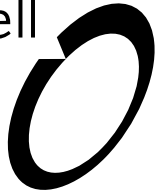


Boffa Miskell



Burnham Quarry

Landscape Effects Assessment
Prepared for Burnham 2020 Ltd

6 September 2023





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Executive Summary

Burnham 2020 Ltd is proposing to develop an existing dairy farm near Burnham, Canterbury for an aggregate quarry to be operated by Winstone Aggregates (a division of Fletcher Concrete and Infrastructure Ltd). The site and its surroundings form part of the Lower Canterbury Plains Landscape and do not contain any waterbodies or form part of any outstanding natural feature or landscape.

During operation, the quarry will extract aggregate in successive phases within a total area of 362 ha. comprising the site. This will be supported by temporary topsoil stockpiles and long-term topsoil bunds formed along the periphery of the Site and extraction areas to reinforce screening through existing shelter belts. During operation, native planting will be established along the long-term bund and resultant batter slopes following rehabilitation to assist with assimilating changes in landform within the Site. As each phase is completed it will be progressively rehabilitated and returned to pasture and native vegetation. Additional blocks of native planting are also proposed within the south-eastern corner and midway along the southern boundary of the Site. While each phase is extracted and rehabilitated, the remainder of the Site will continue to operate as a working farm.

Landscape effects

The character of the Site reflects part of a flat to gently sloping area of rural landscape which comprises remnant ancient, braided rivers that flowed through and shaped the broader Canterbury Plains. Intensive agricultural activity is now prevalent throughout this landscape including the Site. As a working dairy-finishing farm, the Site is currently managed as pasture with several pine shelterbelts and feed crops supported by farm infrastructure and machinery including three large centre pivot irrigators.

Key landscape effects of the proposed quarry will include the gradual and progressive modification to the existing landform. This activity will essentially entail the exposure of bare earth as a broad depression or pit is formed through the extraction of aggregate during each phase. Such effects will gradually shift across the Site through successive phases of development. Changes in land use commence with the establishment of the Site entrance along Aylesbury Road following which operational areas are located within the floor of the resultant quarry as extraction progresses in an anti-clockwise direction in 13 successive phases of activity.

Effects of the proposed quarry on landscape character are considered **moderate adverse** during the initial commencement of quarrying activity and will gradually and progressively reduce through successive phases of planting and associated rehabilitation. The Canterbury Plains have a strong agricultural character overlaid across a broad alluvial plain. The scale and disruption of the physical characteristic associated with the Site will be atypical of day-to-day farming practice. Nevertheless, the progressive nature of the proposal and high level of visual containment achieved through reinforcing the existing framework of vegetation with bunding, temporary stockpiling and progressive planting, including along resultant batter slopes following rehabilitation, will effectively reinforce the character and quality of this contained area of working rural landscape. As the Site is progressively returned to farmland with native planting reintegrating this proposed change in landform within its working rural context, longer-term adverse landscape effects are anticipated to be **low**.

Visual effects

The Site has limited public and private viewpoints due to the flat and gently sloping topography of the wider Canterbury Plains and established framework of shelterbelts. In this context, views are localised to roads and properties near the Site, primarily along Aylesbury and Grange Roads. From these areas, glimpsed views are predominantly limited to the proposed entrance to the Site along Aylesbury Road and into the existing entrance on Grange Road as well as smaller gaps and filtered views through existing

shelterbelts. Adverse visual effects from public viewpoints will be no greater than **low** and will remain limited as shelterbelts are maintained and proposed native vegetation implemented along the intervening perimeter of the quarry becomes established.

Private viewpoints are also limited by the nature of existing intervening shelterbelt vegetation and predominantly localised to transient views from properties in proximity of the Site. Prior to operation, glimpsed and transient views of onsite activity will be limited to glimpses through permeable sections of the pine shelter belt on the boundary of the Site for some properties. Such views will be reduced by the establishment of a permanent bund part way along Aylesbury Road and temporary stockpiles and planting which will reinforce existing screening as quarrying activity continues across the remainder of the Site boundary. As a consequence, visual effects from surrounding dwellings will be **very low**.

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1.0 Introduction

1.1 Scope of the report

Boffa Miskell Limited (BML) has been engaged by Winstone Aggregates (the applicant), a division of Fletcher Concrete and Infrastructure Ltd to undertake a Landscape Effects Assessment (LEA) for a proposed aggregate quarry near Burnham (otherwise referred to as The Site in this report). The Site is zoned Rural within the Outer Plains in the Operative Selwyn District Plan and General Rural in the Proposed Selwyn District Plan.

The following Landscape Effects Assessment assesses the landscape and visual effects of the proposed aggregate extraction activity on the immediate and surrounding environment including its rural character.

1.2 Assessment Process

This assessment has been undertaken with reference to Te Tangi a Te Manu, Aotearoa New Zealand Landscape Assessment Guidelines¹ and a corresponding method statement as set out in **Appendix 1**. In summary, the effects ratings are based upon a seven-point scale which ranges from very low to very high.



Figure 1: Seven-point scale from Te Tangi a Te Manu: Aotearoa Landscape Assessment Guidelines.

This assessment entailed two Site visits. The first was undertaken on Wednesday 23rd March 2022 and focussed on understanding the Site context and establishing the views of the Site from public viewpoints. The second was undertaken on Thursday 19th May 2022 to appraise the Site, including understanding existing land use, and infrastructure.

The methodology used for the assessment involved a combination of fieldwork and visibility analysis including taking photographs from various publicly accessible viewpoints surrounding the Site.

In summary, the assessment process has comprised the following tasks:

- Site visit and familiarisation;

¹ Te Tangi a Te Manu, Aotearoa New Zealand Landscape Assessment Guidelines, New Zealand Institute of Landscape Architects (NZILA), 2022

- Analysis and appraisal of existing landscape and viewing audience, including fieldwork, reconnaissance and GIS data analysis including obtaining and analysis of UAV aerial photography;
- Review of planning documents, and other relevant material;
- Assessment of landscape, visual, and rural character effects;
- Recommendation of mitigation measures during operation and rehabilitation following completion of quarry operations;
- Consideration of development against relevant statutory considerations; and
- Peer Review.

2.0 Existing Environment

The Site forms a triangular wedge of land which adjoins Grange Road and Aylesbury Road to the north of Burnham military camp and approximately 4 kilometres west of Rolleston on the northern side of State Highway 1 (**Figure 1**). This area is characterised by rural and rural lifestyle properties encompassing grazing, dairy farms, and cropping within an established framework of shelter belts along field boundaries. Pivot irrigators and several horse stables and training facilities are also established in this rural area. Burnham Military Base, which includes army barracks, civilian housing, several small local shops, and extensive training grounds is located immediately south of the Site. Road Metals Quarry, an existing aggregate extraction activity is located approximately 3km from the Site boundary to the northeast. Rural dwellings nearby are typically enclosed by shelter and amenity planting located within their own property boundaries.

2.1 Landscape Context

2.1.1 Physical

The Site forms part of the lower eastern area of the Canterbury Plains which extends between the foothills of the Southern Alps and Banks Peninsula and between the Waimakariri River to the north and the Waikirikiri / Selwyn River to the south. The plains are made up of a series of gently sloping fans that contain greywacke gravels produced during successive glaciations of the mountainous regions to the west. These gravels are up to 500 metres deep in some places.

The Selwyn District's low altitude plains include several braided rivers, such as the Waimakariri, Waikirikiri / Selwyn, and Rakaia rivers. The larger rivers, Waimakariri and Rakaia have formed the outwash plains that characterise much of the Canterbury Plains.

Historically, vegetation within the low altitude plains included extensive podocarp forests, including species such as kahikatea, mataī, and tōtara. After the arrival of tangata whenua, fires cleared these forests and were replaced by tussock grassland, and species such as matagouri, kānuka, mānuka, kōwhai and taramea. After the arrival of Europeans, native vegetation was cleared further to accommodate pasture and cropping for farming. Today indigenous vegetation present on the plains is less than 0.5% of the total landcover, and has been reduced to small, isolated and scattered remnants as a result of large-scale land use changes.

