APPENDIX E

Landscape and Visual Impact Assessment
ROYDON QUARRY PROPOSAL LVIA

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EXECUTIVE SUMMARY

DCM Urban have been commissioned by Fulton Hogan Limited (the applicant) to assess the potential landscape and visual effects from a proposed quarry on Jones Road in the Selwyn District. The proposed quarry will cover an area of approximately 170Ha, with material being excavated down to a potential depth of approximately 10 m below the current surface level. The remediation of the site is proposed to be in accordance with the principles set out in the proposed Fulton Hogan Quarry Rehabilitation Plan. During the preparation of this report we have worked closely with the applicant to develop mitigation measures as well as develop suitable staged remediation concepts for the site following the completion of extraction works. The quarry is to include processing plant equipment which will be located centrally, at the base of the quarry. The site and surrounds have been visited several times over the last few months with a view to assessing the likely landscape and visual effects.

Several mitigation measures are suggested to either avoid, remedy or mitigate any potential effects on Landscape Character, Landscape Values and/or Visual Amenity:

- (MM1 and MM2) 3m high grass bunds with tree planting are proposed around the outside of the site and overlapping at the Jones Road entrance to prevent views into the site from all viewpoints. The existing tree planting along the road boundaries of 319 Maddisons Road and along Curraghs Road shall be retained, and the bunds to be constructed along these boundaries shall be located behind these plantings. The proposed plantings will align with existing where required and will be a mix of exotic and natives to achieve a solid screen while also improving biodiversity. Along Johns Road, trees will be maintained to a maximum height of 5m to prevent shading of the road carriageway.

- (MM3) The final internal slopes of the quarry should be formed to provide an irregular form to the edge of the quarry but at gradients which allow for the placement of topsoil and grass growth. The slope gradient should vary between 1 in 3 and 1 in 6 with an irregular form to negate a linear, uniform appearance of the slopes to create a more natural appearance.

- (MM4) Following completion of quarry works, in a staged approach, topsoil should be applied over the finished surface level and sown with a suitable grass species in accordance with the Rehabilitation Plan.

- (MM5) After the completion of works on site, the site could be subdivided into a number of rural and rural/residential lots or operated as a single farm, as per the provisions of the current Selwyn District Plan. The rehabilitation plan allows this flexibility.

In terms of character and context, the Inner Plains site has a rural character, but it is located in a receiving environment which is under-going considerable change with the development of major roading infrastructure, commercial (rural services) activity and rural/residential development. We consider that the proposal, given appropriate mitigation, will result in a moderate magnitude of change resulting in effects on the existing landscape character and values during operation of the quarry. With the rehabilitation of the site, the effects are considered to be less than minor. The greatest change will be on the topographical character of the plains with the creation of irregular internal slopes and a lowered ground level approximately 10m below the original ground level. There are no natural waterways affected by the proposal.

In terms of visual amenity, the site can be seen from several vantage points in the receiving environment, including residents located to the north and west of the proposal, but given the proposed mitigation measures combined with the flat topography of the site and surrounding sites, any adverse effects are considered to range from Less than Minor to Indiscernible for the following reasons:
• Visually, the planting of shelter belts is expected in the receiving environment.
• Existing shelter belts on the site are to be retained and additional planting and bunding established, screening views into the excavation areas from nearby residences;
• In all instances bunding and shelter belts will successfully screen views into the site;
1. INTRODUCTION AND PROPOSAL

DCM Urban have been commissioned by Fulton Hogan Limited to assess the potential landscape and visual effects from a proposed quarry on Jones Road in the Selwyn District. The proposed quarry will cover an area of approximately 170Ha, with material being excavated down to a potential depth of 10 m below the current surface level. The remediation of the site is proposed to be in accordance with the proposed Fulton Hogan Quarry Rehabilitation Plan. During the preparation of this report we have worked closely with the applicant to develop mitigation measures as well as develop suitable staged remediation concepts for the site following the completion of extraction works.

The quarry is to include processing plant equipment which will be located in the middle of the development. The plant will be located at the base of the quarry.

This report is supported by an Appendix of Figures, which include photos of the existing site and surrounding areas, proposed mitigation measures, and proposed rehabilitation works.

2. METHODOLOGY

2.1 INTRODUCTION

The landscape and visual impact assessment considers the likely effects of the proposal in a holistic sense. There are three components to the assessment:

1. Identification of the receiving environment and a description of the existing landscape character, including natural character;
2. The landscape assessment is an assessment of the proposal against the existing landscape values;
3. The visual impact assessment is primarily concerned with the effects of the proposal on visual amenity and people, evaluated against the character and quality of the existing visual catchment.

The methodology is based on the Landscape Assessment and Sustainable Management 10.1, (NZILA Education Foundation), dated 2.11.2010 and Visual Assessment Best Practice Methodologies (Lisa Rimmer) dated 4.11.2007.

2.2 LANDSCAPE DESCRIPTION AND CHARACTERISATION

Landscape attributes fall into 3 broad categories: biophysical features, patterns and processes; sensory qualities; and spiritual, cultural and social associations, including both activities and meanings.

- Biophysical features, patterns and processes may be natural and/or cultural in origin and range from the geology and landform that shape a landscape to the physical artefacts such as roads that mark human settlement and livelihood.
- Sensory qualities are landscape phenomena as directly perceived and experienced by humans, such as the view of a scenic landscape, or the distinctive smell and sound of the foreshore.
• Associated meanings are spiritual, cultural or social associations with particular landscape elements, features, or areas, such as tupuna awa and waahi tapu, and the tikanga appropriate to them, or sites of historic events or heritage. Associative activities are patterns of social activity that occur in particular parts of a landscape, for example, popular walking routes or fishing spots. Associative meanings and activities engender a sense of attachment and belonging.

Describing the landscape character is a process of interpreting the composite and cumulative character of a landscape, i.e. how attributes come together to create a landscape that can be distinguished from other landscapes. International best practice in characterisation has two dimensions of classification: the identification of distinctive types of landscape based on their distinctive patterns of natural and cultural features, processes and influences; and their geographical delineation. The characterisation of a landscape is not to rank or rate a landscape, as all landscapes have character, but determine what landscape attributes combine to give an area its identity, and importantly to determine an area’s sensitivity, resilience or capacity for change.

Table 1: Continuum of Natural Character

<table>
<thead>
<tr>
<th>Natural</th>
<th>Near-natural</th>
<th>Semi-natural (including pastoral agriculture and exotic forests)</th>
<th>Agricultural (arable and intensive cropping)</th>
<th>Near-cultural</th>
<th>Cultural</th>
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<tr>
<td>Very high-pristine</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate-low</td>
<td>Low</td>
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2.3 LANDSCAPE VALUES

Following the descriptive phase of landscape assessment, an evaluative phase is undertaken whereby values or significance is ascribed to the landscape.

