

**APPLICATION AS NOTIFIED**

**Road Metals Limited**

**(RM210685)**

**Submissions Close  
16 November 2021**

## **QUEENSTOWN LAKES DISTRICT COUNCIL**

### **SERVICE OF NOTICE / LIMITED NOTIFICATION**

**Service of Notice for Limited Notification of a Resource Consent application under Section 95B of the Resource Management Act 1991.**

**The Queenstown Lakes District Council has received an application for a resource consent from:**

Road Metals Limited

**What is proposed:**

Application under Section 88 of the Resource Management Act 1991 (RMA) for land use consent to undertake a Mining Activity for the extraction and processing of aggregate for a 7-year term.

**The location in respect of which this application relates is situated at:**

The subject site is situated at Kane Road and is legally described as Section 53 Block VII Lower Hawea Survey held in Record of Title OT10B/549.

**A full copy of this Limited Notified package is available for you to download on the following link:**

<https://www.qldc.govt.nz/services/resource-consents/notified-resource-consents#limited-not-rc> or via our edocs website using RM210685 as the reference <https://edocs.qldc.govt.nz/Account/Login>

**This file can also be viewed at our public computers at these Council offices:**

- **74 Shotover Street, Queenstown;**
- **Gorge Road, Queenstown;**
- **and 47 Ardmore Street, Wanaka during normal office hours (8.30am to 5.00pm).**

The Council planner processing this application on behalf of the Council is Hannah Clowes, who may be contacted by phone at 0274559007 or e-mail at [hannah.clowes@qldc.govt.nz](mailto:hannah.clowes@qldc.govt.nz)

Any person who is notified of this application, but a person who is a trade competitor of the applicant may do so only if that person is directly affected by an effect of the activity to which the application relates that –

- a) adversely affects the environment; and
- b) does not relate to trade competition or the effects of trade competition.

**If you wish to make a submission on this application, you may do so by sending a written submission to the consent authority no later than:**

16 November 2021

The submission must be dated, signed by you and must include the following information:


- a) Your name and postal address and phone number/fax number.
- b) Details of the application in respect of which you are making the submission including location.
- c) Whether you support or oppose the application.
- d) Your submission, with reasons.
- e) The decision you wish the consent authority to make.
- f) Whether you wish to be heard in support of your submission.

You may make a submission by sending a written or electronic submission to Council (details below). The submission should be in the format of Form 13. Copies of this form are available Council website:

[https://www.qldc.govt.nz/services/resource-consents/application-forms-and-fees#other\\_forms](https://www.qldc.govt.nz/services/resource-consents/application-forms-and-fees#other_forms)

You must serve a copy of your submission to the applicant (Peter Murphy [peter.murphy@roadmetals.co.nz](mailto:peter.murphy@roadmetals.co.nz)) as soon as reasonably practicable after serving your submission to Council:

#### QUEENSTOWN LAKES DISTRICT COUNCIL



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(Signed by Dr Lee Beattie pursuant to a delegation given under Section 34A of the Resource Management Act 1991)

**Date of Notification:** 18 October 2021

#### Address for Service for Consent Authority:

Queenstown Lakes District Council  
Private Bag 50072, Queenstown 9348  
Gorge Road, Queenstown 9300

Phone  
Email  
Website

03 441 0499  
[rcsubmission@qldc.govt.nz](mailto:rcsubmission@qldc.govt.nz)  
[www.qldc.govt.nz](http://www.qldc.govt.nz)



APPLICATION FOR RESOURCE CONSENT OR  
FAST TRACK RESOURCE CONSENT

# FORM 9: GENERAL APPLICATION



Under Section 87AAC, 88 & 145 of the Resource Management Act 1991 (Form 9)

**PLEASE COMPLETE ALL MANDATORY FIELDS\* OF THIS FORM.**

This form provides contact information and details of your application. If your form does not provide the required information it will be returned to you to complete. Until we receive a completed form and payment of the initial fee, your application may not be accepted for processing.



## APPLICANT //

- Must be a person or legal entity (limited liability company or trust).
- Full names of all trustees required.
- The applicant name(s) will be the consent holder(s) responsible for the consent and any associated costs.

\*Applicant's Full Name / Company / Trust:

(Name Decision is to be issued in)

All trustee names (if applicable):

\*Contact name for company or trust:

\*Postal Address:

\*Post code:

\*Contact details supplied must be for the applicant and not for an agent acting on their behalf and must include a valid postal address

\*Email Address:

\*Phone Numbers: Day

Mobile:

\*The Applicant is:

Owner

Prospective Purchaser (of the site to which the application relates)

Occupier

Lessee

Other - Please Specify:



Our preferred methods of corresponding with you are by email and phone.

The decision will be sent to the Correspondence Details by email unless requested otherwise.



## CORRESPONDENCE DETAILS //

If you are acting on behalf of the applicant e.g. agent, consultant or architect please fill in your details in this section.

\*Name & Company:

\*Phone Numbers: Day

Mobile:

\*Email Address:

\*Postal Address:

\*Postcode:



## INVOICING DETAILS //

Invoices will be made out to the applicant but can be sent to another party if paying on the applicant's behalf. For more information regarding payment please refer to the Fees Information section of this form.

\*Please select a preference for who should receive any invoices and how they would like to receive them.

Applicant:

Agent:

Other - Please specify:

Email:

Post:

\*Attention:

\*Postal Address:

\*Post code:

\*Please provide an email AND full postal address.

\*Email:



## OWNER DETAILS // Please supply owner details for the subject site/property if not already indicated above

Owner Name:

Owner Address:

If the property has recently changed ownership please indicate on what date (approximately) AND the names of the previous owners:

Date:

Names:



## DEVELOPMENT CONTRIBUTIONS INVOICING DETAILS //

If it is assessed that your consent requires development contributions any invoices and correspondence relating to these will be sent via email. Invoices will be sent to the email address provided above unless an alternative address is provided below. Invoices will be made out to the applicant/owner but can be sent to another party if paying on the applicant's behalf.

\*Please select a preference for who should receive any invoices.

Details are the same as for invoicing

Applicant:

Landowner:

Other, please specify:

\*Attention:

\*Email:

[Click here for further information and our estimate request form](#)



## DETAILS OF SITE // Legal description field must list legal descriptions for all sites pertaining to the application. Any fields stating 'refer AEE' will result in return of the form to be fully completed.

\*Address / Location to which this application relates:

\*Legal Description: Can be found on the Computer Freehold Register or Rates Notice – e.g Lot x DPxxx (or valuation number)

District Plan Zone(s):



## SITE VISIT REQUIREMENTS // Should a Council officer need to undertake a site visit please answer the questions below

Is there a gate or security system restricting access by council?

YES  NO

Is there a dog on the property?

YES  NO

Are there any other hazards or entry restrictions that council staff need to be aware of?

YES  NO

If 'yes' please provide information below



## PRE-APPLICATION MEETING OR URBAN DESIGN PANEL

Have you had a pre-application meeting with QLDC or attended the urban design panel regarding this proposal?

Yes

No

Copy of minutes attached

If 'yes', provide the reference number and/or name of staff member involved:



## CONSENT(S) APPLIED FOR // \* Identify all consents sought

Land use consent

Subdivision consent

Change/cancellation of consent or consent notice conditions

Certificate of compliance

Extension of lapse period of consent (time extension) s125

Existing use certificate



## QUALIFIED FAST-TRACK APPLICATION UNDER SECTION 87AAC

Controlled Activity

Deemed Permitted Boundary Activity

If your consent qualifies as a fast-track application under section 87AAC, tick here to opt out of the fast track process



## BRIEF DESCRIPTION OF THE PROPOSAL //

\* Please complete this section, any form stating 'refer AEE' will be returned to be completed with a description of the proposal

\*Consent is sought to:



## APPLICATION NOTIFICATION

Are you requesting public notification for the application?

Yes

No

Please note there is an additional fee payable for notification. Please refer to Fees schedule



## OTHER CONSENTS

Is consent required under a National Environmental Standard (NES)?

- NES for Assessing and Managing Contaminants in Soil to Protect Human Health 2012

An applicant is required to address the NES in regard to past use of the land which could contaminate soil to a level that poses a risk to human health. Information regarding the NES is available on the website

<https://environment.govt.nz/publications/national-environmental-standard-for-assessing-and-managing-contaminants-in-soil-to-protect-human-health-information-for-landowners-and-developers/>

You can address the NES in your application AEE OR by selecting ONE of the following:

This application does not involve subdivision (excluding production land), change of use or removal of (part of) a fuel storage system. Any earthworks will meet section 8(3) of the NES (including volume not exceeding 25m<sup>3</sup> per 500m<sup>2</sup>). Therefore the NES does not apply.

I have undertaken a comprehensive review of District and Regional Council records and I have found no record suggesting an activity on the HAIL has taken place on the piece of land which is subject to this application.

NOTE: depending on the scale and nature of your proposal you may be required to provide details of the records reviewed and the details found.



## OTHER CONSENTS // CONTINUED

I have included a Preliminary Site Investigation undertaken by a suitably qualified person.

An activity listed on the HAIL has more likely than not taken place on the piece of land which is subject to this application. I have addressed the NES requirements in the Assessment of Environmental Effects.

Any other National Environmental Standard

Yes

N/A

Are any additional consent(s) required that have been applied for separately?

Otago Regional Council

Consents required from the Regional Council (note if have/have not been applied for):

Yes

N/A



## INFORMATION REQUIRED TO BE SUBMITTED //

Attach to this form any information required (see below & appendices 1-2).

To be accepted for processing, your application should include the following:

Computer Freehold Register for the property (no more than 3 months old) and copies of any consent notices and covenants (Can be obtained from Land Information NZ at <https://www.linz.govt.nz>).

A plan or map showing the locality of the site, topographical features, buildings etc.

A site plan at a convenient scale.

Written approval of every person who may be adversely affected by the granting of consent (s95E).

An Assessment of Effects (AEE).

An AEE is a written document outlining how the potential effects of the activity have been considered along with any other relevant matters, for example if a consent notice is proposed to be changed. Address the relevant provisions of the District Plan and affected parties including who has or has not provided written approval. See [Appendix 1](#) for more detail.



We prefer to receive applications electronically – please see Appendix 5 – [Naming of Documents Guide](#) for how documents should be named. Please ensure documents are scanned at a minimum resolution of 300 dpi. Each document should be no greater than 10mb



## PRIVACY INFORMATION

The information you have provided on this form is required so that your application can be processed under the Resource Management Act 1991 and may also be used in statistics collected and provided to the Ministry for the Environment and Queenstown Lakes District Council. The information will be stored on a public register and may be made available to the public on request or on the company's or the Council's websites.



## FEES INFORMATION

Section 36 of the Resource Management Act 1991 deals with administrative charges and allows a local authority to levy charges that relate to, but are not limited to, carrying out its functions in relation to receiving, processing and granting of resource consents (including certificates of compliance and existing use certificates).

Invoiced sums are payable by the 20th of the month after the work was undertaken. If unpaid, the processing of an application, provision of a service, or performance of a function will be suspended until the sum is paid. You may also be required to make an additional payment, or bring the account up to date, prior to milestones such as notification, setting a hearing date or releasing the decision. In particular, all charges related to processing of a resource consent application are payable prior to issuing of the decision. Payment is due on the 20th of the month or prior to the issue date – whichever is earlier.



## FEES INFORMATION // CONTINUED

If your application is notified or requires a hearing you will be requested to pay a notification deposit and/or a hearing deposit. An applicant may not offset any invoiced processing charges against such payments.

Section 357B of the Resource Management Act provides a right of objection in respect of additional charges. An objection must be in writing and must be lodged within 15 working days of notification of the decision.

**LIABILITY FOR PAYMENT** – Please note that by signing and lodging this application form you are acknowledging that the Applicant is responsible for payment of invoices and in addition will be liable to pay all costs and expenses of debt recovery and/or legal costs incurred by QLDC related to the enforcement of any debt.

**MONITORING FEES** – Please also note that if this application is approved you will be required to meet the costs of monitoring any conditions applying to the consent, pursuant to Section 35 of the Resource Management Act 1991.

**DEVELOPMENT CONTRIBUTIONS** – Your development, if granted, may also incur development contributions under the Local Government Act 2002. You will be liable for payment of any such contributions.

A list of Consent Charges is available on the on the Resource Consent Application Forms section of the QLDC website. If you are unsure of the amount to pay, please call 03 441 0499 and ask to speak to our duty planner.

Please ensure to [reference any banking payments correctly](#). Incorrectly referenced payments may cause delays to the processing of your application whilst payment is identified.

If the initial fee charged is insufficient to cover the actual and reasonable costs of work undertaken on the application you will be required to pay any additional amounts and will be invoiced monthly as work on the application continues. Please note that if the Applicant has outstanding fees owing to Council in respect of other applications, Council may choose to apply the initial fee to any outstanding balances in which case the initial fee for processing this application may be deemed not to have been paid.



## PAYMENT // An initial fee must be paid prior to or at the time of the application and proof of payment submitted.

Please reference your payments as follows:

Applications yet to be submitted: RM followed by first 5 letters of applicant name e.g RMJONES

Applications already submitted: Please use the RM# reference that has been assigned to your application, this will have been emailed to yourself or your agent.

Please note processing will not begin until payment is received (or identified if incorrectly referenced).

I confirm payment by:

Bank transfer to account 02 0948 0002000 00 (If paying from overseas swiftcode is – BKNZ22)

Manual Payment (can only be accepted once application has been lodged and acknowledgement email received with your unique RM reference number)

\*Reference

\*Amount Paid: Landuse and Subdivision Resource Consent fees - please select from drop down list below

(For required initial fees refer to website for Resource Consent Charges or spoke to the Duty Planner by phoning 03 441 0499)

\*Date of Payment

Invoices are available on request



## APPLICATION & DECLARATION

The Council relies on the information contained in this application being complete and accurate. The Applicant must take all reasonable steps to ensure that it is complete and accurate and accepts responsibility for information in this application being so.

If lodging this application as **the Applicant:**

I/we hereby represent and warrant that I am/we are aware of all of my/our obligations arising under this application including, in particular but without limitation, my/our obligation to pay all fees and administrative charges (including debt recovery and legal expenses) payable under this application as referred to within the Fees Information section.

OR:

If lodging this application as **agent of the Applicant:**

I/we hereby represent and warrant that I am/we are authorised to act as agent of the Applicant in respect of the completion and lodging of this application and that the Applicant is aware of all of his/her/its obligations arising under this application including, in particular but without limitation, his/her/its obligation to pay all fees and administrative charges (including debt recovery and legal expenses) payable under this application as referred to within the Fees Information section.

I hereby apply for the resource consent(s) for the Proposal described above and I certify that, to the best of my knowledge and belief, the information given in this application is complete and accurate.

PLEASE TICK

Signed (by or as authorised agent of the Applicant) \*\*

Full name of person lodging this form

Firm/Company

Dated

\*\*If this form is being completed on-line you will not be able, or required, to sign this form and the on-line lodgement will be treated as confirmation of your acknowledgement and acceptance of the above responsibilities and liabilities and that you have made the above representations, warranties and certification.



Section 2 of the District Plan provides additional information on the information that should be submitted with a land use or subdivision consent.

The RMA (Fourth Schedule to the Act) requires the following:

### 1 INFORMATION MUST BE SPECIFIED IN SUFFICIENT DETAIL

- Any information required by this schedule, including an assessment under clause 2(1)(f) or (g), must be specified in sufficient detail to satisfy the purpose for which it is required.

### 2 INFORMATION REQUIRED IN ALL APPLICATIONS

- (1) An application for a resource consent for an activity (the activity) must include the following:

- (a) a description of the activity;
- (b) a description of the site at which the activity is to occur;
- (c) the full name and address of each owner or occupier of the site;
- (d) a description of any other activities that are part of the proposal to which the application relates;
- (e) a description of any other resource consents required for the proposal to which the application relates;
- (f) an assessment of the activity against the matters set out in Part 2;
- (g) an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b).

(2) The assessment under subclause (1)(g) must include an assessment of the activity against—

- (a) any relevant objectives, policies, or rules in a document; and
- (b) any relevant requirements, conditions, or permissions in any rules in a document; and
- (c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).

(3) An application must also include an assessment of the activity's effects on the environment that—

- (a) includes the information required by clause 6; and
- (b) addresses the matters specified in clause 7; and
- (c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

Information provided within the Form above

Include in an attached Assessment of Effects (see Clauses 6 & 7 below)

### ADDITIONAL INFORMATION REQUIRED IN SOME APPLICATIONS

- An application must also include any of the following that apply:
  - (a) if any permitted activity is part of the proposal to which the application relates, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity (so that a resource consent is not required for that activity under section 87A(1));
  - (b) if the application is affected by section 124 or 165ZH(1)(c) (which relate to existing resource consents), an assessment of the value of the investment of the existing consent holder (for the purposes of section 104(2A));



## ASSESSMENT OF ENVIRONMENTAL EFFECTS

### Clause 6: Information required in assessment of environmental effects

- (1) An assessment of the activity's effects on the environment must include the following information:
  - (a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity;
  - (b) an assessment of the actual or potential effect on the environment of the activity;
  - (c) if the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use;
  - (d) if the activity includes the discharge of any contaminant, a description of—
    - (i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
    - (ii) any possible alternative methods of discharge, including discharge into any other receiving environment;
  - (e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect;
  - (f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted;
  - (g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved;
  - (h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).
- (2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.
- (3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—
  - (a) oblige the applicant to consult any person; or
  - (b) create any ground for expecting that the applicant will consult any person.

### CLAUSE 7: MATTERS THAT MUST BE ADDRESSED BY ASSESSMENT OF ENVIRONMENTAL EFFECTS

- (1) An assessment of the activity's effects on the environment must address the following matters:
  - (a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects;
  - (b) any physical effect on the locality, including any landscape and visual effects;
  - (c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity;
  - (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations;
  - (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants;
  - (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.
- (2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.



## UNDER THE FOURTH SCHEDULE TO THE ACT:

- An application for a subdivision consent must also include information that adequately defines the following:
  - (a) the position of all new boundaries:
  - (b) the areas of all new allotments, unless the subdivision involves a cross lease, company lease, or unit plan:
  - (c) the locations and areas of new reserves to be created, including any esplanade reserves and esplanade strips:
  - (d) the locations and areas of any existing esplanade reserves, esplanade strips, and access strips:
  - (e) the locations and areas of any part of the bed of a river or lake to be vested in a territorial authority under section 237A:
  - (f) the locations and areas of any land within the coastal marine area (which is to become part of the common marine and coastal area under section 237A):
  - (g) the locations and areas of land to be set aside as new roads.

## Will your resource consent result in a Development Contribution and what is it?

- A Development Contribution can be triggered by the granting of a resource consent and is a financial charge levied on new developments. It is assessed and collected under the Local Government Act 2002. It is intended to ensure that any party, who creates additional demand on Council infrastructure, contributes to the extra cost that they impose on the community. These contributions are related to the provision of the following council services:
  - Water supply
  - Wastewater supply
  - Stormwater supply
  - Reserves, Reserve Improvements and Community Facilities
  - Transportation (also known as Roding)

[Click here for more information on development contributions and their charges](#)

OR Submit an Estimate request \*please note administration charges will apply



Please note that some land use consents can be dealt with as fast track land use consent. This term applies to resource consents where they require a controlled activity and no other activity. A 10 day processing time applies to a fast track consent.

If the consent authority determines that the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

A fast-track application may cease to be a fast-track application under section 87AAC(2) of the Act.

While it is not essential that your documents are named the following, it would be helpful if you could title your documents for us. You may have documents that do not fit these names; therefore below is a guide of some of the documents we receive for resource consents. Please use a generic name indicating the type of document.

Application Form 9

Assessment of Environmental Effects (AEE)

Computer Register (CFR)

Covenants &amp; Consent Notice

Affected Party Approval/s

Landscape Report

Ecological Report

Engineering Report

Geotechnical Report

Wastewater Assessment

Traffic Report

Waste Event Form

Urban Design Report



**FORM 9: APPLICATION FOR RESOURCE CONSENT  
UNDER SECTION 88 OF THE  
RESOURCE MANAGEMENT ACT 1991**

To: Queenstown Lakes District Council  
10 Gorge Road  
Queenstown 9300

**1) We, Road Metals Company Limited (Road Metals) (PO Box 212, Oamaru 9444) apply for the following type(s) of resource consents:**

A land use consent for aggregate extraction on land at Kane Road, Hawea Flat. The site of the quarry is within the Rural General Zone (RG) of the Operative District Plan, and the Rural Zone of the Proposed District Plan.

Resource consent is required under the following rule of the operative Queenstown Lakes District Plan (QLDP):

- a) **Discretionary Activity** Consent under Rule 5.3.3.3 (viii) Mining Activities.

**2) The activity to which the application relates (the proposed activity) is as follows:**

Road Metals are proposing to establish a new quarry. A detailed description of the activity is contained within this report.

**3) The site at which the proposed activity is to occur is as follows:**

The application site is located at Kane Road, Hawea Flat and is located 5km to the south of Hawea Flat township. The location of the site is shown on Figure 1.

The legal description is Section 53 Block VII Lower Hawea SD, and the site has an area of 128ha. A copy of the Certificate of Title for the site are contained in **Appendix A**.

**4) There are no other activities that are part of the proposal to which this application relates.**

Not applicable

**5) There are no additional resource consents required as part of the proposal to which this application relates.**

Not applicable.

**6) We attach an assessment of the proposed activity's effect on the environment that–**

- a) Includes the information requested by clause 6 of Schedule 4 on the Resource Management Act 1991.
- b) Addresses the matters specified in clause 7 of Schedule 4 of the Resource Management Act 1991.

c) Includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

**7) We attach an assessment of the proposed activity against the matters set out in Part 2 of the Resource Management Act 1991.**

See Part 6.2.1 of the AEE.

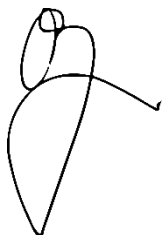
**8) We attach an assessment of the proposed activity against any relevant provisions of a document referred to in section 104(1)(b) of the Resource Management Act 1991, including the information required by clause 2(2) of Schedule 4 of that Act.**

See Part 6.2.3 of the AEE.

**9) We attach the following further information required to be included in this application by the district plan, the Resource Management Act 1991, or any regulations made under that Act:**

This application includes an assessment of the Resource Management Act 1991 and the Queenstown Lakes District Plan.

Dated this 2nd day of August 2021.



Grant Finn  
**Manager – Consents & Compliance**

Signature of the applicant (or person authorised to sign on behalf of the applicant)

**Address for service:**

Grant Finn  
Road Metals Limited  
PO 212  
Oamaru 9444

**Address for fees/charges:**

Richard Hardwick  
Road Metals Co Limited  
PO Box 212  
Oamaru 9444

Telephone: 021 350 192

Email: [grant.finn@roadmetals.co.nz](mailto:grant.finn@roadmetals.co.nz)

## 1.0 INTRODUCTION

Road Metals Company Limited (Road Metals) proposes to establish a quarrying operation to extract and process aggregate on a site located at Kane Road, Hawea Flat.

This report is a resource consent application document under the Resource Management Act 1991 (RMA), including an Assessment of Effects on the Environment (AEE), seeking land use resource consent from Queenstown Lakes District Council (QLDC) for the proposed quarry and associated site operations (crushing, screening etc.).

Extraction of aggregate will involve the use of standard quarry plant and machinery while access to the site will be maintained via an existing constructed track from Kane Road leading into the site, where the proposed quarry will be located. Processing (screening and crushing) will also be undertaken on-site.

## 2.0 SITE AND SURROUNDING AREA

### 2.1 The Site

The site is a rectangle, 12 ha in area located on the western side of Kane Road approximately 110m north of the intersection of Kane Road and McKay Road. The site is shown in **Appendix B**.

The site is part of the farmed terrace on the eastern side of the Clutha River. The site is part of the broader alluvial plains on the true left of the Clutha River that extend from Hawea and the terminal moraine of the Hawea Glacier, south towards Luggate – Tarras Road. The eastern side of the plains, adjacent to the toe of the mountain Ranges that include Trig Hill and Grand view peaks, is incised by a wide, and deep, ancient river channel. The site takes in a slice of the alluvial plains, and ancient river channel and extends to the toe of the mountain range.

The site is currently used for grazing stock, lucerne production and is divided into several paddocks with stock fencing.

A more detailed description of the site is provided for in the Landscape Assessment report compiled by *Michelle Snodgrass Landscape Architect* attached **Appendix C**.

### 2.2 Surrounding Land Uses

Land within the vicinity of the site and the broader eastern plains between the Clutha River and toe of the Grandview Range, north to Hawea Flat and south to Luggate-Tarras Road, is farmed largely for grazing stock.

Two properties, Lot 1 DP341373 and Lot 2 DP341373, approximately 3.0km and 3.5km to the south-west both include quarries of a similar size. One of these is managed by *Central Machine Hire* and Council records indicate their consent sought to quarry aggregate over an area of 10.56ha; to a depth of 10m and a total volume of up to 953,000m<sup>3</sup> for a period of 20 years.

An existing dwelling is located immediately to north on Lot 2 DP 422901 and is approximately 0.3km away from the proposed extraction area.

### 2.3 Roading Network

The site has an extensive frontage and existing access arrangements to Kane Road. The proposed quarrying activity will result in the widening of the existing access point to Kane Road. The upgraded access will accord with Council Standard Drawings.

## 2.4 Other Values

The site has a relatively flat topography, the majority of which is open pasture. In terms of vegetation cover, the site is largely pastoral grasses with a group of exotic conifers in the north-western corner of the site and a line of approximately sixteen trees on the southern boundary and on the top terrace. A mixture of Matagouri (*Discaria toumatou*), *Coprosma crassifolia*, *Mingimingi* (*Corprosma propinqua*), small number of briar and a conifer are scattered over the major western terrace riser.

There are no known recorded historic or archaeological sites within or near the proposed gravel extraction area. No Runanga Sensitive Areas are in proximity to the application site.

## 3.0 DESCRIPTION THE PROPOSAL

### 3.1 Introduction

The proposal is one land use consent to achieve the following:

- Excavation of a 10-ha area in three stages over a 5–7-year period to excavate an estimated 600,000 cubic metres of material. The concept plan prepared by *CS Hughes* and is attached **Appendix D**.
- As each stage is completed the ground will be levelled and graded into the adjacent topography at a grade of approximately 1 in 4. Topsoil will be reapplied over the finished area and grassed.
- The existing gravel road will be widened to 4m.
- A 2.0m high chain link gate will be installed at the top of the terrace riser.
- There will be a processing plant on site periodically.
- A site office (Portacom or container), a portaloo and a 5000L bunded fuel tank will be located within the excavation site.
- Signage at the gate onto Kane Road.

To minimise effects and ensure progressive rehabilitation of the site, extraction activities are proposed to be undertaken in the stages and it is proposed to have no more than 5.0 hectares of the site as active working quarry area at any one time.

*Geosolve* have undertaken a geotechnical investigation of the site and advise the following:

*Our investigation has comprised a site inspection by a geotechnical engineer, 10 machine excavated test pits extending to a maximum depth of 4.2 m to assess the underlying soil stratigraphy and allow for sampling for representative lab testing of the site soils.*

They conclude that:

*Laboratory testing was completed to assess the grading, crushing resistance, sand equivalent and weathering resistance of the aggregate underlying the site.*

*Test results were compared to the NZTA M/4 specification for basecourse roading aggregate to assess the feasibility of using the site soils for roading construction;*

- *Crushing and sand equivalent testing returned results that achieved the requirements of the NZTA M/4 specification in all cases;*
- *Two weathering quality index tests were undertaken from site samples however only one of these tests returned a result that would meet the requirements of the M/4 specification.*

A full copy of their investigation is attached at **Appendix E**.



For the purposes of this, active working quarry area shall comprise the following:

- Working extraction faces and adjacent operational areas.
- Stockpiling and load out areas.
- Quarry haul road.

It shall not include other areas which shall be additional to the 5 hectares, such as:

- Site office, amenity block and surrounding areas
- Storage areas for quarry plant and machinery
- Any areas where backfilling or rehabilitation is occurring.
- Any paved, bunded or planted areas.

### **3.2 Site Preparation**

Prior to quarrying commencing, overburden material will be removed from the extractable aggregate resource and stored for use in future rehabilitation. This material may be used for bunding around the quarry site as required.

The existing access track to the west of the proposed quarry will be widened to accommodate heavy vehicle movements.

No indigenous vegetation clearance will occur from the site.

### **3.3 Extraction and Processing**

The quarry will be developed with a single bench to a maximum depth of 5.0 metres below the natural ground level. Quarrying operations will be undertaken in stages and in accordance with the plan that is attached marked **Appendix D**.

The day-to-day extraction operation will involve the use of standard quarry machinery, including an excavator, loader and trucks as required for the efficient extraction of the resource. The processing of material will also be undertaken on-site.

Large stock mounds will be situated within the quarry pit itself. These stock mounds will not exceed 6.0m in height. It is expected that annual production will not exceed 50000m<sup>3</sup>, although this volume will be subject to Road Metals' operational requirements and customer demand.

External vehicle movements associated with the site operations will involve no more than 50 heavy vehicle return trips to and from the site in any one day, as generated by the proposed site activities. Vehicles will access and egress the site via an existing access onto Kane Road.

It is noted that no hazardous substances will be permanently stored on the site. It is proposed to carry out all refuelling of machinery as required via a portable fuel tanker.

The quarry will be established and managed in accordance with Work Safe NZ Best Practice Guidelines - *Health and Safety at Surface Mines, Alluvial Mines and Quarries*.

