Appendix 12: Landscape and Visual Assessment Report

Boffa Miskell

Smooth Hill Landfill

Landscape, Natural Character and Visual Effects Assessment
Prepared for Dunedin City Council

August 2020 (Updated May 2021)

Document Quality Assurance

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Executive Summary

Dunedin City Council (DCC) commissioned Boffa Miskell to prepare a landscape, natural character and visual effects assessment for a proposal to construct a new 42.5-hectare landfill at Smooth Hill within an existing designation (D659) (the 'Site') along Big Stone Road.

DCC lodged applications for resource consents for the construction and operation of Smooth Hill landfill including upgrades to McLaren Gully Road with both the Otago Regional Council and Dunedin City Council in August 2020. The lodged application included this Landscape and Visual Assessment Report (as Appendix 12). Following lodgement, the ORC and DCC considered the application and requested further information relating to the proposal under Section 92 (s92) of the Resource Management Act (RMA).

This Landscape and Visual Assessment report has subsequently been updated to respond to changes to the lodged landfill design resulting from s92 questions and requests.

Landscape Context

The proposed landfill is situated in the hill country between the Taieri River Plains and the coastline some 28 kilometres south of Dunedin and seven kilometres from the seaside town of Brighton. The landscape in this area forms rolling to steep hill country, within which the Site is contained within folded gullies and ridges and largely concealed from wider views. The hills in the vicinity of the Site are generally managed as exotic forestry and pasture with pockets of indigenous vegetation, including remnant coastal podocarp forest and kanuka scrub.

The Site and its general location are not identified in the coastal environment or part of any outstanding natural feature or landscape or highly valued landscape relating to amenity values or the quality of the environment. Under Designation D659, an outline plan of works must include a landscape plan showing proposed initial planting, final landform, and final planting.

Landscape Effects

Development of a landfill is essentially a long-term and gradual construction project up to approximately 40~~55~~ years, rather than a development that occurs simultaneously across the Site. In physical terms, the proposed landfill will cover a total area of approximately 18.6~~44.5~~ hectares of the 176.5 ha. designated area.

Prior to operation, enabling works associated with the landfill also include upgrades to McLaren Gully Road from its intersection with State Highway 1 to the access into the Site along Big Stone Road. During construction this will reveal a raw work appearance generating **moderate adverse** effects. Once completed, the landfill operation will commence and the upgraded road corridor will maintain part of a wider rural road network which assimilates within this ~~established~~ undulating rural landscape~~road network~~.

Within the Site, enabling works will include earthworks to facilitate access, lining and drainage alongside the construction of plant necessary to facilitate the landfill operation. During operation the creation of a landfill will substantially modify the existing folded landform to infill a gully as ~~create an enclosed amphitheatre and stormwater management as~~ refuse is gradually deposited within the landfill extent. Once the landfill is fully established, the landform will be shaped to resemble a smoothed and sculptured rounded form and maintained as pasture. This will remain contained in a broader productive rural landscape that can continue to be managed as productive forestry and enduring areas of indigenous vegetation, including ecological mitigation included within the balance of the Site. Given this outcome, internalized **moderate-high adverse** physical landscape effects will occur during operation and reduce to **low adverse** physical effects at completion.

The appearance of the Site will continually change through sequences of bare ground, landfill operation and reinstatement of pasture. Vegetation surrounding the Site will gradually establish and continue a dynamic pattern of forestry ~~continually change and comprise of trees~~ at various stages of re-establishment. Such land use will retain an inherent rural character both during and after the project. During landfill activity, movement of large machinery and earthworks will be evident and atypical of the normal day to day rural activities that currently prevail. The construction and operation of plant, soil stockpiles and drainage within the Site will also generate some more distinctive rural-industrial influences however these will remain subservient within surrounding rural land-use with limited visibility from beyond the Site. External views will be mitigated by perimeter trees consistent within surrounding areas of forestry.

Given the relative containment of the Site, the gradual and intermittent nature of the filling and earthworks activity and establishment of perimeter trees and supporting enduring productive land use, potential landscape character effects will be **moderate-low adverse** during operation and reduce to **low adverse** effects at completion.

Natural Character Effects

Waterbodies on the Site are limited to ephemeral streams and an area of swamp wetland which express limited levels of natural character and form tributaries to Otokia Creek. The proposed landfill will avoid the ephemeral streams and wetlands and preserve the limited levels of natural character expressed in these areas. Widening of the road as part of the upgrades will result in the removal of 16.5m^2 of wetlands. These waterbodies associated with the ~~Whilst the location and relationship of such waterbodies will be reconfigured by the proposed landfill, such modification will remain localised and contained within a wider modified working rural landscape. Similarly, affected waterbodies associated with the~~ upgrade to McLaren Gully Road adjoin an established road corridor and surrounding rural landscape expressing a higher degree of modification and more limited natural character. Overall, the removal of 16.5m^2 of low-quality wetland will result in a very low level of effects. It is considered that removing the small areas of wetland and providing substantial ecological planting throughout the designation site will in time result in low beneficial natural character effects. ~~In this context, ecological mitigation including a Wetland Restoration Plan is considered suitable to address any potential for significant natural character effects in the context of ongoing rural activity.~~

Visual Effects

The Site is visually confined within a sequence of hills and valleys which extend between the Taieri Plains and the South Taieri Coast. As such the visual catchment for all but the highest points of the Site are very restricted. Within this context, the potential to observe the proposed landfill operation is largely contained within an internal amphitheatre with the potential viewing audience predominantly limited to adjoining areas, including parts of McLaren Gully and Big Stone Roads.

The location and physical nature of the Site, within a broader folded gully system, essentially contains and mitigates most potential visual effects of the landfill on surrounding areas. Views from dwellings are limited to long distance partial views from ~~two~~ three dwellings which are typically concealed by intervening plantation forest within a wider working rural landscape. Any partial and transient views will entail a foreground of productive plantation forestry and typically maintain a very distant backdrop of Maungatua beyond the Taieri Plains generating some short term **moderate adverse** effects, principally from adjoining roads. Once perimeter trees have established in accordance with ~~staged~~ landscape mitigation, any visual effects generated along the boundary of the landfill will reduce to **low adverse**.

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Appendices

Graphic Supplement (bound separately)

1.0 Introduction

1.1 Scope of the report

Boffa Miskell Limited (BML) has been engaged by Dunedin City Council (DCC) to undertake a landscape, natural character and visual effects assessment for a proposed landfill at Smooth Hill south east of Dunedin.

DCC lodged applications for resource consents for the construction and operation of Smooth Hill landfill including upgrades to McLaren Gully Road with both the Otago Regional Council and Dunedin City Council in August 2020. The lodged application included this Landscape and Visual Assessment Report (as Appendix 12). Following lodgement, the ORC and DCC considered the application and requested further information relating to the proposal under Section 92 (s92) of the Resource Management Act (RMA).

This Landscape and Visual Assessment report has subsequently been updated to respond to changes to the lodged landfill design resulting from s92 questions.

~~The proposed landfill is to be developed in five stages which occupy a total area of 42.5 hectares over a period of up to approximately 50 years~~. ~~For clarification 'Site' as used in this report refers to the designated area (from the District Plan) accessed off Big Stone Road **(Figure 1).**~~

1.2 Project Background

DCC is currently working on an overall Waste Futures programme to identify and procure the best solid waste solution for Dunedin City, to enable it to move towards a zero-waste future and a more 'circular economy'[1]. Part of this programme includes consenting and development of a new landfill at Smooth Hill. The Smooth Hill site ~~was~~ is designated ~~as~~ for use as a future landfill in the Dunedin City Council's Second-Generation District Plan (2GP) having been originally designated as such in 1996.

For clarification 'Site' as used in this report refers to the designated area (from the District Plan) accessed off Big Stone Road **(Figure 1).**

This report forms part of a suite of technical assessments that have provided input into the concept design of the landfill, and considers the potential landscape, natural character and visual effects of the proposed landfill to support the applications for resource consent. An outline plan of works will also be applied for following the granting of resource consents and detailed landfill design. As part of the project team, early assessment of the Site and the proposal provided landscape input into the design of the landform including mitigation measures to minimise the external effects of the landfill on the surrounding community.

[1] A circular economy is an alternative to the traditional linear economy in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life (https://www.mfe.govt.nz/waste/circular-economy).

2.0 Methodology

Landscape, natural character and visual assessments are closely related and, in part, overlapping assessments. Detailed methodologies of the three assessments are attached in **Appendix 1**, the brief descriptions below summarise the fundamentals of each.

2.1.1 Landscape Assessment

To assess the level and nature of physical effects associated with the proposal, the assessment has considered the sensitivity of the physical landscape features undergoing change together with the magnitude of change proposed. For this project, effects may be generated from changes to the landform and vegetation disrupted by landfill activity, as well as associated changes to landscape character.

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

Assessing landscape character effects provides judgement of the level and nature of changes to the existing landscape character. This includes consideration of the specific rural character, associated with the location of the development proposed and the extent to which this will undergo change. To inform an assessment of the magnitude of landscape change, it is also important that the size or scale and the geographical extent of the area influenced is defined where possible together with the duration of the effect and whether potential effects are reversible.

2.1.2 Visual Assessment

The visual assessment considers the visual change that would result from the proposal, (the nature and scale of the change, what change would be visible to whom, and how views may differ from the existing situation). Visual change can impact on a community's visual amenity.

Visual amenity is one component of amenity values which are defined in the RMA as…*those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.*

Visual amenity describes the pleasantness and aesthetic coherence of a place and comprises the visual and aesthetic aspects of amenity. For the purpose of this assessment, access to private property has not been obtained, with visual effects assessed based on desktop analysis and the nearest available public viewpoint from which representative views were obtained.

2.1.3 Natural Character Assessment

Whilst the proposed landfill is located outside the coastal environment, this assessment considers natural character insofar as this applies to freshwater bodies and their margins, (as

defined in RMA Section 6(a))[2]. Natural character is described in terms of the natural elements, patterns and processes of such areas and how they are perceived and experienced. The level of natural character (naturalness) is determined by the level of human-induced modification, where the highest degree of natural character occurs where there is the least amount of modification.

This assessment describes and assesses the existing level of natural character of the relevant waterbodies(wetlands) and then assesses the effects of the proposed landfill (and road widening) on natural character.

2.1.4 Assessment Process

In summary, this assessment aims to:

- Systematically identify and assess the sensitivity of the landscape resource and viewing audience;
- Assess the potential magnitude of natural character, landscape and visual change which will result from the proposed development;
- Indicate the measures proposed to avoid, remedy or mitigate those effects; and
- Provide an overall assessment and professional judgement as to the level of the anticipated natural character, landscape and visual effects, considering the proposed opportunities for mitigation.

The assessments involved the following tasks:

- Familiarisation of the project proposal;
- Desktop analysis of the landscape context;
- Preparation of visibility analysis (ZTV) to identify the potential viewing audience;
- Site visit to understand the Site and its context, including the nature of available views;
- Preparation of a visual simulation from two publicly accessible viewpoints; and
- Assessment of landscape, natural character and visual effects.

This assessment has been undertaken and peer reviewed by NZILA registered landscape architects with reference to best practice guidance, which include:

- Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines, NZILA, April 2021[3] [PW1][JW2]

[2] Section 6(a)) considers natural character as a matter of national importance: *…the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

[3] Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines update and replace the 2010 Best Practice note. They expand and build upon the original concepts established in the 2010 guidance whilst also promoting an approach appropriate to Aotearoa New Zealand. The new guidelines recognise mātauranga Māori and important of tāngata whenua values alongside concepts and values inherited from western and other cultural traditions.

- ~~Best Practice Note 10.1, Landscape Assessment and Sustainable Management, New Zealand Institute of Landscape Architects (2010).~~
- Boffa Miskell Best Practice, Natural Character, Landscape and Visual Assessment Methodology (attached **Appendix 1**).

3.0 Existing Environment

This section describes the existing landscape context, natural character and available viewing audiences, which provides the baseline for the assessment of effects on such aspects.

3.1 Location and Landscape Context

The Site is situated in the hill country between the Taieri River plains, and the coastline some 28 kilometres south of Dunedin and seven kilometres from the seaside township of Brighton (see **Figure 1: Landscape Context**). In the immediate context, the Site is located approximately 1 kilometre south of Smooth Hill and adjoins ~~McLaren Gully Road and~~ Big Stone Road along its respective eastern and southern boundaries.