Within this rural landscape, modern farming activity also supports large scale pivot irrigators which span across open paddocks, most typically associated with dairy farming. Linear roads and fencing with dispersed agricultural sheds and dwellings are also common physical influences encountered throughout this working rural landscape context.

The Site is classified as Land Use Classification 4s7 (NZLRI Land Use Capability 2021) reflecting shallow topsoil over gravels and is not recognised as highly productive land.

2.1.2 Perceptual

The Canterbury Plains remain expressive of their formative processes, containing ancient, braided river channels which form a broad sequence of outwash fans connecting the Southern Alps with Banks Peninsula. Overlaying this, the Canterbury Plains support a strong linear patchwork of rural land use with circular irrigation more frequent in some areas. Roadside shelter belts are common and often enclose and filter transient views. This working, productive rural landscape contrasts with the undeveloped backdrop of the Southern Alps. The vastness and openness of this landscape frequently allows for long distance views of the Southern Alps to the west, and Banks Peninsula to the east. A distinctive feature above the Canterbury Plains is the 'Nor-west arch' which is a distinctive cloud pattern common during the summer months and caused by hot dry winds.

2.1.3 Associative

The Canterbury Plains has a long history of human occupation and settlement.

Kā Pākihi-whakatekateka-a-Waitaha is the name given to reflect the adventures of Waitaha explorer Rākaihautū and his travelling party. The name translates to “the open plains where Waitaha walked proudly”, after the travelling party were relieved that their travels north were not as difficult as those when traversing the Southern Alps. The rivers within the Canterbury Plains are of immense significance to mana whenua, with many being recorded as a kāinga mahinga kai. The Rakaia and Waimakariri Rivers were also a key travel route between the Canterbury Plains and West Coast. No recorded Māori cultural sites which are publicly available have been identified within the Site. Ngāi Tahu are the iwi and Ngai Tūāhuriri and Tauamutu are the rūnanga who have territorial rights over this area for which ongoing engagement is anticipated by the Project Team following lodging of this resource consent.

Since European settlement, the Canterbury Plains have become a prosperous agricultural landscape, particularly in the low altitude plains. The manicured patchwork of the plains spread beneath its vast open skies are distinctive characteristics of this landscape and has inspired both literature and paintings.

2.2 Canterbury Landscape Review

At the regional scale, the landscapes which include the Canterbury Plains were previously considered within the Canterbury Regional Landscape Review (2010)². Within this study, the landscapes encompassing the Site were identified as part of the Lower Plains Landscape Type. This is characterised by a broad very low angle coalescing outwash fan and associated low terraces of the major rivers (Waimakariri, Rakaia, Rangitata, and the Waitaki Rivers),

² Canterbury Regional Landscape Study, 2010. Boffa Miskell Limited.

comprising Pleistocene glacial outwash gravels with variable loess cover, and extensive Holocene alluvium, coastal swamp deposits and minor inland dune belts.

Consistent with much of the Canterbury Plains, this area of landscape has been highly modified by a diverse array of land uses. Almost all of the indigenous vegetation has been replaced with farmland and productive land use. Dryland sheep farming is found on the stony shallow soils and cropping is mainly confined to the free draining deeper soils and along the riverbanks. On the lower plains, intensive dairy farm operations are becoming increasingly prevalent. On the outskirts of the major settlements such as Rolleston and Christchurch, numerous lifestyle farm properties have developed over the last 20 years.

The Site and its surrounding are not identified as part of any outstanding natural landscape or significant amenity landscape at the regional scale.

2.3 Selwyn District Landscape Study

The landscapes within Selwyn District were recently characterised as part of the Selwyn District Landscape Study (2017)³. Within this study, the Site was identified as part of the Low Altitude Plains Character Area (**Figure 2**), part of the central portion of Kā Pākihi Whakatekateka o Waitaha / the wider Canterbury Plains. This character area is defined by the foothills of the Malvern Hills in the north-west, by the Waimakariri River to the north-east, Te Waihora / Lake Ellesmere to the south-east and the Rakaia River to the south-west. This character area is defined by the flat, open and expansive plains which have little topographical relief. Elevation ranges from 0 to 150 metres above sea level.

This highly modified landscape is described as possessing a linearity, emphasised by shelterbelts, dissecting roads and broad scale agricultural land use. The central natural landscape feature of the area is the Waikirikiri / Selwyn River and its tributaries which flow from the Malvern Hills to Te Waihora / Lake Ellesmere. The Low Altitude Plains are dotted with a number of townships of varying scale which service the rural community. The number and size of these townships typically decrease with distance from Christchurch City.

The Selwyn District Landscape Study includes the following key landscape characteristics with relevance to the Site:

- *Flat, open and expansive plains which have little topographical relief.*
- *A largely linear landscape which is emphasised by the characteristic shelterbelts and dissecting roads, as well as the central spine of the Waikirikiri / Selwyn River.*
- *Broad scale, highly modified agricultural land use.*
- *Very little native vegetation.*
- *Distant backdrops of the Te Whata a Rama / Torlesse, Benmore and inland Craigieburn Ranges.*

The Site and its surrounding are not identified as part of any outstanding natural landscape or significant amenity landscape at the district scale.

2.4 Site Description

The character of the Site is typical of much of the surrounding rural landscape which represents a broad patchwork of intensive rural land use, typically enclosed by linear exotic shelterbelts along paddock and roadside boundaries. Natural systems operate; however rural activities, such as pastoral farming and cropping, typically prevail. The presence of built form including

³ Selwyn District Landscape Study, 2018. Boffa Miskell Limited.

dispersed rural dwellings and farm buildings and the straight radial configuration of shelterbelts, roads and powerlines also influence the character of this local area of landscape.

The topography of the Site is generally flat with a gentle slope to the south-east (**Figure 3**) and reflective of ancient, braided river channels which created the broader Canterbury Plains. The Site is approximately 362 hectares in area and is currently managed as an operational dairy finishing farm with some cropping, irrigated via three large centre pivot irrigators, which distribute water supplied by the Central Plains Water (CPW) scheme. The Site is currently accessed from the south on Grange Road. At the centre of the Site is the farm base including a portacom office, large storage shed, shipping containers, and silos. The perimeter of the Site has been almost entirely planted in pine shelter belts, with interior shelter planting following the circumference of the centre pivots. Prior to being established as a dairy farm, the Site was established in plantation pine.

As part of this assessment, an aerial view of the Site was undertaken using UAV (unmanned aerial vehicle) (**Figure 4**), alongside several Site Appraisal Photographs which were taken within the Site boundary. These Site and aerial photographs were taken to understand the existing character of the Site, where existing infrastructure and vegetation is located, and the topography. The locations of **Site Appraisal Photographs A-F** have been labelled on **Figure 4**, in conjunction with the existing shelter belts (SBs) and tree groups (TGs) on the Site. Pine shelter belts (SB1 - SB28) have been trimmed to approximately 4 metres in height on Aylesbury Road and Grange Road, and between 4 and 8 metres on the western boundary of the Site.

At the centre of the Site is the existing farm base, as described above and demonstrated in **Site Appraisal Photograph A**. This area is located between the three large centre pivot irrigators which operate within the Site and has a pine shelter belt to the west to protect the farm base from nor-west winds. From this viewpoint there are open views towards the Southern Alps.

The existing main accessway to the Site is from Grange Road and consists of a wide gravel access track which extends to the centre of the northern centre pivot. As shown in **Site Appraisal Photograph B**, the track approaches the farm base from the south, and severs the two lower paddocks containing centre pivot irrigators, each having a radius of approximately 539 metres. From this viewpoint, the shelter planting surrounding the south-eastern pivot is visible and the storage sheds associated with the farm base.

