Boffa Miskell

Bendigo-Ophir Mining Project

Assessment of Dunstan Mountains Outstanding Natural Landscape

Prepared for Matakanui Gold Limited

14 May 2024

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Cover photograph: View from Mount Mika looking north-west towards the Upper Clutha Basin, © Boffa Miskell, 2024

Executive Summary

This landscape assessment commissioned by Matakanui Gold Limited seeks to better inform the company and their advisors on the landscape values of the Dunstan Mountains Outstanding Natural Landscape. This is intended to assist with the design, planning and management of a proposed mining project and its associated rehabilitation within the Rise and Shine Project Area.

The Dunstan Mountains Outstanding Natural Landscape has been identified in the Central Otago District Plan. This requires protection from inappropriate subdivision, use and development as a matter of national importance in accordance with Section 6(b) of the Resource Management Act. The classification of the Dunstan Mountains as an Outstanding Natural Landscape resulted from a district wide landscape assessment undertaken in 2007 which identified the Dunstan Mountains as part of the district's broader ranges with high or extreme sensitivity.

At a finer scale, the Dunstan mountains are characterised by two distinctive landscape character areas, to the north and south of the Dunstan Mountains. These landscape areas are contiguous and connected via a lower central saddle which is further defined by a central historic east-west access route associated with Thomson Saddle.

The key landscape values of the South Dunstan Mountains include a broad summit plateau which contains the distinctive form of Haehaeata / Leaning Rock to the south-east viewed along the skyline from the Manuherekia Valley and parts of Cromwell Gorge. The broad summit remains intact and visible from broader areas across the Manuherekia and Upper Clutha Valleys. The western edge of this landscape character area culminates along a kanuka covered promontory adjoining a fringe of more modified terraces along the eastern edge of Lake Dunstan. Several historic gold mining artifacts are also evident through this area, including within the Bendigo Historic Reserve.

By comparison, the North Dunstan Mountains form a more defined and angular skyline which extends north of Thomsons Saddle. Cloudy Peak, Dunstan Peak and Thomson Gorge along Thomson Creek adjoining the Manuherekia Valley form similar distinctive more folded angular features within this landscape character area frequently visible along the skyline. Less historic mining activity has occurred throughout this area with extensive grazing and large conservation areas along the summit providing important natural values and context to high country farming and isolated backcountry recreation opportunities.

Within the context of the Dunstan Mountains, the Rise and Shine Project Area forms a local comparatively lower lying folded area to the west of Thomson Saddle and accessible along Thomson Gorge Road. Several remnant gold mining activities within Bendigo Historic Reserve also adjoin this area. Views of this area include parts of a local summit known as Battery Hill (B10D) observed on the skyline from within parts of the Upper Clutha Basin and forming part of an apparent transition from kanuka covered slopes which extend into Bendigo Scenic Reserve and a larger adjoining coherent mountain grassland backdrop.

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1.0 Introduction

Boffa Miskell and Frank Boffa were engaged to assess and identify the relevant landscape values of the area recognised as the Dunstan Mountains Outstanding Natural Landscape (ONL) within the Central Otago District. In assessing and identifying these values, this landscape assessment has also considered the context through which this underlying ONL has been defined and given recognition of the location of the Rise and Shine (RAS) Project Area within which a potential underlying ore deposit has been identified.

The purpose of this landscape assessment is to inform the planning and management of a potential mining activity proposed in this context including its subsequent rehabilitation. In this context, this assessment identifies the statutory requirements, criteria and landscape values applicable as part of seeking to inform appropriate landscape outcomes. This forms part of the overall process necessary when seeking to protect the Dunstan Mountains ONL and avoid, remedy or mitigate potential for adverse landscape and visual effects.

Landscape values have been assessed within the context of the current ONL boundary as defined in the Central Otago District Plan and described as the Dunstan Mountains ONL. This assessment has not reviewed the accuracy or otherwise of this established ONL boundary itself beyond recognition of the consequent statutory protection which applies. Given this context, the intent of this landscape assessment is to provide a more specific understanding of the existing landscape values which can be identified in relation to the Dunstan Mountains ONL and high-level actions which respond to the protection of those values in accordance with current best practice.

Maps and photographs referred to in this assessment are compiled in an accompanying graphic supplement. For ease of reference the elevated highpoint of B10D within the identified RAS Project Area has been labelled on each map.

2.0 Background

The landscape assessment which primarily informed the identification of Central Otago's ONLs was completed by LA4 in 2007 ('LA4 Assessment'). This was undertaken as part of a previous Central Otago District Rural Review and subsequently informed the identification of ONL, outstanding natural features (ONFs) and Significant Amenity Landscapes (SALs) within the Operative Central Otago District Plan (see **Map 1**).

The previous LA4 Assessment divided the district into broad landscape units which display a reasonably consistent landscape character derived from topography, land uses, vegetation cover, presence of water bodies or relationship with nearby bodies of water. Through this process, LA4 identified the Dunstan Mountains as part of a broader more generic landscape type, namely, Landscape Unit 5: Pisa and Dunstan Ranges.

Based on this previous landscape identification, the LA4 Assessment considered each landscape unit based on numerical scoring of landscape values combined with vulnerability to change to inform an overall understanding of sensitivity. This is a reflection of its time and is no longer consistent with current best practice as set out in Te Tangi a te Manu[1]. By comparison best practice now requires identification, description and analysis of relevant landscape

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

attributes when evaluating and defining important landscape values when confirming outstanding natural features and landscapes. On this basis, the previous landscape unit containing the Dunstan Mountains were previously assessed to have high or extreme sensitivity and therefore ranked as outstanding. A copy of the relevant score sheet identified as the Pisa + Dunstan Range identified between 2005 / 2006 is included in **Appendix 1**.

3.0 Statutory Context

3.1 Resource Management Act

The Resource Management Act (RMA, 1991) provides the framework through which ONLs are recognised in Aotearoa New Zealand. In achieving the purpose of this Act under RMA section 6(b), all persons exercising functions and powers under it, must recognise and provide for the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development as a matter of national importance.

3.2 Otago Regional Policy Statement

Policy relevant to the identification of ONLs can be identified in the operative Otago Regional Policy Statement.

3.2.1 Otago Regional Policy Statement (2019)

Within the Operative Otago Regional Policy Statement, the criteria for identification of outstanding natural features, landscapes and seascapes are set out in Schedule 3 of the Operative Otago Regional Policy Statement (2019) which state:

1. Biophysical attributes	*a.*	*Natural Science factors, including geological, topographical, ecological and dynamic components*
	b.	*The presence of water including in seas, lakes, rivers and streams*
	c.	*Vegetation (native and exotic)*
2. Sensory attributes	*a.*	*Legibility of expressiveness – how obviously the feature or landscape demonstrates its formative processes*
	b.	*Aesthetic values including memorability and naturalness*
	c.	*Transient values including presence of wildlife or other values at certain times of the day or year*
	d.	*Wild or scenic values*
3. Associative attributes	*a.*	*Whether the values are shared and recognised*

b. Cultural and spiritual values for Kāi Tahu, identified by working as far as practicable, in accordance with tikanga Māori; including their expression as cultural landscapes and features

c. Historical and heritage associations

Policy 3.2.4 relates to managing outstanding natural features, landscapes and seascapes. This provides the following direction:

Protect, enhance or restore outstanding natural features, landscapes and seascapes, by all of the following:

a) …

b) Beyond the coastal environment, maintaining the values (even if those values are not themselves outstanding) that contribute to the natural feature, landscape or seascape being outstanding;

c) Avoiding, remedying or mitigating other adverse effects;

d) Encouraging enhancement of those areas and values that contribute to the significance of the natural feature, landscape or seascape.

3.2.2 Proposed Otago Regional Policy Statement (2021)

Within the Proposed Otago Regional Policy Statement, Policy NFL-P1 relates to the identification areas and values of outstanding natural landscapes in accordance with Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022. NFL-P1 also requires identification of the capacity of those natural features and landscapes to accommodate use or development while protecting the values that contribute to the natural feature and landscape being considered outstanding or highly valued.

Once identified, Policy NFL–P2 requires the protection of outstanding natural features and landscapes by:

1. *maintaining the values that contribute to the natural feature or landscape being considered outstanding, even if those values are not themselves outstanding,*
2. *avoiding, remedying or mitigating other adverse effects; and*
3. *managing the adverse effects of infrastructure ion the values of outstanding natural features and landscapes in accordance with EIT*-INF-P13.

3.3 Central Otago District Plan

The Central Otago District Plan was adopted in 2013 and sets out the current landscape policy and formal recognition of landscape values within the context of the Central Otago District.

Policy 4.4.1 of the District Plan includes specific recognition of ONLs, as follows:

To recognise the District's outstanding natural landscapes and outstanding natural features and land in the Upper Manorburn/Lake Onslow Landscape Management Area which:

a. Are unique to the district, region or New Zealand; or

b. *Are representative of a particular landform or land cover occurring in the Central Otago District or of the collective characteristics and features which give the District it's particular character; or*

c. *Represent areas of cultural or historic significance in the district, region or New Zealand; or*

d. *Contain visually or scientifically outstanding geological features; or*

e. *Have characteristics of cultural, historical and spiritual value that are significant to Kai Tahu ki Otago;*

f. *Have high natural character values and high landscape quality that can be distinguished from the general landscapes of the Central Otago District and provide protection for them from inappropriate subdivision, use and development.*

The explanation for Policy 4.4.1 refers to Section 6(b) of the RMA in requiring Council to recognise and provide for the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development as a matter of national importance. It also recognises that there are activities that have the potential to compromise the values of these areas. In these circumstances resource consents will be required to enable a thorough environmental impact assessment which includes recognition of the fact that people and communities often utilise these areas to provide for their social, economic and cultural wellbeing.

Landscapes and natural features considered to be outstanding in the Central Otago District are identified in Sections 2.3.1 and 2.3.2 of the District Plan and as identified on the associated planning maps. Based on this identification, relevant landscape values are set out in Schedule 19.6.2 which includes a description and reasons for recognition of each identified ONL in section B.

The description of the "Dunstan Mountains" ONL is referred to as the "*Mountain range between Manuherikia and Upper Clutha Valley extending north-east from Cromwell Gorge*". The reasons for recognition as an ONL are defined as:

> *The mountain range forms part of the backdrop to the Manuherikia Valley to the east and the Upper Clutha Valley to the west and is a memorable feature of the Central Otago landscape. The crest is an extensive summit plateau extending from Haehaeata / Leaning Rock northwards, distinctive rock tors are visible on the skyline.*

Along the western toe of the Dunstan Mountains, a sperate ONL has been identified as the "Elevated areas, Bendigo" comprising the "*Rocky backdrop to the upper portion of the Clutha Arm of Lake Dunstan*". The reasons for recognition describe that this:

> *Rock landscape is a distinctive feature of the upper portion of Lake Dunstan and confines State Highway 8 between the hillside and the lake. Semi-arid schist outcrops provide visual context for future development in this locality.*

4.0 Method

The method engaged to inform this landscape assessment has been drawn from Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines (TTatM), which was endorsed then published by the New Zealand Institute of Landscape Architects, Tuia Pito Ora in

July 2022. This overriding methodology provides a framework of concepts, principles and approaches to suit specific assessment purposes and situations.

The identification of relevant landscape values which apply to the Dunstan Mountains ONL and which may be used to inform mining development has adopted the following process:

- Desktop research including mapping relevant landscape attributes or dimensions;
- Site Visit undertaken during the 7th and 8th March 2024. The RAS Project Area was visited and representative views across the broader Dunstan Mountains were obtained; and
- Analysis across relevant landscape attributes including understanding the nature of the skyline and likely views, delineation of relevant landscape character areas and identification of key landscape values that underpin the classification of outstanding natural landscape.

4.1.1 Landscape Attributes

Within TTatM, landscape character is defined as each landscape's distinct combination of physical, associative and perceptual attributes. An understanding of each attribute for the purpose of undertaking this assessment is set out below:

'Physical' means both natural and human features, and the action (and interaction) of natural and human processes over time. Factors which are considered under this attribute or dimension include:

- geology and geomorphology
- topography and hydrology (including drainage patterns)
- climate and weather patterns
- soil patterns
- vegetation and land use patterns
- ecological (flora and fauna) and dynamic components
- patterns of settlements and occupation, including roads and circulation
- archaeology and heritage including tangata whenua features

'Associative' means intangible things that influence how places are perceived. Such associations typically arise over time and out of the relationship between people and place. Tāngata whenua associations are therefore especially relevant because of primacy and duration. TTatM identifies that pūrākau, tikanga, whakapapa, and mātauranga are key considerations of the associative dimension from a Te Ao Māori perspective, particularly important when considering matters such as mauri and wairua for which it is anticipated further understanding may be developed through ongoing engagement.

'Perceptual' means both direct sensory experience and broader interpretation through the senses. While sight is the sense most typically applied to landscape assessment, direct sensory perception importantly includes all the senses. The following factors are considered most relevant:

- geomorphic legibility (how obviously a landscape expresses the geomorphic processes)
- wayfinding and mental maps (memorable landmarks, routes, nodes, edges, and areas of different character)

- coherence (the extent to which patterns reinforce each other, for example between human patterns and underlying natural landscape)
- aesthetic qualities
- available views

In response to best practice methodology, the first phase of this assessment includes setting out a description and accompanying series of maps through which an initial understanding of landscape character areas were established. On the basis of this understanding, the important landscape values of the Dunstan Mountains ONL have been defined. This process reflects a combination of desktop investigation, research and fieldwork in accordance with current best practice.

No engagement with mana whenua or stakeholders has been undertaken through this initial phase of assessment, however the assessment has drawn on available cultural values assessment engaged by Matakanui Gold Limited where available and we understand that this engagement is ongoing.

4.1.2 Landscape Values

Landscape values depend on certain physical attributes. Values are not attributes but are embodied in attributes. Through analysing the attributes and characteristics of the landscape, the overall purpose of this assessment is to provide an appropriate understanding of the landscape values of the Dunstan Mountains ONL.

The method employed recognises that a landscape assessor's role in a statutory planning context is to assist in managing landscape values: for instance, by managing, planning or designing appropriate landscape outcomes in response to a landscape's values (and the attributes on which those values depend). TTatM also recognise that landscape management is not limited to maintaining existing values but includes realising new values and restoring those values that have been lost or degraded.

Based on this process, this landscape assessment sets out a detailed understanding of the distinctive landscape character areas and important landscape values specific to the Dunstan Mountains ONL. Ongoing assessment and engagement are anticipant to ensure any potential mining activity recognises and provides for the necessary protection and associated landscape management of such values given this statutory context.

5.0 Landscape Description

As set out in the method above, the first phase of this project entailed desktop analysis and mapping in order to gain understanding across relevant landscape attributes and through which an assessment of landscape values is informed. This description has included a combination of hand drawn and computer mapping which is supported by a series of summary maps and photographs included in a separate graphic supplement to this report.

A summary of findings across relevant landscape attributes relating to the Dunstan Mountains which has been identified through this analysis is set out below.

5.1 Land Types (Map 2)

Land typing provides a method and basis for understanding the whenua, the underlying natural diversity of Aotearoa lands, ecosystems and landscapes[2].

The land types of the broader area (1:250,000) identify that the Dunstan Mountains are located within the O21 Dunstan-Cairnmuir land type. This land type is characterised by glacial formations including features such as steep mountain slopes and crests, extensive schist tors, seeps, and bogs. Scattered throughout the landscape are several schist tors and outcrops, and steeply incised gullies in the upper reaches.

Elevations within this land type range from 200 to 1667 masl, with transient characteristics including winter snowfall and fog. Vegetation within this landscape type would have once included expansive areas of narrow leaved and slim snow tussockland and shrubland, with Hall's tōtara, mountain celery pine, and broadleaf forest within the gullies. Today, fescue tussock grassland transitions into narrow-leaved tussockland and wetland vegetation on the upper slopes.

5.2 Geology (Map 3)

Figure 1: TZ4 intercepting TZ3 along Thomson Gorge Fault (source Santana Minerals)

The underlying Otago Schist is formed from sedimentary and minor intermediate volcanics and volcaniclastics known as the Caples and Torlesse tectono-stratigraphic terranes. This underlying schist can be sub-divided into four textural zones based on mineralogy and mineral textures. Textural zone 1 (TZ1) is the lowest metamorphic grade and textural zone 4 (TZ4) is the highest-grade zone, which each increasing as a result of temperature and pressure. Peak metamorphic grades in the Otago Schist occurred during the Jurassic period when the Zealandia micro continent formed the outboard subduction complex of the Gondwana continental margin.

During the Tertiary period, the mountainous landscapes now present within the Upper Clutha catchment were uplifted. Within this broader context, the geology of the Dunstan Mountains comprises a base of metamorphic rock located between the active Dunstan Fault and the Pisa Fault and bisected by the inactive Thomson Gorge Fault (Rise and Shine Shear Zone). This can be broadly split into two geological formations separating biotite zone schists in the south-west

[2] Land Typing NZ (Lucas Associated, 2024)

(footwall, TZ4) from chlorite zone schists in the north-east (hanging-wall, TZ3). The southern side of this fault is characterised by a steady dip-slope along the Rise and Shine Valley (see **Figure 1**) and broad peneplain[3] which continues to the south. More recently, the valleys which define this uplifted sequence of mountains were carved through successive glacial and alluvial processes and associated moraine deposits which remain evident throughout the adjoining Upper Clutha Valley.

Gold mineralisation along the Rise and Shine Shear Zone (RSSZ) occurs within the TZ4 of the Otago Schist. The RSSZ is structurally analogous to the gold deposits which are represented at Macraes Mine. The RSSZ forms a major shear-zones dipping gently to the north-east, juxtaposing TZ3 schist over TZ4 schist. This shear zone can be traced over approximately 30km with multiple ore deposits along their strike. The RSSZ is well defined in the Rise and Shine valley by mapping, geochemistry, geophysics and drilling (over 7km) and is inferred to extend at least 8km south-eastwards across the Dunstan Mountains, based on soil geochemistry and limited geological exposure, and further east under shallow sedimentary cover of the Manuherikia valley.