The proposed quarrying methods will ultimately be subject to the conditions of the resource consent granted for the proposed activity however a number of these methods are in line with the permitted activity framework in the QLDP for mineral extraction and processing.

### **3.4 Hours of Operation and Commencement**

The hours of operation for the proposed quarry including the processing of material will be between 0630 to 1800, Monday to Friday and 0700 to 1700 on Saturday. No quarry operations will be carried out on Sundays or public holidays.

The proposed start date will be subject to obtaining the necessary resource consent. Once resource consent has been obtained, complying with any conditions that need to be fulfilled prior to commencement of the quarrying operation will also determine the start date.

An unlimited consent term is sought for this land use consent.

### **3.5 Details of Plant**

The exact plant and equipment will vary due to plant servicing requirements and the specific aggregate product required. Furthermore, the configuration of plant items (Jaw Crusher, Cone Crusher and screen) will depend on the size of the raw material and the aggregate product specifications.

### **3.6 Screening and Setbacks**

Visual effects will be managed through both the topography of the site and surrounding landscape. There is no existing vegetation on site that is beneficial in terms of providing screening of the proposed quarry.

A detailed Landscape Assessment has been prepared in support of the activity and is attached **Appendix C**. This aspect is addressed in detail at Part 5.5 of this report.

### **3.7 Site Access and Security**

The application site has existing frontage and access arrangements with Kane Road which is a sealed and Council maintained road. Kane Road is identified as a local road within the QLDC Roding Hierarchy and has a posted speed limit of 100kph. Access will be maintained via the existing access point which will be upgraded to accommodate heavy vehicles.

The site is fenced and will be locked when the quarry is not operating, preventing access to the site to the public. Signage will be erected stating that unauthorised access is prohibited to the site.

### **3.8 Rehabilitation**

Rehabilitation of the site will occur progressively over the site once areas of extraction have been completed. Topsoil and subsoil materials which have been stored following site preparation will be used in the site rehabilitation by providing a final topsoil layer. During the quarry's operational life, these materials will be grassed to prevent wind-blown erosion losses.

The site will be progressively rehabilitated to a slope no steeper than 1:3, creating a shallow basin which will be able to be used for productive farmland. Its final level will align with the adjoining terrace to the east.

The remainder of the site will continue to be farmed as will the quarry location once works have finished and the location has been rehabilitated back into productive pasture.

#### 4.0 RULES ASSESSMENT

The site is located within the Rural General Zone (RG) of the Operative District Plan, and the Rural Zone of the Proposed District Plan.

The proposed gravel extraction and processing operation activity is considered to constitute '*mining activity*' in accordance with the following definition from the QLDPA (Section D – Definitions):

*Mining Activity means the use of land and buildings for the primary purpose of the extraction, winning, quarrying, excavation, taking and associated processing of minerals and includes prospecting and exploration.*

An assessment against relevant rules is provided below in Table 1.

Part 5 – Rural Areas		
Rule/Site or Zone Standard	Status	Comment
<p>5.3.3.3viii - Mining Activities</p> <p>Mining except for:</p> <p>(a) Mineral prospecting;</p> <p>(b) Mineral exploration which does not involve bulk sampling exceeding 20m<sup>3</sup> in volume in any one hectare;</p> <p>(c) Mining by means of hand-held, non-motorised equipment and suction dredging, where the total motive power of any dredge does not exceed 10 horsepower (7.5 kilowatt); and</p> <p>(d) The mining of aggregate for farming activities provided the total volume does not exceed 1000m<sup>3</sup> in any one year.</p>	Discretionary	<p>The proposal does not involve mineral prospecting or mineral exploration.</p> <p>The mining of aggregate will exceed 1000m<sup>3</sup> in any one year.</p> <p>Consent is required as a Discretionary Activity.</p>
<p>Site Standard 5.3.5.1iii(b) - Scale and Nature of Activities</p>	Standard requires that no goods, materials or equipment shall be stored outside a building	<p>Stockpiles of excavated and processed materials will be stored outside on-site.</p> <p>The proposal does not comply with this Site Standard.</p>
<p>Rule 5.3.3.3xi – Discretionary Activities</p>	Provides that any activity which is not listed as a prohibited or non-complying activity, and which complies with the relevant Zone Standards but does not comply with one or more Site Standards shall be a discretionary activity.	As per above.
<p>Zone Standard 5.3.5.2v(a) - Noise</p> <p>Sound from non-residential activities measured in accordance with NSZ 6801:2008 and assessed in accordance with NZS 6802:2008 shall not exceed the following noise limits at any point within the notional boundary of any residential unit, other than residential units on the same site as the activity:</p> <p>(i) Daytime (0800 to 2000hrs) 50dB LAeq(15 min)</p> <p>(ii) Night-time (2000 to 0800hrs) 40dB LAeq(15 min)</p> <p>(iii) Night-time (2000 to 0800hrs) 70dB LAFmax</p>		<p>The nearest residential boundary is approximately 0.3km away on the other side of the terrace from the proposed activity.</p> <p>The activity will comply with this Zone Standard.</p> <p>Complies.</p>

<p>Zone Standard 5.3.5.2v(b) – Noise</p> <p>Sound from non-residential activities which is received in another zone shall comply with the noise limits set in the zone standards for that zone</p>		<p>The nearest neighbouring zone is the Luggate Rural Residential Zone located approximately 3km to the southwest of the site.</p> <p>An Acoustic Assessment (<b>Appendix D</b>) has been undertaken in support of the proposal.</p> <p>The proposed activity will not breach the noise limits for this zone at this distance.</p> <p>Complies.</p>
<p><b>Part 14 - Transport</b></p>		
<p><b>Rule/ Site or Zone Standards</b></p>	<p><b>Comment</b></p>	<p><b>Status</b></p>
<p>Site Standard 14.2.4.2(i)(a) – Length of Vehicle Crossing</p> <p>Standard requires that for non-residential activity the minimum length of vehicle crossing should be 4.0m and the maximum should be 9.0m.</p>	<p>The vehicle crossing is already in existence and has a maximum length of approximately 11.0m</p> <p>Whilst no change to the existing arrangements are proposed, it is existing no-complying.</p>	<p>The proposal does not comply with this Site Standard.</p>
<p>Site Standard 14.2.4.2(ii) – Design of Vehicle Crossing</p> <p>Standard requires that vehicle crossings in the Rural Zone shall comply with the standards in Appendix 7.</p>	<p>The existing access is gravel and not a sealed surface.</p> <p>It is likely however that the existing access will require an upgrade in accordance with Appendix 7 - Diagram 3. Private Access (frequent use by heavy vehicles, eg, dairy tankers).</p>	<p>The upgrade will ensure that the proposal complies with the Site Standard.</p>
<p>Site Standard 14.2.4.2(iii) - Maximum gradient for vehicle access</p> <p>Standard requires a maximum gradient of 1:6 for any private way used by vehicles.</p>	<p>Access to the site is to be achieved via an existing formed accessway that has a junction with Kane Road.</p> <p>This will however be upgraded to improve sight lines.</p>	<p>The access will comply with this Site Standard.</p>
<p>Site Standard 14.2.4.2(iv) – Minimum Sight Distance from Vehicle Access</p> <p>Standard sets out minimum sight distances and requires a minimum sight distance of 250m from an access where the speed limit is 100kph.</p>	<p>Kane Road is currently governed by a 100km/h road speed.</p> <p>The existing vehicle access achieves a 250m sight distance in both directions.</p>	<p>The existing access therefore complies with this Site Standard.</p>

**Summary of Activity Status:**

Consent is therefore sought to undertake a discretionary mining activity in the Rural Zone and to breach site standards 5.3.5.1iii, 5.3.5.1viii, 14.2.4.2i(a), 14.2.4.2ii and 14.2.4.2iv.

Overall, the activity should be considered as a **Discretionary Activity**.

## ASSESSMENT OF EFFECTS

### 5.1 Introduction

Assessment Matters 5.4.2.3xix of the Operative QLDP relate to mining and sets out the following matters for consideration:

- (a) The extent to which mining activities will adversely affect:
  - i. Amenity values;
  - ii. Recreational values;
  - iii. Nature conservation values;
  - iv. Landscape and visual amenity values;
  - v. Historical, cultural or known archaeological artefacts or sites;
  - vi. Life supporting capacity of soils, water and air;
  - vii. Public access to and along a lake, river or waterway.
- (b) The ability of the proposal to rehabilitate the site during and after mining.
- (c) The ability of the company to;
  - i. provide a contingency plan for early mine closure;
  - ii. adequately monitor operations and the effects on the receiving environment.
- (d) The necessity of the company to provide a bond to Council reviewed annually, for the purpose of rehabilitating operation areas in the event of non-compliance with terms and conditions of any consent, premature closure or abandonment of the mine

### 5.2 Amenity Values

The nearest residential property is located on Kane Road at approximately 0.3km to the south-east of the proposed quarry. As this property is located on the same side of the terrace, the quarry will be visible from the property. Given the distance of the property from the site and proposed dust and noise management regimes on site, dust and noise will not affect the Kane Road residential property. An acoustic assessment has been provided in support of the proposal and is attached **Appendix F – Acoustic Assessment**.

There are no adverse effects on the amenity of the nearest residential property.

In terms of rural amenity, the site is discretely located at the south-eastern corner of the site and the proposed quarry will not impede on the ability to use the remainder of the site or the adjacent properties for rural purposes. Other than a gap for access, the terrace face will remain until the final stage of the quarrying operation so the activity will be screened from the wider rural area and will have no discernible effect on the surrounding rural amenity.

The main haul route for the quarry will be to Wanaka or Luggate via the Red Bridge. Any materials transported to Hawea will go via McKay Road. Neither of these haul routes will pass the existing residential property on Kane Road.

### 5.3 Recreational Values

The Clutha River/*Mata-Au* is of high recreational value both from water-based activities and walking tracks along the banks of the river. The proposed quarry will not impact on the recreational function of the Clutha River or the walking tracks.

The quarry will also not be visible from the Clutha River or the walking tracks and therefore will have no impact on the recreational value.

#### 5.4 Nature Conservation Values

The application site is entirely pastoral in nature. The proposed quarry site has recently been cultivated (lucerne production) and is currently of no value in terms of nature conservation.

#### 5.5 Landscape and Visual Amenity Values

A landscape and visual assessment was undertaken by *Michelle Snodgrass Landscape Architect* and is contained at **Appendix C**.

The assessment considers the site to be part of a Rural Character landscape (RCL) and assesses it against the Other Rural Landscapes assessment matters contained within Part 5.4.2.2(4) of the District Plan.

##### Effects on landscape quality and character:

The Consultant advises that *"the proposed development will not degrade the quality or character of the Rural Character Landscape."*

##### Effects on visual amenity:

The quarry will not be visually prominent or reduce the visual amenity of the Rural Character Area.

The quarry will not be visually prominent or detract from private views.

The location of the quarry is screened by the terrace risers on either side of the ancient river channel which reduce visibility from public places.

##### Design and density of development:

The quarry is located within the ancient river channel – the least visible part of the site that will result in the least impact on the wider pastoral character of the RLC.

##### Tangata Whenua, biodiversity and geological values:

There are no known Tangata Whenua values for the site.

##### Cumulative effects of development on the landscape:

The quarry will not further degrade landscape quality or visual amenity or result in reducing openness of the landscape as the open paddocks on either side of the ancient river channel will be unchanged.

The perceived quality of the farming land will retain its current quality as the quarry will largely be unseen and well contained by topography.

Granting a consent for the proposed quarry will not push the landscape to a tipping point where it cannot absorb further development as the development does not introduce elements that are uncharacteristic of the rural landscape.

##### Other factors and positive effects, applicable in all the landscape categories (ONF, ONL and RCL)

The remainder of the site outside of quarry operations will remain farmed and the quarry site once rehabilitated will also be farmed.

Conclusion:

The landscape architect concludes with the following:

*In my opinion the site and surrounding landscape can absorb the proposed quarry without having a detrimental effect on the surrounding landscape character or visual amenity*

**5.6 Historical, Cultural or known Archaeological Artefacts or Sites**

There are no known historical, cultural or archaeological artefacts or sites within or around the proposed quarry site. The site has been previously cultivated and no evidence of any such sites has been found.

**5.7 Life Supporting Capacity of Soils, Water and Air**

The remediation of the quarry site will see the land returned to pasture with the existing grade access to the upper terrace so as not to impeded agricultural activities. The post-quarry site will therefore have the same production capability as the site currently has.

**5.8 Public access to and along a lake, river or waterway**

The proposed activity does not affect public access to and along a lake, river or waterway.

**5.9 The ability of the proposal to rehabilitate the site during and after mining.**

As advised in Part 3.8, rehabilitation of the site will occur progressively over the site once areas of extraction have been completed and its final slope will align with the adjoining terrace to the east. The remainder of the site will continue to be grazed as will the quarry location once works have finished and the site has been rehabilitated back into grazing.

**5.10 The ability of the company to provide a contingency plan for early mine closure and adequately monitor operations and the effects on the receiving environment.**

The gravel from the proposed quarry is required for the use in construction of nearby planned residential and civil developments within the Wanaka region. The quarry will conclude after 5 years as per the agreement with the landowner.

In terms of monitoring operations and the effects on the receiving environment, Road Metals has significant experience in gravel extraction and will use best practice to conduct operations in a manner that avoids or minimises effects on the receiving environment.

**5.11 The necessity of the company to provide a bond to Council reviewed annually, for the purpose of rehabilitating operation areas in the event of non-compliance with terms and conditions of any consent, premature closure or abandonment of the mine.**

The site is owned by Kim Landreth and Road Metals has entered into an agreement with the landowner for the extraction of material for a specified timeframe. Road Metals is a family-owned business with a proven track record of successful extraction throughout New Zealand.



Non-compliance or abandonment will not be in the best interests of Road Metals or the landowner as this will compromise his on-going agricultural use. In addition, the site has the benefit of a discrete location and minimal effects generated by the proposal do not require significant mitigation or remediation.

It not considered necessary to provide a bond to Council for this development at this location.

#### **5.12 Dust Effects**

The proposed extraction, screening and stockpiling activities have the potential to generate dust that can be objectionable and offensive if not properly controlled. The presence of dust can potentially lead to a decrease in amenity of an area through nuisance effects on people living and working in the vicinity of dusty activities.

In terms of dust, the nearest residential property is approximately 0.3km away on the other side of the terrace from the site and is unlikely to be affected by dust. However, on days when dust is likely to be an issue, water tankers will dampen down the site to ensure there are no adverse effects in relation to dust.

The adoption of a Dust Management Plan (DMP) which promotes the following will ensure any potential effect of dust are avoided, remedied and mitigated:

- a. carrying out crushing or screening with regard to wind direction and speed, to minimise the discharge of any particulate matter and other contaminants into the air;
- b. Keeping stockpiles, roadways and working areas damp during dry, windy conditions;
- c. Minimising spills on yard surfaces and, if spills of crushed material occur, spilt material shall be cleaned up immediately;
- d. Limiting stockpile heights to no greater than three metres;
- e. Ensuring that the slope angles of stockpiles are minimised and do not exceed the natural slump angle of the dry product;
- f. Limiting the drop height of product from machine to stockpile; and
- g. Using water sprays for dust suppression on the crushing and screening plant.

Therefore, adverse effects from the discharge of dust from the activity will be avoided.

#### **5.13 Noise Effects**

The following noise sources are expected to contribute to the noise emitted from the site and received at the dwelling nearby:

- Gravel extraction and construction activities - the removal of topsoil and overburden material, construction of bunds, extraction of aggregates, backfilling and site rehabilitation.
- Vehicle movements on-site

The following noise sources are expected to contribute to noise associated with the activity but off-site:

- Vehicle movements on the roading network distant to the site
- Vehicles slowing and accelerating as they enter and exit the site.

No blasting or night-time activity is proposed, and no quarry operations (including processing) will occur on Sundays or Public Holidays. The proposed activity will not occur during times identified by Council associated with reduced noise levels. The proposed activity will be carried out in accordance with the QLD Noise Standards.

In terms of noise, the nearest residential property is approximately 0.3km away on the other side of the terrace from the site and is likely to be potentially affected by noise. Written approval has been secured from the owner/occupier.

An acoustic assessment has been prepared by *Powell Fenwick* in support of the proposed activity. A copy is attached **Appendix F**.

In conclusion the consultants advise the following:

*Comparing the above predicted noise levels to the guidance criteria we conclude that the operational levels are well below the 50 dB LAeq(15mins) daytime limit in the QLD, and importantly, is also below the more stringent night-time limit of 40 dB LAeq(15mins) applicable during the initial part of the operational period from 0700-0800 h.*

*The levels are also well below guidance criteria for outside noise limits, including 50 dB LAeq(16hours) in the WHO guidelines, to avoid moderate annoyance in outdoor living areas, and 55 dB LAeq(15mins) daytime limit in NZS 6802:2008.*

*Specific to guidance for amenity at rural dwellings, the noise meets quantitative and qualitative criteria.*

*The noise effects expected from the quarry are therefore expected to be minimal.*

#### **5.14 Hazards**

The District Plan identifies part of the site as possibly being susceptible to liquefaction. The part of the site affected by these hazards is the terrace that is currently in production. The proposed activity will not exacerbate this hazard, therefore the effects relating to natural hazards are less than minor.

#### **5.15 Traffic Effects**

Adverse effects of truck movements such as noise, vibration and spillage of material on roads can be a source of nuisance to nearby residents and general road users.

Traffic generated by the proposal is likely to be large vehicles picking up aggregate for delivery to construction sites. Many of these construction sites will require large quantities of aggregate within a short time. This will mean that multiple trips may be needed during a day to deliver multiple loads to a particular site. The limiting factors that would affect traffic generation are the total number of vehicles available and how quickly a vehicle can be loaded at the quarry.

The greatest likely traffic flow would be a result of having enough vehicles to enable continuous loading at the quarry. If it takes six minutes to load a single vehicle it is possible to load ten vehicles per hour (vph). This will result in a maximum traffic generation of 20vph being 10vph entries and 10vph exits. If the quarry operated at peak for an 8-hour day this could lead to a peak daily traffic flow of 180vph, which includes an allowance for on-site staff.

It is anticipated the activity will generate an average of 25 heavy vehicle return trips per day, with a maximum of 50vph.

In terms of effects, although the maximum volume of traffic is low, it will represent an increase in traffic using the local road network.

As detailed in Part 3.7, access to the site will be maintained via the existing access point to Kane Road. This access point will be upgraded in accordance with Site Standard 14.2.4.2(ii) – *Design of Vehicle Crossing, Appendix 7 Drawing 3*. This design will accommodate the use of NZ semi-trailer vehicles. This is the largest vehicle that is expected at the site and would be used to transport plant and machinery to the site.

The visibility to the north and south exceeds the District Plan requirement of a minimum 250m sight distance for a road with a posted speed of 100kph, although the actual operating speed of the road is likely to be less than 100kph. The intersection of Kane Road and McKay Road located 325m to the south is priority controlled with a give way sign maintained by QLDC.

In terms of traffic effects, a traffic assessment has not been undertaken in support of the proposal given the compliant sight distance and improvements the upgraded access will contribute to the existing road network.

#### **5.16 Cumulative Effects**

Effects are defined at s3 of the Act.

"Cumulative effect" means *"any cumulative effect which arises over time or in combination with other effects regardless of the scale, intensity, duration, or frequency of the effect."*

Cumulative effects in this instance relate to the fact that a number of existing quarries are located within proximity of the application site. As a result, we are required to account for potential cumulative effects that may result from this proposal.

Quarries are a characteristic of rural land and quarrying is now a predominant rural productive activity. The site has the benefit of being unseen when viewed in relation to its surroundings from publicly accessible vantage points. The landscape architect advises that *"The quarry is located within the ancient river channel – the least visible part of the site that will result in the least impact on the wider pastoral character of the RLC."*

As such the proposed quarry can be absorbed without bringing the landscape to a tipping point and changing its character. The landscape will still be strongly pastoral.

#### **5.17 Positive Effects**

There are several positive effects of the proposed quarry.

Gravel is an essential element of road construction and other civil works, the quarry will have a positive effect in enabling the physical growth of the Wanaka, Luggate and Hawea communities and other rural areas. In terms of location, the quarry is situated 13km from Wanaka; 14km from Hawea; and 4.5km from Luggate. This places it in an ideal location to service planned developments within these areas while ensuring efficiency in vehicle movements.

Being able to access material close to where it is required will significantly reduce the transport costs of processed aggregate to local road maintenance and construction sites, having cost savings for NZTA and local

authorities. In addition, it reduces transportation effects and the emission of contaminants associated with truck movements.

The siting of the quarry is such that it will only be visible from a small section of McKay Road. It will not be visible from any other public road or public places and has no nearby residential neighbours. This concealed yet accessible to local development, make the proposed quarry an ideal location.

An additional benefit provided is that the proposed extraction from a portion of the wider site does not preclude the use of the site for activities envisaged by the Rural General Zone, at the completion of quarrying or as parts of the site are rehabilitated and made available for other rural uses. In this respect, it is important to note that quarrying is by its nature a temporary activity, and a wide range of other activities can establish on a site once quarrying has ceased.

## **6.0 STATUTORY CONSIDERATIONS**

### **6.1 Introduction**

This section of the document assesses the relevant statutory matters that arise from the RMA and the planning documents in relation to the proposed quarrying activity and associated operations.

### **6.2 Resource Management Act 1991**

#### **6.2.1 Part 2 – Purpose and Principles**

In assessing an application for resource consent, a consent authority is required to determine whether the proposal is consistent with the purpose and principles of the Act (Part 2), having regard to the matters set out in section 104, of Schedule 4, and any other statutory consideration.

The relevant matters of Part 2 have been reproduced and assessed below:

#### *5. Purpose*

*(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.*

*(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –*

*a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*

*b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

*c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

The proposal will provide for the social and economic wellbeing of the applicant and future owners of the site by providing a material that will contribute to the ongoing development of the region.

#### *8. Other matters*

*In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to –*

*c) the maintenance and enhancement of amenity values:*

*f) maintenance and enhancement of the quality of the environment.*

The proposed development will provide for a level of development that is anticipated within the receiving environment, noting that a number of quarries are already in existence and that by virtue of its location it will not adversely affect the maintenance of amenity values.

The assessment concludes that given the location, nature and scale of the proposed quarry together with the mitigation measures and management techniques proposed for the site operations, it is considered the proposal is consistent with the policy framework of the QLD. Therefore, no further assessment against Part 2 of the RMA is considered necessary.

### **6.2.2 Sections 95A to 95F – Notification**

Sections 95A to 95F of the RMA set out requirements in relation to the public and limited notification of resource consent applications. Sections 95A, 95B, 95D and 95E have relevance to this application.

The steps in Section 95A relate to whether public notification should be given. With regards to its requirements:

**Step 1:**

The applicant does not request public notification, s95C is not relevant as this relates to requests for further information; and the application is not made jointly with one to exchange recreation reserve land. Therefore, public notification is not mandatory under s95A(2)(a).

**Step 2:**

The application is not subject to a rule or national environmental standard that precludes public notification; and the application is not for a controlled activity, a subdivision of land, a residential activity, boundary activity or a prescribed activity. Therefore, public notification is not precluded under s95A(4)(a).

**Step 3:**

The application is not subject to a rule or national environmental standard that requires public notification; and as demonstrated in Section 4.0 of this report, the application will not or is not likely to have adverse effects on the environment that are more than minor in relation to s95D. Therefore, the application need not be publicly notified under s95A(7)(a).

**Step 4:**

No special circumstances are considered to exist in relation to the application that would warrant the application being publicly notified, therefore public notification is not required under s95A(9)(a).

Therefore, in applying the tests set out under Section 95A of the RMA, it is considered that the application should not be publicly notified.

The steps in Section 95B relate to whether limited notification should be given. With regards to its requirements:

**Step 1:**

There are no affected protected customary rights groups or customary marine title groups; and the proposed activity is not identified as being on, adjacent to, or affecting land that is the subject of a statutory acknowledgement. Therefore, there are no specific people or groups that are affected, to whom limited notification should be given under s95B(4).

**Step 2:**

The application is not subject to a rule or national environmental standard that precludes limited notification; and the application is not for a controlled activity or a prescribed activity. Therefore, limited notification is not precluded under s95B(5)(a).

Step 3:

The application is not for a boundary activity or a prescribed activity, but the consent authority must notify any other person they determine to be affected under s95E. Under s95E, there are no persons that have been identified as being affected to an extent that is minor or more than minor. Therefore, limited notification is not required under s95B(9).

Step 4:

No special circumstances are considered to exist in relation to the application that would warrant limited notification, therefore limited notification is not required under s95B(10)(a).

Therefore, in applying the tests set out under Section 95B of the RMA, it is considered that the application does not warrant limited notification. A pre-app meeting with Richard Campion on Friday 19<sup>th</sup> February 2021 confirmed that the applicant should volunteer notification of the application.

### 6.2.3 Section 104 and 104B Considerations

For any resource consent application, section 104 of the RMA requires the consent authority, in making a decision on a resource consent application, to have regard to:

*The actual and potential effects on the environment of allowing the activity (section 104(1)(a)).*

- *Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity (section 104(1)(ab))*
- *The relevant provisions of any national environmental standard, other regulation, national policy statement, coastal policy statement, regional policy statement or proposed regional policy statement, plan or proposed plan (section 104(1)(b)).*
- *Any other matters considered relevant or necessary to consider (section 104(1)(c)).*

Under section 104B, a consent authority may grant or refuse the application for discretionary or non-complying activities and if it grants such an application, may impose conditions under section 108.

The actual and potential effects associated with the proposal have been assessed in Section 5.0 of this document.

## 6.3 National Policy Statements

Under Section 104(1)(b)(iii) of the RMA, the consent authority shall have regard to the relevant provisions of a National Policy Statement.

### 6.3.1 National Policy Statement for Freshwater Management 2020 (NPS Freshwater)

The NPS Freshwater came into effect on the 3 September 2020 and replaces the NPS Freshwater 2014 (amended 2017).

On the basis that the application site does not contain any watercourses, or does it overlay a groundwater source, it is not considered pertinent to consider the objective and relevant policies of the NPS Freshwater.

## 6.4 National Environmental Standards

### 6.4.1 Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NESCS)

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (the NES) apply to activities if the land is covered by the NES, i.e., if

any activity or industry on the Hazardous Activities and Industries List (HAIL) is being undertaken, has been undertaken, or is more likely than not to have been undertaken on the piece of land.

The method outlined in Section 6(2) of the regulations has been used to determine whether the piece of land is covered by the NES. This involves a review of the information held about the site by the Queenstown Lake District Council (QLDC) and Otago Regional Council, and in this instance, it has been determined that the NES does not apply to this application.

#### 6.4.2 Freshwater Regulations 2020

The NES Freshwater includes new requirements such as managing freshwater that ‘gives effect’ to Te Mana o te Wai, improves degraded water bodies, and maintains or improves all others using bottom lines defined in the NPS Freshwater and expands on the national objective’s framework.

As the proposed land use activity (quarry) does not overlay a groundwater resource it is not considered pertinent to consider the objective and relevant policies of the NPS Freshwater.

#### 6.5 Otago Regional Policy Statement

The Otago Regional Policy Statement (RPS) was made operative on 1st October 1998. Chapter 5 of the RPS relates to Land.

Objective/Policy	Issue	Assessment
Objective 5.4.2	To avoid, remedy or mitigate degradation of Otago’s natural and physical resources resulting from activities utilising the land resource.	On completion of the quarry the land will be remediated as pastureland to enable its on-going use as a physical resource.
Objective 5.4.5	To promote the sustainable management of Otago’s mineral resources to meet the present and reasonably foreseeable needs of Otago’s communities.	The explanation is that mineral resources are fixed in their location and can only be used, developed or protected where they are found. Because of this, other development activities establishing over or near minerals can adversely impact upon the future use or development of that mineral resource.
Policy 5.5.8	To recognise known mineral deposits and to consider the potential for access to those mineral resources to be compromised or removed by other alternative land development.	The geological investigations undertaken show that there is a valuable gravel resource at this location suitable for civil construction purposes. The site is currently isolated from residential activity and is actively used for agricultural purposes. Quarrying at the site at this time will enable the harvesting of the gravel resource without impacting or residential or rural activities. The site

		will be remediated and returned to pastoral use on completion of the quarry.
--	--	--

Overall, the proposed activity is consistent with the RPS.

## 6.6 Queenstown Lakes District Plan

The site is zoned Rural General in the District Plan. In addition to the District Wide Issues (chapter 4) and Transport provisions (chapter 14) of the operative District Plan are also relevant to the application.

An assessment of relevant objectives and policies contained in the QLDP is provided in Table 2 below.

Part 4 - District Wide Rules		
Objective/Policy	Issue	Assessment
Objective 4.2.5	The subdivision, use and development being undertaken in the district in a manner which avoids, remedies or mitigates adverse effects on landscape and visual amenities. The relevant supporting policies relate to visual amenity landscapes and mining	Views of the site are restricted to a section of Kane Road, McKay Road and Small Road.  The proposed activity is to be developed within the least visible part of the site.
Policy 13 - Mining	To maintain the rural or natural qualities of the landscape by: <ul style="list-style-type: none"> <li>• Placing a limit on the size of the open area of any quarry, landfill site, refuse dump or extraction site.</li> <li>• Encouraging the activities in suitable areas away from any visually sensitive locations</li> <li>• Requiring that the area be progressively restored during the life of the operation.</li> <li>• Controlling the form of the open area and of any waste heaps or long-term stockpiles to ensure that they are compatible with the forms in the landscape.</li> <li>• Requiring restoration to be finished to a contour sympathetic to the surrounding topography and revegetated with a cover appropriate to the site and setting</li> </ul>	The finished quarry will be a maximum area of 10ha and will be developed in stages so that the front face of the terrace remains largely intact until the final stage.  The quarry is located away from visually sensitive locations and will be progressively remediated as far as practicable. Much of the remedial works will take place once quarrying is complete.  The finished level of the quarry site will be in line with the lower terrace of the landform. The site will return to pasture.



