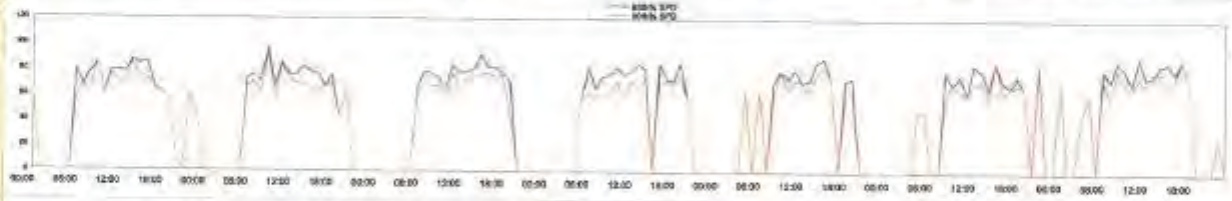
Date Record		Tuesday 07/03/2017			Wednesday 08/03/2017			Thursday 09/03/2017			Friday 10/03/2017			Saturday 11/03/2017			Sunday 12/03/2017			Monday 13/03/2017		
Interval: mm	00	North Bound	South Bound	Two-ways	North Bound	South Bound	Two-ways	North Bound	South Bound	Two-ways	South Bound	South Bound	Two-ways	North Bound	South Bound	Two-ways	North Bound	South Bound	Two-ways	North Bound	South Bound	Two-ways
Short	%	82%	88%	85%	80%	87%	84%	89%	96%	91%	81%	91%	86%	84%	100%	93%	83%	97%	90%	86%	90%	88%
Med	%	15%	10%	12%	17%	11%	14%	11%	4%	7%	16%	8%	12%	16%	0%	7%	17%	3%	10%	10%	6%	8%
Long	%	3%	2%	2%	2%	2%	2%	0%	0%	2%	3%	2%	2%	0%	0%	0%	0%	0%	0%	4%	4%	4%
7am-7pm	Vol	50	48	98	42	36	78	49	44	93	53	52	105	23	38	55	37	30	67	45	45	90
24Hr Vol		62	60	122	48	47	93	55	54	109	64	69	133	31	38	69	42	39	81	51	52	103
85%ile	Km	81.7	75.0	80.0	82.1	78.0	81.1	83.5	80.0	81.7	83.0	81.1	82.0	84.0	78.0	81.3	82.4	78.2	80.3	86.4	76.4	83.6
Mean Spd		69.5	62.3	65.9	70.4	65.4	67.9	72.5	67.6	70.1	70.5	67.4	69.0	71.8	65.6	68.5	70.1	67.1	68.6	72.8	66.7	69.7
Std Dev		13.2	15.6	14.8	11.9	12.8	12.6	15.5	15.2	15.6	12.3	13.7	13.1	13.6	12.2	13.2	11.5	14.4	13.1	13.5	11.2	13.0
AM Pk Interval Vol		11	5	14	8	5	11	7	5	9	8	5	14	7	3	10	4	4	6	9	5	14
AM Pk Factor		0.18	0.08	0.11	0.17	0.11	0.12	0.13	0.09	0.08	0.14	0.08	0.11	0.23	0.08	0.14	0.10	0.10	0.07	0.18	0.10	0.14
AM Pk 85%		76.4	71.5	74.8	70.2	80.8	77.6	83.6	77.5	82.6	75.0	63.0	78.7	73.8	65.1	71.5	80.0	79.4	74.0	88.3	77.9	89.9
AM Pk starts		08:00	07:00	08:00	09:00	11:00	09:00	11:00	07:00	11:00	08:00	06:00	06:00	10:00	10:00	10:00	08:00	13:00	09:30	08:00	08:00	08:00
PM Pk Interval Vol		9	7	12	5	6	10	7	8	11	8	11	12	3	5	7	6	7	12	6	6	11
PM Pk Factor		0.15	0.12	0.10	0.11	0.13	0.11	0.13	0.17	0.10	0.13	0.17	0.09	0.16	0.13	0.10	0.14	0.18	0.15	0.12	0.12	0.11
PM Pk 85%		64.3	76.8	82.0	75.8	67.0	75.0	79.0	82.0	83.4	79.0	76.8	80.4	80.0	79.3	82.8	76.5	78.0	84.2	87.5	70.2	84.7
PM Pk starts		15:00	16:00	15:00	12:00	17:00	12:00	13:00	16:00	16:00	12:00	15:00	12:00	15:00	14:00	14:00	16:00	12:00	12:00	15:00	16:00	15:00