Due to the flat underlying topography of the Canterbury Plains, there are open views from the Site to both Banks Peninsula and the Southern Alps. The view towards Banks Peninsula is demonstrated in **Site Appraisal Photograph C**, looking in a south-easterly direction. From this viewpoint the open rural landscape character of the Site is demonstrated. The area irrigated by each pivot is divided into several paddocks which contain a mixture of kale, stock, and improved pasture. Beyond this, pine shelter belts are maintained along Site boundaries and on the edges of the pivot circles.

From the northern corner of the Site, the Site's open character within the dense shelter planting on the eastern and western boundaries is evident as illustrated in **Site Appraisal Photograph D**. This viewpoint also illustrates the Site's connection to the wider Central Plains Water (CPW) scheme. The scheme's mainline extends from the northern corner of the Site to the south of the Site and supplies the three large pivot irrigators which operate throughout the Site.

Further south looking towards the eastern boundary of the Site, **Site Appraisal Photograph E** demonstrates an example of smaller irrigation schemes found throughout the Site. These areas are situated between each of the larger centre pivot irrigators and provide smaller scale irrigation to areas of pasture. In the distance, shelter planting on the eastern boundary of the Site is evident, and on the perimeter of the pivot irrigator circle.

The south-eastern corner of the Site adjoins the intersection of Grange Road, Aylesbury Road, Sandy Knolls Road and Two Chain Road. As shown in **Site Appraisal Photograph F**, the south-eastern corner of the Site is framed by pine shelter planting and is bounded by an area of exotic forestry associated with the Burnham Military Camp. This corner of the Site is also located near several rural lifestyle properties accessed from Aylesbury Road, Sandy Knolls Road, Kerrs Road, and Two Chain Road.

2.5 Visual Catchment

The underlying topography of the Site and broader context coupled with the existing shelter planting around the perimeter of the Site restricts views from both public and private viewpoints, creating a relatively contained viewing catchment. Public views of the Site are available intermittently between gaps in the existing shelter planting from Aylesbury Road (a primary collector road), and Grange Road, with long distance views of the western boundary of the Site available from Kivers Road. Views of the Site from neighbouring dwellings are typically restricted due to intervening shelter planting within the Site and reinforced with planting introduced along neighbouring property boundaries. Many of these neighbouring dwellings are clustered towards the intersection of Grange Road, Aylesbury Road, and Two Chain Road at the south-eastern corner of the Site.

The extent and degree to which the Site is visible from within the surrounding landscape was considered as part of the site visit. Under the methodology, a continuum of visibility has been considered, ranging from no view of the Site to full, open views. In this instance, the nature of available views is almost entirely truncated by intervening vegetation. For completeness, the potential public and private viewing audience surrounding the Site which has been identified is illustrated on **Figure 5**, adopting the following three categories:

- Truncated/Glimpsed views: a view towards the Site that is curtailed by a visual barrier;
- Partial View: a view of part of the Site between trees or structures, or a filtered view of the Site, or a distant view where the Site is perceived as a small part of the view; and
- Open view: a clear view of a significant proportion of the Site within the wider landscape.

To support the above assessment, a series of Site Context Photographs have been taken to illustrate the representative views from publicly accessible viewpoints. These photographs are found within the accompanying Graphic Supplement with their locations outlined on **Figure 5** and briefly described below.

Site Context Photograph 1 is taken near the intersection of Aylesbury Road, Two Chain Road, Sandy Knolls Road and Grange Road, and is orientated to the north-west towards the Site. From this viewpoint the existing planting on the boundary is visible, curtailing views into the Site. This viewpoint also shows some of the neighbouring dwellings clustered near the south-eastern corner of the Site. Most of these dwellings which neighbour the Site are accessed from Two Chain Road, Kerrs Road and Sandy Knolls Road.

Site Context Photograph 2 is taken to the south of the Site near 159 and 139 Grange Road and illustrates the existing site access from Grange Road. This viewpoint offers views of the existing pivot irrigators, stock, and farming activity within the Site. From this viewpoint, there are no restrictions on views into the Site. It would generally be experienced only obliquely and for a transient moment as drivers and passengers pass the Site on the open road.

Site Context Photograph 3 demonstrates the view from the south-western corner of the Site on Grange Road and is taken near 273 and 259 Grange Road. The existing shelter vegetation on the boundary of the Site truncates views from public viewpoints with the planting reaching approximately 4 metres in height. In the centre of the photograph, there is a small gap in existing shelter vegetation to allow for access into the Site from the road. There are other similar small gaps along the southern and eastern site boundary equivalent to that demonstrated in this photograph. This allows for transient and partial views into the Site when passing adjacent to the Site along Grange and Aylesbury Roads.

Site Context Photograph 4 demonstrates views from Kivers Road and is representative of long-distance views of the Site which are available from the west. From this viewpoint the western boundary of the Site is visible however due to existing shelter planting, views into the Site remain concealed.

Site Context Photograph 5 illustrates the view of the northern corner of the Site from Aylesbury Road, which connects between Burnham and State Highway 73 to the north-west. From this viewpoint, the Site remains enclosed by boundary vegetation along the western and eastern boundaries with the exception of glimpsed views associated with access to the Site. Any such views are limited to transient views when travelling along Aylesbury Road. The western boundary of the Site has a taller hedge which is evident when approaching the Site from the north.

Site Context Photograph 6 demonstrates the view near the proposed entry to the Site from Aylesbury Road. From this viewpoint views into the Site are currently glimpsed and transient views through gaps in boundary vegetation. This view also encompasses a small area of planting associated with a tank and pump shed seen in the centre of the photograph. Beyond such gaps, the internal shelter planting which surrounds the pivot irrigators in the Site are visible alongside smaller irrigation schemes which are found throughout the Site

3.0 Relevant Statutory Provisions

As part of this assessment, there are a number of planning provisions that are relevant to this project. Specifically, they include:

- *The Resource Management Act, 1991*
- *The Canterbury Regional Policy Statement*
- *The Operative Selwyn District Plan*
- *The Partially Operative Selwyn District Plan*

3.1 Resource Management Act, 1991

The Site is not located within the coastal environment, nor does it contain any waterbodies. As identified above, it has not been identified within any outstanding natural feature or landscape overlays or visual amenity landscape overlays at either the regional or district scales. Therefore Section 6(a), and Section 6(b) of the Resource Management Act do not apply.

Sections of the Resource Management Act which are relevant and apply to this landscape and visual assessment include:

- Section 7(c) the maintenance and enhancement of amenity values.
- Section 7(f) maintenance and enhancement of the quality of the environment.

3.2 Canterbury Regional Policy Statement

Within the Canterbury Regional Policy Statement landscape matters are addressed within Chapter 12, with the purpose being to support the management and identification of other landscapes that may warrant protection or management for other reasons such as maintaining natural character, historic and cultural heritage or amenity, as well as outstanding natural features and landscape, none of which apply to the Site.

3.3 Operative Selwyn District Plan

Within the Operative Selwyn District Plan the Site is zoned Outer Plains (**Figure 6**). Objectives and policies of relevance to this assessment include the following:

Quality of the Environment — Objectives

Objective B3.4.1

The District's rural area is a pleasant place to live and work in.

Objective B3.4.2

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

Quality of the Environment — Policies

Rural Character

Policy B3.4.1

Recognise the Rural zone as an area where a variety of activities occur and maintain environmental standards that allows for primary production and other business activities to operate.

Policy B3.4.3

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

3.4 Partially Operative Selwyn District Plan (Decisions Version)

Within the Partially Operative Selwyn District Plan (Decisions Version) the Site is zoned General Rural (**Figure 7**), with the primary purpose of the zone being “...to provide for primary production activities and other compatible activities.”

The objectives and policies within the Partially Operative Selwyn District Plan include the following.