The Site comprises one of many folded gully and ridges which characterise the rolling to steep hill country south of Dunedin. The typical elevation in this area is between 100 and 200 metres above sea level (masl) with some hills reaching up to over 300 masl including Gladknowe at 303 masl (see **Figure 2: Existing Landform**). The hill country extends well beyond the immediate vicinity of the Site, from the southern edge of Dunedin City to the Clutha River in the south.

The Site or its immediate vicinity is not considered to form part of any outstanding or highly valued natural feature or landscape. Many of the hills in the vicinity, including the Site ~~, with the hills in the vicinity of the Site having largely~~ have been developed for exotic forestry production, ~~clad in~~primarily *Pinus radiata* at varying ages and stages of harvest. A stand of semi-mature Macrocarpa has also been recently harvested in the south-east area of the Site. In the wider area, occasional pockets of exotic trees and some ~~Within the immediate area there are occasional pockets of~~ indigenous vegetation are also established, ~~,~~ including manuka and kanuka scrub, and broadleaf forest, as well as areas of grazed pasture.

Saddle Hill Significant Natural Landscape is located approximately 2 kilometres to the north of the Site and defined by the visible hill face adjoining State Highway 1 (SH1) and visible across the broader Taieri ~~River~~ Plain~~s~~. Further to the east, Hope Hill Scenic Reserve is accessed from McLaren Gully Road 1.3 kilometres north-east of the Site~~. The reserve~~ and contains an intact area of broadleaf and podocarp forest ~~and is~~ popular for goat and pig hunting.

The surrounding environment represents an enclosed valley system supporting forestry, farmland, and lifestyle blocks. This typically maintains a remote working rural character dispersed throughout smooth undulating hill tops and gradually sloping gullies. Five dwellings are located within 2 km of the Site. Three dwellings are located to the south-east of the Site, namely, 513, 689 and 731 Big Stone Road and typically situated beyond intervening pine forest which restricts views towards the Site.

Closer to SH1 two dwellings are located at 108 and 109 McLaren Gully Road, however direct views towards the Site from this area are curtailed by intervening landform. The local roads in

the area are predominantly single lane and unsealed, typically aligned to the undulating topography.

3.1.1 Landscape Character Areas

The landscape character areas (LCAs) which make up the Dunedin District were previously identified as part of the Dunedin Landscape Management Area Review[4]. Within this study, the Site is identified within the Taieri Slopes LCA which comprise a series of rural hillsides which encircle the Taieri Plains. The defining characteristics of this landscape as identified within this study are set out below[5]:

- *Low hills enclosing the Taieri Plain, incorporating prominent landform features*
- *Spur and gully hillside morphology, incorporating streams and gullies, with varied vegetation types and cover*
- *Rural dwellings generally located within lower slopes alongside pastoral farming*
- *Ridgeline breached by significant watercourses draining into the Plain*

The overall significance of the Taieri Slopes was identified as Medium-High with citywide importance[6]. Collectively, the rural hillsides that surround the Taieri Plain were described as having inherent visual amenity, landscape and ecological values. They include iconic landmark features of citywide importance, founded on strong cultural associations. The diversity of natural remnant vegetation covering the collective hillsides and emerging valleys provide an important green backdrop to the modified Plain below.

3.2 Site Appraisal

The Site boundaries are defined by the existing Designation (D659) ~~bisected by a legal road and provided~~ with direct access into the designated land from Big Stone Road (see **Figure 3: Site Appraisal**).

The Site accommodates a sequence of gullies and spurs which generally slope north from Big Stone Road along the Site's more elevated south-east boundary. The highest part of the Site is located in the south~~-western~~ern corner of the Site and reaches an elevation of 187 masl. The lowest point is at an elevation of 95 masl and accommodates an existing wetland area surrounded by scrub and recently planted pine trees. Big Stone Road ~~and McLaren Gully Road~~ adjoining the Site ~~both lie between the~~reaches an elevation of between 140 and 150 masl, with the proposed entrance ~~being~~ located at 140 masl.

Much of the existing landcover within the Site is associated with production forestry which has recently been felled and replanted with *Pinus radiata*. This is consistent with most of the nearby land which is clad with pine forest of varying heights and ages. Colonising plants such as gorse, broom and the native shrub poroporo (*Solanum laciniatum*) are also scattered throughout the Site, especially at the lowest points in the wetland. A plantation of semi-mature macrocarpa which was recently harvested (see **Photo 1**) adjoins part of Big Stone Road boundary and includes a group of large macrocarpa trees enclosing a building ruin identified as an archaeological site (see **Photo 2**).

[4] Boffa Miskell (2007) Dunedin Landscape Management Area Review: Landscape Assessment.

[5] Ibid., page 103.

[6] Ibid., page 105.

Photo 1: Existing macrocarpa plantation which has recently been harvested beyond foreground of young pine

Photo 2: Building ruins within mature macrocarpa and Eucalypt trees

To assist the Site Appraisal, three photographs **(Site Appraisal Photographs A - C[7])** were taken from within the Site and described below:.[PW3][JW4]

Site Appraisal Photograph A is taken near the lower central area of the Site adjoining an existing wetland looking south towards the highest part of the Site reaching 187 masl. Part of the existing macrocarpa plantation which was recently ~~due to be~~ harvested is visible in the left-hand side of the photograph. Throughout the foreground of the photograph, land resulting from harvested forestry which characterises much of the Site is visible and has recently been replanted. Beyond this, more established plantation forestry adjoins the Site in the vicinity of Big Stone Road visible on the skyline. An existing wetland and backdrop of slightly more established pine trees within regenerating scrub is visible in the right-hand side of the photograph and characterises the north-western area of the Site.

Site Appraisal Photograph B is taken from the western area of the Site looking north-east across the folded gully landform in the centre of the Site. From here, recently planted pine trees and scrub is visible throughout the foreground of an area of wetland visible in the lower central part of the Site. Beyond this, land with recently removed plantation trees are visible in the eastern area of the Site with semi-mature macrocarpa trees which have been harvested visible to the right.

Site Appraisal Photograph C is taken from an elevated spur dividing the central area of the Site looking east towards a contained gully which has recently been re-established in pine. Beyond this, an adjoining pasture covered spur encloses the eastern area of the Site which curtails views in the direction of McLaren Gully Road. A sequence of undulating hills covered with a mosaic of vegetation occupies the midground with a distant backdrop of Maungatua seen in the right-hand side of the photograph along the skyline.

3.3 Natural Character of Waterbodies

Two ephemeral streams and a wetland area occupy part ~~of the proposed landfill footprint~~of the Site. The proposed landfill footprint avoids these areas. There are identified wetlands on both sides of McLaren Gully Road. Initially a larger area of wetlands alongside McLaren Gully Road were to be affected by the proposed road widening. This has been revised to reduce the

[7] Photos taken 23rd May 2019 and 24th February 2020.

amount of wetlands affected, so that ~~Due to technical constraints with the road alignment and proposed widening approximately~~only about 16.5m^2 area of wetlands near the road will be impacted~~s~~. The wetlands consist of sedgeland and grass land and have low-moderate ecological value. The wetlands from part of a modified rural landscape ~~and ephemeral streams form part of a modified rural landscape~~ and have limited levels of natural character.

4.0 Relevant Statutory Provisions

The assessment of landscape, natural character and visual effects addresses the following relevant RMA matters:

> **Section 6(a):** Preserving the natural character of wetlands, streams, rivers and their margins
>
> **Section 7(c):** Maintain and enhance amenity values
>
> **Section 7(f):** Maintain and enhance the quality of the environment

In accordance with this overriding national direction, the following statutory planning documents have been considered with relevance to this project. Such direction also confirms that the Site has not previously been identified in the coastal environment nor part of an outstanding natural feature or landscape for which Sections 6(a) and 6(b) of the Resource Management Act (RMA) apply (see **Figure 1**):

- Partially Operative Otago Regional Policy Statement (RPS)
- Regional Plan: Water for Otago
- Proposed Second Generation Dunedin District Plan (2GP)

Key landscape policy directions identified within the above documents are summarised below.

Partially Operative Otago RPS

The RPS requires identification of outstanding natural features and landscapes (ONFL) (RMA Section 6b) and protection, enhancement and restoration of ONFL and other natural features and landscapes which are highly valued for their contribution to the amenity or quality of the environment, but which are not outstanding.

The Site and its general location are not identified as part of any outstanding natural feature or landscape or otherwise identified as being highly valued for their contribution to the amenity values or the quality of the environment. As illustrated on **Figure 1**, the Site also does not form part of the coastal environment[8].

[8] Moore, M. et al. (2015) Coastal Environment of Otago Natural Character and Outstanding Natural Features and Landscapes Assessment: Dunedin City Section Report

Regional Plan: Water for Otago

Key provisions relevant to this assessment relate to preservation of the natural character of waterbodies and their margins and protection from inappropriate use and development (RMA Section 6.a). Summarised below:

- Protect the natural character of Otago's lakes and rivers and their margins from inappropriate subdivision, use or development. (Policy 5.3.3)
- Maintain or enhance the amenity values associated with Otago's lakes and rivers and their margins. (Policy 5.3.4)
- In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding, in preference to remedying or mitigating adverse effects on the natural character of any lake or river, or its margins; and amenity values supported by any water body. (Policy 5.4.2)
- Have particular regard to the following features of lakes and rivers, and their margins, when considering adverse effects on their natural character:
    - The topography, including the setting and bed form of the lake or river;
    - The natural flow characteristics of the river;
    - The natural water level of the lake and its fluctuation;
    - The natural water colour and clarity in the lake or river;
    - The extent of use or development within the catchment, including the extent to which that use and development has influenced matters (a) to (e) above. (Policy 5.4.8)
- To have particular regard to the following qualities or characteristics of lakes and rivers, and their margins, when considering adverse effects on amenity values:
    - Aesthetic values associated with the lake or river; and
    - Recreational opportunities provided by the lake or river, or its margins. (Policy 5.4.9)
- Retain flows in rivers sufficient to maintain their life-supporting capacity for aquatic ecosystems, and their natural character. (Policy 6.3.1)
- Promote the creation, retention and enhancement of appropriate riparian vegetation. (Policy 8.7.1)

Proposed Second Generation Dunedin District Plan (2GP)

The decisions on the 2GP were notified in November 2018. All 2GP provisions had legal effect from that date. Within this plan, the proposed landfill is contained within Designation D659 which requires that the outline plan of works application will need to address the following designation condition:

> *A landscape plan showing proposed initial planting, final landform, and final planting shall be prepared by the Requiring Authority under the direction of a*

qualified landscape architect prior to the commencement of landfilling operations. Development of the site shall be in accordance with this landscape plan.

In addition, several provisions in the Plan relating to earthworks, landfills, new and upgraded roads and new structures, address potential effects on landscape, rural character, visual amenity and amenity matters, as summarised below. Provisions which address earthworks, vegetation clearance, and alterations to roads are of particular relevance to the resource consents being applied for the road upgrades. Other provisions addressing landfills and structures are also included only to provide context, noting no resource consents are required for these elements, and that they will be addressed through the future outline plan of works application:

- In relation to large scale earthworks the plan requires the following effects be avoided or, if avoidance is not practicable, adequately mitigated:
    - adverse effects on visual amenity and character; and
    - adverse effects on the amenity of surrounding properties, including from changes to drainage patterns. (Policy 8A.2.1.3)
- Require vegetation clearance to be set back an adequate distance from water bodies, including wetlands, to
    - minimise, as far as practicable, the risk of erosion; and
    - protect, or enable the enhancement of, biodiversity and natural character values. (Policy 10.2.2.3)
- Only allow new roads or additions or alterations to existing roads where the location and design of the road minimises, as far as practicable, adverse effects on surrounding residential or other sensitive activities. (Policy 6.2.1.3)
- Only allow landfills where adverse effects on the amenity of residential activities on surrounding properties will be avoided or, if avoidance is not practicable, adequately mitigated. (Policy 16.2.2.5)
- Only allow landfills where there is reasonable certainty that land will be restored or rehabilitated to an acceptable standard with respect to landform and to enable a return to productive, recreational or conservation use as soon as possible. (Policy 16.2.3.4)
- Only allow landfills where adverse effects from large scale development on rural character and visual amenity will be avoided or minimised as far as practicable. (Policy 16.2.3.5)
- Require buildings and structures to be set back from site boundaries and of a height that maintains the rural character values and visual amenity of the rural zones. (Policy 16.2.2.5)

5.0 Proposed Development

The project comprises the construction of a landfill with a capacity to provide for the safe disposal of municipal solid waste (hereinafter described as the Proposed Development). The

total landfill will have a capacity of approximately 3.36 million ~~tonnes~~ m^3 and will only receive waste from commercial waste companies or bulk loads. An indication of the proposed completed landform accommodating this volume is illustrated on **Figures 4** and **5**, including indicative cross sections and elevation above existing ground level associated with the completed landform.

