

Appendix 11: Landscape and Visual Assessment

Whitehall Quarry Expansion

Landscape Effects Assessment
Prepared for Winstone Aggregates

4 June 2025





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Bibliographic reference for citation:

Boffa Miskell Limited 2025. *Whitehall Quarry Expansion: Landscape Effects Assessment*.
Report prepared by Boffa Miskell Limited for Winstone Aggregates.

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Status: FINAL

Revision / version: [2]

Issue date: 4 June 2025

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Template revision: 20210624 0000

File ref: BM19311B_01_Whitehall_Quarry_Expansion_2025_FINAL.docx

Cover photograph: View from within the proposed quarry expansion area, looking in an easterly direction across the existing quarry, © Tom Lines, 2024.

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1.0 Introduction

Boffa Miskell Limited (BML) has been engaged by Winstone Aggregates (Winstone) to prepare a Landscape and Visual Effects Assessment (LVA) of the proposed 15.5-hectare (ha) expansion of an existing consented quarry pit at Whitehall Quarry. The proposed quarry expansion area (footprint) under assessment is referred to as ‘**quarry expansion area**’ and is located at 249 and 253 Whitehall Road within the Waipā District. The proposed expansion is anticipated to provide a 35-year resource and will be completed in two stages.

The Site is located across three land parcels which collectively are approximately 280ha in area. The Site is located approximately 4kms north-east of Lake Karapiro and the small rural residential settlement of Karapiro. A majority of the quarry expansion area is located within the Significant Mineral Extraction Zone (SMEZ) under the Waipā District Plan (the Plan). However, the western portion of the quarry expansion area extends beyond the SMEZ boundary as illustrated in **Plate 1** below. The quarry expansion area also includes several areas of indigenous forests identified as Significant Natural Areas (SNAs) and gully watercourses and natural inland wetlands.



Plate 1: The proposed quarry expansion area is delineated in a red dashed line above.

The quarry has been operating and supplying greywacke aggregate since the 1950s. Winstone (the Applicant) has owned and managed quarrying operations at the Site since 1998. The quarry produces high-quality roading and building aggregate, which is supplied to clients throughout the Waikato Region.

This assessment has considered the proposal in the context of the existing environment, the landscape character and landscape values that relate to the Site, the statutory context and the potential effects of the proposed quarry extension on the surrounding landscape.

An Ecological Assessment has also been prepared by BML ecologists and should be read in conjunction with this report as it focuses on the ecological effects and mitigation for the proposed quarry expansion area.

2.0 Project background

Winstone is continuing to experience very high demand for its aggregate resource due to the on-going growth and development occurring in the Waikato Region. On 11 November 2021, resource consent (RC/3770.01 and LU/0143/15.01) was granted by Waipā District Council to change the existing conditions of consent to enable aggregate extraction in the southwestern portion of the quarry pit.

On 30 September 2022, concurrent applications were granted by Waipā District Council (RC/3770.02 & LU/0143/15.02) to change conditions of two resource consents to expand the aggregate extraction area, and an associated land use consent to establish new overburden disposal area (OBDA).

On 5 December 2023, resource consent was granted by Waipā District Council to expand the quarry footprint (LU/0171/23). A subsequent resource consent was granted on 19 December 2023 which provides for Stage 2 of the (OBDA) (LU/0140/22.01 & LU/0220/23).

BML provided planning, ecological, and landscape assessments for the 2022 and 2023 quarry expansion consent applications, as well as the 2023 Stage 2 OBDA. BML is familiar with the Site, its context, and the associated landscape values and sensitivities.

3.0 Methodology

This assessment follows the concepts and principles outlined in *Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines*¹. A full methodology is outlined in **Appendix 1** of this report. The effects ratings are based upon a seven-point scale, which ranges from very low to very high. A **Graphic Supplement** has been included as **Appendix 2**, which includes several maps, visibility studies, Site photographs and visual simulations.

¹ *Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines*, Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022.

3.1 Assessment Process

The assessment involved the following tasks:

- Familiarisation of the proposal and background documents, including:
 - The 2021, 2022 and 2023 Landscape and Visual Effect Assessments undertaken by BML regarding previous quarry expansions and OBDA's of the Whitehall Quarry.
- Desktop analysis of the Site and surrounding landscape context, including a review of relevant information relating to landscape and visual aspects of the proposal including:
 - Waikato Regional Landscape Assessment, prepared by Mary C. Buckland, Landscape Architect, O'Connor Planning Consultants Limited, Chow: Hill and GHD, dated February 2010.
- Site visit: Tom Lines (Landscape Architect, BML) visited the Site on 6th September 2024, during fine weather conditions to survey the Site, its context and the extent and nature of available views. While on the Site visit, the immediate surrounding area was also visited to understand the Site's physical and visual relationship to nearby public and private locations. As expected, many of the locations the proposal would be visible from, closely relate to those obtained in previous assessments pertaining to the quarry expansions and OBDAs of the Whitehall Quarry. Representative public viewpoints were visited, and Site photos are included in **Appendix 2: Graphic Supplement**.
- Review of statutory provisions including:
 - The Resource Management Act 1991 ("**RMA**").
 - The Waikato Regional Policy Statement ("**RPS**") and the Waikato Regional Plan.
 - The Waipā District Plan ("**the Plan**").
- Description of the proposal as relevant to this landscape, natural character and visual effects assessment.
- Description of existing environment and landscape values.
- Assessment of landscape, natural character and visual effects of the proposal.

3.2 Visual Simulations

Five visual simulations illustrating the proposal have been prepared to provide a greater understanding of the proposal and its extent of visibility within the wider visual catchment. The visual simulations have been prepared in accordance with the NZILA Best Practice Guideline for Visual Simulations². The simulations illustrate the proposal once it has been completed (at the end of the earthworks season). The following scenarios have been prepared:

1. Existing environment;
2. Consented environment (including Stages 1 and 2 of the OBDA³);
3. Proposal during Stage 2 following Stage 1 mitigation;
4. Proposal following Stage 2 with Stage 2 mitigation.

² https://nzila.co.nz/media/uploads/2017_01/vissim_bpg102_lowfinal.pdf

³ Note, at the time of writing, the consented OBDA (Stages 1 and 2) has not been completed to its final landform, however, the visual simulations include a modelled version of the consented OBDA (Stages 1 and 2).

It should be noted that any form of visualisation does not depict “real life views”. Rather they are a tool which illustrates a view of a proposed activity from a viewpoint as depicted – not as it would appear in reality with the human eye. Therefore, visual simulations are not solely relied on to determine the nature and level of visual effects but rather to assist in the assessment of visual effects. This is explained further in the simulation methodology – refer to **Appendix 2** Graphic Supplement, **Figure 11** Visual Simulations Methodology.

4.0 Existing Environment

This section describes the existing landscape context, the Site, quarry expansion area and available viewing audiences, which provides the baseline for the assessment of effects.

4.1 Broader Site and Context

Refer to **Figure 1** in **Appendix 2**

Within the Waikato Regional Landscape Assessment, the Site is included within Landscape Type 3: Central Hill Country. As part of the description of the area, the following is relevant to the Site:

‘The Central Hill Country comprises the southern section of the Hunua Range, the Hapuakohe Range, Mangakawa and Hangawera, and the hills around Te Miro and Maungatautari. These hills and ranges vary in elevation from around 400m to nearly 800m and are comprised of sedimentary and volcanic rock. The hill country comprises rolling and steep landforms, with a mix of pasture, some mature bush in the gullies and along the higher tops, with pine plantations in places. There are also other exotic tree groups on the lower slopes.

There are a number of quarries on the lower hill slopes which are quite visible. Morrinsville is located in the centre of this area; the railway lines from Hamilton, Paeroa and Rotorua meet at Morrinsville, and the Hamilton-Paeroa main highway passes through the town. The main primary industries of the area, which is one of the most intensively farmed areas in New Zealand, are dairy farming and fat-lamb production. There are dairy factories at Motumaoho, Tātuanui and nearby at Waitoa. A large fertiliser works is located 2 km south of Morrinsville’.⁴

The broader landscape around the Site includes the town of Cambridge, located approximately 7.5 km to the west, and the volcanic landforms of Mt Maungakawa (495 meters above sea level) and Te Tapui (492 meters above sea level) about 9.5 km to the northeast. Lake Karapiro lies roughly 3 km to the south, while the Waikato River and Mt Maungatautari (797 meters above sea level) are further south.

The terrain near the Site features a mix of rolling pastoral hills and steep, distinctive ridgelines. The surrounding landscape is largely made up of expansive pastureland, interspersed with patches of indigenous bush and kiwifruit orchards. Forestry blocks are found south of the Site, along with more fragmented areas of forest across the broader landscape. The land around the existing quarry is primarily used for rural activities, with some smaller lifestyle properties.

⁴ *Waikato Regional Landscape Assessment*, Environment Waikato Technical Report 2010/12, page 25.

Overall, the wider landscape has a rural character, marked by rolling to steep hills, large open grazing pastures, and a mosaic of indigenous bush and forestry.

4.2 The Wider Site

The Site consists of three land parcels, totalling approximately 280 hectares (Figure 2, Appendix 2), featuring a variety of landforms. Steep ridges dominate the northern and western sections, while the terrain becomes more undulating toward the southeast (Figure 3, Appendix 2). In the western portion, a ridge rises to a local high point of 295 meters above sea level, characterised by a mix of pasture and pockets of regenerating native vegetation. The upper part of this ridge has a "Visually Sensitive Hill Country" overlay, as identified in the Plan (Figure 5, Appendix 2), and forms the backdrop to the existing quarry operations when viewed from off-site. The Site is part of a series of steep hillslopes descending eastward.

Whitehall Quarry is situated on the eastern portion of this elevated, undulating terrain, bordered by steep ridges along the northern, eastern, and western boundaries. To the south, the land flattens as it extends toward the lower catchment of the Karapiro Stream.

Whitehall Quarry is an established greywacke quarry located within the Waipā District, in a landscape typical of the Waikato Region's rolling to steep terrain. The main access road originates from Whitehall Road (east of the quarry), and passes through predominantly flat land used for grazing. North of the access road are flat pasture fields and an elevated landform, rising to 114 meters above sea level, located just east of the aggregate stockpile area. This elevated area is a former overburden site that has since been reshaped and grassed over. To the south of the access road, farm sheds, tree stands, and an isolated hill rising to 125 meters above sea level lie in the southeast portion of the Site. Stage 2 of the recently consented OBDA is also located within the Site and the landform continues to take shape.

Overall, the Site retains the character of a working quarry due to ongoing operations, though certain areas still reflect a rural, farmland aesthetic, with pastoral grasses and pockets of indigenous bush in the gully areas.

4.3 Quarry Expansion Area

*Refer to **Figures 2 and 3** in Appendix 2*

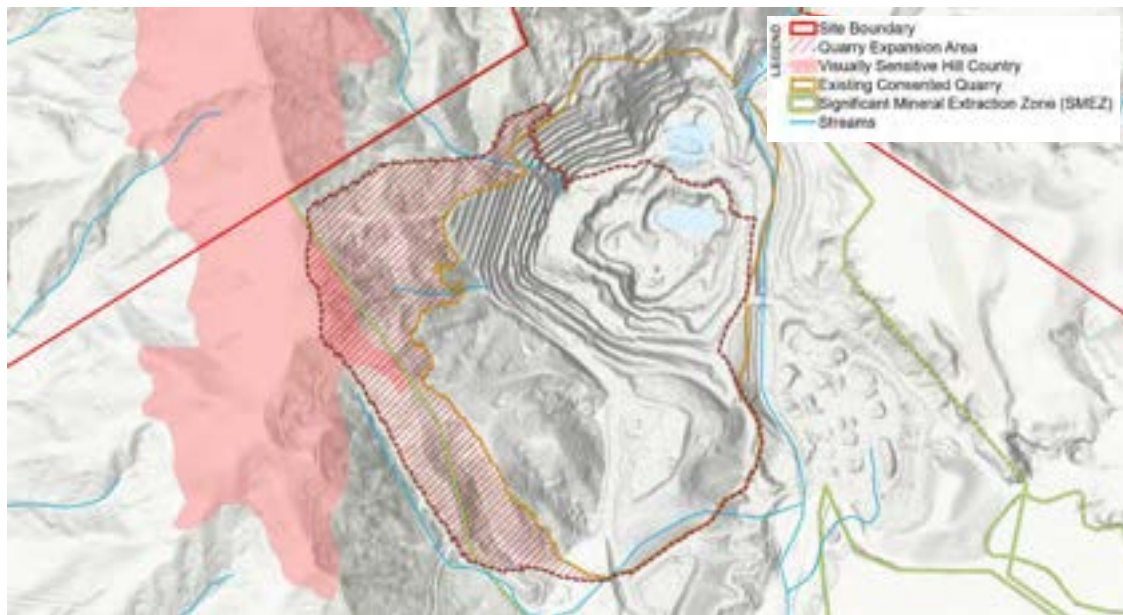


Plate 2: Quarry expansion area.

The quarry expansion area is located west of the consented quarry footprint on steep to undulating terrain that is primarily covered in pasture with pockets of indigenous bush. The existing quarry is situated on the eastern slope of a steep ridge, with its quarry faces oriented toward the east, southeast, and northeast.

The quarry expansion area is bound by a large tract of indigenous forest to the north (SNA WP527), the existing quarry to the east, steep hills to the south and a sizable area of indigenous forest (SNA WP530) to the west. The quarry expansion area partially extends into the Visually Sensitive Hill Country overlay to the west as illustrated on **Plate 2** above.

The terrain in the quarry expansion area is relatively steep, as it lies on the eastern hillslopes of the ridge landform to the west. The highest point of the quarry expansion area reaches approximately 294 meters above sea level and forms part of a wider hillscape which forms the background to the local area. Whilst the quarry extends further up the hillsides, it will remain below the ridge that backdrops the site.

4.4 Landscape Values

The landscape values relating to the quarry expansion area are associated with the Visually Sensitive Hill Country overlay⁵ and the areas of SNAs. The landscape values that underpin the Visually Sensitive Hill Country Overlay have been identified as:

- (a) *A mixture of steep grade to gently rolling country dominated by pasture and pockets of bush; and*
- (b) *These rural hills form the backdrop to many of the views in the District; and*
- (c) *The aesthetic value of these landscapes is moderate with pockets of forest which have high natural character values. The main characteristic is a patchwork of pasture, trees and bush.*

Beyond the overlay, other notable landscape values include:

⁵ Refer to Policy 25.3.4.1.

- The presence of wetlands and indigenous forests which provide habitat for indigenous fauna.
- The SNAs display a diverse range and sequence of vegetation which provides visual contrast to the open pastoral grassland cover.

The two areas of SNAs within the Site consist of large areas of indigenous vegetation (*WP527* and *WP530*). SNA (*WP527*) relates to a large tract (34.5 ha) of dense indigenous vegetation located within the Site immediately north of the consented quarry footprint. It comprises an indigenous forest located adjacent to the consented quarry footprint and within the SMEZ.

SNA (*WP530*) relates to a reasonably large area (12 ha) of indigenous forest which is located within the Site. This SNA is immediately west of the consented quarry footprint within steep terrain. A tributary of the Waiarumu Stream flows through this SNA.

4.5 Natural Character Condition

The primary aspects of Natural Character are considered in relation to waterbodies to be the biophysical (abiotic and biotic) attributes reflecting the extent to which natural elements, patterns and processes occur and the extent to which human modification has occurred. Secondary experiential aspects associated with the context of such waterbodies and their margins has also been considered. Relevant to this application, the natural character study, and analysis has been undertaken in relation to the “*wetlands, and lakes and rivers and their margins*” that occur within the Site, being the affected area relating to the proposed quarry expansion.

Streams (Watercourses) and wetlands have been identified within the proposed expansion footprint and surveyed by the project ecologists. A description of these features in relation to their natural character condition is provided below.

Gully A Watercourse

Gully A is located in the eastern portion of the quarry expansion area. The watercourse has been partially cut off by the existing quarry operations, redirecting the stream water along the proposed expansion area toward an overburden area, where it flows into the primary stormwater management system. The watercourse is a perennial stream, with a well-defined channel in its lower reaches. In its upper reaches, it consists of short channels, wetland sections, and areas of overland flow. A smaller tributary joins the main stream partway along its course. The streambed is mostly fine sediment interspersed with cobbles, gravel, and occasional bedrock. Evidence of livestock grazing is visible throughout the gully and livestock grazing and trampling along the riparian margin has also occurred.

In the upper reaches, both the main channel and the smaller tributary lack riparian cover, with grasses covering the hardbottom substrate. The downstream section shows similar conditions. Water levels have been observed as low, with only small, shallow pools and some riffles observed. Riparian vegetation includes patches of gorse, kawakawa, kanuka, and mahoe, while blackberry dominates some stream edges and covers sections of the stream. Inkweed, various *Juncus* species, and common ground ferns are also present. No fish species were observed in Gully A's watercourse.

In terms of the abiotic levels of natural character, it is considered these are low-moderate. Whilst the watercourse has already been partly cut off by existing quarry operations the stream consists of some shallow pools and riffles and includes cobbles, gravel and bedrock in some areas within the stream bed.

In terms of biotic levels of natural character, it is also considered these are low-moderate. Whilst no fish species were recorded and the riparian margin is accessed by stock containing exotic and pest species, some indigenous vegetation does exist along the stream margins such as Kanuka.

In considering the experiential attributes, the watercourse is considered to hold low-moderate levels. The stream is cut off by the existing quarry operations at its lower reaches and includes stock access and exotic/ pest species. Some indigenous species are present and combined with the broadly unmodified stream channel in the upper reaches ephemeral qualities do exist.

Gully B Watercourse

Gully B is situated in the northern portion of the proposed expansion and flows in a southeastern direction. The stream is surrounded by steep terrain, with rocky waterfalls forming at points of elevation drop. Water levels were observed as low, with only a few deep pools; shallow pools, runs, and riffles. The surrounding vegetation is primarily native, including tree ferns, tawa, pukatea, nikau, kareao, mahoe, kiekie, and common ground ferns, along with likely other native and exotic species. The stream does not connect to any other waterbody, as its flow discharges directly over the north face into the quarry. No evidence of fish presence was recorded.