Where Planning Documents have identified Outstanding Natural Features or Landscapes, the objectives, policies and rules contained within the plan are used as the basis for landscape significance or value, and it is these values which the proposal is assessed against. Where there is some uncertainty of the landscape value, such as when the District Plan has a broad description of an Outstanding Natural Landscape (ONL), but it is not site specific, or the site neighbours an ONL, it is often necessary to complete an assessment against the values of the District Plan for completeness sake. Most district plans have policies or objectives which are relevant to Landscape and Natural Character if proposed in a rural or sensitive environment.

An accepted approach, where the landscape value of the site is not identified in the District Plan under Section 6(b) of the RMA, is to use criteria identified in Wakatipu Environmental Society Inc. & Ors v QLDC [2000] NZRMA 59 (generally referred to as the Amended Pigeon Bay criteria). The assessment criteria have been grouped into 3 broad categories or ‘landscape attributes’ which are to be considered:

1. Biophysical elements, patterns and processes;
2. Associative meaning and values including spiritual, cultural or social associations; and
3. Sensory or perceptual qualities.

2.4 VISUAL ASSESSMENT METHODOLOGY

In response to section 7(c) of the RMA, an evaluation is undertaken to define and describe visual amenity values. As with aesthetic values, with which amenity values share considerable overlap, this evaluation was professionally-based using current and accepted good practice. Amenity values are defined in the Act as “those natural or physical qualities and characteristics of an area that contribute to people’s appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.” The visual assessment looks at the sensitivity of receptors to changes in their visual amenity through the analysis of selected representative viewpoints and wider visibility analysis. It identifies the potential sources for visual effect resulting from the Proposal and describes the existing character of the area in terms of openness, prominence, compatibility of the project with the existing visual context, viewing distances and the potential for obstruction of views.¹

The visual impact assessment involves the following procedures:

- Identification of key viewpoints: A selection of key viewpoints is identified and verified for selection during the site visit. The viewpoints are considered representative of the various viewing audiences within the receiving catchment, being taken from public locations where views of the proposal were possible, some of which would be very similar to views from nearby houses. The identification of the visual catchment is prepared as a desktop study in the first instance using Council GIS for aerials and contours. This information is then ground-truthed on site to determine the key viewpoints and potential audience. Depending on the complexity of the project a ‘viewshed’ may be prepared which highlights the ‘Theoretical Zone of Visual Influence’ (TZVI) from where a proposal will theoretically be visible from. It is theoretical as the mapping does not take into account existing structures or vegetation so is conservative in its results (given the scale and form of the proposal, the creation of a TZVI was not considered necessary).

- Assessment of the degree of sensitivity of receptors to changes in visual amenity resulting from the proposal: Factors affecting the sensitivity of receptors for evaluation of visual effects include the value and quality of existing views, the type of receiver, duration or frequency of view, distance from the proposal and the degree of visibility. For example, those who view the change from their homes may be considered highly sensitive. The attractiveness or otherwise of the outlook from their home will have a significant effect on their perception of the quality and acceptability of their home environment and their general quality of life. Those who view the change from their workplace may be considered to be only moderately sensitive as the attractiveness or otherwise of the outlook will have a less important, although still material, effect on their perception of their quality of life. The degree to which this applies also depends on factors such as whether the workplace is industrial, retail or commercial. Those who view the change whilst taking part in an outdoor leisure activity may display varying sensitivity depending on the type of leisure activity and a greater sensitivity to those commuting. For example, walkers or horse riders in open country on a long-distance trip may be considered to be highly sensitive.

to change while other walkers may not be so focused on the surrounding landscape. Those who view the change whilst travelling on a public thoroughfare will also display varying sensitivity depending on the speed and direction of travel and whether the view is continuous or occasionally glimpsed.

- Identification of potential mitigation measures: These may take the form of revisions/refinements to the engineering and architectural design to minimise potential effects, and/or the implementation of landscape design measures (e.g. screen tree planting, colour design of hard landscape features etc.) to alleviate adverse urban design or visual effects and generate potentially beneficial long-term effects.
- Prediction and identification of the residual effects after the implementation of the mitigation measures.

2.5 EFFECTS METHODOLOGY

Analysis of the existing landscape and visual environment is focused upon understanding the functioning of how an environment is likely to respond to external change (the proposal). The assessment assesses the resilience of the existing character, values or views and determines their capacity to absorb change. The proposal is assessed in its ‘unmitigated’ form and then in its mitigated form to determine the likely residual effects. The analysis identifies opportunities, risks, threats, costs and benefits arising from the potential change.

The assessment of likely effects is based on the NZILA Best Practice Guide – Landscape Assessment and Sustainable Management (02.11.10) with a seven-point scale and the Quality Planning Websites, being:

EXTREME / VERY HIGH / HIGH / MODERATE / LOW / VERY LOW / NEGLIGIBLE

In determining the extent of adverse effects, the level of effects is along a continuum to ensure that each effect has been considered consistently and in turn cumulatively. This continuum may include the following effects:

- **Indiscernible Effects** No effects at all or are too small to register.
- **Less than Minor Adverse Effects** Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons.
- **Minor Adverse Effects** Adverse effects that are noticeable but will not cause any significant adverse impacts.
- **More than Minor Adverse Effects** Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied.
- **Significant Adverse Effects that could be remedied or mitigated** An effect that is noticeable and will have a serious adverse impact on the environment but could potentially be mitigated or remedied.
- **Unacceptable Adverse Effects** Extensive adverse effects that cannot be avoided, remedied or mitigated.
2.6 PHOTOGRAPHY METHODOLOGY

All photos are taken using a Fuji Finepix 5600 digital camera with a focal length of 50mm. No zoom was used. In the case of stitched photos used as the viewpoint images, a series of 4 portrait photos were taken from the same position to create a panorama. The photos were stitched together automatically in Adobe Photoshop to create the panorama presented in the figures.

2.7 STATUTORY DOCUMENTS

Relevant statutory documents in terms of Landscape Values and Visual Amenity are referred to below are the Resource Management Act 1991, and the Selwyn District Plan.

2.7.1 Resource Management Act 1991

Section 6 of the RMA identifies matters of national importance:

"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 recognise and provide for the following matters of national importance:

s.6 (a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development;

s.6 (b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development;

s.6 (c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna."

Other matters are included under Section 7:

"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."

2.7.2 Selwyn District Plan

Under the Selwyn District Plan, the site is zoned Inner Plains. The Inner Plains rural zone recognises the rural land extending from West Melton through to Tai Tapu and is consistent with Objective 3 and Policy 5 of Chapter 12 of the RPS, with the Inner Plains providing an important contrast to the ‘urban’ landscape of the city.

Policy B1.4.12

Recognise that the land between the Christchurch City and a line extending from West Melton to Tai Tapu is identified in the RPS as providing a significant ‘rural’ landscape in contrast with the ‘urban’ landscape of the City.

The Selwyn District Plan recognises Outstanding Natural Landscapes (ONL) and Visual Amenity Landscapes (VAL) but the proposal is not located in either an ONL or VAL. There are several policies in the Rural Objectives
and Policies of the Selwyn District Plan which relate to Landscape Values and amenity which have been addressed in 3.3 below.