Chapter 14 - Transportation		
Objective/Policy	Issue	Assessment
Objective 1	<p>The efficient use of the district's existing and future transportation resource and fossil fuel usage associated with transportation This is supported by relevant policies which seek to:</p> <ul style="list-style-type: none"> <li>• Encourage efficiency in the use of motor vehicles;</li> <li>• To promote the efficient use of road by ensuring the nature of activities alongside roads are compatible with road capacity and function.</li> </ul>	<p>The proposed activity will not affect the operations or activities of adjacent landowners. Traffic generated will be within the permitted standards of the QLDP. The Applicant will upgrade the entrance to the site from Kane Road.</p> <p>The location of the proposed quarry is near Wanaka, Luggate and Hawea is one of the reasons for choosing the site as it will enable efficient use of vehicles. The most direct haul routes will be used to ensure efficient use of the roads. There is sufficient capacity on the roads to accommodate the proposal.</p> <p>The proposal is consistent with this policy.</p>
Proposed District Plan; Chapter 21 – Rural		
Objective/Policy	Issue	Assessment
21.2.1 Objective – Zone purpose	<p>A range of land uses, including farming and established activities, are enabled while protecting, maintaining and enhancing landscape, ecosystem services, nature conservation and rural amenity values.</p>	<p>The application site is in an RCL. The proposed quarry will only be partly visible from a short section of McKay Road and will not have an adverse effect on the character and landscape value of the rural area. This is supported by the landscape assessment - <b>Appendix C</b> and described in section 5.5 of this AEE.</p> <p>Quarries are a characteristic of rural land and quarrying is now a predominant rural productive activity.</p> <p>The location of the proposed quarry, the design of the quarry and the use of best practice quarrying methods will ensure the activity is carried out in a manner which avoids or mitigates any adverse effects on the environment.</p> <p>As such the proposed quarry can be absorbed without bringing the landscape to a tipping point and</p>

		changing its character. The landscape will still be strongly pastoral.
Policy 21.2.1.1	Enable farming activities while protecting, maintaining and enhancing the values of indigenous biodiversity, ecosystem services, recreational values, the landscape and surface of lakes and rivers and their margins.	<p>The landscape architect advises that <i>“The quarry is located within the ancient river channel – the least visible part of the site that will result in the least impact on the wider pastoral character of the RLC.”</i></p> <p>As such the proposed quarry can be absorbed without bringing the landscape to a tipping point and changing its character. The landscape will still be strongly pastoral.</p>
Policy 21.2.1.4	Minimise the dust, visual, noise and odour effects of activities by requiring them to locate a greater distance from formed roads, neighbouring properties, waterbodies and zones that are likely to contain residential and commercial activity.	<p>The proposed quarry may also give rise to effects such as noise, dust or traffic generation. These effects are like those anticipated in the rural area. However, the proposed quarry is in a discrete location and the effects will be contained within the site.</p> <p>The quarry will be established and managed in accordance with Work Safe NZ Best Practice Guidelines - <i>Health and Safety at Surface Mines, Alluvial Mines and Quarries.</i></p> <p>Dust will be mitigated through the imposition of a Dust management Plan.</p> <p>The acoustic engineers confirm that noise effects expected from the quarry are therefore expected to be minimal.</p> <p>It is not expected that the activity will have any adverse effect on rural amenity.</p>
Policy 21.2.1.15	Ensure traffic from new commercial activities does not diminish rural amenity or affect the safe and efficient operation of the roading and trail network, or access to public places.	Transport related matters have been addressed in response to Chapter 14 of the Operative QLDP.

21.2.2 Objective - The life supporting capacity of soils is sustained.	21.2.2.1 Allow for the establishment of a range of activities that utilise the soil resource in a sustainable manner.	The subject site will be available for agricultural use during the lifetime of the quarry and the remediation of the site will see it returned to pasture.  The proposal will therefore not affect the life supporting capacity of the soil in the short or long term.
Policy 21.2.2.2	Maintain the productive potential and soil resource of Rural Zoned land and encourage land management practices and activities that benefit soil and vegetation cover.	As above
Policy 21.2.2.3	Protect the soil resource by controlling activities including earthworks, indigenous vegetation clearance and prohibit the planting and establishment of identified wilding exotic trees with the potential to spread and naturalise.	The proposal does not involve the clearance of indigenous vegetation.
21.2.5 Objective - Mineral extraction	Opportunities are provided for on the basis the location, scale and effects would not degrade amenity, water, wetlands, landscape and indigenous biodiversity values.	The proposal will not affect these values.
Policy 21.2.5.1	Have regard to the importance and economic value of locally mined high-quality gravel, rock and other minerals including gold and tungsten.	The location is taking advantage of a locally mined, high quality gravel resource.
Policy 21.2.5.3	Ensure that during and following the conclusion of mineral extractive activities, sites are progressively rehabilitated in a planned and co-ordinated manner, to enable the establishment of a land use appropriate to the area.	The site will be progressively rehabilitated and returned to agricultural use – pasture.

It is therefore considered that the proposal is consistent with the relevant objectives and policies of the operative QLDP and proposed QLDP.

## 7.0 CONSULTATION

At this stage, Road Metals has only carried out consultation with the adjoining property owners as they are not considered to be affected as they have provided their written approval in support of the proposal.

No other persons or parties are considered to be affected by this proposal.

## **8.0 DRAFT CONDITIONS**

To ensure that the potential adverse effects of the proposed quarrying activity and associated site operations will be less than minor, Road Metals propose that the following conditions be attached to the resource consent:

### **General**

- 1) That the activity be in general accordance (taking into account any conditions imposed) with the application submitted and received by Council on XX July 2021 from Road Metals Company Limited.
- 2) The consent holder shall ensure that, should any human remains or archaeological items be exposed while undertaking works to give effect to conditions of this consent, works in that area will cease immediately. The Police, Heritage New Zealand, and Kaumatua representing the local Tangata Whenua shall be contacted and work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

### **Operational**

- 3) All works associated with the consented activity, including, but not limited to, extraction and the transportation of material off-site shall be limited to the hours of 0630 to 1800 Monday to Friday, 0700 to 1700 on Saturday. No works associated with the activity, including the transportation of material off site shall be carried out on Sundays or public holidays.
- 4) The maximum volume of gravel extracted and processed shall not exceed 50000 cubic metres per annum.
- 5) The maximum volume of gravel stockpiled on the site shall not exceed 20000 cubic metres per stockpile.
- 6) The maximum height of any stockpile shall not exceed 6 m above the pit ground level.
- 7) There shall be no more than 50 heavy vehicle return trips in any one day.
- 8) That noise from the operation of the consented activities on the site shall at all times comply with the noise standard 55dB LAeq (15min) at the notional boundary of any lawfully established habitable building on another site that existed at the date of this consent, as set out in the QLDP.

### **Earthworks**

- 9) That the consent holder shall take all practicable steps to ensure that dust from the earthworks is not offensive or objectionable beyond the boundary of the site.
- 10) That disturbed topsoil shall be stored on the site and shall be used to progressively rehabilitate the site.
- 11) Following the extraction earthworks, the consent holder shall ensure that the areas of denuded soil, shall be revegetated with a cover appropriate to the site. All cuts shall be graded back and rounded off to merge with the adjoining landform. Rehabilitation works shall be undertaken within 3 months following the completion of physical works in any one area.

### **Review of Consent**

- 12) The QLDC may, once per year, serve notice on the consent holder of its intention to review, in whole or in part, the conditions of this consent to deal with any adverse effects arising from the exercise of the consent.

## **9.0 CONCLUSION**

Road Metals is seeking resource consent from QLDC to establish a new quarry at a site on Kane Road, Hawea Flat. The potential effects associated with the proposed quarrying activity at the site are assessed in Section 5.0 of this document. This assessment identifies that although there is the potential for there to be adverse effects,

subject to the mitigation measures proposed, it is considered that the adverse effects of the proposal will be less than minor.

The proposed activity will have positive effects including increased production and transportation of aggregate products to meet growing demand generated throughout the Wanaka region, while providing for effective site rehabilitation.

The proposed activity is consistent with Part 2 of the RMA and the applicable policy framework of the relevant to the QLDP. In addition, there are no barriers to granting the resource consents being sought, including pursuant to section 104B of the Act.

Therefore, it is considered that the application can be granted subject to appropriate conditions of consent.

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**RECORD OF TITLE  
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R.W. Muir  
Registrar-General  
of Land

**Identifier** **OT10B/549**

**Land Registration District** **Otago**

**Date Issued** 15 July 1985

**Prior References**

OT138/125

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**Estate** Fee Simple  
**Area** 128.8100 hectares more or less  
**Legal Description** Section 53 Block VII Lower Hawea Survey  
District

**Registered Owners**

Kimberley Lex Landreth and Russell James Cassidy

---

**Interests**

Subject to Section 5 Coal Mines Act 1979

Subject to Section 8 Mining Act 1971

Appurtenant hereto is a right to pump, store and convey water and electricity created by Transfer 5284617.4 - 15.7.2002 at 3:14 pm

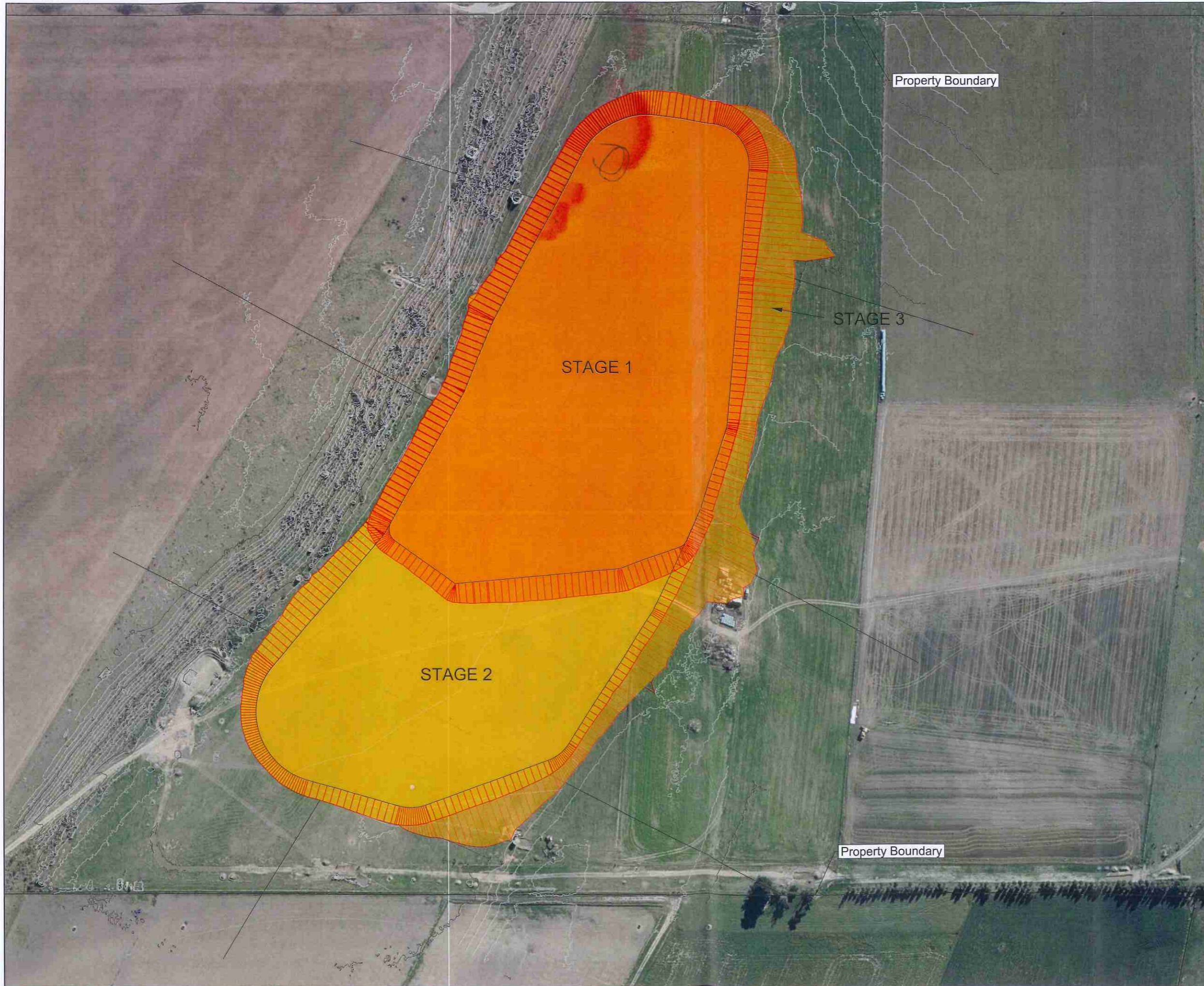
11247075.5 Mortgage to Westpac New Zealand Limited - 11.10.2018 at 4:45 pm

Google Maps Kane Road



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PRELIMINARY EARTHWORKS VOLUMES:

TOTALS:

STAGE 1 CUT = 220650 m<sup>3</sup>  
 STAGE 2 CUT = 347160 m<sup>3</sup>  
 STAGE 3 CUT = 369305 m<sup>3</sup>

EARTHWORKED AREAS:

STAGE 1 = 67000 m<sup>2</sup>  
 STAGE 2 = 106000 m<sup>2</sup>  
 STAGE 3 = 120000 m<sup>2</sup>

NOTES:

1. PRELIMINARY PURPOSES ONLY
2. Aerial photo is taken from QLDC database and is for indicative purpose only
3. UAV ground contour data from UAV Flight #15122020.
4. CONTOUR INCREMENTS : 1m Minor, 5m Major
5. ORIGIN OF LEVELS: AE9M, NZVD2016

REVISION	DETAIL	DATE

**C HUGHES & ASSOCIATES LTD**

Surveying and Resource Management · Central Otago

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 LEVEL 3, 80 ARDMORE ST 17A MURRAY TERRACE  
 P.O. BOX 599 P.O. BOX 51  
 03 443 5052 03 445 0376



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Project

Section 53 Block VII  
 Lower Hawea SD

Title

Final Stage  
 Quarry Earthworks

**FOR DISCUSSION**

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 The Contractor shall verify all dimensions on site.

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Job No: 1:13000	Drawn By: A	Datum: JDL
Drawing No: 6100	Sheet No: W1534	Revision: Date Created: 1/2 Feb 2021



Kim Landreth  
By email: [kim.landreth1@gmail.com](mailto:kim.landreth1@gmail.com)  
CC: C Hughes and Associates

Attention: Kim Landreth and Jack Lister

## Geotechnical Letter Report Proposed Quarry – Kane Road, Hawea

Dear Kim and Jack,

In accordance with our Agreement dated 14 January 2021, we have undertaken a geotechnical investigation to assess the underlying soil conditions to aid a feasibility assessment for a proposed aggregate quarry operation within Section 53 Block VII, Lower Hawea SD.

Our investigation has comprised a site inspection by a geotechnical engineer, 10 machine excavated test pits extending to a maximum depth of 4.2 m to assess the underlying soil stratigraphy and allow for sampling for representative lab testing of the site soils.

Investigation locations are detailed within the attached plan.

### Subsurface Investigations

The completed test pits indicate the sub-surface stratigraphy within the proposed quarry operation area comprises:

- 0.2 m of **topsoil**, overlying;
- 0.1-0.5 m of **loess**, overlying;
- 0.6 m of **outwash sand** (TP9 and 10 only), overlying;
- 2.6-3.9 m+ of **outwash gravel**.

**Topsoil** was observed at the surface of all test pits and extended to 0.2 m below ground level (bgl). Topsoil was observed to comprise organic silty SAND and sandy SILT.

**Loess** was observed to underlie the topsoil in all test pits and extended to between 0.3 and 0.7 m bgl. Loess was observed to comprise loose silty SAND.

**Outwash sand** was observed to underlie the loess in TP9 and interbedded within the outwash gravel in TP10. Outwash sand was observed to comprise loose to medium dense/firm silty SAND, SAND and SAND with some SILT and SILT. Outwash sand was also observed in the Road Metals excavated test pit observed during a site inspection completed by GeoSolve in December 2020.

**Outwash gravel** was observed to underlie the loess and outwash sand in all test pits and extended to between 3.7 and 4.2 m bgl. Outwash gravel was observed to comprise loose to medium dense, GRAVEL with some to minor sand and minor to trace silt, sandy cobbly GRAVEL with some to minor boulders, sandy GRAVEL with some cobbles and minor boulders and silty sandy GRAVEL to sandy GRAVEL with some silt. A lens of outwash sand/silt was observed within the outwash gravel within TP10 only at 2.3 m (extending to 2.7 m). Outwash gravel was observed to extend to the base of all test pits.

Groundwater was not encountered during any investigations (extending to between 3.7 and 4.2 m bgl) within the site. Groundwater is expected to lie greater than 10 m below the site. It is understood the quarry operation is proposing excavations up to approximately 3-4 m bgl and therefore it is unlikely that groundwater will be encountered during excavation.

More detailed geotechnical descriptions of the soil are provided in the attached test pit logs within Appendix B.

Photos of the soil profile and excavated material within test pits (including the Road Metals test pit observed in December 2020) are attached within Appendix D.

## Lab Testing

Representative samples were taken from within TPs 2, 4, 7 and 10 to complete lab testing to confirm characteristics of the site soils to inform suitability for use within a future aggregate quarry operation. The following laboratory testing was completed by Central Testing Services (CTS):

- **4x Particle Analysis Tests** (NZS4407:2015, Test 3.8.1) - to assess grading of site soils to allow comparison to standard AP40 and 65 grading curves;
- **4x Crushing Resistance Tests** (NZS4407:2015, Test 3.10) – to assess crushing resistance relative to NZTA M/4 specification requirements for basecourse roading aggregate;
- **2x Sand Equivalent Tests** (NZS4407:2015, Test 3.6) – to assess sand equivalent relative to NZTA M/4 specification for basecourse roading aggregate;
- **2x Weathering Resistance Tests** (NZS4407:2015, Test 3.11) – to assess weathering resistance relative to NZTA M/4 specification for basecourse roading aggregate.

The combined laboratory testing results completed by CTS are attached.

### Particle Analysis Testing

Grading curves of the raw site material were compared to AP40 and AP65 grading curves to assess the amount of screening/crushing that would be required to produce these aggregate gradings.

Based on results, all samples except the sample taken from the lower unit observed within TP10 (described as gravelly SAND with some cobbles and trace silt) were recorded to be within or more coarse than the requirements of both AP40 and AP65 grading curves. Based on this information the site won material is expected to be able to be efficiently sorted to create products within the upper and lower limits of these grading curves. We note that the samples collected for lab testing purposes included a smaller fraction of cobbles and boulders compared to the complete profile observed within test pits. The cobble and boulder fraction will require crushing to meet these grading curves.

### **Crushing Resistance Testing**

Four crushing resistance test samples were undertaken to assess the strength of the aggregate to allow comparison to the requirements of the NZTA M/4 specification for basecourse roading aggregate. To meet the NZTA M/4 specification an aggregate must produce less than 10% fines under a load of 130 kN. The four test samples produced between 5.2 and 9.1% fines under the specified 130 kN load. The aggregate was estimated to have a crushing resistance (to produce 10% fines) of between 140 and 200 kN based on lab testing results, which meets the requirements of the NZTA M/4 specification in all cases.

### **Sand Equivalent Testing**

Two sand equivalent tests were undertaken to assess the proportion of fines within the aggregate sample. A higher sand equivalent indicates that there is less clay-like material within the sample. To meet the NZTA M/4 specification an aggregate must have a sand equivalent of at least 40. The two test samples returned a sand equivalent of 50 and 74 which meets the requirements of the NZTA M/4 specification in both cases.

### **Weathering Resistance Tests**

Two weathering resistance were completed to assess the resistance of the aggregate to the effects of wetting, drying, heating and cooling to allow comparison to the requirements of the NZTA M/4 specification for basecourse roading aggregate. To meet the NZTA M/4 specification an aggregate must have a weathering resistance quality index of AA, AB, BA, BB or CA. The weathering resistance test for the TP4 sample returned an index rating of BB however the TP7 samples returned a weathering resistance quality index of CB which is outside the NZTA M/4 specification requirements.

## **Earthworks Recommendations**

It is understood that cuts of approximately 3-4 m depth will be undertaken to form the proposed quarry. It is recommended that batter slopes are formed at a maximum of 1.5H:1V within the outwash sand and gravel at the site.

### **Conclusions**

- It is understood an aggregate quarry is proposed for the site. Based on discussions with the client/surveyor it is understood that cuts of approximately 3-4 m are proposed as part of the quarry operation. 10 test pits were undertaken to assess the soil conditions underlying the site. Test pits observed surficial topsoil and loess overlying generally consistent outwash gravel (extending to at least 4 m). Outwash sand was observed overlying the outwash gravel within TP9 and within a lens within TP10 at between 2.3 and 2.7 m bgl only.
- Laboratory testing was completed to assess the grading, crushing resistance, sand equivalent and weathering resistance of the aggregate underlying the site. Test results were compared to the NZTA M/4 specification for basecourse roading aggregate to assess the feasibility of using the site soils for roading construction;

- Crushing and sand equivalent testing returned results that achieved the requirements of the NZTA M/4 specification in all cases;
- Two weathering quality index tests were undertaken from site samples however only one of these tests returned a result that would meet the requirements of the M/4 specification.

### **Applicability**

This report has been prepared for the sole use of our client, Kim Landreth, with respect to the particular brief and on the terms and conditions agreed with our client. It may not be used or relied on (in whole or part) by anyone else, or for any other purpose or in any other contexts, without our prior review and written agreement.

Yours faithfully,



Mike Plunket  
Geotechnical Engineer

Reviewed by: Fraser Wilson, Senior Engineering Geologist  
GeoSolve Limited

Attachments:           Appendix A - Site Investigation Plan  
                              Appendix B - Test Pit Logs  
                              Appendix C - Laboratory Test Results  
                              Appendix D - Test Pit Photos

# Appendix A: Site Investigation Plan



PRELIMINARY EARTHWORKS VOLUMES:

TOTALS:

STAGE 1 CUT = 220650 m3  
 STAGE 2 CUT = 347160 m3  
 STAGE 3 CUT = 369305 m3

EARTHWORKED AREAS:

STAGE 1 = 67000 m2  
 STAGE 2 = 106000 m2  
 STAGE 3 = 120000 m2

NOTES:

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3. UAV ground contour data from UAV Flight #15122020.
4. CONTOUR INCREMENTS : 1m Minor, 5m Major
5. ORIGIN OF LEVELS: AE9M, NZVD2016

REVISION	DETAIL	DATE

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Project  
**Section 53 Block VII  
 Lower Hawea SD**



Title  
**Final Stage  
 Quarry Earthworks**  
 FOR DISCUSSION

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Datum: JDL	
Drawing No: 6100	Sheet No: W1534
Revision: 1/2	Date Created: Feb 2021

Key

-  = Test Pit location
-  = Test Pit completed by Road Metals



DRAWN	MDP	06/21
DRAFTING CHECKED	FAW	06/21
APPROVED	FAW	06/21
FILE :	PDF	
SCALE: (AT A3 SIZE)	As Shown	
PROJECT No.	200871	

Kim Landreth  
 Kane Road- Section 53 Block VII Lower Hawea  
 Geotechnical Investigation  
 Investigation Site Plan

FIG No. Appendix A - Figure 1a

REV. 0

# Appendix B: Test Pit Logs



# TEST PIT LOG

EXCAVATION NUMBER:

**TP 1**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic silty fine to medium SAND with trace of rootlets; dark brown. Dry.		0.0 0.1	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown. Loose; dry.		0.2		
OUTWASH GRAVEL	Fine to medium GRAVEL with some sand and minor silt; light brownish grey, bedded. Medium dense; dry; gravel, predominantly fine, subangular to subrounded.		0.35m		
OUTWASH GRAVEL	Fine to medium GRAVEL with some sand and trace of silt; light brownish grey, bedded. Medium dense; dry; gravel, predominantly fine, subangular to subrounded.		0.6m		
OUTWASH GRAVEL	Sandy cobbly fine to coarse GRAVEL with some to minor boulders; grey/dark grey, bedded. Loose to medium dense; dry; gravel, rare medium and coarse; sand, fine to coarse.		0.8m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand; grey/dark grey, bedded. Medium dense; dry; gravel, subrounded to subangular; sand, fine to coarse; boulders, up to 700 mm diameter.		1.1m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand; grey, bedded. Medium dense; dry; gravel predominantly fine to medium.		1.7m		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with some cobbles and minor boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular; sand, fine to coarse; boulders, up to 600 mm diameter.		2.2m		
OUTWASH GRAVEL	Cobbly sandy fine to coarse GRAVEL with some boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 800 mm diameter.		2.7m		
			4.1m		

Total Excavation Depth = 4.1 m








COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

## TP 2

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with rootlets; dark brown. Dry.		0.0 0.1	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.1 0.2 0.3		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand and minor silt; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded.		0.3 0.4 0.5 0.6 0.55m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand; grey, bedded. Medium dense; dry; gravel, subangular to subrounded.		0.6 0.7 0.8 0.55m		
OUTWASH GRAVEL	Fine to medium GRAVEL with minor sand; grey, bedded. Loose to medium dense; dry; gravel, subangular to subrounded.		0.8 0.9 1.0 1.1 0.8m		
OUTWASH GRAVEL	GRAVEL with some sand, cobbles and minor boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 700 mm diameter.		1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.1m		
OUTWASH GRAVEL	Cobbly fine to coarse GRAVEL with some sand and boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; sand, fine to coarse.		1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 1.8m		
Total Excavation Depth = 4.0 m			4m		

COMMENT:	Sample taken of outwash gravel for lab testing.	LOGGED BY:	MDP
		CHECKED DATE:	15/07/2021
		SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 3**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace rootlets; dark brown. Dry.		0.0 0.1 0.2	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3 0.35		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with some silt and trace rootlets; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse.		0.35 0.4 0.5 0.6 0.55		
OUTWASH GRAVEL	Fine to medium GRAVEL with some sand; grey, bedded. Loose to medium dense; dry; gravel, predominantly fine, subangular to subrounded.		0.55 0.6 0.7 0.8 0.75		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand; grey, bedded. Medium dense; dry; gravel, subangular to subrounded.		0.75 0.8 0.9 1.0 1.1 1.2 1.3 1.4		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with some cobbles and some boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 800 mm diameter.		1.4 1.5 1.6 1.7 1.8 1.9		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with some cobbles and minor boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 700 mm diameter.		1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9		

Total Excavation Depth = 3.9 m

COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 4**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace of rootlets; dark brown. Dry.		0.0 0.1 0.2	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3 0.4		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with some silt and trace of rootlets; light brown, bedded. Medium dense; dry; gravel, predominantly fine to medium, subangular to subrounded.		0.4 0.5 0.6		
OUTWASH GRAVEL	Fine to medium GRAVEL with minor sand; grey, bedded. Loose to medium dense; dry; gravel, predominantly fine, subangular to subrounded.		0.6 0.7 0.8		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some cobbles, minor sand and boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders, up to 1000 mm diameter.		0.8 1.0 1.1 1.2 1.3 1.4 1.5		
OUTWASH GRAVEL	Fine to medium GRAVEL with some sand; grey, bedded. Medium dense; dry; gravel, subangular to subrounded.		1.5 1.6 1.7 1.8		
OUTWASH GRAVEL	Fine to coarse GRAVEL with minor sand, cobbles and trace of boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; boulders, up to 250 mm diameter.		1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8		
Total Excavation Depth = 3.8 m					

COMMENT:	Sample taken of outwash gravel for lab testing.	LOGGED BY:	MDP
		CHECKED DATE:	15/07/2021
		SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 5**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with rootlets; dark brown. Dry.		0.0 0.1 0.2		
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3		
OUTWASH GRAVEL	Silty sandy fine to medium GRAVEL with trace of rootlets; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse.		0.3 0.4 0.5 0.6 0.55		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some cobbles, minor sand and boulders; light brownish grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders, up to 450 mm diameter.		0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand, cobbles and boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to surrounded; sand, medium to coarse; boulders, up to 700 mm diameter.		1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2	NO SEEPAGE	

Total Excavation Depth = 4.2 m

COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 6**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with rootlets; dark brown. Dry.		0.0 0.1 0.2		
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3 0.4		
OUTWASH GRAVEL	Silty sandy fine to coarse GRAVEL with trace of rootlets; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse.		0.4 0.5 0.6		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some to minor sand, cobbles and some boulders; grey to dark grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders, 900 mm diameter.		0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with cobbles and minor boulders; dark grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded, sand, fine to coarse; boulders, up to 600 mm diameter.		1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7	NO SEEPAGE	

Total Excavation Depth = 3.7 m

COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 7**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace of rootlets; dark brown. Dry.		0.0 0.1 0.2m	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3 0.4		
OUTWASH GRAVEL	Sandy fine to coarse GRAVEL with minor silt and trace of rootlets; light brown grey, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 350mm.		0.4m 0.5 0.6 0.7 0.8 0.85m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand, minor cobbles and trace of boulders; grey, bedded. Medium dense; dry to moist; boulders, up to 600 mm diameter.		0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2m		
OUTWASH GRAVEL	Cobbly fine to coarse GRAVEL with minor sand and boulders; grey, bedded. Medium dense; dry to moist; gravel, subangular to subrounded; boulders, up to 500 mm diameter.		2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.2m		