The abiotic aspects of the watercourse's natural character are assessed as moderate. The stream features some rocky waterfalls and deep pools as well as runs and riffles. It is noted that the stream is impacted by the quarry operations to the southeast (in the direction of the stream flow) where the watercourse discharges into the quarry.

The biotic elements of the natural character are also considered moderate. The stream supports native vegetation along its margins (and is within an SNA), in addition to exotic species.

Regarding experiential attributes, the watercourse is rated as having moderate levels. The stream is proximate to and impacted by neighbouring quarry activities in its lower reaches. Notwithstanding this indigenous vegetation along the margins exist and together with the remaining channel being unmodified, some sense of wilderness and tranquillity within the upper reaches of the stream exist.

Wetlands

Two wetlands, a northern (0.016 ha) and southern (0.055 ha) wetland have been identified on site by the project ecologists which are located nearby and along the Gully A watercourse. These wetlands are located in a gully/land depression feature within the proposed footprint of the quarry expansion as illustrated below.

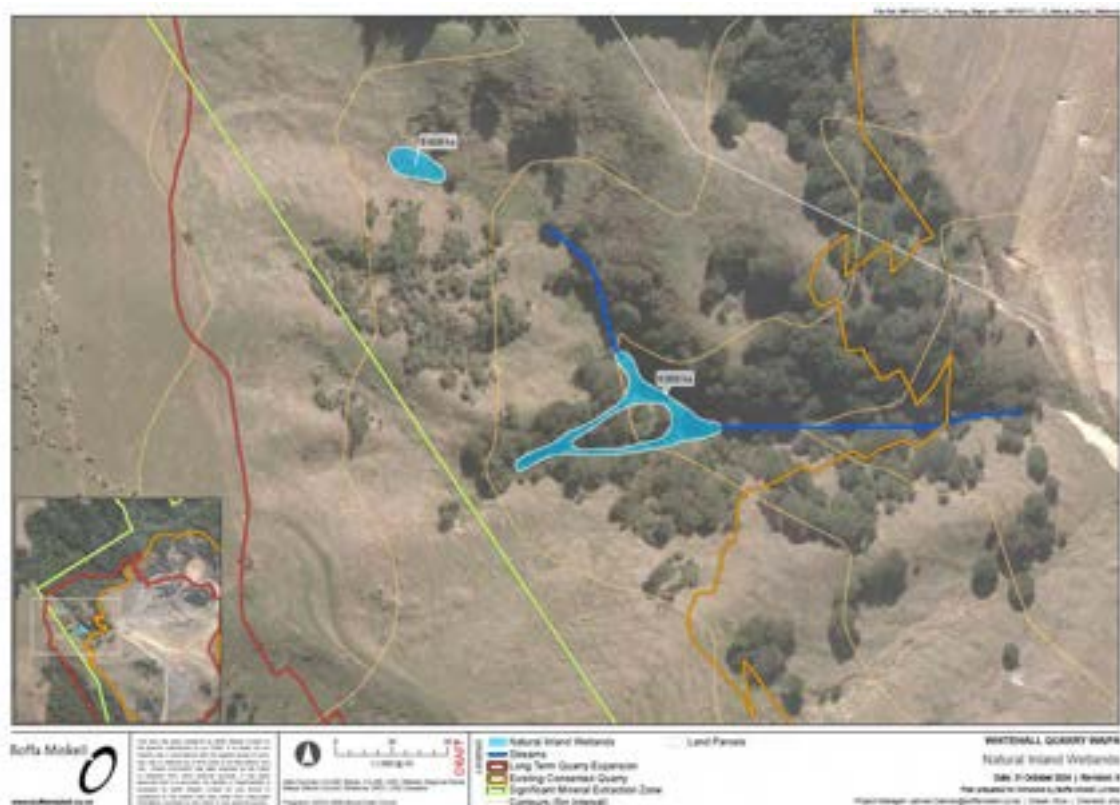


Plate 3: Identified Wetlands in Quarry Expansion Area

While performing hydrological functions, the wetlands are predominantly exotic in their biotic attributes and affected by human influences through farming practices such as stock access as well as roaming deer or goat. The diversity of species within the wetlands were low, and the vegetation composition overall was dominated by low growing exotic species. With the above in mind, it is considered that these wetlands have a low level of natural character (for biotic, abiotic and exponential attributes). This is due to their abiotic condition (such as water quality or induced condition through farm animals), biotic condition (such as prevalence of exotic species and limited indigenous species or habitat), and experiential condition (due to the limited sense of wilderness or remoteness as a result of human influence and managed land use context).

4.6 Visual Catchment and Viewing Audiences

Refer to **Figures 7 and 8** in Appendix 2

To identify the visual catchment and potential viewing audience of the proposal, a Zone of Theoretical Visibility (ZTV) analysis⁶ was conducted, along with a study of aerial photography (considering land use, landform, and vegetation patterns) and a Site visit. Private properties likely to be affected were also visually surveyed from nearby publicly accessible locations where feasible, with further reference to aerial imagery to better understand the visual catchment.

⁶ GIS analysis tool using topographical information combined with the elevation of the proposal elements to determine areas in the Site context that will obtain views of the quarry expansion area.

The viewing audience includes individuals or groups residing on or using properties and roads that fall within the visual envelope or ZTV of the Site and the quarry expansion area. The ZTV analysis estimates theoretical visibility providing a useful approximation of visibility, which has been validated through the Site visit. The ZTV analysis is illustrated on **Figures 7 - 8**, incorporating both the quarry expansion area and the approved OBDA (Stage 1 and 2) landforms.

Based on this, key representative viewpoints have been photographed and are contained within **Appendix 2: Graphic Supplement**.

4.6.1 Visual Catchment

Given the undulating to steep terrain surrounding the Site and the broader landscape, the visual catchment of the quarry expansion area is mainly confined to views from the northeast, east, and southeast. Once completed, the consented OBDA landforms will offer some element screening in the foreground for views from the southeast of the expansion area. Additionally, vegetation along the Wairumu Stream serves as a visual buffer for views from the east. The rising topography to the north, west, and south of the quarry expansion area will continue to provide a backdrop and screen views from the northern, western, and southern directions.

4.6.2 Viewing Audience

Most of the area to the northeast, east, and southeast of the quarry expansion area is primarily farmland. Although some residential properties fall within the visual catchment, many have obstructed views due to the intervening topography and vegetation, such as shelterbelts and tree stands.

A series of viewpoints (refer to **Appendix 2, Figures 7 - 27**) were documented during the Site visits to illustrate the visibility of the quarry expansion area within the broader landscape. The photographs show that views of the expansion area are generally limited. Where visible, it is seen from either nearby or distant vantage points, and within the context of the existing quarry operations.

Private properties within the visual catchment are expected to have varying levels of visibility of the quarry expansion area including those along French Pass Road, Brunskill Road, Oliver Road, Whitehall Road, and Dunning Road. The associated viewing audiences for these areas are either a small number of road users travelling on these local roads or residents accessing properties from these roads.

4.6.2.1 North-eastern viewing audience

- a. Road users of French Pass Road, Brunskill Road and Oliver Road
- b. Residents of French Pass Road, Brunskill Road and Oliver Road

4.6.2.2 Eastern and Southern-eastern viewing audience

- a. Road users of Whitehall Road and Dunning Road
- b. Residents of Whitehall Road and Dunning Road

Refer to **Section 7.4** below for a visual effects analysis and assessment.

5.0 The Proposal

The proposal consists of expanding the Whitehall Quarry pit located at 249 and 253 Whitehall Road by 15.5 ha in a westerly direction to meet the increased demand for aggregate resources. This proposed expansion is anticipated to provide a 35-year resource and will be undertaken in two stages. The proposed extension will slightly extend beyond the Significant Mineral Extraction Zone, encroaching into Rural zoned land, as shown in **Plate 4**.

Existing quarrying operations at Whitehall Quarry will continue unchanged by this proposal. There are also no changes proposed to the operation of the quarrying (including the access, existing location of the plant, the hours of operation, or the frequency of traffic movements) as part of the Long-Term quarry expansion.



Plate 4: Proposed quarry expansion area.

5.1 Staging

It is proposed to undertake vegetation clearance and strip most of the area north of the pit terrace T15/45 in the first earthworks season 2025 to 2026. For operational reasons the Stage 1 expansion area is required to progress initially in a westerly direction, then extend to the north in a series of campaigns. This will include removing vegetation within the gully and within SNA WP527 (2.6 ha within the Significant Natural Area). Refer to **Plate 5**.

The quarry is required to progress in the area to the north initially because of operational requirements. Specifically, the depth of overburden is expected to be less than 20m in the northern portion of the expansion area and provides immediate access to aggregate resource to meet immediate demands to service significant projects. Within the south-western part of the expansion area the overburden depth is 100m depth below the surface, therefore access to the aggregate resource in this location is logically more challenging and will meet longer term needs.

The stripped material will be immediately deposited into dump trucks for disposal to the overburden disposal area on the flat fields to the south (authorised by consent ref LUC/140/22). Stage 1 is expected to provide approximately 15 years of resource (subject to demands).

Stage 2 (south-western portion of the expansion area) would involve stripping the area to the west over a series of campaigns and removing the vegetation in SNA WP530 (2.86ha).

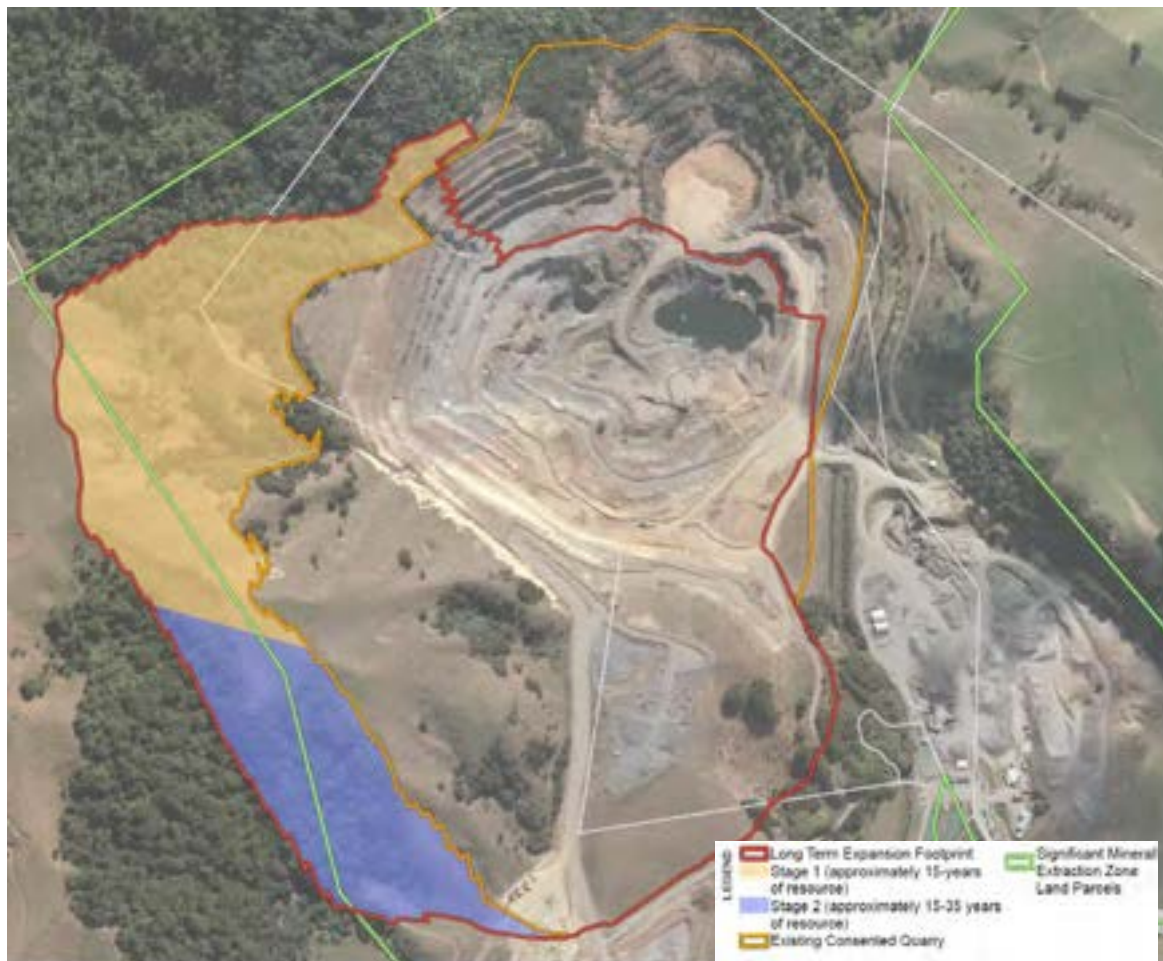


Plate 5: Indicative Staging of proposed quarry expansion area.

5.2 Proposed Mitigation

In considering the nature of the project and the anticipated change to the receiving environment, there are a number of measures which will assist in mitigating the natural character, landscape and visual effects associated with the project. These areas of planting will be further developed and detailed through a Landscape and Ecological Management Plan (LEMP) (appended to the Quarry Management Plan), forming part of the conditions of consent. These measures have been considered in evaluating the level of effects associated with the project and are illustrated on **Figure 9, Appendix 2**.

Hydroseeding

In line with current practice at the quarry, grass hydroseeding will be applied progressively to quarry benches as they are formed. Whilst assisting with erosion and sediment control, grass hydroseeding will assist in visually integrating the benches.

Planting Quarry Benches

Quarry benches would be established in indigenous planting (manuka and kanuka) to visually integrate the completed works into the vegetated hillside context. Where practical, excavated topsoil could be re-used on completed quarry benches to a depth of 150 to 200mm, with imported topsoil being a secondary option. Following topsoiling, manuka and kanuka seedlings suitable for revegetation (e.g. 1 litre grade) would be planted on completed quarry benches. It is expected that due to the proximity of the benches to the neighbouring significant natural areas, natural seed dispersal (birds/ wind) may occur to supplement the colonising species. Potential enrichment planting could also be explored once pioneering species have become established.

Ridge Planting

It is proposed indigenous planting (including tree planting) is established along the ridgeline which backdrops the quarry, as soon as practicable at the beginning of the first planting season following granting of the resource consent for the long-term expansion. The purpose of the ridge planting is to increase the prominence of the ridgeline above the quarry (which is within the Visually Sensitive Hill Country Overlay) and build on the underlying landscape values.

Ecological Enhancement Planting

The ecological mitigation package (refer Boffa Miskell Ecological Assessment), proposes that planting occurs across approximately 15.5 ha of predominately open pasture to the southwest of the proposed quarry expansion, for the unavoidable loss of tawa forests and kanuka scrub (5.46 ha tawa forests and 0.22 ha of kanuka scrub). The planning specifications is to be provided in a Planting Plan. The Planting Plan will include a species list and maintenance of the planting area, fencing requirements, and follow the provisions in the Quarry Revegetation Plan (as set out in the QMP). Pest controls will be outline in a separate Pest Management Plan.

Lighting

Lighting throughout the Project will be minimised as far as practicable so it meets the permitted standards of the zone(s). Placement and direction of lights should avoid high points which are visible outside of the Site. Light shields should be used where necessary, and all lightings shall be down facing to minimise effects on the night sky.

6.0 Statutory Provisions

The following is a review of the provisions relevant to the assessment. The purpose of such a review is to help frame the landscape assessment rather than to undertake a comprehensive appraisal of the provisions or a planning assessment of the proposal against the provisions.

6.1 Resource Management Act (RMA)

RMA s6(a) concerns *‘the preservation of natural character of... wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate, subdivision use and*

development'. The quarry expansion area includes identified watercourses and natural inland wetlands, this is addressed further in **Section 7.0** below.

Under RMA s6(b), it is necessary to determine the attributes and extent of outstanding natural features and landscapes in order to assess how they will be affected by a specific proposal. There are no Outstanding Natural Features or Landscapes within the Site.

Visual amenity aspects are a part of amenity values, and form part of the suite of Other Matters to consider under s7(c) of the RMA. Visual amenity values stem from the observer's appreciation of the pleasantness, aesthetic coherence and cultural and recreational attributes of an area. The quarry expansion area extends into the Visually Sensitive Hill Country overlay as illustrated on **Figure 5**. An assessment of this is provided in Section 7.0 below.

6.2 Waikato Regional Policy Statement (RPS)

The Waikato Regional Policy Statement (RPS) provides the current framework for the sustainable management of the Region's natural resources. The key objectives and policies from the RPS for this proposal are those relating to Amenity and Natural Character (overland flow paths and wetlands).

Objective IM-O9 Amenity – 'The qualities and characteristics of areas and features, valued for their contribution to amenity, are maintained or enhanced'.

Policy IM-P5 – Maintain and enhance areas of amenity value

Areas of amenity value are identified, and those values are maintained and enhanced. These may include:

1. areas within the coastal environment and along inland water bodies;
2. scenic, scientific, recreational or historic areas;
3. areas of spiritual or cultural significance;
4. other landscapes or seascapes or natural features; and
5. areas adjacent to outstanding natural landscapes and features that are visible from a road or other public place.

Objective NATC-O1 Natural Character – 'The natural character of the coastal environment, wetlands, and lakes and rivers and their margins are protected from the adverse effects of inappropriate subdivision, use and development.'

6.3 Waipā District Plan (the Plan)

*Refer to **Figures 4 and 5** in Appendix 2*

The majority of the quarry expansion area is located within the SMEZ. However, the western portion of the quarry expansion area extends beyond the SMEZ boundary and occupies approximately 4.1ha of the neighbouring Rural Zone. The project also extends 1.6 ha into the Visually Sensitive Hill Country overlay. Further to this, the quarry extension area also encroaches into two identified SNAs (WP527 and WP530) that are located west of the consented quarry footprint.