Volume Distribution

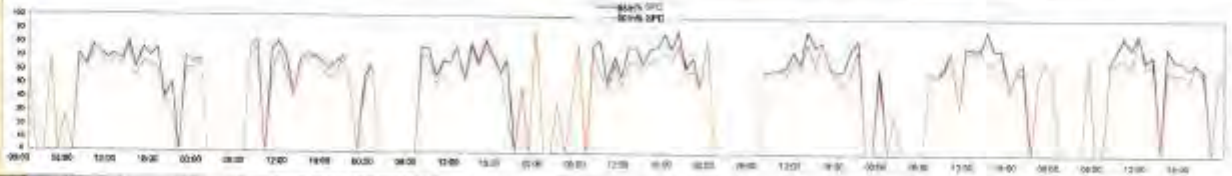


Speed Stats

North Bound Speed Dist. 50th & 85th Percentiles



South Bound Speed Dist. 50th & 85th Percentiles



1: Car+MotorCycle	49	50	99	38	40	78	46	49	95	51	60	111	25	34	59	32	37	69	42	45	87
2: Car + Trailer	2	3	5	1	1	2	1	3	4	1	0	1	1	4	5	1	1	4	2	2	4
3: 2 axle truck	7	4	11	7	4	11	6	2	8	9	3	12	5	0	5	4	0	6	5	3	8
4: 3axle truck	1	1	2	0	0	0	0	0	0	1	2	3	0	0	0	1	1	2	0	0	0
5: 4 axle truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6: 3 axle semi	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7: 4 axle semi	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8: 5 axle semi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9: 6 axle semi	2	1	3	1	1	2	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0
10: 7/8 axle truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
11: Road Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Job#		Title		Location		Tyrrell Lane Express Way														
	Client		Lelands Engineering		Street		Tyrrell Lane														
	Ref		Tyrrell LN south of Run		Suburb		Stream Creek														
	Speed Limit		60		Shield		T_14														
	Map Ref																				
12: Road Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13: Unpower	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14: Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unclassified	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	4
Pace Mr	56.0	56.0	56.0	62.0	56.0	56.0	67.0	65.0	65.0	63.0	54.0	60.0	54.0	54.0	59.0	61.0	65.0	66.0	61.0	60.0	60.0
%Vol	60%	62%	51%	57%	53%	53%	58%	63%	57%	50%	60%	47%	52%	56%	49%	57%	61%	51%	49%	52%	54%

Definitions
85th Percentile Speed = The speed at or below which 85% of volume is observed to travel
10kph Pace Speed = The 10kph speed range within which the largest percentage of volume is observed to travel

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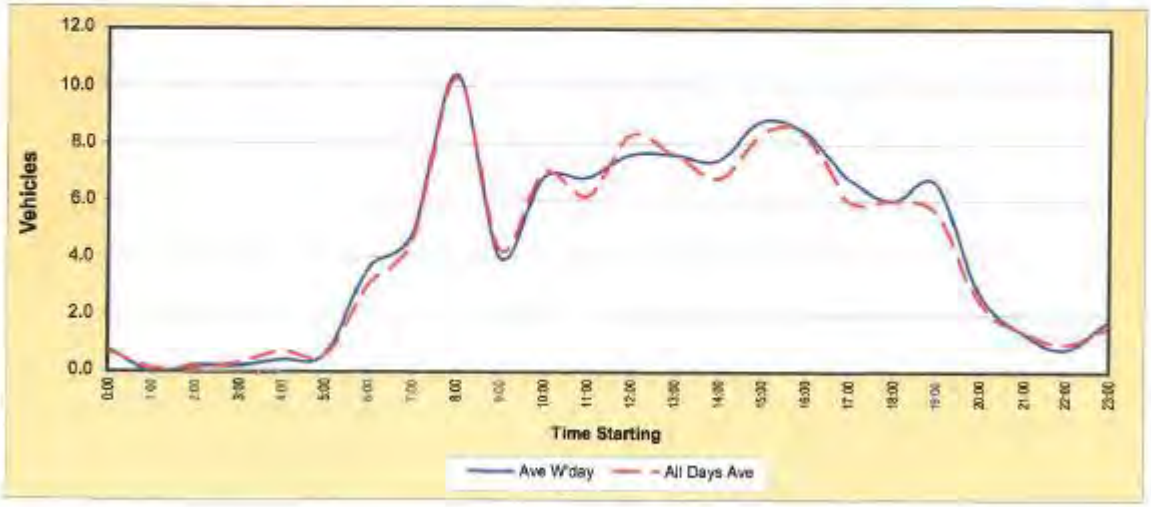
Road	Tiyces Lane
Location	Tiyces Lane Egress Point
Site No.	1_N
Start Date	Tuesday 07/03/2017
Direction	Two ways