Development of a landfill is essentially a long-term and gradual construction project rather than a development that occurs simultaneously across the Site. Following preliminary works, the landfill will be developed in ~~five~~ four formal stages. The Proposed Development will also require upgrades to McLaren Gully Road (including its intersection with State Highway 1) and Big Stone Road.

The activities of the project fall into three general categories[9]:

- Preliminary Works
- Operation Phase
- Closure / Closed Phase

The key aspects of the proposal as they relate to potential landscape and visual matters are summarised below:

5.1.1 Preliminary Works

Preliminary works occur prior to the landfill accepting its first waste. Such works include upgrades to existing access and preparation of the Site to accommodate landfill. In summary, initial construction works cover the following:

- Upgrades to McLaren Gully Road, including its intersection with State Highway 1, and Big Stone Road to the site entrance;~~;~~
- Initial site clearance;
- Construction of landfill site access and internal access to the facilities areas, soil stockpiles (temporary), and perimeter road for stage 1. The eastern stockpile will reach a maximum height of 5m, the western stockpile will be a maximum height of 20m with a 2(h):1(v) slope;
- Construction of landfill facilities;
- Creation of the landfill toe embankment, stormwater attenuation basin, and the sediment control measures and landfill perimeter drain for stage 1;
- Formation of the base grade, groundwater collection, low permeability liner system, and leachate collection systems for stage 1.;
- Perimeter planting and all ecological mitigation planting;
- Landfill environmental monitoring systems, including groundwater/LFG wells; and
- ~~LFG collection and destruction system to coincide with the timing for placement of 200,000 tonnes of waste in the landfill – approximately 2 years after commencement of landfill~~

[9] Refer to GHD Technical Report A: Concept Design Report (Updated May 2021) for full details of the proposal .

5.1.2 Operational Phase

During the operational phase, construction activities will be undertaken as required to develop each landfill stage so that it is ready to accept waste when required. Wherever possible, soils required during the operation of a stage will be taken from the footprint of the next or subsequent stage.

In accordance with the procedures of the Smooth Hill Landfill Management Plan, the landfill will be constructed and managed in ~~five~~ four stages which progress across the Site~~. Stages 1,2 and 3 will be in the north-eastern portion of the landfill footprint and Stages 4 and 5 are in the southwestern portion.~~. Prior to operation, each stage will be lined to collect leachate and encircled with perimeter storm water drains to the attenuation basin. The timing of the stages will be determined by the volumes of fill in any given year. Completion of the landfill is expected to take up to ~~55~~ 40 years assuming a projected waste flow of 6~~9~~0,000 t/year.

Operating machinery within the Site and truck movements to and from the Site will occur over the life of the landfill. Stockpiles will consist of topsoil and loess and will be ~~be~~ track rolled and trimmed to regular shapes. Piles not expected to reworked within 1 month will have mulch or hydroseeding of grass species applied. The north east Stockpile Heights will be a maximum of 5m with 2(h):1(v) side slopes and the western Stockpile will be a maximum height of 20m with 2(h):1(v) sides.. ~~and those not expected to be reworked within 1 month will have mulch or hydroseeding applied.~~
Security fencing will also be required around the perimeter of the landfill and will need to be realigned as the landfill progresses. Much of this activity will remain embedded within a balance of land primarily managed as productive forest consistent with the surrounding landscape context.

Where the landfill is under operation, the deposit of waste will be supported by transitional stages of cover. This is outlined as follows:

Daily Cover
Daily cover will be placed at the end of each working day such that there are no uncovered areas of waste while the Site is not operating. The operating cell of the landfill will be limited to around 300 m^2 to provide for not less than 1.0 m compacted depth of waste to be placed to avoid excessive percentage of cover soils to waste.

Intermediate Cover
Intermediate cover will be placed where waste will not be overlaid with fresh waste for more than 3 months. The cover soils will be low permeability loess stripped from subsequent landfill stages or stockpiles placed in compacted layers not less than 300 mm thick and with hydroseed applied. The cover shall be graded to the stormwater system where possible to allow runoff of uncontaminated water and reduction in leachate generation. Intermediate cover will be stripped before placement of fresh waste.

During the life of the project, the existing landform will change gradually as refuse is deposited and subsequently capped during each successive stage. The proposed cap will include 150 mm of topsoil, over 600 mm of clay. The lower slopes will be constructed at 1(v):4~~5~~(h) with 10 m wide benches every 10 m vertical increase in height. The upper surface will be constructed at 1(v):20(h) with a maximum finished height of R.L ~~150~~149~~.~~m.

5.1.3 Closure and Aftercare Activities

Closure activities include, placing the final capping layer on completion (where it is intended that the remainder of the material in the stockpiles will be used for this purpose), establishing any

final landscaping and removing any facilities and infrastructure that is not required during the aftercare period, or modifying such infrastructure for the aftercare period. Planting vegetation, other than grass, on the landfill cap is not proposed. Grass will continue to be managed by grazing with light stock (sheep) or mown. The closed landfill will require ongoing stormwater management including the ongoing drainage from the capping and water quality monitoring.

5.2 Mitigation Planting Embedded in Design

Mitigation which includes planting along the Site boundary has been designed in association with identification of the extent of the landfill footprint. Planting will be undertaken prior to the commencement and operation of the project. During operation, a minimum 10 m wide planted strip has been provided. This mitigation planting includes two approaches. (**Refer Figure 8 Landscape Mitigation Plan**).

- Mitigation Type A: includes a mix of exotic and indigenous tree species along the central boundary of the Site adjoining Big Stone Road (**Refer Figure 8 Landscape Mitigation Plan**). This planting accommodates two rows of pine trees with further native planting adjoining this providing a permanent long-term screen reinforced with perimeter trees within the Site. This approach allows for faster growing pine perimeter trees to be felled and replaced with kanuka and totara to reinforce adjoining semi-mature native trees which would have established and maintain an effective long-term vegetative screen.
- Mitigation Type B: provides for a 10m wide planted strip of indigenous native planting. This planting includes kanuka and totara species. This planting approach is taken for the area adjacent existing pine forestry that will act as a more permanent shelter species and visual mitigation whilst forestry within the Site establishes.

Both planting approaches along the boundary of the Site will provide visual screening during operation and following completion of the landfill.

~~Mitigation which includes planting along the Site boundary has been designed in association with identification of the extent of the landfill footprint. During operation, a minimum 10 m wide planted strip has been provided which includes a mix of exotic and indigenous tree species along the boundary of the Site adjoining Big Stone Road and along the central spur within the Site to the north of the proposed access. This planting accommodates two rows of pine trees with further native planting adjoining this providing a permanent long-term screen reinforced with perimeter trees within the Site.~~

~~Planting along the boundary of the Site is proposed to provide visual screening during operation. Indigenous trees will provide a further long-term reduction in visibility combined with maintaining the balance of the Site as productive forest. Perimeter trees and ongoing plantation forestry within the footprint of Stages 4 and 5 occurs at the commencement of the project (**Figure 8: Stage A Mitigation**). Stage B Mitigation replaces plantation forestry within stages 4 and 5 with landform changes and perimeter trees (**Figure 9: Stage B Mitigation**). This change is not expected to occur until about year 29.~~

~~Stage B Mitigation also enables mature pine perimeter trees to be felled and replaced with kanuka and totara to reinforce adjoining semi-mature native trees which would have established and maintain an effective long-term vegetative screen.~~

5.3 Landscape Rehabilitation Plan

Land use across the remainder of the Site includes continued use of forestry with areas of existing and proposed native vegetation including wetland areas associated with ecological mitigation. Once completed, the resultant capped landfill will also be re-established in pasture.

Pine trees established in mitigation Type A along Big Stone Road are to be progressively ~~Pine trees established along Big Stone Road and the north east ridge are to be progressively~~ removed once kanuka and totara are semi-mature and have formed an effective screen to the Site (in approximately 30 years). At this time, further indigenous planting would reinforce established indigenous trees. The long-term outcome for the Site would represent a modified grassed landform contained within elevated belts of established indigenous perimeter trees adjoining road boundaries and extending along the central ridge. Landscape mitigation complements areas of treeland and wetland habitat to be maintained and enhanced as set out in the Smooth Hill Landfill Ecological Assessment (Boffa Miskell, 2021).

Visual Catchment and Viewing Audience

The Site is visually confined within a sequence of hills and valleys which extend between the Taieri Plains and the South Taieri Coast. As such the visual catchment for all but the highest points of the Site are very restricted. Within this context, the potential to observe the proposed landfill operation is largely contained within an internal amphitheatre with the potential viewing audience limited to adjoining areas including parts of McLaren Gully and Big Stone Roads.

Figure 6: Visual Appraisal illustrates the zone of theoretical visibility (ZTV) of the highest points of the proposed completed landfill (yellow) and built infrastructure within the Site (blue). This indicates the theoretical 'worst case' extent from which views towards elevated parts of the Site are available based solely on existing and proposed topography and does not take intervening vegetation including plantation forestry into account. As such, it overstates actual visibility. The ZTV was used to identify the Site Context Photographs as well as viewpoints used in the simulations (discussed in section 6.1).~~Therefore, the ZTV illustrates the potential visual catchment and was used to identify the Site Context Photographs as well as viewpoints used in the simulations (discussed in section 6.1).~~

The ZTV (without consideration of intervening forestry) shows that visibility is limited to a contained area within the surrounding folded landform. Private views occur in the vicinity of three ~~two~~ dwellings on Big Stone Road, however, cross sections included on **Figure 7: Cross Sections, ,** show the extent to which parts of the Site may be visible from these houses, namely: 731 Big Stone Road (Section A-a) 689 Big Stone Road **(Section Bb)** and 513 Big Stone Road **(Section Cc)**.~~show the extent to which only highest parts of the Site may be visible from these two houses, namely: 689 Big Stone Road **(Section Bb)** and 513 Big Stone Road **(Section Cc)**. No potential views have been identified from the dwelling at 731 Big Stone Road (**Section Aa**)~~ The site is not visible from greater distances north including the two dwellings further north along McLaren Gully Road along the South-Taieri Coast or across open areas of the Taieri Plains.~~and the two dwellings further north along McLaren Gully Road. Similarly, the Site is not visible from greater distances including along the South-Taieri Coast or across open areas of the Taieri Plains.~~

5.1 Site Context Photographs

To assist the assessment of available views, six panoramic photographs (**Site Context Photographs 1-6**) [10] were taken from publicly available vantage points surrounding the Site. These are briefly described below:

Site Context Photograph 1 is taken from Big Stone Road approaching the Site from the north. This represents the first view available towards the Site from this direction which forms a distant glimpse towards the head of the valley seen beyond recently planted pine. Given the viewing distance and nature of intervening vegetation, no more than glimpses of intermittent views are expected from this area of Big Stone Road.

Site Context Photograph 2 is taken from the intersection between McLaren Gully Road and Big Stone Road. From here the eastern boundary of the Site is visible separating areas of recently re-established pine trees to the left and grazed pasture with mature specimen trees to the right. The folded gully to the north of this viewpoint is proposed to contain a stockpile supporting the landfill during operation, however the landfill itself is largely concealed by the intervening spur seen in the left-hand side of the photograph which accommodates the existing access into the Site. ~~The existing building ruin is just visible in the far-left hand side of this photograph within mature macrocarpa trees near the southern end of this spur.~~

Site Context Photograph 3 is taken along Big Stone Road at the existing entrance to the Site. From here an existing gravel access track extends along an existing spur into the Site and below a sequence of undulating hills covered with recently established pine trees. A plantation of semi-mature macrocarpa trees are visible in the left-hand side of the photograph with further mature macrocarpa and gum trees visible in the right sides of the photograph which surround and conceal the existing building ruin further to the right. The distant backdrop of Maungatua is visible along the horizon from this area, however the Taieri Plain is concealed.

Site Context Photograph 4 is taken along Big Stone Road near the turn off to Isobel Road. From here the Site is observed through a recently felled shelter belt along the Site's south-eastern boundary. To the left of the photograph, Big Stone Road is visible winding along the Site's southern boundary and adjoining plantation forestry which continues to the south. Through the centre of the photograph, much of the Site is visible as an area of recently harvested forestry trees adjoining a sequence of undulating hills which form a mosaic of forestry, scrub and pasture including the rounded form of Smooth Hill at approximately 1.5 km. Beyond this, Maungatua remains a distant backdrop beyond the Taieri River plains along the horizon.