Total Excavation Depth = 4.2 m







COMMENT:	Sample taken of outwash gravel for lab testing.	LOGGED BY:	MDP
		CHECKED DATE:	15/07/2021
		SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 8**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace of rootlets; dark brown. Dry.		0m 0.1m 0.2m	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2m 0.3m 0.4m 0.45m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand, silt and trace of rootlets; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded.		0.45m 0.5m 0.6m 0.7m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with minor sand, cobbles and boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders, up to 500 mm.		0.7m 0.8m 0.9m 1.0m 1.1m 1.2m 1.3m 1.4m 1.5m 1.6m 1.7m 1.8m 1.9m 2.0m 2.1m 2.2m 2.3m 2.4m 2.5m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with minor sand, trace of cobbles and boulders; grey, bedded. Medium dense; dry; gravel, predominantly fine to medium; boulders, up to 350 mm.		2.5m 2.6m 2.7m 2.8m 2.9m 3.0m 3.1m		
OUTWASH GRAVEL	Fine to coarse GRAVEL with minor sand, cobbles and boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders, up to 500 mm.		3.1m 3.2m 3.3m 3.4m 3.5m 3.6m 3.7m 3.8m 3.9m 4.0m 4.1m		
Total Excavation Depth = 4.1 m					

COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1



# TEST PIT LOG

EXCAVATION NUMBER:

**TP 9**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace of rootlets; dark brown. Dry.		0.0 0.1 0.2m	NO SEEPAGE	
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.3 0.4 0.5 0.6 0.7m		
OUTWASH SAND	Silty fine to medium SAND with trace of fine gravel; light greyish brown, massive. Medium dense; dry; rootlet voids.		0.8 0.9 1.0 1.1m		
OUTWASH SAND	Fine SAND; light grey, bedded. Loose to medium dense; dry.		1.2 1.3m		
OUTWASH GRAVEL	Sandy cobbly fine to coarse GRAVEL with some to minor boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 1.2 m diameter.		1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9m		
Total Excavation Depth = 3.9 m					

COMMENT:	LOGGED BY:	MDP
	CHECKED DATE:	15/07/2021
	SHEET:	1 of 1

# TEST PIT LOG

EXCAVATION NUMBER:

**TP 10**

PROJECT:	Kane Road Quarry			JOB NUMBER:	200871
LOCATION:	See Site Plan	INCLINATION:	Vertical		
EASTING:		EQUIPMENT:	20 T Excavator	OPERATOR:	Robbie
NORTHING:		COORD. SYSTEM:	Aerial Photography	COMPANY:	Client
ELEVATION:		EXCAV. DATUM:		HOLE STARTED:	18/03/2021
METHOD:	Aerial Photography	ACCURACY:	+ 5 m	HOLE FINISHED:	18/03/2021

Soil / Rock Type	Description	Graphic Log	Depth (m)	Groundwater / Seepage	Scala Penetrometer
TOPSOIL	Organic sandy SILT with trace of rootlets; dark brown. Dry.		0.0 0.1 0.2		
LOESS	Silty fine to medium SAND with trace of rootlets; light brown, massive. Loose; dry.		0.2 0.3 0.4		
OUTWASH GRAVEL	Silty sandy fine to coarse GRAVEL with trace of cobbles and boulders; light brown, bedded. Medium dense; dry; gravel, subangular to subrounded; sand, fine to coarse; boulders, up to 300 mm diameter.		0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3		
OUTWASH GRAVEL	Fine to coarse GRAVEL with some sand and cobbles and minor boulders; grey, bedded. Medium dense; dry; gravel, subangular to subrounded; boulders up to 700 mm diameter.		0.55m 2.3m		
OUTWASH SAND/SILT	Fine SAND with some silt and SILT; greyish brown/light brown, bedded. Loose/firm; moist; silt, nonplastic.		2.3 2.4 2.5 2.6 2.7		
OUTWASH GRAVEL	Gravelly medium to coarse SAND with trace of cobbles and boulders; grey, bedded. Medium dense; dry to moist; gravel, fine to medium - rare coarse grains, subangular to subrounded; boulders, up to 300 mm diameter.		2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2	NO SEEPAGE	

Total Excavation Depth = 4.2 m

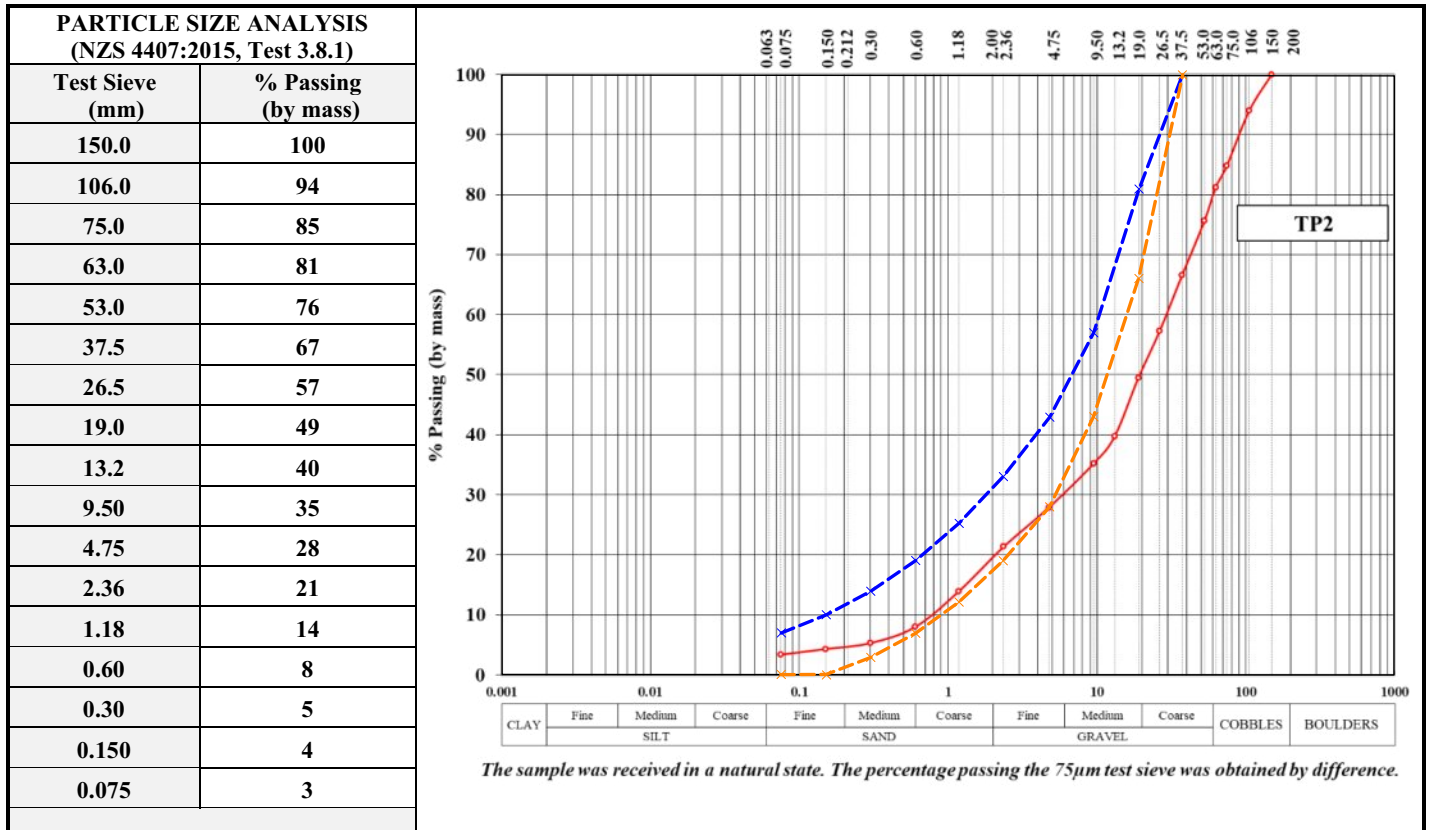
COMMENT:	Sample taken of upper and lower outwash gravel/sand for lab testing seperately.	LOGGED BY:	MDP
		CHECKED DATE:	15/07/2021
		SHEET:	1 of 1

# Appendix C: Lab Testing Results



## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with some cobbles, some sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP2	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



**Notes:**

- Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005, the estimated crushing resistance, the client supplied information (cs), sample method and sampling.
- This report may not be reproduced except in full.

**Tested By:** K. Hipkins, L.T. Smith, C. Julius & A.P. Julius      **Date:** 30-Mar-21 to 29-Apr-21

**Checked By:** *[Signature]*

- = AP40 Upper Limit % Passing (by Mass)
- = AP40 Lower Limit % Passing (by Mass)
- = Sample % Passing (by Mass)

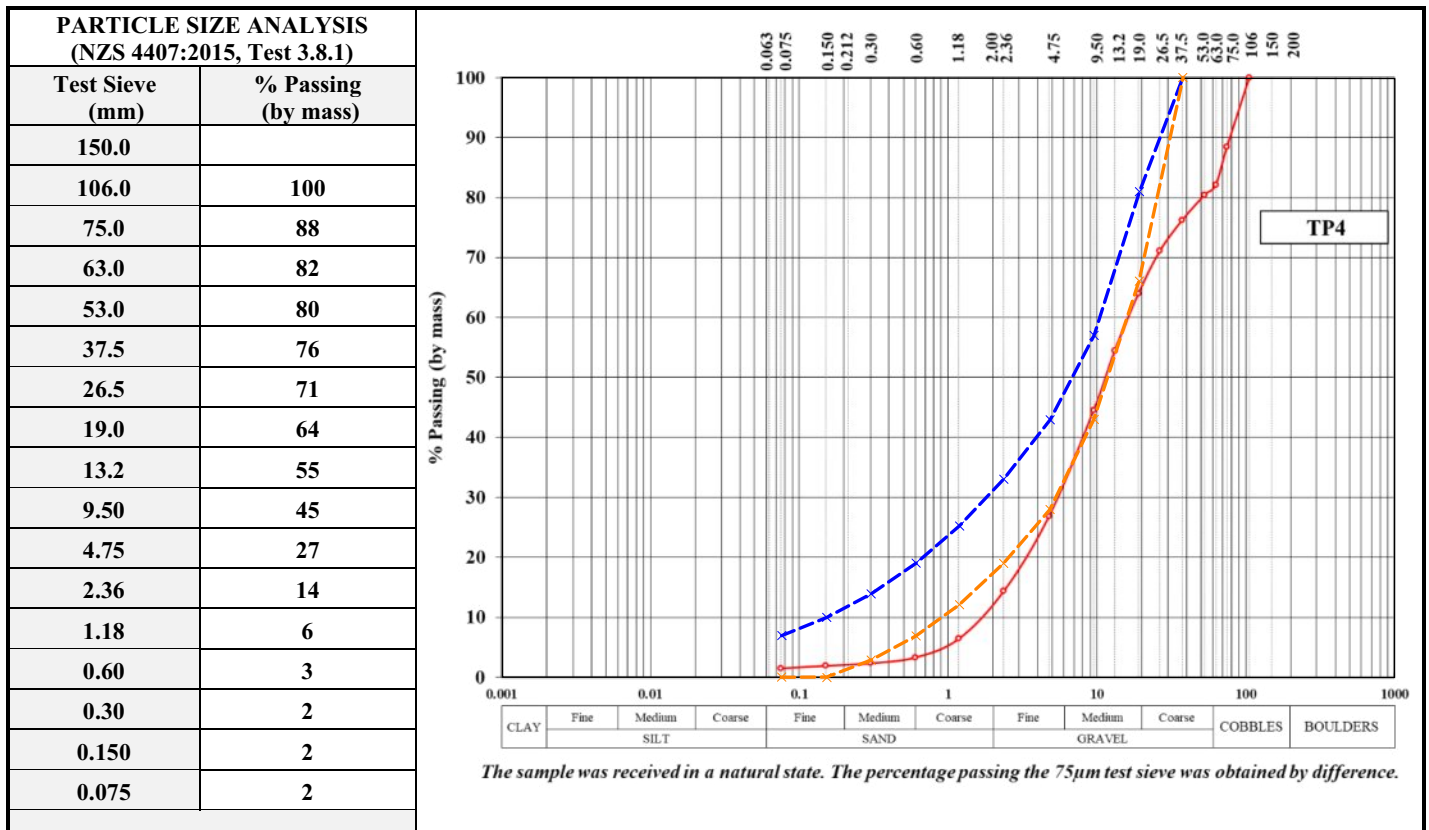


Test results indicated as not accredited are outside the scope of the laboratory's accreditation



## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with some cobbles, minor sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP4	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



SAND EQUIVALENT - NZS 4407:2015, Test 3.6		
Test Description	Sample Result	TNZ M/4 Specification
Sand Equivalent:	74	Minimum 40
<i>Note: The hand shaking method was used in the sand equivalent test.</i>		

**Notes:**

- Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005, the estimated crushing resistance, the client supplied information (cs), sample method and sampling.
- This report may not be reproduced except in full.

**Tested By:** K. Hipkins, L.T. Smith, C. Julius & A.P. Julius      **Date:** 30-Mar-21 to 29-Apr-21

**Checked By:** *[Signature]*

- = AP40 Upper Limit % Passing (by Mass)
- = AP40 Lower Limit % Passing (by Mass)
- = Sample % Passing (by Mass)



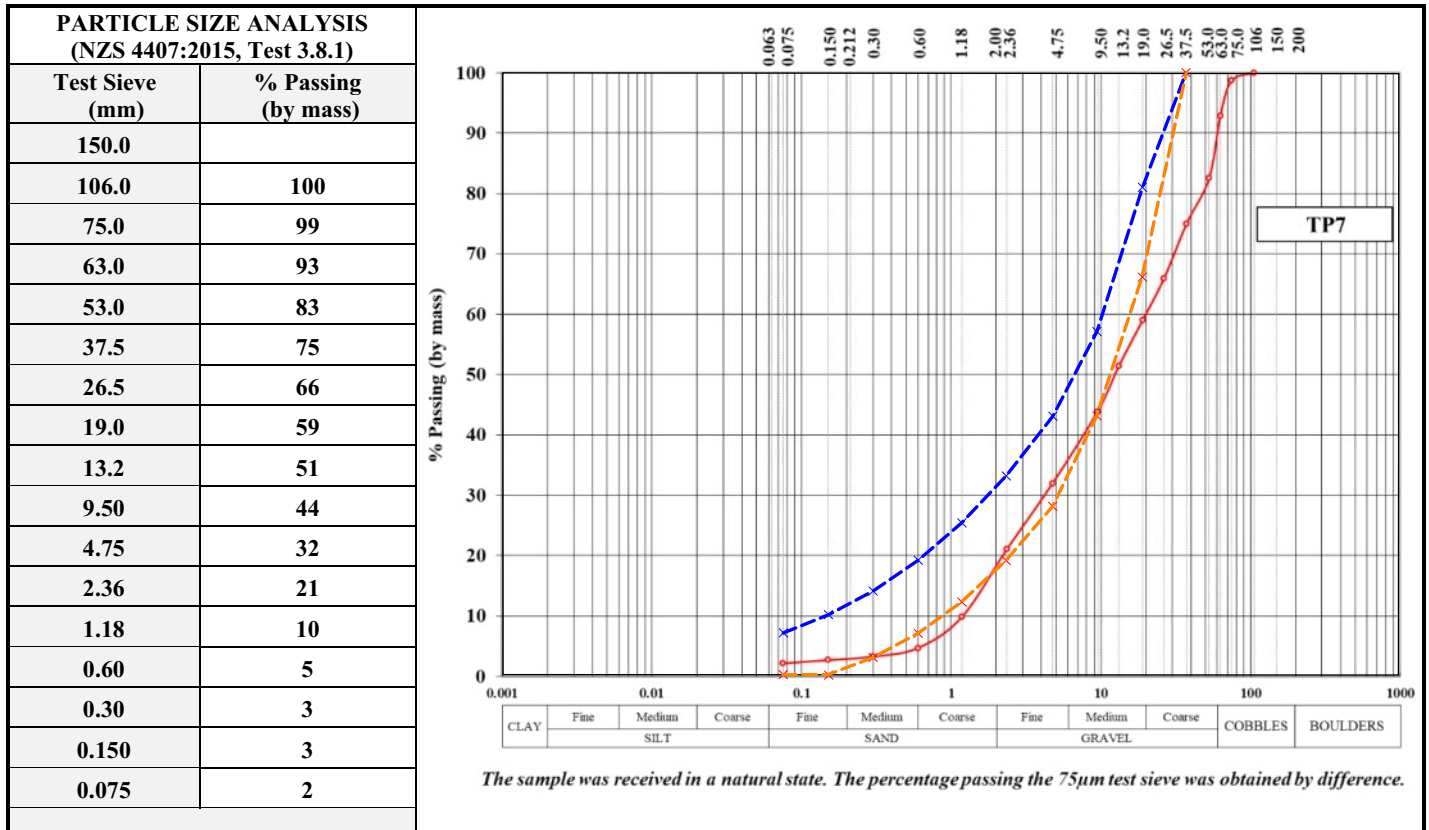
Test results indicated as not accredited are outside the scope of the laboratory's accreditation

*Specialist Quality Assurance Service in Aggregate, Concrete and Soils Testing*



## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with minor cobbles, minor sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP7	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



**Notes:**

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Tested By: K. Hipkins, L.T. Smith, C. Julius & A.P. Julius      Date: 30-Mar-21 to 29-Apr-21

Checked By: *[Signature]*

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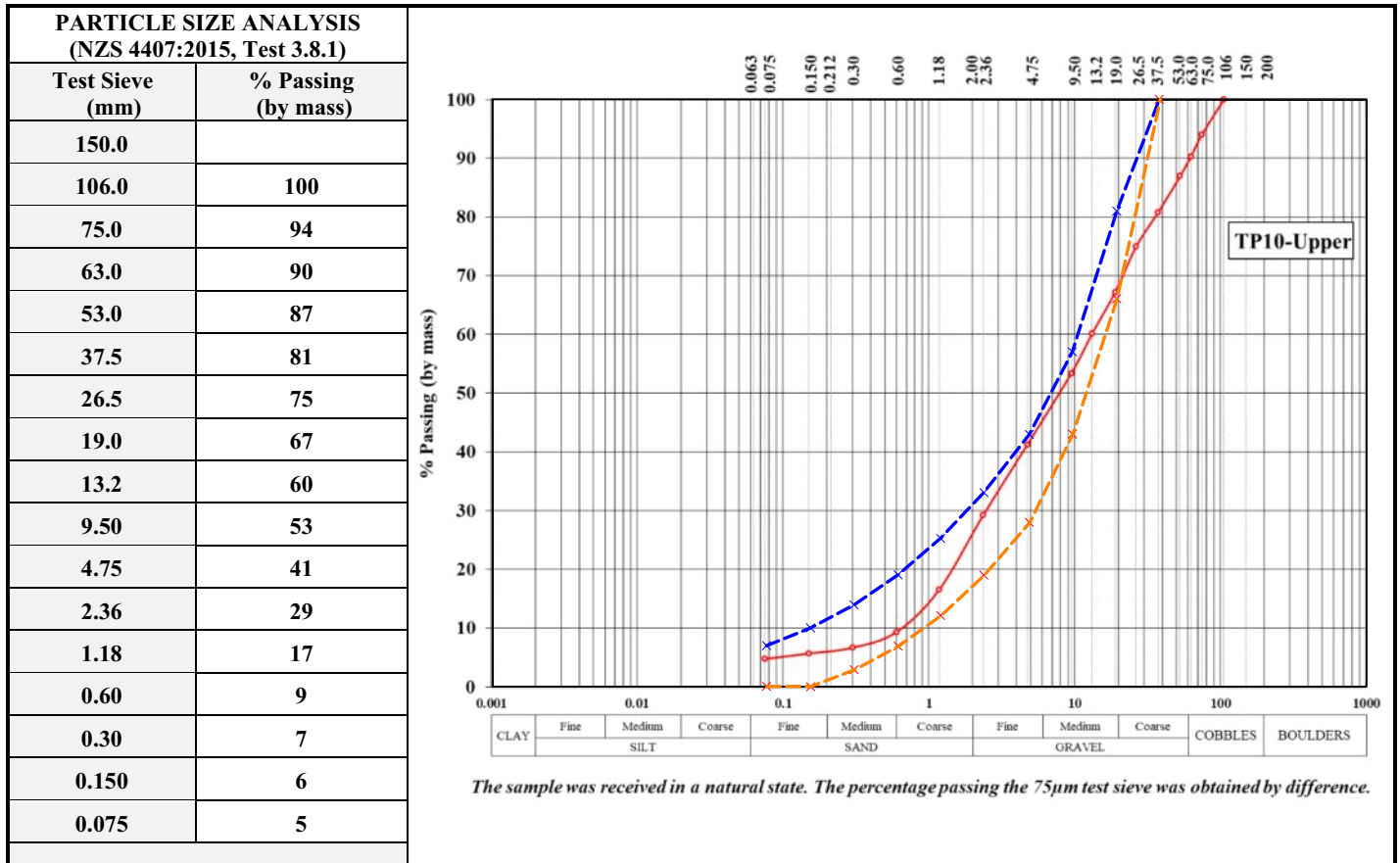


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## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	Sandy GRAVEL with minor cobbles and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP10-Upper	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



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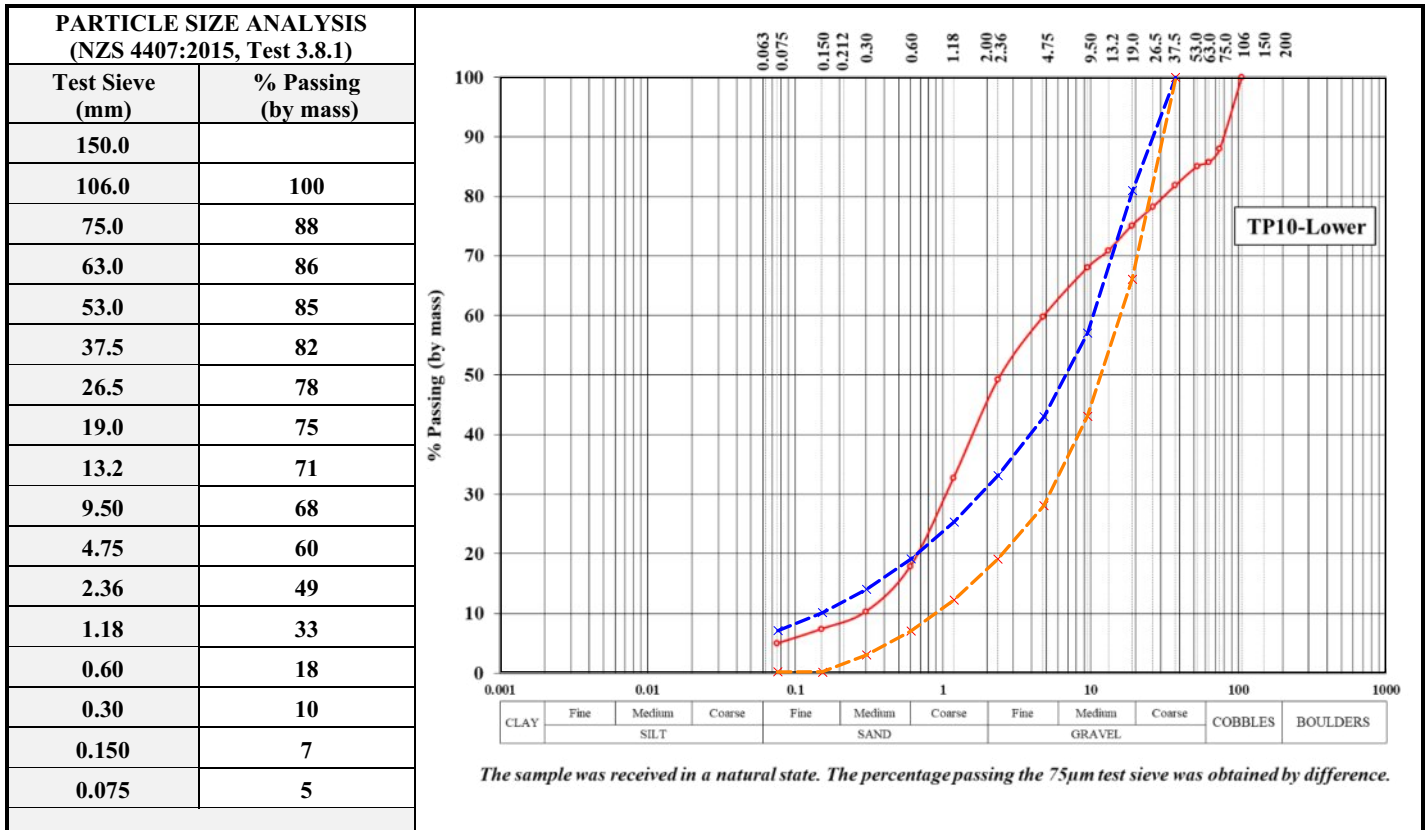


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## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	Gravelly SAND with some cobbles and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP10-Lower	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



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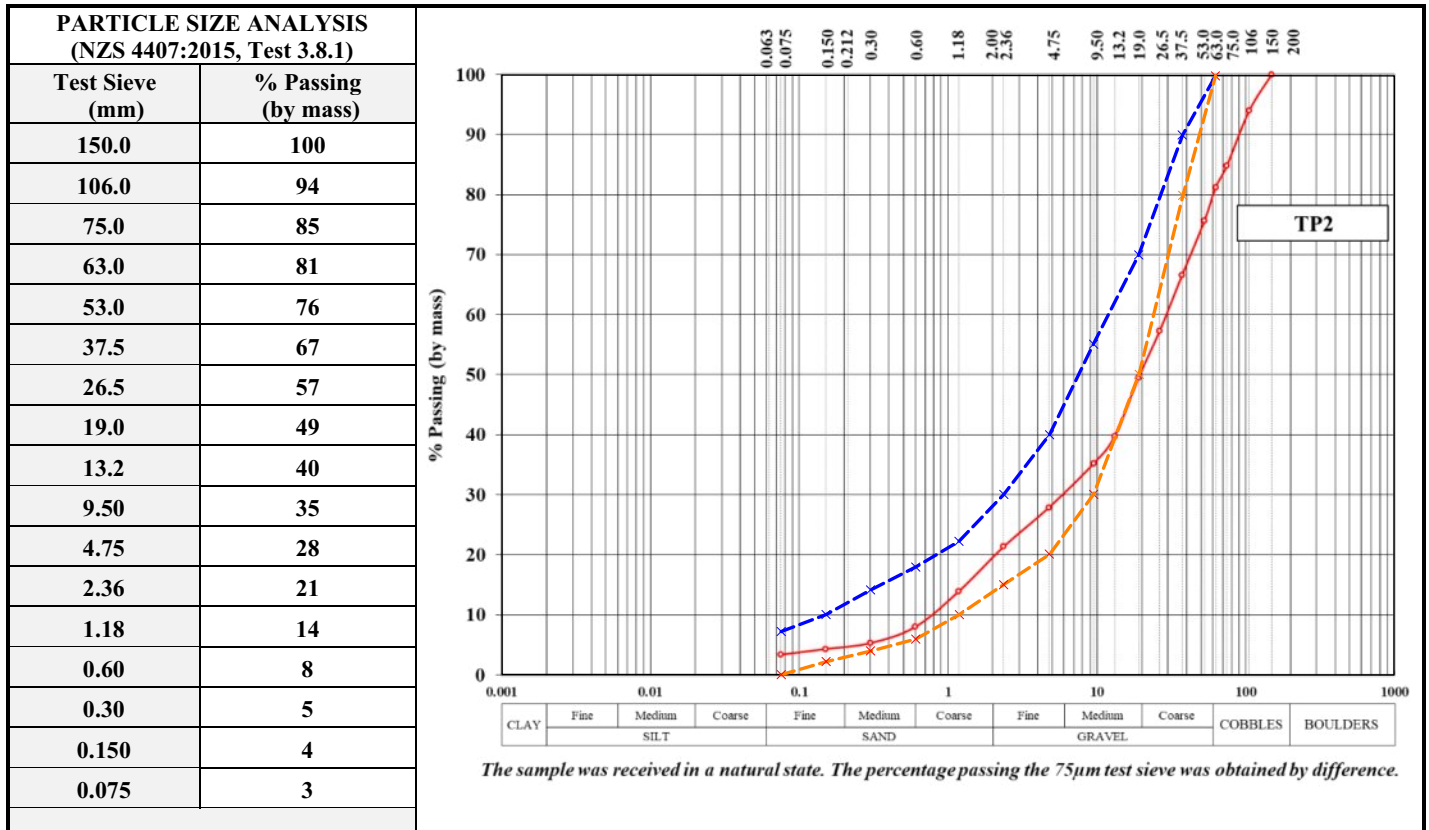
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## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with some cobbles, some sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP2	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



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**Checked By:** *[Signature]*

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- = Sample % Passing (by Mass)