3. ASSESSMENT OF EFFECTS

3.1 EXISTING SITE CHARACTER

The receiving environment of the Canterbury Lower Plains zone is characterised by large open paddocks, with boundaries often delineated by well-established shelter belts of exotic species, rural dwellings surrounded by large trees, and a mix of different land uses. The relatively flat landforms flow from the base of the Southern Alps in an assortment of agricultural fields, criss-crossed with roadways and shelterbelts. The existing site is framed by Jones Road, along the southern boundary, Dawsons Road, along the eastern boundary, Curraghs Road along the Western Boundary, and Maddisons Road along the northern boundary. While the site does not run adjacently along Maddisons Road, the large rectangular shape of the containing block is a further prominent man-made characteristic of the lower plains’ environmental characteristic. The proposal is located on relatively flat topography with only a minor variation in vertical height perceivable from eye level (Refer to Page 5 in attached drawings.) Overall, the topographical attributes of the receiving environment are relatively low with no defining features.

The existing land type of the Lower Canterbury Plains was acknowledged by Boffa Miskell in the Canterbury Regional Landscape Study Review (2010) as forming part of the L2 – Plains Coastal Fringe Land Type. A landscape formed from broad low angle coalescing outwash fans and low terraces associated with the major rivers that slice through the plains. The comprising Pleistocene glacial outwash gravels and Holocene alluvium deposits form the underlying structure of the ground, giving the site its contemporary value for aggregates.

Vegetation types in the receiving environment are predominantly exotic species, with small amounts of native species, used predominantly for shelter belts running along the paddock boundaries. The shelter belts consist mostly of either *Pinus radiata*, *Cupressus macrocarpa* or *Eucalyptus* species varying in height between 4 – 8m forming mostly dense, visually impenetrable screens along stretches of the western, eastern and northern boundaries. Open grass fields fill the centre of the site itself. The open grass fields are only disrupted by small clusters of existing vegetation and individual eucalyptus trees with an estimated height of 20m. Surrounding the site, aligning the road reserve is a border consisting of a mown grass and exposed earth verge running up to the post and rail timber fence line. Further south lies a large cluster of pine forest and open grass fields with intermittent pine shelterbelts, separating Jones Road and Main South Road. Vegetation surrounding the site, mirrors what is found within the proposal, where the large open expanses of grassed fields are framed with shelter belts.

Indigenous vegetation has been identified in the Canterbury Regional Landscape Study as being reduced to small, isolated and scattered remnants because of the large-scale land use changes seen throughout the plains. This has resulted in 0.5% of the plains supporting native vegetation. This is seen in the existing vegetation patterns found on site, comprising largely of exotic species, which have been used for their ability to fulfil a role as fast growing shelterbelts. This is typical of the rural setting surrounding the site. Overall, the vegetation cover in the area has a low sensitivity to change, given the high level of fast growing introduced exotic species,

In terms of sensory qualities, the flat open geometric fields are back dropped by the Southern Alps. Expansive views are often possible but are equally screened by large shelter belts and buildings at various locations. The patchwork fields are an iconic visual cue for the Canterbury plains, and this contrast with the rugged alps is a
significant aesthetic and shard landscape value also identified in the Canterbury Regional Landscape Study Review. The existing provisions of shelterbelts that run along some roadsides currently prevent some of these continual views however, their strong forms have become integral to the rural aesthetic. The natural characteristic of the environment is considered to be modified, with a rural character as opposed to a natural character. No waterways are within the proposal site. Quarrying has been a past land use activity within the receiving environment. A now disused quarry site, ‘Curraghs Pit’ is located on the western side of the intersection of Jones and Curraghs Roads and is estimated to be 4m deep in some locations. Since its closure, the 2ha site has become overgrown with rank grass some weed species and exposed patches of earth visible.

In terms of built form, dwellings and farm or auxiliary structures are common throughout the area. The scale, character, form, colour and materiality of the buildings vary throughout the area with no common style or palette. There are existing single-story dwellings at 220 Jones Road, and 127 and 120 Dawsons Road. These dwellings are supported by additional farm buildings such as sheds and storage buildings clustered together. These lots are generally bundled together, with large open fields separating clusters of development. Similar dwellings are found outside the site in neighbouring lots, with additional industrial sheds and agricultural facilities such as greenhouses or warehousing dispersed into the surrounding landscape. There are several commercial and industrial activities fronting SH1 including Farm Chief Machinery, Cropmark Seeds, Farmec Farm Machinery, and Affordable Mowers and Machinery. The premises are typically large warehouse type buildings with surface carparking, storage of plant machinery and signage. SH1 itself is currently undergoing a substantial upgrade and realignment with the construction of the Christchurch Southern Motorway – Stage 2 (CSM2) on the southern side of the rail corridor. The upgrade includes lighting (the road is currently unlit), bridges and motorway style signage as well as a wider footprint allowing for two lanes in either direction. The bridges and associated structures were considered in the Landscape and Visual Impact Assessment prepared for CSM2 would have the most significant landscape effect due to their elevated form, removal of vegetation, extensive areas of hard surfacing and engineered landforms. The western edge of Templeton is approximately 700m away, where the built character is denser, being approximately 10-15hh/ha and has a suburban character.

Overall, the receiving environment has a rural, open character but is undergoing a significant level of change with nearby residential and rural-residential development, and infrastructure construction. Commercial enterprises are also common in the area, recognising the transformation occurring between Templeton and Rolleston.

3.2 EFFECTS ON LANDSCAPE CHARACTER

Landscape character is the combination and composition of biophysical elements such as topography, vegetation, built form and sensory qualities perceived by humans. Landscape character is also spiritual, cultural and social associations.

The proposal will have greater effects on Landscape Character during the period in which the quarry is under operation, prior to the site being rehabilitated. During operation there will be a loss of groundcover, existing vegetation within the site, installation of plant equipment, and the creation of cut faces. During construction there will be a loss of some vegetation within the site, but the biggest effects will occur from permanent changes to the topography, from a flat grass paddock to an open face quarry site. The most significant effects on topography will be during construction but will be mitigated by the creation of irregular, grassed slopes and the establishment of pasture grass when the site is rehabilitated. The rural character of the site will be re-established, but the character of the site will change.
The potential Landscape Character effects from planting shelter belts and bunding as a mitigative measure are Less than minor. Shelter belt planting is a common sight throughout the Canterbury plains, and is an integral part of the rural character, stemming from its origins in sheep farms and plantations. The use of shelter belts as mitigation inevitably changes an open character to a character with more enclosed views and compartmented character. However, this is not necessarily seen as adverse as these shelter belts build into the wider rural character of the lower Canterbury plains. Planted shelter belts are a permitted activity within the district plan and are anticipated within this zone. Potential shading issues from the proposed plantings have been modelled to ensure adverse shading issues do not occur between 10am and 2pm as per Rule 2.1.1.5 of the Selwyn District Plan. On the Jones Road frontage, the plantings will be maintained to a maximum height of 5m to ensure no shading occurs on the carriageway. On Dawsons Road, the proposed plantings will not shade the road until after 2pm due to the road running north-north-east. On Curraghs Road, proposed plantings will be positioned behind the existing pine shelter belt resulting in no additional shading.