Site Context Photograph 5 is taken from Big Stone Road in the vicinity of the Site's elevated south-west corner. From here views become available beyond a roadside embankment across recent replacement forestry looking down towards the vicinity of the proposed landfill. From here views into the internal amphitheatre containing the Site become available as part of a basin of established forestry. Beyond this, the Site remains contained as part of a broader sequence of vegetated hills.

~~The established macrocarpa forest block is also visible in the right-hand side of the photograph. Beyond this, the Site remains contained within a broader sequence of vegetated hills.~~ **Site Context Photograph 6** is taken at approximately 1.1 kilometres from the Site (1.4 kilometres from the proposed landfill) along Big Stone Road. From here the Site forms part of the distant sequence of undulating hills which establish a

[10] Photos taken on 16th March 2021

mosaic of forestry in various stages of growth and harvest. Beyond this the very long distant form of Maungatua is visible along the horizon.

5.2 Visual Simulations (Viewpoints 1-4)~~2)~~

~~Two~~ Four viewpoints have been identified to simulate and assist in understanding the change anticipated within the Site. This includes a viewpoint approaching the Site to the east along McLaren Gully Road **(VP1)**, a~~nd the~~ view extending alongside the Site when approaching the Site from the west along Big Stone Road **(VP2)**, a view from the end of the Driveway of 689 Big Stone Road **(VP3)** and a view looking north from SH1 towards the new road upgrade **(VP4).** The simulations have been prepared in accordance with NZILA Best Practice as detailed in **Appendix 1** to show the anticipated change which will occur, as summarised below:

~~. Simulations have been prepared in accordance with NZILA Best Practice as detailed in **Appendix 1** to show the anticipated change which will occur, as summarised below:~~

VP1: McLaren Gully Road to the east of the Site

Viewpoint 1 (VP1) shows the view along McLaren Gully Road approaching the Site from the east. This view is obtained approximately 230 metres from the intersection with Big Stone Road and approximately 550 metres from the proposed Site access. From here the spur within the Site is viewed in the midground with the highest point of the Site forming the distant skyline. ~~A sequence of~~ Two simulations from **VP1** (~~**A - D**~~ **Figures 10** and **11**) have been prepared to show views of the anticipated change within the Site from the establishment of the project as follows:

VP1A ~~-~~ (At Implementation) shows the proposed landfill ~~1 year after the commencement of~~following ~~site~~ enabling works and includes internal site access and associated infrastructure including leachate tanks, amenity buildings, workshops, flares and stockpile. Additional ~~M~~native mitigation planting is shown at one year growth.

VP1B – (With Mitigation) shows the proposed landfill at its maximum extent including the internal site access and associated infrastructure including leachate tanks, amenity buildings, workshops, flares and stockpile with mitigation planting ~~immediately following implementation~~established. Mitigation planting is shown at 10 years growth.

~~**VP1A** - shows the view of stages 1-3 including the internal site access and associated infrastructure including leachate tanks, amenity buildings, workshops, flares and 10 metre stockpiles without mitigation planting.~~

~~**VP1B** - shows the view of stages 1-3 including proposed stockpile at its maximum extent with proposed permanent mitigation at 10 metres.~~

~~**VP1C** - shows the view during stages 1-3 with mitigation and proposed forestry.~~

~~**VP1D** – shows the view during stages 4-5 with mitigation and proposed forestry. At this time distant views of the more elevated final stages of the development may be available beyond trees of at least 10 metres retained along the central spur.~~

VP2: Big Stone Road to the west of the Site

Viewpoint 2 (VP2) is similar to the view described as Site Context Photograph 5 above. ~~As with VP1, a sequence of~~Three simulations ha~~s~~ve been prepared from **VP2 (~~A - D~~ Figures 12 to 14)** to show views of the anticipated change as follows:

VP1~~2~~A - shows the proposed landfill ~~1 year after the commencement of site~~following enabling works and includes internal site access and associated infrastructure including

leachate tanks, amenity buildings, workshops, flares and stockpile. In this view native m~~M~~itigation planting is also shown at one year growth, however it is expected that existing plantation forestry to be maintained will have established further at the time the landfill operation commences.

VP~~1~~2B – (Stage 1) shows the proposed landfill ~~at its maximum extent~~following completion of Stage 1- including the internal site access and associated infrastructure. ~~including leachate tanks, amenity buildings, workshops, flares and stockpile with m~~ This is the view expected following 10 years of operation and shows mitigation planting, including existing plantation pine- ~~immediately following implementation. Mitigation planting is shown at~~fter 10 years growth.

VP2C (Stage 4) shows the proposed landfill at its maximum extent and once mitigation planting has established (10 metre trees).

~~**VP2A** – shows the view of stages 1 to 3 including access into the Site without proposed mitigation.~~

~~**VP2B** - shows the view of stages 1 to 3 with Stage A Mitigation continuing plantation forest in the western area of the Site.~~

~~**VP2C** - shows the view near the completion of Stage 3 at which time forestry established in stages 4 and 5 is removed and Stage B Mitigation is implemented (2m pine trees).~~

~~**VP2D** - shows the view once planting along Big Stone Road during stages 4 and 5 once Stage B Mitigation is established (10m pine trees).~~

VP3: From driveway of 689 Big Stone Road

Viewpoint 3 shows the view from the south of the site from the driveway of 689 Big Stone Road. This view is obtained approximately 30m from the proposed edge of the landfill which will occur beyond intervening boundary vegetation. ~~A sequence o~~One simulation from **VP3** (**~~A - B~~Figure 15**) has been prepared to show views of the anticipated change within the Site from the establishment of the project as follows:

VP3A – (with mitigation) shows the proposed landfill at its maximum extent including the internal site access and associated infrastructure including leachate tanks, amenity buildings, workshops, flares and stockpile with mitigation planting ~~immediately following implementation~~established. Mitigation planting is shown at 10 years growth ~~.~~ ~~Th~~beyond which the landfill is ~~not visible and~~ entirely screened ~~behind mitigation planting~~.

VP4: From SH1

Viewpoint 4 (VP4) shows the views from SH1 at the intersection of McLaren Gully Road. This view is from the northern side of SH1 looking in a south east direction. From here the Site is not visible however proposed upgrades to McLaren Gully Road will be seen. A simulation has been prepared that shows this proposed road upgrade (~~VP4A~~**Figure 17**):

6.0 Assessment of Effects

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

The assessment of potential landscape and visual effects is based on a combination of the sensitivity landscape and viewing audience together with the nature and scale of the Proposed Development.

Particular effects considered relate to the following:

- Landscape / rural character;
- Natural Character;
- Visual amenity from public and private locations; and
- In relation to statutory provisions.

The main elements of the project that could give rise to landscape, natural character and visual effects are:

- The location, nature and extent of the landfill operation and proposed new landform and the way in which this would be seen within the local and wider landscape;
- The location and nature of ancillary structures, including workshops, flares, signage and lighting;
- The location, nature and extent of the stockpile areas, in addition to the staged timing of these areas;
- Physical changes to watercourses, wetlands and landform; and
- The location and extent of existing vegetation (to be retained and removed) and proposed new vegetation.

6.1 Landscape Effects

In physical terms, the proposed landfill will cover a total area of approximately ~~44.5~~18.6 hectares of the 176.5 ha. designated area. During operation the Proposed Development will substantially modify the existing landform within the Site as landfill is gradually deposited within the identified landfill extent. As each successive stage is developed, the existing landform will gradually rise to reach a maximum elevation of approximately 4-5 vertical metres above adjoining areas of Big Stone Road. Reaching 150~~4~~9 metres above existing ground level.~~approximately 40 metres above existing ground level.~~

The natural amphitheatre setting lends itself to staged landfill development, which will occur in four stages (Stages 1 to 4). Stage 1 will involve filling behind the toe buttress constructed at the northern base of the amphitheatre. Stages 2 to 4 will then progress in a clockwise fashion from northeast to west, filling over Stage 1 and buttressing into the surrounding gully. At the completion of each formal stage, the proposed work will culminate along a defined ridge which steps down to the west at a gradient of 1(h):3(V). This will generate an increasingly enclosed

gully between the operational landform and the local high point. ~~reaching 187 masl to the west, within which future stages of the landfill operation will occur. Stages 1-3 occupy the eastern area of the Site which will remain enclosed by boundary vegetation established along Big Stone Road throughout the Proposed Development. Conversely, stages 4 and 5 will remain in plantation forestry within the western area of the Site until these final stages are implemented.~~

A mixture of existing planation forestry and proposed mitigation and native planting will be established along Big Stone Road prior to the construction of the landfill (see **Figure 5**). By the time stage 3 – 4 begin (at approximately 11 – 12 years) the planting will have established to enable screening of the proposed fill. The existing plantation forestry will be retained in neighbouring sites and planted with a border of native vegetation. ~~Following Stage 3, plantation forestry which occupies the footprint of stages 4 and 5 will be felled with the resultant landform requiring engineered fill along Big Stone Road to enclose the final stages of the landfill. This will open up views into the Site along an adjoining area of Big Stone Road until replacement perimeter tree planting is established to provide continued visual screening when adjoining the Site and traveling east.~~ The final stages of the landfill will continue within an enclosed amphitheatre and will remain visually contained once perimeter tree planting is re-established.

At completion of all ~~five~~ four stages, the proposed landfill will generate a final form which resembles a smooth ridge at the head of the localised gully which culminates along the vicinity of Big Stone Road (see **Figure 5**). This will be maintained in pasture in a broader productive rural landscape which can include the continued harvest of productive forestry and enduring areas indigenous vegetation. Given this outcome, the potential for adverse landscape effects primarily occurs during operation.

6.1.1 Upgrade to McLaren Gully and Big Stone Road

Prior to the landfill entering operation, enabling works include upgrades along McLaren Gully Road and part of Big Stone Road between McLaren Gully Road and the Site access. The proposed upgrade is to accommodate a sealed two-lane carriage width of 7 m with swales either side similar to existing.

Due to constraints with the wetlands adjacent to the road there are locations where this carriage width is reduced. The concept level design identifies that upgrades along the existing road corridor will require some areas of vegetation and a 16.5m^2 area of wetlands to be removed alongside additional cut and fill batters which extend outside the road corridor to tie the proposed road upgrade into the surrounding rolling landform.

~~The concept level design identifies that upgrades along the existing road corridor will require some areas of vegetation to be removed alongside additional cut and fill batters which extend outside the road corridor to tie the proposed road upgrade into the surrounding rolling landform.~~ Indictive cut batters ~~reach a maximum of~~ range between 2-~~-~~4 metres at 1(v):0.3(h Due to constraints within the roadway around the areas of wetlands, these batters reach up to 7.4 – 7.6 metres in two locations (Refer Chainage 2860 and 2440) at a grade of 1(v) in 0.2(h). These slopes will be scarified and hydroseeded where possible or left to weather and tie with the surrounding vegetation. There will also be localised areas of fill extending up to 6 metres and predominantly between 2 and 4 metres at (1v):2(h). Such earthworks will initially reveal a raw landform surface that contrasts with existing established and road embankments which are typically ~~) with a localised area of fill extending 6 metres and predominantly between 2 and 4 metres at (1v):2(h). Such earthworks will initially reveal a raw landform surface that contrasts with existing established and road embankments which are typically vegetated. Given~~vegetated. Given the existing road corridor established through this working rural area, this upgrade would

generate localised modification in the context of established rural access and existing road embankments. No residential properties are located in close proximity to these areas of cut and will therefore have no views. Road users will experience a transitory glimpse when passing. ~~the existing road corridor established through this working rural area, this upgrade would generate localised modification in the context of established rural access and existing road embankments~~. During construction, this level of modification and raw worked appearance would generate some **moderate adverse landscape effects** which may initially appear prominent but not necessarily uncharacteristic given their established association with part of an existing rural road network.

Limited existing residential development accesses directly onto McLaren Gully Road where the road is proposed to be upgraded with the exception of the two dwellings located at 108 and 109 McLaren Gully Road. In this area, some localised removal of existing gum trees will accommodate a wider road with, the alignment remaining well contained along the floor of the gully. Provided all batters are reinstated with vegetation to tie into their landscape context and exposed surfaces are scarified and reinstated with grass ~~at completion~~where practicable, the extent of cut and fill batters along the proposed upgrade to McLaren Gully Road is considered to generate **low landscape effects** absorbed in this rural context.