A key characteristic of this and Central Otago's surrounding landscapes is the presence of elevated schist tors. These distinctive geological features are formed through the erosion of soft rock, leaving the harder schist behind. Haehaeata (Leaning Rock), is one such a memorable feature located to the south of the Dunstan Mountains. Another unique feature of this landscape is the process of solifluction[4]. Within the upper slopes of the mountain range, there are partially collapsed slopes formed through this process, where water saturated soil cannot permeate through the underlying permafrost. This causes the slope to slowly move downwards leaving a distinctive slip on the hillside.

5.3 Geopreservation Sites (Map 4)

Central Otago has a relatively unique and extremely diverse natural landform and geological heritage. The New Zealand Geological Society has compiled a comprehensive inventory of significant geological sites and landforms within the Otago region, including the Central Otago District Inventory of Important Geological Sites and Landforms in the Otago Region, (J A Kenny and B W Hayward, Geological Society of New Zealand, 1993).

Geopreservation Sites within the context of the Dunstan Mountains are primarily associated with the southern extent near Bendigo and the south-eastern arm of Lake Dunstan. This includes the following:

- The internationally significant Nine Mile Landslide, with features including landslide scars, lobes, rockfalls and rock topples.
- The nationally significant Bendigo Goldfield, which is the best example of a large gold mining settlement in the South Island. One of the largest reef mines in Otago and;
- The regionally significant Dunstan Mountains summit tors and biotite-bearing schist.

Outside of the study area, there are several geopreservation sites associated with the Upper Clutha valley surround the Lake Dunstan and the Kawarau Gorge, and the Manuherikia valley.

[3] A more or less level land surface produced by erosion over a long period, undisturbed by crustal movement. Oxford English Dictionary.

[4] Flowage of water-saturated soil down a steep slope. Because permafrost is impermeable to water, soil overlying it may become oversaturated and slide downslope under the pull of gravity. Britannica.

5.4 Soils (Map 5)

The diversity of soils within the study area includes a range of Brown soils within the upper reaches, to a mixture of Pallic and Semiarid Soils on the lower reaches. Brown soils within the upper reaches of the mountains range extend from approximately 950 masl to the summits. These soils are not waterlogged in winter and usually contain large populations of soil organisms such as earthworms. Brown soils to the north of the Dunstan Mountains are predominantly orthic, found on slopes and young land surfaces. In comparison, soils to the south on the remnant peneplain are dominated by more acidic soils.

Below 950 masl, pallic soils are the most prevalent. The composition of these soils is weak and are dry in summer and wet in winter. These soils are found to the west and east of the Dunstan Mountains and are predominantly immature (weakly expressed).

The western extent of the Dunstan Mountains includes a third variety of soil composition on the lower slopes, consisting of Semi-Arid soils. These soils are dry for most of the growing season, and therefore require irrigation to be productive. They are also great for rabbits and characteristic of much of the surrounding Upper Clutha Valley where rain is less than 500mm annually.

5.5 Elevation and Slope (Maps 6 and 7)

The Dunstan Mountains are a distinctive feature within the Upper Clutha and Manuherikia catchments. Maximum elevations exceed 1,650 masl, with Dunstan summit reaching 1,667 masl. Key landscape features include Dunstan Peak (1,569 masl), Rocky Peak (1,430) and Cloudy Peak (1,526 masl) to the north with Mount Horn (1,136 masl), Dunstan (1,667 masl), and Haehaeata (Leaning Rock) (1,647 masl) to the south. B10D (916 masl) within the RAS Project Area is comparatively lower adjoining the Thomsons Saddle which reaches a similar elevation.

Slopes across the Dunstan Mountains are generally characterised by steep slopes to the north and a comparatively more gradual and broad sloping plateau to the south. Where the landscape becomes more folded, slopes are predominantly greater than 34° and typically represented by narrow ridgelines viewed along the skyline. More gradual slopes between 3-15° are characteristic of the larger southern plateau and a more confined area to the west of Dunstan Peak. A mix of gentle and steeper incised gullies are also dispersed throughout this mountainous terrain.

5.6 Climate and weather

The climate of the Dunstan Mountains is reflective of the broader climate of Central Otago. Inland areas are more sheltered from the exposed winds experienced on the coast, with the Dunstan Mountains representing the most landward part of New Zealand. Nevertheless, the upper reaches are often subjected to strong prevailing north-west to westerly winds (Macara, 2015).

Central Otago, including the area encompassing the Dunstan Mountains is recorded as the driest area of Otago and New Zealand. The average rainfall within this area is approximately 600 to 700mm annually, in comparison to the high rainfall areas further west which exceed annual rainfall measurements of 2,000 mm (Macara, 2015). Given the lack of rainfall, the area experiences a higher soil moisture deficit, and this is particularly concentrated to areas surrounding Cromwell, Clyde, and Alexandra within the Upper Clutha, and Manuherikia catchments.

In tandem with the lower levels of rainfall within Central Otago, the area experiences in excess of 2,000 sunshine hours annually (Macara, 2015). Average temperatures between summer and winter are extreme. During the summer months, lower altitude areas experience temperatures of 22℃ on average in the summer, and 16℃ on the upper reaches of the mountains above. In comparison, temperatures in winter range between 0℃ within lower altitude areas, and -2℃ in the upper reaches of the mountain ranges above (Macara, 2015).

Climate change will continue to have an impact on this area of Central Otago through the form of increased strong winds, increased high rainfall events causing flooding downstream, warmer temperatures, increased risk of drought and drier days, and reduced snowfall (Tonkin & Taylor Ltd, 2021).

5.7 Land Cover (Map 8)

The historic landcover within the Dunstan Mountains would have included expansive areas of narrow leaved and slim snow tussockland and shrubland in the upper reaches. The dominant species included hard and silver tussock at lower altitudes, and snow tussock above. Within the gullies Hall's totara woodland would have been present, including species such as *Dacrydium bidwillii, Phyllocladus alpinus, Dracophyllum longifolium* and some *Podocarpus nivalis.* Areas of matagouri (*Discaria toumatou*), native brooms (*Carmichaelia, Chordospartium*), and kanuka (*Kunzea sp*.) would also have occurred. *Luzula ulophylla* would also have been found within areas prone to erosion with alpine areas and herbfield ecosystems dominated by *Celmisiaviscosa* and *Poa colensoi*, transitioning into cushionfield in the most exposed alpine zone (McEwen, 1987).

Today due to historic and current pastoral farming and significant numbers of introduced pests such as rabbits, the landcover is often dominated by depleted tussockland and scabweed. Where pastoral grazing occurs, the dominant species are usually exotic and include sweet vernal (*Anthoxanthum odoratum*), Kentucky bluegrass (*Poa pratensis*), *Bromus spp*. (soft brome (*B. hordeaceus*), ripgut brome (*B. diandrus*), cheatgrass (*B. tectorum*)), and cocksfoot (*Dactylis glomerata*) alongside native tussock, shrubs and herbs usually at low densities. There are also isolated areas of matagouri (*Discaria toumatou*), and larger areas of briar rose (*Rosa rubiginosa*) at lower elevations to the west with exotic pasture and weed communities on alluvial fans (McEwen, 1987). Areas of mingimingi (*Coprosma propinqua var. propinqua*), and scented tree daisy (*Olearia odorata*) also occur as well as kowhai (*Sophora microphylla*) and kānuka (*Kunzea sp.*) occasionally up to 6 m in height.

Along valley floors, vegetation communities tend to occupy deeper organic and hydric soils which have developed where the ground is permanently saturated. The dominant species are native Carex spp. sedges (mainly Sinclair's sedge (*C. sinclairii*), rautahi (*C. coriacea*), and *C. diandra* with less common speckled sedge (*C. testacea*), Buchanan's sedge (*C. buchananii*), and pukio (*C. secta*)). Juncus spp. (exotic soft rush (*J. effusus*), jointed rush (*J. articulatus*)) and native herbs are also common.

At higher altitudes, more extensive indigenous vegetation remains. Blue tussock (*Poa colensoi*), hard tussock (*Festuca novae-zelandiae*), silver tussock (*Poa cita*) and snow tussock (*Chionochloa rigida*) continue to dominate, with extensive alpine cushionfield and herbfield towards the southern extent of the mountain ranges (McEwen, 1987). Golden Spaniard (*Aciphylla aurea*) also occurs throughout these elevated areas.

Within the Bendigo Scenic and Historic Reserves, the remnant stands of kanuka which remains in association with former mining activity is significant being one of few remnants in Central Otago[5].

5.8 Hydrology (Map 9)

The hydrology of the Dunstan Mountain Range predominantly comprises 1-3 order streams[6], the majority of which tend to remain relatively dry throughout the year. This is largely due to the low rainfalls, steep topography, and short and small catchments. In this context the streams within the Dunstan Mountains are characterised by a network of largely unmodified and some more locally modified streams due to a general absence of bores and water takes and some limited historic water races. The former construction of dams along Rise and Shine Creek remains evident in some areas in association with previous gold mining activity. At lower elevations, the margins of streams often retain expressive rock outcrops through incised gullies, often with increased areas of native vegetation and scrub.

5.9 Conservation and Reserve Areas (Map 10)

There are several conservation areas within the Dunstan Mountains. These are associated with Lauder Creek to the north-east, Neine i kura and Ardgour Conservation Areas in the middle and Bendigo to the south-west. There are two main conservation areas associated with Bendigo, including a contiguous scenic and historic reserve along the western toe of the larger maintain, and the Bendigo Conservation Area along the upper slopes. The scenic and historic reserves near the historic Bendigo mining settlement provide opportunities for day trips, walks, and exploring historic gold mining relics. At higher altitudes within the Bendigo Conservation Area there are opportunities for expansive views of the Upper Clutha catchments, and more remote recreational experiences. This includes mountain biking, hunting, walking, cross country skiing, and four-wheel driving.

To the north, the Ardgour and Neine i kura conservation areas can be accessed via Thomson Gorge Road with the Lauder Creek conservation area accessed via easements to the east and west of the Dunstan Mountains. With a similar remote character to the Bendigo Conservation Area to the south, recreational opportunities include tramping, mountain biking, four-wheel driving, hunting, and horse trekking.

5.10 Cultural Values Assessment

The broader context of Central Otago contained an intertwined network of traditional travel routes between the west and east coast of Te Waipounamu, as well as networks to Southland and the Mackenzie Basin. The entire Mata-au (Clutha River) was part of a Mahika kai trail that connected Kati Kuri, Ngati Ruahikihiki, Ngati Huirapa and Ngai Tuahuriri to inland Central Otago and the broader network of trails.

The Mata-au was a significant indigenous fishery, with species including tuna (eels), kanakana (lamprey) and kokopu. It was also used to transport pounamu from the west coast to the east coast where it was traded.

[5] https://www.doc.govt.nz/globalassets/documents/parks-and-recreation/places-to-visit/otago/bendigo-area-brochure.pdf

[6] Stream order is the numerical position of a tributary or section of a river within the entire network. Headwater streams are assigned a stream order of 1. When two tributaries of the same stream order meet, the order increments by one for the next section downstream. However, if two sections meet where one section has higher order than the other, the next section downstream has the same order as the highest upstream section. New Zealand River Environment Classification User Guide, 2010.

Matakinui (Dunstan Mountains) were used by mana whenua to travel between the upper Mata-au and the Manuherikia. The mountains are noted as being a mahika kai site where weka and tikumu (mountain daisy) were gathered.

The Dunstan Mountains are a significant cultural marker for mana whenua, including Haehaeata, the original name for Leaning Rock. A traditional travel route through the mountain was via Thomsons Saddle and was used during the spring when travelling to inland Central Otago. Between summer and winter, mana whenua would catch and dry eels for food, which accompanied fernroot which was gathered.

In addition to being recognised as a mahika kai site, Matakinui was recognised by mana whenua as an important site for collecting taramea (wild Spaniard). The plant was harvested by mana whenua due to its scent which was primarily used for Chief's clothing.

5.11 Heritage Sites (Map 11)

Tangata whenua originally used the gorge as a method of travelling from Moeraki on the east coast (south of Oamaru) to Makarora, located at the southern extent of the Haast Pass. The pass became an alternative route compared to following the Clutha River. Identified heritage sites likely associated with this traditional travel route include middens, pits, and remnants of shelter.

A greater concentration of European heritage Sites are located within the Thomsons Gorge, in addition to the sites nearby within the Blue Mines Road area. These sites and artefacts are largely associated with gold mining including prospect sites, huts, dams, and tailings.

European settlement in the area in the 1850s saw the establishment of the Morven Hills Station run by the McLean family from 1858. The large station once extended from the Cromwell Gorge to just south of the Lindis Pass. This was consequently broken up into three stations, Bendigo, Ardgour, and Northburn in 1910. The farm comprised a mixture of sheep, cattle, horses, forestry, and large areas of cultivated land.

Concurrent activity within the area also included the discovery of gold in 1862. The arrival of miners and prospectors saw the mining of alluvial gold until 1865, before underground gold mines were established. As of 1875, the Bendigo gold mine became one of the most prolific hard rock mines in Otago. Remnants of settlement within the area are still present today, and plentiful around Bendigo Historic Reserve. Gold mining within the Bendigo area extended into the upper reaches of the Dunstan Mountains in proximity of Rise and Shine Creek, Bendigo Creek, and Aurora Creek catchment.

Throughout the Bendigo area there were several makeshift towns including Logantown, Welshtown, and Wakefield at the height of gold mining activity. The towns included several corrugated iron buildings forming general stores, butcheries, a bakery, and a draper and community structures including a community hall, a church, and a school. Remnants of these buildings can still be seen today.

Figure 2: Bendigo Historic Reserve

There are several heritage Sites identified within the Dunstan Mountains which are predominantly associated with what is now known as Thomson Gorge Road. The Thomson Gorge was also well known and used as an alternative to the Cromwell Gorge when travelling to the Wanaka region[7].

Throughout the wider Dunstan Range there are limited, scattered heritage sites. These are largely remnants of water races associating with gold mining activity, and trig stations.

5.12 Skylines and Primary Views (Maps 12 - 15)

As the current classification for the Dunstan Mountains ONL makes specific reference to the mountain and skyline backdrop as a memorable feature in the Otago landscape, further detailed assessment of skylines has been undertaken in views from the main public roads to gain better understanding of the nature, extent of this landscape attribute in order to inform consequent landscape values. To this end, the skylines and primary views of the Dunstan Mountains have been assessed using a combination of desktop analysis and fieldwork to identify their nature and extent. This analysis has principally been focussed from State Highways which surround the Dunstan Mountains and includes an understanding of the theoretical extent of skylines and their associated visibility.

Based on desktop analysis, four separate maps (**Map 12 -15**) have been prepared to illustrate the extent of skylines viewed from the main highways which surround the Dunstan Mountains. These maps are each based on defined observer points located 2 metres above the centre line of each highway and at intervals of either every 10 or 50 metres, as referenced in each legend. From each observer point, a GIS 'skyline tool' has been employed to generate a 3D polyline representation of the line separating the sky from the surface of a digital elevation model, therefore representing the extent of skyline observed from that point. These points have then been combined to show the overall areas of land, which is visible as the skyline from each road.

[7] Central Otago District Plan, Section 2.2.2

It must be emphasised that this analysis shows where skylines are likely to be observed on this basis of landform only and does not therefore take account of any intervening vegetation or structures which may restrict available views. The locations of representative viewpoints obtained during fieldwork which relate to each map have been annotated and included within the graphic supplement.

5.12.1 State Highway 8 - West (Map 12)

State Highway 8 skirts along the western and southern ends of the Dunstan Mountains ONL. Along this extensive section of inland highway, a range of impressive and more localised and intimate framed views of the Dunstan Mountains are generally available between Alexandra to the south-east and the Lindis Valley to the north-west. As State Highway 8 continues north of the turn off to Cromwell at the northern end of the Cromwell Gorge, it continues along the western toe of the Dunstan Mountains along the Tarras Cromwell Road and southern part of the Lindis Pass Tarras Road. For this assessment, this has been identified as State Highway 8 (West) from which available views of the skyline have been assessed (see **Map 12**).

Views of the Dunstan Mountains from the south-west along State Highway 8 are typically near distance views along a series of more modified terraces which skirt the larger mountain landform. This section of State Highway 8 includes a separate ONL described as, “elevated areas, Bendigo” which adjoins Lake Dunstan between Cromwell and Rocky Point beyond which potential views towards the RAS Project Area remain entirely concealed. Here longer distance views of the larger Dunstan Mountains ONL to the east are typically constrained to glimpse views through gullies and often beyond pockets of horticultural activity stepped above intact scarps. Expressive rock outcrops remain interspersed within grassland and mixed native and exotic scrub, alongside broader often panoramic views to the west across Lake Dunstan and towards the Pisa Range.

To the north of Rocky Point, views of the larger extent of the Dunstan Mountains including the RAS Project Area become available in the vicinity of Bendigo Station (see **Site Context Photograph 1**). Through this area, the broader extent of the Dunstan Mountains emerges beyond a more immediate backdrop and skyline which includes Bendigo Scenic Reserve which comprises an expressive kanuka covered promontory along the immediate skyline adjoining the north-eastern end of Lake Dunstan. This area is currently excluded from the Dunstan Mountains ONL. Where the RAS Project Area becomes visible, views of B10D marks a transition between the kanuka covered foreground slopes to the south and broader more defined grassland dominated skyline which continues to the north.