6.3.1 Rural Zone

The Rural Zone is primarily a pastoral rural working environment that is reliant on the rural land and soil resource of the District and is largely typified by an open landscape. A variety of other rural-based industrial uses can occur in the Rural Zone, as can mineral extraction, forestry, tourism and home occupations.

6.3.2 SMEZ and Quarry Buffer Area

The overarching purposes of the SMEZ in the District Plan are to differentiate regionally significant resources from smaller-scale extraction activities, and to recognise the benefits of making regionally significant aggregate resources available for infrastructure and development.⁷ The SMEZ provisions contain objectives, policies and rules that seek to provide for the continued operation and expansion of regionally significant quarries including Whitehall Quarry.

The Quarry Buffer area is defined in the District Plan as an area associated with a Mineral Extraction Area for the purpose of addressing reverse sensitivity issues associated with the operation of Mineral Extraction Activities.

6.3.3 Significant Natural Areas (SNA)

*Refer to **Figure 5** in Appendix 2*

The two SNAs partially located within the quarry expansion area are detailed below. It is also noted that the site is located within a Biodiversity Corridor (indigenous forest in the Waipa District Plan).

⁷ Refer to the Waipa District Plan, Section 4A.1.2.

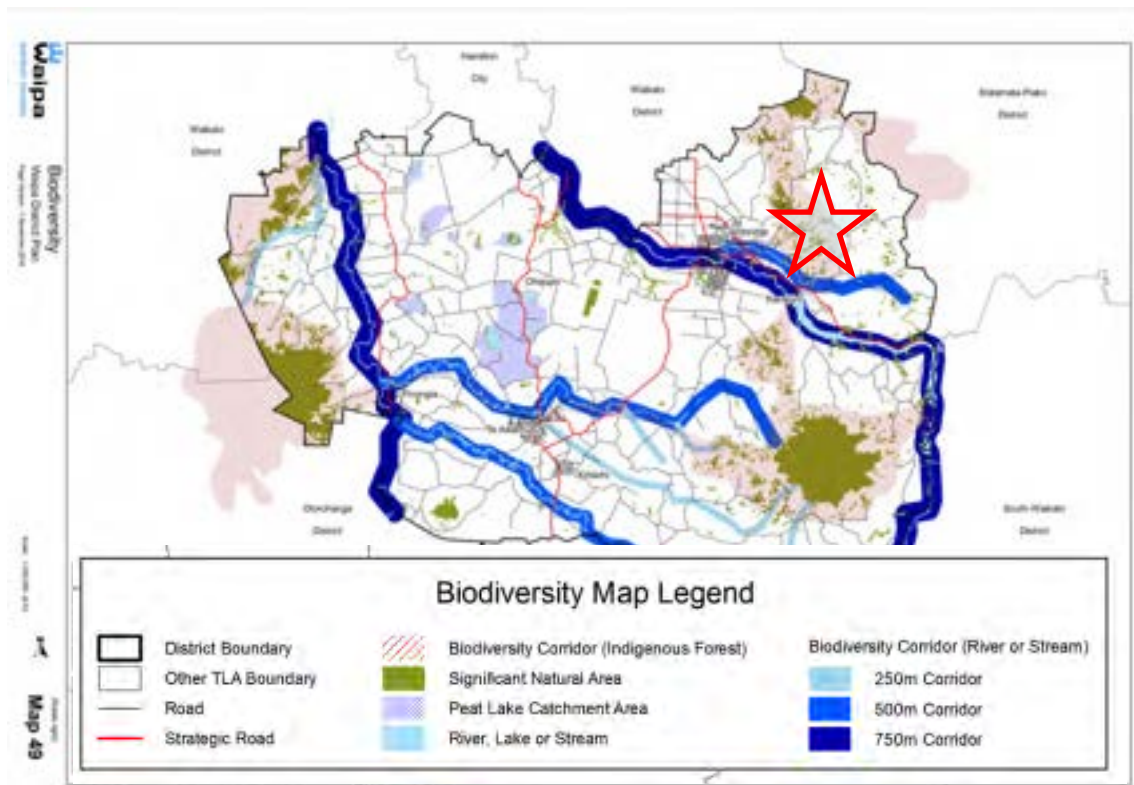


Plate 6: Waipa District Plan, Biodiversity Map 49

SNA (WP527) relates to a large tract (34.5 ha) of dense indigenous vegetation located within the Site immediately north of the consented quarry footprint. It comprises an indigenous forest located adjacent to the consented quarry footprint and within the SMEZ.

SNA (WP530) relates to a reasonably large area (12 ha) of indigenous forest which is located within the Site. This SNA is immediately west of the consented quarry footprint within steep terrain. A tributary of the Waiarumu Stream flows through the SNA.

Policy 4A.3.1.5 of the Waipa District Plan

Where the removal of a significant natural area in whole or part is necessary to provide for mineral extraction activities, adverse effects should be remedied, mitigated or offset to achieve no net loss in biodiversity values.

6.3.4 Visually Sensitive Hill Country

Refer to **Figure 5** in Appendix 2

The western portion of the quarry expansion area extends beyond the SMEZ boundary into the Visually Sensitive Hill Country overlay (but remaining below the ridge), thereby impacting approximately 1.6ha of the visually sensitive hill country overlay. This portion of the overlay consists of steep slopes and the crest of a ridge landform.

Objective 25.3.4 *To provide for lawfully established farming activities while ensuring the location of buildings, driveways and infrastructure does not compromise and where practicable enhances the landscape qualities of visually sensitive hill country and river and lake environs.*

Policy 25.3.4.1 *To recognise that visually sensitive hill country provides a visual backdrop to large parts of the District, and in some locations this land is of quite a steep grade.*

Policy 25.3.4.2 *Maintaining the values of the visually sensitive hill country*

- *To maintain or enhance the values of the visually sensitive hill country by recognising the landscape values associated with working pastoral environments and through the careful location of buildings, driveways and infrastructure that align with the contours of the land, the use of appropriate design, materials and colours, and minimising earthworks and minimising the need for bush removal.*

7.0 Assessment of Effects

A landscape effect is a consequence of changes in a landscape's physical attributes on that landscape's values. Change is not an effect: landscapes change constantly. It is the implications of change on landscape values that is relevant. While an effect arises from changes to physical attributes, the consequences of such change to landscape values are considered across the combination of a landscape's physical, associative, and perceptual dimensions. Landscape effects can be either adverse, neutral or positive.

Effects are considered against the existing and potential landscape values, and the outcomes sought in the statutory provisions. Such provisions often anticipate change and rely on retaining certain landscape values. Whether effects on landscape values are appropriate will therefore depend on both the nature and magnitude of the effect on the existing landscape values and what the statutory provisions anticipate.

The nature of the effect can be determined as adverse (negative), neutral (benign) or beneficial (positive). The landscape, natural character and visual effects have been determined using a seven-point scale ranging from very low to very high as set out in **Appendix 1** of the assessment methodology.

The principal elements of the proposal that will give rise to landscape, natural character and visual effects are:

- The physical landform changes as a result of the 15.5 ha expanded quarry pit.
- The visual change arising from the exposure of quarry faces, particularly in the elevated areas that extend into the Visually Sensitive Hill Country overlay.
- Progressive removal of indigenous vegetation, wetlands, and watercourses, potentially affecting the natural character attributes of the Site.

7.1 Effects on landscape attributes and values

The quarry expansion area will extend to the west of the existing quarry footprint and increase the quarry pit by 15.5 ha in area. The quarry expansion area currently displays relatively steep

terrain with several spur and gully landforms radiating down in a south-easterly direction from a larger ridge landform.

The proposed quarry expansion will involve permanent removal of material and in time create a terraced hillslope, therefore altering the physical characteristics (spurs, gullies and hillslopes) of this portion of the Site. While the legibility of the wider ridge landform and the ridgeline will remain intact a sizeable portion of terrain and landscape features will be altered. The lower slopes of the ridge landform (within the SMEZ) have already been partly compromised through the existing quarrying operations, as can be expected within a SMEZ.

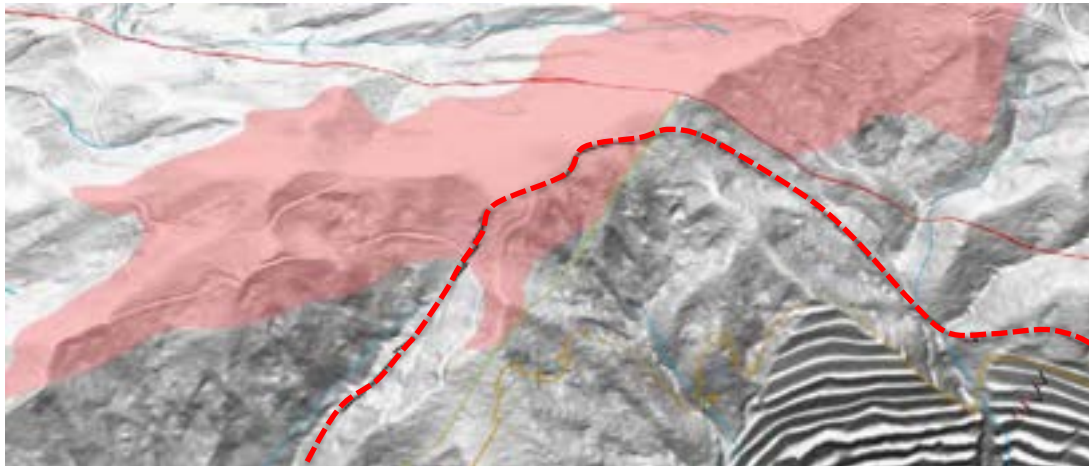


Plate 7: Indicative extent of the expansion area (dashed red line) and Visually Sensitive Hill Country overlay (pink fill).

The most valued landscape feature is considered to be the defining ridge to the west of the quarry expansion area. Approximately 1.6ha of the Visually Sensitive Hill Country overlay will be quarried and terraced as a result of the expansion. This portion of the overlay is currently characterised by open pastoral grasses, bordered by indigenous vegetation to the north and south. As a result of the expansion, the steep, pasture-dominated terrain, interspersed with pockets of native bush, will be replaced by a more modified, human-influenced landscape. While the broader rural hills will continue to serve as the backdrop to local views, the aesthetic value of the landscape will diminish due to the removal of some of the vegetation and the increased visual prominence of quarrying operations in this elevated area.

Notwithstanding this, the values that underpin the broader Visually Sensitive Hill Country overlay will largely be maintained. However, at a more Site-specific level, the working pastoral environment will be replaced with a working quarry character. The expansion area will be seen in the context of the existing quarry operations, which are anticipated within the SMEZ, and will remain framed by surrounding indigenous vegetation, though several landscape elements will be lost. The main ridge landform adjacent to the expansion area will remain intact (with quarry operations occurring below the ridge). This ridge landform will also be further supported by indigenous vegetation (ridge planting) as part of this Project. It is envisaged that this vegetation will assist in reinforcing the ridgeline and its prominence in the context of the quarry to the south east.

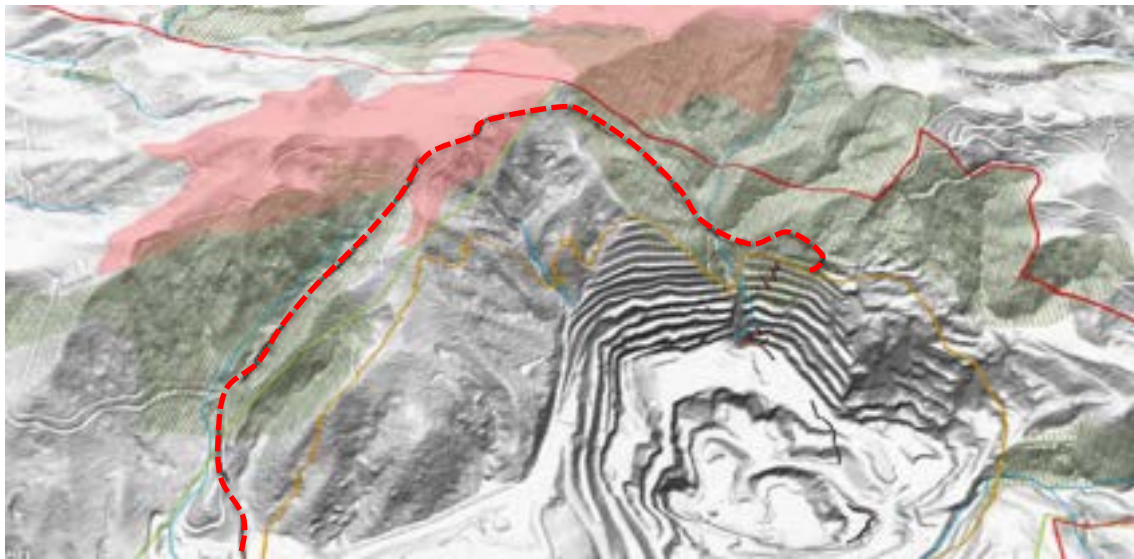


Plate 8: Indicative extent of the expansion area (dashed red line), SNAs (green hatch) and Visually Sensitive Hill Country overlay (pink fill).

As described in the proposal above, approximately 5.46 ha of indigenous vegetation in the SNAs will be removed as a result of the quarry expansion. Currently, this vegetation frames the more open pastoral grassy eastern slopes and contributes to the aesthetic of the overlay, whilst it is acknowledged that much of this is within the SMEZ. The removal of indigenous vegetation from the SNAs will alter the landscape's character. As a result, the contrast between the initial raw quarry edges (before hydroseeding and planting of benches) and the remaining natural landscape will likely increase.

To mitigate the landscape effects of this vegetation loss and landform modifications associated with quarrying in the overlay, 1.25 ha of indigenous mitigation planting is proposed along the ridgeline behind the quarry in addition to proposed planting as detailed in the ecological effects assessment. Further, in combination with grass hydroseeding and indigenous planting (manuka and kanuka) is proposed along the mid to upper quarry benches which will occur progressively as the stages (Stage 1 and Stage 2) are completed. Together, this planting aims to soften the interface between the quarry and surrounding forested areas, restoring a more natural aesthetic and ecological function over time.

Over time, the quarry expansion area will replicate the existing pattern of landform modification already apparent due to quarrying operations. In the short term, the newly exposed, unweathered terraces and forest edges will present a more noticeable visual contrast, but these changes will be seen alongside, and in the context of, the current quarry operations. Following hydroseeding and manuka/kanuka planting, the newly modified faces will gradually visually soften and contribute to the wider vegetated values of the surrounding hillsides and associated gullies.

With the above in mind, it is considered that as each stage is progressively undertaken, with mitigation measures established, landscape effects will be no more than **Low** (adverse) (*less than minor*). This also acknowledges that a majority of the expansion area is within SMEZ and quarrying in this area is already a part of the receiving environment, therefore the landform outcomes associated with quarrying activities could be reasonably anticipated.

7.2 Natural Character Effects

In terms of natural character, the highest degree of naturalness occurs where there is the least amount of human induced modification. The identified wetlands are considered to have low levels of natural character. The identified watercourses are considered to have low-moderate and moderate levels of natural character.

The proposal includes removing features within the planned quarry footprint, affecting approximately 700m² of wetland habitat and 250 meters of watercourse length (combined Gully A and B watercourses). Although these areas have been influenced through human activity (e.g. nearby quarry operations and/or farming/ stock access) and include exotic species

For the watercourses, the quarry footprint will entirely remove these features, with management of runoff undertaken through constructed channels along the quarry benches. Therefore, mitigation needs to occur in alternative areas within the site.

Land to the west of the quarry has been identified by the project ecologist which contains wetlands and watercourses suitable for enhancement. Winstone proposes enhancement planting of wetlands and riparian margins, stock proofing and managing for invasion of pest plant species, predator control, and protection of headwaters (wetland and tributaries) creating an enhancement area of roughly 2500m² and 500m of stream enhancement, to make up for the loss of wetlands and watercourses as part of the Long-term expansion. Refer Boffa Miskell ecological effects assessments

Overall, whilst there would be **low- moderate** natural character effects resultant from the removal of the wetlands and Gully watercourse, these mitigation actions are expected to provide benefits through the enhancement of wetland and watercourses in the wider site and an increase in natural character within these areas.

7.3 Visual Effects

Visual effects are effects on landscape values as experienced in views. The nature of a view depends on how it is perceived and the extent to which it is valued or not. It includes how the landscape in the view is understood, interpreted and what is associated with it. Effects are also assessed in the context of the relevant statutory provisions. In this respect, the proposed quarry expansion will mainly occur within the SMEZ, where quarrying activities can reasonably be anticipated, however as previously described the expansion footprint does extend beyond this zone and 4.1ha into the Rural Zone to the west. Notwithstanding this, quarry activities do occur in rural environments and such activities can influence rural zones which occur along the margins of significant mineral extraction zones and their associated quarries.

To assist in understanding the effects, a ZTV analysis and a series of Visual Simulations ('VS') have been prepared, from publicly accessible roads where the Site is visible from. These have been prepared based on **Viewpoints 1, 3 - 6** within **Appendix 2: Graphic Supplement**. 3D model views ('MV') from identified private properties have also been prepared where it was considered that representative views from public locations could not be attained (**Model Views 7, 8, 9 and 10** within **Appendix 2: Graphic Supplement**).

The following visual analysis is based on observations from the Site visit and ZTV analysis. Refer to **Viewpoints 1 – 6** and **Model Views 7 to 10** in the **Graphic Supplement**.

7.3.1 Visual Effects from French Pass Road

Review Visual Simulation 1, Appendix 2 for a representative view

Due to the undulating topography and intervening vegetation along and around French Pass Road, views towards the quarry expansion area are predominately screened. Where the more elevated portions of the quarry expansion area are visible, only glimpses will be available for viewing audiences traveling along the local road in restricted locations between Brunskill Road/ French Pass Road and Baker Road/ French Pass Road intersections. With these fleeting views considered, it is anticipated that the visual effects on road users of French Pass Road who obtain views will be **low** adverse across both stages of the proposed quarry expansion prior to the implementation of hydroseeding, reducing to **very low** following hydroseeding.