GRUZ-O1

Subdivision, use, and development in rural areas that:

1. supports, maintains, or enhances the function and form, character, and amenity value of rural areas;
2. prioritises primary production, over other activities to recognise its importance to the economy and wellbeing of the district;
3. allows primary production, those activities that directly support primary production and have a functional or operational need to locate with the General Rural Zone and important infrastructure, to operate without being compromised by incompatible sensitive activities and reverse sensitivity effects;
4. retains a contrast in character to urban areas; and
5. protects highly productive land.

GRUZ-P1

Maintain or enhance rural character and amenity values of rural areas by:

1. retaining a low overall building density, and predominance of vegetation cover;
2. enabling primary production while managing adverse effects of intensive primary production, and mineral extractive industries;
3. managing the density and location of residential development; and
4. retaining a clear delineation and contrast between the district's rural areas and urban areas; and
5. recognising that primary production activities can produce noise, dust, odour and traffic that may be noticeable to residents and visitors to the General Rural Zone.

GRUZ-P7

Avoid reverse sensitivity effects on lawfully established primary production activities.

GRUZ-P8

Enable mineral extraction in the General Rural Zone to meet the District's and region's supply needs, including by recognising the need for mineral extraction to locate where the mineral resource exists, while:

1. managing the spatial extent and effects of mineral extraction activities in order to maintain the amenity values of sensitive activities and residential activities; and
2. internalising adverse environmental effects as far as practicable, including by using industry best practice and management plans; and
3. avoiding mineral extraction on highly productive land unless there is a functional or operational need to locate it on that land and the mineral extraction provides either:
 - a. a significant national public benefit; or
 - b. in the case of aggregate extraction, a significant national or regional public benefit.

GRUZ-P9

Ensure that mineral extraction sites are progressively rehabilitated to:

1. mitigate erosion and subsidence risks; and
2. reinstate the land so that it is suitable for an alternative permitted or consented activity.

3.4.1 Quarry Rehabilitation Plan Guidance, Christchurch City Council

The Quarry Rehabilitation Plan Guidance (2018) prepared by Christchurch City Council provides relevant guidance for the design and rehabilitation of quarries within the local context of the Canterbury Plains and sets out recommendations to ensure effective long-term rehabilitation and mitigation.

4.0 Proposal Description

The proposal is to establish and operate an aggregate quarry over a 60-year period near Burnham, Canterbury. The proposal facilitates a gradual process of extraction which will occur progressively across the 362 ha. Site. Throughout the life of the quarry this encompasses several phases of excavation and rehabilitation of approximately 23 - 30 hectares with a maximum area of 40-hectares being operational at any one time. Each phase will be undertaken over approximately five-years moving clockwise around the Site (**Figure 8**). Consequently, the existing landform will become substantially modified forming a localised depression or pit within the broad flat character of the Canterbury Plains.

The proposed quarry will require initial construction (Phase 1) and extraction (Phase 2) to enable the setup of the site access, offices, amenities, stockyard ramp, and processing area (**Figure 9**). Access to the quarry will be located from Aylesbury Road near the mid-point of the eastern boundary and will introduce a cluster of utilitarian buildings which are proposed to remain embedded within reinforced amenity planting along this edge of the Site. Signage displaying the name of the quarry (each approximately 2m²) will be located either side of the entrance and may be lit as the Site will be accessed at night. As extraction activity continues during Phase 2, the processing areas, stockyards and silt ponds, will be relocated below existing ground level and nearer the centre of the Site where they will remain for the life of the quarry.

After Phase 1 and 2 are completed (1 - 6 years), the remaining 12 phases will be carried out in approximately 5-year increments depending on demand. Each phase will occur gradually and progressively, commencing with extraction of aggregate followed by rehabilitation as proposed extraction moves onto the next phase. The depth of the resultant pit will vary depending on depth above the water table, with an approximate depth of up to 10 metres below the existing ground level. During extraction, the existing farming operation will continue to be accessed from Grange Road. Prior to Stage 6, the existing farm access from Grange Road will be reconfigured through the modified landform to allow continued access to ongoing farming activity in response to the proposed changes in levels (see **Figure 11**).

During the initial stages of work, a long-term bund will be constructed from the proposed Aylesbury Site access to a point approximately 1km to the south along the boundary (**Figure 10, Section A-A**). This will be planted in native vegetation and remain present throughout the life of the quarry, encompassed within a 24.5m setback from the road boundary. For the remainder of the Site (southern, western, and north-eastern boundary), a 3m high temporary topsoil stockpile will be constructed within a 17.5m setback along each new area of extraction as it progresses around the Site (**Figure 10, Section B-B**). These stockpile areas will be formed when works within each respective phase commences within 250 metres of the Site boundary. This topsoil material will be reused as part of rehabilitation upon the completion of each extraction phase. In addition to existing planting retained along the boundary of the Site, a setback of 100 metres from neighbouring dwellings in the south and south-east are also proposed. These areas will be retired from farming and planted with native vegetation similar to vegetation to be established in larger trees and shrubs (**Figure 11**).

During the rehabilitation of each phase, the base of the pit will be resurfaced with at least 400 mm of material, comprised of a minimum of 200mm of subsoil material topped with at least 200mm of topsoil and sown with grass seed. The slopes of the pit edge will be regraded and combined with additional onsite material to achieve batters with an average gradient of 1(v):2(h) (**Figure 10, Section B-B: Grange Road rehabilitation**) and allowing for local variation between 1:1 and 1(v):3(h) within which areas of planting established along the boundaries of the Site boundary will increase. This represents average planted buffers of 39.5 metres after rehabilitation adjoining the long-term bund along Aylesbury Road (**Section A-A**), and 32.5 metres after rehabilitation for the remainder of the Site (**Section B-B**).

To support integration of the proposed permanent change in landform within the broader flat to gently undulating Canterbury Plains, planted patches and corridors of approximately 30 hectares of native planting will also be established in association with extraction activity. Such planting includes 8 hectares of representative native planting forming patches within setbacks at the south-eastern corner of the Site and the central southern boundary of the Site. Batter slopes which enclose the perimeter of the quarry will also be planted with native vegetation alongside rehabilitation of the base of the pit to allow for grass or crops to re-establish as part of supporting ongoing rural land use.

5.0 Assessment of Effects

Landscape and visual impacts result from natural or induced change in the components, character or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. All these impacts are assessed to determine their effects on character and quality, amenity as well as on public and private views.

In this study, the assessment of potential effects is based on a combination of the landscape's sensitivity and visibility together with the nature and scale of the development proposal.

Particular effects considered relate to the following:

- *Landscape / rural character effects;*
- *Visual amenity effects from public and private locations;*
- *Potential cumulative effects; and*
- *Effects in relation to statutory provisions.*

5.1 Landscape Effects

5.1.1 Landscape Character Effects

Landscape character is derived from the distinct and recognisable pattern of elements that occur consistently in a particular landscape. It reflects particular combinations of geology, landform, soils, vegetation, land use and features of human settlement. It creates the unique sense of place defining different areas of the landscape.

During operation, the character of the Site will gradually change as existing areas of pastoral activity are progressively excavated then rehabilitated at a lower ground level within this broader established working rural context. Earthworks activity and the ongoing operation of large machinery will permanently modify the existing landform and expose areas of bare ground and aggregate within the Site to an extent which is atypical of the scale of normal day to day farming activity that currently prevails. As activity continues, this will create a locally defined depression excavated within the existing broader flat rural context which remains characteristic of the Canterbury Plains. The proposed development will also support ongoing agricultural activity both prior to extraction and following rehabilitation, albeit the latter occurring approximately 10 metres below existing ground level.

Physical landscape effects of the proposal on the Site will occur gradually over the life of the quarry rather than everywhere all at once. As aggregate is gradually excavated over the life of the quarry, earthworks will subsequently be required near the perimeter of the Site following each defined phase to form and rehabilitate permanent batter slopes which work to integrate the perimeter of the quarry within its wider setting. These batters will be formed at an average gradient of 1(v):2(h) allowing for some local variation between 1:1 to 1(v):3(h) and to facilitate revegetation. The resultant batters will be revegetated with native plants representative of the Canterbury Plains ecological district and appropriate for the conditions within the Site, including the addition of fire-resistant species along edges.