When continuing north-east along State Highway 8 between Bendigo and Tarras, views of the Dunstan Mountains continue as a broader mountain backdrop and skyline to the east viewed beyond a varied rural valley floor. A foreground of glacial and alluvial sculptured landforms remains evident within this area of landscape including both Bendigo Terrace (ONF and SAL) and the Bend Terrace (SAL). These terraces frequently frame or conceal the broader mountain backdrop to the east beyond which B10D is frequently visible on the skyline and forms part of the legible transition through Thomson Saddle and between the broad plateau skyline along the Dunstan Mountains to the south and more angular and defined skyline which continues north of Cloudy Peak (see **Site Context Photograph 2**).

The northern most views of the RAS Project Area from State Highway 8 culminate at Cluden Hill Summit (see **Site Context Photograph 3**). From here, the northern end of the Dunstan Mountains ONL is highly visible in the midground beyond a folded mountain landform comprising of tussock and pockets of grey scrub between Archies Flat and the skyline. In very long-distance views to the right of the photograph, the RAS Project Area including B10D is visible below the broad flat elevated plateau and skylines to the south of the larger massif of the Dunstan Mountains ONL.

5.12.2 State Highway 8A (Map 13)

Views from State Highway 8A extend along the eastern banks of the Clutha River and between the Upper Clutha Basin and the Tarras Cromwell Road which ends approximate 6 kilometres from the base of the Dunstan Mountains ONL at its nearest point (see **Map 13**).

When viewed from the eastern end of State Highway 8A approaching Tarras, elevated scarps including the Bend Terrace and Bendigo Terrace form striking linear landform features along the valley floor, beyond which the Dunstan Mountains ONL is visible along the distant skyline. From this area, the transition through Thomsons Saddle between the more elevated angular and folded northern end of the Dunstan Mountains and the elevated broad Dunstan Mountains plateau summit to south remains clearly visible (see **Site Context Photograph 4**).

Over longer distances from along State Highway 8A, views of the Dunstan Mountains are typically framed between the Pisa Range to the south and the Grandview Mountains to the north. Within this context, the RAS Project Area remains below the broader more varied skyline represented by the sloping plateau summit to the south of the Dunstan Mountains ONL (see **Site Context Photograph 5**).

5.12.3 State Highway 6 (Luggate - Cromwell Road) (Map 14)

The Luggate-Cromwell Road (State Highway 6) extends along the western side of Lake Dunstan and the Clutha River between Cromwell and Luggate (see **Map 14**). This section of State Highway provides some of the most open long-distance views of the western extent of the Dunstan Mountains including long distance views of the RAS Project Area. From this broader perspective, it also provides a clear distinction between the more dispersed skyline apparent across the sloping plateau to the south and the more defined angular skyline to the north. The RAS Project Area forms part of this apparent transition in landform and skyline.

As State Highway 6 extends into Central Otago District to the south of Luggate in the vicinity of Willow Bank Road, the Dunstan Mountains becomes visible including the RAS Project Area (see **Site Context Photograph 6**). From here the broader mountain backdrop of the Dunstan Mountains extends between the Grandview Mountains to the left and the eastern more modified toe of the Pisa Range to the right. Where visible, the RAS Project Area occurs below the skyline and appears contiguous with the elongated sloping plateau ridgetop which forms the southern end of the larger mountain backdrop.

When continuing south along State Highway 6 to the north of Lake Dunstan, the broader western aspect of the Dunstan Mountains remains highly legible in available long-distance views. Through this area, B10D becomes visible along the skyline and defines the northern end of the larger elongated extensive summit plateau which continues to the south above the fringe of kanuka established in Bendigo Scenic Reserve (see **Site Context Photograph 7**). To the left of this, the more defined and folded mountain backdrop of the northern part of the Dunstan Mountains extends above the linear terraces of the Bend Terrace and Bendigo Terrace.

From State Highway 6, B10D is visible along the skyline for several kilometres (see **Map 16**)**.** Where first visible when traveling north along State Highway 6, this appears to the left of the larger southern sloping plateau which remains along the skyline beyond the closer and more vegetated form of Bendigo Reserve (see **Site Context Photograph 8**). Views of the larger backdrop of the Dunstan Mountains are often also obscured beyond a foreground of horticultural land use and clearly differentiate a distinction between a productive rural character established throughout lower lying areas and views of the distinctive more linear folded and defined natural mountain backdrops and skyline.

From the western shores of Lake Dunstan, the RAS Project Area and its highpoint B10D is obscured beyond a midground of kanuka covered slopes which culminate at Mount Koinga

within the broader Dunstan Mountains ONL (see **Site Context Photograph 9**). From this area, the western toe of the Dunstan Mountains forms a more modified apron of horticultural land use and scrub, including the contiguous “Elevated areas, Bendigo” ONL identified in closer proximity to the lake shore in this area. Similarly, from the southern end of the Luggate -Cromwell Road and the brief section of State Highway 8B which connects with State Highway 8, views of the RAS Project Area are entirely concealed as the broader mountain backdrop which includes a highpoint of Mount Horn along a broader plateau summit (see **Site Context Photograph 10**).

5.12.4 Cromwell Gorge and State Highway 85 (Map 15)

For completeness, the assessment of views of Mount Dunstan including its skyline has been considered in views from within Cromwell Gorge to the south and continuing into the Manuherekia Valley along State Highway 85 to the east (see **Map 15**). No potential views of the RAS Project Area or B10D have been identified from within these areas.

The Cromwell Gorge is a steep gorge cut by the former Clutha / Matu-Au River which winds approximately 19km between the Dunstan and Cairnmuir Mountains. Through this area, the distinctive form of Leaning Roack / Haehaeata is visible along the skyline at the southern end of the larger Dunstan Mountains which continue to the north-east (see **Site Context Photograph 11**). Despite modification created through the construction of the Clyde Dam completed in the 1980s, this area of landscape remains highly memorable and scenic with various lookouts through which the lake remains embedded and framed within a broader natural mountain backdrop.

At the southern end of the Manuherekia Valley, including views from Spring Road, Leaning Rock/ Haehaeata remains highly visible as a memorable rocky tor which is characteristic of the southern skyline of the Dunstan Mountains (see **Site Context Photograph 12**). Through the centre of the Manuherekia Valley, including views from Glassford Road, Thomson Gorge forms a striking division which separates the more elongated tor covered plateau landform to the south and the more defined angular mountain forms which continue to the north (see **Site Context Photograph 13**). From within the northern end of the Manuherekia Valley, including views from St Bathan Loop Road, the northern end of the Dunstan Mountains forms a more varied sequence of angular skylines which include Rockey Peak and Dunstan Peak (see **Site Context Photograph 14**).

5.12.5 Potential Visibility (Map 16)

To further assist with identification of potential views of the highpoint of B10D within the RAS Project Area, a zone of theoretical visibility (ZTV) was prepared to examine the extent to which this high point is visible from within the surrounding landscape (**Map 16**). This demonstrates that potential views are entirely focused within the Upper Clutha Basin and adjoining hill slopes to the north of Lake Dunstan. For completeness, the areas from which B10D is visible along the skyline from adjoining State Highways is also identified on this map. Where relevant, an analysis of primary views of the RAS Project Area has been based on the existing landform only and does not consider the nature or extent of potential public and private views of any proposed mining activity or associated development.

Figure 3: Summit of B10D observed against backdrop of Pisa Range and surrounding Upper Clutha Basin

6.0 Landscape Characterisation

Based on the landscape description across relevant landscape attributes as set out above, the Dunstan Mountains ONL can essentially be divided into two specific landscape character areas, namely the South Dunstan Mountains and North Dunstan Mountains. These landscape character areas are contiguous either side of the comparatively lower lying Thomsons Saddle. Through this landscape characterisation, both Bendigo Historic and Scenic Reserves have been recognised as a coherent part of the South Dunstan Mountains as illustrated on **Map 17**.

A brief description of the North Dunstan Mountains and South Dunstan Mountains is set out below ahead of a more detailed overall landscape evaluation of the identified Dunstan Mountains ONL in Section 7.0.

6.1 South Dunstan Mountains

Figure 4: Extensive plateau of South Dunstan Mountains

The South Dunstan Mountains Landscape Character Area extends between the Cromwell Gorge and Thomsons Saddle. This landscape character area includes the distinctive form of Haehaeata / Leaning Rock to the south-east of a larger distinctive summit plateau which is viewed along the skyline from the Manuherekia Valley and parts of Cromwell Gorge. More distant views of the rolling summit ridge also occur to the west including along the eastern slopes of the Pisa Range and from within the Upper Clutha Valley.

The western edge of this landscape character area culminates along a rocky vegetated backdrop above Lake Dunstan which also encompasses Bendigo Scenic Reserve seen along the local skyline. Below this distinctive rugged local backdrop, the western toe of the Dunstan Mountains adjoins a more modified apron of land which includes some more recently established residential development and horticultural land use above a less modified and often vegetated lower escarpment separately defined as the Elevated areas, Bendigo ONL.

The northern edge of the South Dunstan Mountains character area culminates at Thomsons Saddle which provides an historic access route bisecting the broader Dunstan Mountains and connecting the Manuherekia Valley with the Upper Clutha Basin. Within the South Dunstan Mountains, this access corridor also adjoins several remaining mining artefacts and evidence of former gold mining activity which typically increase in the vicinity of Bendigo Historic Reserve to the north-west.

The landcover throughout the South Dunstan Mountains comprises a mix of tussock dominated grassland on the upper slopes and a distinctive skirt of kanuka and scrub along the lower western slopes and promontory which adjoin Lake Dunstan. Dramatic rock outcrops and distinctive tors are widely dispersed and form memorable backdrop features and skylines observed from some areas. Land use includes ongoing extensive grazing and recreation use within Reserves and along Thomson Gorge Road.

6.2 North Dunstan Mountains

Figure 5: Sequence of defined more angular peaks of North Dunstan Mountains extending north of Thomsons Saddle

The North Dunstan Mountains are contiguous with the South Dunstan Mountains and extend between Thomsons Saddle and Dunstan Creek. Compared to the broad more gently sloping grassland plateau of the South Dunstan Mountains, the North Dunstan Mountains express a more angular folded and defined ridgeline which continues north towards Dunstan Pass.

Panoramic views of the North Dunstan Mountains primarily occur from within the Upper Clutha Basin, Lower Lindis and Upper Manuherikia Valley. From these areas the Northern Dunstan Mountains express several distinctive peaks between Coudy Peak to the south-west and Dunstan Peak to the north-east.

The landcover throughout the North Dunstan Mountains is consistent with tussock grassland in the upper slopes, with pockets of indigenous and exotic scrub increasing at lower elevations in more sheltered gullies. Distinctive rock outcrops continue throughout this area including at the eastern entrance to Thomsons Gorge from within the Manuherekia Valley and visible from Thomson Gorge Road, immediately to the south.

By comparison, the North Dunstan Mountains have undergone less extensive evident mining activity and consequent concentrations of remaining mining artifacts. Extensive high-country pastoral grazing continues alongside extensive conservation areas, including Lauder Conservation Area and provide recognised back country experiences in this context.

7.0 Landscape Evaluation – Dunstan Mountains

Based on the landscape description and characterisation of the Dunstan Mountains ONL, the landscape values which can be identified across relevant physical, perceptual and associative attributes in accordance with current best practice are set out below:

Landscape values: Dunstan Mountains	
Physical	• Highly intact mountain sequence, expressive of its tectonic, and glacial formative processes. • Remnant peneplain from the Cretaceous period remains highly legible and forms an extensive summit plateau feature to the south which remains distinct from the more angular mountain forms and summits to the north. • Several recognised geopreservation sites including Nine Mile Landslide, Dunstan Mountains summit tor and biotite bearing schist, and Bendigo Goldfield. • At higher altitudes vegetation including blue tussock (*Poa colensoi*), hard tussock (*Festuca novae-zelandiae*), snow tussock (*Chionochloa rigida*) and extensive alpine cushionfield and herbfield remain present. These are recognised as valuable remnants of historic vegetation within the area. • Within the area and adjoining Bendigo Scenic Reserve is a remnant stand of kanuka valued as one of a few remnants left in Otago associated with former gold mining activity.
Perceptual	• Panoramic views of a broader mountain backdrop and unobstructed skyline are highly valued and broadly visible throughout the Upper Mata au/Clutha and Manuherikia catchments. • Important local landmarks and wayfinding features include the Mata-au gorge, Haehaeata and Thomsons Gorge. • The underlying geology and geomorphology of the landform is an important feature of this landscape. Schist tors, the gradual movement of soil at higher elevations (solifluction), and intricate network of streams and creeks form legible characteristics which express their formative processes. • The shifting shadows across open landforms different times of the day and year form a key dynamic characteristic of this mountain backdrop alongside in changing weather patterns and transient influences of winter snowfall and fog. • Rugged kanuka covered promontory along the immediate skyline (part of which falls outside the ONL within Bendigo Scenic Reserve) adjoins the north-eastern end of Lake Dunstan before transitioning into a broader more defined grassland plateau and mountain backdrop above. • General lack of visible structures and modifications ensures the landform remains largely open and is perceived as natural with some more localised and limited evidence of gold mining amongst a broader coherent and open mountain backdrop.
Associative	• Matakinui (Dunstan Mountains) formed part of a traditional travel route between Makarora and Moeraki. The area is recognised as a mahika kai site where weka and tikumu (mountain daisy) were gathered, as well as taramea (wild spaniard) which was gathered for its perfume. The Mata au (Clutha River) to the south of this ONL was also significant for gathering tuna (eels), kanakana (lamprey) and kokopu. This section of the river formed part of a traditional travel route, prior to passing through the Matakinui /Dunstan Mountains.

	• The Bendigo area is renowned for its gold mining history from the mid-1800s. Remnants of this time period are still present today near the settlement of Bendigo. • Several stations including Bendigo, Northburn, Matakanui, Cloudy Peak and Cluden Stations support a strong farming history in the area that dates back to the 1850's when the large Morven Hills Station was formed. This land use is ingrained in the character and shared associations of the landscape. • The Dunstan Mountains are highly valued for their recreational opportunities, including hunting, tramping, mountain biking, and horse trekking. Day walks are available near Bendigo in addition to backcountry experiences including within the larger Lauder Basin Conservation Area which is located to the north-east of the ONL.

8.0 Conclusion

Based on this landscape assessment, several important landscape values can be identified which relate to and help define the Dunstan Mountains ONL landscape classification. These can be divided into distinctive, northern and southern landscape character areas within which important landscape values can be defined across relevant physical, perceptual and associative landscape dimensions.

Within this broader landscape context, potential views of the RAS Project Area remain more relatively contained, albeit from within a broad area of the Upper Clutha Basin which includes larger more comparatively open mountain backdrops and skyline. Landscape and visual effects will be assessed together, and any mining proposal developed in this landscape context will need to be carefully defined to address important landscape values and through which the protection and management of outstanding natural landscapes must be recognised and provided for.

While a specific Bendigo-Ophir Mining Project proposal has not yet been reviewed, based on attributes assessed within the Dunstan Mountains ONL, the key actions to consider when responding to the relevant landscape values relating to any mining in the immediate vicinity of RAS Project Area include the following -

- Protecting the landscape character and integrity of the "landscape edges" that define the two distinctive landscape character areas within this ONL;
- Maintain and manage the landscape values encompassing cultural and historic access along Thomson Gorge Road and the associated artefacts from previous mining activities;
- Protecting and maintaining the form and integrity of the skyline of Battery Hill (BD10D) which remains apparent within some distant views associated with the Dunstan Mountains from State Highways 6 and 8; and
- Protecting the adjacent conservation and reserve areas from adverse effects.

In addition to the above, it is anticipated a mine closure plan will need to be carefully considered as a necessary and integral component of the RAS Project. This plan is to incorporate and build on mining heritage and cultural values within and adjacent to access through Thomson Gorge. Through this opportunity, potential values of the underlying indigenous vegetation communities and their contribution to sense of place should also be fully integrated into closure outcomes with, and into the ONL landscape.

9.0 References

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Appendix 1: LA4 Score Sheets

CENTRAL OTAGO LANDSCAPE ASSESSMENT WORKSHEET

LANDSCAPE UNIT IDENTIFICATION

NUMBER: 5

DESCRIPTION OF LOCATION: Pisa + Dunstan Ranges

LA4 LANDSCAPE ARCHITECTS

LANDSCAPE CHARACTER UNITS

PART 1. VALUE ATTACHED TO THE LANDSCAPE

AESTHETIC VALUE

Worksheet ratings on a 1-7 scale

Field evaluation of Aesthetic Value using the following criteria (with individual ratings):

- ***Vividness***

How immediately impressive and memorable is the landscape as a result of its visual distinctiveness, diversity or other factors - both compositional and geo-physical? …….. 6

- ***Complexity/ Diversity***

To what extent does the unit have a sense of richness and interest about it arising from the diversity of elements found within it - without that diversity leading to discontinuity? …….. 6

- ***Cohesion***

Is there a continuity of key statements I patterns I themes I accents that give the landscape both character and a sense of unity? …… 7

- ***Legibility***

To what extent is it possible to develop a clear mental image of the unit's landscape because of i) *the clear definition of features and patterns within it that emphasize its 3 dimensional structure (layering); and*
ii) identifiable landmarks (points of focus and reference)? …… 7

- ***Mystery***

Does the landscape's spatial structure and array of elements promote a sense of sequence and 'enticement' through the unit's space: the promise of more to unfold around the next bend' -just beyond the landscape that is immediately visible? …… 6

RATING FOR *AESTHETIC VALUE (1 - 7, with 7 indicating extremely high value) ……..* 6.5

NATURAL CHARACTER & HERITAGE VALUE

To what extent does the unit reveal and convey a distinctive sense of identity because of:

- ***Natural Character***

Arising from natural elements, patterns and processes in the landscape that contribute to the character and sense of place of the locality and Region, e.g. Beech forest …… 7

- ***Cultural Associations***

Arising from man-made landscape elements that are distinctive and valued because of their association with both Maori and Pakeha cultures, e.g. old pa sites, historic buildings, mining…… 6?