Similar to road users, most viewing audiences in residential dwellings along French Pass Road will not observe the quarry due to the undulating topography and established, mature shelterbelts. It is however recognised that a two storey dwelling located at 808 French Pass Road (in the vicinity of Visual Simulation 1) will have partial views of the Project. In considering the consented environment, people at the property will have the opportunity to view the consented quarry in the south-western portion of the site. Further, any anticipated expansion within the SMEZ zone would reveal a greater area of the quarry within their view which would represent a more noticeable level of change.

Whilst the proposed expansion area will form a modest portion of the view, the elevated location of the change will be clearly discernible, particularly with the contrasting hues of any recently cut quarry benches in the mid to upper portions of Stage 1. Notwithstanding this, much of the change can be broadly expected within the associated SMEZ which underpins the Project and activity. The most elevated benches of Stage 1 will however be outside of the SMEZ and further, would partially occur within the Visually Sensitive Hill Country Overlay.

In recognising this, firstly progressive hydroseeding following the formation of the benches (after the earthworks season has finished) will assist in downplaying the prominence of the quarry overall. Based on current site observations, the hydroseeding establishes itself within approximately 1 month following application. Further, early establishment of the ridgeline planting will, through the course of Stage 1 begin to visually contain the extent of the quarry, forming a vegetated element along the skyline framing the quarry. With the above considered, effects during Stage 1 would be up to **low** adverse from this private location.

During Stage 2, in addition to the further matured ridgeline planting, quarry bench planting (manuka and kanuka) would have been progressively planted through Stage 1 and be seen in combination with grass hydroseeding. This means that the extent of exposed quarry benches will remain restricted to the Stage 2 area. Stage 2 will broadly occur across the mid to lower slopes of the landscape which is observed in the overall view. Where the proposal is appreciable in the view, it would be seen in the context of the quarry. With the above considered, any effects during Stage 2 would be no more than **low** adverse, further reducing once hydroseeding and quarry bench planting is established.

Remaining dwellings along French Pass Road who will obtain views of the proposed quarry expansion are considered to have up to **very low** adverse visual effects as the proposed quarry expansion will predominately be screened from view due to the viewing angle and intervening topography/vegetation.

7.3.2 Visual Effects from Brunskill Road

Refer Viewpoint 2, Appendix 2, for a representative view

Brunskill Road is located north east of the site, approximately 3.5km from the proposed quarry expansion. Viewing audiences along this road were observed to be relatively few in number given it being a local rural road and servicing a limited number of residential properties. From public vantage points along Brunskill Road, existing quarry operations are visible, with working faces of the consented quarry seen alongside the progressive hydroseeding of the disturbed areas.

From public locations and private residences the quarry remains as a legible element within the wider rural views. Pasture covered fields, shelterbelts and tree stands form much of the foreground and midground which give way to the rising topography and vegetated ridges interspersed with pasture areas that backdrop and sit in the context of the site.

The proposed Stage 1 works would increase the prominence of the quarry through its occupation on more elevated slopes near to the sequence ridges around the site. This would however be seen in the immediate context of existing quarry activities and elements within the view. Further, the majority of the works visible from this location would remain within the SMEZ zone and the quarry benches would be progressively hydroseeded as the works occur. The proposed ridge planting to the west of the quarry will also in time visually connect the two SNAs and assist in increasing the collective presence of these two vegetated areas in addition supporting the visible ridge observed between.

During Stage 2, whilst the extent of the quarry would further expand, from a number of locations (including that seen in Visual Simulation 2), much of the Stage 2 expansion will be obscured by intervening grass covered landforms. Where views are available, the extent of exposed quarry faces will be limited to the Stage 2 area, following hydroseeding and manuka / kanuka planting on the Stage 1 benches. This would overall, continue to limit the extent of active quarried areas within the views. Moreover, views from Brunskill Road are panoramic in nature, capturing wide angles of the surrounding rural context, and such change associated with the Project will form a small part of the overall view. With the above considered, any effects would be no more than **very low** for road users and **low** for residents during Stage 1. Effects are anticipated to be **very low** through Stage 2 for road users and residents.

7.3.3 Visual Effects from Oliver Road

Refer Visual Simulation 3, Appendix 2 for a representative view

Oliver Road is located north-east of the quarry expansion area. The most elevated portion of the road provides for views at distances of approximately 4.6km from the Project. Viewing audiences in this location are primarily limited to residents located in lifestyle blocks and farms. Road users are anticipated to be few in number given it is a no exit road, servicing a limited number of properties.

From this location, views are of the recent quarried faces associated with the consented quarry activities are visible. Progressive hydroseeding of these faces can also be seen in the upper most benches.

The proposed quarry expansion will be observed as an expansion to the existing quarry operations and be seen to visually extend between the two identified SNA's in addition to moving closer to the ridge. The quarry expansion area will appear nearly double in size than what is currently visible, however progressive hydroseeding of exposed cut faces will reduce the overall extent that is visible at one time. Planting along the ridge above the quarry will assist in reinforcing the prominence of the ridge as vegetation establishes, physically and visually linking the SNA's. Overall, whilst the proposed expansion will be a legible element in the view, it will remain consistent with the anticipated activities which form part of the view. Further the

panoramic views attained from locations similar to that illustrated, the proposal will form a small part of the overall view. With the above in mind, any adverse effects are anticipated to be no more than **low** during Stage 1 for residents and **very low** for road users.

Stage 2 works would be seen in the context of the hydroseeded and planted benches undertaken in Stage 1. In time, this would be seen to connect to the northern SNA in addition to the more established ridge planting, implemented at the beginning of Stage 1. Stage 2 benching would be progressively formed and involve the removal of a lower ridge just above the consented quarry footprint. Portions of this stage will be obscured behind an intervening landform and stand of vegetation. Progressive hydroseeding along with planting on the benches will reduce the extent of exposed quarry faces observed within the views. Similar to that described in Stage 1, views from these elevated positions are panoramic with wide viewing angles. The presence of the quarry forms an existing element and the works will occur in the immediate context of this established activity. Progressive hydroseeding along with vegetation on the benches will assist in reducing the overall prominence of the activity. With the above considered, any adverse effects through Stage 2 would be no greater than **very low** for residents and road users.

7.3.4 Visual Effects from Dunning Road

Refer Visual Simulation 4 and 5, Appendix 2 for a representative view

Views towards the site from along Dunning Road are variable, which include broadly open views towards the quarry, as well as views where intervening vegetation and topography intersect with the view. Where views are attained, given the relative close proximity from along Dunning Road, the prominent ridge which backdrops the site appears more dominant in the landscape, and the scale of quarry operations becomes more noticeable.

For the limited number of road users, due to the undulating terrain, views of the proposed expansion area will be brief but evident, given the relative proximity where they are visible. Consequently, a **low** adverse visual impact is expected for drivers on Dunning Road.

For private residences along Dunning Road (particularly 11, 15, 17, 109, 111 and 1/114 Dunning Road), the majority of the quarry expansion area and existing operations will be distinctly visible due to the viewing direction. The previously quarried faces have weathered over time, appearing more neutral in colour, which allows the terraced surfaces to blend with the landscape. However, the quarry expansion area will initially contrast with the darker green hues of the nearby SNA's and pasture covered hillsides, making it more visually prominent in the short term. Moreover, the extent of the quarry will clearly expand towards the ridgeline in addition the removal of lower slopes alongside the western SNA.

Ridge planting established in the early phases of the project will in time provide some visual containment of the quarry activities as they draw towards the crest, however this would not be apparent until such planting has become established (and discernible) along the ridge (after approximately 5 years). Progressive hydroseeding of quarried faces during Stage 1 will assist in reducing the overall prominence, although noting that for periods of time, freshly cut quarry faces will be clearly visible in these views. These include areas outside of the SMEZ, and will contribute to adverse effects up to **low-moderate** in the short term for residential viewing audiences along Dunning Road⁸. Notwithstanding this, the quarry is an established activity in the views from these locations and the residents of these properties could reasonably expect the quarry to continue to expand within the SMEZ, therefore there is some reduced sensitivity of

⁸ 11, 15, 17, 109, 111 and 1/114 Dunning Road

such activities being observed in the views. Over time, the hydroseeded quarry benches together with planting as well as the more established ridgeline planting will assist in the quarry's appearance to more readily blend into its surroundings. With the above considered, following the competition of Stage 1 (with mitigation measures now established), any effects will be **low** adverse.

During Stage 2, the quarry will extend down the lower slopes to the south west of the quarry to a similar elevation to that already observed in the consented scenarios, however the quarry footprint would move further into the landform and facilitate the removal of a low ridge and portion of a gully and associated SNA. This will mean that there will be an 'abrupt' edge to the quarry as it meets the SNA vegetation, much like that observed in the existing quarry to the north. Prior to the implementation of hydroseeding on the upper slopes of Stage 2, up to **low-moderate** effects would be experienced for residents in dwellings along Dunning Road⁹. Progressive hydroseeding of the slopes as the quarry takes shape, together with indigenous planting on the mid to upper benches will in time, assist in blending the edges of these differing landscapes. Together with more established planting on the Stage 1 benches along with ridge planting to contain the extent of the activity along the upper most reaches, will assist in managing adverse landscape effects. With the above in mind, effects during Stage 2 (following mitigation) would be no more than **low**.

7.3.5 Visual Effects from Whitehall Road

Refer Visual Simulation 6 and Model Views 7 - 14, Appendix 2 for representative views

Views from along Whitehall Road towards the quarry tend to be limited to locations immediately east and south east of the site. Many of these locations are however influenced by undulating landforms and roadside vegetation. To the north east along Whitehall Road, the quarry and proposed extension is largely blocked by the road's curves and topographic shifts in addition to intervening vegetation.

Where views are obtained (such as the view shown in Visual Simulation 6) from the eastern to southeastern stretch of Whitehall Road, landforms¹⁰ and vegetation along the southern part of Whitehall Road often interact with views and screen lower portions of the existing quarry. The upper weathered benches of the quarry can often be seen meeting the vegetated SNA areas to the north. The ridgeline behind the site forms the termination of the view which is defined by the SNA's and pasture covered slopes.

Following on from the consented extent of the quarry, Stage 1 will signalise a further expansion of the quarried benches across the south facing slopes of the hillside. The quarry will be seen to extend further along the hillside as well as toward the ridgeline between the SNA's. From locations along Whitehall Road, planting along the ridge above the quarry will assist in visually softening a perceived 'abrupt' termination of the activity. Initially, the recently cut faces of the expansion area will contrast with the weathered surfaces of the existing quarry and surrounding darker hues of the neighbouring SNA's. Hydroseeding progressively applied will however assist in gradually reducing the prominence of the benches, together with the implementation of planting along the Stage 1 benches. Through Stage 2, the quarry will be seen to expand further along the hillside whilst in the context of the Stage 1 portion of the project where mitigation has been established. Therefore, whilst the quarry landscape will expand further within the view, the hydroseeding and planting will manage the extent of exposed cut faces that are revealed at any

⁹ 11, 15, 17, 109, 111 and 1/114 Dunning Road

¹⁰ on occasion including the OBDA currently taking shape

one time. For road users passing the site, it is anticipated that any effects would range between **low** and **very low** during Stage 1 or Stage 2 of the project.

Residential viewing audiences along Whitehall Road will obtain fixed views towards the site. Through reviewing the visibility analysis and undertaking the site visit, a number of residents have been identified along Whitehall Road which are impacted by the project. These include 1/207, 2/207, 103, 57, 2/159, 178, 196 and 3/207 Whitehall Road. Some residents along Whitehall Road however will not observe any change to their view due to intervening topography and vegetation (for example 308 Whitehall Road).

Potentially impacted dwellings along Whitehall Road are located away from the road where representative views could not be obtained, therefore 3D model views have been prepared. These include 2/207, 1/207, 103 and 57, 3/207, 196, 178 and 2/159 Whitehall Road and are illustrated in Appendix 2, MV7 to 14. These model views assist to understand the position of the dwellings within the landscape and the potential nature of their views, including how landform and vegetation may interact with their overall outlooks.

1/207 and 2/207 Whitehall Road

Refer Appendix 2, MV7 and 8 for representative views

Residential viewing audiences at 1/207 and 2/207, have comparable outlooks due to their proximities, elevation and direction of view. Both residences are positioned within a rural/ lifestyle lot setting featuring pasture slopes with large tree stands and are located less than 1km from the proposed quarry extension. Established vegetation surrounds both residential properties and interacts with views by filtering, but unlikely fully screening, the outlook towards the existing quarry activities. Trees lining margins of both sides of the Waiaurumu Stream together with a previously completed overburden landform to the south east of the quarry also interact with the low portions of the existing quarry benches.

During Stage 1, partial/ filtered views towards the quarry from these dwellings will be captured and benching in the upper slopes of the hillside will become visible. Whilst this will be seen as an extension to existing quarry activities, the project would occur at a greater elevation to that previously considered and will be observed in close proximity to the ridge and on hillside slopes containing some tree stands. A portion of this most elevated area of the works will be outside of the SMEZ and within the sensitive hillside overlay. This will likely be the most visible portion of the project during Stage 1 for these viewing audiences. Ridgeline planting toward the end of Stage 1 will assist in strengthening the visual presence of the ridge, however in the early stages of Stage 1 when ridgeline planting has yet to establish, and exposed cut benches have yet to be hydroseeded, effects will be **moderate** adverse. Following establishment of hydroseeding (approximately 1 month following earthworks season) of these upper benches during Stage 1, effects would reduce to **low-moderate** for these residential viewing audiences at 1/207 and 2/207 Whitehall Road.

Stage 2 works would occur in a similar line of sight to Stage 1, with Stage 2 essentially being observed in front of previous works. The upper reaches of Stage 2 are also located beyond the SMEZ but beyond the sensitive hillside country overlay, occurring at a lower minor ridge. Works will however be visible for residential viewing audiences at 1/207 and 2/207 (albeit potentially filtered through vegetation surrounding the dwellings). During Stage 2, hydroseeding will remain established on the Stage 1 slopes together with planting on the benches. Ridge planting including Kanuka will have become more established through the approximate 15 year duration of Stage 1. Therefore, the extent of exposed cut faces and quarry activities will be limited to the Stage 2 area. Prior to hydroseeding and planting on the benches within Stage 2, the exposed

cut faces, particularly those outside of the SMEZ, will contrast with the neighbouring SNA bush to the left of the view and will result in effects considered as **moderate** adverse. Following hydroseeding and planting the Stage 2 cut faces will appear more visually absorbed within the view. Stage 1 bench planting, together with the now well established ridge planting will assist in reducing these adverse effects to **low-moderate**.

103 Whitehall Road

Refer Appendix 2, MV9 for representative views

Residential Viewing Audiences at 103 Whitehall Road will obtain views with a similar orientation to those described for 1/207 and 2/207 Whitehall Road. However, the topography gradually rises in front of the dwelling and together with an established native tree stand on the northern slopes of this rising topography, views towards the site are more limited. From this location, the ridgeline and upper slopes of the sensitive hillside country overlay provides the backdrop of the view. The uppermost portion of works within Stage 1 will become visible, including an area within the SMEZ as well as the area outside of the SMEZ, however, these will form a small portion of the overall view. The most apparent period during Stage 1 will be before hydroseeding is progressively established on the upper slopes. It is during this time, the cut faces will visually contrast with the neighbouring SNA's. It is however acknowledged that portions of the observed quarry will be within the SMEZ and as such, if quarrying activities are currently not seen from this property, there is some degree of anticipation that quarry activities could form part of the view. Moreover, the extent of the project that will be visible will be limited and therefore before hydroseeding is established in Stage 1, any effects would be no more than **low-moderate**.

Stage 2 works are unlikely to be visible from this property due to the rising landform in the foreground of the view, together with established indigenous vegetation which reaches the crest of this landform. Therefore, during Stage 2, the established hydroseeding on Stage 1, together with quarry bench planting will become more legible and contribute to the pasture and vegetated hill slopes seen in the wider view. In combination with the more established ridge planting above the Stage 1 quarry slopes, any effects will reduce to **very low** during Stage 2.

57 Whitehall Road

Refer Appendix 3, MV10 for representative views

Views from 57 Whitehall Road are at a more southern location than those previously described. This means that the proposed works within Stage 1 and Stage 2, beyond the SMEZ and within the sensitive hillside country overlay, will not be discernible as they occur beyond the remaining landform to the south of the site. The outlook will therefore be orientated across the rural landscape toward the exiting quarry. Observable works within Stage 1 would be seen to expand on this existing activity resulting in the quarry operations becoming more prominent. Notwithstanding this, as the observable portions of the project will be within the SMEZ, there is some anticipation that this activity will occur within this area. Moreover, progressive hydroseeding and planting on the benches will in time reduce the prominence of these activities. With the above in mind, any effects would be no greater than **low**, reducing to **very low** following the establishment of hydroseeding and manuka/ kanuka quarry bench planting.

2/159, 178, 196 and 3/207 Whitehall Road

Refer Appendix 3, MV11-14 for representative views

This group of viewing audiences are broadly located in proximity to one another and will share a similar direction of view towards the project. Viewing audiences at 2/159, 178 and 196 are slightly more elevated than those at 3/207. From 178, 196 and 3/207, the OBDA landform intersects with the mid to lower slopes of the existing quarry, whereby from 2/159 which is more to the south, the OBDA is more offset/ to the side of the quarry faces. From all locations where views are obtained, the prominent ridge backdrop together with the adjoining SNA's forms a dominant element in the view.

Building on the previously approved quarry boundaries, Stage 1 will be observed as a further expansion of quarrying activities across the southern slopes of the hillside, albeit with a portion extending beyond the SMEZ. This phase will extend the quarry along the hillside and toward the ridgeline between the SNAs. Planting along the ridge above the quarry will help to soften the visual impact of an otherwise abrupt end to the excavation. Initially, the freshly cut faces in the expansion area will stand out against the weathered surfaces of the existing quarry and the darker tones of the neighbouring SNAs. However, progressive hydroseeding will help reduce the prominence of these new benches over time, along with additional planting on the Stage 1 benches. Until hydroseeding is established, effects would be up to **moderate** for these viewing audiences, reducing to **low-moderate** once hydroseeding has established.