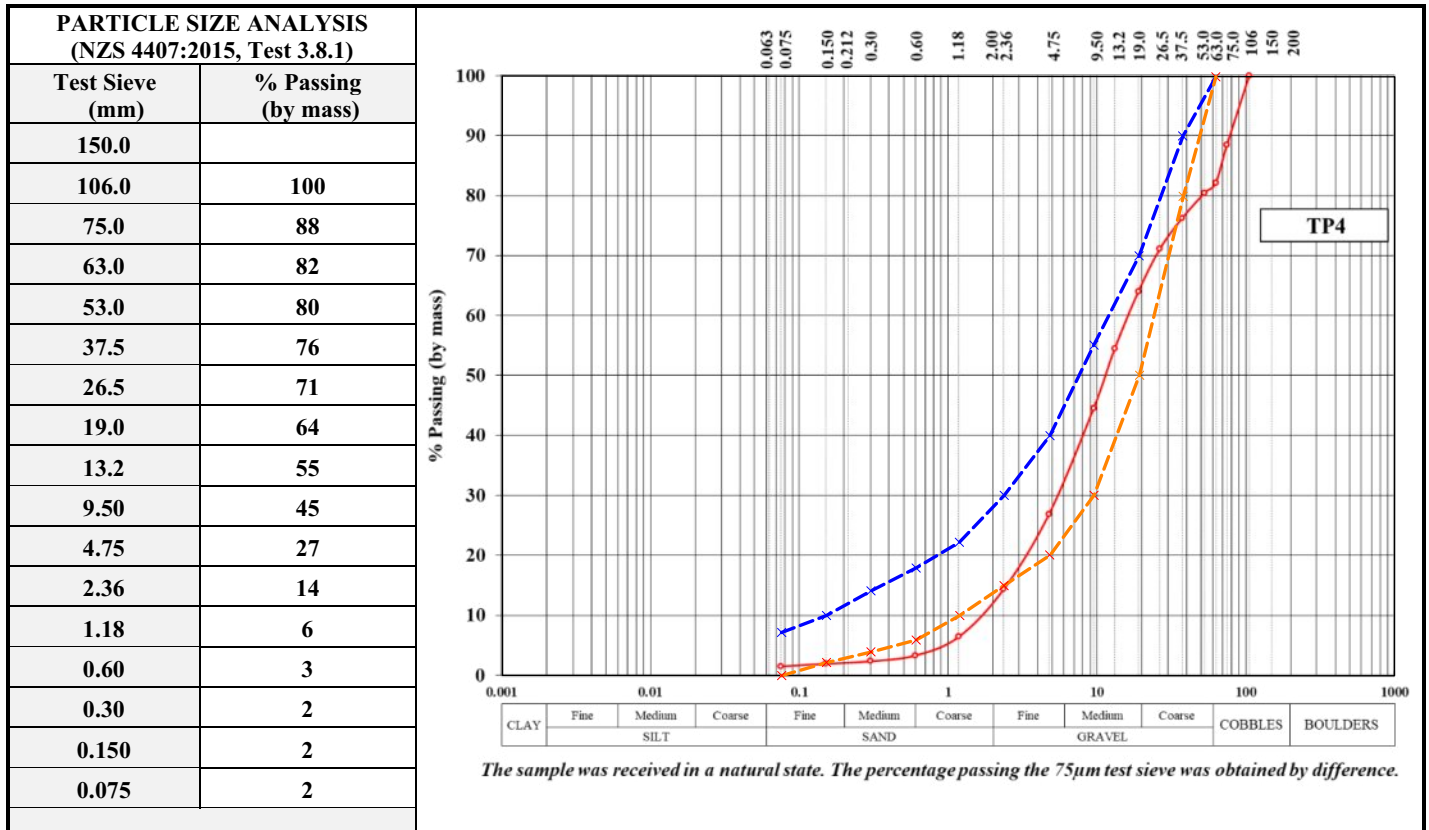


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## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with some cobbles, minor sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP4	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



SAND EQUIVALENT - NZS 4407:2015, Test 3.6		
Test Description	Sample Result	TNZ M/4 Specification
Sand Equivalent:	74	Minimum 40
<i>Note: The hand shaking method was used in the sand equivalent test.</i>		

**Notes:**

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**Checked By:**

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- = Sample % Passing (by Mass)



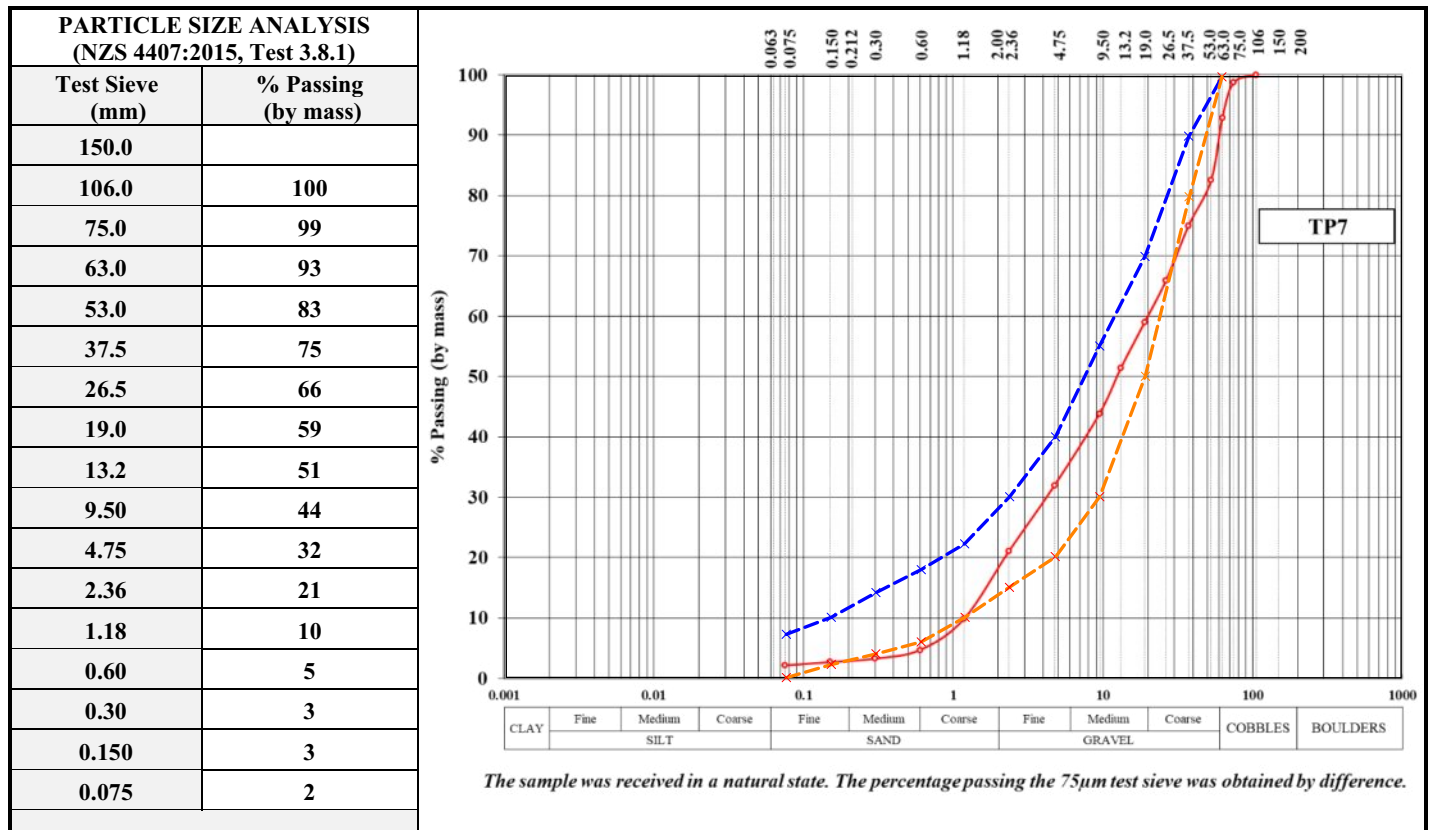
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*Specialist Quality Assurance Service in Aggregate, Concrete and Soils Testing*



## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	GRAVEL with minor cobbles, minor sand and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP7	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



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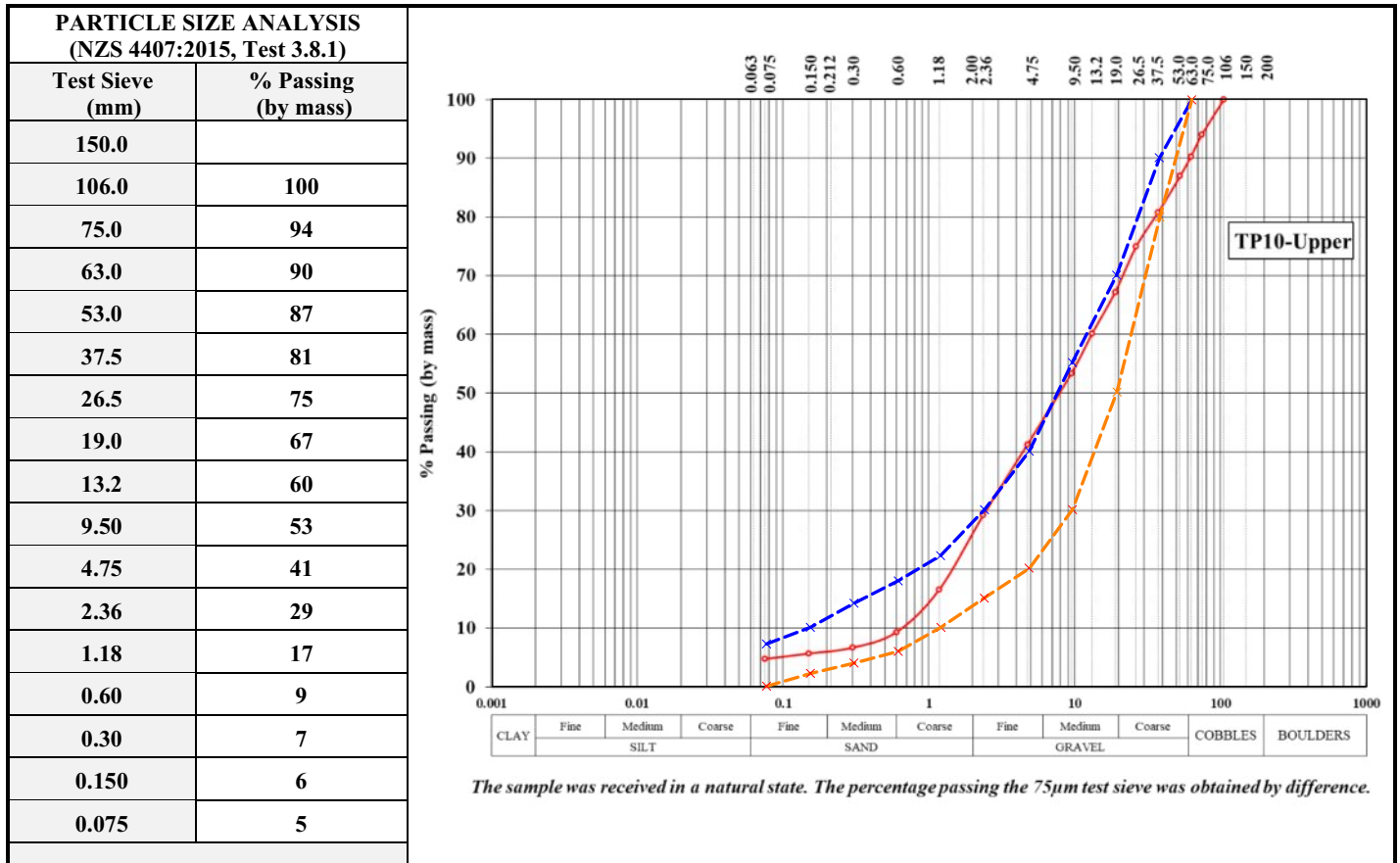


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## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	Sandy GRAVEL with minor cobbles and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP10-Upper	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



**Notes:**

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**Checked By:** *[Signature]*

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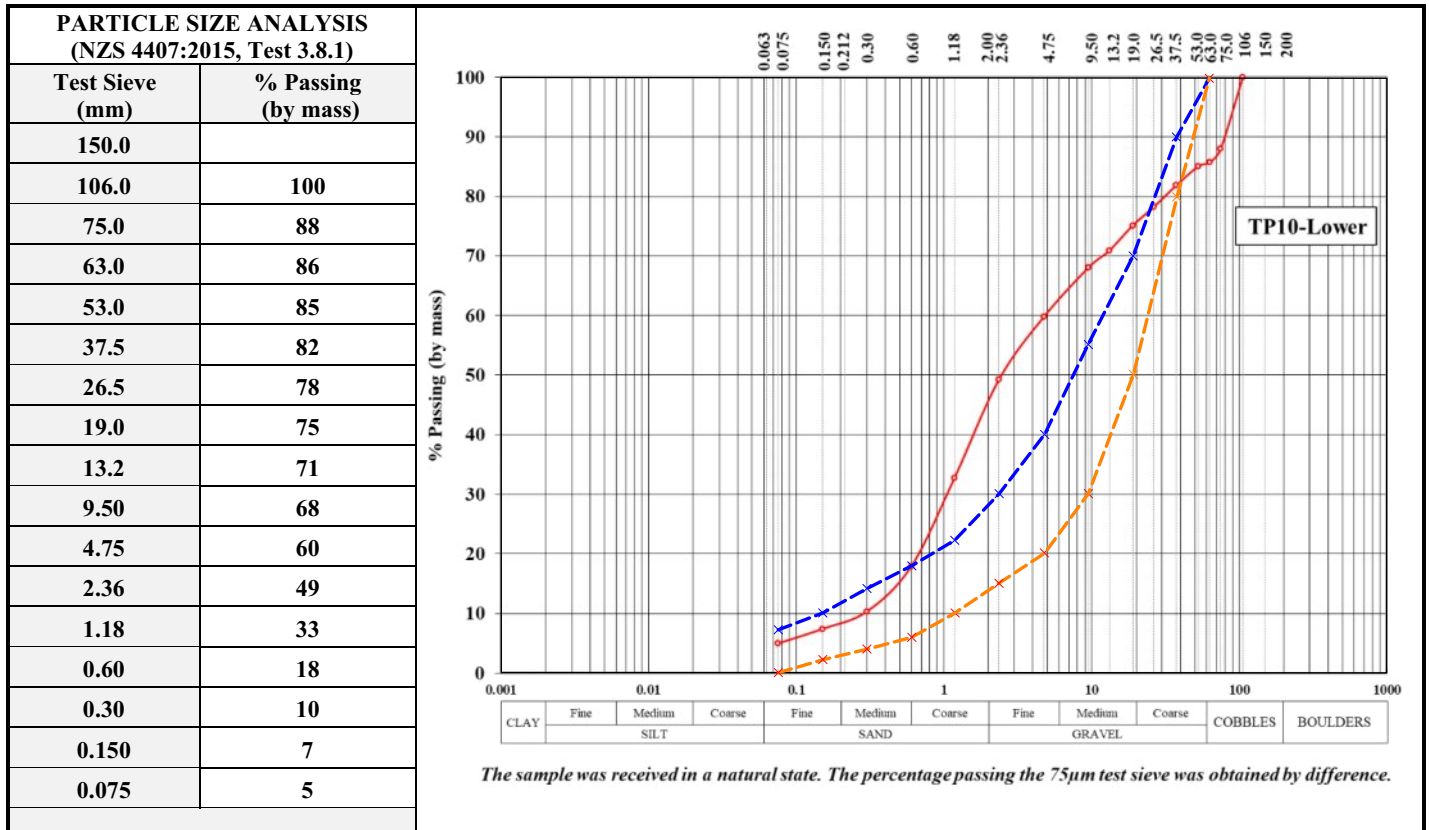


Test results indicated as not accredited are outside the scope of the laboratory's accreditation



## TEST REPORT – KANE ROAD INVESTIGATIONS

<b>Client Details:</b>	GeoSolve Ltd, 25D Gordon Road, Wanaka	<b>Attention:</b>	M. Plunket
<b>Job Description:</b>	Kane Road Investigations		
<b>Sample Description:</b>	Gravelly SAND with some cobbles and trace of silt	<b>Client Order No:</b>	Not Stated
<b>Sample Source: (cs)</b>	TP10-Lower	<b>Sample Label No:</b>	N/A
<b>Date &amp; Time Sampled:</b>	Unknown	<b>Sampled By:</b>	Unknown
<b>Sample Method: (cs)</b>	Test Pit	<b>Date Received:</b>	25-Mar-21



**Notes:**

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**Tested By:** K. Hipkins, L.T. Smith, C. Julius & A.P. Julius      **Date:** 30-Mar-21 to 29-Apr-21

**Checked By:** *[Signature]*

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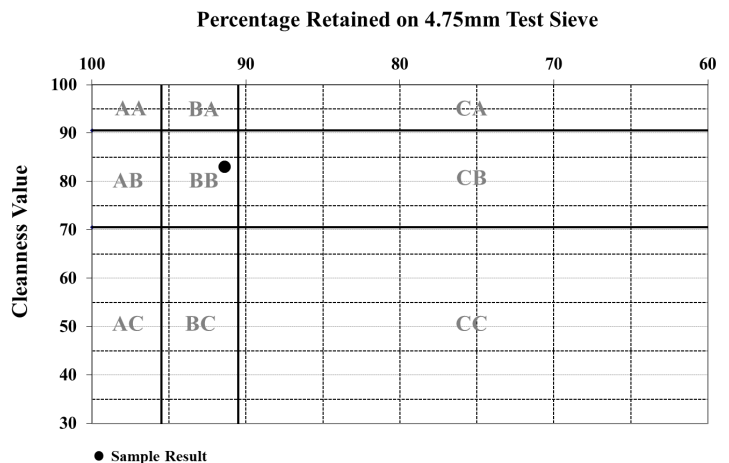
## TEST REPORT – KANE ROAD INVESTIGATIONS

Client Details:	GeoSolve Ltd, 25D Gordon Road, Wanaka	Attention:	M. Plunket
Job Description:	Kane Road Investigations		
Sample Description:	GRAVEL with some cobbles, minor sand and trace of silt	Client Order No:	Not Stated
Sample Source: <sup>(cs)</sup>	TP4	Sample Label No:	N/A
Date & Time Sampled:	Unknown	Sampled By:	Unknown
Sample Method: <sup>(cs)</sup>	Test Pit	Date Received:	25-Mar-21

CRUSHING RESISTANCE - NZS 4407:2015, Test 3.10		Specification Notes:  To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must produce less than 10% fines under a load of 130 kN.
Specified Load:	130 kN	
% Passing 2.36 mm Test Sieve:	5.2	
Crushing Resistance Compliance:	Greater Than Specified Load	
Estimated Crushing Resistance:	200 kN <sup>(1)</sup>	

<sup>(1)</sup> The estimated crushing resistance is a derived result from NZS 3111:1986, Test 14. IANZ endorsement does not apply to this value.

WEATHERING RESISTANCE (NZS 4407:2015, Test 3.11)		Percentage Retained on 4.75mm Test Sieve  Cleanness Value
% Retained on 4.75 mm Test Sieve:	91	
Cleanness Value:	83	
Weathering Resistance Quality Index:	BB	
Specification Notes: To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must have a weathering resistance quality index of AA, AB, AC, BA, BB or CA.		



### Notes:

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Tested By: K. Hipkins, L.T. Smith, C. Julius & A.P. Julius Date: 30-Mar-21 to 29-Apr-21

Checked By:



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**Specialist Quality Assurance Service in Aggregate, Concrete and Soils Testing**



## TEST REPORT – KANE ROAD INVESTIGATIONS

Client Details:	GeoSolve Ltd, 25D Gordon Road, Wanaka	Attention:	M. Plunket
Job Description:	Kane Road Investigations		
Sample Description:	GRAVEL with minor cobbles, minor sand and trace of silt	Client Order No:	Not Stated
Sample Source: <sup>(cs)</sup>	TP7	Sample Label No:	N/A
Date & Time Sampled:	Unknown	Sampled By:	Unknown
Sample Method: <sup>(cs)</sup>	Test Pit	Date Received:	25-Mar-21

CRUSHING RESISTANCE - NZS 4407:2015, Test 3.10		Specification Notes:  To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must produce less than 10% fines under a load of 130 kN.
Specified Load:	130 kN	
% Passing 2.36 mm Test Sieve:	8.9	
Crushing Resistance Compliance:	Greater Than Specified Load	
Estimated Crushing Resistance:	140 kN <sup>(1)</sup>	
<sup>(1)</sup> The estimated crushing resistance is a derived result from NZS 3111:1986, Test 14. IANZ endorsement does not apply to this value.		

WEATHERING RESISTANCE (NZS 4407:2015, Test 3.11)		Percentage Retained on 4.75mm Test Sieve  Cleanness Value
% Retained on 4.75 mm Test Sieve:	85	
Cleanness Value:	72	
Weathering Resistance Quality Index:	CB	
Specification Notes: To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must have a weathering resistance quality index of AA, AB, AC, BA, BB or CA.		

## Notes:

- Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005, the estimated crushing resistance, the client supplied information <sup>(cs)</sup>, sample method and sampling.
- This report may not be reproduced except in full.

Tested By: K. Hipkins, L.T. Smith, C. Julius &amp; A.P. Julius Date: 30-Mar-21 to 29-Apr-21

Checked By:



Test results indicated as not accredited are outside the scope of the laboratory's accreditation



## ***TEST REPORT – KANE ROAD INVESTIGATIONS***

Client Details:	GeoSolve Ltd, 25D Gordon Road, Wanaka	Attention:	M. Plunket
Job Description:	Kane Road Investigations		
Sample Description:	Sandy GRAVEL with minor cobbles and trace of silt and Gravelly SAND with some cobbles and trace of silt	Client Order No:	Not Stated
Sample Source: <sup>(cs)</sup>	TP10 - Combined Upper & Lower	Sample Label No:	N/A
Date & Time Sampled:	Unknown	Sampled By:	Unknown
Sample Method: <sup>(cs)</sup>	Test Pit	Date Received:	25-Mar-21

CRUSHING RESISTANCE - NZS 4407:2015, Test 3.10		Specification Notes:  To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must produce less than 10% fines under a load of 130 kN.
Specified Load:	130 kN	
% Passing 2.36 mm Test Sieve:	9.1	
Crushing Resistance Compliance:	Greater Than Specified Load	
Estimated Crushing Resistance:	140 kN <sup>(1)</sup>	
<sup>(1)</sup> The estimated crushing resistance is a derived result from NZS 3111:1986, Test 14. IANZ endorsement does not apply to this value.		

## Notes:

- Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005, the estimated crushing resistance, the client supplied information <sup>(cs)</sup>, sample method and sampling.
- This report may not be reproduced except in full.

Tested By: K. Hipkins, L.T. Smith, C. Julius & A.P. Julius Date: 30-Mar-21 to 29-Apr-21

Checked By: 

Approved Signatory



A.P. Julius  
Laboratory Manager



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

***Specialist Quality Assurance Service in Aggregate, Concrete and Soils Testing***





## TEST REPORT - ROAD AGGREGATE

Client Details:	Road Metals Co Ltd, P.O. Box 212, Oamaru	Attention:	J. Parker
Job Description:	Road Metals Co Ltd Aggregate Investigations		
Sample Description:	Pit Run	Client Order No:	938
Sample Source:	Landreth	Sample Label No:	54442
Date & Time Sampled:	9-Sep-20 @ 11.15am	Sampled By:	J. Parker
Sample Method:	NZS 4407:2015, Test 2.4.2 *	Date Received:	11-Sep-20
Sample Specification:	TNZ M/4:2006, Specification for Basecourse Aggregates		

<b>CRUSHING RESISTANCE - NZS 4407:2015, Test 3.10</b>		<i>Specification Notes:</i>  To comply with the requirements of TNZ M/4:2006 (Basecourse) an aggregate must produce less than 10% fines under a load of 130 kN.
Specified Load:	130 kN	
% Passing 2.36 mm Test Sieve:	8.4 %	
Crushing Resistance Compliance:	Greater Than Specified Load	
Estimated Crushing Resistance:	150 kN <sup>(1)</sup>	
<sup>(1)</sup> The estimated crushing resistance is a derived result from NZS 3111:1986, Test 14. IANZ endorsement does not apply to this value.		

SAND EQUIVALENT - NZS 4407:2015, Test 3.6		
Test Description	Sample Result	TNZ M/4 Specification
Sand Equivalent:	50	Minimum 40
<i>Note: The hand shaking method was used in the sand equivalent test.</i>		

**Additional Notes:**

- The sample was received in a natural state.
- Information contained in this report which is Not IANZ Accredited relates to the estimated crushing resistance, the sample method \* and sampling.
- This report may not be reproduced except in full.

Tested By: C. Julius & L.T. Smith      Date: 15 to 17-Sep-20

Checked By: 

**Approved Signatory**



A.P. Julius  
Laboratory Manager



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

# Appendix D: Test Pit Photos



Test Pit 1 Excavated Material



Test Pit 1 Sidewall Profile



Test Pit 2 Excavated Material



Test Pit 2 Sidewall Profile



Test Pit 3 Excavated Material



Test Pit 3 Sidewall Profile



Test Pit 4 Sidewall Profile



Test Pit 5 Excavated Material



Test Pit 5 Sidewall Profile



Test Pit 6 Excavated Material



Test Pit 6 Sidewall Profile





Test Pit 7 Sidewall Profile



Test Pit 8 Sidewall Profile



Test Pit 9 Sidewall Profile



Test Pit 10 Sidewall Profile



**Road Metals Test Pit Sidewall Profile**

# DESIGN ADVICE MEMO

## ACOUSTIC



Memo No **A01 Issue A**  
Job Name **Quarry - Kane Rd, Wanaka**  
Job No **210505/A**  
Date **7 June 2021**  
To **C. Hughes and Associates Ltd**  
Email **Level 3, 80 Ardmore Street, Wanaka 9343**  
Attention **Jack Lister**  
Copies to Client **Grant Finn - Road Metals Otago**

P (03) 366-1777  
E [engineering@pfc.co.nz](mailto:engineering@pfc.co.nz)  
W [www.pfc.co.nz](http://www.pfc.co.nz)

383 Colombo St, Sydenham  
Christchurch

Level 1, 1 Searle Lane  
Queenstown

PO Box 7110, Sydenham  
Christchurch 8240

  
Signature **Mark Lewthwaite**

## Establishment of New Quarry off Kane Rd - Noise Assessment Report

### 1. Introduction

Powell Fenwick have been commissioned by C. Hughes and Associates to provide a noise assessment of effects for the proposed establishment of an aggregate quarry off Kane Rd, near Wanaka. The site is in the Queenstown Lakes District and is Rural General Zone land under the Operative Queenstown Lakes District Plan. Road Metals Otago is the proposed operator of the quarry. It is expected this assessment will accompany an application for resource consent.

The proposal is to dig into a section of river terrace located at Section 53, Block VII, Lower Hawea Survey District located between Luggate and Hawea Flat that is deemed to be a suitable location for raw material, refer Figure 1 below. There are two other quarries 2-3 km to the south and others in the Wanaka/Hawea area.



Figure 1. Site location. Image from C. Hughes and Associates.

The quarry will be accessed at the south-west corner from an existing unsealed farm road off Kane Rd. The road will be widened where necessary and condition improved to provide reasonable access. The finished surface will be graded AP65, compacted to a smooth surface by vehicle movements.

There are expected to be 2-3 occasions per year where a mobile crusher is brought in and operates for a period of 3-4 weeks producing stockpiles of graded materials. At all times there would be a loader present, filling 30-40 truck and trailer units on a high output day. The operational hours will be 0700-1800 h Mon-Fri and 0700-1300 h Sat.

The initial development of the pit will be to establish an initial working footprint for the crusher, as a priority digging down to approximately 3 m below the current surface. The working area of the pit will grow towards the north as the operation continues. The majority of the operation will therefore be within the formed pit, including all of the operation towards the north end of the site, where noise will be screened by the pit walls.

The last stage of earthworks will be to break out the east wall to join the lower terrace on the east of the site so the land can be returned to a farmable paddock.

The quarry is expected to be in operation for two years. This consent application is for a period of use up to five years, during which up to 600,000 m<sup>3</sup> of material could be excavated.

The closest dwelling to the north on Lot 1 DP 22387 we understand has provided affected party approval and therefore effects are not required to be assessed at this location. A dwelling on Section 35 and other dwellings along a treeline on Section 52 at approx. 970-1150 m from the centre of the proposed quarry pit are the next closest / highest noise exposure for the purpose of assessing noise effects, refer Figure 2 below.



Figure 2. Closest dwellings. Aerial Image from LINZ.

## 2. Criteria

### Resource Management Act

Under the Resource Management Act 1991, local authorities are required to put in place district plans to manage the effects of land use activities. The principal tool in New Zealand to manage noise impacts is by zoning land to both sensitive and noise producing and separating them or providing reasonable mitigation (acoustic insulation) such that they are compatible and do not unreasonably interfere with amenity and/or business operation.

Section 16 of the RMA also places a duty on the land occupier to avoid creating unreasonable noise effects by using the best practicable option for mitigation; this is additional to any District Plan rule.

### Queenstown Lakes District Plan

From the Operative Queenstown Lakes District Plan Rule 5.3.5.2.v Noise:

(a) *Sound from non-residential activities measured in accordance with NZS 6801:2008 and assessed in accordance with NZS 6802:2008 shall not exceed the following noise limits at any point within the notional boundary of any residential unit, other than residential units on the same site as the activity:*

- (i) *daytime (0800 to 2000 hrs) 50 dB  $L_{Aeq(15 min)}$*
- (ii) *night-time (2000 to 0800 hrs) 40 dB  $L_{Aeq(15 min)}$*
- (iii) *night-time (2000 to 0800 hrs) 70 dB  $L_{AFmax}$*

...

(c) *The noise limits in (a) shall not apply to construction sound which shall be assessed in accordance and comply with NZS 6803:1999.*

...

As the application is **non-complying**, the above limits are guidance only.