RATING FOR HERITAGE VALUE (1 - 7, with 7 indicating extremely high value) …… 6

PHYSICAL ELEMENTS THAT ENHANCE THE LANDSCAPE CHARACTER VALUE

CRITICAL ELEMENTS	ELEMENTS THAT CONTRIBUTE TO THE LANDSCAPE CHARACTER
TOPOGRAPHY:	
High block mountain ranges	
Cirque lakes on Pisa range	
1699 – 1964m	
Many tors – leaving Rock Dunstan	
VEGETATION:	
Wetlands, snowgrass, + herbfields	
Cuslias fields	
Tussock	
Pasture lower down	
STRUCTURES:	
Tops and leaning rocks	
No man made structures	
WATER BODIES:	
Stream gullies + valleys	
SIGNIFICANT LANDSCAPE FEATURES:	
The ranges themselves	
'Leaning Rock	
Pisa Rock	

PATTERNS & COMPOSITIONAL FACTORS THAT ENHANCE LANDSCAPE CHARACTER & VALUE

CRITICAL TO LANDSCAPE CHARACTER	ELEMENTS THAT CONTRIBUTE TO LANDSCAPE CHARACTER
BROAD LANDSCAPE PATTERNS (E.G. BLOCKS OF VEGETATION & OPEN SPACE, LAND & WATER):	
Rocky bare tops – dissected	
Steep gullies on side slopes	
Tussock pasture lower down	
LAND USE LOCATIONS PATTERNS (E.G. TYPICAL; SITING OF HOUSES, FARM FORESTRY, PASTURE):	
Lower slopes	Mining

RARITY

To what extent is the unit or key elements within it rare or even unique at the ***Regional Level***

RATING FOR RARITY (1 - 7, with 7 indicating extremely high value) …….. 7

COMPOSITE VALUE RATING *(NB. this rating is not an average - it would be rare to find any one landscape that achieves high ratings for aesthetic value, heritage value and rarity - but it should reflect the particular values found within the individual unit):*

1.	2.	3.	4.	5.	6.	7.
						✓

(extremely low) *(v. high)*

PART 2. VULNERABILITY TO CHANGE

VISUAL ABSORPTION CAPACITY (VAC)

Field evaluation of VAC using the following criteria to determine the capacity of the unit or view to visually absorb change without significant modification of its character:

- ***Land Uses***

How 'developed' is the existing landscape - from areas that are primarily native and natural to those which are highly developed and urbanized? …… 7

- ***Vegetation Cover & Type***

How extensive and varied is existing vegetation cover - from no cover and monocultural dominance to a high level of vegetated cover and diverse species? …… 6

- ***Topographic Type & Diversity***

Does the unit's terrain assist or limit viewing because of its character and the viewing angles that would typically arise between vantage areas and locations subject to modification - from the simplicity and openness of a plain or shallow ridgeline to incised foot hills with a high level of visual containment? …… 5

OVERALL RATING FOR V.A.C. (1-7 with 7 indicating extremely low VAC) …… 6

SPATIAL CHARACTERISTICS:	
Distinctive expansive ranges	

CHANGES THAT AFFECT LANDSCAPE CHARACTER & VALUE	
PROMINENT ELEMENTS	NOTICEABLE ELEMENTS
STRUCTURES:	
	None
VEGETATION:	
Distinctive bright green pasture being created high on the side slopes	
BROAD LANDSCAPE PATTERNS:	
PATTERNS OF LAND USE LOCATION:	
EVIDENCE OF SOIL EROSION:	

ELEMENTS THAT CONTRIBUTE TO THE VISUAL ABSORPTION CAPABILITY	
ELEMENTS THAT HEIGHTEN VAC:	ELEMENTS THAT REDUCE VAC:
Indented landforms + gulllies	Height + wide visual exposure of landforms
	Lack of high vegetation

EXPOSURE / VISIBILITY

How visually exposed is the unit /sub-unit / view to the likes of:

- ***Residential Areas***
- ***Areas Of Recreational Use And Tourism Activity***
- ***Public Transport Routes And Tourist Routes***
- ***Commercial Areas***

RATING FOR EXPOSURE / VISIBILITY (1 - 7, with 7 indicating extremely high exposure) …….. 6

1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*
					✓	

(extremely low) *(v. high)*

AUDIENCES	THEIR RELATIVE SCALE
Residential Cromwell, Alex + Clyde	
Travellers on main roads	
Tourist routes + trails	Large

PART 3: OVERALL SENSITIVITY

OVERALL SENSITIVITY CLASSES

(Derived from both the Value and Vulnerability ratings - with an indication of over-riding factors where the final rating is not the average of those for Value and Vulnerability)

✓	7.	EXTREME SENSITIVITY	**Outstanding Landscape**
	6.	HIGH SENSITIVITY	**Outstanding Landscape**
	5.	SIGNIFICANT SENSITIVITY	**Landscape of District Significance**
	4.	MODERATE SENSITIVITY	
	3.	LIMITED SENSITIVITY	
	2.	LOW SENSITIVITY	
	5.	NO / VERY LOW SENSITIVITY	

OVER-RIDING FACTORS
Distinctive high ranges alongside Lake Dunstan + state highways.
Highly visible from Cromwell + Alex
Distinctive tors
Very high natural character

Boffa Miskell

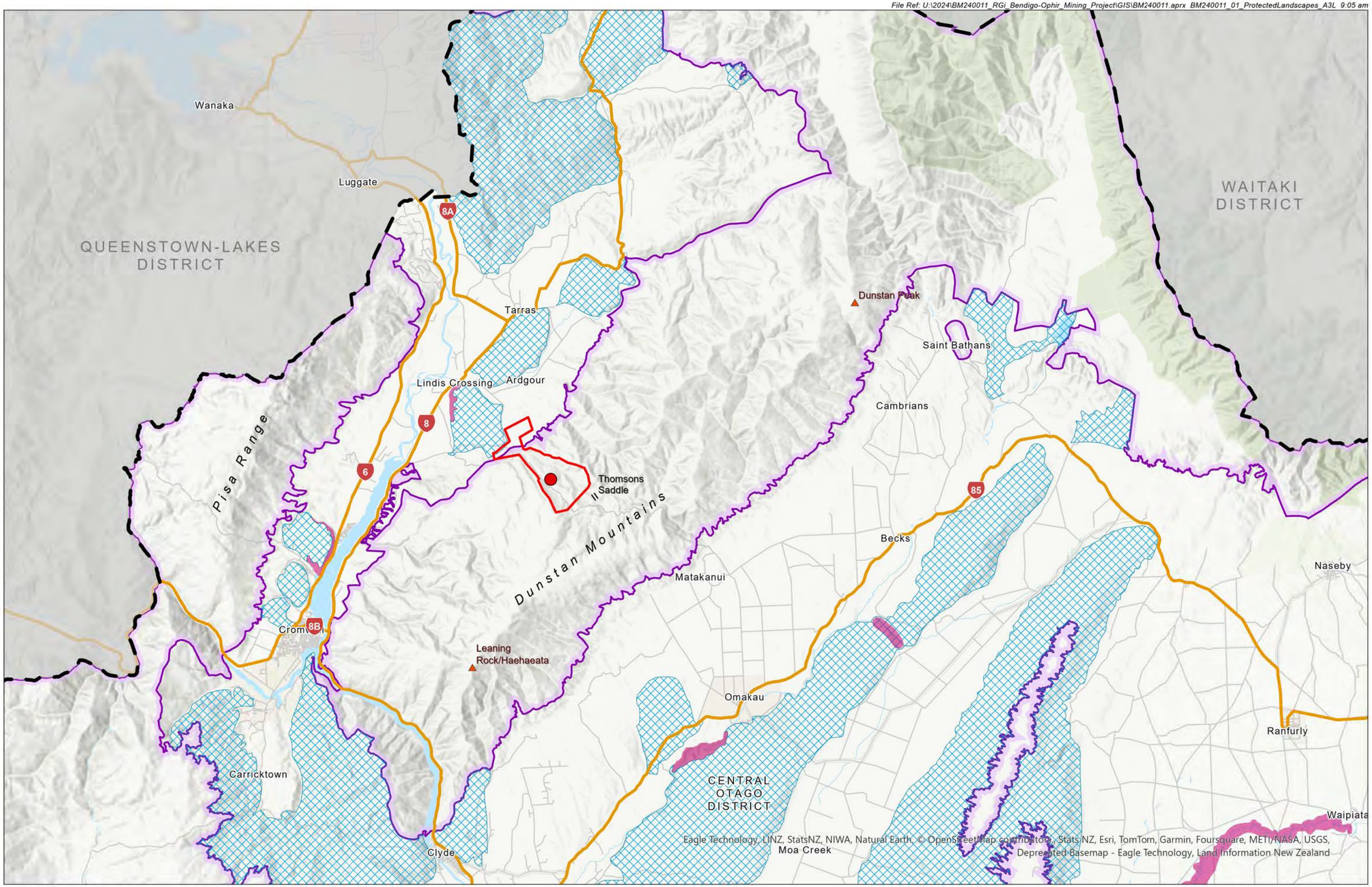
BENDIGO-OPHIR MINING PROJECT

GRAPHIC SUPPLEMENT

28 MARCH 2024

Bendigo-Ophir Mining Project

CONTENTS



Boffa Miskell

www.boffamiskell.co.nz

0 8 km

1:250,000 @ A3

Data Sources:
Protected Landscapes sourced from CODC data service

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- RAS Project Area
- Trig B10D
- Outstanding Natural Landscape
- Outstanding Natural Features
- Significant Amenity Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

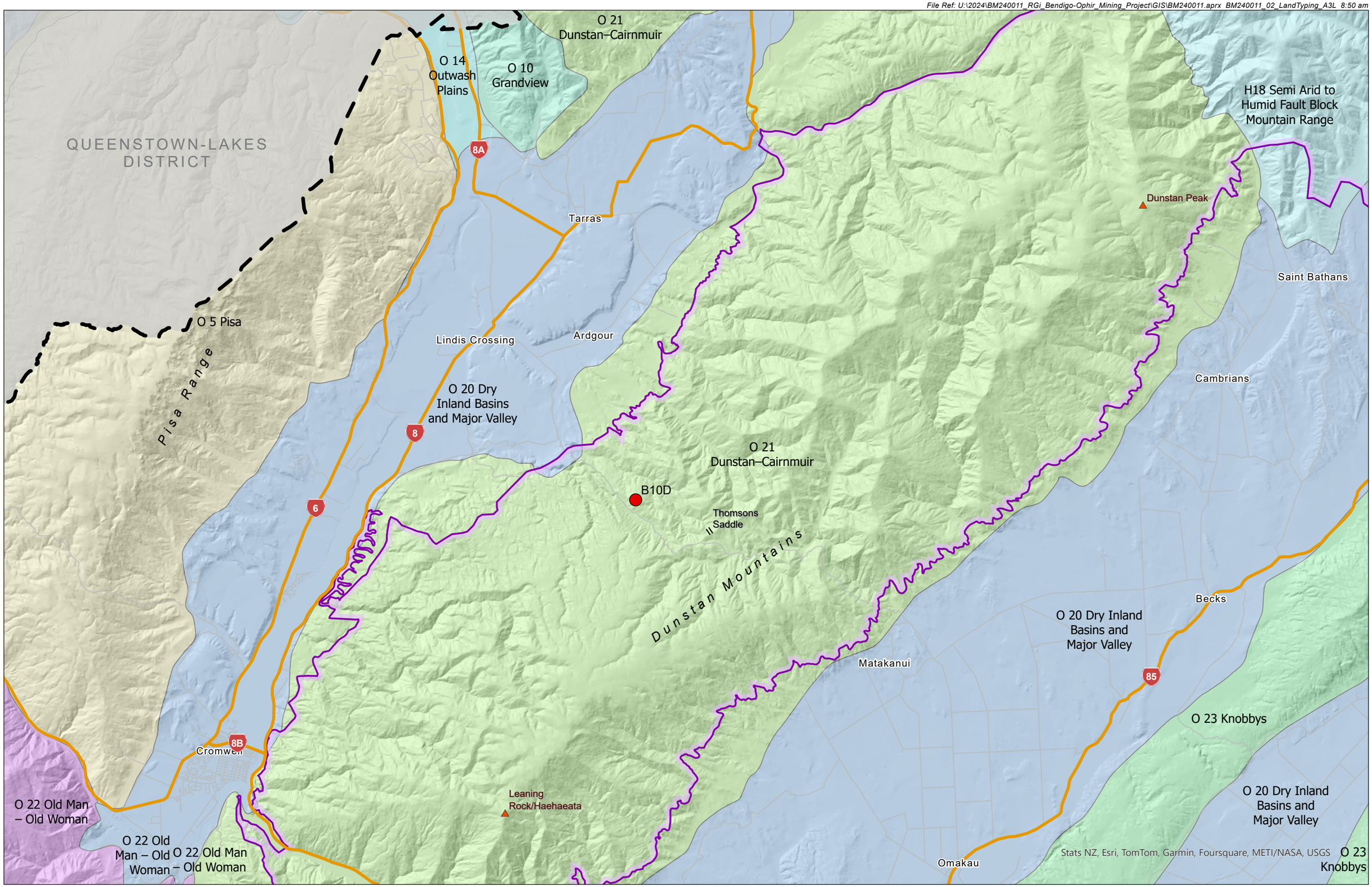
Protected Landscapes

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 1



Boffa Miskell

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0 4 km

1:150,000 @ A3

Data Sources:
Land types sourced from Lucas Associates (https://www.landtyping.nz/)

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Outstanding Natural Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

Land Types

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

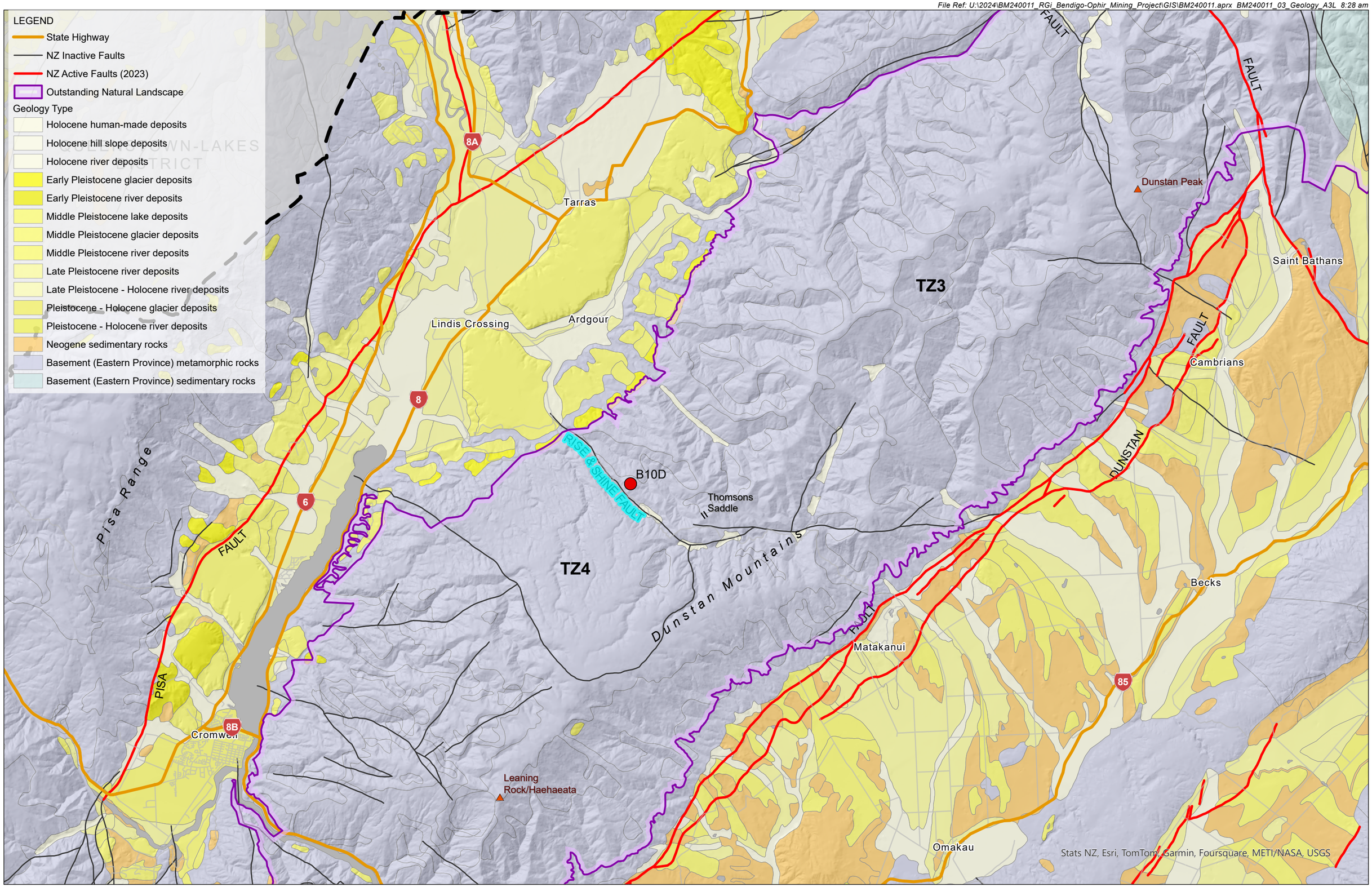
Map 2

LEGEND

- State Highway
- NZ Inactive Faults
- NZ Active Faults (2023)
- Outstanding Natural Landscape