In Stage 2, the quarry will continue to extend along the hillside, but with established mitigation from Stage 1 also forming part of the outlook, thereby limiting the extent of exposed cut faces being visible at one time. During Stage 2, prior to the application of hydroseeding, effects would be up to **low-moderate**, reducing to **low** once successful hydroseeding and quarry bench planting has established.

7.3.6 Summary of Visual Effects

As established above, quarry activities within the site form a legible feature in most views for the surrounding viewing audiences. The project will expand upon this established activity although it will impact areas outside of the SMEZ as well as the Sensitive Hill Country Overlay. Mitigation measures applied across both stages will assist in reducing the prominence of the quarry and impacts on the landscape values (including the sensitive hill country overlay) of the views, however it is acknowledged that for some residents with fixed views, effects up to **moderate** are anticipated until hydroseeding is established.

Table 1: Adverse Visual Effects Summary

Viewing Audience	Stage 1 – Prior to hydroseeding and quarry bench planting	Stage 1 – Following hydroseeding and quarry bench planting	Stage 2 – Prior to hydroseeding and quarry bench planting	Stage 2 – Following hydroseeding and quarry bench planting
French Pass Road – Road users	Low	Very Low	Low	Very Low
French Pass Road – Residents	Low	Very Low	Low	Very Low
Brunskill Road – Road users	Very Low	Very Low	Very Low	Very Low

Brunskill Road – Residents	Low	Very Low	Very Low	Very Low
Oliver Road – Road users	Very Low	Very Low	Very Low	Very Low
Oliver Road – Residents	Low	Very Low	Very Low	Very Low
Dunning Road – Road users	Low	Very Low	Low	Very Low
Dunning Road – Residents	Low-moderate	Low	Low-moderate	Low
Whitehall Road – Road users	Low	Very Low	Low	Very Low
1/207 and 2/207 Whitehall Road – Residents	Moderate	Low-Moderate	Moderate	Low-Moderate
103 Whitehall Road – Residents	Low-Moderate	Low	Very Low	Very Low
57 Whitehall Road – Residents	Low	Very Low	Very Low	Very Low
2/159, 178, 3/207 and 196 Whitehall Road – Residents	Moderate	Low-Moderate	Low-Moderate	Low

According to the methodology in Appendix 1 to this report, in RMA terms:

- the following residents are likely to experience temporary visual effects that are ‘minor’ in nature 808 French Pass Road; and
- the following residents are likely to experience temporary visual effects that are ‘more than minor’ in nature: 11, 15, 17, 109, 111 and 1/114 Dunning Road, 1/207 and 2/207, 103, 2/159, 178, 196 and 3/207 Whitehall Road

In time these effects will reduce and the project staging (and therefore staging of mitigation measures) will reduce the extent of exposed quarry faces and associated quarrying activities within the views.

- the following residents are likely to experience permanent visual effects that are ‘minor’ in nature 11, 15, 17, 109, 111 and 1/114 Dunning Road, 2/159, 178, 3/207 and 196 Whitehall Road; and
- the following residents are likely to experience permanent visual effects that are ‘more than minor’ in nature: 1/207 and 2/207 Whitehall Road

8.0 Conclusion

The proposal consists of expanding the Whitehall Quarry pit by 15.5 ha to the west of the existing quarry footprint which is located at 249 and 253 Whitehall Road within the Waipā District. The Site is located across three land parcels which collectively are approximately 280ha in area. The proposed quarry expansion area is predominately located within SMEZ under the Plan and contains several pockets of indigenous forests identified as SNAs. However, it does extend marginally into the Rural Zone and within a small portion of the Visually Sensitive Hill Country overlay.

In terms of landscape effects, the quarry expansion area will involve permanent removal of current hillside topography and in time create a terraced hillside, therefore changing the physical characteristics (gullies and hillslopes) of this portion of the Site. In particular, this will impact on the sensitive hill country overlay.

However, the legibility of the wider ridge landform (upper extent) will remain and will be supported by ridge planting to assist in reinforcing its prominence. Removed SNA vegetation which typically occurs within the SMEZ, will be mitigated through enhancement planting in the balance of the site in addition to proposed ridge planting behind the quarry. As a result of the quarry expansion area, landscape effects are considered to be **low** adverse.

In relation to natural character, where effects on wetlands and watercourses and their margins will occur, it is recognised that these areas within the SMEZ zone. Accepting that the removal of these features is an inevitable consequence of quarry activities, effects are anticipated to be **low-moderate**. Mitigation achieved through protecting and planting up of identified wetlands and watercourses in the wider site will however result in some beneficial effects.

In terms of visual effects, for road users along Whitehall Road, Dunning Road, Oliver Road, Brunskill Road and French Pass Road, effects will be no more than **low** through the duration of the quarry. Landform and vegetation interact with these moving views which would mean that views are glimpsed, partial and often seen in the context of the existing quarry.

In relation to residential viewing audiences, effects will be more elevated due to the fixed views attained from dwellings. Notwithstanding this, many residents in the catchment will not observe discernible change from their dwellings. Further, for those that do observe change, whilst portions of the quarry will appear outside of the SMEZ, this change will often be seen in the immediate context of the working quarry environment. The greatest effects will be during Stage 1 and 2 before mitigation has been established. Most notably, exposed cut faces on elevated slopes will contribute to generating adverse effects. The most adverse effects during Stage 1 prior to mitigation being established will be **low-moderate**¹¹, and **Moderate**¹². This would however reduce once hydroseeding has greened the benches (within one month of application), particularly the uppermost portions. During Stage 2, exposed cut benches will again elevate effects, with the most adverse effects being **Moderate**¹³ to **Low-moderate**¹⁴. Overtime

¹¹ Residents at 11, 15, 17, 109, 111 and 1/114 Dunning Road and 103 Whitehall Road

¹² Residents at 1/207, 2/207, 3/207, 2/159, 196 and 178 and Whitehall Road

¹³ Residents at 1/207, 2/207 Whitehall Road

¹⁴ Residents at 1, 15, 17, 109, 111 and 1/114 Dunning Road and 1/207, 2/207, 3/207, 2/159, and 178 and 196 Whitehall Road

mitigation will visually soften the quarry and together with the proposed ridge planting the quarry will become more integrated with the landscape.

Appendix 1: Methodology Statement

22 November 2023

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 (where possible) and describe the nature and extent of engagement, together with any relevant sources 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. The level of effect has not been quantified where the nature of effect is neutral or beneficial. 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.

VERY LOW	LOW	LOW-MOD	MODERATE	MOD-HIGH	HIGH	VERY HIGH
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Landscape Effects

A landscape effect relates to the change on a landscape’s character and its inherent values and in the context of what change can be anticipated in that landscape in relation to relevant zoning and policy. The level of effect is influenced by the size or spatial scale, geographical extent, duration and reversibility of landscape change on the characteristics and values 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 from where the proposal may be visible from, 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 and backdrop, as well as the potential change that could be anticipated in the view as a result of zone / policy provisions of relevant statutory plans.

Natural Character Effects

Natural Character, under the RMA, specifically relates to ‘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 only involves examining the proposed changes to natural elements, patterns and process which may occur in relevant landscape / seascape contexts.

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, hydrology, marine, freshwater, and terrestrial ecology as well as input from tāngata whenua. An understanding of

natural character considers the level of naturalness and essentially reflects the current condition of the environment assessed in relation to the seven-point scale. A higher level of natural character means the waterbody and/or margin is less modified and vice versa.

A natural character effect is a change to the current condition of parts of the environment where natural character occurs. Change can be negative or positive. The resultant natural character effect 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 proposal); and
- Determine the overall level of effect based on the consequence of change.



The Significance of Effects

Decision makers assessing resource consent applications must evaluate if the effect on individuals or the environment is less than minor¹⁵ or if an adverse effect on the environment is no more than minor¹⁶. For non-complying activities, consent can only be granted if the s104D 'gateway test' is satisfied, ensuring adverse effects are minor or align with planning objectives. In these situations, the assessment may be required to translate the level of effect in terms of RMA terminology.

This assessment has adopted the following scale applied to relevant RMA circumstances¹⁷ (refer to diagram below), acknowledging low and very low adverse effects generally equate to 'less than minor' and high / very high effects generally equate to significant¹⁸.

						SIGNIFICANT	
LESS THAN MINOR		MINOR		MORE THAN MINOR			
VERY LOW	LOW	LOW-MOD	MODERATE	MOD-HIGH	HIGH	VERY HIGH	

¹⁵ RMA, Section 95E

¹⁶ RMA, Section 95E

¹⁷ Seven-point level of effect scale. Source: Te tangi a te Manu, Pg. 15

¹⁸ The term 'significant adverse effects' applies to specific RMA situations, including the consideration of alternatives for Notices of Requirement and AEEs, as well as assessing natural character effects under the NZ Coastal Policy Statement.

Appendix 2: Graphic Supplement

APPENDIX 2

WHITEHALL QUARRY EXPANSION

GRAPHIC SUPPLEMENT

JUNE 2025



Whitehall Quarry Expansion



MAPS

FIGURE 1:	Site Context	FIGURE 6:	Staging Plan
FIGURE 2:	Location Map	FIGURE 7:	Visibility Analysis
FIGURE 3:	Elevation Map	FIGURE 8:	Visibility Comparison
FIGURE 4:	Statutory Context - Zoning	FIGURE 9:	Landscape Mitigation Plan
FIGURE 5:	Statutory Context - Overlays		

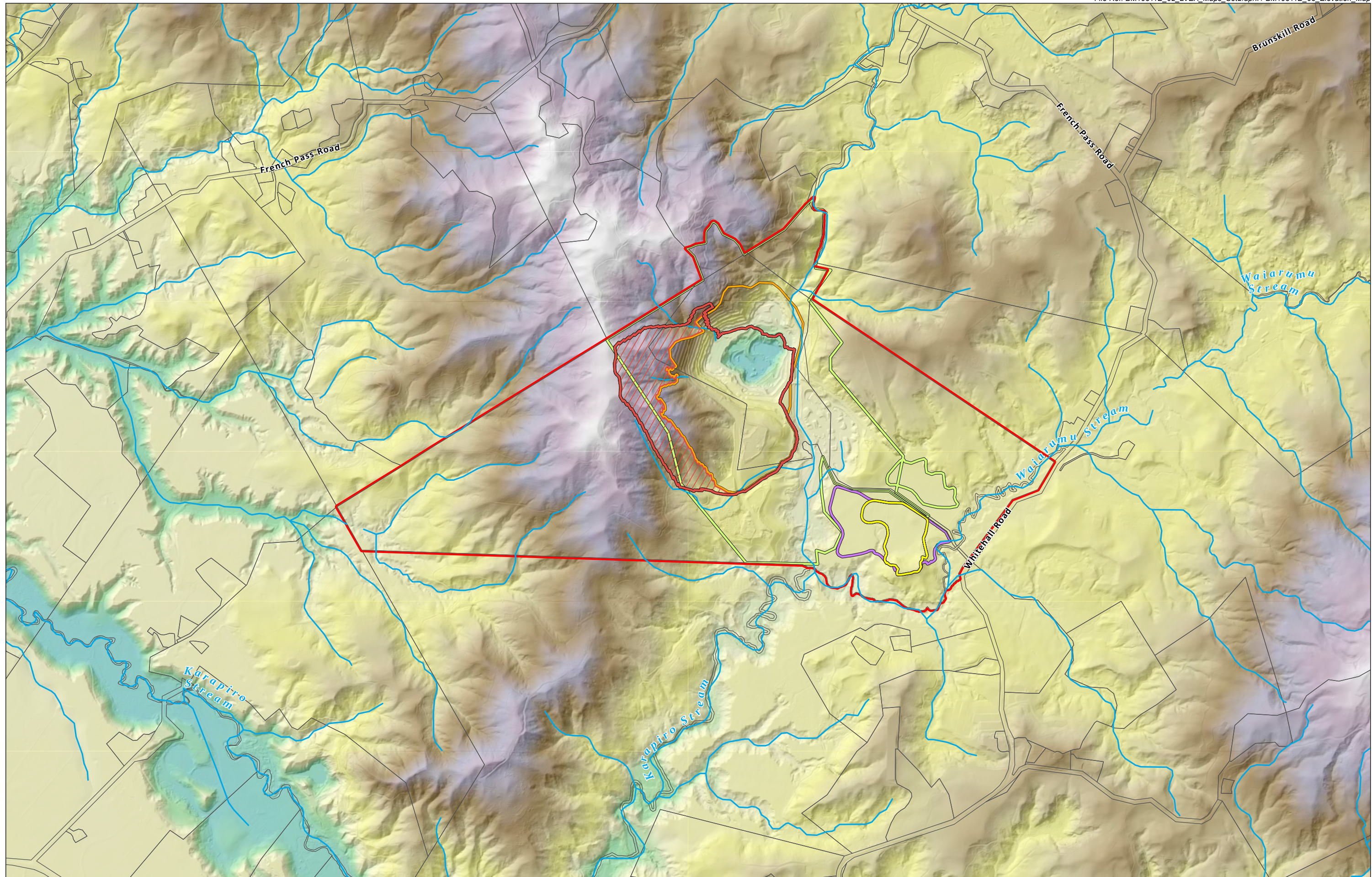
VISUAL SIMULATIONS AND MODEL VIEWS

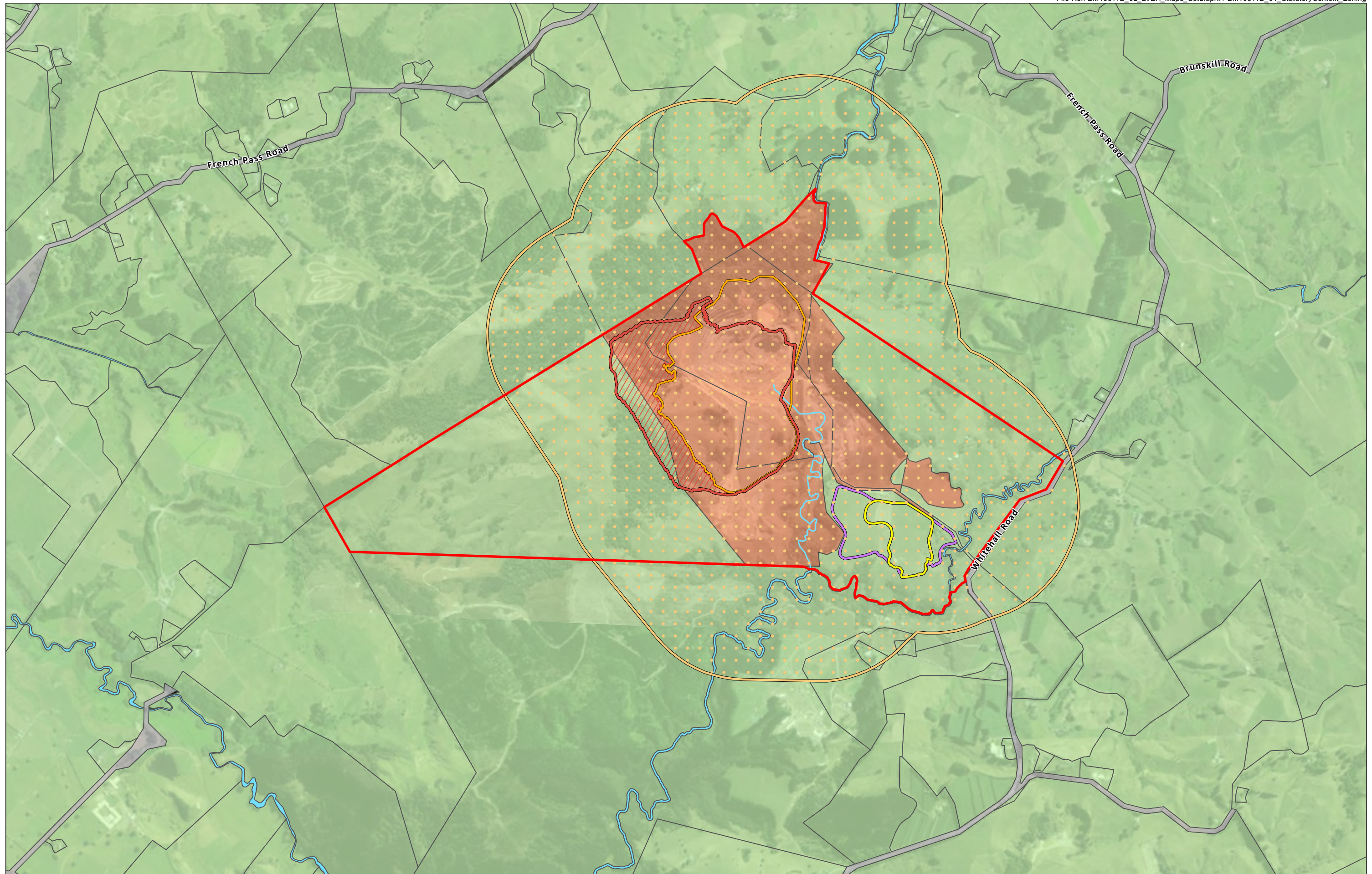
VS 1A:	View from French Pass Road (Existing View)		
VS 1B:	View from French Pass Road (Consented Environment)		
VS 1C:	View from French Pass Road (Proposed expansion following mitigation applied during Stage 1)		
VS 1D:	View from French Pass Road (Proposed expansion following mitigation applied during Stage 2)		
VP 2:	View from Brunskill Road (Existing View)		
VS 3A:	View from Oliver Road (Existing View)		
VS 3B:	View from Oliver Road (Consented Environment)		
VS 3C:	View from Oliver Road (Proposed expansion following mitigation applied during Stage 1)		
VS 3D:	View from Oliver Road (Proposed expansion following mitigation applied during Stage 2)		
VS 4A:	View from Dunning Rd (Existing View)		
VS 4B:	View from Dunning Rd (Consented Environment)		
VS 4C:	View from Dunning Rd (Proposed expansion following mitigation applied during Stage 1)		
VS 4D:	View from Dunning Rd (Proposed expansion following mitigation applied during Stage 2)		
VS 5A:	View from Dunning Rd (Existing View)		
VS 5B:	View from Dunning Rd (Consented Environment)		
VS 5C:	View from Dunning Rd (Proposed expansion following mitigation applied during Stage 1)		
VS 5D:	View from Dunning Rd (Proposed expansion following mitigation applied during Stage 2)		
VS 6A:	View from Whitehall Road (Existing View)		
VS 6B:	View from Whitehall Road (Consented Environment)		
VS 6C:	View from Whitehall Road (Proposed expansion following mitigation applied during Stage 1)		
VS 6D:	View from Whitehall Road (Proposed expansion following mitigation applied during Stage 2)		
MV 7:	3D Model View 07	MV 11:	3D Model View 11
MV 8:	3D Model View 08	MV 12:	3D Model View 12
MV 9:	3D Model View 09	MV 13:	3D Model View 13
MV 10:	3D Model View 10	MV 14:	3D Model View 14