After Phase 1, processing areas, such as stockyards and silt ponds will be relocated below the existing ground level (Phase 2) where they will remain throughout the life of the quarry. Locating such activity centrally within the Site will ensure this remains set back from the road and surrounding properties and therefore minimises the potential for more intensive industrial influences within the surrounding rural landscape. At the end of the Project, extracted areas including the processing areas will be rehabilitated back to a pastoral landscape, albeit at a lower elevation and surrounded by more extensive corridors of representative native vegetation.

Prior to and during operation, a permanent bund and temporary topsoil stockpiles of up to 3m in height will be constructed along the boundary of future extraction areas. These areas will be located within the Site beyond existing boundary vegetation which limits the extent to which these remain visible from beyond the Site. Whilst such elements are uncharacteristic of the inherent flat overall character of the surrounding plains, any potential longer-term effects of such elements will remain limited as stockpiled material is progressively used to support subsequent rehabilitation.

During the life of the Project, a mosaic of patches and corridors of native planting equating to approximately 30 hectares will also be established. Such planting includes a combined 8 hectares of native planting introduced at the south-eastern corner and central southern boundary of the Site forming local buffers introduced between the nearest adjoining dwellings. This will connect with additional native planting reintroduced along rehabilitated batter slopes which enclose the perimeter of the quarry and adjoins grass or crops as part of supporting ongoing rural land use at the base of the pit. As proposed planting becomes established and

farmland is rehabilitated, this will further soften and contain the raw worked appearance of operational areas within the Site and assist with assimilating the proposed changes in landform within the broader Canterbury Plains landscape. The extent of such planting also provides a relatively unique opportunity to restore indigenous habitat opportunities within this heavily modified aspect of the Canterbury Plains.

Based on the locally contained and progressive nature of the Project combined with proposed mitigation, effects on landscape character will initially be **moderate adverse** during Phases 1 to 3 and will gradually reduce as the project shifts across the Site and increasing areas of rehabilitation following extraction become established. During all phases of the operation, the proposed activity within the Site will remain relatively well enclosed within existing boundary vegetation. This high level of containment will be progressively reinforced with native vegetation introduced along rehabilitated batters which will gradually increase throughout the life of the quarry.

The proposed change in landform will be gradual over the life of the quarry rather than simultaneous and all at once. While the form of Site will gradually change, the landscape character and prevailing land use will be similar to the existing environment, with the Site predominantly remaining in productive rural land use prior to and following each phase of extraction. Once established, the Site will remain rural in character albeit in the context of a modified landform rehabilitated with substantial planting. This will enhance opportunities for biodiversity and ensure that any apparent change in character will remain well integrated into the broader landscape, resulting in no more than **low adverse** effects at completion.

5.2 Visual Effects

Visual amenity effects are influenced by a number of factors including the nature of the proposal, the landscape absorption capability and the character of the Site and the surrounding area. Visual amenity effects are also dependent on distance between the viewer and the proposal, the complexity of the intervening landscape and the nature of the view.

5.2.1 Effects from public vantage points

Views from public viewpoints are effectively contained to the immediate context surrounding the Site. This is largely due to the flat topography of the wider Canterbury Plains landscape combined with established shelterbelt planting enclosing the immediate boundaries. Given this context, public vantage points are limited to transient views along parts of Aylesbury Road and Grange Road where these adjoin the Site as well as longer distance partial views of shelterbelts established along the western boundary from Kivers Road.

During operation, views into the Site from Aylesbury Road to the east will be limited to filtered views through established shelter belts along the boundary of the Site. Prior to extraction, such screening will be reinforced by a long-term bund with additional native planting maintaining a longer-term screen, including a 100-metre width of planting in the south-eastern corner. During the initial phases of the project, transient glimpsed views of the Site entrance and temporary stockyard area will be available. As the project continues, such views will gradually reduce as stockyards are located below existing ground level and planting at the site entrance becomes established. Views of access and associated signage at the Aylesbury Road Site entrance will include bunding and native vegetation which reinforces biodiversity opportunities in the context of the Canterbury Plains and remains compatible with surrounding rural based activity. Adverse visual effects from public viewpoints on Aylesbury Road are therefore considered **low adverse**.

Views from Grange Road to the south of the Site will remain curtailed due to existing pine shelter belts which extend along the majority of the Site boundary and are retained throughout the life of the quarry. Beyond this, some more transient, long-distance views of above ground activity during Phases 1-3 may occur but will remain largely curtailed by internal shelter belt (SB26) when viewed through a gap in roadside planting. Such views will remain curtailed as temporary stockpiling and planting is introduced within this gap during Phase 5 and prior to beginning excavation in adjoining areas (**Figure 8**). On completion of Phases 5 and 6, these views will remain restricted as the proposed farm access is realigned and intervening planting becomes established (**Figure 11**). Adverse visual effects from public viewpoints on Grange Road are therefore considered **very low** until the implementation of the planting near the existing farm entry. On establishment of this planting, visual effects will become **neutral**.

Long-distance, glimpsed views of the Site are also available from Kivers Road to the west of the Site, through gaps in the existing shelter belt to be retained. Beyond this, any views into the Site will remain curtailed by the intervening shelter belt on the western boundary of the Site combined with planting on intervening private properties. Accordingly, any visual effects from public viewpoints on Kivers Road are considered **neutral** during extraction and on completion.

5.2.2 Effects from private vantage points

While no access was obtained to assess the project from private properties, an assessment of visual effects on nearby dwellings was undertaken during the Site visit from the nearest public vantage points, principally the intervening road. A desktop analysis was also undertaken to understand the proximity to the Site; the apparent orientation of the house and the nature of the view, including any existing or proposed vegetation that might provide full or partial screening of views. The assessment is based on observations from public roads and use of aerial photos and is summarised in detail within **Appendix 2** of this report.

Private viewpoints from dwellings typically have a higher sensitivity due to the fixed nature of the view and the established association residents may have within their surrounding landscape context. The dwellings within the vicinity of the Site are largely orientated to the north or north-west with views towards the Southern Alps. The private viewing audience associated with this development includes 51 private properties, and additional dwellings within the Burnham Military Camp base (as shown in **Figure 5** of the Graphic Supplement).

Private viewing audiences to the east of the Site include Houses 1 – 25, with House 1 being the closest property to the Site. These properties are largely orientated to the north-west towards the Southern Alps and clustered near the intersection of Grange Road, Two Chain Road, Aylesbury Road, and Sandy Knolls Road. Houses 1-2 and 4-7 are orientated towards the Site and are accessed from Aylesbury and Sandy Knolls Road. During Phase 1, glimpsed and transitory views of the construction of the long-term bund and planting within the 100-metre buffer to the south-eastern corner of the Site will be available. These views will however be largely curtailed by the existing shelter belt which extends along the eastern boundary of the Site. Upon the extraction of Phase 4 (at approximately 10 years) planting introduced during Phase 3 will also begin to establish. Views of processing areas and ongoing extraction activity will therefore be concealed by an established pine shelter belt, the long-term bund to the north and a 100-metre planted setback from the Site boundary in the south-eastern corner of the Site. Visual effects from private properties to the east of the Site will therefore be no greater than **very low adverse**.

Houses 26-37 are located to the south of the Site and are predominantly accessed from Grange Road and Two Chain Road. These dwellings are located on larger lifestyle properties and are predominantly orientated to the north-west towards the Southern Alps. Houses 26-31 and 34

are orientated towards the Site, with the closest dwelling within this viewing catchment being House 27 which is located opposite the existing main entrance into the Site beyond intervening shelter planting established to the south of Grange Road. Views of the Project from dwellings in this area will remain truncated or completely curtailed by intervening vegetation. This includes the existing shelter belt along the southern boundary of the Site which will be retained and reinforced by internal planting surrounding the existing Site entrance and extended along the tops of rehabilitated batters. Once implemented, this planting will continue to establish throughout the life of the quarry to maintain an effective visual screen. Given this high level of visual containment, any adverse visual effects are considered no greater than **very low**.