Geology Type

- Holocene human-made deposits
- Holocene hill slope deposits
- Holocene river deposits
- Early Pleistocene glacier deposits
- Early Pleistocene river deposits
- Middle Pleistocene lake deposits
- Middle Pleistocene glacier deposits
- Middle Pleistocene river deposits
- Late Pleistocene river deposits
- Late Pleistocene - Holocene river deposits
- Pleistocene - Holocene glacier deposits
- Pleistocene - Holocene river deposits
- Neogene sedimentary rocks
- Basement (Eastern Province) metamorphic rocks
- Basement (Eastern Province) sedimentary rocks



Boffa Miskell

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0 4 km

1:150,000 @ A3

Data Sources:
Dast sourced from GNS data service (https://data.gns.cri.nz/server/rest/services/)

Projection: NZGD 2000 New Zealand Transverse Mercator

BENDIGO OPHIR MINING PROJECT

Geology

Date: 27 March 2024 | Revision: 0

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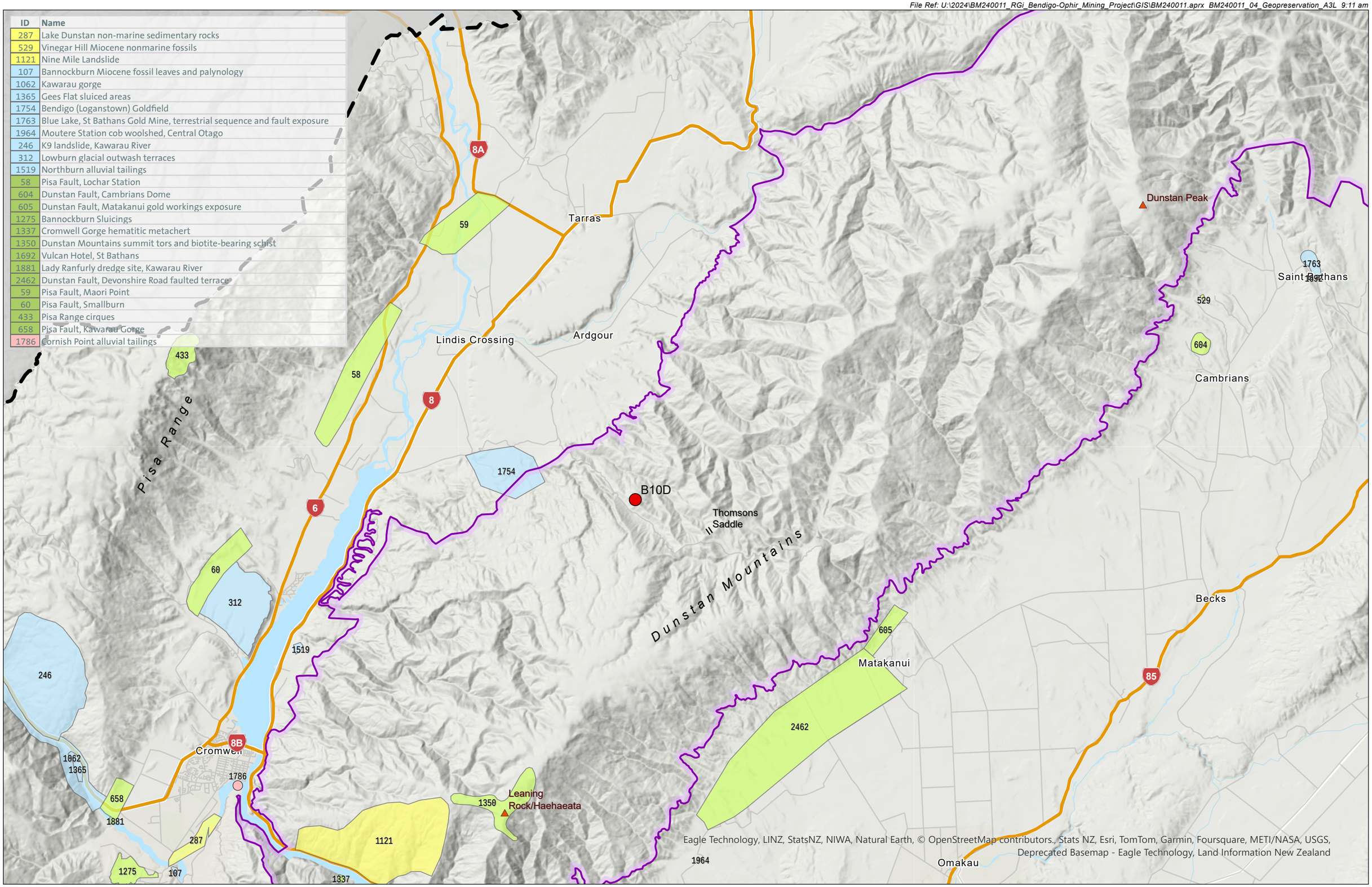
Map 3

ID	Name
287	Lake Dunstan non-marine sedimentary rocks
529	Vinegar Hill Miocene nonmarine fossils
1121	Nine Mile Landslide
107	Bannockburn Miocene fossil leaves and palynology
1062	Kawarau gorge
1365	Gees Flat sluiced areas
1754	Bendigo (Loganstown) Goldfield
1763	Blue Lake, St Bathans Gold Mine, terrestrial sequence and fault exposure
1964	Moutere Station cob woolshed, Central Otago
246	K9 landslide, Kawarau River
312	Lowburn glacial outwash terraces
1519	Northburn alluvial tailings
58	Pisa Fault, Lochar Station
604	Dunstan Fault, Cambrians Dome
605	Dunstan Fault, Matakanui gold workings exposure
1275	Bannockburn Sluicings
1337	Cromwell Gorge hematitic metachert
1350	Dunstan Mountains summit tors and biotite-bearing schist
1692	Vulcan Hotel, St Bathans
1881	Lady Ranfurly dredge site, Kawarau River
2462	Dunstan Fault, Devonshire Road faulted terrace
59	Pisa Fault, Maori Point
60	Pisa Fault, Smallburn
433	Pisa Range cirques
658	Pisa Fault, Kawarau Gorge
1786	Cornish Point alluvial tailings



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0 4 km

1:150,000 @ A3

Data Sources:
Geopreservation sites sourced from Nature maps (https://naturemaps.nz/geoserver)

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Geopreservation Site
  - Internationally Significant
  - Nationally Significant
  - Regionally Significant
  - Other
- Outstanding Natural Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

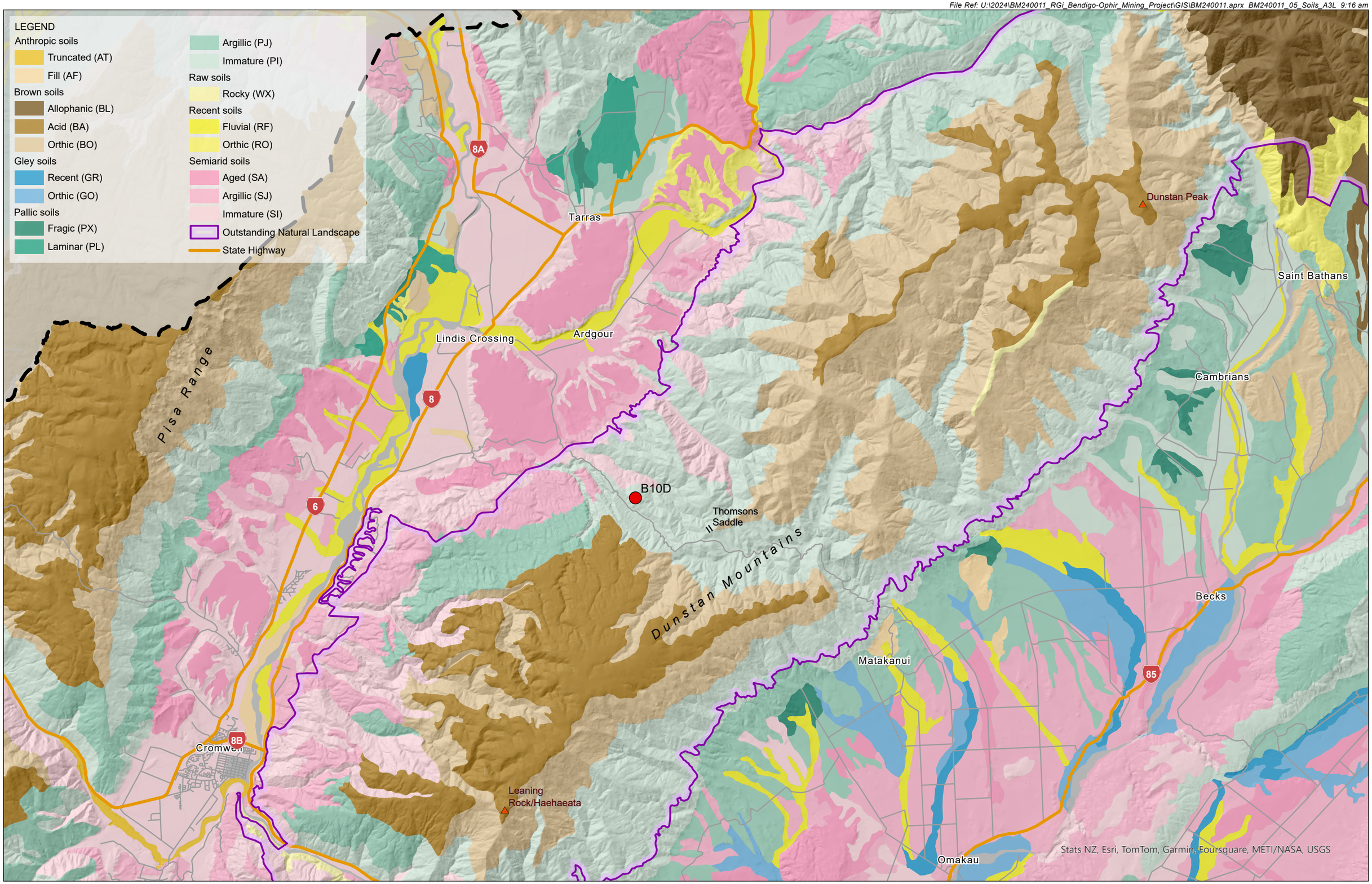
Geopreservation Sites

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 4



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0 4 km

1:150,000 @ A3

Data Sources:
Soils sourced from Landcare (NZFSL)

Projection: NZGD 2000 New Zealand Transverse Mercator

BENDIGO OPHIR MINING PROJECT

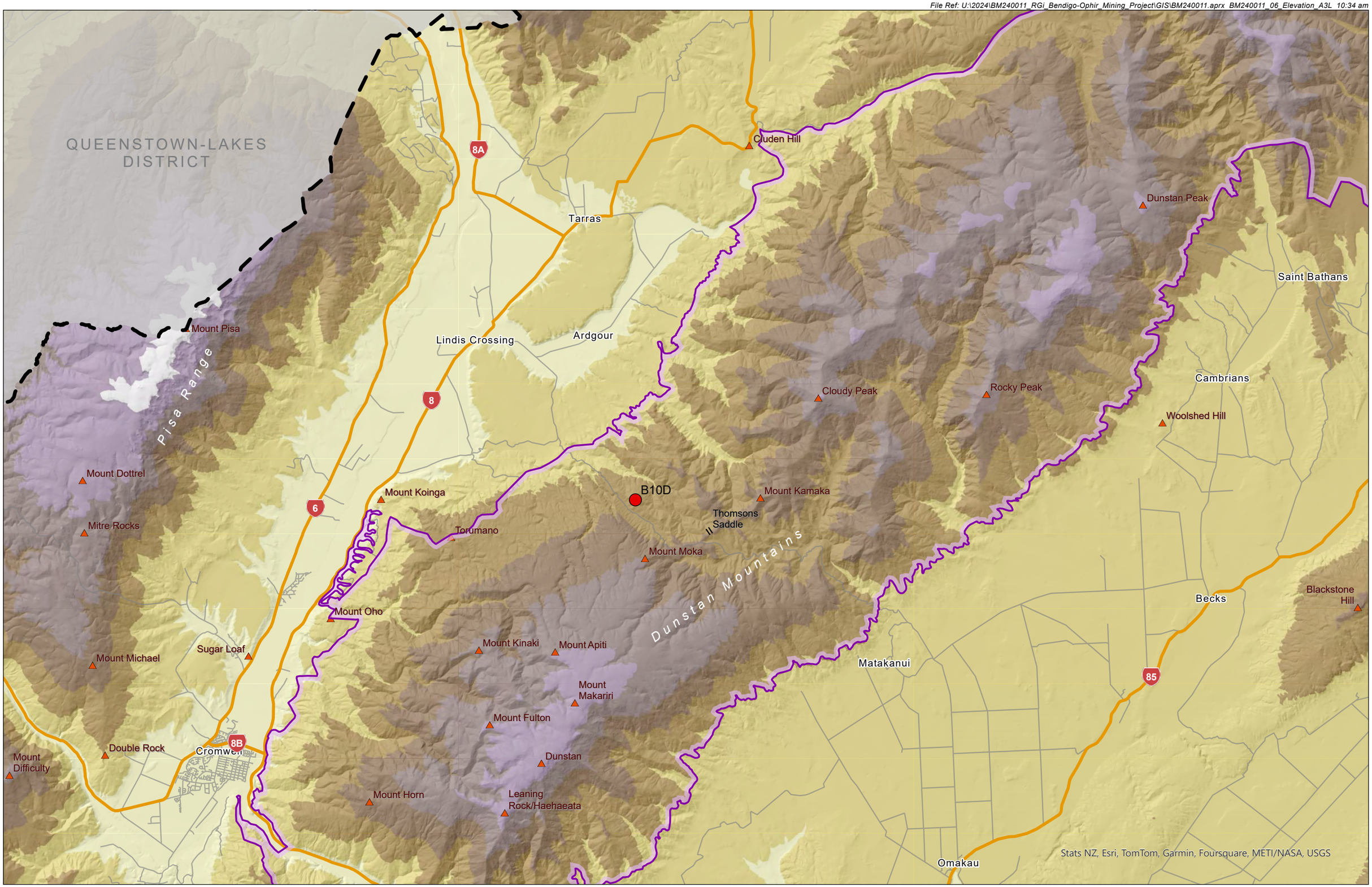
Soils

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 5



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0 4 km

1:150,000 @ A3

Data Sources:
Elevation grid sourced from Geographix DEM

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

Elevation (m)
- 0 - 300
- 300m - 600m
- 600m - 900m
- 900m - 1,200m
- 1,200m - 1,500m
- 1,500m - 1,800m
- over 1800m

Outstanding Natural Landscape

State Highway

BENDIGO OPHIR MINING PROJECT

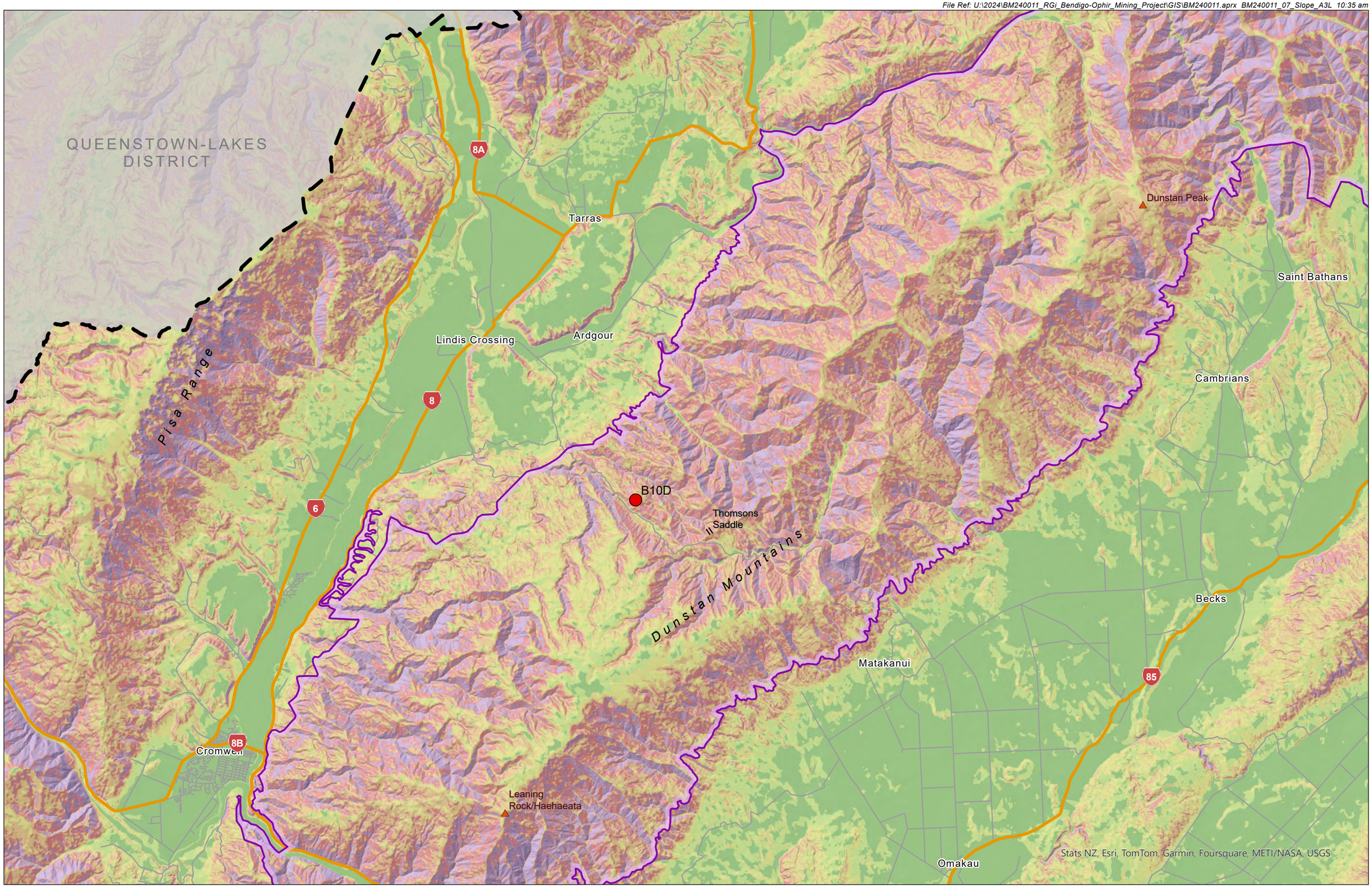
Elevation

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 6



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0 4 km

1:150,000 @ A3

Data Sources:
Elevation grid sourced from Geographix DEM

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

Slope (8m Grid)
- < 3°
- 3 - 7°
- 7 - 15°
- 15 - 25°
- 25 - 34°
- > 34°
- Outstanding Natural Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