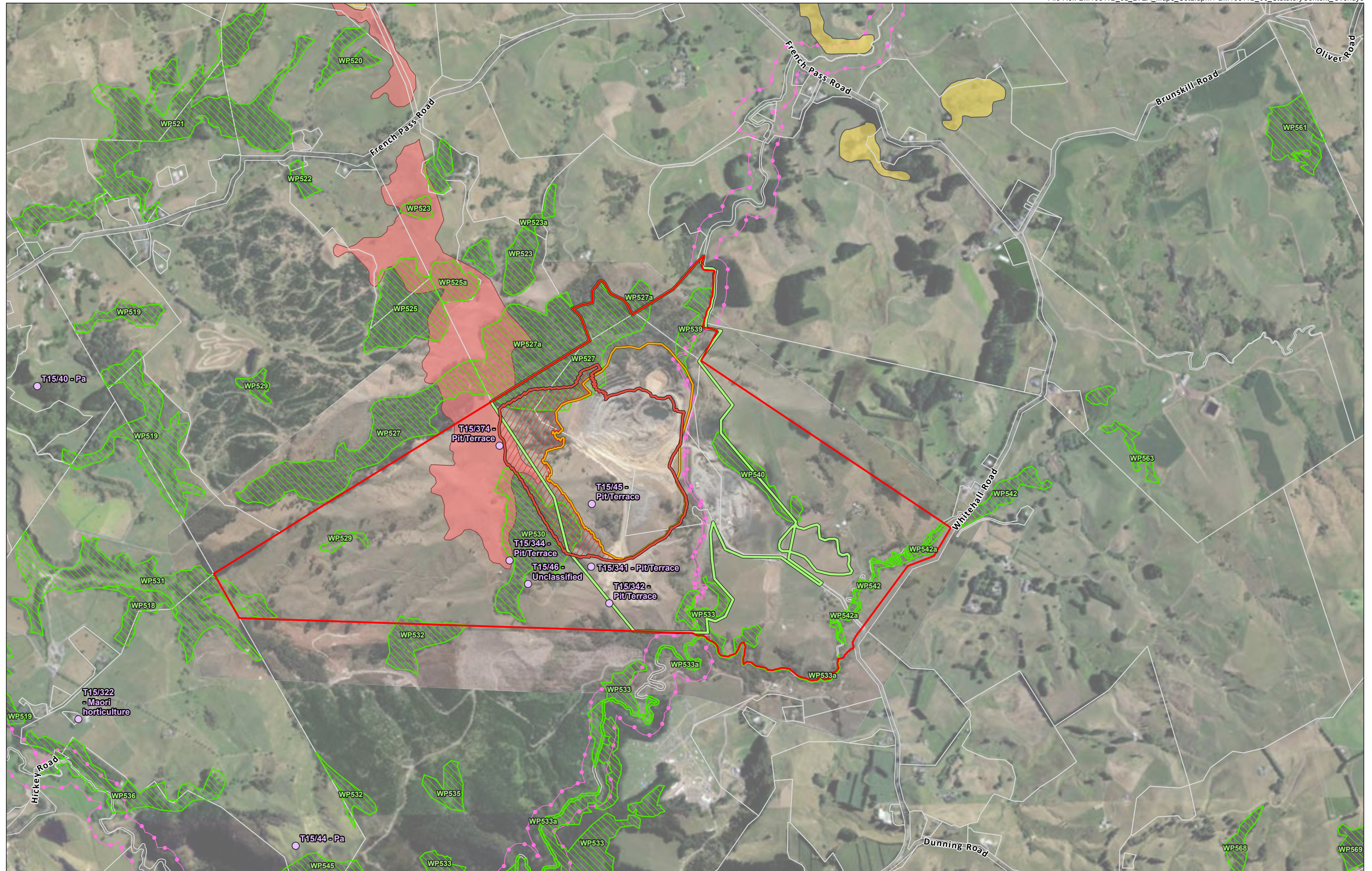
FIGURE 10:	Visual Simulations - Methodology
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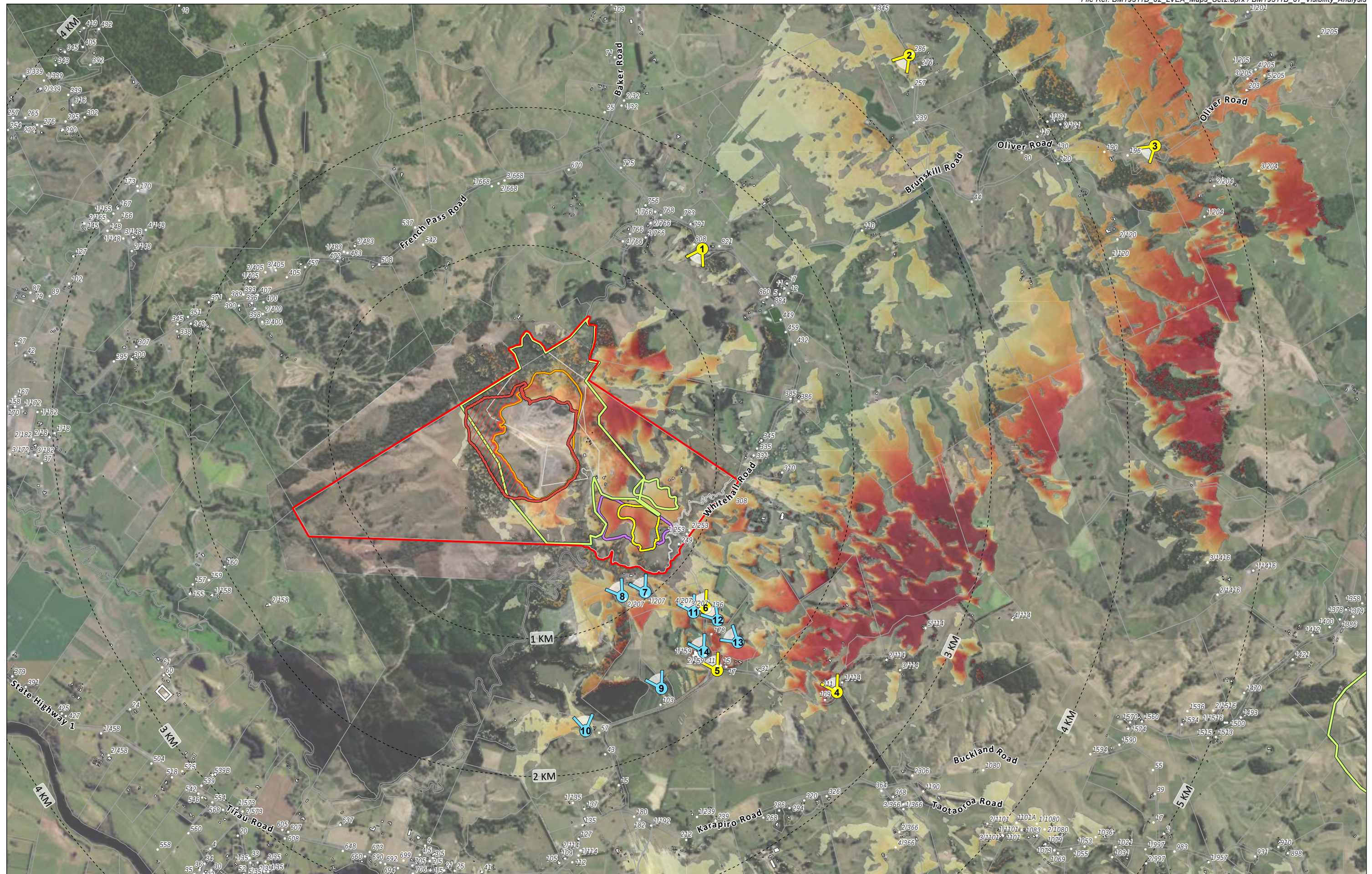


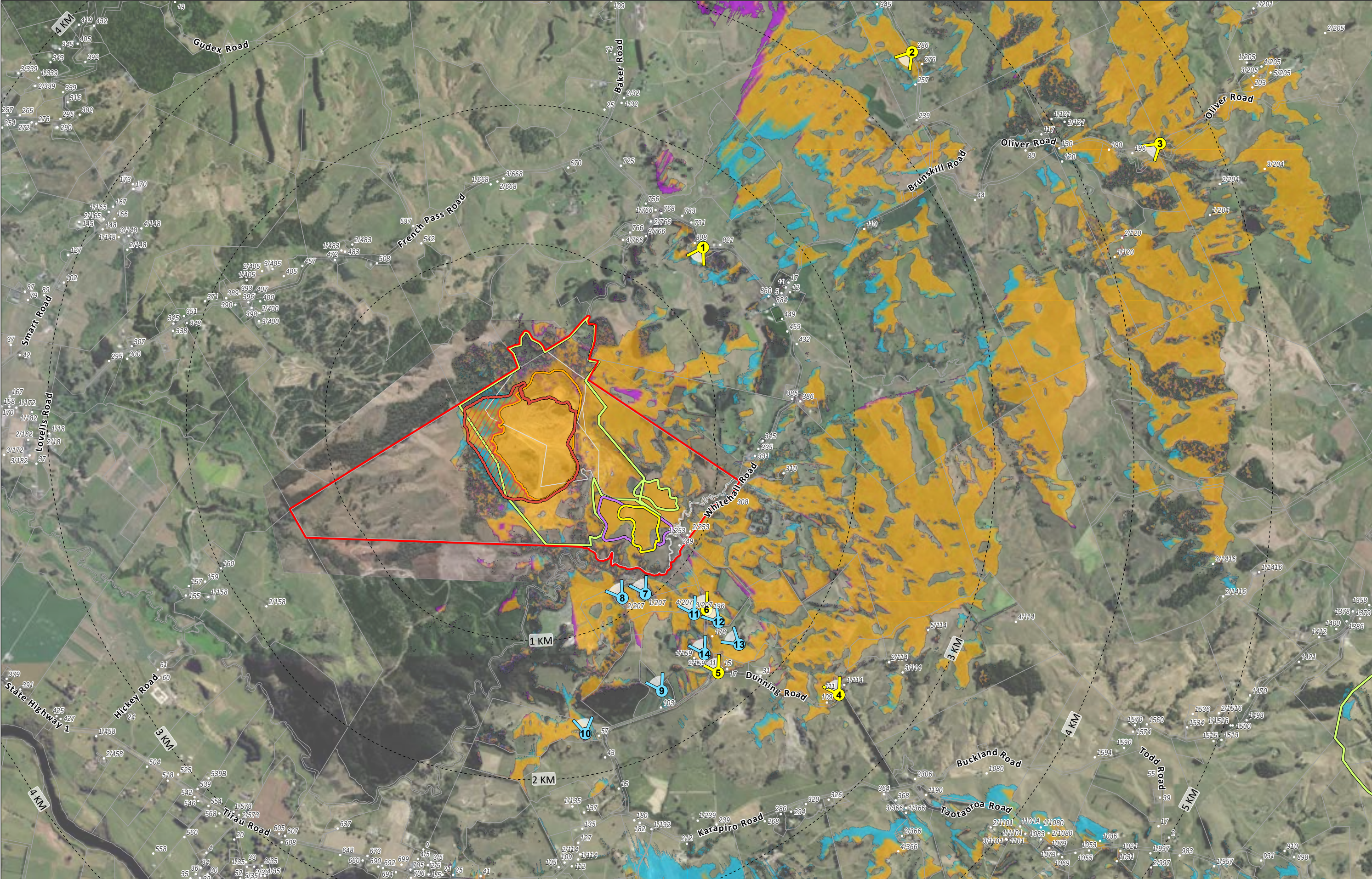




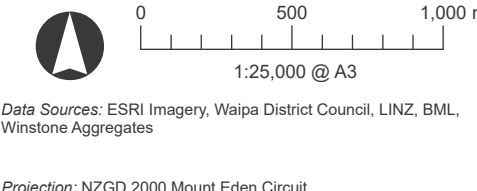




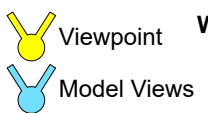




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- LEGEND**
- Site Boundary
 - Proposed Long Term Expansion Area
 - Long Term Expansion Footprint
 - Consented Stage 1 OBDA
 - Consented Stage 2 OBDA
 - Existing Consented Quarry
 - Significant Mineral Extraction Zone (SMEZ)
 - Visibility Comparison
 - Consented Only
 - Consented & Long Term (Common)
 - Long Term Only



WHITEHALL QUARRY EXPANSION, WAIPA
Visibility Comparison
Date: 06 June 2025 | Revision: 0
Plan prepared by Boffa Miskell Limited
Project Manager: Tom.Lines@boffamiskell.co.nz | Drawn: SGA | Checked: TLI





View from French Pass Road



View from French Pass Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from French Pass Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from French Pass Road



View from Brunskill Road



View from Oliver Road



View from Oliver Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Oliver Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Oliver Road



View from Dunning Road



View from Dunning Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Dunning Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Dunning Road

NZTM Easting : 1 826 700 mE
NZTM Northing : 5 801 834 mN
Elevation/Eye Height : 175m / 1.7m
Date of Photography : 6 September 2024

Horizontal Field of View : 40°
Vertical Field of View : 25°
Projection : NA
Image Reading Distance @ A3 is 50 cm



View from Dunning Road



View from Dunning Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Dunning Road



Visually Sensitive Hill Country Significant Mineral Extraction Zone

View from Dunning Road



Existing View



Consented Environment



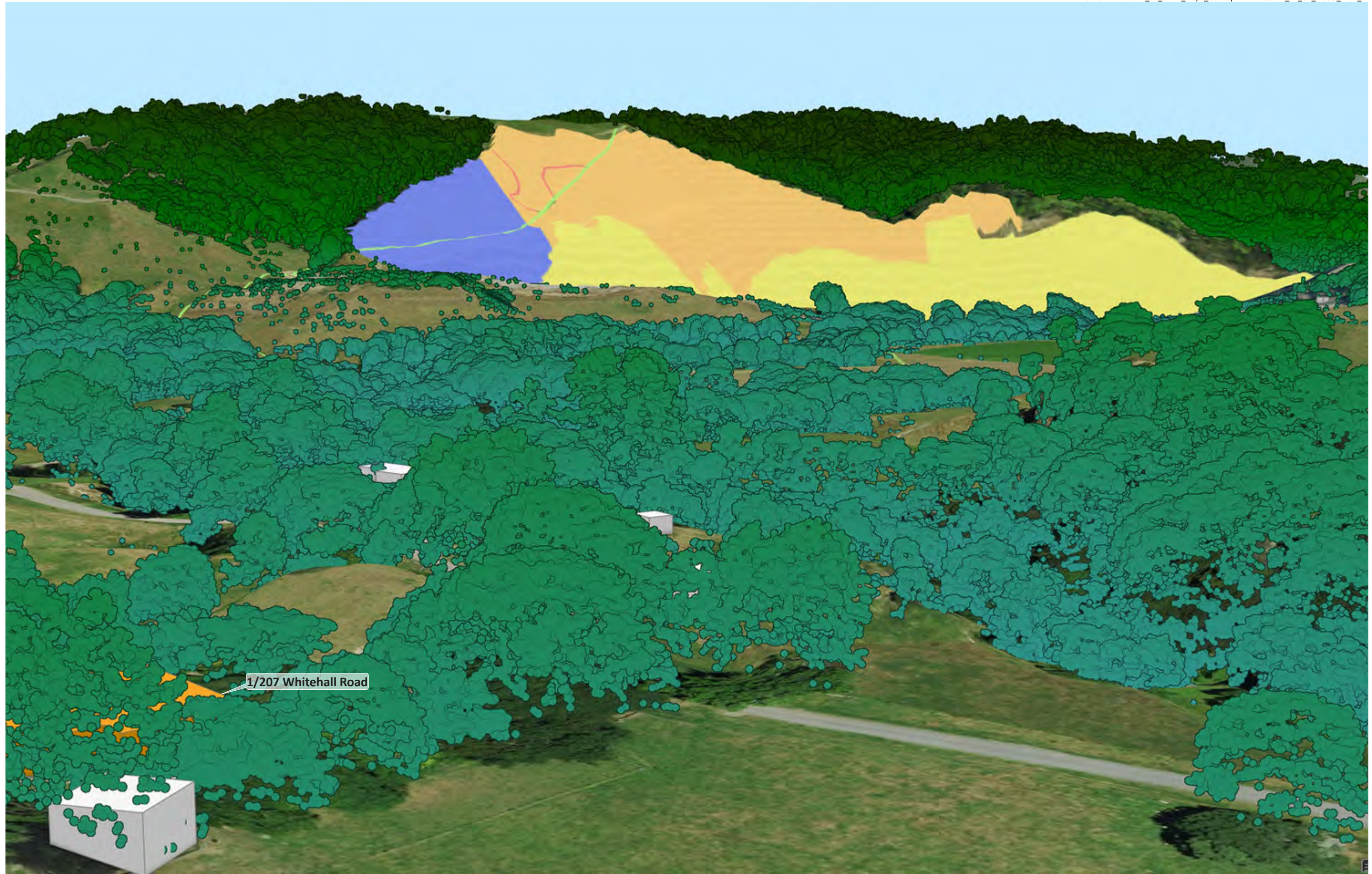
Proposed Expansion following mitigation applied during Stage 1