6.1.2 Effects on landform

The nature of landfill activities mean that the proposal will inevitably alter the existing landform within the Site. During operation the deposition of refuse will represent a raw worked appearance which gradually moves across the Site and contrasts with surrounding established pastoral and forestry land-use. Such transformation is consistent with the underlying designation which requires a landscape plan to address adverse effects. Once completed, the broader shape and appearance of the modified landform would remain sympathetic within the surrounding topography, representing a rounded hill and ridge similar to the broader sequence of hills within which it forms a part (see **Figure 5**).

In addition to the upgrade to parts of McLaren Gully and Big Stone Road, enabling works prior to the commencement of the project requires the construction of an internal access road and the establishment of onsite infrastructure and associated amenity buildings which support the landfill operation. This will require cut batters along the central spur through the Site and the creation of a lowered level platform at approximately 124 masl upon which the workshop and associated facilities will be constructed. Such disruption will remain localised and enables planting on batters to soften and visually assimilate such exposed areas within their rural surroundings.

Prior to construction, boundary planting will be established along Big Stone Road. This includes fast growing plantation species in areas with existing open views to ensure effects of landform modification within stage 1 will rapidly become screened from view. As planting establishes, including existing areas of forestry and native buffer planting surrounding the landfill within the Site, this will ensure potential adverse effects on landform will remain predominantly concealed from view.

~~During stages 1- 3, planting along the boundary of the Site and forestry in the footprint of stages 4 and 5 will ensure effects on landform are predominantly concealed from view. Prior to the completion of Stage 3, the removal of forestry in the western area of the Site will result in an area of engineered fill being required along Big Stone Road to enclose Stages 4 and 5 in the~~

~~western area of the Site. This will be laid back at a gradient of 1(v): 4(h) from the margin of Big Stone Road and reach an elevation of up to 14 metres above adjoining areas along Big Stone, below the highest part of the Site at 187 masl. Once formed, this landform will be planted and appear consistent with surrounding area of plantation forestry to contain views into the Site.~~

As refuse is deposited during each stage of the landfill, activity will involve exposing areas of open ground prior to this being covered in accordance with daily and intermediate cover requirements as described in section 5.1.2 above. Such activity will encompass the operation of heavy machinery and result in a raw worked appearance generating engineered landforms which reinforce the transitional working nature of the Site. Such internal landform modification will inevitably contrast with surrounding rural based activity, however, it is consistent with effects anticipated by the underlying designation. In landform terms this will ~~and~~ result in localised **moderate-high adverse** ~~landform effects within the Site which remain largely internalised and generate **low adverse** effects from external areas.~~ landform effects limited to within the site.

During operation, the resultant completed batter face of each successive stage as well as the front northern edge of the landfill will introduce a more linear 'engineered' appearance within the existing rolling and undulating Site's contours. Notwithstanding this, such modification occurs in the context of established plantation influences and will create an enclosed amphitheatre form which remains largely concealed from external areas. The resulting batter would gradually be covered by subsequent stages of the landfill which are ultimately capped and reinstated in pasture, set within surrounding areas of forestry and a periphery of native and forestry trees consistent with their surrounding rural context. Accordingly, any perceived linearity would remain ~~consistent with their surrounding rural context. Accordingly, any perceived linearity would remain~~ localised and subservient in the context of this wider working landscape.

In the event the landfill is terminated prior to the completion of Stage 5, the undeveloped stages would form an enclosed gully retained in productive forestry which ensures the established landfill remains visually contained. At completion, the intermittent raw worked appearance resulting from the gradual sequence of operation would terminate and the proposed landform would resemble a smoothed flattened ridge within the surrounding rolling landform characteristic of this area of landscape. Following removal and restoration of the temporary stockpile areas to forestry or pasture, the completion of the landfill capping and grassing as well as the retention of riparian and other amenity planting, resulting in **low adverse** landform effects overall.

6.1.3 Land cover

The Site is currently used for forestry and grazing and includes areas of recently planted and more established exotic vegetation with pockets of indigenous vegetation. Typically, regenerating native vegetation occurs in the gullies, with a small wetland area located in the lower central area of the Site.

During operation, much of the internal vegetation within the Site will undergo a sequence of change, similar to cycles of harvesting productive exotic forestry characteristic of the existing Site and much of the surrounding rural areas. Whilst such change in landcover will result in a raw worked appearance generating locally adverse effects, it will not appear prominent or uncharacteristic, remaining largely concealed beyond vegetation established along Site boundaries. Similarly, areas of native vegetation outside the landfill footprint will be retained and reinforced within a wider ongoing framework of plantation forestry. Accordingly, any change in landcover during operation is considered to generate **moderate-low adverse** effects.

Prior to the landfill commencing and each successive stage being implemented, the Site will incrementally be cleared to allow landfill operations to occur. To the north and south of the proposed landfill, plantation forestry will be retained on neighbouring sites and a 10m section of indigenous vegetation established along the roadside in these areas (see **Figure 8**). This vegetation will establish through the life of the project and will provide long term mitigation once these neighbouring forestry lots are cleared. Such work will ensure the extent of vegetation clearance typically remains confined within an established screen. ~~Such work will ensure the extent of vegetation clearance typically remains confined within an established screen. As an initial stage of the Proposed Development, the boundary of the Site would be established in two rows of pine trees and rows if indigenous vegetation parallel to this which would continue to establish through the life of the project. Consequently, the boundaries of the Site would become increasingly enclosed within boundary vegetation designed to endure throughout operation and to the completion of the Proposed Development.~~

Immediately adjacent to the Proposed Development where the existing plantation forestry has been cleared, two rows of pine trees (along a 5 metre corridor) will be established alongside a 5-metre row of indigenous vegetation parallel to this (see **Figure 8**). This ~~which~~ would continue to establish through the life of the project. Once the pine trees mature and are felled, ~~at the time~~ and adjoining native vegetation has established this will enable~~, subsequent~~additional native vegetation ~~will~~to be established. Consequently, the boundaries of the Site would become increasingly enclosed within boundary vegetation. The pine will provide fast growing visual mitigation and the native vegetation is designed to endure throughout operation and to the completion of the Proposed Development.

~~Prior to the completion of Stage 3, plantation forestry retained in the footprint of stages 4 and 5 will be felled to make way for the continuation of the landfill in the western area of the Site. This will appear consistent with the surrounding harvest of productive forestry, however, will enable temporary open views into the landfill from an adjoining section of Big Stone Road approaching the Site from the west (see **VP2C**). Once completed this will be re-established with vegetation to assimilate within its vegetated surroundings and maintain an effective vegetated screen when approaching the Site from the west (see **VP2D**).~~

Following completion of the project, vegetation within the Site will include pasture with areas of plantation pine and pockets of native vegetation, consistent with a working farm. The capping of the landform will be required to be maintained as pasture and either grazed or mown in the context of surrounding areas of plantation forestry. In this context, the gradual change of landcover associated with the operation of a landfill within the Site will cease and remain consistent with grazing and forestry operations which might otherwise occur, generating enduring **low neutral** effects. ~~In this context, the gradual change of landcover associated with the operation of a landfill within the Site will cease and remain consistent with grazing and forestry operations which might otherwise occur, generating enduring **low neutral** landscape effects.~~

6.1.4 Landscape Character Effects

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

Rural landscapes are a combination of the natural landform and human introduced elements. The type of rural activity and settlement patterns that overlay them are also factors which contribute to their character. In rural landscapes, natural patterns are evident and natural systems operate; however rural activities, such as pastoral farming, cropping and forestry prevail.

The appearance of the Site will continually change through sequences of bare ground, landfill operation and reinstatement of pasture. Vegetation surrounding the Site will continue to occur in various stages of re-establishment that retain an inherent rural character both during and after the project. During landfill activity, movement of large machinery and earthworks will be evident and atypical of the normal day to day rural activities that currently prevail. The construction and operation of plant, soil stockpiles and drainage within the Site will also generate some more distinctive rural-industrial influences however such changes will remain subservient to surrounding land uses and have limited visibility from beyond the Site, becoming increasingly screened by perimeter trees and assimilated within the gradual change across the Site.

The landscape character expressed outside the landfill extent will remain associated with a working rural landscape and characteristic of the Taieri Slopes landscape character area within which an existing designation anticipates the construction of a landfill. Within this context, the Proposed Development, including landscape and ecological mitigation embedded in the design, has been configured to ensure adverse landscape character effects associated with the landfill remain well contained. Much of the activity will remain visually concealed with most external views continuing to be characterised by established areas of pine which are apparent in much of the surrounding landscape.

Given the relative containment of the Site enhanced by perimeter trees and the gradual and intermittent nature of the filling and earthworks activity, any long-term landscape character effects of the proposed landfill would be limited. The Proposed Development will not appear prominent within views or uncharacteristic within the receiving landscape generating **moderate-low adverse** landscape character effects during operation. Once works are completed, the form and scale of the landform itself and the pattern of proposed vegetation would appear consistent with the existing rural landscape generating **low adverse effects**.

6.1.5 Summary of Landscape Effects

A summary of the identified landscape effects is set out in the table below:

	Contributing factors	During Operation (with mitigation)		Residual Effects[11]	
		Level of Effect[12]	Nature of Effect[13]	Level of Effect	Nature of Effect
Road Upgrade	• Increasing the width of an existing gravel road to accommodate two lanes and sealing alongside informal swales • Localised areas of cut up to 4 metres and fill up to 6 metres, with exposed substrate to be hydroseeded and re-established in grass and vegetation to tie in with adjoining areas.	Moderate	Adverse	Low	Adverse

[11] Residual Effects following completion of operation (55+ years)

[12] Level of Effect assessed as: Very High, High, Moderate-High, Moderate, Moderate-Low, Low, Very Low

[13] Nature of Effect assessed as: Adverse, Neutral or Beneficial

	Contributing factors	During Operation (with mitigation)		Residual Effects[11]	
		Level of Effect[12]	Nature of Effect[13]	Level of Effect	Nature of Effect
Landform effects	• During operation the existing landform within the Site will undergo a raw worked appearance which contrasts with surrounding rural activity • Views of landform modification associated with the landfill will remain largely internalised • Once completed, the shape and appearance of the modified landform would appear sympathetic within the surrounding topography	Moderate – High	Adverse	Low	Adverse
Vegetation effects	• During operation, changes in landcover remain largely concealed beyond perimeter trees • Forestry trees will appear consistent with surrounding species forming exotic forestry in addition to adjoining native trees species • At completion, vegetation within the Site will remain consistent with a working farm with pasture established and grazed alongside areas of exotic and native plantation forestry	Low	Adverse	Low	Neutral
Landscape Character Effects	• Landscape has no formal protection • The Site remain relative well contained with screening enhanced by perimeter trees which appear consistent with surrounding areas • The construction and operation of plant, soil stockpiles and drainage within the Site will generate a rural-industrial influence where apparent, becoming increasingly screened • The gradual and intermittent nature of the filling and earthworks activity, ensure any long-term landscape character effects of the proposed landfill would be limited • Once completed, the form and scale of the landform and the pattern of proposed vegetation would appear consistent with the existing rural landscape	Moderate - Low	Adverse	Low	Adverse

6.2 Natural Character Effects

Works as part of the proposed landfill will avoid the ephemeral streams and wetlands that form tributaries to Otokia Creek. Widening of McLaren Gully Road as part of the upgrades will result in the removal of 16.5m^2 of wetlands[14] as identified in the Ecological Impact Assessment Report (EcIA)[15]. These wetlands have been identified as having low levels of natural character. Such waterbodies occur in the context of an existing modified rural environment which includes extensive areas of plantation forestry and retains limited existing levels of natural character. Effects on wetlands due to the widening of McLaren Gully cannot be mitigated at the point of impact as these areas include private land. The EcIA report recommends that the mitigation of ecological impacts can be achieved through planting wetland species in a 0.49ha area within the designation valley floor. This planting includes ecologically appropriate wetland species and tree species. (Refer General Arrangement Plan – figure 9 Graphic Supplement / Draft Forest

[14] Refer Ecology report.