Slope

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 7

LEGEND

Land Cover Database (LCDB5)

- 1 Built-up Area (settlement)
- 6 Surface Mines and Dumps
- 5 Transport Infrastructure
- 2 Urban Parkland/Open Space
- 12 Landslide
- 15 Alpine Grass/Herbfield
- 16 Gravel and Rock
- 20 Lake or Pond
- 21 River
- 30 Short-rotation Cropland
- 33 Orchard Vineyard and Other Perennial Crops
- 40 High Producing Exotic Grassland
- 41 Low Producing Grassland
- 42 Tall Tussock Grassland
- Depleted Grassland
- 44 Herbaceous Freshwater Vegetation
- 45 Fernland
- 50 Gorse and/or Broom
- 51 Manuka and/or Kanuka
- 52 Broadleaved Indigenous Hardwoods
- 54 Sub Alpine Shrubland
- 55 Mixed Exotic Shrubland
- 56 Matagouri or Grey Scrub
- 58 Forest - Harvested
- 64 Deciduous Hardwoods
- 68 Indigenous Forest
- 69 Exotic Forest
- 71 Outstanding Natural Landscape
- Outstanding Natural Landscape
- State Highway

Tarras
Lindis Crossing
Ardgour
Dunstan Peak
Saint Bathans
Cambrians
Becks
Pisa Range
B10D
Thomsons Saddle
Dunstan Mountains
Matakanui
Cromwell
Leaning Rock/Haehaeata
Omakau
8A
8
6
8B
85

Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

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0 4 km

1:150,000 @ A3

Data Sources:
Land Cover data sourced from the Ministry for the Environment, LCDB database version 5

Projection: NZGD 2000 New Zealand Transverse Mercator

BENDIGO OPHIR MINING PROJECT

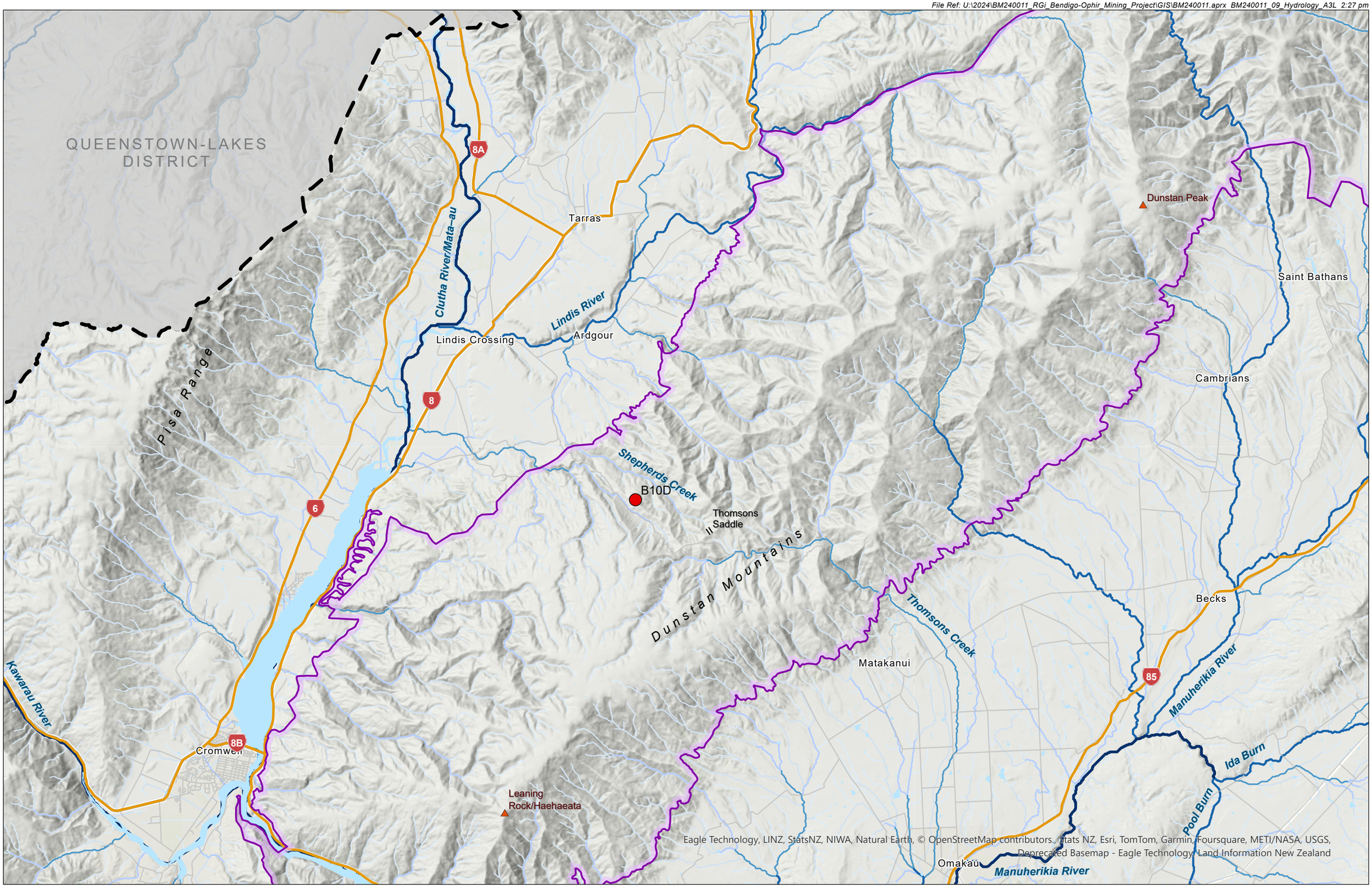
Land Cover (LCDBv5)

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 8



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0 4 km

1:150,000 @ A3

Data Sources:
River Environment Classification v5 sourced from MFE

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Outstanding Natural Landscape
- State Highway

Stream order (REC)

- 1
- 2
- 3
- 4
- 5, 6
- 7, 8

BENDIGO OPHIR MINING PROJECT

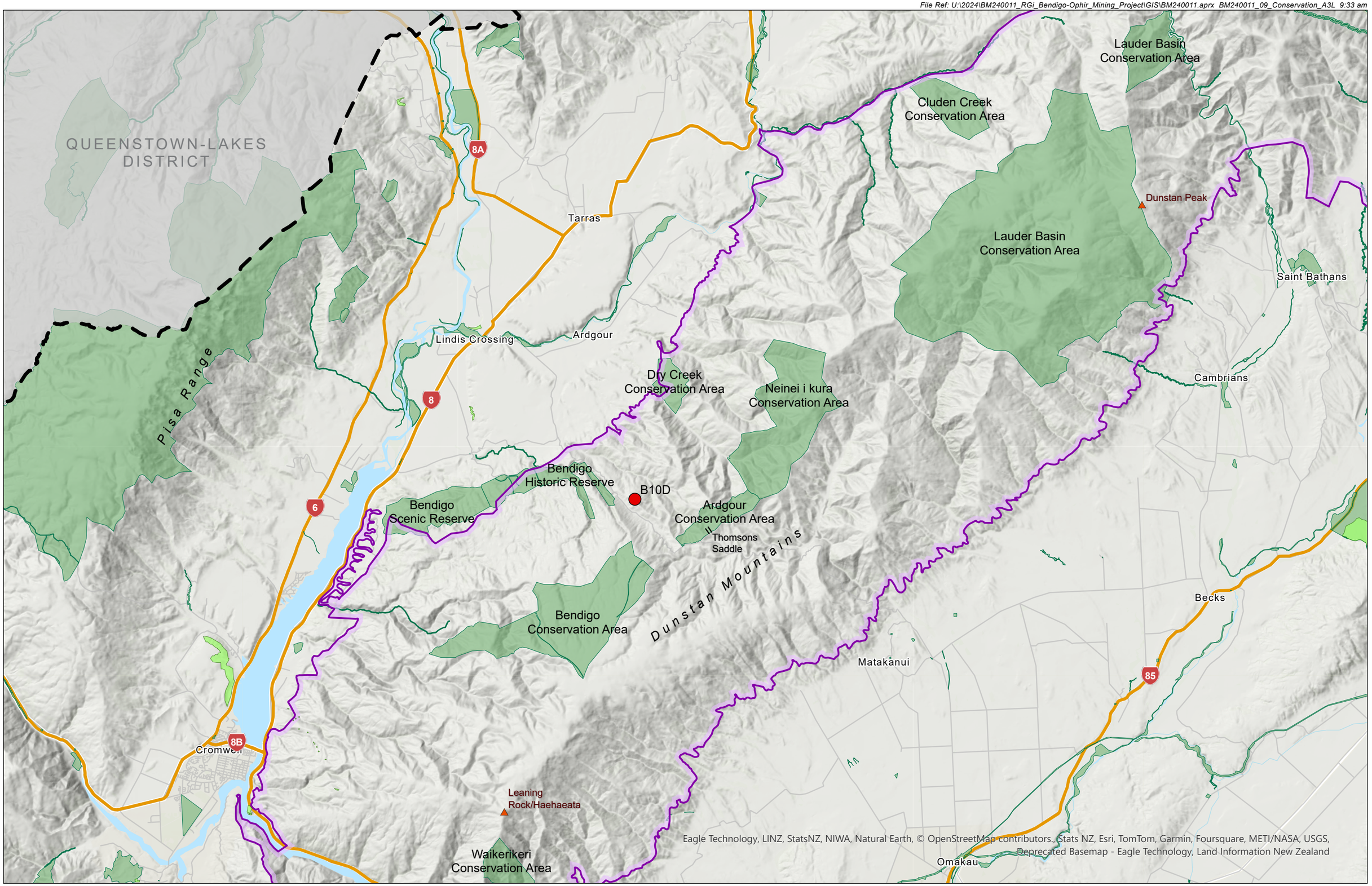
Hydrology

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 9



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0 4 km

1:150,000 @ A3

Data Sources:
Public Conservation Area sourced from DOC
QEII Covenants sourced from The QEII National Trust

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Public Conservation Area
- QEII Covenant
- Outstanding Natural Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

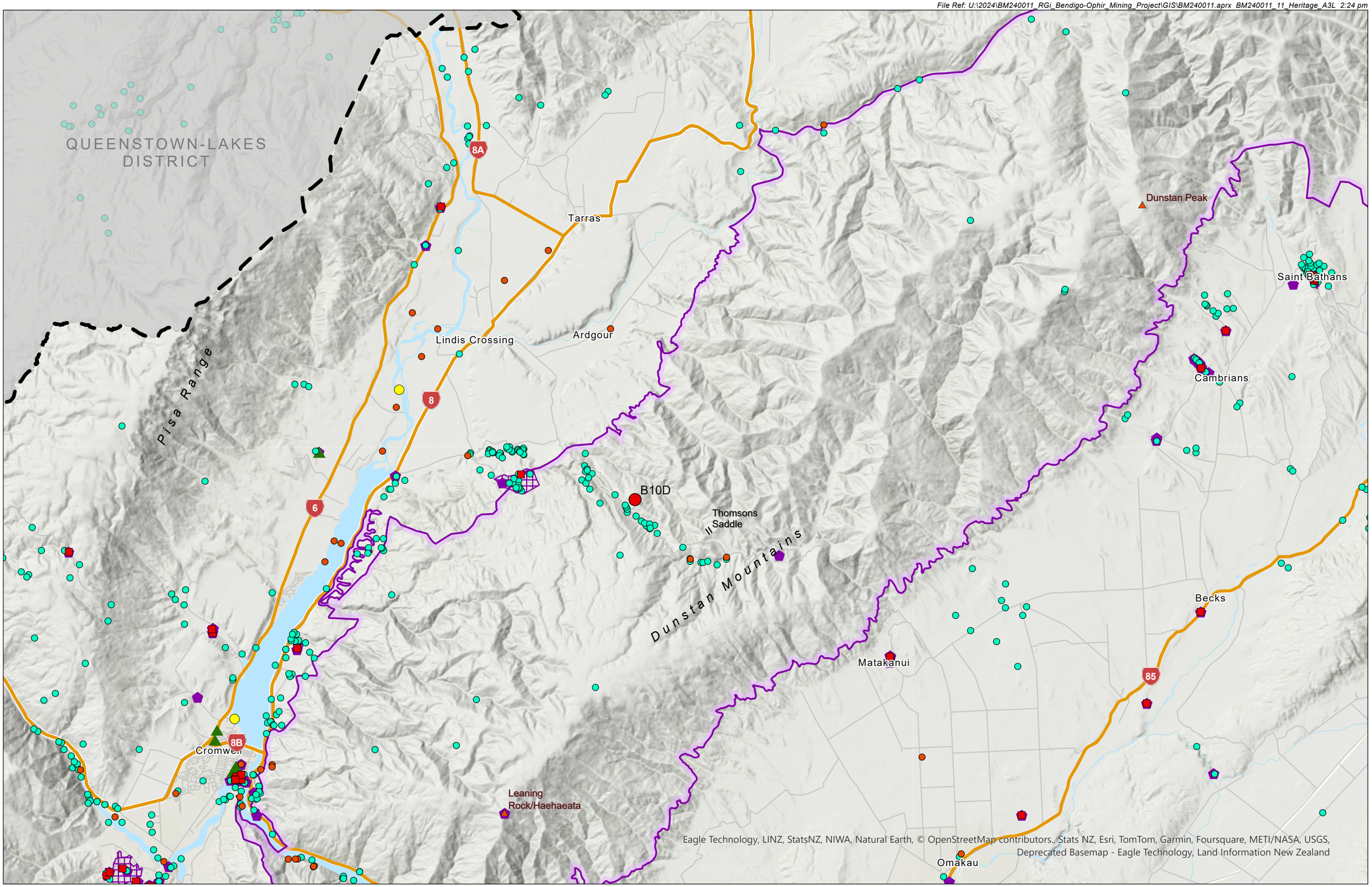
Conservation and Reserve Areas

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 10



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0 4 km

1:150,000 @ A3

Data Sources:
Historic Places sourced from Heritage NZ. Archaeological sites sourced from NZ Archaeological Association (NZAA). Other heritgae data sourced from CODC data service.

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Heritage NZ Site (NZHPT)
- NZAA Archaeological Site (Māori)
- NZAA Archaeological Site (European)
- Notable Trees
- Heritage Buildings
- Nohanga
- Heritage Reserve\Precinct
- Outstanding Natural Landscape
- State Highway

BENDIGO OPHIR MINING PROJECT

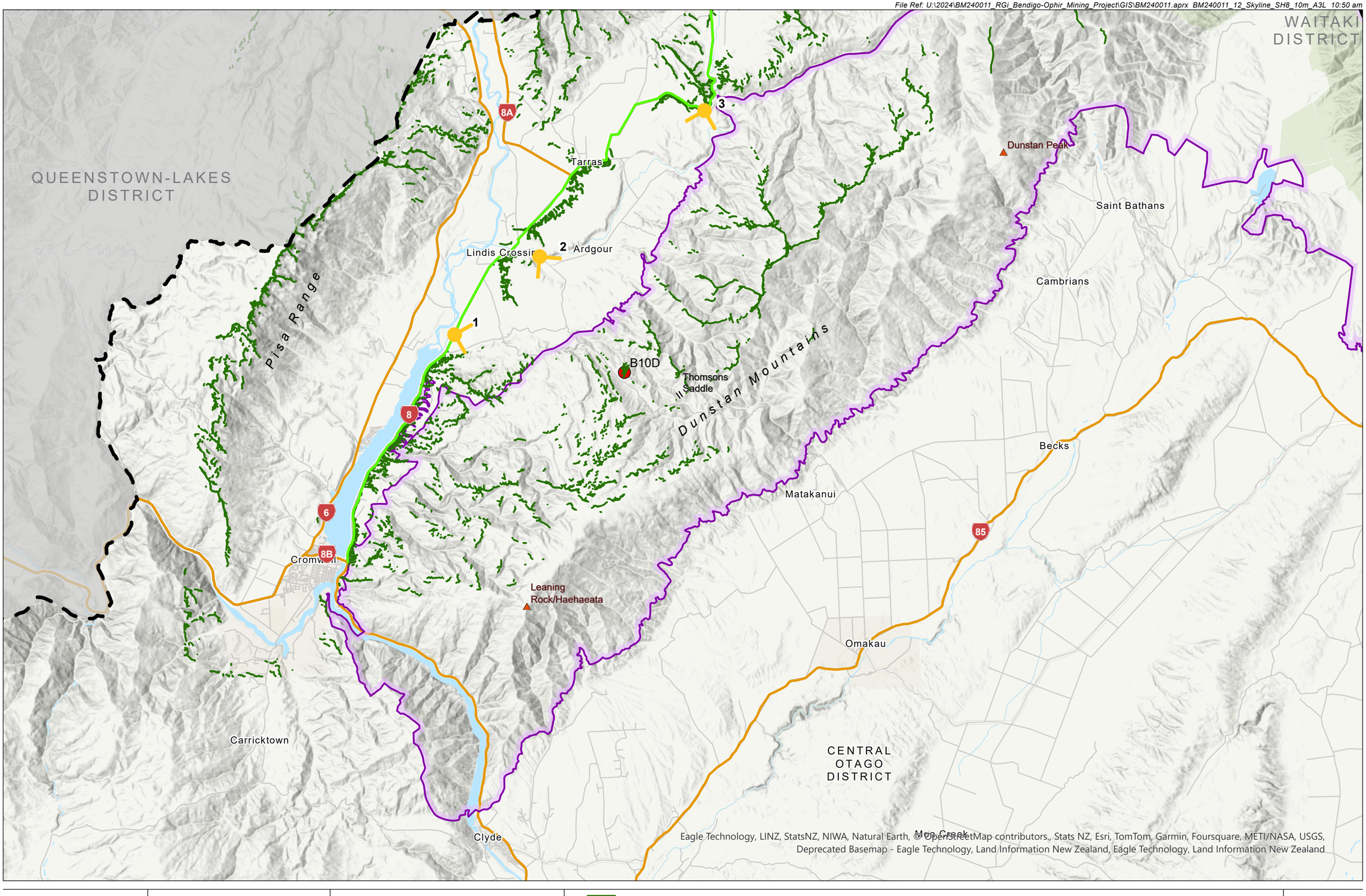
Identified Heritage Sites

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 11



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0 4 km

1:200,000 @ A3

Data Sources:
DEM sourced from Geographx

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Skyline SH 8 (10m)
- Viewpoints SH 8
- Outstanding Natural Landscape
- Site Context Photographs 1 - 3