Average Weekday	105
All Day Average	101
Weekday Heavy's	12.6%
All Day Heavy's	12.2%

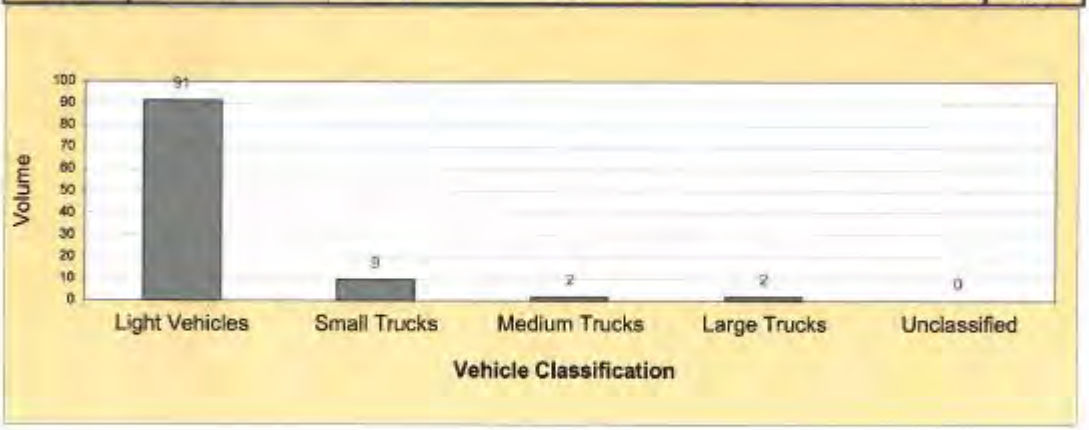
Starting Time	Day of Week							Ave W'day	All Days Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	3-Jul	4-Jul	5-Jul	6-Jul	7-Jul	8-Jul	9-Jul		
AM Peak	14	11	9	14	10	6	14		
PM Peak	12	10	11	12	7	12	11		
0:00	2	1	1	0	0	0	1	1	1
1:00	0	0	0	0	0	1	0	0	0
2:00	0	0	0	1	0	0	0	0	0
3:00	1	0	0	0	0	0	1	0	0
4:00	0	0	0	1	1	1	2	0	1
5:00	1	0	0	2	0	1	0	1	1
6:00	7	2	3	5	1	1	2	4	3
7:00	6	5	8	4	1	1	7	5	5
8:00	14	11	8	14	5	6	14	10	10
9:00	5	2	5	5	3	3	7	4	4
10:00	4	4	4	12	10	5	10	7	7
11:00	7	7	9	6	5	5	4	7	6
12:00	7	10	6	12	3	12	8	8	8
13:00	10	5	9	9	5	6	9	8	8
14:00	6	6	10	8	7	8	2	7	7
15:00	12	6	9	11	6	3	11	9	8
16:00	12	8	11	8	3	8	8	8	8
17:00	8	7	10	7	2	3	5	7	6
18:00	5	7	4	9	5	7	5	6	6
19:00	3	7	9	7	7	5	1	7	6
20:00	6	2	0	3	3	0	3	3	2
21:00	0	1	2	4	0	3	0	1	1
22:00	3	0	0	1	0	1	2	1	1
23:00	3	2	1	1	2	1	1	2	2
Total	**122**	**93**	**109**	**130**	**69**	**81**	**103**	**105**	**101**
% Heavies	**14.8%**	**16.1%**	**9.2%**	**13.8%**	**7.2%**	**9.9%**	**11.7%**	**12.6%**	**12.2%**



Volume Summary

Road	Tiyces Lane		**Light Vehicles**	87.4%	
Location	Tiyces Lane Egress Point		**Small Trucks**	9.0%	
Site No.	1_N		**Medium Trucks**	1.7%	
Start Date	Tuesday 07/03/2017		**Large Trucks**	1.9%	
Displayed	WeekDay Avg Two ways		**Unclassified**	0.0%	
AM Peak	08:00	10.4	**PM Peak**	15:00	8.8