[15] Boffa Miskell May 2021

and Wetland Restoration Plan). The proposed offset will constitute a substantial Net Gain. Overall, the removal of 16.5m^2 of low-quality wetland will result in a very low level of effects. It is considered that removing the small areas of wetland and providing substantial ecological planting throughout the designation site will in time result in low beneficial natural character effects. A summary of the assessment in accordance with the methodology set out in **Appendix 1** is set out below:

~~In addition to direct effects relating to the landfill, there may also be some indirect effects which include potential downstream effects and loss of existing wetland areas associated with the proposed upgrade to McLaren Gully Road as identified in the ecological assessment (Boffa Miskell, 2020). Such modification would occur in the context of an established road corridor and surrounding working rural landscape including plantation pine, with lower apparent levels of natural character. In this context, the potential for any significant adverse effects on natural character would be addressed through monitoring and enhancement initiated through a Wetland Restoration Plan in accordance with ecological recommendations.~~

~~6.2.1 Summary of Natural Character Effects~~

~~The waterbodies on the Site considered in the assessment are two ephemeral streams and an area of swamp wetland. Whilst the location and relationship of such waterbodies within the Site will change, such modification will remain contained within a wider modified working rural landscape which remains apparent. Following ecological mitigation, including wetland restoration identified on the Landscape Mitigation Plan (see **Figures 8 and 9**) and enhancement as recommended within the ecological assessment, there is considered to be no potential for any significant residual adverse effects on natural character.~~

6.3 Visual Effects

Visual amenity effects are influenced by several factors including the nature of the proposal and the character of the surrounding area, taking account of the ability of the landscape to absorb change. Visual amenity effects are also dependent on the distance between the viewer and the proposal, the complexity of the intervening landscape and the nature of the view. It should also be emphasised that a change in view does not, of itself, constitute an adverse visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways; any change in view must be assessed within the context of the landscape which such change occurs.

During operation, parts of the Site would be visible from nearby locations, typically transient views obtained from people in vehicles passing in the vicinity of the Site along both Big Stone Road and McLaren Gully Road. Such observers may see infrastructure including operational plant and vehicles within or accessing the Site and the visual contrast of bare ground, more typically associated with stockpiles, or areas of exposed landfill under operation. ~~Following Stage 3, engineered fill during Stages 4 and 5 of the Proposed Development will also be visible prior to replacement planting becoming established.~~

The incremental nature of the landfill activity and associated rehabilitation processes in association with both proposed landscape mitigation and ongoing plantation forestry means only a portion of the Site would be bare at any one time, with most of the Site typically remaining screened. The continued cycle of harvest and re-establishment of productive forestry will also influence the extent to which views towards the Site are opened up and become enclosed. This existing context also ensures any development will be seen and remain part of a wider working rural landscape within which the underlying designation anticipates such change.

In the broader landscape context, the location and physical nature of the Site embedded within an area of undulating hill country, generally avoids any potential visibility of the landfill during operation, including views from surrounding rural dwellings. In 'worst case' views, where the landfill is at its highest and without the benefit of intervening vegetation, some long-distance views may occur during ~~Stages 4 and 5~~Stages 3 and 4 from ~~two~~three dwellings on Big Stone Road (731, 689 and 513 Big Stone Road). Given the gradual and sequential nature of the Proposed Development in the context of established plantation pine reinforced by boundary vegetation, visibility of the landfill from these dwellings ~~remains virtually non-existent prior to Stage 4 (30 to 50 years) and~~ provides sufficient time to ensure boundary vegetation will become effective in limiting such potential future visibility.

Other features such as security fencing will also be visible from Big Stone Road and parts of McLaren Gully Road however most of the landfill facilities and support structures will be in the base of the gully and generally not highly visible from any external locations. Once planting along the boundary of the Site is established, the ongoing landfill operations will remain visually well contained and manages the potential for significant adverse visual effects. An assessment of visual effects from the surrounding viewing audience is set out in **Appendix 2** and summarised below.

Visual Effects from Dwellings

Three dwellings at 731, 689 and 513 Big Stone Road could potentially see elevated parts of the Site in long distance views beyond approximately 600 metres, including the highest finished elevation of the landfill and part of the administration building constructed along the upper central ridgeline. ~~Two dwellings at 689 and 513 Big Stone Road could potentially see elevated parts of the Site in long distance views beyond approximately 600 metres, including the highest finished elevation of the landfill and part of the administration building constructed along the upper central ridgeline.~~ The workshop and landfill activity in Stages 1-23 are not expected to be visible from these dwellings. Where views of the Site are available, it will typically be observed through and beyond intervening plantation forestry which culminates in permanent pine shelter planting along the southern boundary. Such views will also occur below a more distant backdrop which includes Maungatua. In this context any views are considered to form a limited aspect of a wider working rural landscape ~~.~~ and limited **to low adverse** effects once mitigation has established.

Where access from these properties connects with Big Stone Road, initial views into the Site will occur however the proposed landfill will become increasingly screened by areas of permanent screen planting established along the road boundary. Such planting will include a combination of fast-growing exotics equivalent to existing forestry and an adjoining band of kanuka and totara to provide an effective long-term screen that remains during the life of the landfill operation. Once planting reaches 2-3 metres (year 3-4) transient views from the accessways to these properties will become increasingly screened and reduce temporary adverse effects. Short-term transient views experienced when exiting adjoining accessways are considered to generate temporary **moderate-low adverse effects**, limited to within the first five years of operation. Following the establishment of landscape mitigation as proposed, adverse visual effects will reduce to **low**.

Visual Effects from Roads[PW5]

Prior to the landfill becoming established, the most apparent visual change along McLaren Gully Road and Big Stone Road to the entrance to the Site will be the upgrade of the existing road from SH1. This will replace a gravel road with a two-lane sealed road which retains similar informal swales along the margins. During construction, the proposed extension of the road is anticipated to generate some initial cut batters up to 74 metres in height. Once established, the

upgrade of this road has the ability to retain the existing rural character and should ensure batter slopes are revegetated to appear benign in the context of the existing road corridor.

The contained visual context of the Site means the potential for adverse visual effects resulting from the proposed landfill are limited to adjacent areas. Once planting reaches approximately 2-3 m high (year 3-4), this will screen direct views into the Site from adjoining areas. During operation, once existing plantation trees reach ~~6-8~~ 10m high (~~year~~within the first 10 years of operation) these will provide additional screening of facilities on the ridge when approaching the Site from McLaren Gully Road to the east. No properties are located in close proximity to the proposed batter slopes and any views from of these cut batters will be transient.

~~Transient views are generally limited to parts of McLaren Gully Road when approaching the Site approximately 300 metres to the east (**VP1**) and from Big Stone Road when passing adjacent to the Site, including elevated transient views from the south-west boundary (**VP2**).~~

Prior to proposed planting becoming established, the Site establishment and early stages of the landfill operation will be visible from some adjacent areas. Once planting reaches approximately 2-3 m high (year 3-4), this will screen direct views into the Site from adjoining areas. ~~During operation, once trees reach 6-8 m high (year 10) these will provide additional screening of facilities on the ridge when approaching the Site from McLaren Gully Road to the east.~~

When approaching the Site from the east along McLaren Gully Road (**VP1**), the initial stages of the landfill ~~under~~ operation ~~in Stages 1-2~~3 will predominantly be screened by the intervening spur which contains the site access and associated infrastructure on a central spur (**VP1A**). Once mitigation is established in approximately 10 years ~~reaches approximately 10 metres~~, views of infrastructure required to support the Proposed Development will become largely screened (**VP1B**). The upper crest of the landfill maybe visible in the context of established forestry as may part of the eastern stockpile albeit largely screened by intervening landform. ~~Perimeter trees will be enhanced by plantation forestry retained in the balance of the Site (**VP1C**). The final stages of the landfill will require the removal of areas of forestry established in the footprint of Stages 4 and 5, however this will remain barely visible in distant views given the sequence of intervening plantation pine and mature mitigation planting (**VP1D**).~~

When approaching the Site from the west (**VP2**), the landfill will be visible from Big Stone Road, prior to mitigation becoming established (**VP2A**). During the initial stage of the landfill, the combination of intervening plantation forestry and boundary planting will increasingly become established and screen the western stockpile area and much of the lower lying internal operation in fleeting views (VP2B). Once mitigation is established, the combination of plantation forestry~~ing~~ and enduring native vegetation along the boundary ~~plantation forestry~~ will ensure an effective long term visual screen (**VP2C~~B~~**) ~~for the stockpile and roading.~~ ~~Due~~ to the elevation of this viewpoint, the upper parts of the landfill will be visible above the vegetation in glimpsed views.

~~Once mitigation is established, the combination of planting and enduring plantation forestry has been designed to ensure an effective visual screen (**VP2B**). Following Stage 3, and in the event the full landfill capacity is required, plantation forestry established during stages 4 and 5 will be felled and replaced with engineered fill and associated landscape mitigation required to support Stages 4 and 5 (**VP2C**). This will initially enable views of the landfill from Big Stone Road approaching the Site from the west, however once planting is re-established at 6-8 m high (year 10), this will reinstate a permanent screen of the final stages of the landfill (**VP2D**).~~ Views of proposed perimeter trees and plantation forestry within the Site will appear consistent with the transition in forestry presently apparent within adjoining areas. Such planting ensures transient open views will remain temporary and limits potential to observe the landfill extent

where this may generate potential for more significant adverse visual effects. Once vegetation is established, potential views into the Site will become entirely screened (VP3A~~)~~

Overall, views from McLaren Gully Road and Big Stone Road are considered to result in temporary **moderate adverse** visual effects which reduce to **low adverse** effects once mitigation has established.

~~Additional temporary **moderate adverse** visual effects generated following Stage 3 from along Big Stone Road from the west occur in approximately 30 years.~~

6.3.1 Summary of Visual Effects

The location and physical nature of the Site, within in a folded gully system, essentially contains and mitigates most visual effects of the landfill on the surrounding area. Views from dwellings are limited to long distance partial views and typically concealed by intervening plantation forest with a working rural landscape. Once perimeter planting is established, temporary views along the boundary of the landfill will become obscured generating **low adverse** visual effects.

6.4 Effects in relation to Statutory Provisions

The Site is not identified as part of any outstanding natural feature or landscape or highly valued amenity landscape within which statutory protection must occur. Any adverse effects in terms of natural character (RMA S6a) will be localised and have been addressed by ecological mitigation included as an integral part of the Landscape Mitigation Plans (**Figures 8** and **9**).

Designation D659 Landscape Plan

The Proposed Development includes landscape plans designed to support integration of the landfill within the Site in accordance with the underlying designation. The landscape plans identify initial planting designed to achieve a comprehensive screen along and within the Site and complements ecological mitigation and ongoing forestry land use which contributes further to containment in terms of views into the Site.

Effects on rural character and visual amenity

The proposed landfill operation will inevitably alter the local rural landscape characteristics within the Site for the duration of the project. During the landfill operation, activity including vehicle movements and modifications to landform through temporary stockpiles, will adversely affect the existing open rural character of the Site and requires mitigation in the form of planting embedded within the Proposed Development to mitigate the potential for wider adverse effects.

The nature of the undulating valley topography and established pattern of mature forestry trees ensures the potential for adverse effects on the visual amenity of surrounding residential dwellings will all but be avoided. Some potential long-distance views may occur from two dwellings to the east of the Site accessed from Big Stone Road, however such views occur during Stage~~s~~ 4 ~~and 5~~ of the Proposed Development at which point sufficient time is inherent in the sequential nature of the process to ensure mitigation will have become well established to mitigate effects.

Once the landfill is completed and grassed and the temporary stockpiles removed, the landscape character will be rehabilitated to a similar state as currently exists with a new landform, wetlands, enhanced riparian margins and additional amenity planting[JW6][RE7], all in keeping and enhancing the existing landscape elements and rural characteristics on the Site.

7.0 Recommendations

Mitigation Planting

Landscape mitigation associated with the landfill is divided into two complementary types Mitigation Planting Type A and Type B (**Figure 8**). Type A Landscape mitigation consists of a 5m strip of Pine and 5m strip of native kanuka and totara. The Pine trees are to be progressively removed once kanuka and totara are semi-mature and have formed an effective screen to the Site (in approximately 30 years). Type B Landscape mitigation comprises dense 10m bands of kanuka and totara along the Big Stone Road boundary. The vegetation will be planted at the outset (year 1) and will assist to further visually contain the activity within the Site.

At this time, further indigenous planting would reinforce established indigenous trees. The long-term outcome for the Site would represent a modified grassed landform contained within elevated belts of established indigenous perimeter trees adjoining road boundaries and extending along the central ridge.

Planting Design

The planting will comprise at least 4 rows of trees with 2m between rows. Perimeter trees will comprise of the following:

Type A Mitigation

- 2 offset rows of *Pinus radiata* planted on the outer edge @ 3.0 m centres (5m wide)
- > 5 m wide strip on the inner (landfill) side comprising a mixture of eco sourced kanuka (*Kunzea ericoides*) @ 1.5m centres, and totara (*Podocarpus totara*) at 3m centres
- *Pinus radiata* replaced by eco-sourced Kanuka and Totara to reinforce screening provided by adjoining semi-mature indigenous trees

Type B Mitigation

- 10m wide strip on inner (landfill) side comprising a mixture of kanuka (*Kunzea ericoides*) @ 1.5m centres, and totara (*Podocarpus totara*) at 3m centres. Seedlings to be eco-sourced with totara at least PB 3 grade (3 litre bag) at planting

Internally, during operation, the landfill will be managed with daily and intermediate cover. Temporary stockpiles are limited to 5 m above existing ground level to limit available views and will be track rolled and trimmed to regular shapes. Those not expected to be reworked within 1 month will have mulch or hydroseeding applied.