Houses 38 to 46 are located to the west of the Site and are accessed from Kivers Road. These properties are also larger lifestyle properties and orientated to the north-west towards the Southern Alps and away from the Site. Visual effects of the proposal on properties to the west of the Site are no greater than **very low adverse** as activities will remain largely contained beyond the existing boundary vegetation. During the extraction of Phases 7 to 11 there will be glimpsed, transitory views through the existing shelter belt of machinery operating within the quarry. These will be curtailed by the construction of a temporary stockpiling and final rehabilitation of the battered slope with native vegetation following the extraction of these phases.

North of the Site are Houses 47-51. These properties are accessed from Wards Road and are closest to the final stages of extraction (Phases 11-14). These properties are also orientated to the north, away from the Site. Visual effects of the proposal on these dwellings are **neutral**. This is due to views from these properties being curtailed by the intervening shelter planting, orientation of the dwellings, and intervening vegetation within the wider landscape.

Burnham Military Camp to the south of the Site contains a mixture of civilian housing and army barracks. The camp is orientated to the north-west, parallel to State Highway 1, and towards the Southern Alps. Visual effects of the proposal on the Burnham Military Camp are considered **neutral**. Views towards the Site are already curtailed by intervening vegetation within the wider landscape and the exotic shelter belt on the Site boundary.

5.2.3 Summary of Visual Effects

Visual effects of the proposed quarry will be no greater than **low adverse** from public viewpoints, and **very low adverse** from private viewpoints. Views of the Site from public viewpoints will be largely curtailed by the existing pine shelter belt which extends along all boundaries of the Site and the existing and proposed entrances to the Site along Grange and Aylesbury Roads.

As the proposed long term bund, temporary stockpiles, and areas of planting are established prior to extraction and following rehabilitation of each phase, visual effects from public and private viewpoints will remain effectively mitigated. It is also recognised that as the extraction of each phase occurs the majority of activity will be occurring up to some 10 metres below the existing ground level in addition to the proposed reinforced planting along the Site boundary. The greatest visual effect will be from public viewpoints at the Site entrance along Aylesbury Road at the commencement of the project, albeit becoming increasingly screened by planting and the relocation of processing areas to the floor of the quarry as work continues.

Views from private viewpoints will largely remain unchanged and will be truncated or entirely curtailed by the existing shelter belt planting, the long-term bund and intervening areas of planting including additional native vegetation introduced along the tops of rehabilitated slopes of the quarry.

5.3 Effects in relation to Statutory Provisions

The Site is located within the Outer Plains Zone of the Operative Selwyn District Plan (**Figure 6**) and the General Rural Zone of the Partially Operative Selwyn District Plan (Decisions Version) (**Figure 7**). Both zones allow for rural activity while balancing the need for maintaining rural character. The Site is not classified as highly productive land.

The Site is not located within or near any Outstanding Natural Landscape, nor any other landscape overlays within the Operative or Partially Operative Selwyn District Plan. The Site is also not located within an identified Urban Growth Overlay associated with intensifying and developing new urban areas adjacent to existing townships (**Figure 7**). Therefore, any potential for reverse sensitivity effects on proposed urban development is very low.

As discussed in Section 5.1.1 above, the Site is characterised by an existing dairy farm and has a flat to gradually sloping topography towards the south-eastern corner of the Site.

Effects on rural character will continually change throughout the life of the quarry as each phase is excavated, exposing bare ground which is subsequently rehabilitated back to a rural land use at a lower elevation. While the existing rural character of the Site will be adversely affected by the proposal, the effects will be progressive and remain relatively well contained. Outside of areas undergoing quarrying activity, the Site will continue to operate as a dairy farm (or another rural farming use depending on future demand). Effects on rural character are also reduced by the rehabilitation of each previous phase during the extraction of the next phase, minimising potential for any longer-term or cumulative adverse effects on rural character.

On completion, the Site will remain part of a broader working rural landscape, with the key landscape changes being the planted batter slopes which follow the perimeter of the Site and ecological benefits of resultant native vegetation and associated enhanced opportunities for biodiversity.

6.0 Recommendations

In accordance with the landscape and visual assessment set out above, the following landscape mitigation measures are recommended to be included via consent conditions:

1. Prior to development commencing, prepare a landscape plan in accordance with the landscape strategy submitted with the application to identify the following:
 - a. Existing shelterbelts to be retained along site boundaries to ensure an effective long-term screen. This shall also identify any areas of infill planting where necessary and include measures to ensure its ongoing screening benefit is maximised;
 - b. Areas, species, and density of planting to establish the long-term bund, planting blocks in the south-east corner and southern boundary of the site, and rehabilitated batter slopes in accordance with the Low Plains Ecological District;
 - c. Measures to reduce the risk of fire, including through the use of low flammability species along the edge of the Site;

- d. Areas, species, and density of planting associated with the Aylesbury Road Site entrance to enhance the amenity values and soften and assimilate built form during Phase 1.

In addition to an overall landscape plan, to address rehabilitation areas and necessary screening from surrounding areas, staged rehabilitation plans should be prepared to provide certainty or rehabilitation implemented following extraction activity. These plans should provide sufficient flexibility to enable suitable future end uses, once known, whilst facilitating measures to ensure the health and longevity of proposed native vegetation incorporated within the Site. Plant trials and environmental monitoring including ecological input where necessary should also form an integral component of rehabilitation works so that planting and ongoing management is optimised throughout the lifetime of the operation. Landscape consent conditions should address the following:

2. A detailed landscape rehabilitation management plan should be prepared for each stage of extraction activity and prior to commencing each subsequent phase in accordance with the overall landscape strategy. Such plans shall ensure extraction facilitates a progressive staged rehabilitation process. Each plan shall identify the following:
 - a. The final form of batters proposed to accommodate revegetation (average 1:2 slope), to assimilate changes in level within the Site through revegetation and ensure proposed revegetation will thrive;
 - b. The final volumes of subsoil and topsoil required to rehabilitate batters and facilitate ongoing rural land use;
 - c. Plant establishment and maintenance, including the following specifications:
 - i. establish a minimum 200mm depth of topsoil supporting successful establishment of all planted areas;
 - ii. The specifications and schedules of planting;
 - iii. Means to ensure plants will be irrigated for at least two years after planting until established; and
 - iv. Pest protection to include the installation of combi-guards and/or predator proof fencing around areas of new planting for two years after establishment and ongoing means of monitoring plant success including pest eradication as necessary.

7.0 Conclusion

The proposed aggregate quarry near Burnham in Canterbury will have relatively internalised effects on landscape and visual amenity. The quarry design ensures the effects of the proposal will be gradual and adverse effects will be addressed progressively over the life of the quarry, including the sequential extraction and rehabilitation of each phase. Whilst the landscape associated with the Site will change, the Project will remain relatively well contained within both existing boundary vegetation and reinforced native planting which also works to integrate the resultant change in landform within the wider landscape during rehabilitation. This outcome

works to minimise landscape impacts during operation and contributes to maintaining and enhancing the character and quality of the surrounding landscape in the longer term.

The key landscape features which contribute to the character of the Site and wider landscape values include the gently sloping topography of the remnant braided riverbed, linear shelter planting, and expansive areas of pasture facilitating productive rural land use. In this context, landscape effects are considered **moderate adverse** during the initial phases of extraction and will reduce to **low adverse** as rehabilitation continues following each phase. The progressive staging of extraction and the contribution of more substantial areas of native planting will ensure the magnitude of such impacts will be effectively managed and gradually reduce. While the landform within the Site will permanently change, the landscape will largely retain a rural character during operation and remain well integrated into the surrounding landscape at completion.