Time Starting	Vehicle Classification					Hour Total
	Light Vehicles	Small Trucks	Medium Trucks	Large Trucks	Unclassified	
0:00	1	0	0	0	0	1
1:00	0	0	0	0	0	0
2:00	0	0	0	0	0	0
3:00	0	0	0	0	0	0
4:00	0	0	0	0	0	0
5:00	0	0	0	0	0	1
6:00	3	1	0	0	0	4
7:00	5	0	0	0	0	5
8:00	9	1	0	0	0	10
9:00	4	0	0	0	0	4
10:00	6	1	0	0	0	7
11:00	4	1	1	0	0	7
12:00	7	1	0	0	0	8
13:00	7	0	0	0	0	8
14:00	7	1	0	0	0	7
15:00	8	0	0	0	0	9
16:00	8	1	0	0	0	8
17:00	6	0	0	0	0	7
18:00	5	0	0	0	0	6
19:00	6	1	0	0	0	7
20:00	3	0	0	0	0	3
21:00	1	0	0	0	0	1
22:00	1	0	0	0	0	1
23:00	2	0	0	0	0	2
Total	91	9	2	2	0	105



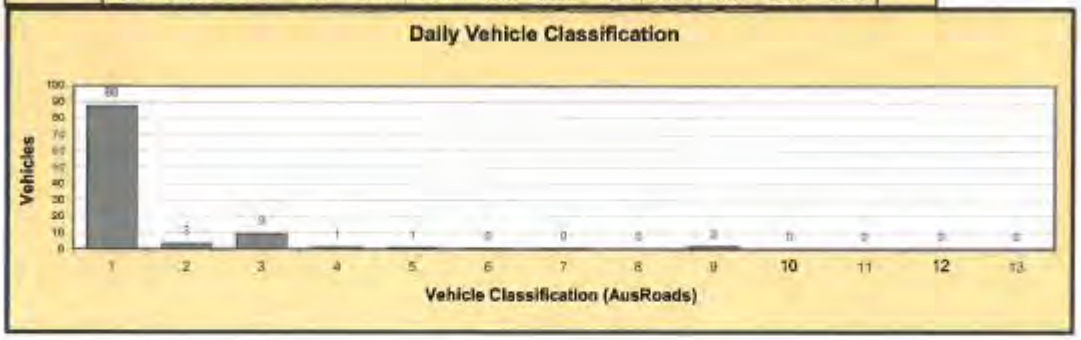
Consolidated Classified

austraffic

Road	Tyces Lane	**AADT**	105		
Location	Tyces Lane Egress Point	**Ave Speed**	68.5		
Site No.	1_N	**85%ile**	82		
Start Date	Tuesday 07/03/2017	**% Heavy's**	12.6%		
Displayed	WeekDay Avg				

Peak	Time	Vol
AM	08:00	10
PM	15:00	9

Time Starting	Vehicle Classification													Total	Speed	
	1	2	3	4	5	6	7	8	9	10	11	12	13		Ave.	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	63.9	63.5
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	37.8	37.0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	70.2	70.0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	51.0	50.5
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	54.9	60.4
6:00	3	0	1	0	0	0	0	0	0	0	0	0	0	3.6	66.8	76.5
7:00	4	0	0	0	0	0	0	0	0	0	0	0	0	4.8	69.6	75.2
8:00	8	1	1	0	0	0	0	0	0	0	0	0	0	10.4	67.0	76.3
9:00	3	0	0	0	0	0	0	0	0	0	0	0	0	4.0	67.3	74.9
10:00	5	0	1	0	0	0	0	0	0	0	0	0	0	6.8	67.1	74.2
11:00	4	0	1	1	0	0	0	0	0	0	0	0	0	6.8	72.1	79.9
12:00	6	0	1	0	0	0	0	0	0	0	0	0	0	7.6	71.3	77.5
13:00	7	0	0	0	0	0	0	0	0	0	0	0	0	7.6	70.0	80.5
14:00	7	0	1	0	0	0	0	0	0	0	0	0	0	7.4	74.6	82.1
15:00	8	0	0	0	0	0	0	0	0	0	0	0	0	8.8	74.1	82.1
16:00	7	0	1	0	0	0	0	0	0	0	0	0	0	8.4	72.5	80.9
17:00	6	1	0	0	0	0	0	0	0	0	0	0	0	6.8	68.2	75.2
18:00	5	0	0	0	0	0	0	0	0	0	0	0	0	6.0	66.6	74.2
19:00	6	0	1	0	0	0	0	0	0	0	0	0	0	6.6	58.6	73.8
20:00	3	0	0	0	0	0	0	0	0	0	0	0	0	2.8	52.9	63.1
21:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1.4	56.7	60.3
22:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0.8	58.8	65.3
23:00	2	0	0	0	0	0	0	0	0	0	0	0	0	1.8	61.5	67.4
Total	88	3	9	1	1	0	0	0	2	0	0	0	0	105	68.5	82.0
	84.1%	3.3%	9.0%	1.0%	0.8%	0.2%	0.2%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%			



Classified Summary