While the use of shelter belts brings about a change to the existing site character, the mixture of planting types and sizes provides for more visually interesting boundary when compared to a more typical pine planting. In addition, the inclusion of a post and rail fence maintains elements of the surrounding existing open character to provide for a mitigative solution that not only mitigates adverse effects from the development, but also builds on the strong rural character of the lower Canterbury plains.

The staging of the quarry is important to minimise potential adverse effects in terms of topography with exposed slopes being shaped and grassed once work has been completed in an area as progress is made into the next area. It is highly likely the rural character of the site will change over time given the site’s proximity to urban areas and could be subdivided down into 4Ha lots under the current district plan rules, each lot potentially with its own dwelling and associated utility buildings. Based on observations of other rural areas close to urban settlements, new boundaries are established with fencing and shelter belts planted. The character of the environment, while still rural, changes becoming much more compartmented into small units. The openness of the plains is changed, apart from views down linear road corridors, to a much more enclosed character.

Overall, we consider that there will be adverse effects on Landscape Character during construction, with the largest impact being changes to Topography, but that any such effects will be short term, staged and mitigated by plantings on the outside of the bunds occurring prior to bunding. All other effects on landscape character can be appropriately mitigated or remedied. Overall, we consider the effects to be less than minor.

3.3 EFFECTS ON LANDSCAPE VALUES

The proposal is located in the Inner Plains zone of the Selwyn District Plan. Outstanding Natural Landscape (ONL) and Visual Amenity Landscape (VAL) have been identified in the Selwyn District Plan but the proposal site is not located in an ONL or a VAL. Selwyn District, like many other councils, is undertaking a significant review of their District Plan. The council is currently seeking feedback on draft changes to the Outstanding Natural Features and Landscapes listed, where the number of ONL areas increases from four to eight, and the number of VAL areas increases from one to four. This is partly due to Forestry Exclusion Areas becoming part of ONL or VAL, and one ONF becoming ONL. The draft landscape areas are similar in location to the current District Plan areas; however, a larger area of the district is now identified. The site is also not included in any of the draft landscape areas proposed.

As there are no landscape specific overlays across the site, the proposal has been assessed against the relevant Rural Objectives and Policies of the Selwyn District Plan which relate to Landscape Values and amenity but has
not been specifically assessed against Section B1.4, Outstanding Natural Features and Landscapes. The effects on landscape values are considered in the context of the policy assessment below.

QUALITY OF THE ENVIRONMENT

Objective B3.4.2

A variety of activities are provided for in the rural area, while maintaining rural character and avoiding reverse sensitivity effects.

Policy B3.4.3

Avoid, remedy or mitigate significant adverse effects of activities on the amenity values of the rural area.

The use of bunding and vegetation, combined with the staging of excavation and rehabilitation, to build upon the rural amenity of the surrounding landscape will mitigate adverse effects of the development. By providing a visual screen, the proposal’s scale and works are mitigated from having any effect of substance on the surrounding visual amenity values. A full visual impact assessment has been undertaken in Section 3.4 of this report.

The rehabilitated site, which could accommodate future subdivision or a range of other permitted rural activities, provides for a remedying approach to address the adverse effects of activities on the amenity values of the rural area. Quarrying is recognised as a rural activity in both the RPS and the proposed Selwyn District Plan with a focus of this report on how the site can be returned to grazing or plantation activities as parts of the quarry are rehabilitated.

Policy B3.4.6

Maintain low levels of building density in the Rural zone and the predominance of vegetation cover.

Plant equipment will be positioned in the centre of the site, over 400m from the property boundary, to ensure they are not visible from outside of the site. Any buildings/offices will be of a scale that will not be greater than the permitted building density in the Rural zone, adhering to bulk and location requirements.

During operation, the quarry will have a lower level of built form than if the site were to be developed to its full potential under the current District Plan standards, with the open character of the site retained and generally a low-level of building density.

Following rehabilitation of the site, vegetation cover will become the predominant element of the site with a rural character maintained. The proposed landscape plantings will increase the level of vegetation on the site over and above what is present currently.

Policy B3.4.17

Ensure buildings and trees do not excessively shade adjoining properties.

Given the character of the area, existing vegetation and setbacks from adjoining properties and the site’s orientation, the proposed plantings are not considered to create any shading issues. A maximum height of 5m for plantings on Jones Road is proposed frontage to mitigate any potential adverse effects from shading on the road carriageway.
Overall, we consider that the proposal, is consistent with the Objectives and Policies relating to the character and amenity of the Rural zone with effects being less than minor. Quarrying is a rural activity as defined under the RPS, and with the establishment of the bunds and shelter belts during operation, the visual coherence of the site will be maintained within the existing landscape context. Following rehabilitation, the site will be re-established for use for a permitted rural activity or another suitable activity at the time quarrying ceases. Rehabilitated areas may be used for other rural activities prior to the quarry on the site ceasing.

3.4 EFFECTS ON VISUAL AMENITY

The visual context of the receiving environment is considered to be an 800m offset from the edge of the proposed development. This distance has been used due to the receiving environment’s flat topography resulting in views from further away not being possible or any proposed changes being indiscernible at distance. If the site were in a more undulating landscape, a Zone of Theoretical Visual Influence (ZTVI) could be prepared to determine the visual catchment, however for this project, it is considered, a ZTVI would be of little value. Dwellings to the north look across on to the site with views possible over existing vegetation from Curraghs Road, while open views are present from the majority of Dawsons Road and all of Jones Road. Views from Maddisons are limited due to existing vegetation and setback due to the paddocks running adjacent to the roadway. A series of key viewpoints were selected to show a representative sample of the likely visual effects which could result from the proposal (refer to Appendix 1 for the relevant photo). Viewpoints are generally located on public land, and where possible located as close as possible to existing or proposed residential dwellings. In assessing the potential effect of a proposal, the quality and openness of the view is considered as well as the availability of alternative views.

These were as follows:

1) View West – Globe Bay Reserve;
2) View North – Intersection of Dawsons and Jones Road;
3) View North West – Jones Road Entrance;
4) View North East – Jones Road;
5) View North East – Intersection of Curraghs and Jones Road;
6) View East – Curraghs Road
7) View South – 370 Maddisons Road
8) View South West – Intersection of Dawsons and Maddisons Road
9) View West – Dawsons Road

In assessing the potential effects on visually sensitive receptors, the key viewpoints outlined above have been used as a reference point where it is considered that the effects are likely to be similar to the viewpoint and for a group of viewers. The viewpoint is a representative view, as close as possible to the view likely to be experienced from a private residence or property but obtained from a public location.