Visual amenity effects of the proposal are limited to **low adverse** from public viewpoints and **very low adverse** from private viewpoints. While glimpsed views will be available from the existing main entrance, proposed entrance, and in glimpses through established shelter belt planting, these views will become increasingly curtailed by the combination of localised areas of bunding and more substantial intervening vegetation introduced within the Site boundary as part of the progressive and ongoing proposed rehabilitation. The majority of quarrying activity will continue up to approximately 10 metres below ground level, further limiting adverse effects on visual amenity within surrounding areas.

Overall, the Project will respond well to its enclosed working rural environment and remain well integrated within the Canterbury Plains landscape.

8.0 References

Boffa Miskell Ltd. (2010). *Canterbury regional landscape study review: Final report* (Report No. C08016). Prepared by Boffa Miskell Ltd for Environment Canterbury.

Boffa Miskell Ltd. (2018). *Selwyn District Landscape Study: Landscape Characterisation and Evaluation*. (Report No. C15143F) Prepared by Boffa Miskell Ltd for Environment Canterbury.

Christchurch City Council. (2018). *Quarry Rehabilitation Plan Guidance*. Prepared by Christchurch City Council.

Appendix 1: Method Statement

This assessment method statement is consistent with the methodology (high-level system of concepts, principles, and approaches) of 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022. The assessment provides separate chapters to discuss landscape, visual and natural character effects where relevant, but is referred to throughout as a Landscape Effects Assessment in accordance with these Guidelines. Specifically, the assessment of effects has examined the following:

- *The existing landscape;*
- *The nature of effect;*
- *The level of effect; and*
- *The significance of effect.*

The Existing Landscape

The first step of assessment entails examining the existing landscape in which potential effects may occur. This aspect of the assessment describes and interprets the specific landscape character and values which may be impacted by the proposal alongside its natural character where relevant as set out further below. The existing landscape is assessed at a scale(s) commensurate with the potential nature of effects. It includes an understanding of the visual catchment and viewing audience relating to the proposal including key representative public views. This aspect of the assessment entails both desk-top review (including drawing upon area-based landscape assessments where available) and field work/site surveys to examine and describe the specific factors and interplay of relevant attributes or dimensions, as follows:

Physical –relevant natural and human features and processes;

Perceptual –direct human sensory experience and its broader interpretation; and

Associative – intangible meanings and associations that influence how places are perceived.

Engagement with tāngata whenua

As part of the analysis of the existing landscape, the assessment should seek to identify relevant mana whenua values (where possible) and describe the nature and extent of any engagement, informing an understanding of the existing landscape from a Te Ao Māori perspective.

Statutory and Non-Statutory Provisions

The relevant provisions facilitating change also influence the consequent nature and level of effects. Relevant provisions encompass objectives and policies drawn from a broader analysis of the statutory context and which may anticipate change and certain outcomes for identified landscape values.

The Nature of Effect

The nature of effect assesses the outcome of the proposal within the landscape. The nature of effect is considered in terms of whether effects are positive (beneficial) or negative (adverse) in the context within which they occur. Neutral effects may also occur where landscape or visual change is benign.

It should be emphasised that a change in a landscape (or view of a landscape) does not, of itself, necessarily constitute an adverse landscape effect. Landscapes are dynamic and are constantly changing in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important when assessing and managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate adverse effects. The aim is to maintain or enhance the environment through appropriate design outcomes, recognising that both the nature and level of effects may change over time.

The Level of Effect

Where the nature of effect is assessed as ‘adverse’, the assessment quantifies the level (degree or magnitude) of adverse effect. Assessing the level of effect entails professional judgement based on expertise and experience provided with explanations and reasons. The identified level of adverse natural character, landscape and visual effects adopts a universal seven-point scale from **very low** to **very high** consistent with Te Tangi a te Manu Guidelines and reproduced below.



Landscape Effects

A landscape effect is an outcome for a landscape value. In essence, this takes account of the proposed change to a landscape’s character and values (as identified across relevant landscape dimensions) and in the context of what change can be anticipated in that landscape as a result of relevant zoning and policy. The level of effect can also be influenced by the size or spatial scale, geographical extent, duration and reversibility of landscape effects within the specific context in which they occur.

Visual Effects

Visual effects are a subset of landscape effects. They are consequence of changes to landscape values as experienced in views. To assess where visual effects of the proposal may occur requires an identification of the area where it may be visible and the specific viewing audience(s) affected. Visual effects are assessed with respect to landscape character and values. This can be influenced by several factors such as distance, orientation of the view, duration, extent of view occupied, screening, backdrop etc. as well as potential change that could be anticipated in the view as a result of zone / policy provisions of relevant plans.

Natural Character Effects

Natural Character, under the RMA, specifically concerns ‘*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*’. Therefore, the assessment of natural character effects involves examining the proposed changes to natural elements, patterns and process which may occur in relevant landscape / seascape contexts only.

As with assessing landscape effects, the first step when assessing natural character effects involves identifying the relevant physical and experiential characteristics and qualities which occur and may be affected by a proposal at a commensurate scale. This can be supported through the input of technical disciplines such as geomorphology and marine, aquatic, and terrestrial ecology as well as input from tāngata whenua. Through this assessment, natural character also considers the level of naturalness and essentially reflects the current condition of the environment assessed in relation to the universal seven-point scale. A higher level of naturalness means the waterbody and/or margin is less modified and vice versa.

A natural character effect can be conceived of as a change to the current condition of parts of the environment where natural character occurs. Change can be negative or positive. The resultant level of natural character effects is influenced by the existing level of naturalness within which change is proposed; a greater level of effect will generally occur when the proposal reduces the naturalness of a less modified environment. In short, the process of assessing natural character effects can be summarised as follows:

- Identify the characteristics and qualities which contribute to natural character within a relevant context and defined spatial scale(s), including the existing level of naturalness;
- Describe the changes to identified characteristics and qualities and the consequent level of natural character anticipated (post construction); and
- Determine the overall level of effect based on the consequence of change.



The Significance of Effects

Assessing the significance of effects may be required in certain RMA situations. To support transparency in such circumstances, the assessment may qualify where the level of effect falls in terms of being ‘minor’⁴ or ‘significant’⁵. This assessment has adopted the following scale applied to relevant RMA circumstances⁶, acknowledging low and very low adverse effects generally equate to ‘less than minor’.



⁴ Whether the adverse effect on a person is less than minor (RMA, 95E); whether the adverse effect on the environment is no more than minor (RMA, 95D); or when assessing a non-complying activity whether the adverse effects of the activity on the environment will be ‘minor’ (RMA, 104D).

⁵ Triggering requirement to consider: alternative sites, routes, and methods for Notices of Requirement (RMA s171(1)(b)), alternatives in AEEs (RMA s6(1)(a) of the 4th Schedule); or effects on natural features and landscapes within the coastal environment to be avoided (New Zealand Coastal Policy Statement (NZCPS) Policy 13 (1)(b) and 15(b)).

⁶ Seven-point level of effect scale. Source: Te tangi a te Manu, Pg. 151

Appendix 2: Summary Table of the Nature and Level of Visual Effects

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
1	168 Aylesbury Road, Burnham	33	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Adverse	Very Low	Neutral	Views of the Site will be glimpsed and transient through the existing exotic shelter belt during the construction of the long-term bund and planting of the south-eastern block during Phase 1. The long-term bund, and 120 metre setback of established planting will curtail any views of the Phase 3 extraction activity. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
2	61 Sandy Knolls Road, Burnham	305	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.