Considering wider context around noise controls in the Rural General Zone we note the following from the Operative Queenstown Lakes District Plan Rule 5.1.iii Protecting the Rural Amenity Values:

*All Rural Zones have particular amenity and environmental values, which are important to rural people. These include privacy, rural outlook, spaciousness, ease of access, clean air and, at times, quietness. However, because of the range of activities that necessarily occur in a rural area, there are levels of noise, dust, traffic generation and smell that are an integral part of rural amenity values. Provided that these effects do not constitute a genuine nuisance or a health risk, they must be accepted as anticipated components of rural amenity values.*

We also consider other relevant criteria from the World Health Organisation and New Zealand Standards.

### WHO Guidelines

The World Health Organisation (WHO) Guidelines for Community Noise 1999 is commonly referenced to for determining design sound levels outside and inside buildings.

Table 1: From WHO Table 1 Guideline values for community noise in specific environments.

<i>Specific environment</i>	<i>Critical health effect(s)</i>	<i><math>L_{Aeq}</math> [dB(A)]</i>	<i>Time base [hours]</i>	<i><math>L_{Amax}</math> fast [dB]</i>
<i>Outdoor living area</i>	<i>Serious annoyance, day-time and evening</i>	55	16	
	<i>Moderate annoyance, day-time and evening</i>	50		
<i>Dwelling, indoors</i>	<i>Speech intelligibility &amp; moderate annoyance, daytime &amp; evening</i>	35	16	

### New Zealand Standards

The New Zealand Standard NZS 6802:2008 Acoustics - Environmental noise, in section 8.6.2 recommends outside design sound levels for sites in the New Zealand context.

With reference to section 8.6.2 Table 3 of the Standard, *Guideline residential upper noise limits*

Table 2: 8.6.2 Table 3 of NZS 6802:2008.

Daytime <sup>(1)</sup>	55 dB $L_{Aeq(15\ min)}$
Evening <sup>(1,2)</sup>	55 dB $L_{Aeq(15\ min)}$
Night-time <sup>(1)</sup>	55 dB $L_{Aeq(15\ min)}$
Night-time <sup>(1)</sup> $L_{max}$	55 dB $L_{AFmax}$
<p>Note -</p> <p>(1) The definition of times of day are a matter for the relevant local authority and should recognise that a period of not less than 8 hours needs to be provided for sleep to ensure at least the minimum acceptable degree of health protection.</p> <p>(2) Inclusion of an evening period and its hours of application are a matter for the relevant local authority.</p> <p>...</p>	

The Australian and New Zealand Standard AS/NZS 2107:2016 recommends internal design sound levels for buildings in the Australasian context.

With reference to Table 1, Item 7 of the standard for Residential:

*Houses in Rural areas with negligible transportation*

- *Sleeping areas (night time) 25 to 30 dB  $L_{Aeq}$*

### 3. Noise Survey

A site noise survey of relevant areas of the river flats was conducted and ambient measurements undertaken on Wed 14 Apr 2021 by Mark Lewthwaite of Powell Fenwick. The measurements were undertaken between XXXX h at the application site at location shown in Figure 2. Meaningful measurements were not possible near the dwellings further north as construction noise related to a new dwelling was present. The ambient measurements would be expected to be representative of the dwelling at Section 51 and lower than other dwellings closer to Kane Rd.

During the survey, there was no discernible wind and the sky was overcast with no rain. The sound level meter (B&K 2250: ser.2625254) was calibrated to 114 dB before and after the survey and no significant drift was observed. The sound level meter was laboratory calibrated on 05 Mar 2020. The calibrator (SV33a: ser.58057) was calibrated on 05 Mar 2020. All instrumentation used within this survey is therefore considered to be in calibration.

The measurements ranged from XXXX - XXXX dB  $L_{Aeq}$  duration.

Observations made during the survey were as follows:

- XXXX

A further site visit of operational Parkburn Quarry near Cromwell was conducted on Fri 16 Apr 2021 and measurements of Road Metals equipment undertaken between XXXX h including at locations near to crushing equipment shown in Figure 3. This survey was also undertaken by Mark Lewthwaite of Powell Fenwick.

The same measurement equipment was used and no significant drift in calibration was observed.

XXXX

Figure 3. Measurement locations and levels relevant to mobile crusher.

Observations made during the survey were as follows:

- XXXX

## 4. Modelling and Results

The noise breakout from the quarry activities to the wider river flats area has been modelled using SoundPlan **VER 8.2**, a proprietary noise modelling software which implements the principles of ISO 9613-2 for outdoor noise propagation. The modelling has been used to determine noise levels at neighbouring notional boundaries. Topography and generally soft ground surfaces were included in the model.

The worst case scenario has been modelled, being the mobile crusher equipment in operation, as well as 40 truck and trailers day being loaded on one day. Noise inputs were as follows:

- For the crushing equipment, the crushing was assumed to be towards the north end of the proposed quarry but set back from the quarry wall where screening effects would be more typical. The noise levels used in the model were calibrated to be within 1 dB of the source noise measurements at Parkburn Quarry with the marginally noisier direction arbitrarily oriented north towards the closest dwellings.
- For the loading activities, the loading was assumed to be towards the north end of the proposed quarry but set back from the quarry wall where screening effects would be more typical. The noise levels in the model were based on the measured levels and assumed equal noise propagation in all directions.
- The vehicle movements were based on the measured levels, using British Standard BS 5228-1:2009 Section F2.5 for predicted noise levels of mobile plant on a well-defined route.

A contour plot of the noise propagation has been produced and is presented in Appendix A Figure A1 for the plant in a pit 3 m below the existing contours. The noise levels at the earlier identified rural dwellings are as follows:

- Dwelling on Section 51, Blk VII: 29 dB  $L_{Aeq}$
- Dwelling on Section 52, Blk VII: 28 dB  $L_{Aeq}$
- Dwelling on Section 35, Blk VII: 34 dB  $L_{Aeq}$

For comparison, a contour plot of noise propagation for the plant at current ground level has also been produced and is presented in Appendix A Figure A2. The difference in noise level is subtle between the pit and ground level activities, reinforcing that initial and final stages of works, when screening from the pit walls will not always be in effect, that noise levels will not differ significantly.

## 5. Assessment

Comparing the above predicted noise levels to the guidance criteria we conclude that the operational levels are well below the 50 dB  $L_{Aeq(15mins)}$  day time limit in the QLDP, and importantly, is also below the more stringent night-time limit of 40 dB  $L_{Aeq(15mins)}$  applicable during the initial part of the operational period from 0700-0800 h.

The levels are also well below guidance criteria for outside noise limits, including 50 dB  $L_{Aeq(16hours)}$  in the WHO guidelines, to avoid moderate annoyance in outdoor living areas, and 55 dB  $L_{Aeq(15mins)}$  day time limit in NZS 6802:2008 - most commonly applied between 0700-2300 h.

The above criteria is generic for residential environments, further consideration could be given to whether living environments in rural settings is to be afforded additional attention. To quantify this AS/NZS 2107:2016 states that for houses in rural areas with negligible transportation the noise level within sleeping areas during night time should be between a relatively demanding range of 25-30 dB  $L_{Aeq}$ . Typically 15 dB of reduction is afforded to a façade with windows ajar, therefore this level would correspond to 40-45 dB  $L_{Aeq}$  external to the dwelling. This is no lower than the District Plan rule of 40 dB  $L_{Aeq}$  at night-time, if operation between 0700-0800 h should be assessed as night-time.

On a qualitative basis, the Plan states: "rural zones ... have amenity and environmental values ... These include ... at time, quietness. However there are levels of noise ... that are an integral part of rural amenity values. Provided that these effects do not constitute a genuine nuisance or a health risk, they must be accepted as anticipated components of rural amenity values." The effects are expected to be minimal at the determined levels, and additionally the described levels are only valid for the lesser proportion of the annual period when the crusher is in operation - this has parallels to seasonal farming activities.

It is unlikely that special audible characteristics will be present, and in any case, more than 5 dB margin exists to all of the criteria.

## 6. Conclusion

Powell Fenwick have been commissioned by C. Hughes and Associates to provide a noise assessment of effects for the proposed establishment of an aggregate quarry off Kane Rd, near Wanaka. The site is in the Queenstown



Lakes District and is Rural General Zone land under the Operative Queenstown Lakes District Plan. Road Metals Otago is the proposed operator of the quarry.

A contour plot of the noise propagation has been produced and is presented in Appendix A Figure A1. The noise levels at the closest assessable rural dwellings are as follows:

- Dwelling on Section 51, Blk VII: 29 dB  $L_{Aeq}$
- Dwelling on Section 52, Blk VII: 28 dB  $L_{Aeq}$
- Dwelling on Section 35, Blk VII: 34 dB  $L_{Aeq}$

Comparing the above predicted noise levels to the guidance criteria we conclude that the operational levels are well below the 50 dB  $L_{Aeq(15mins)}$  day time limit in the QLDP, and importantly, is also below the more stringent night-time limit of 40 dB  $L_{Aeq(15mins)}$  applicable during the initial part of the operational period from 0700-0800 h.

The levels are also well below guidance criteria for outside noise limits, including 50 dB  $L_{Aeq(16hours)}$  in the WHO guidelines, to avoid moderate annoyance in outdoor living areas, and 55 dB  $L_{Aeq(15mins)}$  day time limit in NZS 6802:2008.

Specific to guidance for amenity at *rural* dwellings, the noise meets quantitative and qualitative criteria.

The noise effects expected from the quarry are therefore expected to be minimal.

## 7. Appendix A - Noise Contour Plots

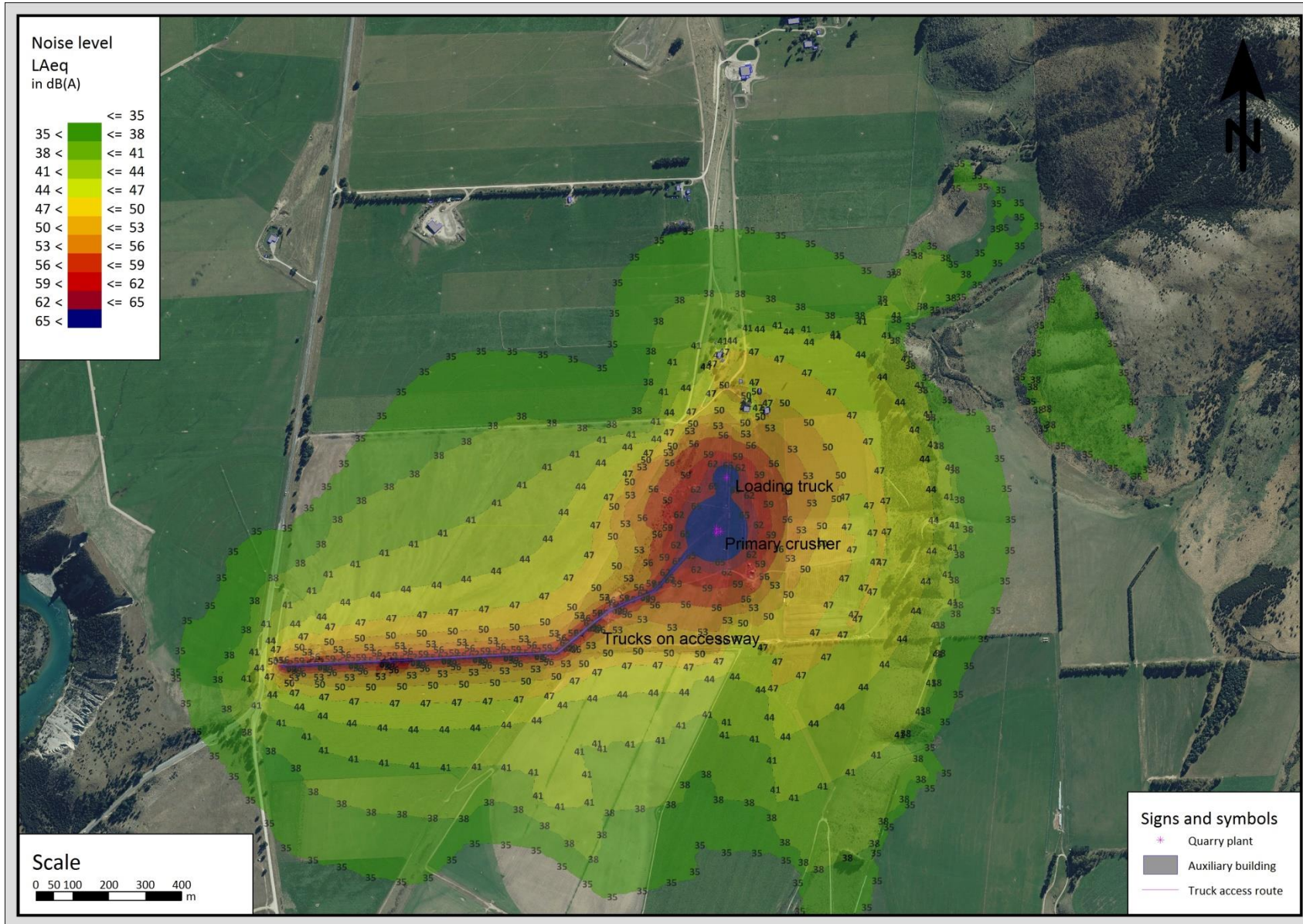


Figure A1: Noise contour plot of quarry plant in operation in a pit 3 m below the surface. For a 15 minute assessment period, this is two truck and trailer units loaded with shingle, four truck and trailer movements on the access way (two entering and two exiting), and the mobile crusher in continuous operation.

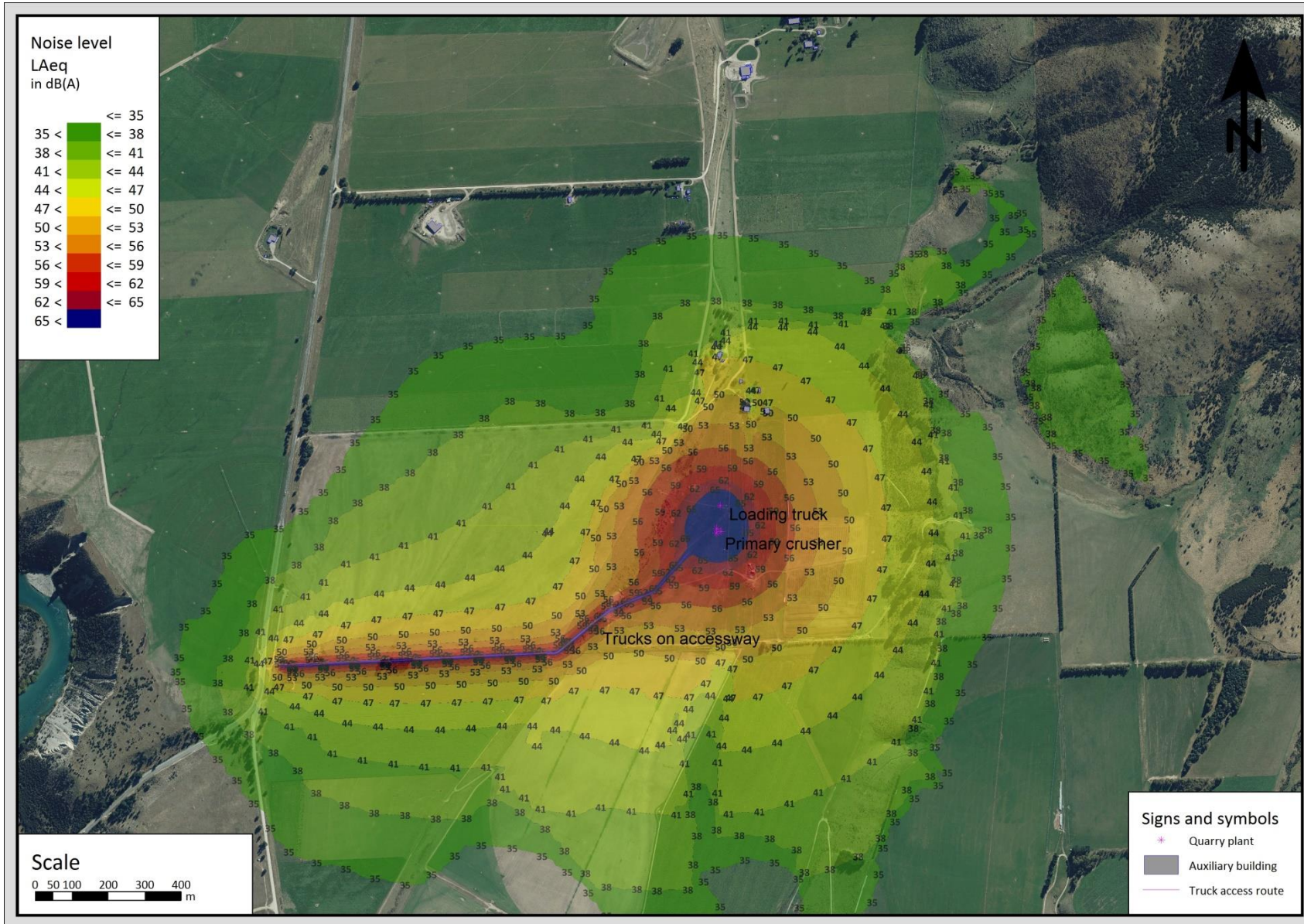
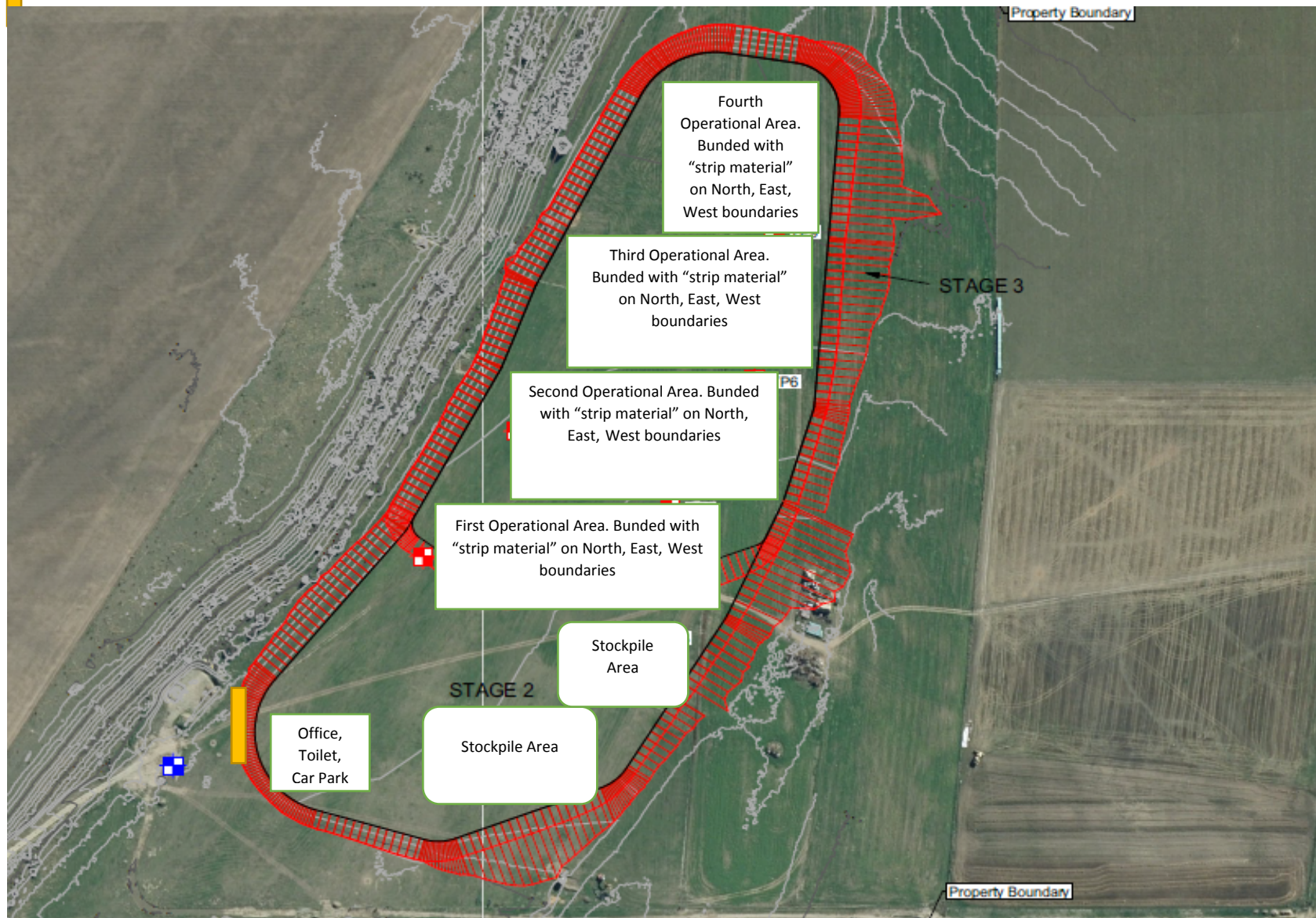


Figure A2: Noise contour plot of quarry plant in operation on the surface of existing contours. For a 15 minute assessment period, this is two truck and trailer units loaded with shingle, four truck and trailer movements on the access way (two entering and two exiting), and the mobile crusher in continuous operation.

# Kane Road Worksite Plan October 2021

Denotes Gate to Processing Area





**JCL**  
**ASPHALT**

0800 525 753  
www.jclasphalt.co.nz

**ROAD METALS**

**PARKBURN  
QUARRY**

Phone: 021 238 788  
Aggregate Sales: Peter Murphy 021 238 788  
Quarry Manager: Craig Hurling 021 394 171



**FIRTH PARKBURN**

**Allied**

**Cromwell**  
State Highway 53  
Ph: 03 44...

# DESIGN ADVICE MEMO

## ACOUSTIC



Memo No **A01 Issue B**  
Job Name **Quarry - Kane Rd, Wanaka**  
Job No **210505/A**  
Date **4 July 2021**  
To **C. Hughes and Associates Ltd**  
Email **Level 3, 80 Ardmore Street, Wanaka 9343**  
Attention **Jack Lister**  
Copies to Client **Grant Finn - Road Metals Otago**

P (03) 366-1777  
E [engineering@pfc.co.nz](mailto:engineering@pfc.co.nz)  
W [www.pfc.co.nz](http://www.pfc.co.nz)

383 Colombo St, Sydenham  
Christchurch

Level 1, 1 Searle Lane  
Queenstown

PO Box 7110, Sydenham  
Christchurch 8240

Signature **Mark Lewthwaite**

### Establishment of New Quarry off Kane Rd - Noise Assessment Report

#### 1. Introduction

Powell Fenwick have been commissioned by C. Hughes and Associates to provide a noise assessment of effects for the proposed establishment of an aggregate quarry off Kane Rd, near Wanaka. The site is in the Queenstown Lakes District and is Rural General Zone land under the Operative Queenstown Lakes District Plan. Road Metals Otago is the proposed operator of the quarry. It is expected this assessment will accompany an application for resource consent.

The proposal is to dig into a section of river terrace located at Section 53, Block VII, Lower Hawea Survey District located between Luggate and Hawea Flat that is deemed to be a suitable location for raw material, refer Figure 1 below. There are two other quarries 2-3 km to the south and others in the Wanaka/Hawea area.



Figure 1. Site location. Image from C. Hughes and Associates.

The quarry will be accessed at the south-west corner from an existing unsealed farm road off Kane Rd. The road will be widened where necessary and condition improved to provide reasonable access. The finished surface will be graded AP65, compacted to a smooth surface by vehicle movements.

There are expected to be 2-3 occasions per year where a mobile crusher is brought in and operates for a period of 3-4 weeks producing stockpiles of graded materials. At all times there would be a loader present, filling 30-40 truck and trailer units on a high output day. The operational hours will be 0700-1800 h Mon-Fri and 0700-1300 h Sat.

The initial development of the pit will be to establish an initial working footprint for the crusher, as a priority digging down to approximately 3 m below the current surface. The working area of the pit will grow towards the north as the operation continues. The majority of the operation will therefore be within the formed pit, including all of the operation towards the north end of the site, where noise will be screened by the pit walls.

The last stage of earthworks will be to break out the east wall to join the lower terrace on the east of the site so the land can be returned to a farmable paddock.

The quarry is expected to be in operation for two years. This consent application is for a period of use up to five years, during which up to 600,000 m<sup>3</sup> of material could be excavated.

The closest dwelling to the north on Lot 1 DP 22387 will be approached for affected party approval and therefore effects are not specifically addressed at this location. A dwelling on Section 35 and other dwellings along a treeline on Section 52 at approx. 970-1150 m from the centre of the proposed quarry pit are the next closest / highest noise exposure for the purpose of assessing noise effects, refer Figure 2 below.



Figure 2. Closest dwellings. Aerial Image from LINZ.

## 2. Criteria

### Resource Management Act

Under the Resource Management Act 1991, local authorities are required to put in place district plans to manage the effects of land use activities. The principal tool in New Zealand to manage noise impacts is by zoning land to both sensitive and noise producing and separating them or providing reasonable mitigation (acoustic insulation) such that they are compatible and do not unreasonably interfere with amenity and/or business operation.

Section 16 of the RMA also places a duty on the land occupier to avoid creating unreasonable noise effects by using the best practicable option for mitigation; this is additional to any District Plan rule.

### Queenstown Lakes District Plan

From the Operative Queenstown Lakes District Plan Rule 5.3.5.2.v Noise:

(a) *Sound from non-residential activities measured in accordance with NZS 6801:2008 and assessed in accordance with NZS 6802:2008 shall not exceed the following noise limits at any point within the notional boundary of any residential unit, other than residential units on the same site as the activity:*

(i) *daytime (0800 to 2000 hrs) 50 dB  $L_{Aeq(15 min)}$*

(ii) *night-time (2000 to 0800 hrs) 40 dB  $L_{Aeq(15 min)}$*

(iii) *night-time (2000 to 0800 hrs) 70 dB  $L_{AFmax}$*

...

(c) *The noise limits in (a) shall not apply to construction sound which shall be assessed in accordance and comply with NZS 6803:1999.*

...

As the application is discretionary, the above limits are guidance only.

Considering wider context around noise controls in the Rural General Zone we note the following from the Operative Queenstown Lakes District Plan Rule 5.1.iii Protecting the Rural Amenity Values:

*All Rural Zones have particular amenity and environmental values, which are important to rural people. These include privacy, rural outlook, spaciousness, ease of access, clean air and, at times, quietness. However, because of the range of activities that necessarily occur in a rural area, there are levels of noise, dust, traffic generation and smell that are an integral part of rural amenity values. Provided that these effects do not constitute a genuine nuisance or a health risk, they must be accepted as anticipated components of rural amenity values.*

We also consider other relevant criteria from the World Health Organisation and New Zealand Standards.

### WHO Guidelines

The World Health Organisation (WHO) Guidelines for Community Noise 1999 is commonly referenced to for determining design sound levels outside and inside buildings.

Table 1: From WHO Table 1 Guideline values for community noise in specific environments.

<i>Specific environment</i>	<i>Critical health effect(s)</i>	<i><math>L_{Aeq}</math> [dB(A)]</i>	<i>Time base [hours]</i>	<i><math>L_{Amax}</math> fast [dB]</i>
<i>Outdoor living area</i>	<i>Serious annoyance, day-time and evening</i>	55	16	
	<i>Moderate annoyance, day-time and evening</i>	50		
<i>Dwelling, indoors</i>	<i>Speech intelligibility &amp; moderate annoyance, daytime &amp; evening</i>	35	16	

### New Zealand Standards

The New Zealand Standard NZS 6802:2008 Acoustics - Environmental noise, in section 8.6.2 recommends outside design sound levels for sites in the New Zealand context.



With reference to section 8.6.2 Table 3 of the Standard, *Guideline residential upper noise limits*

Table 2: 8.6.2 Table 3 of NZS 6802:2008.

Daytime <sup>(1)</sup>	55 dB $L_{Aeq(15\ min)}$
Evening <sup>(1,2)</sup>	55 dB $L_{Aeq(15\ min)}$
Night-time <sup>(1)</sup>	55 dB $L_{Aeq(15\ min)}$
Night-time <sup>(1)</sup> $L_{max}$	55 dB $L_{AFmax}$
<p>Note -</p> <p>(1) The definition of times of day are a matter for the relevant local authority and should recognise that a period of not less than 8 hours needs to be provided for sleep to ensure at least the minimum acceptable degree of health protection.</p> <p>(2) Inclusion of an evening period and its hours of application are a matter for the relevant local authority.</p> <p>...</p>	

The Australian and New Zealand Standard AS/NZS 2107:2016 recommends internal design sound levels for buildings in the Australasian context.

With reference to Table 1, Item 7 of the standard for Residential:

*Houses in Rural areas with negligible transportation*

- *Sleeping areas (night time) 25 to 30 dB  $L_{Aeq}$*

### 3. Noise Survey

A site noise survey of relevant areas of the river flats was conducted and ambient measurements undertaken on Wed 14 Apr 2021 by Mark Lewthwaite of Powell Fenwick. The measurements were undertaken between 1400-1430 h at the application site at location shown in Figure 2. Meaningful measurements were not possible near the dwellings further north as construction noise related to a new dwelling was present. The ambient measurements would be expected to be representative of the dwelling at Section 51 and lower than other dwellings closer to Kane Rd.

During the survey, there was no discernible wind and the sky was overcast with no rain. The temperature was mild, in the order of 15°C. The sound level meter (B&K 2250: ser.2625254) was calibrated to 114 dB before and after the survey and no significant drift was observed. The sound level meter was laboratory calibrated on 05 Mar 2020. The calibrator (SV33a: ser.58057) was calibrated on 15 Mar 2021. All instrumentation used within this survey is therefore considered to be in calibration.