The following table outlines the potential visual effects each Visually Sensitive Receptor might receive and how the effects may potentially be mitigated. The effects take into account the likely sensitivity of the receptor (based on type), combined with the likely magnitude of effects (a combination of distance from the proposal and degree of change) to determine what the likely residual effects from the proposal will be. Mitigation measures are outlined in Section 4.
### Table 2: Assessment of Effects on Visually Sensitive Receptors

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Visually Sensitive Receptors (VSR)</th>
<th>Distance from Proposal (m)</th>
<th>Type of View (open, partial, screened)</th>
<th>Description of existing view (from public location)</th>
<th>Sensitivity of VSR</th>
<th>Mitigation Measures</th>
<th>Magnitude of Change</th>
<th>Description of Effects</th>
<th>Effects (after mitigation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. View West – Globe Bay Reserve</td>
<td>Residents and visitors of Globe Bay Reserve</td>
<td>750</td>
<td>SCREENED</td>
<td>The existing view over the reserve is blocked by a large shelterbelt of approximately 4m in height and consists almost entirely of Pinus radiata. This shelterbelt runs the entire length of the residential development with few gaps. The reserve itself is a large open green space with young trees running adjacent to the abutting Globe Bay Drive and the driveway.</td>
<td>High</td>
<td>MM2</td>
<td>Negligible</td>
<td>The proposed quarry site will not be visible to the residents or users of Globe Bay Reserve. The screening provided by the large Pinus radiata shelterbelt prevents any potential views of the site. The effects are not considered to change if this shelter belt were to be removed, as there is a subsequent shelter belt behind (approximately 150m away). This second layer of shelterbelt would continue to prevent any views of the Dawsons Road site. Visual effects are Indiscernible.</td>
<td>Indiscernible</td>
</tr>
<tr>
<td>2. View North – Intersection of Dawson's and Jones Road</td>
<td>Vehicle and Cycle users of Jones Road</td>
<td>15</td>
<td>OPEN</td>
<td>This existing view has open sightlines over the proposed site, with the Southern Alps visible in the distance. A post and rail fence is visible in the foreground. This view also contains a number of large well-established Eucalyptus Trees, approximately 20m in height scattered around the boundary of the site, as well as located within the proposal.</td>
<td>Low</td>
<td>MM2</td>
<td>Low</td>
<td>The proposed quarry site would be openly visible behind the low-level existing fencing if mitigation measures are not implemented. Given the site’s flat topography, the potential for mitigative measures to improve or retain the existing amenity allows for the integration of berries and plantings. Bundling with a height of 3m would allow for an effective screening measure that prevents sightlines into the site by passing motorists and TranzAlpine users. The setback of the bundling allows for the preservation of existing fence lines. The 1:3 slope of the road boundary side of the bundling allows for a gentle slope, accentuated by a 4m deep combination of native plantings and fast-growing exotic species of trees. The remaining bundling is grassed, allowing for a 1m accessway on the top of the bund for maintenance. The residual effects following implementation of the mitigation measures are less than minor.</td>
<td>Less than Minor</td>
</tr>
<tr>
<td>3. View North West – Jones Road Entrance</td>
<td>Vehicle and Cycle users of Jones Road</td>
<td>35</td>
<td>OPEN</td>
<td>This view shows the existing open view over the proposed site. The Southern Alps provide a strong backdrop to open fields that connect onto Jones Road. A post and rail fence frame the edge of the boundary to the road reserve and establishes the existing vehicle access into the site. Sporadic vegetation and a visually permeable fence line permit open views deep into the proposed site. Signage for a Fulton Hogan site is also visible from this perspective.</td>
<td>Low</td>
<td>MM1, MM2</td>
<td>Low</td>
<td>The proposed re-use of the existing vehicle entrance on Jones Road, would allow views into the site from this viewpoint if not mitigated. The proposed mitigation measures with a ‘dual’ bund and associated planting will screen the internal workings of the site from this viewpoint, resulting in Less than Minor residual effects.</td>
<td>Less than Minor</td>
</tr>
<tr>
<td>4. View North – East – Jones Road</td>
<td>Vehicle and Cycle users of Jones Road</td>
<td>35</td>
<td>PARTIAL</td>
<td>This view has open views over the proposed site. A low open style post and rail fence runs along the road reserve and its visually permeable design allows sightlines to see through it. The site is partially framed by shelter belts visible in the distance on the northern most boundary.</td>
<td>Low</td>
<td>MM1, MM2</td>
<td>Low</td>
<td>The proposed quarry site would be visible behind the low-level existing fencing and vegetation if mitigation were not implemented. The proposed bundling and associated planting will screen views into the site and of internal workings.</td>
<td>Less than Minor</td>
</tr>
<tr>
<td>5. View North – East – Intersection of</td>
<td>Vehicle and Cycle users of Jones Road, including bus users.</td>
<td>15</td>
<td>OPEN</td>
<td>This viewpoint maintains the open views out over the proposed site. The western boundary is framed by a large Pine shelterbelt which connects on the southern post and rail fence which runs along the road reserve. The open views of the site allow for sightlines over the existing development located within the proposal as well as several large clusters of existing vegetation.</td>
<td>Low</td>
<td>MM2</td>
<td>Low</td>
<td>The proposed quarry site would be visible behind the existing fencing and vegetation if mitigation were not implemented. The proposed bundling and associated planting will screen views into the site and of internal workings. With the implementation of the mitigation measures, the residual effects will be Less than Minor</td>
<td>Less than Minor</td>
</tr>
</tbody>
</table>