BENDIGO OPHIR MINING PROJECT

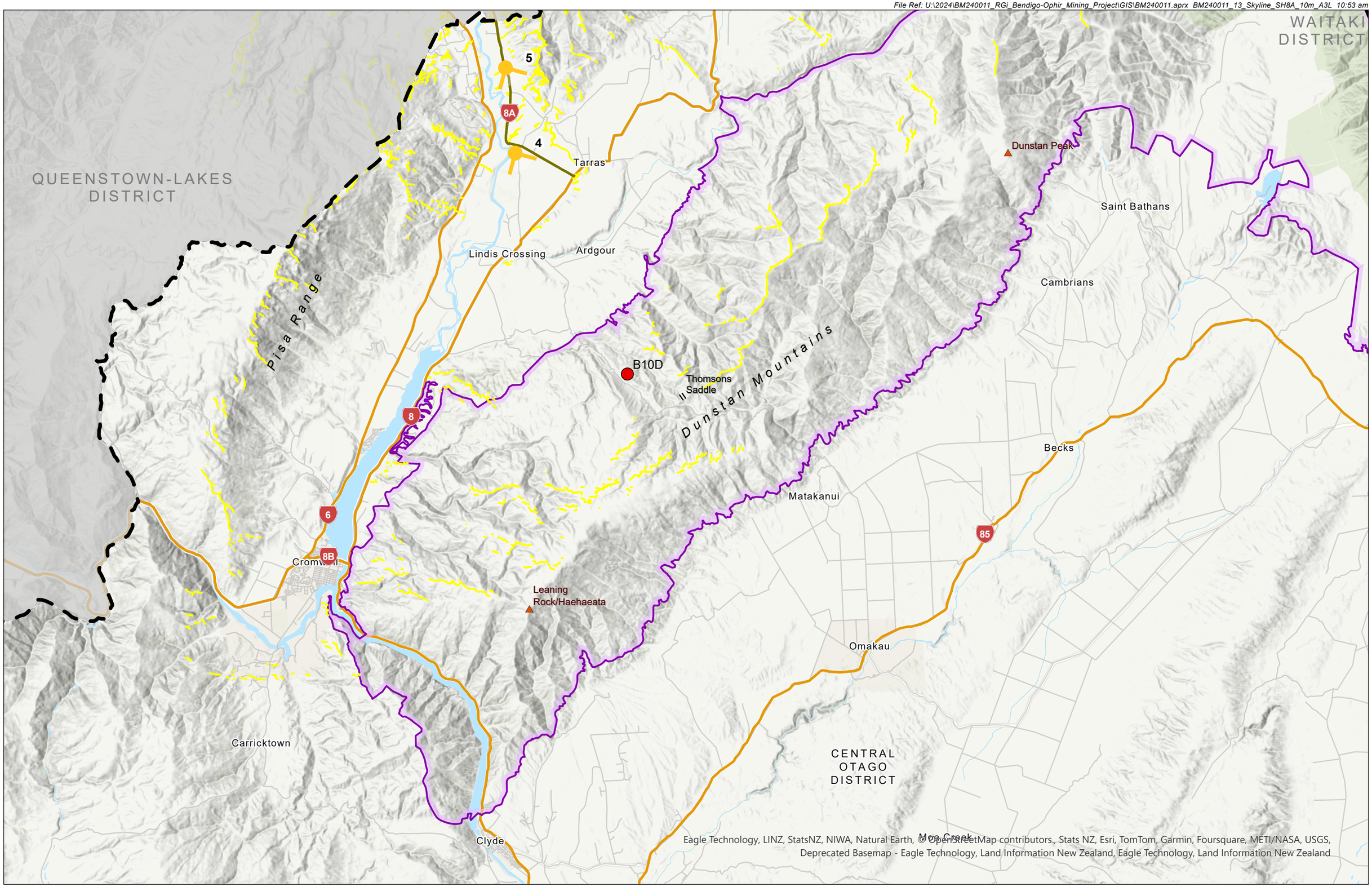
Skyline SH 8

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 12



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0 4 km

1:200,000 @ A3

Data Sources:
DEM sourced from Geographx

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Skyline SH 8A (10m)
- Viewpoints SH 8A
- Outstanding Natural Landscape
- Site Context Photographs 4 - 5

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Skyline SH 8A

Date: 27 March 2024 | Revision: 0

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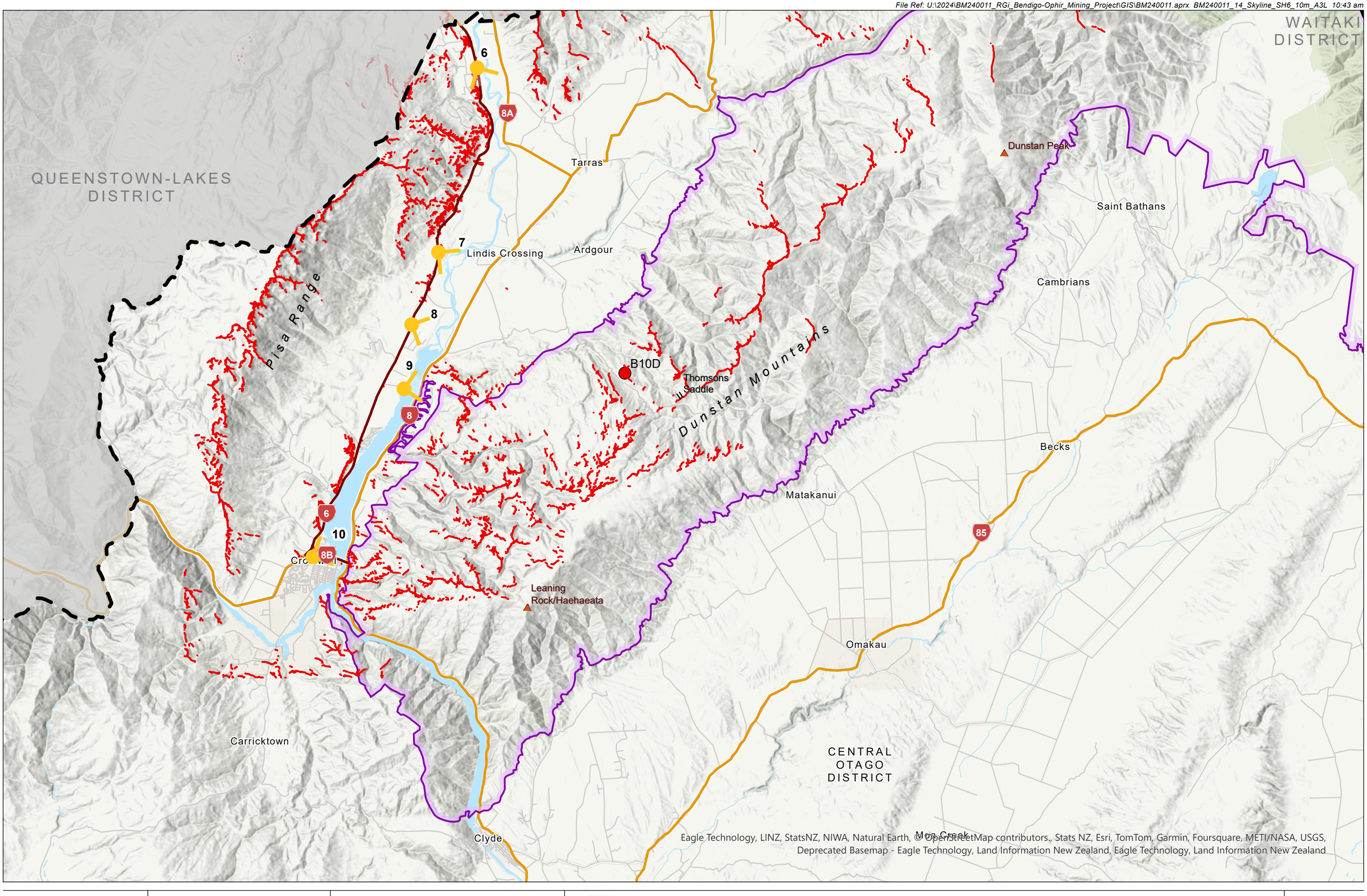
Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 13



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0 4 km

1:200,000 @ A3

Data Sources:
DEM sourced from Geographx

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Skyline SH 6 (10m)
- Viewpoints SH 6
- Outstanding Natural Landscape
- Site Context Photographs 6 - 10

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Skyline SH 6

Date: 27 March 2024 | Revision: 0

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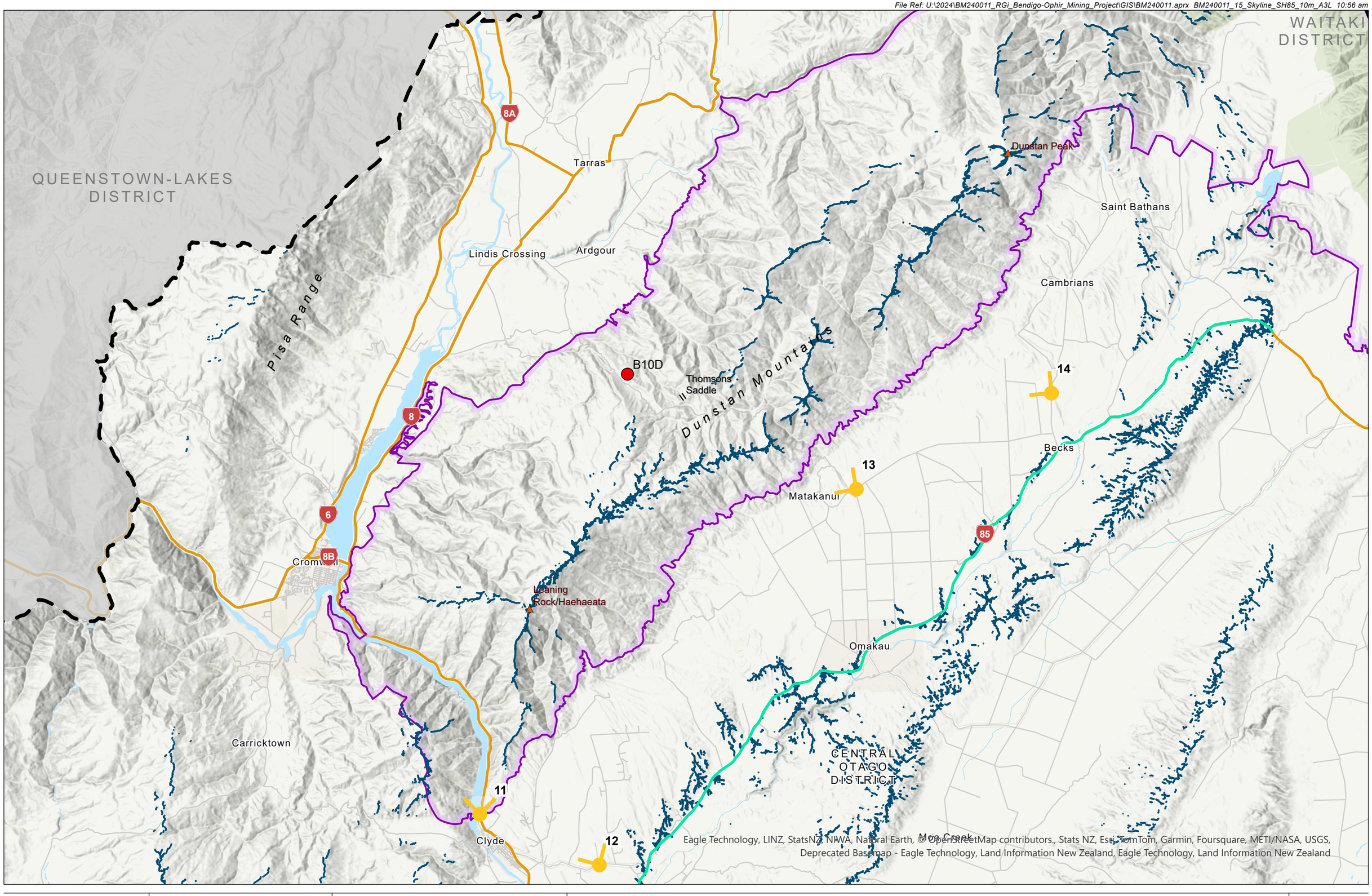
Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 14



Boffa Miskell

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0 4 km

1:200,000 @ A3

Data Sources:
DEM sourced from Geographx

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Skyline SH 85 (50m)
- Viewpoints SH 85 (Alexandra to Hills Creek)
- Outstanding Natural Landscape
- Site Context Photographs 11 - 14

BENDIGO OPHIR MINING PROJECT

Skyline SH 85

Date: 27 March 2024 | Revision: 0

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Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 15

Zone of Theoretical Visibility' (ZTV) is based on a Digital Terrain Model (DTM) with an 8 metre grid.
Observer points were located at the summit of B10D, set to 916m
Vegetation is not taken into account. Earth curvature is taken into account.
The term ZTV is preferred for its emphasis of two key factors that are often misunderstood:
• Visibility maps represent where an object may be seen theoretically – that is, it may not actually be visible in reality, for example due to localised screening from intervening vegetation, buildings or other structures which is not represented by the DTM; and
• ZTV indicates potential visibility only – that is, the areas within which there may be a line of sight. They do not convey the nature or magnitude of visual impacts, for example whether visibility will result in positive or negative effects and whether these will be significant or not.

QUEENSTOWN-LAKES DISTRICT
Pisa Range
Tarras
Lindis Crossing
Ardgour
Dunstan Peak
Saint Bathans
Cambrians
B10D
Thomsons Saddle
Dunstan Mountains
Becks
Matakanui
Cromwell
Leaning Rock/Haehaeata
Omakau
1
2
3
4
5
6
7
8
8A
8B
85

Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors., Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Deprecated Basemap - Eagle Technology, Land Information New Zealand

Boffa Miskell
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0 4 km
1:150,000 @ A3

Data Sources:
Protected Landscapes sourced from CODC data sevice
DEM sourced from Geographx

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND
- Trig on skyline (SH 6)
- Trig on skyline (SH 8)
- Trig B10D
- Trig B10D visible (2m)
- RAS Project Area
- Outstanding Natural Landscape
- Outstanding Natural Features
- Significant Amenity Landscape
- Viewpoints with view of B10D (Site Context Photographs 1 - 8)

BENDIGO OPHIR MINING PROJECT

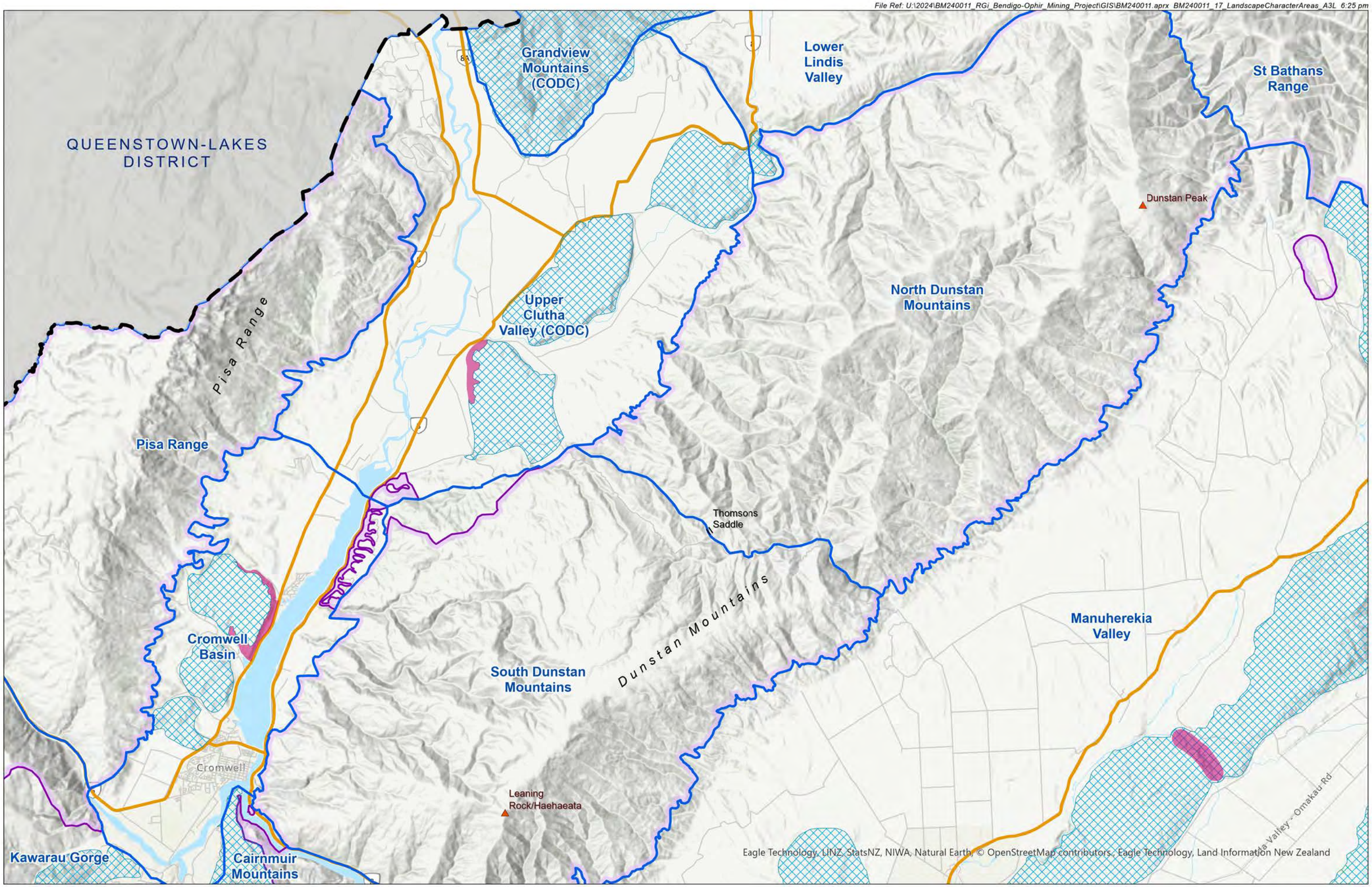
Zone of Theoretical Visibility of B10D

Date: 27 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: BMc | Checked: SCh