In addition to the landfill operation, the concept road design identifies cut batters up to a maximum of 7.4 metres at 1(v):2(h) and fill batters up to a maximum of 6 metres at 1(v):2(h). Subject to the final road design, these will require hydroseeding with grass or planting with shrub species consistent with their surroundings to ensure they are effectively assimilated within their rural context.

~~Landscape mitigation associated with the landfill is divided into two complementary stages. **Stage A Mitigation** (**Figure 8**) applies to Stages 1 - 3 of the landfill followed by **Stage B Mitigation** (**Figure 9**) which covers Stages 4 and 5 to the completion of the Proposed Development. Landscape mitigation comprises dense bands of pine, kanuka and totara along the eastern ridge and the Big Stone Road boundary, together referred to as the 'perimeter trees'. The perimeter trees will be planted at the outset (year 1) and will assist to further visually contain the activity within the Site.~~

~~Initially, perimeter trees along Big Stone Road boundary will extend as far west as the Stage 3 extent, with the balance of Stages 4 and 5 managed as productive forestry (**Stage A Mitigation**). Once Stage 3 is near completion (anticipated 29 years), Stage 4 & 5 will entail implementation of engineered fill and replacement perimeter trees, with pine replaced with native vegetation to reinforce established semi-mature indigenous perimeter trees (**Stage B Mitigation**).~~

~~Planting Design~~

~~The planting will comprise at least 4 rows of trees with 2m between rows. Perimeter trees will comprise of the following:~~

~~Stage A Mitigation~~

- ~~2 offset rows of *Pinus radiata* on the outer edge of the permitre trees @ 3.0 m centres~~
- ~~> 5 m wide strip on the inner (landfill) side comprising a mixture of kanuka (*Kunzea ericoides*) @ 1.5m centres, and totara (*Podocarpus totara*) at 3m centres. Seedlings to be eco-sourced with totara at least PB 3 grade (3 litre bag) at planting~~

~~Stage B Mitigation~~

- ~~2 offset rows of *Pinus radiata* planted on the outer edge of Stage 4 and 5 adjoining Big Stone Road @ 3.0 m centres~~
- ~~> 5 m wide strip on the inner (landfill) side comprising a mixture of eco sourced kanuka (*Kunzea ericoides*) @ 1.5m centres, and totara (*Podocarpus totara*) at 3m centres~~
- ~~*Pinus radiata* established as part of Stage A Mitigation replaced by eco-sourced Kanuka and Totara to reinforce screening provided by adjoining semi-mature indigenous trees~~

~~Internally, during operation, the landfill will be managed with daily and intermediate cover. Temporary stockpiles are limited to 10 m above existing ground level to limit available views and will be track rolled and trimmed to regular shapes. Those not expected to be reworked within 1 month will have mulch or hydroseeding applied.~~

~~In addition to the landfill operation, the concept road design identifies cut batters up to a maximum of 4 metres at 1(v):3(h) and fill batters up to a maximum of 6 metres at 1(v):2(h). Subject to the final road design, these will require hydroseeding with grass or planting with shrub species consistent with their surroundings to ensure they are effectively assimilated within their rural context.~~

~~Ground preparation~~

~~Planting on areas of compacted (engineered) fill, to be ripped before applying 0.6m of topsoil. All roadside cut and fill batters to be scarified prior to hydroseeding.~~

Maintenance

Early and ongoing maintenance is essential to the successful establishment and vigour of landscape mitigation including perimeter trees, in order that they are able to thrive and achieve an effective exterior screen and buffer around the Site. The planted area will need to be actively maintained until the planting achieves 80% canopy cover (up to 5 years). Maintenance shall include weed control, rubbish removal, replacement of failed/unhealthy plants and fertiliser. Irrigation may also be required to ensure initial establishment.

8.0 Conclusions

The proposed landfill has been accommodated within an existing designation (D659) and includes a comprehensive landscape plan to integrate the nature of a landfill development within the Site and mitigate the potential for adverse effects. The Site is not identified as an outstanding natural feature and landscape or highly valued amenity landscape and is consistent with a working rural landscape.

The location and physical nature of the Site, within ~~in~~ a folded gully system, essentially contains the Proposed Development and mitigates most visual effects of the landfill on the surrounding area. The upgraded road will assimilate within an established rural road network and any views of the landfill from adjoining roads will become increasingly screened. Potential views of the proposed landfill from dwellings are limited to long distance partial views, typically concealed by intervening plantation forest within a working rural landscape. The landscape mitigation plan ensures temporary views along the boundary of the landfill will become increasingly contained and no more than low adverse visual effects will occur in the long-term.

9.0 References

Boffa Miskell (2007) Dunedin Landscape Management Area Review: Landscape Assessment.

Boffa Miskell (2020) Smooth Hill Landfill, Ecological Impact Assessment.

Moore, M. et al. (2015) Coastal Environment of Otago Natural Character and Outstanding Natural Features and Landscapes Assessment: Dunedin City Section Report

Appendix 1: Natural Character, Landscape and Visual Effects Assessment Methodology

Introduction

The Boffa Miskell Ltd Landscape and Visual Effects Assessment (LVA) process provides a framework for assessing and identifying the nature and level of likely effects that may result from a proposed development including natural character effects associated with the margins of a river. Such effects can occur in relation to changes to physical elements, changes in the existing character or condition of the landscape and the associated experiences of such change. In addition, the landscape assessment method includes an iterative design development processes, which seeks to avoid, remedy or mitigate adverse effects (see **Figure 1**).

This outline of the natural character, landscape and visual effects assessment methodology has been undertaken with reference to the **Quality Planning Landscape Guidance Note**[16] and its signposts to examples of best practice, which include the **UK guidelines for landscape and visual impact assessment**[17] and the **New Zealand Landscape Institute Guidelines for Landscape Assessment**[18].

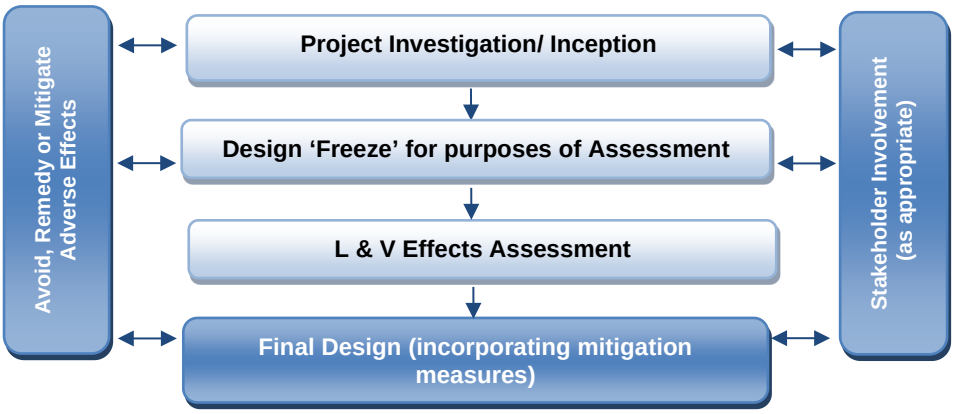


Figure 1: Design feedback loop

When undertaking a LVA, it is important that a **structured and consistent approach** is used to ensure that **findings are clear and objective**. Judgement should be based on skills and experience and be supported by explicit evidence and reasoned argument.

While natural character, landscape and visual effects assessments are closely related, they form separate procedures. Natural character effects consider the change in degree of modification relating to a river and its margins. The assessment of the potential effect on the landscape considers effect on landscape elements, features and on landscape character. The assessment of visual effects considers how changes to the physical landscape affect the viewing audience. The types of effects can be summarised as follows:

Natural Character effects: *Change in the level or degree of naturalness along a waterbody.*

Landscape effects: *Change in the physical landscape, which may affect its characteristics or qualities.*

Visual effects: *Change to views which may affect the visual amenity experienced by people.*

The policy context, existing landscape resource and locations from which a development or change is visible, all inform the 'baseline' for landscape and visual effects assessments. To assess effects, the existing natural

[16] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[17] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)
[18] Best Practice Note Landscape Assessment and Sustainable Management 10.1, NZILA

character and landscape must first be **described**, including an understanding of the **key landscape characteristics and qualities**. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into character areas or types. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described together with, a judgement made on the value or importance of the potentially affected landscape.

Natural Character Effects

In terms of the RMA, natural character specifically relates to coastal and freshwater environments. The RMA provides no definition of natural character. Section 6(a)) considers natural character as a matter of national importance:

> *…the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

Natural character comprises the natural elements, patterns and processes of the waterbodies and their margins, and how they are perceived and experienced. This assessment interprets natural character as being the degree of naturalness of waterbodies and their margins' consistent with the following definition[19]:

> *The degree or level of natural character within an environment depends on:*
>
> *1. The extent to which the natural elements, patterns and processes occur*
>
> *2. The nature and extent of modification to the ecosystems and landscape/seascape.*
>
> *The degree of natural character is highest where there is least modification*
>
> *The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community.*

The process to assess natural character involves an understanding of the many systems and attributes that contribute to a waterbody including biophysical and experiential factors. This can be supported through the input of technical disciplines such as river hydrology and morphology, aquatic and terrestrial ecology, and landscape architecture.

For the purposes of describing and assessing natural character, the river corridor has been considered as two interrelated components; active bed and margin. Each component can be described and assessed in terms of the attributes and qualities that comprise them.

The wider landscape character context of the catchment adjacent to the lake/river may also be relevant in interpreting natural character, (e.g. natural characteristics and qualities may gain significance because of their location within a national park or downtown waterfront.

Active Bed

The active bed comprises the wetted areas/channels and may include dry margins, islands, banks and abandoned channels that form part of the river's natural migration across the riverbed, as well as flood channels, and side channels.

Margins

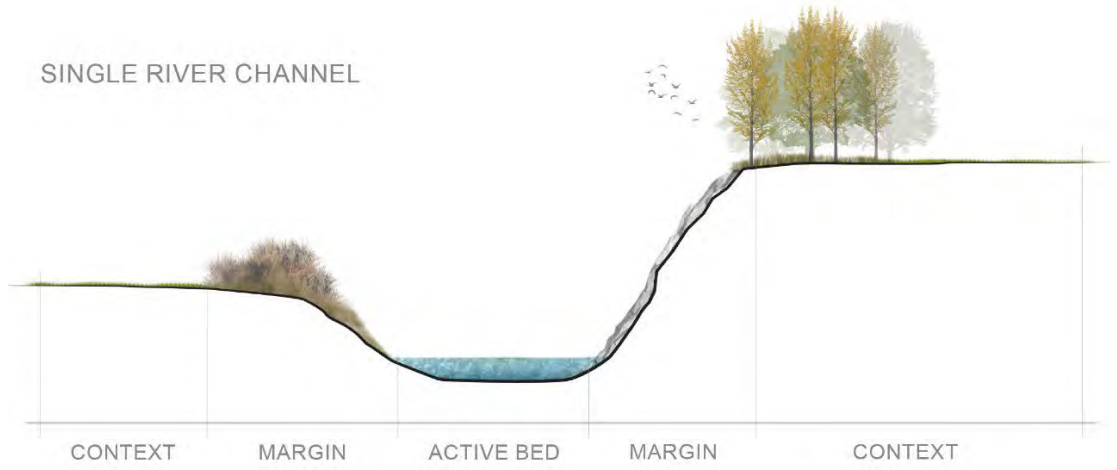
The river margin refers to the area between the active bed and the wider landscape context, including the banks. River processes, patterns and influences will be evident in the margin, such as occasional flooding, historic banks and channel patterns. Generally topographic features define the extent of the margin as they extend between the top and base of stopbanks or terraces. Vegetation type boundaries can also define the margin extent, such as where riparian vegetation or flood protection planting meets the wider landscape context.

[19] Department of Conservation (2011) Natural Character and the NZCPS: National Workshop – Summary and Discussion Outcomes

Table 2 below describes the attributes and qualities used to describe and assess the level of natural character, recognising that the active bed and margin have differing attributes and qualities.