The measurements were 43 dB  $L_{Aeq}$  for an initial 17 min duration measurement and 30  $L_{Aeq}$  dB for a second 6 min measurement.

Observations made during the survey were as follows:

- The first measurement included a higher level of insect noise from a field to the south, and included air traffic.
- The second measurement was “cleaner” with distant road traffic and bird sound the greater contributors to the noise level.

A further site visit of operational Parkburn Quarry near Cromwell was conducted on Fri 16 Apr 2021 and measurements of Road Metals equipment undertaken between 0815-0915 h including at locations near to crushing equipment shown in Figure 3. This survey was also undertaken by Mark Lewthwaite of Powell Fenwick.

The same measurement equipment was used and no significant drift in calibration was observed. There was light wind however this was not significant due to the relatively close proximity measurements to the machinery. The sky was overcast and the temperature was cool, in the order of 10°C.



Figure 3. Components of mobile crusher.

Observations made during the survey were as follows:

- The mobile crushing equipment measured is that to be used at the application site.
- The louder components of the mobile crusher are those labelled above. Other sources such as conveyors and generator (located on the other side from the photo near to the primary crusher), were lesser contributors.
- A variety of close and more distant measurements were taken of the mobile crusher which were used to calibrate the model. Example measurements included a measurement in a position similar to the photo, 20 m from the impact screen, of 79 dB  $L_{Aeq}$  for 39 sec duration, and a measurement on the opposing side from the photo, at 40 m from the primary crusher, of 73 dB  $L_{Aeq}$  for 1 min 01 sec duration.
- A truck and trailer unit being loaded, at typically 12 m from the loader (varying 10-20 m from the loader and truck positions), was 75 dB  $L_{Aeq}$  for 2 min 20 sec duration.
- The truck and trailer driving away, on stoney pit aggregate, at 16 m from the closest part of the truck route, was 68 dB  $L_{Aeq}$  for 10 sec duration.

#### 4. Modelling and Results

The noise breakout from the quarry activities to the wider river flats area has been modelled using SoundPlan Ver 8.2, a proprietary noise modelling software which implements the principles of ISO 9613-2 for outdoor noise propagation. The modelling has been used to determine noise levels at neighbouring notional boundaries. Topography and generally soft ground surfaces were included in the model.

The worst case scenario has been modelled, being the mobile crusher equipment in operation, as well as 40 truck and trailers day being loaded on one day. Noise inputs were as follows:

- For the crushing equipment, the crushing was assumed to be towards the north end of the proposed quarry but set back from the quarry wall where screening effects would more typical. The noise levels used in the

model were calibrated to be within 1 dB of the source noise measurements at Parkburn Quarry with the marginally noisier direction arbitrarily oriented north towards the closest dwellings.

- For the loading activities, the loading was assumed to be towards the north end of the proposed quarry but set back from the quarry wall where screening effects would be more typical. The noise levels in the model were based on the measured levels and assumed equal noise propagation in all directions.
- The vehicle movements were based on the measured levels, using British Standard BS 5228-1:2009 Section F2.5 for predicted noise levels of mobile plant on a well-defined route.

A contour plot of the noise propagation has been produced and is presented in Appendix A Figure A1 for the plant in a pit 3 m below the existing contours. The noise levels at the earlier identified rural dwellings are as follows:

- Dwelling on Section 51, Blk VII: 29 dB  $L_{Aeq}$
- Dwelling on Section 52, Blk VII: 28 dB  $L_{Aeq}$
- Dwelling on Section 35, Blk VII: 34 dB  $L_{Aeq}$

For comparison, a contour plot of noise propagation for the plant at current ground level has also been produced and is presented in Appendix A Figure A2. The difference in noise level is subtle between the pit and ground level activities, reinforcing that initial and final stages of works, when screening from the pit walls will not always be in effect, that noise levels will not differ significantly.

## 5. Assessment

Comparing the above predicted noise levels to the guidance criteria we conclude that the operational levels are well below the 50 dB  $L_{Aeq(15mins)}$  day time limit in the QLDP, and importantly, is also below the more stringent night-time limit of 40 dB  $L_{Aeq(15mins)}$  applicable during the initial part of the operational period from 0700-0800 h.

The levels are also well below guidance criteria for outside noise limits, including 50 dB  $L_{Aeq(16hours)}$  in the WHO guidelines, to avoid moderate annoyance in outdoor living areas, and 55 dB  $L_{Aeq(15mins)}$  day time limit in NZS 6802:2008 - most commonly applied between 0700-2300 h.

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On a qualitative basis, the Plan states: “rural zones ... have amenity and environmental values ... These include ... at time, quietness. However there are levels of noise ... that are an integral part of rural amenity values. Provided that these effects do not constitute a genuine nuisance or a health risk, they must be accepted as anticipated components of rural amenity values.” The effects are expected to be minimal at the determined levels, and additionally the described levels are only valid for the lesser proportion of the annual period when the crusher is in operation - this has parallels to seasonal farming activities.

It is unlikely that special audible characteristics will be present, and in any case, more than 5 dB margin exists to all of the criteria.

## 6. Conclusion

Powell Fenwick have been commissioned by C. Hughes and Associates to provide a noise assessment of effects for the proposed establishment of an aggregate quarry off Kane Rd, near Wanaka. The site is in the Queenstown Lakes District and is Rural General Zone land under the Operative Queenstown Lakes District Plan. Road Metals Otago is the proposed operator of the quarry.

A contour plot of the noise propagation has been produced and is presented in Appendix A Figure A1. The noise levels at the closest assessable rural dwellings are as follows:

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- Dwelling on Section 35, Blk VII: 34 dB  $L_{Aeq}$

Comparing the above predicted noise levels to the guidance criteria we conclude that the operational levels are well below the 50 dB  $L_{Aeq(15mins)}$  day time limit in the QLDP, and importantly, is also below the more stringent night-time limit of 40 dB  $L_{Aeq(15mins)}$  applicable during the initial part of the operational period from 0700-0800 h.

The levels are also well below guidance criteria for outside noise limits, including 50 dB  $L_{Aeq(16hours)}$  in the WHO guidelines, to avoid moderate annoyance in outdoor living areas, and 55 dB  $L_{Aeq(15mins)}$  day time limit in NZS 6802:2008.

Specific to guidance for amenity at *rural* dwellings, the noise meets quantitative and qualitative criteria.

The noise effects expected from the quarry are therefore expected to be minimal.

## 7. Appendix A - Noise Contour Plots

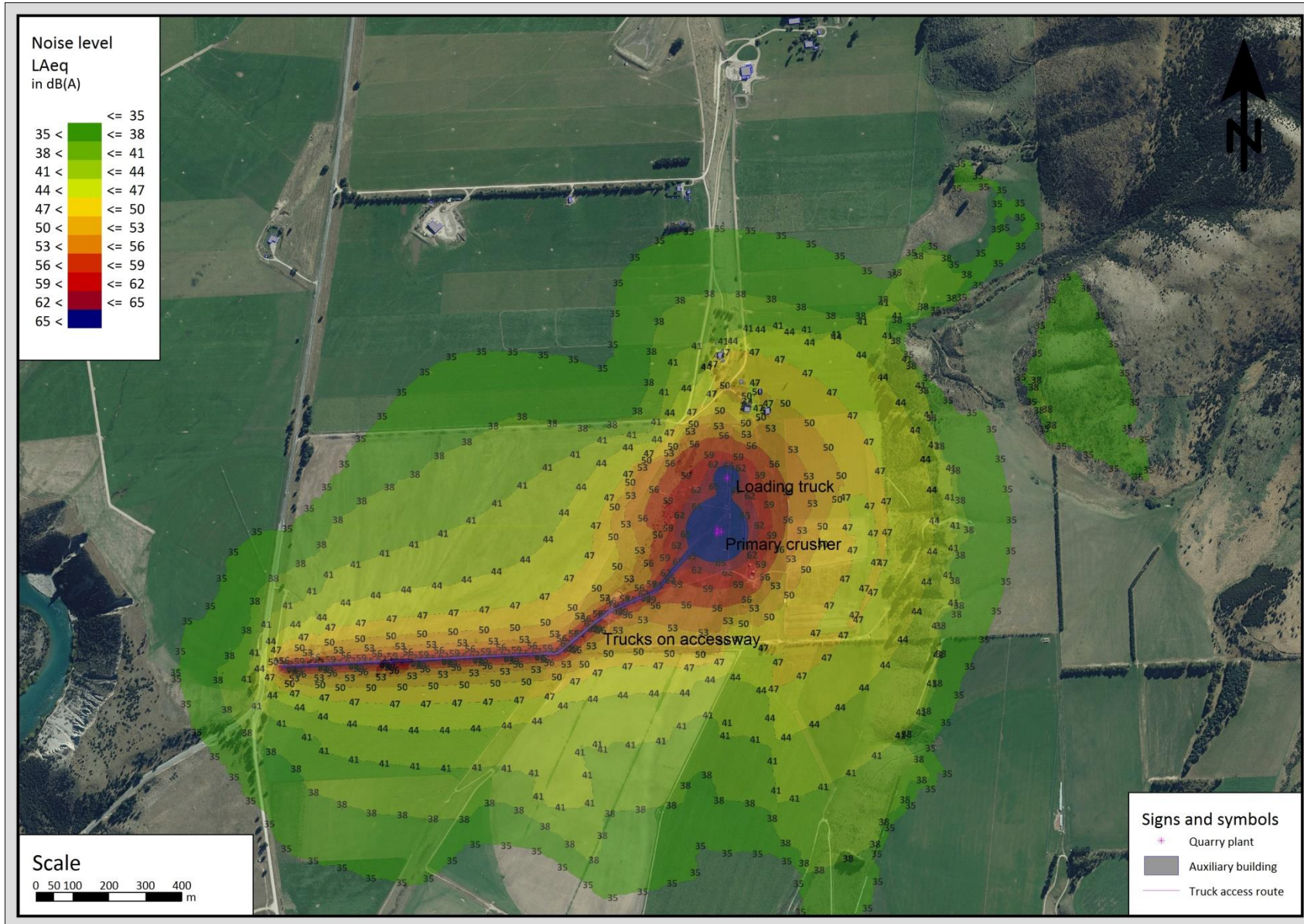


Figure A1: Noise contour plot of quarry plant in operation in a pit 3 m below the surface. For a 15 minute assessment period, this is two truck and trailer units loaded with shingle, four truck and trailer movements on the access way (two entering and two exiting), and the mobile crusher in continuous operation.

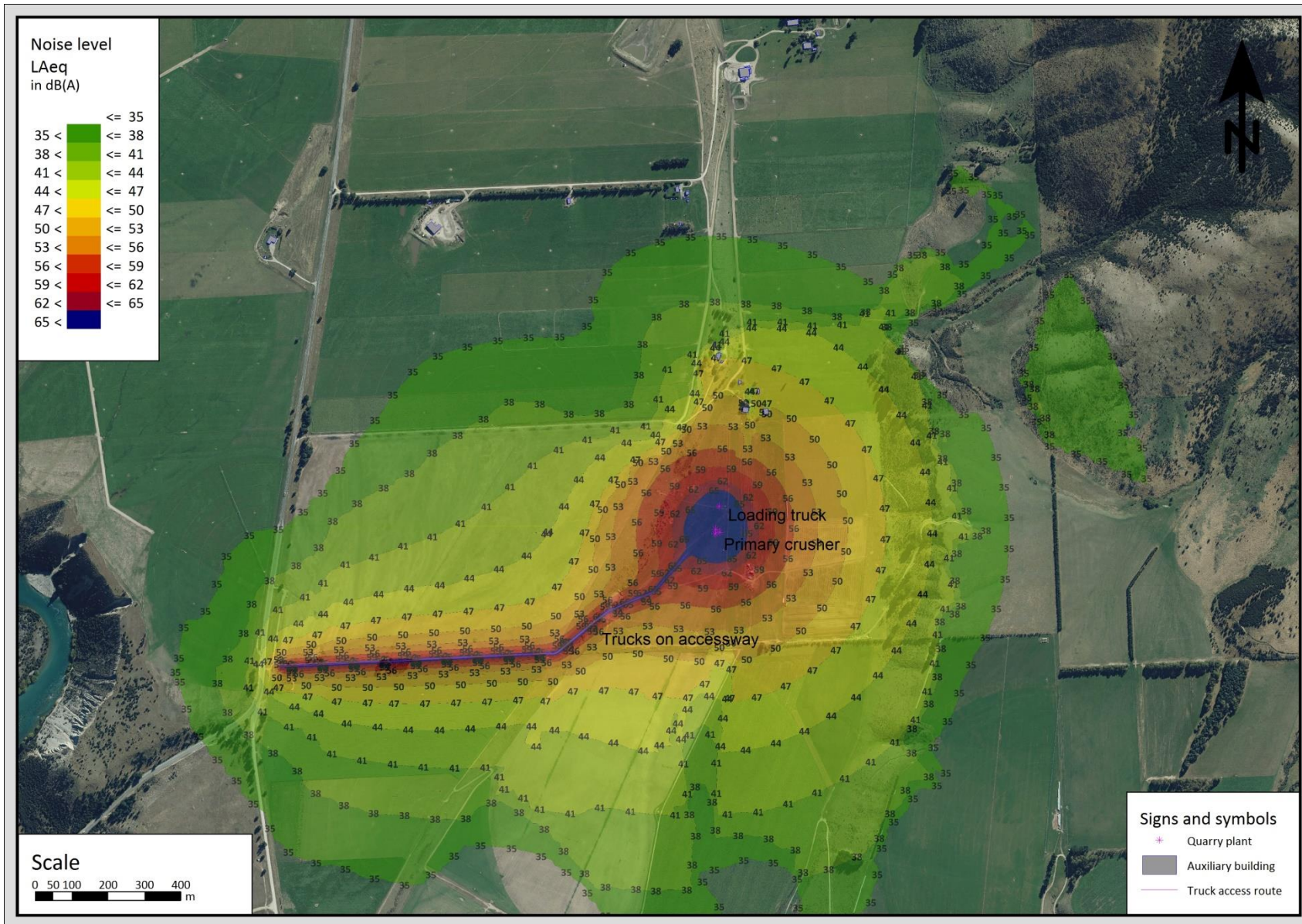
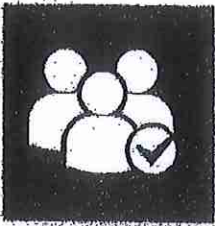


Figure A2: Noise contour plot of quarry plant in operation on the surface of existing contours. For a 15 minute assessment period, this is two truck and trailer units loaded with shingle, four truck and trailer movements on the access way (two entering and two exiting), and the mobile crusher in continuous operation.



# AFFECTED PERSON'S APPROVAL



FORM 8A

Resource Management Act 1991 Section 95

## # RESOURCE CONSENT APPLICANT'S NAME AND/OR RM #

Road Metals Ltd

## PERSON AFFECTED PERSON'S DETAILS

I/We Kim Landreth Box 725 Wanaka  
Are the owners/occupiers of  
Sec 53, Blk VIII Lower Hawon 60

## ☰ DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:  
establishment of a quarry as detailed in the AEE  
that has been prepared in support of this activity.

at the following subject site(s):  
Section 53, Blk VIII Lower Hawon Survey District  
Kare Rd, Hawon Flat



I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.



I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87B of the Act, written approval cannot be withdrawn if this process is followed instead.

## 📄 WHAT INFORMATION/PLANS HAVE YOU SIGHTED



I/We have sighted and initialled ALL plans dated and approve them.

*[Handwritten Signature]*

SECTION 53 BLOCK VII LOWER HAWEA SD,  
KANE ROAD, WANAKA  
LAND USE CONSENT FOR GRAVEL  
EXTRACTION  
LANDSCAPE ASSESSMENT REPORT



Michelle Snodgrass  
**LANDSCAPE ARCHITECT**

0275 777 909 | michelle@msla.co.nz  
7 Ferry Lane, Central Otago 9383



# Landscape Assessment Report

## 1.0 Introduction

---

This report has been prepared for Road Metals Co. Ltd, the applicant and quarry company that proposes to quarry gravels from an area of Section 53 Block VII Lower Hawea SD. The purpose of the report is to determine the landscape and visual effects of the proposed gravel quarry against the relevant assessment matters in the Operative and Proposed QLDC District Plan.

The site of the quarry is within the Rural General Zone (RG) of the Operative District Plan, and the Rural Zone of the Proposed District Plan. Road Metals Co. Ltd is applying for a Discretionary Consent under Rule 5.3.3.3 (viii) Mining Activities.

Earthworks plans have been prepared by C.H Hughes & Associates and are attached to the consent application prepared by Road Metals Co. Ltd.

The effects assessment methodology that has been used to assess the effects of the quarry is to assess the degree of visibility, the landscape effects and the visual effects, including effects on visual amenity, informed by:

- The NZILA Best Practice Note, the Landscape Assessment and Sustainable Management 10.1'.
- *'Guidelines for Landscape and Visual Impact Assessment'* by the Landscape Institute and Institute of Environmental Management & Assessment Third Edition published 2013.
- *'Guidelines for Landscape and Visual Impact Assessment'* by the Landscape Institute and Institute of Environmental Management & Assessment' Second Edition published 2002.
- *'Landscape and Visual Effects Rating Scales'* Consultant landscape assessment reviews for QLDC

Attached to this report, in the appendix, are:

- Attachment A: 'Landscape and Visual Effects Rating Scales'
- Attachment B: Photos from the public places in the vicinity of the site.

The site has no existing resource consents.

## 2.0 The Proposal

---

The proposal is one land use consent to achieve the following:

- Excavation of a 10-ha area in three stages over a 5–7-year period to excavate an estimated 600,000 cubic metres of material.
- A 3m high bund around the boundary of the works.
- As each stage is completed the ground will be levelled and graded into the adjacent topography at a grade of approximately 1 in 4. Topsoil will be reapplied over the finished area and grassed.
- The existing gravel road will be widened to 4m,
- A 2.0 m high chain link gate will be installed at the top of the terrace riser.
- There will be a processing plant on site periodically.
- A site office (Portacom or container), a portaloos and a 5000L fuel tank will be located within the excavation site.
- Signage at the gate onto Kane Road.

The remainder of the site, and the quarry post rehabilitation will continue to be farmed.

## 3.0 Site and context description

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The site is a rectangle, 128.81 ha in area located on the eastern side of Kane Road approximately 170m north of the intersection of Kane Road and McKay Road. The site is part of the farmed plains on the eastern side of the Hawea River.

The site is part of the broader alluvial plains on the true left of the Clutha River that extend from Hawea and the terminal moraine of the Hawea Glacier, south towards Luggate – Tarras Road. The eastern side of the plains, adjacent to the toe of the mountain Ranges that include Trig Hill and Grand view peaks, is incised by a wide, and deep, ancient river channel. The site takes in a slice of the alluvial plains, and ancient river channel and extends to the toe of the mountain range. The difference in height between Kane Road and the base of the ancient river channel is approximately 14 m.

There is a further degree of complexity of the topography with a minor terrace approximately 5m high on the western side of the river channel against the terrace riser. The eastern side of the channel rises higher than the western side by approximately 60m.

The site is currently used for grazing stock and is divided into a number of paddocks with stock fencing. Yards are located against the southern boundary approximately halfway along the minor terrace. A collection of old cars is located at the base of the river channel and close to the riser of the minor terrace. A farm road approximately 3m wide and gravelled accesses the site from Kane Road

towards the southwestern corner, travels along the Kane Road boundary then down the southern boundary to the edge of the terrace where it drops diagonally down the terrace riser to the minor terrace and base of the river channel. A second farm road has been cut from the minor terrace along the southern boundary then diagonally up the terrace riser on the eastern side of the river channel onto the higher terrace.

Two freight containers connected by a shelter and a small horticultural area covered by shade netting and deer fenced create a small, contained area at the bottom of the farm road that travels diagonally down the western terrace riser.

The vegetation cover of the site is largely pastoral grasses with a group of exotic conifers in the north western corner of the site and a line of approximately sixteen trees on the southern boundary and on the top terrace. A mixture of Matagouri (*Discaria toumatou*), *Coprosma crassifolia*, Mingimingi (*Corprosma propinqua*), small number of briar and a conifer are scattered over the major western terrace riser.

Land within the vicinity of the site (1.1km) and the broader eastern plains between the Clutha River and toe of the Grandview Range, north to Hawea Flat and south to Luggate-Tarras Road, is farmed largely for grazing stock. Two properties, Lot 1 DP341373 and Lot 2 DP341373, approximately 2.0km and 2.5km to the southwest both include quarries of a similar size.

## 4.0 Landscape classification and character

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The site is zoned Rural General under the ODP. The Appendix 8 maps do not include the southern part of the Upper Clutha and the site itself does not have a landscape classification determined in an Environment Court Case. The site, and the surrounding landscape has a strongly authentic rural working character of pastoral farming. Houses tend to be small and outbuildings simple and functional. Tree planting is generally for shelter around buildings and along fence lines and comprises exotic evergreen conifers, although the shelterbelts are intermittent and maintain a character of large-scale paddocks which in turn allow wide, open views across the farmland to the mountain ranges that enclose the Upper Clutha landscape. This character extends across the plains from Hawea Flat, west and south to the true left of the Clutha River and east to the toe of the Grandview Range which is part of the ONL 'walls' of the Upper Clutha.

In my opinion the landscape character of the site and surrounds is Visual Amenity Landscape with a strongly authentic pastoral character but not an Arcadian character. The site and broader landscape do not display a chocolate box, romantic landscape of houses in groves of trees, small scale spaces defined by tree groups or mixtures of exotic trees and a general, pleasant domestication which in my opinion is characteristic of an Arcadian landscape. The landscape of the site and broader plains is a functional, working landscape with a minimal and functional domestication.

The site and surrounding plans between the Clutha River and the Grandview Mountain Range is zoned Rural Character Landscape under the PDP.

## 5.0 Visual Amenity

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Visual amenity means the overall pleasantness of views observers enjoy of their surroundings. It is connected to the landscape character in that the pleasantness of a view is reliant on cohesive elements that make up the landscape character. As described previously the site has in my opinion a strongly pastoral character. The visual amenity provided by the site to external viewers comes from the flat, open, grazed paddocks with very little tree planting which allows views to the mountain ranges which include Trig Hill and Grand View peaks. Views are long, and broad. The character of the site and it's resulting visual amenity is cohesive with the landscape character in the vicinity of the site.

## 6.0 Visibility baseline

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Views of the terraces of the site are generally open and unobstructed, while those of the quarry location within the site are screened due to the topography of the site and surrounding landscape.

Public locations where the site is visible from:

- Kane Road
- Small Road
- McKay Road

Views of the site are restricted to a section of Kane Road, McKay Road and Small Road. Small Road has been gravelled from the intersection with Kane Road until the edge of the terrace. From this point Small Road continues legally to the toe of the mountain range while the gravelled road continues on private property diagonally down the terrace riser to the base of the river channel.

Neighbouring private properties the site is generally, and partially visible from:

- 342 Kane Road, Wanaka which is on the northern boundary of the site.
- 359 Luggate-Tarras Road, RD3, Cromwell on the eastern boundary.
- 51 Luggate-Tarras Road, RD2, Wanaka on the southern boundary.

The owners of 342 Kane Road have signed an APA and the effects on those neighbours are therefore not considered further in this assessment. 359 Luggate-Tarras Road is Glen Foyle Station. There do not appear to be any dwellings that would have views of the site. 51 Luggate-Tarras Road also does not appear to contain a dwelling. There will therefore be no visibility or visual amenity effects on the neighbour's place of residence from the proposed quarry.

The degree of visibility of the above viewing locations will be discussed further in the next section of this report. Visibility of the location of the quarry within the site is restricted by the ancient river channel topography of the site and surrounding landscape.

## 7.0 The visual effects of the proposal

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An assessment of visual effects deals with the effects of change and development on the views available to people, and their visual amenity. The visual amenity effect is the difference between the landscape character of the current site, and the changes to the character from the proposed development. This visibility assessment is an estimate of effects.

For each viewpoint, the current visibility of the site, the current visual amenity, the visibility of the quarry and associated works, and the effect on visual amenity of the quarry will be described.

The degree of visibility is described as:

- Nil
- Low
- Moderate
- High

The effect on visual amenity is assessed as per the '*Landscape and Visual Effects Rating Scales*' in Attachment A of the report and is described as:

- Very Low
- Low
- Moderate-Low
- Moderate
- Moderate-High
- High
- Very High

### **PUBLIC LOCATIONS**

#### **Kane Road**

##### *Existing visibility of site*

The terrace on the western side of Kane Road is generally visible from Small Road until the intersection with McKay Road when travelling in both directions – a distance of approximately 1.4km. This viewshaft is broken by a group of exotic conifers on either side of the northern boundary property

where it meets Kane Road. Further north of Small Road the site is screened by a shelterbelt on the southern side of Small Road and the flatness of the topography.

#### *Existing visual amenity*

The existing visual amenity is provided by the contiguous flat terrace and grazed land which allow long and broad views across the terraces to the mountain ranges beyond.

#### *Visibility of the proposal*

The existing access road and proposed signage will be visible from Kane Road when passing the site. The proposed gate at the top of the terrace may also be visible. No aspect of the quarrying operations will be visible.

The degree of visibility of the quarrying operations will be nil.

#### *Effect on visual amenity*

The effect on visual amenity will be a small increase in the access road width and the addition of a sign at the entrance to the site. The paddocks on the terrace will remain grazed and views across those grazed paddocks to the other side of the ancient river channel and the mountain ranges will remain as they are currently. The change to the road width and a sign will have a negligible effect on the visual amenity.

The degree of effect on the visual amenity of the quarrying operations will be very low.

### **Small Road**

#### *Existing visibility of site*

The base of the ancient river channel, eastern riser and higher terrace can be seen from the end of Small Road at the edge of the terrace before the road turns north into private property. The site from the remainder of the gravelled section of Small Road is screened by a conifer shelterbelt on the southern side of the road and the gently rolling topography of the land on that side of the road. The remainder of Small Road legally continues directly east to the toe of the mountain range where it ends at a boundary.

#### *Existing visual amenity*

The existing visual amenity from this viewpoint is the form of the ancient river channel, the terrace riser to the east and layers of mountain ranges beyond. The base of the channel is irrigated and grazed while the terrace risers are generally ungrazed with scattered Matagouri, Mingimingi, coprosma and exotic trees such as pine and Eucalyptus. The terrace risers are more patterned and complex due to the mixed vegetation cover than the base of the channel.

#### *Visibility of the proposal*

I estimate that the northeastern corner of the quarry will be visible from the eastern end of Small Road where it reaches the terrace edge.

The degree of visibility will be low.

### *Effect on visual amenity*

The effect on visual amenity will be a small portion of a quarry visible in the midground and on the very edge of that view. The vast majority of the landscape will remain as it is currently as will the visual amenity.

The degree of effect on the visual amenity of the quarrying operations will be low due to the small area that is visible and the dead-end nature of Small Road which is likely to result in a small number of casual observers.

## **McKay Road**

### *Existing visibility of site*

The terrace on the western side of Kane Road is generally visible from a short section of McKay Road from the intersection with Kane Road south for approximately 280m although this view is broken by existing large conifers on the eastern side of the road and only when a viewer is travelling north on McKay Road. From this viewpoint the terrace paddocks and line of sixteen conifers are visible. The ancient river channel and location of the proposed quarry works is not visible. Beyond this point McKay Road drops below the level of the adjacent land on the eastern side and the site is screened until a point approximately 1.27km south of the site's southern boundary and on the southern side of a triangular block of pines where part of the terrace riser and the location of the site works are visible to a low degree. This view is available for approximately 66m until it is screened by a small group of pines. The view is available again from the southern side of the pines for approximately 80m until McKay Road drops below the level of the adjacent terrace.

### *Existing visual amenity*

The existing visual amenity is provided by the contiguous flat terrace and grazed land which allow long and broad views across the terraces to the mountain ranges beyond.

### *Visibility of the proposal*

The proposed 3m high bund on the southern edge of the works will be visible from the above two stretches of McKay Road that are located 1.27km south of the site's southern boundary. The bund will screen views into the site works. No other aspects of the proposal will be visible from McKay Road.

The degree of visibility of the quarrying operations will be very low.

### *Effect on visual amenity*

There will be a very small change to the visual amenity of the site as experienced from McKay Road due to the addition of the bund. At the distance it is viewed at – approximately 1.6km to the working area, and the horizontal line of the bund which will mimic the horizontal lines of the terrace and changes in paddock use, the change to the visual amenity is will be negligible and is unlikely to be noticeable to a casual observer.

The degree of effect on the visual amenity of the quarrying operations will be very low.

## 8.0 The landscape effects of the proposed consent

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The magnitude of landscape effect will be described as:

- Very Low
- Low
- Moderate-Low
- Moderate
- Moderate-High
- High
- Very High

The definition of the above scale is described under Attachment A.

Landscape effects are those effects on the landscape as a resource, namely its landscape character and the components that make up that character, rather than visual issues. I have considered these effects with reference to the sites current use and character.

As described in Sections 3.0 and 4.0 the sites and surrounding landscape's character is strongly pastoral.

The change to the character of the site is the introduction of a small quarry, signage, quarry associated infrastructure and a gate. The quarry, and associated infrastructure will be entirely contained within the ancient river channel and as described in Section 3.0, will only be visible to a very small degree from three short sections on two roads. The character of the landscape will remain strongly rural and pastoral, and to a casual observer, unchanged. Quarries are characteristic of rural areas due to the nature of the activity and availability of stone sources. There are two quarries within approximately 1.5km and 2.1km of the site, both are located on Kane Road and the quarrying activity is not visible from Kane Road and only indicated by the entrance signage.