Map 16



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0 4 km

1:150,000 @ A3

Data Sources:
Protected Landscapes sourced from CODC data service

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Landscape Character Areas
- Outstanding Natural Landscape
- Significant Amenity Landscape
- Outstanding Natural Features

BENDIGO OPHIR MINING PROJECT

Landscape Character Areas

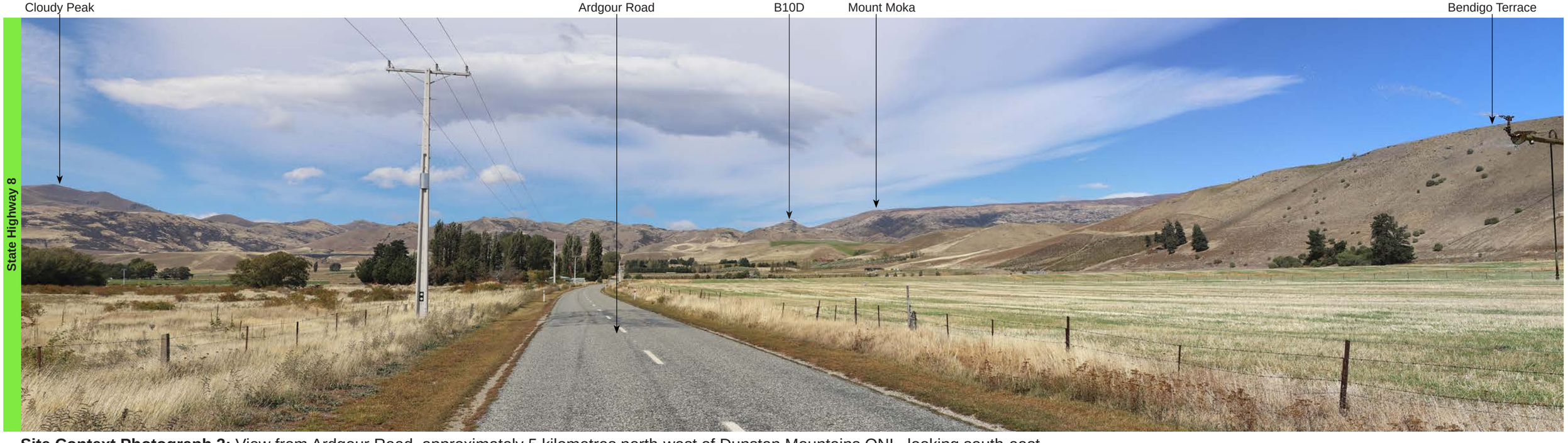
Date: 21 March 2024 | Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi

Map 17

Site Context Photograph 1: View from Tarras-Cromwell Road / State Highway 8, approximately 3 kilometres north-west of Dunstan Mountains ONL, looking east.



Site Context Photograph 2: View from Ardgour Road, approximately 5 kilometres north-west of Dunstan Mountains ONL, looking south-east.

Boffa Miskell

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Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is 20 cm	

BENDIGO-OPHIR MINING PROJECT

Site Context Photographs 1 - 2

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

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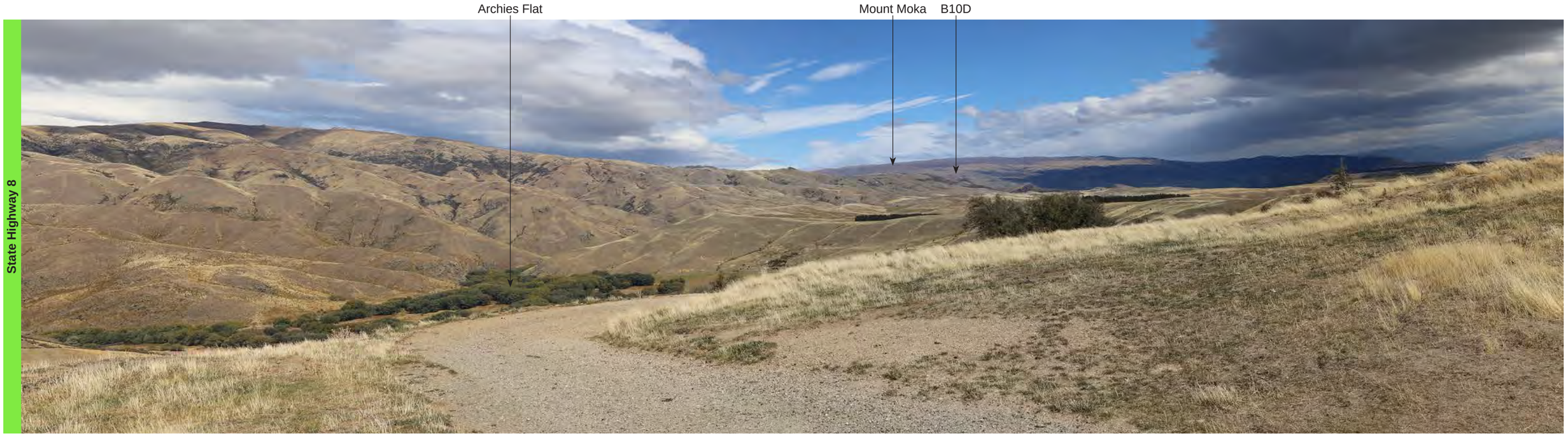

Site Context Photograph 3: View from Cluden Hill Summit, approximately 700 metres west of Dunstan Mountains ONL, looking south-west.

Site Context Photograph 4: View from Maori Point Road, approximately 9 kilometres north-west of Dunstan Mountains ONL, looking south-east.

Boffa Miskell

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Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is 20 cm	

BENDIGO-OPHIR MINING PROJECT

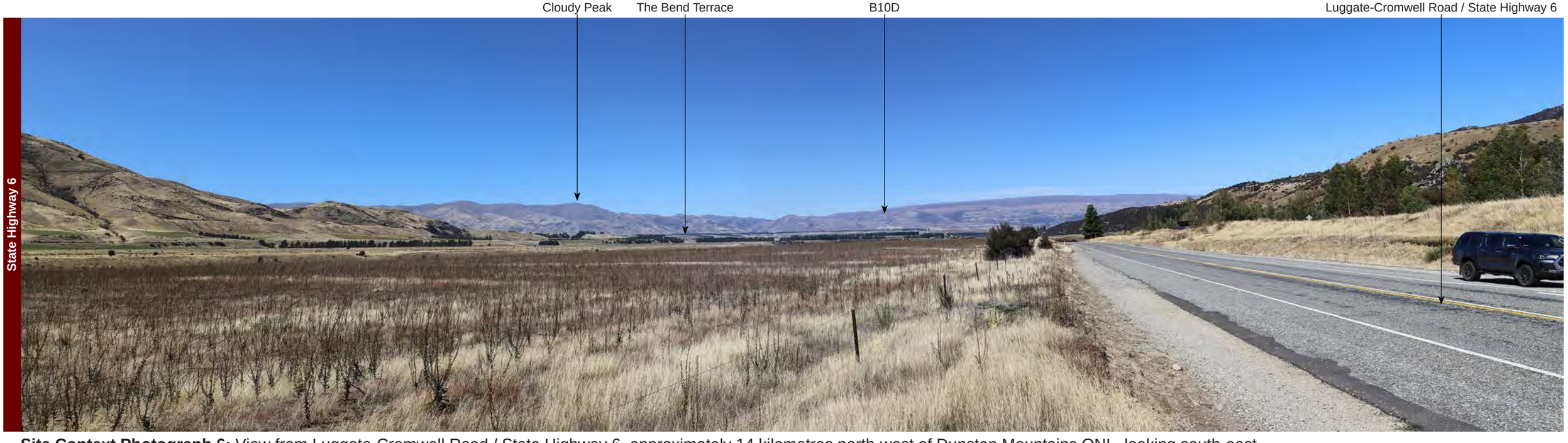
Site Context Photographs 3 - 4

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: Rhys.Girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi

Site Context Photograph 5: View from Tarras Road / State Highway 8A, approximately 13 kilometres north-west of Dunstan Mountains ONL, looking south-east.



Site Context Photograph 6: View from Luggate-Cromwell Road / State Highway 6, approximately 14 kilometres north-west of Dunstan Mountains ONL, looking south-east.

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is 20 cm	

BENDIGO-OPHIR MINING PROJECT

Site Context Photographs 5 - 6

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: Rhys.Girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi

Site Context Photograph 7: View from Luggate-Cromwell Road / State Highway 6, approximately 7 kilometres north-west of Dunstan Mountains ONL, looking south-east.

Site Context Photograph 8: View from Silver Tussock Vineyard on State Highway 6, approximately 3 kilometres north-west of Dunstan Mountains ONL, looking south-east.

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is 20 cm	

BENDIGO-OPHIR MINING PROJECT

Site Context Photographs 7 - 8

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: Rhys.Girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi

Site Context Photograph 9: View from Smiths Way, approximately 2 kilometres west of Dunstan Mountains ONL, looking north-east.

Site Context Photograph 10: View from State Highway 8B, approximately 2 kilometres west of Dunstan Mountains ONL, looking north-east.

Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is 20 cm	

BENDIGO-OPHIR MINING PROJECT

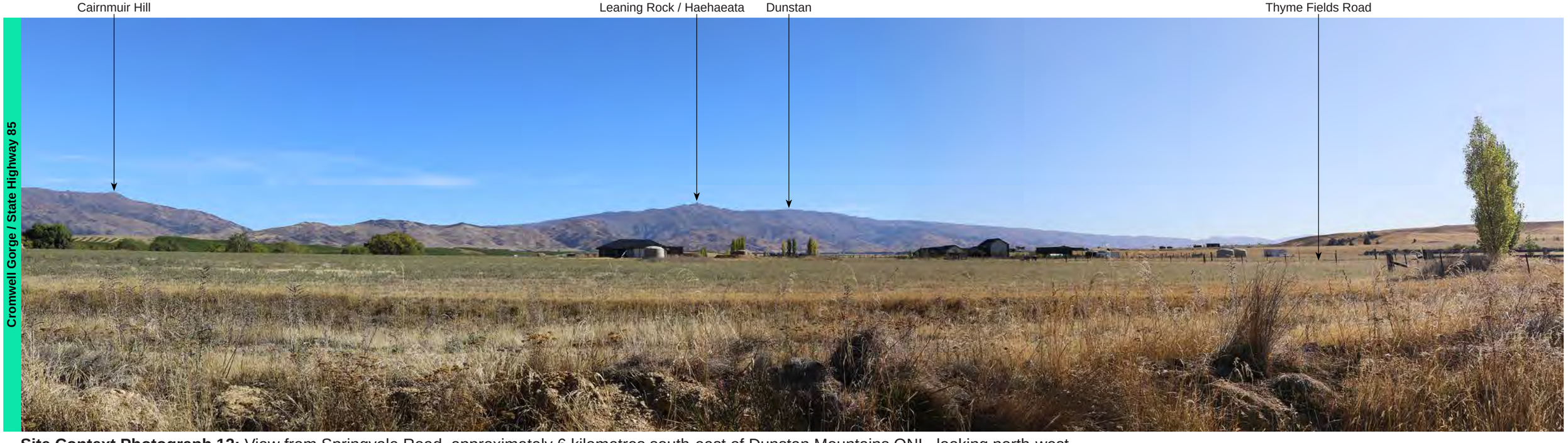
Site Context Photographs 9 - 10

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: Rhys.Girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi

Site Context Photograph 11: View from near Clyde Dam Upper Lookout, along the southern edge of Dunstan Mountains ONL, looking north.



Site Context Photograph 12: View from Springvale Road, approximately 6 kilometres south-east of Dunstan Mountains ONL, looking north-west.

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Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is	20 cm

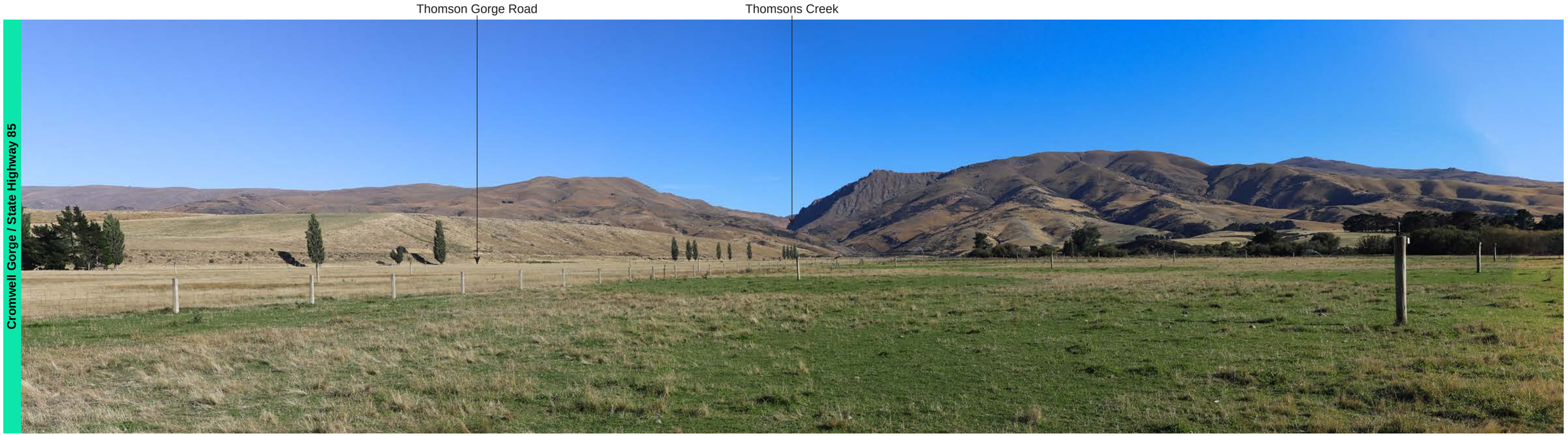
BENDIGO-OPHIR MINING PROJECT

Site Context Photographs 11 - 12

Date: 21 March 2024 Revision: 0

Plan prepared for Santana Minerals Ltd by Boffa Miskell Limited

Project Manager: Rhys.Girvan@boffamiskell.co.nz | Drawn: SCh | Checked: RGi



Site Context Photograph 13: View from Glassford Road, approximately 3 kilometres east of Dunstan Mountains ONL, looking north-west.

Site Context Photograph 14: View from St Bathans Loop Road, approximately 5 kilometres east of Dunstan Mountains ONL, looking north-west.

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Viewpoint Details

Horizontal Field of View	: 90°
Vertical Field of View	: 30°
Projection	: Rectilinear
Image Reading Distance @ A3 is	20 cm

BENDIGO-OPHIR MINING PROJECT

Site Context Photographs 13 - 14

Date: 21 March 2024 Revision: 0

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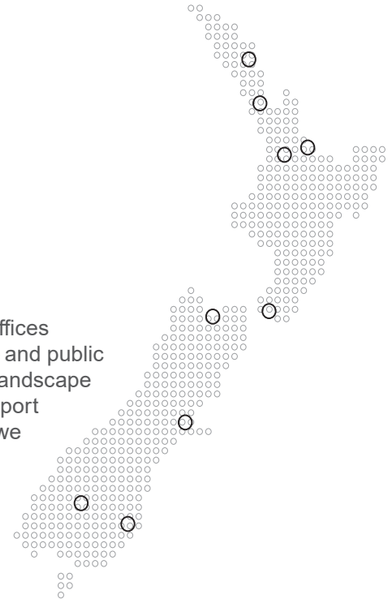
Together. Shaping Better Places.

Boffa Miskell is a leading New Zealand environmental consultancy with nine offices throughout Aotearoa. We work with a wide range of local, international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, Te Hīhiri (cultural advisory), engagement, transport advisory, climate change, graphics and mapping. Over the past five decades we have built a reputation for creativity, professionalism, innovation and excellence by understanding each project's interconnections with the wider environmental, social, cultural and economic context.



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