**Note:** The proposed site would be partially visible behind the low-level existing fencing and vegetation if mitigation were not implemented. The proposed bundling and associated planting will screen views into the site and of internal workings. The residual effects following implementation of the mitigation measures are less than minor.
<table>
<thead>
<tr>
<th>Event / Location</th>
<th>Users of Road</th>
<th>35</th>
<th>OPEN</th>
<th>50</th>
<th>Open / Partial / Screened</th>
<th>Low</th>
<th>MM2</th>
<th>Low</th>
<th>Less than Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. View East – Curraghs Road</td>
<td>Vehicle and Cycle users of Curraghs Road</td>
<td></td>
<td></td>
<td></td>
<td>This viewpoint has open views over the proposed site. The grassed boundary to the road reserve provides no visual interference between the roadway and the proposal. The paddock directly in front of the viewpoint is not part of the site however, the paddocks southern and eastern boundary border the proposed development.</td>
<td>Low</td>
<td>MM2</td>
<td>Low</td>
<td>The proposed quarry site would be visible behind the low-level existing fencing and vegetation if mitigation were not implemented. The proposed bunding and associated planting will screen views into the site and of internal workings.</td>
</tr>
<tr>
<td></td>
<td>Residents at 151 and 153 Curraghs Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. View South – 370 Maddisons Road</td>
<td>Vehicle and Cycle users of Maddisons Road</td>
<td></td>
<td></td>
<td></td>
<td>This viewpoint has partial views out over the proposed development site. Framed in front of the Port Hills the large existing vegetation on site is clearly visible from the road side. The paddock located in the foreground is not part of the site, with the nearest boundary being approximately 250m away.</td>
<td>Low</td>
<td>MM2</td>
<td>Very Low</td>
<td>The proposed quarry site would be visible behind existing fencing and vegetation if mitigation were not implemented. The proposed bunding and associated planting will screen views into the site and of internal workings.</td>
</tr>
<tr>
<td></td>
<td>Residents/visitors at 370 Maddisons Road / Samadhi Buddhist Vihara visitors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. View South-West – Intersection of Dawsons and Maddisons Road</td>
<td>Vehicle and Cycle users of Maddisons Road</td>
<td></td>
<td></td>
<td></td>
<td>This viewpoint looks South West over the proposed site. A small open paddock is separated from the road reserve by a low post and wire fence, typically seen in the area. A large macrocarpa hedge approximately 6m high runs along the Northern most boundary of the proposed development. Subsequently, this screens any view over the site from the roadside. The small paddock in the foreground of this viewpoint is not part of the proposed development.</td>
<td>Low</td>
<td>MM2</td>
<td>Negligible</td>
<td>The proposed quarry site will not be visible to the residents at 165 Maddison’s Road. The screening provided by the large macrocarpa shelter belt prevents any potential views into the site.</td>
</tr>
<tr>
<td></td>
<td>Residents at 165 Maddisons Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residents at 319 Maddisons Road</td>
<td></td>
<td></td>
<td></td>
<td>Views from the existing dwelling at 319 Maddisons Road are screened by an existing macrocarpa hedge, estimated to be 6m high. The hedge is located on the Maddisons Road property</td>
<td>High</td>
<td>MM2</td>
<td>Negligible</td>
<td>With the retention of the existing hedge, views will be screened into the quarry site. Combined with the proposed mitigation measures, any adverse effects are Less than Minor</td>
</tr>
<tr>
<td>9. View East – Dawsons Road</td>
<td>Vehicle and Cycle users of Dawsons Road</td>
<td></td>
<td></td>
<td></td>
<td>This viewpoint reveals a large open sightline over the proposed site, with clear lines visible to the opposing boundaries of the site, including Curraghs and Jones Road. The foreground presents a typical post and rail fence running along the eastern boundary with low level grass that ultimately does not interfere with sightlines from the roadway. The large tree clusters within the proposal are visible from this location, as is the Christchurch Southern Motorway Stage 2 Bridge.</td>
<td>Low</td>
<td>MM2</td>
<td>Very Low</td>
<td>The proposed quarry site would be openly visible behind the low-level existing fencing and vegetation. With the proposed mitigation measures, views into the quarry area will be screened resulting in Less than minor residual effects.</td>
</tr>
</tbody>
</table>
3.5 SUMMARY OF EFFECTS ON VISUAL AMENITY

The likely visual effects are described above in the Assessment of Effects table. The highest effects after mitigation will be experienced by those residential properties closest to the proposal at 151 and 153 Curraghs Road, and 319 Maddisons Road. For the Curraghs Road properties the existing, albeit limited, semi-open views will be replaced with views contained by boundary plantings and the proposed landscape bunds. However, given that landscape plantings on the boundary are a permitted activity and could be planted as of right, the magnitude of change for these residents in visual terms is considered very low. Views will be possible of the proposed bunds, but with a shallow gradient of 1:3, a maximum height of 3m, and a complete grass cover, the magnitude of change is still considered low, resulting in Less than Minor visual effects.

The use of bunding and planting along site boundaries provides for a visual screen around the proposal that enables the site to respond to the existing rural landscape character. The layering of both exotics and native planting on the bunding preserves the visual lines provided by existing shelter belts. Where a row of fast-growing pittosporums, horerias, ribbonwoods, pines, macrocarpas, and eucalyptus trees will blend in with similar vegetative mixes found in the surrounding shelter belts neighbouring the site. The re-introduction of native species in the front two rows of planting provide a variety of species that allow for both visual interest to be maintained along extended lines of planting.

For passing motorists, pedestrians (including walkers and runners using the new shared path between Curraghs Road and Dawsons Road being constructed as part of CSM2), cyclists and train users (TranzAlpine), views will be possible of the proposed bunds, landscape plantings as well as a possible intermittent view into the site via the entrance opening as they move past the site to the south. Open, intermittent views will also be possible for eastbound motorists using the new CSM overpass which is currently under-construction although these views will be fleeting, intermittent and not in the direct line of sight. An internal bund is proposed at the entrance, and combined planting will restrict views into the site. The magnitude of change for these VSRs is low, resulting in Less than Minor visual effects.

4. MITIGATION MEASURES

The following mitigation measures are suggested to either avoid, remedy or mitigate any potential effects on Landscape Character, Landscape Values and/or Visual Amenity:

**MM1 JONES ROAD ENTRANCE PLANTING**

3m high earth bunds with a 1m wide flat top shall be constructed at the main Jones Road entrance. The bunds shall have a slope of at least 1:3 (one vertical to three horizontal) on the outer side. The bunds will be positioned to restrict views into the site from Jones Road. The use of additional bunding is designed to prevent views into the site for the road users of Jones Road, cyclist and walkers using the new shared path and users of the TranzAlpine line as they move past the entrance. This measure is designed to create a seamless appearance of boundary treatment for travelling VSRs passing by the site.

The proposed plantings will align with existing where required and will be a mix of exotic and natives to achieve a solid screen while also improving biodiversity.
Road, trees will be maintained to a maximum height of 5m to prevent shading of the road carriageway.

**MM2  BUND AND LANDSCAPE PLANTING**

A 3m high earth bund with a 1m wide flat top is to be constructed around the entire site as part of the establishment works. The bunds shall have an outer slope of at least 1:3 (one vertical to three horizontal) to give a total bund width of approximately 15m with some flexibility required depending on location.

The existing tree planting along the road boundaries of Curraghs Road and portions of Dawsons Road shall be retained, with the bunds to be constructed along these boundaries located behind these plantings. To ensure the survival of the existing shelter belts, bunds should not be constructed at the base of trees or over root plates.

Bunding should be set back a minimum of 1m from the closest part of the shelterbelt or at least 4m from the tree trunks, whichever is the furthest, in order to avoid undermining the shelterbelt and/or damaging its roots.

Immediately following construction, the bunds are to be sown with grass or hydro-seeded to achieve swift grass cover and watered regularly to ensure grass cover is established immediately after construction. To assist in achieving swift grass cover, construction of the bunds shall take place between the months of February to May or August to November to enable grassing of the bunds to occur in autumn or spring.