The magnitude of landscape effect will be low. There will be a modification to the topography of the site, and the quarry will be characteristic of the surrounding landscape. Once quarrying has finished the site will be rehabilitated into pastoral grass and be utilised for grazing along with the remainder of the site.

## 9.0 Assessment matters under Section 5.4.2.2 of the Operative D.P

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The site is within a Visual Amenity Landscape as discussed in Section 4.0 of this report. The effects of the proposal are to be assessed under the following VAL assessment matters under the QLDC



Operative District Plan. I note that some of the assessment matters are irrelevant to the proposal as no subdivision is proposed.

### **Effects on natural and pastoral character**

*(i) where the site is adjacent to an Outstanding Natural Landscape or Feature, whether and to the extent to which the visual effects of the development proposed will compromise any open character of the adjacent Outstanding Natural Landscape or Feature.*

The very northeast corner of the site includes a small part of the ONL at the toe of the mountain range. This part of the site and the higher terrace adjacent to the ONL is not proposed to be modified or changed in any way. The quarry is located at a lower elevation and will only be visible in views of the ONL from three short viewpoints on two public roads. There will be no effect on the ONL.

*(ii) whether and extent to which the scale and nature of the development will compromise the natural or Arcadian pastoral character of the surrounding Visual Amenity Landscape.*

The surrounding VAL has a strongly pastoral character. This character will not be compromised as quarries are part of the surrounding VAL and they are located where effects can be contained. The character of the surrounding visual amenity landscape will remain unchanged.

The scale of the quarry is similar in scale to the existing quarries on Kane Road to the southwest of the site. The strongly pastoral character of the landscape will remain during the operation of the quarry and post rehabilitation.

*(iii) Whether the development will degrade any natural or Arcadian pastoral character of the landscape by causing over-domestication of the landscape.*

No subdivision or housing is proposed and therefore no domestic elements will be introduced to degrade the pastoral character of the landscape.

*(iv) whether any adverse effects identified in (i)-(iii) above are or can be avoided or mitigated by appropriate subdivision design and landscaping, and/or appropriate conditions of consent (including covenants, consent notices and other restrictive instruments) having regard to the matters contained in (b) to (e) below.*

The proposal is not a subdivision, and any adverse effects from the quarry will be mitigated by its location within the ancient river channel.

### **Visibility of development**

*(i) the proposed development is highly visible when viewed from any public places, or is visible from any public road and in the case of proposed development in the vicinity of unformed legal roads, the*

*Council shall also consider present use and the practicalities and likelihood of potential use of unformed legal roads for vehicular and/or pedestrian and other means of access; and*

The current gravelled section of Small Road finishes at the terrace edge and due to the steep topography of the terrace riser it would be impractical for the road to continue to be formed its full legal length.

The visibility of the proposal has been described in Section 7.0 of this report and it will only be visible from a single viewpoint at the end of the gravelled section of Small Road and from two short viewpoints on McKay Road. The quarry will not be visible from any other public place.

*(ii) the proposed development is likely to be visually prominent such that it detracts from public or private views otherwise characterised by natural or Arcadian pastoral landscapes.*

The quarry will not be visually prominent. It is located within the ancient river channel and will not be visible from outside of the site, apart from a single viewpoint at the end of Small Road and two short viewpoints on McKay Road at a distance of approximately 1.6km. From the McKay Road viewpoints the quarrying operations will be screened by a 3m high bund along the southern boundary of the works.

*(iii) there is opportunity for screening or other mitigation by any proposed method such as earthworks and/or new planting which does not detract from or obstruct views of the existing natural topography or cultural plantings such as hedge rows and avenues.*

A 3m high bund is proposed around the boundary of the works which will screen the quarrying operations from the viewpoints on McKay Road. Existing views of the topography of the alluvial plains and adjacent mountains will not be obstructed.

*(iv) the subject site and the wider Visual Amenity Landscape of which it forms part is enclosed by any confining elements of topography and/or vegetation.*

The location of the quarry is enclosed by the terrace risers on either side of the base of the ancient river channel. The remainder of the site – the flat, alluvial terraces are not enclosed and are not proposed to be modified or changed.

*(v) any building platforms proposed pursuant to rule 15.2.3.3 will give rise to any structures being located where they will break the line and form of any skylines, ridges, hills or prominent slopes.*

No building platforms are proposed as the proposal is not a subdivision. None of the buildings or occasional machinery associated with the quarry will break any skylines, ridges, hills or prominent slopes.

*(vi) any proposed roads, earthworks and landscaping will change the line of the landscape or affect the naturalness of the landscape particularly with respect to elements which are inconsistent with the natural topography.*

The existing farm road will be widened by approximately a metre, but the alignment will stay the same.

The quarry will affect the natural topography of the site by modifying the minor terrace within the river channel. The area of the quarry will be regraded once works are complete to grade into the adjacent landforms. This will create a largely flat area at the same level as the base of the ancient river channel.

*(vii) any proposed new boundaries and the potential for planting and fencing will give rise to any arbitrary lines and patterns on the landscape with respect to the existing character.*

No new boundaries or fences are proposed as the proposal is not a subdivision. A 2 m high chain link gate is proposed at the top of the western terrace. A farm gate already exists in this location. The new gate will not give rise to any new lines.

*(viii) boundaries follow, wherever reasonably possible and practicable, the natural lines of the landscape and/or landscape units.*

No new boundaries are proposed as the proposal is not a subdivision.

*(ix) the development constitutes sprawl of built development along the roads of the district and with respect to areas of established development.*

The proposal does not constitute sprawl. The proposal is not a subdivision.

### **Form and density of development**

*(i) there is the opportunity to utilise existing natural topography to ensure that development is located where it is not highly visible when viewed from public places.*

As described in Section 7.0 of this report the degree of visibility of the quarry has been assessed as not visible from either Kane Road, and visible from two short viewpoints on McKay Road 1.6km from the proposed site works. The northern end of the quarry will be visible from a single viewpoint at the end of Small Road. The quarry will not be highly visible when viewed from public places.

*(ii) opportunity has been taken to aggregate built development to utilise common access ways including pedestrian linkages, services, and open space (i.e., Open space held in one title whether jointly or otherwise).*

The existing farm track is the only access way into and around the site. No additional access ways are proposed.

*(iii) development is concentrated in areas with a higher potential to absorb development while retaining areas which are more sensitive in their natural or Arcadian pastoral state.*

The quarry is located within the river channel where the effects can be absorbed while the terraces on either side of the channel, which are more sensitive to development, will continue to be farmed and retain their pastoral state.

*(iv) the proposed development, if it is visible, does not introduce densities which reflect those characteristic of urban areas.*

The proposal is not a subdivision and does not include houses.

*(v) if a proposed residential building platform is not located inside existing development (being two or more houses each not more than 50 metres from the nearest point of the residential building platform) then on any application for resource consent and subject to all the other criteria, the existence of alternative locations or methods:*

- a) within a 500-metre radius of the centre of the building platform, whether or not:*
- b) subdivision and/or development is contemplated on those sites.*
- c) the relevant land is within the applicant's ownership; and*
- d) within a 1,100-metre radius of the centre of the building platform if any owner or occupier of land within that area wishes alternative locations or methods to be taken into account as a significant improvement on the proposal being considered by the Council - must be taken into account*

No residential building platforms are proposed.

*(vi) recognition that if high densities are achieved on any allotment that may in fact preclude residential development and/or subdivision on neighbouring land because of the adverse cumulative effects would be unacceptably large.*

The proposal is not a subdivision. No houses are proposed.

### **Cumulative effects of development on the landscape**

*(i) the assessment matters detailed in (a) to (d) above.*

*(ii) the nature and extent of existing development within the vicinity or locality.*

Existing development within the vicinity of the site, taken as 1.1km is farming and this activity continues to the natural features of the Clutha River and the mountain ranges to the east. Within this area and 2.5km of the site are two existing quarries.

*(iii) whether the proposed development is likely to lead to further degradation or domestication of the landscape such that the existing development and/or land use represents a threshold with respect to the vicinity's ability to absorb further change.*

There will be no domestication of the site as the proposal is not residential. Quarries are characteristic of rural land, and the proposed quarry can be absorbed without bringing the landscape to a tipping point and changing its character. The landscape will still be strongly pastoral.

*(iv) whether further development as proposed will visually compromise the existing natural and Arcadian pastoral character of the landscape by exacerbating existing and potential adverse effects.*

The quarry will not visually compromise the pastoral character of the wider landscape. There are no existing adverse effects from development on the site or surrounding landscape.

*(v) the ability to contain development within discrete landscape units as defined by topographical features such as ridges, terraces or basins, or other visually significant natural elements, so as to check the spread of development that might otherwise occur either adjacent to or within the vicinity as a consequence of granting consent.*

As described previously the quarry location is contained by the terrace risers on the western and eastern side of the channel.

*(vi) whether the proposed development is likely to result in the need for infrastructure consistent with urban landscapes in order to accommodate increased population and traffic volumes.*

No urban infrastructure is required or proposed.

*(vii) whether the potential for the development to cause cumulative adverse effects may be avoided, remedied or mitigated by way of covenant, consent notice or other legal instrument (including covenants controlling or preventing future buildings and/or landscaping, and covenants controlling or preventing future subdivision which may be volunteered by the applicant).*

Subdivision of the site is not proposed.

## **Rural Amenities**

*(i) the proposed development maintains adequate and appropriate visual access to open space and views across Arcadian pastoral landscapes from public roads and other public places; and from adjacent land where views are sought to be maintained.*

Visual access to open paddocks and views across those paddocks will remain unchanged.

*(ii) the proposed development comprises the ability to undertake agricultural activities on surrounding land.*

The proposal will not prevent agricultural activities being undertaken on surrounding land.

*(iii) the proposed development is likely to require infrastructure consistent with urban landscapes such as street lighting and curb and channelling, particularly in relation to public road frontages.*

No curb and channelling or street lighting are proposed. The quarry will not operate at night.

*(iv) landscaping, including fencing and entrance ways, are consistent with traditional rural elements, particularly where they front public roads.*

No additional fencing or landscaping is proposed. A higher gate is required at the top of the terrace to prevent access to the quarry outside of working hours.

*(v) buildings and building platforms are set back from property boundaries to avoid, remedy or mitigate the potential effects of new activities on the existing amenities of neighbouring properties.*

No buildings or building platforms are proposed.

## 10.0 Assessment matters under Section 21.21 of the Proposed D.P

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### **Rural Character Landscape (RCL)**

*The assessment matters below have been derived from Policies 3.3.32, 6.3.10 and 6.3.19 to 6.3.29 inclusive. Applications shall be considered with regard to the following assessment matters because in the Rural Character Landscapes the applicable activities are unsuitable in many locations.*

#### **Existing vegetation that:**

*a. was either planted after, or, self-seeded and less than 1 metre in height on 28 September 2002:  
and,*

*b. obstructs or substantially interferes with views of the proposed development from roads or other public places, shall not be considered as beneficial under any of the following assessment matters unless the Council considers the vegetation (or some of it) is appropriate for the location in the context of the proposed development, and as part of the permitted baseline*

There is no existing vegetation on site that is beneficial in terms of providing screening of the proposed quarry.

***Effects on landscape quality and character:***

*The following shall be taken into account:*

*a. where the site is adjacent to an Outstanding Natural Feature or Landscape, whether and the extent to which the proposed development will adversely affect the quality and character of the adjacent Outstanding Natural Feature or Landscape.*

The site, as in the extent of the full property, takes in a very small part of the ONL in the north-west corner. The location of the quarry is to the west and below the elevation of the toe of the ONL. The proposed quarry will not affect the quality of character of the ONL as it will not modify the ONL in any way and the quarry location within the site is contained within topography that provides a buffer between the quarry and the ONL.

*b. whether and the extent to which the scale and nature of the proposed development will degrade the quality and character of the surrounding Rural Character Landscape.*

The scale of the quarry is similar to that of existing quarries on Kane Road and is dictated by topography which restricts its extent. The nature of the proposed development is characteristic of the surrounding Rural Character Landscape as can be seen in the existing quarries on Kane Road. The remainder of the site will continue to be grazed as will the quarry location once works have finished and the location has been rehabilitated back into grazing.

The proposed development will not degrade the quality or character of the Rural Character Landscape.

*c. Whether the design and any landscaping would be compatible with or would enhance the quality and character of the Rural Character Landscape.*

Landscaping would not enhance the quality or character of the site. The existing elements of grazed pastoral grass, the conifers and native shrubs on the terrace risers are authentic rural elements of the

strongly pastoral character. Additional landscaping, depending on the species and arrangement used could change the character to one that is more Arcadian or more natural which would not be consistent with the surrounding RLC.

***Effects on visual amenity:***

*Whether the development will result in a loss of the visual amenity of the Rural Character Landscape, having regard to whether and the extent to which:*

*a.the visual prominence of the proposed development from any public places will reduce the visual amenity of the Rural Character Landscape. In the case of proposed development which is visible from unformed legal roads, regard shall be had to the frequency and intensity of the present use and, the practicalities and likelihood of potential use of these unformed legal roads as access.*

The effect on visual amenity has been described in Section 7.0. The quarry will not be visually prominent or reduce the visual amenity of the Rural Character Area.

It is impractical and unlikely the remainder of Small Road will be formed due to the steep topography of the terrace riser, and therefore it will not be visible from the unformed section of Small Road.

*b.the proposed development is likely to be visually prominent such that it detracts from private views.*

The quarry will not be visually prominent or detract from private views. An APA has been obtained from the only neighbouring property at 342 Kane Road with a dwelling that has views of the site.

*c.any screening or other mitigation by any proposed method such as earthworks and/or new planting will detract from or obstruct views of the Rural Character Landscape from both public and private locations.*

A 3m high bund is proposed around the boundary of the works. Views will not be obstructed by the bund or the quarry.

*d.the proposed development is enclosed by any confining elements of topography and/or vegetation and the ability of these elements to reduce visibility from public and private locations.*

The location of the quarry is screened by the terrace risers on either side of the ancient river channel which reduce visibility from public places to one viewpoint at the end of the gravelled section of Small Road and from two short viewpoints on McKay Road. This same topography also screens the quarry location from private views outside of those neighbours who have signed the APA.



*e.any proposed roads, boundaries and associated planting, lighting, earthworks and landscaping will reduce visual amenity, with particular regard to elements which are inconsistent with the existing natural topography and patterns.*

No roads, boundaries, lighting or landscaping are proposed. Earthworks are proposed as the proposal is a quarry. The quarry will modify the existing topography of a minor terrace and on completion the lines of the landscape will be consistent.

*boundaries follow, wherever reasonably possible and practicable, the natural lines of the landscape or landscape units.*

No new boundaries are proposed, and the development is not a subdivision.

***Design and density of development:***

*In considering the appropriateness of the design and density of the proposed development, whether and to what extent:*

*a. opportunity has been taken to aggregate built development to utilise common access ways including roads, pedestrian linkages, services and open space (i.e., open space held in one title whether jointly or otherwise).*

The existing farm road will be used to access the quarry location.

*b. there is merit in clustering the proposed building(s) or building platform(s) having regard to the overall density and intensity of the proposed development and whether this would exceed the ability of the landscape to absorb change.*

No buildings or building platforms are proposed.

*c.development, including access, is located within the parts of the site where they will be least visible from public and private locations.*

The quarry is located within the ancient river channel – the least visible part of the site.

*d.development, including access, is located in the parts of the site where they will have the least impact on landscape character.*

The quarry is located within the ancient river channel and while it is characteristic of the landscape character it will have the least impact on the wider pastoral character of the RLC.

The access is the existing farm road which is an element of rural character.

***Tangata Whenua, biodiversity and geological values:***

*a. whether and to what extent the proposed development will degrade Tangata Whenua values including Tōpuni or nohoanga, indigenous biodiversity, geological or geomorphological values or features and, the positive effects any proposed or existing protection or regeneration of these values or features will have.*

The site contains scattered Matagouri, Coprosma crassifolia, and Mingimingi which are common on the terrace risers on the site and landscapes to the east. The terrace risers are not part of the quarry operations and will be unaffected.

*The Council acknowledges that Tangata Whenua beliefs and values for a specific location may not be known without input from iwi.*

I am not aware of any Tangata Whenua values for the site.

***Cumulative effects of development on the landscape:***

*Taking into account whether and to what extent any existing, consented or permitted development (including unimplemented but existing resource consent or zoning) has degraded landscape quality, character, and visual amenity values. The Council shall be satisfied.*

*a. the proposed development will not further degrade landscape quality, character and visual amenity values, with particular regard to situations that would result in a loss of valued quality, character and openness due to the prevalence of residential or non-farming activity within the Rural Landscape.*

The quarry will not further degrade landscape quality or visual amenity or result in reducing openness of the landscape as the open paddocks on either side of the ancient river channel will be unchanged. The perceived quality of the farming land will retain its current quality as the quarry will largely be unseen and well contained by topography.

*b. where in the case resource consent may be granted to the proposed development but it represents a threshold to which the landscape could absorb any further development, whether any further cumulative adverse effects would be avoided by way of imposing a covenant, consent notice or other legal instrument that maintains open space.*

Granting a consent for the proposed quarry will not push the landscape to a tipping point where it cannot absorb further development as the development does not introduce elements that are uncharacteristic of the rural landscape – no housing is proposed.

***Other factors and positive effects, applicable in all the landscape categories (ONF, ONL and RCL)***

*In the case of a proposed residential activity or specific development, whether a specific building design, rather than nominating a building platform, helps demonstrate whether the proposed development is appropriate. Other than where the proposed development is a subdivision and/or residential activity, whether the proposed development, including any buildings and the activity itself, are consistent with rural activities or the rural resource and would maintain or enhance the quality and character of the landscape.*

*In considering whether there are any positive effects in relation to the proposed development, or remedying or mitigating the continuing adverse effects of past subdivision or development, the Council shall take the following matters into account:*

*a. whether the proposed subdivision or development provides an opportunity to protect the landscape from further development and may include open space covenants or esplanade reserves.*

The proposal is not a subdivision – no houses are proposed.

*b. whether the proposed subdivision or development would enhance the character of the landscape, or protects and enhances indigenous biodiversity values, in particular the habitat of any threatened species, or land environment identified as chronically or acutely threatened on the Land Environments New Zealand (LENZ) threatened environment status.*

The development is not a subdivision and there are no biodiversity values on the site of any significance. The areas of scattered Matagouri, Coprosma crassifolia, and Mingimingi occur on the terrace risers which will not be modified by the quarry works.

*c. any positive effects including environmental compensation, easements for public access such as walking, cycling or bridleways or access to lakes, rivers or conservation areas.*

The site is not adjacent to any lakes, rivers or conservation areas to access from the site.

*d. any opportunities to retire marginal farming land and revert it to indigenous vegetation.*

The site is farmed and is proposed to continue being farmed one quarry operations have ceased.

*e. where adverse effects cannot be avoided, mitigated or remedied, the merits of any compensation.*

No compensation is proposed.

*f. whether the proposed development assists in retaining the land use in low intensity farming where that activity maintains the valued landscape character.*

The remainder of the site outside of quarry operations will remain farmed and the quarry site once rehabilitated will also be farmed.

## 11.0 Conclusion

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To summarise the site has a strongly authentic rural, farming character which extends beyond the site into the wider landscape as far as the Clutha River and toe of the mountain ranges to the east. The location of the proposed quarry is within the ancient river channel and involves quarrying of a minor terrace on the western side of the channel down to the level of the base of the channel. The quarry location will then be graded to meet the surrounding topography and rehabilitated back to flat grazing land.

There are three viewpoints from which the quarry is visible. The northernmost end of the quarry is visible from the eastern end of Small Road where it meets to edge of the terrace. Part of the terrace riser and the proposed bund on the southern edge of the quarry will be visible from a two viewpoints on McKay Road when travelling north.

From all other public viewpoints, the terraces on either side of the ancient river channel are visible but the base of the channel and quarry location is not. The degree of visibility of the quarry will be low and the effect on visual amenity will be low to very low.

Quarries are characteristic of rural land due to the nature of the activity and are present in the wider landscape. The location of the quarry works is discrete and well contained and is unlikely to be perceived by a casual observer.

In my opinion the site and surrounding landscape can absorb the proposed quarry without having a detrimental effect on the surrounding landscape character or visual amenity.

ATTACHMENT A: *'Landscape and Visual Effects Rating Scales'* Consultant landscape assessment reviews for QLDC

# Landscape and Visual Effects Rating Scales

## Consultant landscape assessment reviews for QLDC

### Adverse Visual Effects Rating Scale

Effect Rating	Use and Definition
<b>Very High:</b>	Total loss of key elements / features / characteristics, i.e. amounts to a very significant negative change in visual amenity.
<b>High:</b>	Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development visual amenity remains and amounts to a significant negative change in visual amenity values. <u>Concise Oxford English Dictionary Definition</u> <i>High: adjective - Great in amount, value, size, or intensity.</i>
<b>Moderate - High:</b>	Modifications of several key elements / features / characteristics, i.e. the pre-development visual amenity remains evident but materially changed.
<b>Moderate:</b>	Partial loss of or modification to key elements / features / characteristics, i.e. the pre-development visual amenity remains evident but is changed. <u>Concise Oxford English Dictionary Definition</u> <i>Moderate: adjective - average in amount, intensity, quality or degree</i>
<b>Moderate - Low:</b>	Small loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not uncharacteristic within the visual environment and do not disturb the pre development visual amenity.
<b>Low:</b>	Very little material loss of or modification to key elements / features / characteristics. i.e. new elements integrate seamlessly into the pre-development visual environment. <u>Concise Oxford English Dictionary Definition</u> <i>Low: adjective- 1. Below average in amount, extent, or intensity.</i>
<b>Very Low:</b>	Negligible loss of or modification to key elements/ features/ characteristics of the baseline, i.e. visual influence of new elements is barely discernible.

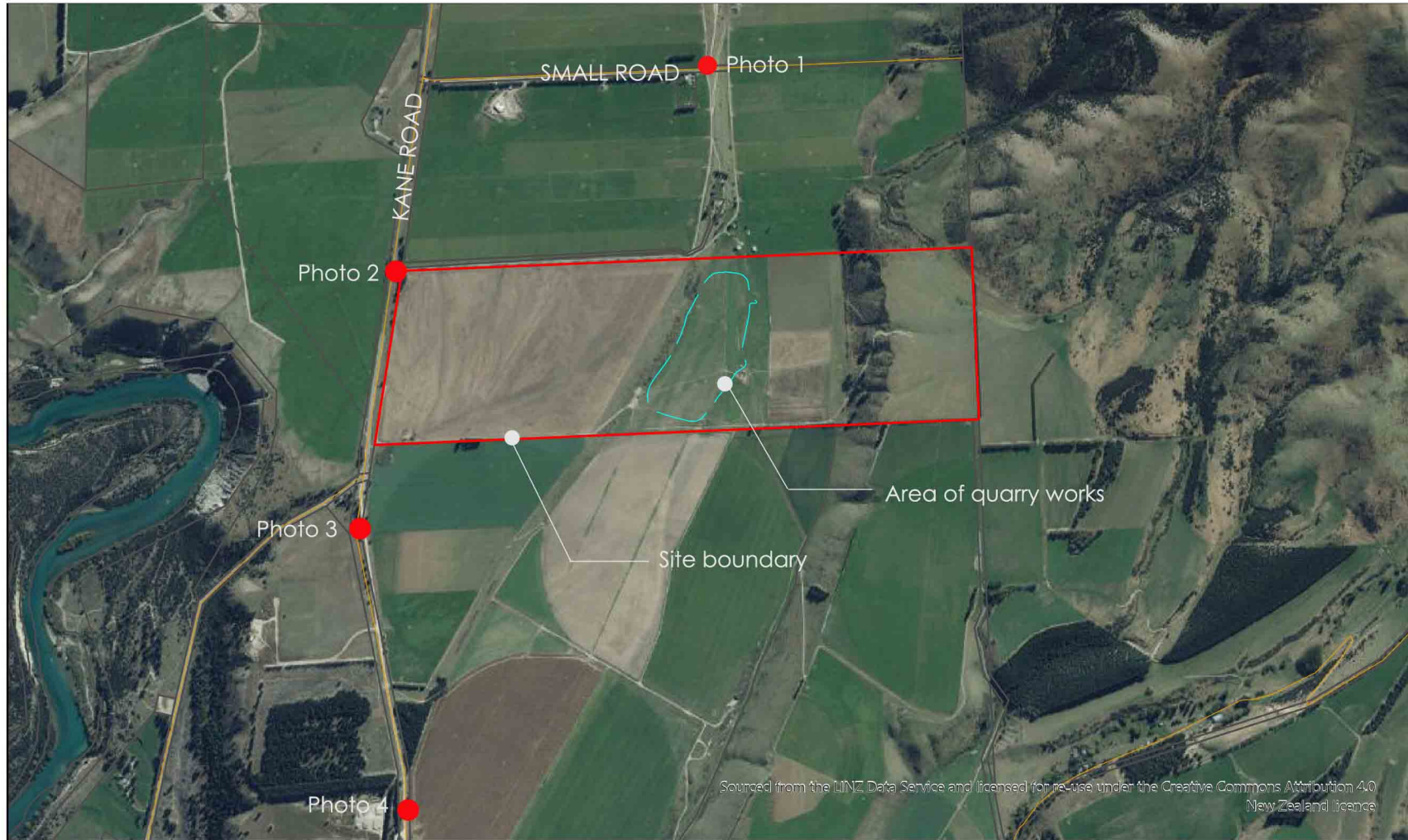
### Adverse Landscape Effects Rating Scale

Effect Rating	Use and Definition
<b>Very High:</b>	Total loss of key elements / features / characteristics / values, i.e. amounts to a very significant negative change in landscape character and / or landscape values.
<b>High:</b>	Major modification or loss of most key elements / features / characteristics / values, i.e. little of the pre-development landscape character remains and amounts to a significant negative change in landscape character and / or landscape values. <u>Concise Oxford English Dictionary Definition</u> <i>High: adjective - Great in amount, value, size, or intensity.</i>
<b>Moderate - High:</b>	Modifications of several key elements / features / characteristics / values, i.e. the pre-development landscape character and / or landscape values remains evident but materially changed.
<b>Moderate:</b>	Partial loss of or modification to key elements / features / characteristics / values, i.e. the pre-development landscape character and / or landscape values remains evident but is changed. <u>Concise Oxford English Dictionary Definition</u> <i>Moderate: adjective - average in amount, intensity, quality or degree</i>
<b>Moderate - Low:</b>	Small loss of or modification to one or more key elements / features / characteristics / values, i.e. new elements are not uncharacteristic within the receiving landscape and do not disturb the pre development landscape character and / or landscape values.
<b>Low:</b>	Very little material loss of or modification to key elements / features / characteristics / values. i.e. new elements integrate seamlessly into the pre-development landscape character and / or landscape values. <u>Concise Oxford English Dictionary Definition</u> <i>Low: adjective- 1. Below average in amount, extent, or intensity.</i>
<b>Very Low:</b>	Negligible loss of or modification to key elements/ features/ characteristics / values of the baseline, i.e. influence of new elements on landscape character and / or landscape values is barely discernible.

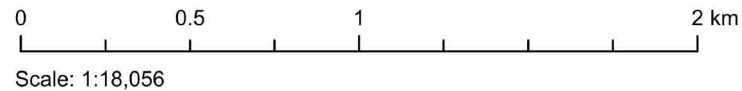
For the purposes of notification determination, an adverse effects rating of Moderate- Low corresponds to a 'minor' adverse effects rating. An adverse effects rating of 'Low' or 'Very Low' corresponds to a 'less than minor' adverse effects rating.

NB. These rating scales apply to **adverse** effects, not to **positive** effects.

ATTACHMENT B: Photos from the public places in the vicinity of the site.



The information provided on this map is intended to be general information only. While considerable effort has been made to ensure that the information provided on this map is accurate, current and otherwise adequate in all respects, Queenstown Lakes District Council does not accept any responsibility for content and shall not be responsible for, and excludes all liability, with relation to any claims whatsoever arising from the use of this map and data held within.



Map Date:  
31/03/2021



Michelle Snodgrass  
LANDSCAPE ARCHITECT

## ATTACHMENT C: SITE PHOTOS

ALL PHOTOS TAKEN WITH A DIGITAL 50MM LENS EQUIVALENT ON 15TH MARCH AND 30TH SEPTEMBER 2021

PHOTO POINT MAP





Michelle Snodgrass  
**LANDSCAPE ARCHITECT**

Document Set ID: 7031041 | michelle@msla.co.nz  
Version: 1, Version Date: 13/10/2021 | 7 Fern Lane, Central Otago 9383

## ATTACHMENT C: SITE PHOTOS

ALL PHOTOS TAKEN WITH A DIGITAL 50MM LENS EQUIVALENT ON 15TH MARCH 2021

PHOTO POINT 1



Michelle Snodgrass  
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## ATTACHMENT C: SITE PHOTOS

ALL PHOTOS TAKEN WITH A DIGITAL 50MM LENS EQUIVALENT ON 15TH MARCH 2021

PHOTO POINT 2



Michelle Snodgrass  
**LANDSCAPE ARCHITECT**

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## ATTACHMENT C: SITE PHOTOS

ALL PHOTOS TAKEN WITH A DIGITAL 50MM LENS EQUIVALENT ON 15TH MARCH 2021

PHOTO POINT 3



Michelle Snodgrass  
**LANDSCAPE ARCHITECT**

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## ATTACHMENT C: SITE PHOTOS

ALL PHOTOS TAKEN WITH A DIGITAL 50MM LENS EQUIVALENT ON 30TH SEPTEMBER 2021

PHOTO POINT 4