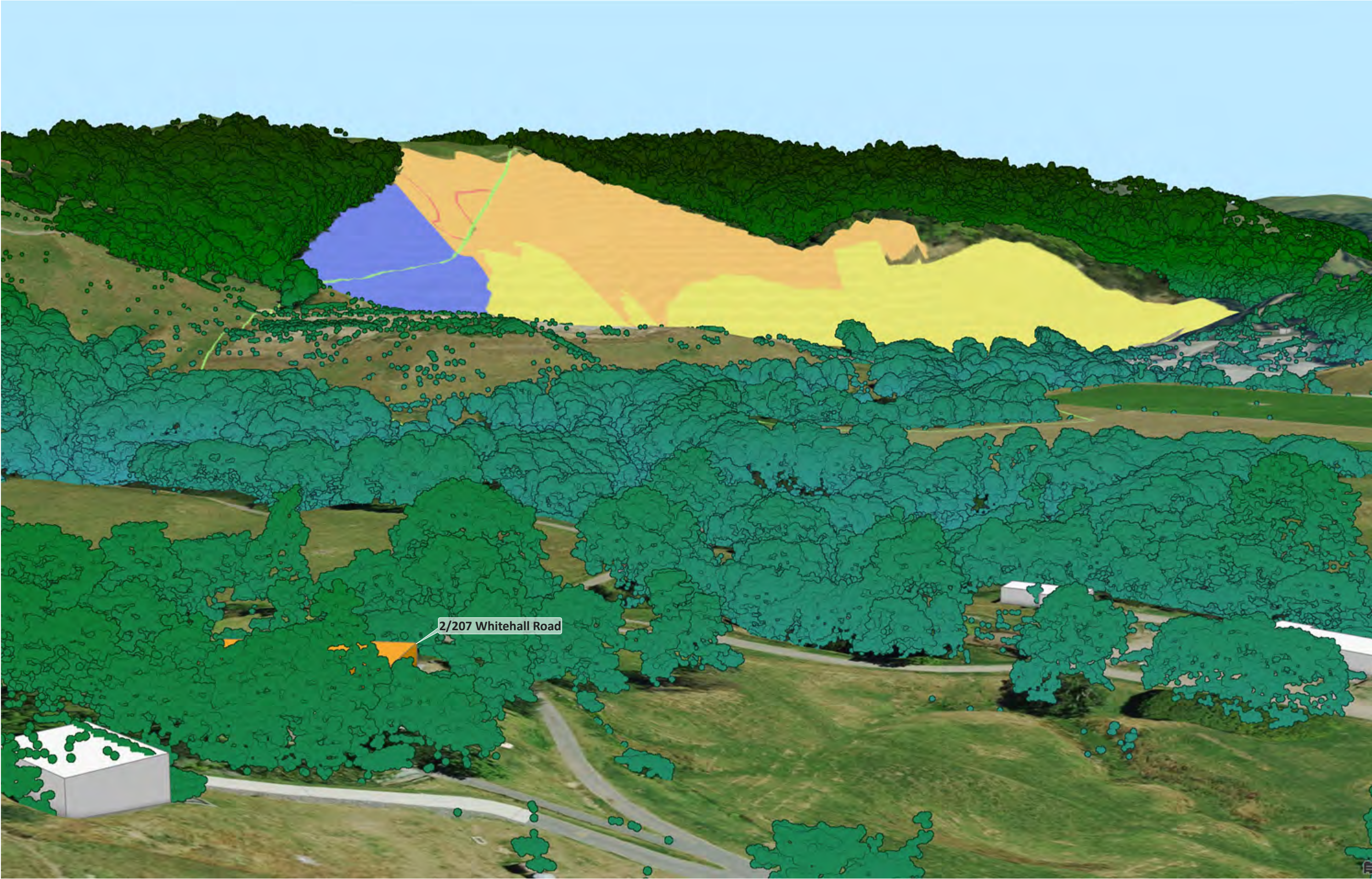
Visually Sensitive Hill Country Significant Mineral Extraction Zone

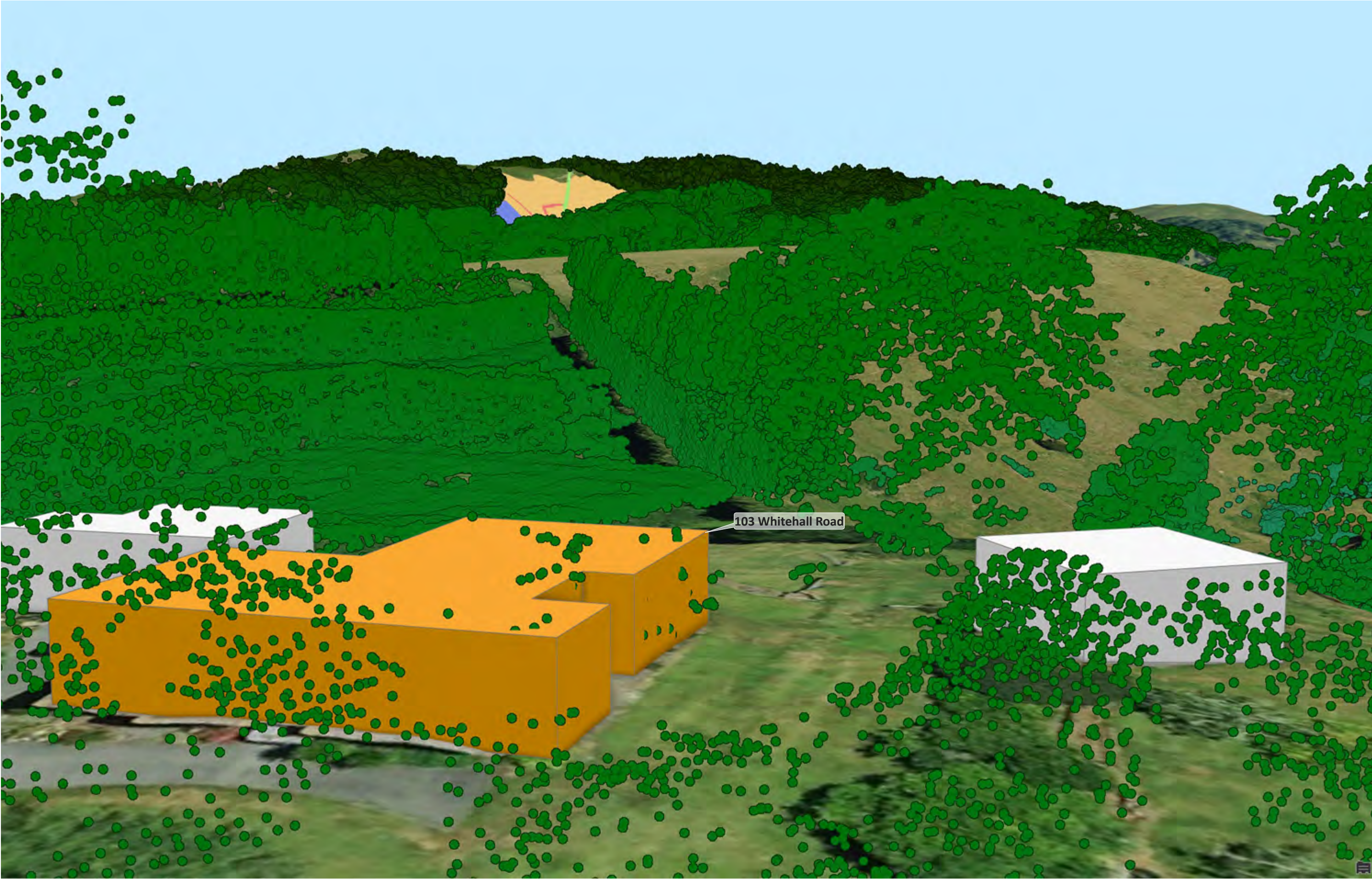


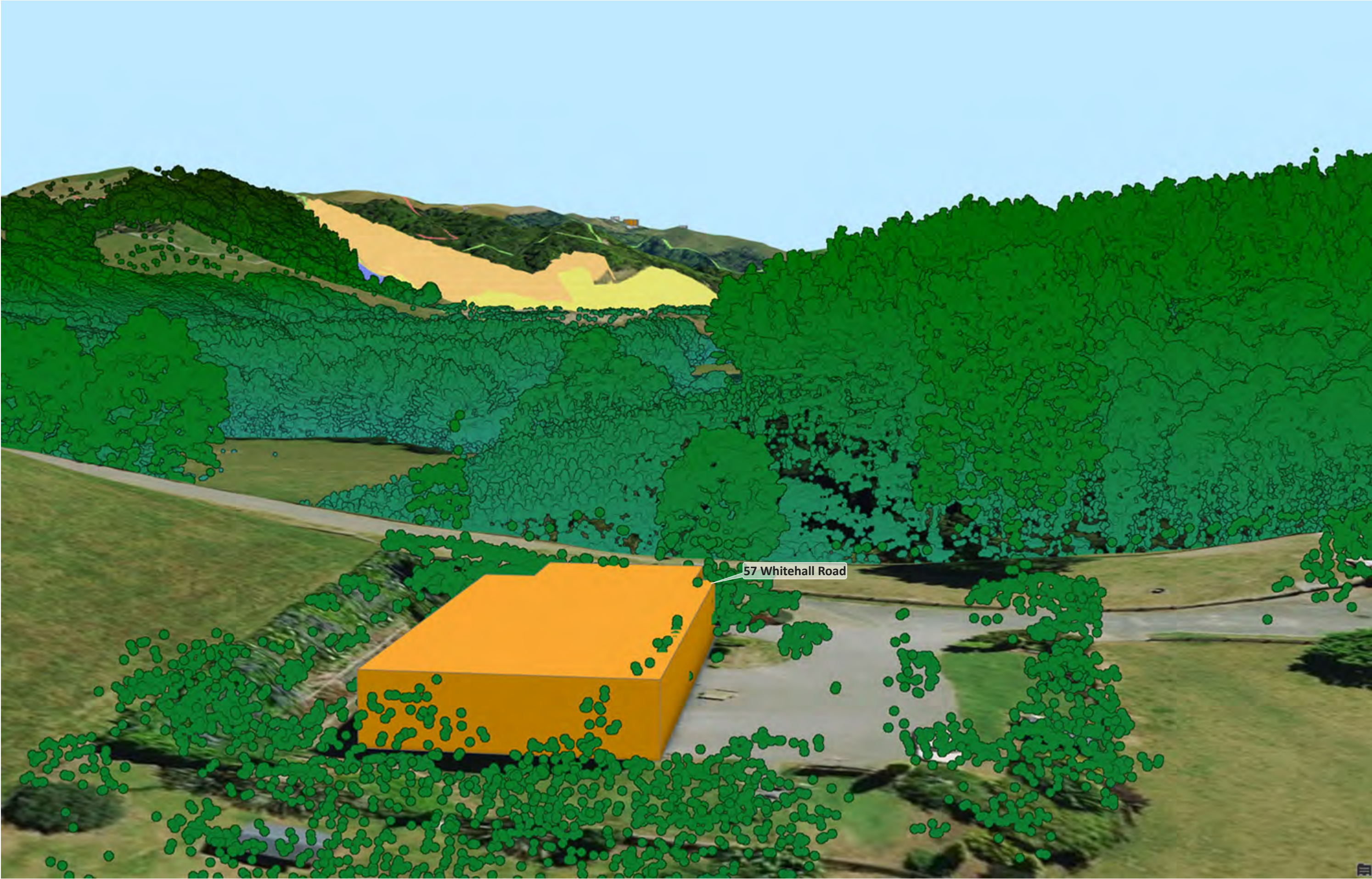
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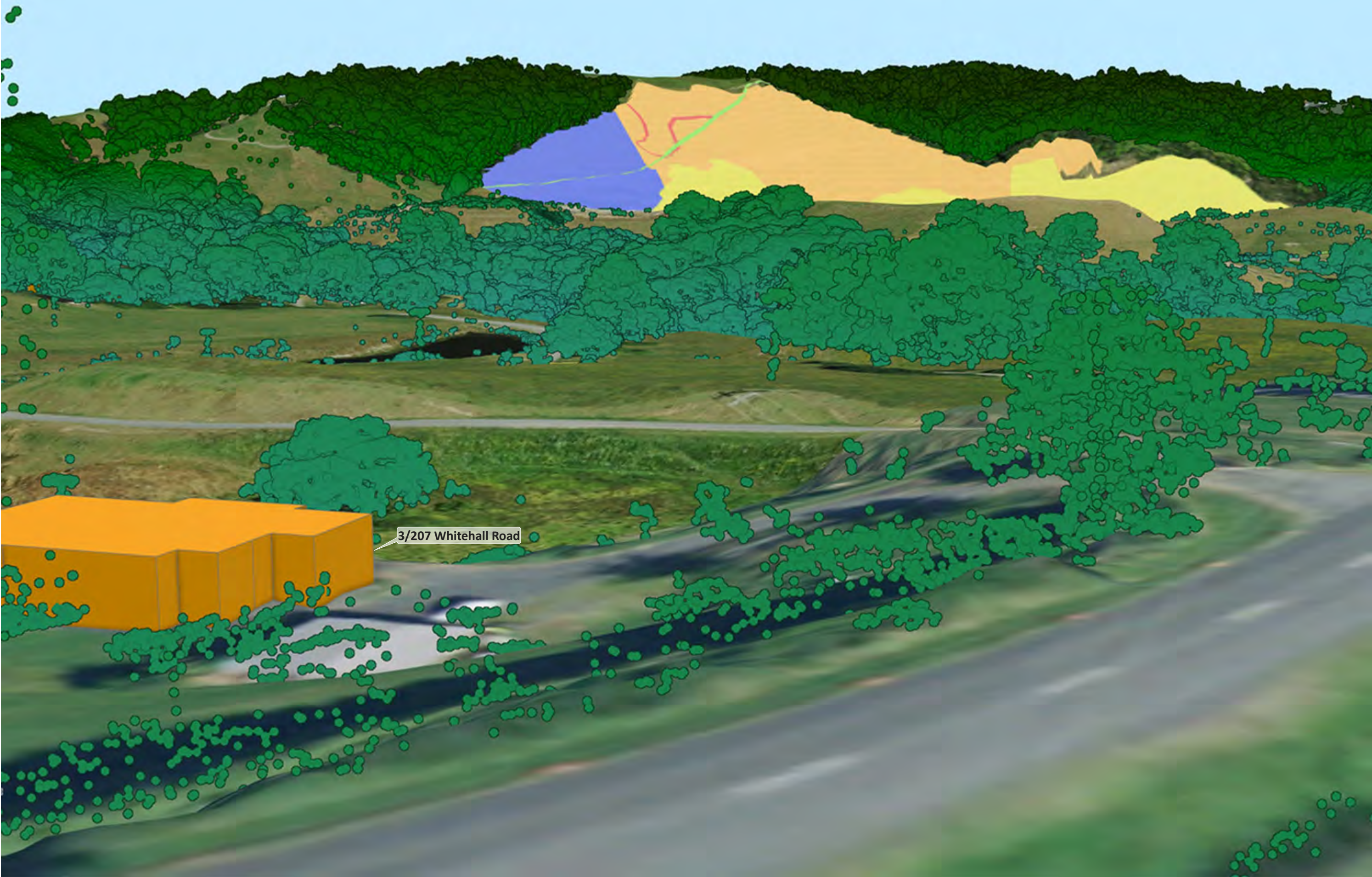
Visually Sensitive Hill Country Significant Mineral Extraction Zone