The grassed bunds shall be mown regularly or grazed to give a tidy appearance. The grassed bunds shall be watered (to suppress potential dust) until a grass cover has been established. All landscaping shall be maintained. Any dead, diseased, or damaged landscaping is to be replaced immediately with plants of a similar species. Rehabilitation of the site may result in the removing of the bunds but it is likely the bunds and planting will be retained to maintain biodiversity enhancements post completion of quarrying. The proposed plantings will align with existing where required and will be a mix of exotic and natives to achieve a solid screen while also improving biodiversity.

**MM3  REHABILITATED FINAL INTERNAL SLOPES**

The final internal slopes of the quarry should be formed to provide an irregular form to the edge of the quarry but at gradients which allow for the placement of topsoil and grass growth. The slope gradient should vary between 1:3 and 1:6 with an irregular form to negate a linear, uniform appearance of the slopes to create a more natural appearance.

**MM4  TOPSOILING AND GRASSING**

Following completion of quarry works, in a staged approach, topsoil should be applied over the finished surface level and sown with a suitable grass species in accordance with the Draft Quarry Rehabilitation Plan prepared for the site.

**MM5  FUTURE RURAL ACTIVITIES**
After the completion of works on site, the site could be subdivided into a number rural and rural/residential lots or operated as a single farm, as per current District Plan. The rehabilitation plan allows this flexibility. The installation of linear fence lines, planting of boundaries with shelter belts, and the eventual construction of residential dwellings and farm buildings would re-establish the landscape character of the receiving environment.

5. CONCLUSIONS

In terms of landscape character and values of the area, subject to the mitigation proposed, the proposal will result in a moderate magnitude of change resulting in adverse effects on the existing landscape character and values during operation of the quarry. The greatest change will be on the topographical character of the plains with the creation of irregular internal slopes and a lowered ground level up to 10m below the original ground level. There are no waterways affected by the proposal. Subject to the mitigation measures proposed, including the rehabilitation of the site, it is considered that effects will be less than minor.

In terms of visual amenity, the proposed site can be seen from a number of vantage points in the receiving environment, including residents located to the north and west of the proposal, but given the proposed mitigation measures and limited existing views, any adverse effects are considered to range from Less than Minor to Indiscernible.
ROYDON QUARRY, LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Project no: 2017_031
Document title: Landscape and Visual Impact Assessment
Revision: J
Date: 14 NOVEMBER 2018
Client name: FULTON HOGAN

Author: David Compton-Moen

File name: \ADMIN\DCM urban share\4_DCM - Projects\2017_031 - Fulton Hogan - Golders - Dawsons Road LVIA\3_Working Files\3_InDesign\2017_031_Fulton HoganDawsons Road_Landscape and Visual Impact Assessment Appendix

DOCUMENT HISTORY AND STATUS

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LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

CONTEXT - EXISTING BASELINE CHARACTER

Roydon Quarry, Jones Road, Templeton
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LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

CONTEXT - HUMAN STRUCTURES

Roydon Quarry, Jones Road, Templeton
LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

CONTEXT - EXISTING TOPOGRAPHY
Roydon Quarry, Jones Road, Templeton
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Legend:
TG1 TREE GROUP (1-5) - A significant cluster of trees or vegetation.
T1 TREE (1-7) - A significant tree.

VP1: Globe Bay Reserve
View: Screened
Effects: Indiscernible/less than minor
Distance: 1350m to site centre

VP2: Dawsons and Jones Road
View: Open/screened
Effects: Less than minor
Distance: 750m to site centre

VP3: Jones Road Entrance
View: Open
Effects: Less than minor
Distance: 780m to site centre

VP4: Jones Road
View: Open/screened
Effects: Less than minor
Distance: 975m to site centre

VP5: Curraghs Road
View: Open/Partial/Screened
Effects: Less than minor
Distance: 950m to site centre

VP6: Curraghs and Jones Road
View: Open
Effects: Less than minor
Distance: 900m to site centre

VP7: Maddisons Road
View: Open
Effects: Indiscernible/less than minor
Distance: 780m to site centre

VP8: Dawsons and Maddisons Road
View: Screened
Effects: Indiscernible/less than minor
Distance: 1050m to site centre

VP9: Dawsons Road
View: Open
Effects: Less than minor
Distance: 475m to site centre

Context - Character Photo and Viewpoint Locations
Roydon Quarry, Jones Road, Templeton

Aerial map (1:10000@A3 approximately - taken from Canterbury Maps)
The view north from Jones Road is open, with post and rail fencing. Housing is set back some distance from the house, and in most instances is surrounded by vegetation.

Modern residential developments in Templeton tend to consist of large detached dwellings on low density type lots. There is a high level of stewardship.

Significant infrastructure upgrades are being undertaken on SH1 with the construction of the new southern motorway linking Rolleston to CSM1. A new overpass is under construction ~240m from the edge of the proposal.

Large shelter belts of pine, macrocarpa and eucalyptus species are common throughout the area, often forming dense screens and limiting views into site.

Older style houses tend to be setback greater distances than modern residential developments and are surrounded by large, well established exotic trees.

An old garage and storage yard is present on Maddisons Road. The building has a rustic, yet industrial character.

Roydon Quarry, Jones Road, Templeton
Views from Globe Bay reserve towards the proposed site are blocked by existing shelter belt planting. The shelter belt is estimated to be 4m high, consisting of almost purely Pinus radiata. This shelterbelt runs almost the entire length of both the reserve and the neighbouring residential development with few gaps.
This view was taken from the intersection of Dawsons and Jones Road looking across the proposed site. The current view is open with expansive views available across to the Alps. A number of large Eucalyptus trees, estimated to be in excess of 20m in height, are common in the area.
This view looking north west along Jones Road shows the existing entrance to the site and the post and rail fence.
This view looking north from Jones Road is open with few features or landmarks of note.
This view is from the intersection of Jones and Curraghs Road looking north. The current view is open with the existing farm house (220 Jones Road) and building visible in the centre of the viewpoint. The western boundary of the site contains TG3, which largely runs the full length of the proposal in parallel with Curraghs Road. Intermittent views through this group are possible.

A. IMAGE LOCATION

B. EXISTING VIEW

Image captured on Fuji FinePix 5600
Focal length of 50mm.
Date: 24th January 2018 at 12:13 pm.
Height of 1.7 metres
43°33'37.11"S 172°26'35.14"E
4 Photos merged in Photoshop CS to create panorama
This view looking east across open paddocks towards the northern edge of the proposal. The paddock in the foreground is not part of the proposal area but borders the proposals north and north eastern boundaries.

The western edge of the proposal (out of photo) is screened from Curraghs Road by a 4-6m high shelter belt of Macrocarpas.
This view was taken in front of 370 Maddisons Road looking south east. The paddock in the foreground is not part of the proposed area, with the proposal setback 250m from Maddisons road at this point.

These trees are within the project area, being approximately 390m away from this viewpoint.
This view looks south from in front of 165 Madison Road towards the site. The site is screened by an existing Macrocarpa hedge (TG4), approximately 6m high, from Maddisons Road with the paddock in the foreground not part of the proposal area.