⁷ Locations where Proposed Development is Visible

⁸ Extent of visibility: Full, Partial, Small Amount, Negligible

⁹ Orientation of Views: Frontal, Oblique, Rear

¹⁰ Significance of Effects: Very Low, Low, Moderate-Low, Moderate, Moderate-High, High, Very High

¹¹ Nature of Effect: Adverse, Neutral, Beneficial

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
3	43 Sandy Knolls Road, Burnham	235	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
4	41 Sandy Knolls Road, Burnham	220	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
5	35 Sandy Knolls Road, Burnham	180	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
6	27 Sandy Knolls Road, Burnham	160	Proposed planting to the south of the Site.	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
											term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
7	146 Aylesbury Road, Burnham	65	Proposed planting to the south of the Site.	Negligible	Frontal / Oblique	Fixed	Very Low	Adverse	Very Low	Neutral	Views of the Site will be glimpsed and transient through the existing exotic shelter belt during the construction of the long-term bund and planting of the south-eastern block during Phase 1. The long-term bund, and 120 metre setback of established planting will curtail any views of the Phase 3 extraction activity. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
8	68 Sandy Knolls Road, Burnham	430	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
9	49 Kerrs Road, Burnham	560	Proposed planting to the south of the Site.	Negligible	Rear/ Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
10	47 Kerrs Road, Burnham	445	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
11	37 Kerrs Road, Burnham	370	Proposed planting to	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form,

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							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
			the south of the Site.								vegetation, and the shelter belt on the Site boundary.
12	25 Kerrs Road, Burnham	230	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
13	7 Kerrs Road, Burnham	165	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback.
14	104 Kerrs Road, Burnham	1000	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
15	82 Kerrs Road, Burnham	800	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
16	46 Kerrs Road, Burnham	475	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
17	40 Kerrs Road, Burnham	395	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
18	522 Two Chain Road, Burnham	285	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
19	534 Two Chain Road, Burnham	175	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be truncated by the existing exotic shelter belt and intervening vegetation within the wider context. Any glimpsed views into the Site will be mitigated during Phase 1 on establishment of the long-term bund and planted 120 metre setback. As proposed planting

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											becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
20	514 Two Chain Road, Burnham	410	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
21	500 Two Chain Road, Burnham	460	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
22	486 Two Chain Road, Burnham	675	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
23	478 Two Chain Road, Burnham	730	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
24	476 Two Chain Road, Burnham	790	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
25	462 Two Chain Road, Burnham	940	Proposed planting to the south of the Site.	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the Site boundary.
26	139 Grange Road, Burnham	215	Phase 4 -6	Small Amount	Frontal	Fixed	Very Low	Adverse	Very Low	Neutral	Views of the Site will be largely truncated by intervening vegetation within the wider landscape and the existing exotic shelter belt on the southern boundary of the Site. Any glimpsed views into the Site during Phases 1-3 will be further curtailed by intervening internal shelterbelts. As quarrying activity extends along the southern boundary of the Site during Phase 4-7 temporary stockpiles and southern block of planting (Grange Road Entrance) may be visible through gaps in intervening

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
											vegetation. Following rehabilitation and the introduction of further proposed planting along the tops of resultant batter slopes, glimpsed views of native vegetation may be visible above the intervening shelter belt from this property.
27	159 Grange Road, Burnham	85	Phase 4 -6	Small Amount	Frontal	Fixed	Very Low	Adverse	Very Low	Neutral	Views of the Site will be largely truncated by intervening vegetation within the wider landscape and the existing exotic shelter belt on the southern boundary of the Site. Any glimpsed views into the Site during Phases 1-3 will be further curtailed by intervening internal shelterbelts. As quarrying activity extends along the southern boundary of the Site during Phase 4-7 temporary stockpiles and southern block of planting (Grange Road Entrance) may be visible through gaps in intervening vegetation. As proposed planting becomes established, glimpsed views of native vegetation may be visible above the shelter belt from this property.
28	181 Grange Road, Burnham	150	Phase 5-7	Small Amount	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be largely truncated by intervening vegetation within the wider landscape and the existing exotic shelter belt on the southern boundary of the Site. Any glimpsed views into the Site during Phases 1-3 will be further curtailed by internal shelterbelts. As quarrying activity extends along the southern boundary of the Site during Phase 4-7 temporary stockpiles and southern block of planting (Grange Road Entrance) may be visible through gaps in intervening vegetation. As proposed planting becomes established, glimpsed views of native

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
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											vegetation may be visible above the shelter belt from this property.
29	179 Grange Road, Burnham	400	Phase 5-7	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
30	177 Grange Road, Burnham	505	Phase 5-7	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
31	162 Burdons Road, Burnham	1300	Phase 4 -6	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
32	808 Two Chain Road, Burnham	855	Phase 6 & 7	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
33	816 Two Chain Road, Burnham	940	Phase 6 & 7	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
34	259 Grange Road, Burnham	480	Phase 6 & 7	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the southern boundary of the Site.
35	273 Grange Road, Burnham	325	Phase 6 & 7	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the southern boundary of the Site.
36	860 Two Chain Road, Burnham	975	Phase 6 & 7	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
37	908 Two Chain Road, Burnham	1100	Phase 6 & 7	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.
38	42 Kivers Road, Burnham	1000	Phase 7 & 8	Negligible	Oblique	Fixed	Very Low	Adverse	Very Low	Neutral	Long distance, glimpsed views through the existing exotic shelter belt will be available into the Site prior to the extraction of Phase 7.

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
											These views will be curtailed by the proposed temporary stockpiles to be constructed prior to extraction of Phase 7, and long-term proposal to plant a native strip parallel to the Site boundary.
39	126 Kivers Road, Burnham	960	Phase 8	Negligible	Rear / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western of the Site.
40	121 Kivers Road, Burnham	1300	Phase 8	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the western boundary of the Site.
41	176 Kivers Road, Burnham	415	Phase 8	Negligible	Rear / Oblique	Fixed	Very Low	Adverse	Very Low	Neutral	Middle distance, glimpsed views will be available through the existing exotic shelter belt on the western boundary of the Site prior to the extraction of Phases 7 and 8. These views will become curtailed upon the establishment of the temporary stockpiles prior to the extraction of Phases 7 and 8, and long term proposal to plant a native strip parallel to the Site boundary.
42	164 Kivers Road, Burnham	1100	Phase 8	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the western boundary of the Site.
43	151 Kivers Road, Burnham	1300	Phase 8	Negligible	Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the western boundary of the Site.
44	171 Kivers Road, Burnham	1150	Phase 8	Negligible	Rear / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the western boundary of the Site.
45	216 Kivers Road, Burnham	470	Phases 8 - 10	Negligible	Frontal / Oblique	Fixed	Very Low	Adverse	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.

House Number	Viewing Audience	Minimum Distance to Views (approx. metres)	Area Proposed Development is Visible ⁷	Extent of visibility ⁸	Orientation of Views ⁹	Transient / Fixed	During Construction		Completion		Notes
							Level of Visual Effect ¹⁰	Nature of Effect ¹¹	Level of Visual Effect	Nature of Effect	
46	228 Kivers Road, Burnham	920	Phases 8 - 11	Negligible	Frontal / Oblique	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the western boundary of the Site.
47	718 Wards Road, Burnham	1345	Phases 11 & 12	Negligible	Rear	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.
48	716 Wards Road, Burnham	1100	Phases 11 & 12	Negligible	Rear	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.
49	578 Wards Road, Burnham	1150	Phases 11-14	Negligible	Rear	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.
50	536 Wards Road, Burnham	1450	Phases 11-14	Negligible	Rear	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.
51	515 Wards Road, Burnham	1465	Phases 11-14	Negligible	Rear	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening vegetation, and the shelter belt on the western boundary of the Site.
n/a	Burnham Military Camp	540	Phases 11-14	Negligible	Frontal	Fixed	Very Low	Neutral	Very Low	Neutral	Views of the Site will be curtailed entirely by intervening built form, vegetation, and the shelter belt on the southern boundary of the Site.



About Boffa Miskell

Boffa Miskell is a leading New Zealand professional services consultancy with offices in Whangarei, Auckland, Hamilton, Tauranga, Wellington, Christchurch, Dunedin, and Queenstown. We work with a wide range of local and international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, cultural heritage, graphics and mapping. Over the past four decades we have built a reputation for professionalism, innovation and excellence. During this time we have been associated with a significant number of projects that have shaped New Zealand's environment.

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