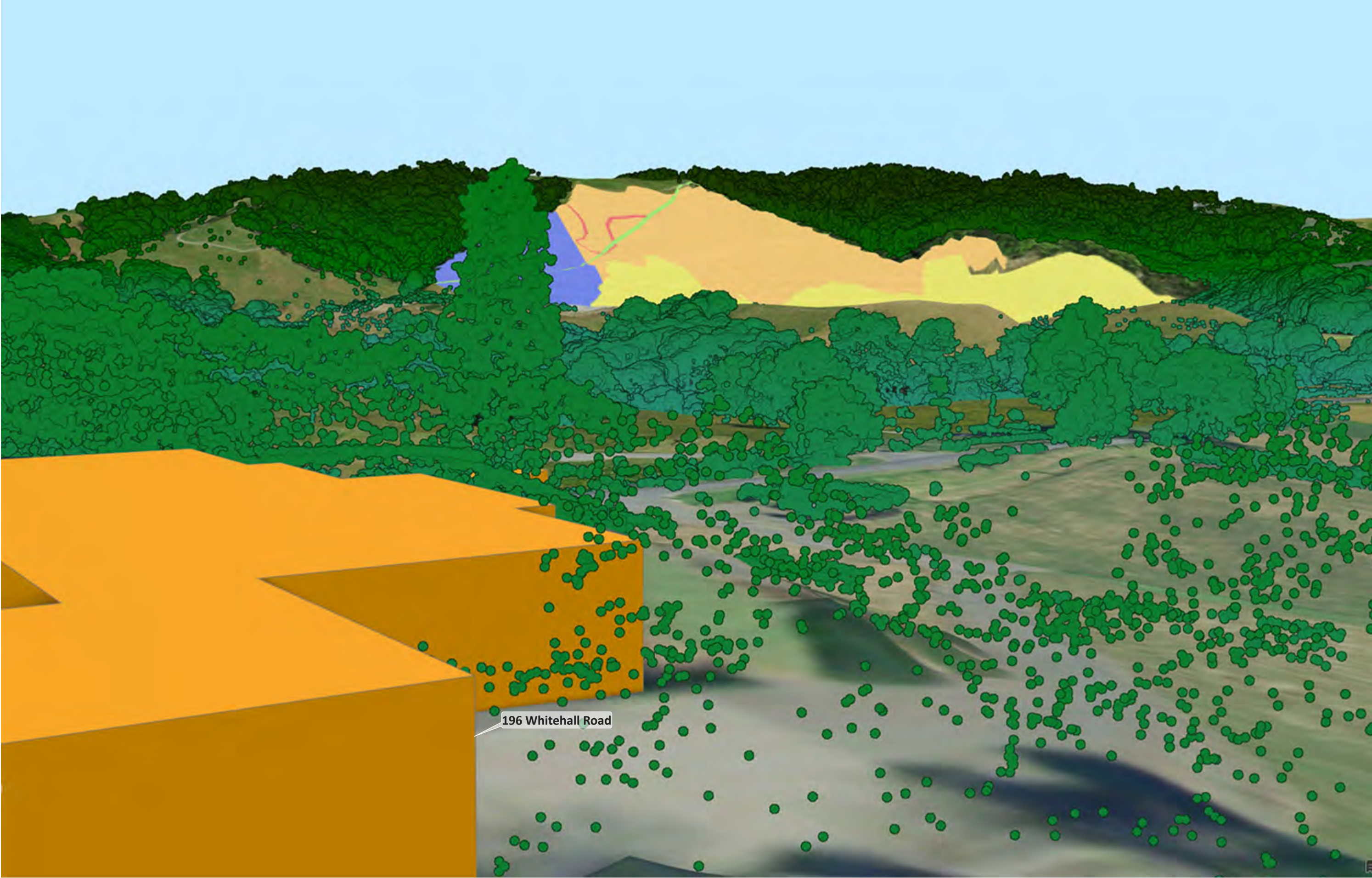


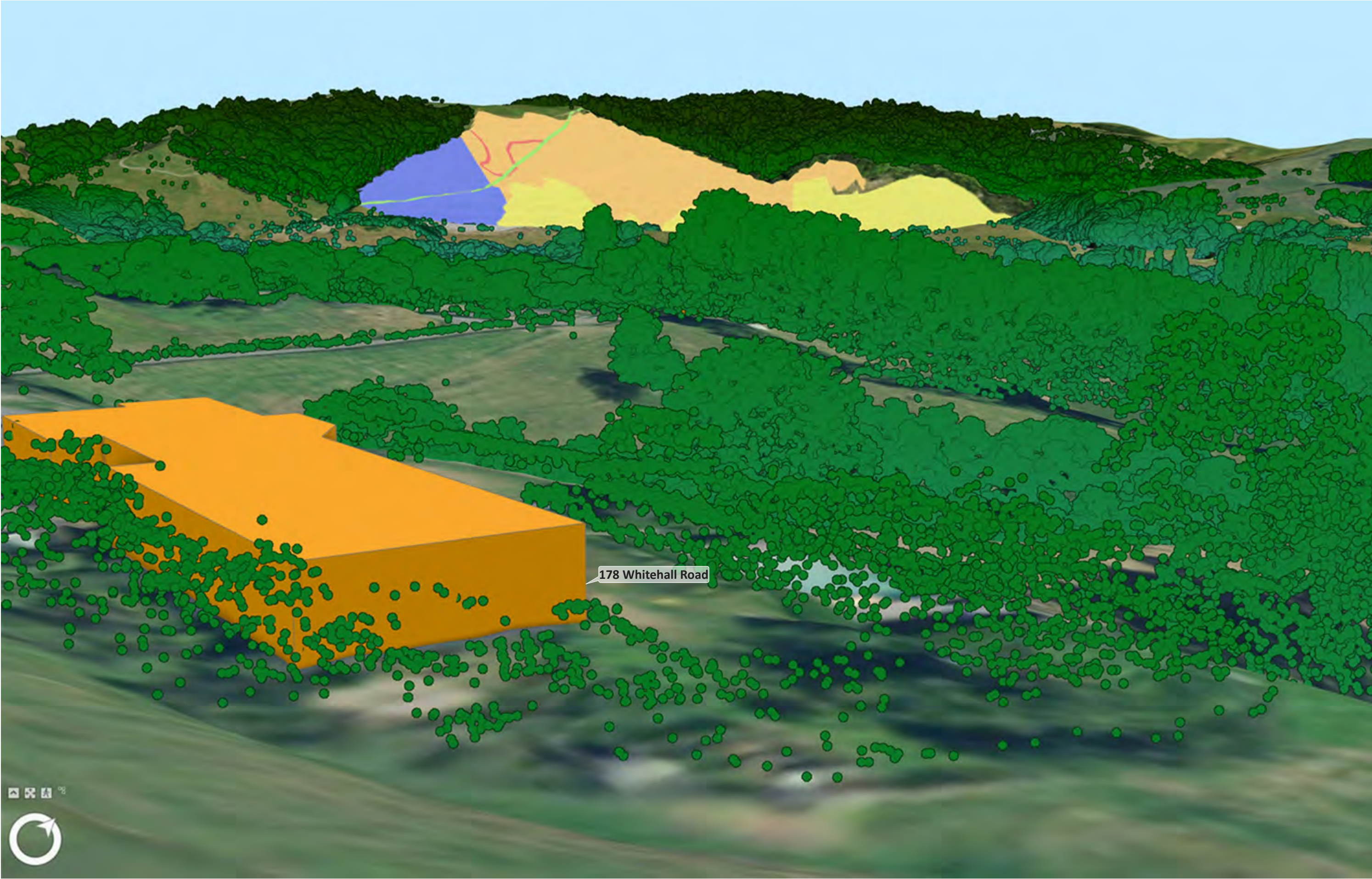


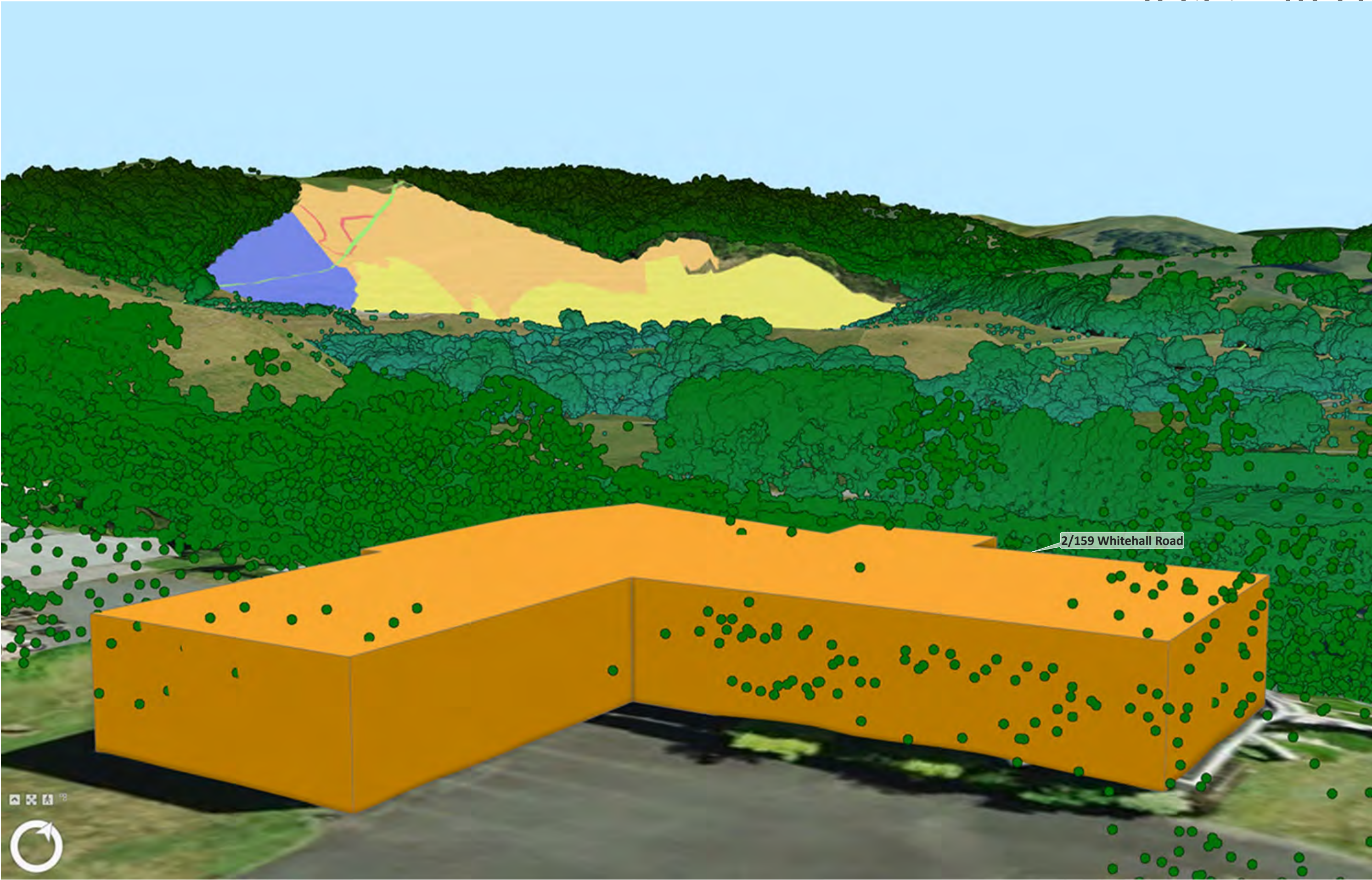












VISUAL SIMULATIONS - METHODOLOGY

SITE VISIT & PHOTOGRAPHY

Site photographs were taken with a Canon digital SLR camera fitted with a 50mm focal length lens, mounted on a tripod and panoramic head. A series of photos were taken at predetermined viewpoints, situated on public land. The locations of each viewpoint were fixed by either hand held GPS or GPS units built in to the cameras.

NZILA GUIDELINES & PANORAMA PREPARATION

The visualisations have been produced in accordance with the NZILA Best Practice Guidelines for Visual Simulations (BPG 10.2) and also adhere to Boffa Miskell’s internal Visualisation Guidelines.

Camera lenses of different focal lengths capture images with differing fields of view. To understand how illusions are created by different lens sizes, one must understand depth of field and how “depth of field” and “field of view” are related. As can be seen below (derived from Fig 9 of the NZILA BPG), a photo taken with a 28mm lens will provide a horizontal field of view of 65° - using a 50mm lens will provide a “cropped” (40°) version of the same view. The same image size can also be achieved by taking multiple 50mm photos in “portrait” mode, and using digital stitching software to merge and crop to 65° or 40°.

COMPOSITING

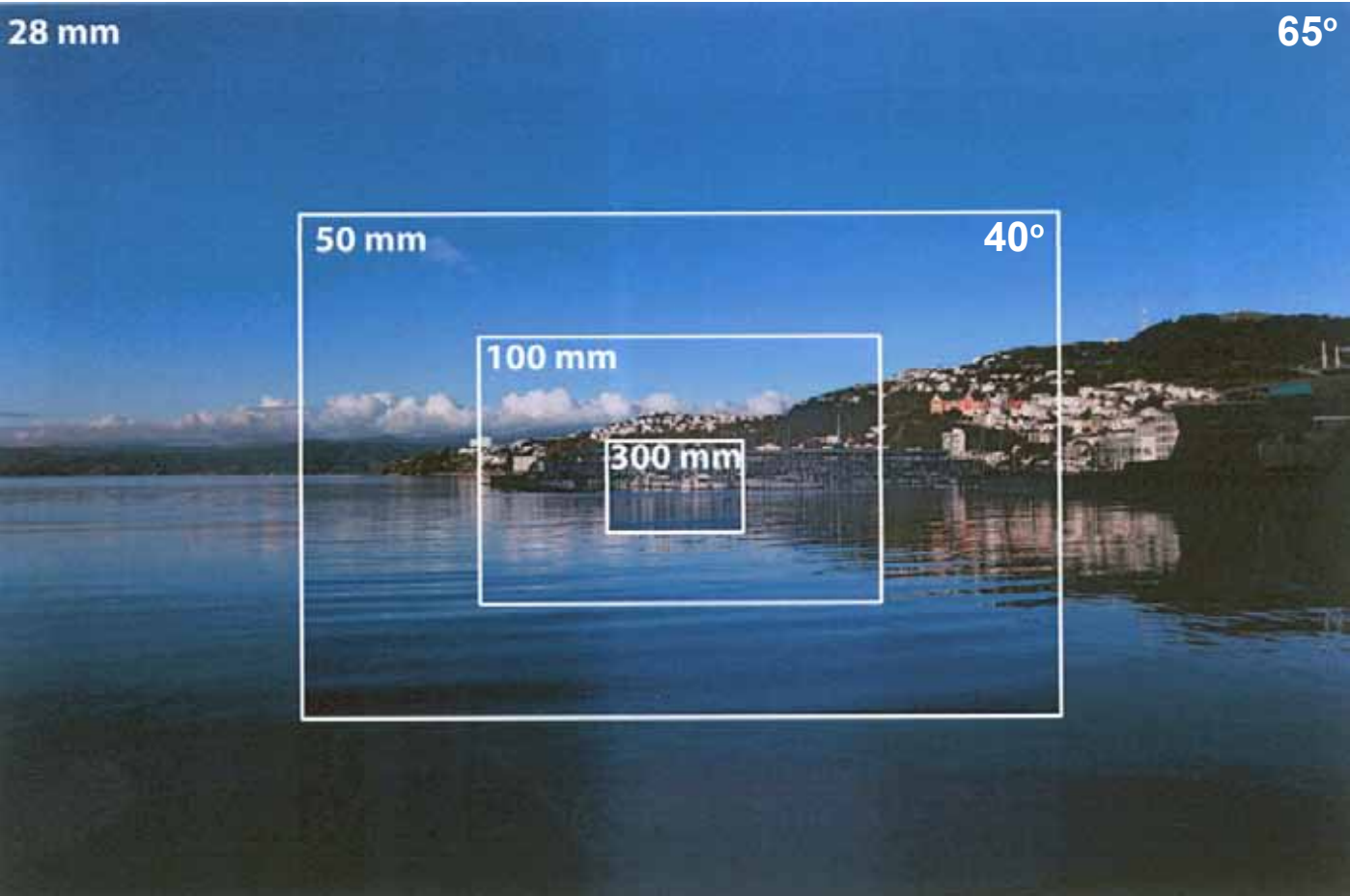
Virtual camera views were then created in 3D modelling software, and a combination of 3D contour data and 3D engineering drawings turned on in each of these views. These were then matched to the corresponding photographic panorama, using identifiable features in the landscape and the characteristics of the camera to match the two together. The visualisations were then assembled using graphic design software.

RECOMMENDED IMAGE READING DISTANCE

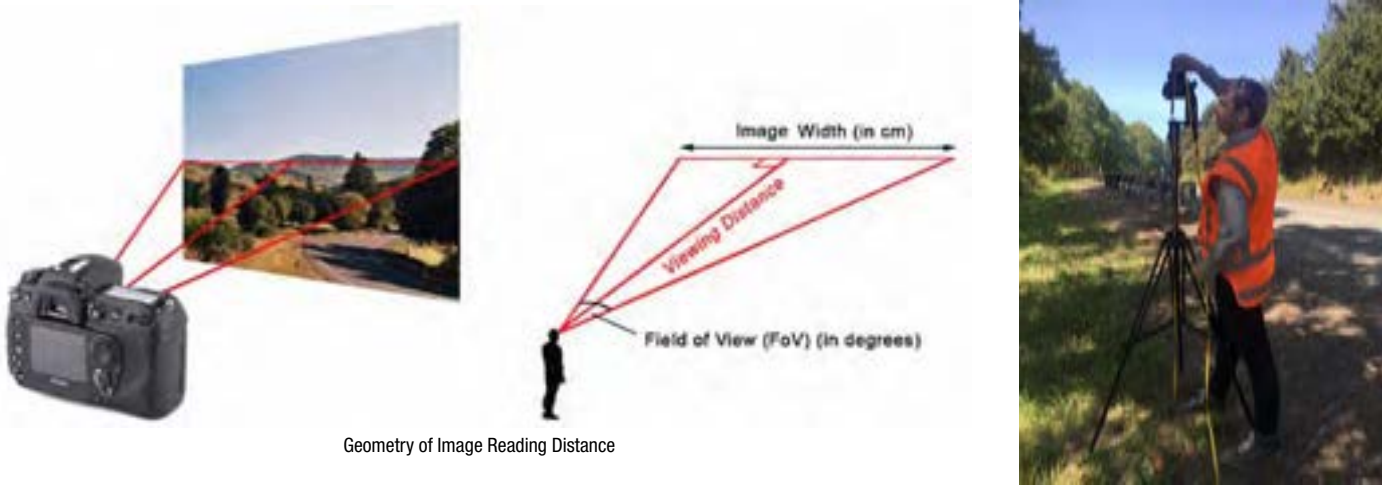
Views which have a field of view of 90° should be viewed from a distance of 20 cm when printed at A3
Views which have a field of view of 65° should be viewed from a distance of 31.5cm when printed at A3
Views which have a field of view of 40° should be viewed from a distance of 55 cm when printed at A3

For convenience, Boffa Miskell has adopted image reading distances of 20cm, 30cm and 50cm.

This will ensure that each simulation is viewed as if standing on-site at the actual camera location, and is in accordance with Section 7.11 of the NZILA BPG (reproduced below). Users are encouraged to print these pages on A3 transparency, go to the viewpoint and hold at the specified reading distance in order to verify the methodology.



LENS	HORIZ FoV ¹	PAPER SIZE	ACTUAL IMAGE SIZE ²	READING DISTANCE ³
28mm	65°	A4	277mm W x 185mm H	215mm
		A3	400mm W x 267mm H	315mm
		A2	574mm W x 383mm H	450mm
50mm	40°	A4	277mm W x 185mm H	380mm
		A3	400mm W x 267mm H	550mm
		A2	574mm W x 383mm H	790mm



About Boffa Miskell

Boffa Miskell is a leading New Zealand professional services consultancy with offices in Whangarei, Auckland, Hamilton, Tauranga, Wellington, Nelson, 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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