A. IMAGE LOCATION

Image captured on Fuji FinePix 5600
Focal length of 50mm.
Date: 24th January 2018 at 12:26 Pm.
Height of 1.7 metres
43°32'56.76"S 172°26'51.31"E
4 Photos merged in Photoshop CS to create panorama

B. EXISTING VIEW
This view is looking southwest-west across the proposed site towards Curraghs Road. Approximately 800m away, TG2 can be seen on the left of the photo. The edge treatment to the south of this photo is open with a low-level row of gorse bushes and two individual eucalyptus.
LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

MITIGATION MEASURES - JONES ROAD LIGHT VEHICLE ENTRANCE PHOTO ILLUSTRATION

Roydon Quarry, Jones Road, Templeton
LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

MITIGATION MEASURES - EDGE TREATMENTS

Roydon Quarry, Jones Road, Templeton

1. CURRAGHS ROAD

   EXISTING PINE HEDGE TO BE RETAINED. A 16M WIDE BUND IS TO BE FORMED BEHIND THE EXISTING TREES WITH A SINGLE ROW OF PINUS RADIATA PLANTED.

2. MADDISONS ROAD

   A 15M WIDE, 3M HIGH BUND IS TO BE FORMED WITH 3 ROWS OF PLANTING PROPOSED.

3. MADDISONS ROAD

   EXISTING PINE HEDGE TO BE RETAINED. A 15M WIDE BUND IS TO BE FORMED BEHIND THE EXISTING TREES WITH A SINGLE ROW OF PINUS RADIATA PLANTED.

4. DAWSONS AND JONES ROAD

   A 16M WIDE, 3M HIGH BUND IS TO BE FORMED WITH 3 ROWS OF PLANTING PROPOSED. ANY EXISTING VEGETATION TO BE RETAINED WHERE POSSIBLE.

Fixed plant centralised to ensure a 500m buffer from the boundary edge is maintained.

Aerial map (1:10000@A3 approximately - taken from Canterbury Maps)
A 3m high, 15m wide earth bund is to be constructed around the perimeter of the site. The outer edge of the bund has a 1:3 slope with a variable 1:2 - 1:1 gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. The front edge of the bund has no offset with planting occurring approximately behind the existing Pine shelterbelt.

A temporary irrigation scheme would be operated for the 2 years of establishment. Rabbit proof shields would also be installed.

Row a: the inner row of planting consists of a single row (staggered spacings) of large, fast growing Pinus radiata. To be planted approximately 3m behind the existing Pinus radiata shelterbelt.

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

MITIGATION MEASURES - EDGE TREATMENT 1 - CURRAGHS ROAD

Roydon Quarry, Jones Road, Templeton
A 3m high, 16 m wide earth bund is to be constructed around the perimeter of the site. The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. There is no offset from the front edge of the bund.

A temporary irrigation scheme would be operated for the 2 years of establishment. Rabbit proof shields would also be installed.

Row 1: the outer row of planting, 2m wide, consists of a mix of native species at 1.0m centres including, Cordyline australis, Phormium tenax, Poa cita amongst others.

Row 2: consists of a single row of larger native species including Pittosporum tenuifolium, Hoheria sextylosa, Plagianthus regius and Pittosporum eugenioides.

Row 3: the inner row of planting consists of a single row (staggered spacings) of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata and Cupressus Macrocarpa

Existing farm fences are to be retained, to retain an open character. Security or closed board fencing would not be permitted where it is visible from a public viewpoint.
A 3m high, 16m wide earth bund is to be constructed around the perimeter of the site. The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. The front edge of the bund is offset 20m from the road boundary to ensure shading of adjacent roads does not occur.

A temporary irrigation scheme would be operated for the 2 years of establishment. Rabbit proof shields would also be installed.

Row 3: the inner row of planting consists of a single row (staggered spacings) of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata and Cupressus Macrocarpa.

Existing farm fences are to be retained, to retain an open character. Security or closed board fencing would not be permitted where it is visible from a public viewpoint.
A 3m high, 16m wide earth bund is to be constructed around the perimeter of the site. The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund.

A temporary irrigation scheme would be operated for the 2 years of establishment. Rabbit proof shields would also be installed.

Row 3: the inner row of planting consists of a single row (staggered spacings) of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata, Hoheria augustifolia, Plagianthus regius and Cupressus Macrocarpa

Row 2: consists of a single row of larger native species including Pittosporum tenuifolium, Hoheria sextylosa, Plagianthus regius and Pittosporum eugenioides.

Row 1: the outer row of planting, 2m wide, consists of a mix of native species at 1.0m centres including, Cordyline australis, Phormium tenax, Poa cita amongst others.

Existing farm fences are to be retained, to retain a rural character. Security or closed board fencing would not be permitted where it is visible from a public viewpoint.

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES
MITIGATION MEASURES - EDGE TREATMENT 4 - DAWSONS / JONES ROAD
Roydon Quarry, Jones Road, Templeton
Sunrise: 8.02 AM
Sunset: 4.59 PM
Latitude: 43.561279S
Longitude: 172.454935E

Shadows developed in Sketchup. Model has been geolocated and dated 21.06.2018. A series of images were overlaid in Photoshop.
**LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES**

**SHADOW PROFILE AND IMPACT - BUND AND LANDSCAPE PLANTING**

Roydon Quarry, Jones Road, Templeton

Sunrise: 8.02 AM
Sunset: 4.59 PM
Latitude: 43.554551S
Longitude: 172.451019E

Shadows developed in Sketchup. Model has been geolocated and dated 21.06.2018.
3m high grass bund and planting is to be established around the entire site as part of Stage 1, including around the entrance.

Trees will be maintained at 5m along Jones road to avoid adverse shading of the road by trees.

Retention of farm fences

Plant equipment is located in the middle of the quarry, away from property boundaries.

Excavation works are staged with the site being rehabilitated with topsoil and grass as work progresses.
10m high slope + 3m high bund, grassed with an irregular slope between 1:3 and 1:6. Planting established as mitigation on the bund would be retained.

Rehabilitation of the quarry would allow for farming activities.

Plantation planting would be possible.
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Aerial map (1:10000@A3 approximately - taken from Canterbury Maps)

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

ENHANCEMENT - WALKING TRACK ROUTES

Roydon Quarry, Jones Road, Templeton
LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

WALKING TRACK A - CURRAGHS ROAD

Roydon Quarry, Jones Road, Templeton
PROPERTY BOUNDARY

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

WALKING TRACK B - 319 MADDISONS ROAD (WESTERN SECTION)
Roydon Quarry, Jones Road, Templeton
Kilometre marking post
unsealed running/walking track

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES
WALKING TRACK C - 319 MADDISONS ROAD (EASTERN SECTION)
Roydon Quarry, Jones Road, Templeton
Kilometre marking post

Unsealed running/walking track

LANDSCAPE AND VISUAL IMPACT ASSESSMENT FIGURES

WALKING TRACK D - DAWSONS AND JONES ROAD

Roydon Quarry, Jones Road, Templeton