Biophysical (Active bed and margins)
Active Bed • *Flow Regime and river levels – how natural/modified are the flows or river level changes (dams, diversions, altered flow pattern/ river levels).* • *River morphology- active bed shape, including, sedimentation, structures and human modifications.* • *Aquatic ecology - Indigenous taxa assemblages, ecosystem functioning, Presence / absence of exotic aquatic flora and fauna, including presence of pest species. Periphyton and Macro invertebrates provide indication of water quality.* • *Water quality*
Margins • *Morphology- river bank, including sedimentation, structures and human modifications.* • *Riparian vegetation and habitat – indigenous vegetation and fauna (birds, lizards), as well as presence of pest species.*
Experiential
• *Human perception of naturalness of waterbody. The expression of the biophysical attributes.* o *How natural does the area appear (dominance of human activity)* o *The remote/untamed experience.* o *Experiential attributes such as sound of water, smells, feel and transient values.*

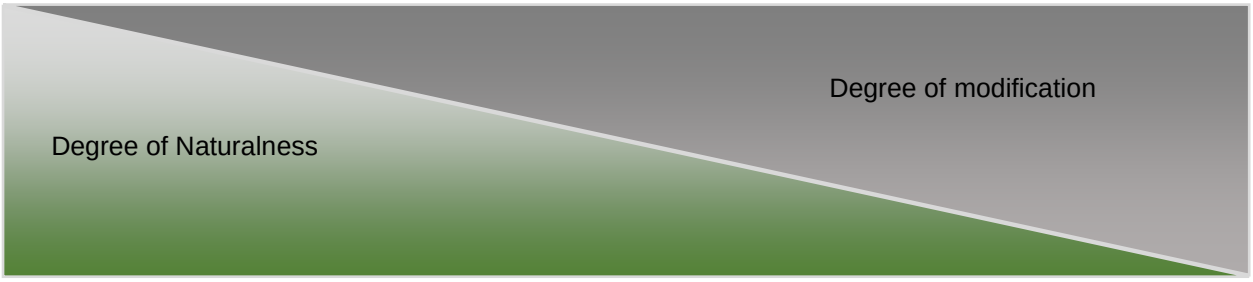
Table 1: Natural Character Attributes

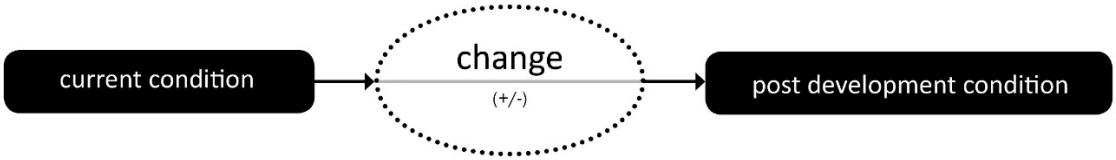


Defining the level of natural character

The level of natural character is assessed in relation to a seven-point scale. The diagram below illustrates the relationship between the degree of naturalness and degree of modification. A high level of natural character means the waterbody is less modified and vice versa.

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





The natural character effects assessment involves the following steps;

- assessing the existing level of natural character;
- assessing the level of natural character anticipated (post construction); and
- considering the significance of the change

Landscape Effects

Assessing landscape effects requires an understanding of the landscape resource and the magnitude of change which results from a proposed activity to determine the overall level of landscape effects.

Landscape Resource

Assessing the sensitivity of the landscape resource considers the key characteristics and qualities. This involves an understanding of both the ability of an area of landscape to absorb change and the value of the landscape.

Ability of an area to absorb change

This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosure / openness of views and distribution of the viewing audience;
- The zoning of the land and its associated anticipated level of development;
- The scope for mitigation, appropriate to the existing landscape.

The ability of an area of landscape to absorb change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

The value of the Landscape

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of Outstanding Natural Feature or Landscape (ONFL) (RMA s.6(b)) based on important biophysical, sensory/ aesthetic and associative landscape attributes, which have potential to be affected by a proposed development. A landscape can have value even if it is not recognised as being an ONFL.

Magnitude of Landscape Change

The magnitude of landscape change judges the amount of change that is likely to occur to areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the level of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. **Table 3** below helps to explain this process. The tabulating of effects is only intended to inform overall judgements.

Contributing Factors		Higher	Lower
Landscape (sensitivity)	**Ability to absorb change**	The landscape context has limited existing landscape detractors which make it highly vulnerable to the type of change resulting from the proposed development.	The landscape context has many detractors and can easily accommodate the proposed development without undue consequences to landscape character.
	The value of the landscape	The landscape includes important biophysical, sensory and shared and recognised attributes. The landscape requires protection as a matter of national importance (ONF/L).	The landscape lacks any important biophysical, sensory or shared and recognised attributes. The landscape is of low or local importance.
Magnitude of Change	**Size or scale**	Total loss or addition of key features or elements. Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements.	The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent.
	Geographical extent	Wider landscape scale.	Site scale, immediate setting.
	Duration and reversibility	Permanent. Long term (over 10 years).	Reversible. Short Term (0-5 years).

Table 2: Determining the level of landscape effects

Visual Effects

To assess the visual effects of a proposed development on a landscape, a visual baseline must first be defined. The visual 'baseline' forms a technical exercise which identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of theoretical visibility (ZTV)' of the site and proposal. Where possible, computer modelling can assist to determine the theoretical extent of visibility together with field work to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

The Sensitivity of the viewing audience

The sensitivity of the viewing audience is assessed in terms of assessing the likely response of the viewing audience to change and understanding the value attached to views.

Likely response of the viewing audience to change

Appraising the likely response of the viewing audience to change is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focussed on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and the reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the wider landscape setting.

Value attached to views

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors. Important viewpoints are also likely to appear in guidebooks or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

Magnitude of Visual Change

The assessment of visual effects also considers the potential magnitude of change which will result from views of a proposed development. This takes account of the size or scale of the effect, the geographical extent of

views and the duration of visual change, which may distinguish between temporary (often associated with construction) and permanent effects where relevant. Preparation of any simulations of visual change to assist this process should be guided by best practice as identified by the NZILA[20].

Visual Simulations

As part of the assessment process, visual simulations have been prepared in accordance with NZILA Best Practice Guide: Visual Simulations BPG 10.2[21]. This has entailed taking digital photographs from each of the identified viewpoints and recording their GPS locations. Preparation of visual simulations required the preparation of a 3D model of the proposed landform supplied by GHD. The viewpoint GPS coordinate was also added to the model and using the same focal length parameters as that of the camera, an image of the 3D wire frame of the proposed landform was then generated for each viewpoint. This was then registered over the actual photograph, using known reference points to bring the two together. The surface of the proposed landform was then rendered to approximate the likely appearance of the Site.

When determining the overall level of visual effect, the nature of the viewing audience is considered together with the magnitude of change resulting from the proposed development. **Table 4** has been prepared to help guide this process:

Contributing Factors		Higher	Lower	Examples
The Viewing Audience (sensitivity)	**Ability to absorb change**	Views from dwellings and recreation areas where attention is typically focussed on the landscape.	Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors.	Dwellings, places of work, transport corridors, public tracks
	Value attached to views	Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature. High visitor numbers.	Viewpoint is not typically recognised or valued by the community. Infrequent visitor numbers.	Acknowledged viewshafts, Lookouts
Magnitude of Change	**Size or scale**	Loss or addition of key features in the view. High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture). Full view of the proposed development.	Most key features of views retained. Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture. Glimpse / no view of the proposed development.	- Higher contrast/ Lower contrast. - Open views, Partial views, Glimpse views (or filtered); No views (or obscured)
	Geographical extent	Front on views. Near distance views; Change visible across a wide area.	Oblique views. Long distance views. Small portion of change visible.	- Front or Oblique views. - Near distant, Middle distant and Long distant views
	Duration and reversibility	Permanent. Long term (over 15 years).	Transient / temporary. Short Term (0-5 years).	- Permanent (fixed), Transitory (moving)

Table 3: Determining the level of visual effects

[20] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

[21] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

Nature of Effects

In combination with assessing the level of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is benign.

It should also be noted that a change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes.

This assessment of the nature effects can be further guided by **Table 5** set out below:

Nature of effect	Use and Definition
Adverse (negative):	The activity would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values
Neutral (benign):	The activity would be consistent with (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values
Beneficial (positive):	The activity would enhance the landscape and / or visual amenity through removal or restoration of existing degraded landscape activities and / or addition of positive elements or features

Table 4: Determining the Nature of Effects

Cumulative Effects

This can include effects of the same type of development (e.g. bridges) or the combined effect of all past, present and approved future development[22] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can also be positive, negative or benign.

Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and level of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the nature of the viewing audience and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

Determining the Overall Level of Effects

The landscape and visual effects assessment conclude with an overall assessment of the likely level of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation. The process can be illustrated in Figure 2:

[22] The life of the statutory planning document or unimplemented resource consents.

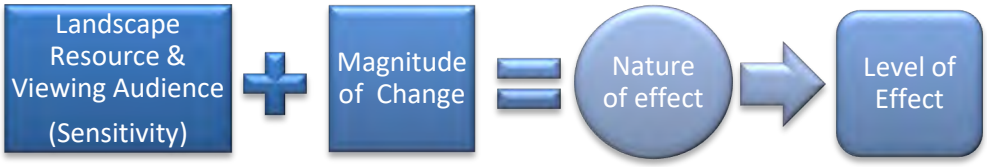


Figure 2: Assessment process

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in **Table 6** below. This table which can be used to guide the level of landscape and visual effects uses an adapted seven-point scale derived from NZILA's Best Practice Note.

Effect Rating	Use and Definition
Very High:	Total loss of key elements / features / characteristics, i.e. amounts to a complete change of landscape character and in views.
High:	Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development landscape character remains and a major change in views. *Concise Oxford English Dictionary Definition* *High: adjective- Great in amount, value, size, or intensity.*
Moderate- High:	Modifications of several key elements / features / characteristics of the baseline, i.e. the pre-development landscape character remains evident but materially changed and prominent in views.
Moderate:	Partial loss of or modification to key elements / features / characteristics of the baseline, i.e. new elements may be prominent in views but not necessarily uncharacteristic within the receiving landscape. *Concise Oxford English Dictionary Definition* *Moderate: adjective- average in amount, intensity, quality or degree*
Moderate - Low:	Minor loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not prominent within views or uncharacteristic within the receiving landscape.
Low:	Little material loss of or modification to key elements / features / characteristics. i.e. modification or change is not uncharacteristic or prominent in views and absorbed within the receiving landscape. *Concise Oxford English Dictionary Definition* *Low: adjective- **1.** Below average in amount, extent, or intensity.*
Very Low:	Negligible loss of or modification to key elements/ features/ characteristics of the baseline, i.e. approximating a 'no change' situation and a negligible change in views.

Table 5: Determining the overall level of landscape and visual effects

Determination of "minor"

Decision makers determining whether a resource consent application should be notified must also assess whether the effect on a person is less than minor[23] or an adverse effect on the environment is no more than minor[24]. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be 'minor' or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration, guidance may be sought on whether the likely effects on the landscape or effects on a person are considered in relation to 'minor'. It must also be stressed that more than minor effects on individual elements or viewpoints does not necessarily equate to more

[23] RMA, Section 95E

[24] RMA Section 95D

than minor landscape effects. In relation to this assessment, moderate-low level effects would generally equate to 'minor' (see **Table 7**).

The third row highlights the word 'significant' which has particular reference to the NZCPS and Policy 13 and Policy 15 and where on the effects-spectrum 'a significant' effect would be placed.

Less than Minor		**Minor**	**More than Minor**			
Very Low	**Low**	**Moderate – Low**	**Moderate**	**Moderate-High**	**High**	**Very High**
					Significant[25]	

Table 6: Determining minor effects for notification determination and non-complying activities

[25] To be used only about Policy 13(1)(b) and Policy 15(b) of the New Zealand Coastal Policy Statement (NZCPS), where the test is 'to avoid significant adverse effects'.

Appendix 2: Visual Effects

Address	Approximate Distance to the Proposed Development[26]	Magnitude of change				Description of visual change	During Operation (Without Mitigation)		Following Mitigation (after 10 years)		Mitigation (during Operation)
		Nature of available views[27]	Angle of View towards the Development[28]	Proportion of Development Visible[29]	Transient / Fixed		Level of effect	Nature of effect	Level of effect	Nature of effect	
DWELLINGS											
731 Big Stone Road	370 m	~~None/~~ Glimpse	Oblique	~~None~~Small Amount	Transient	Potential views towards the landfill are largely concealed by the intervening ridge along Big Stone Road presently managed as forestry. Planting established along the margins of Big Stone Road at the access to this property will provide an effective long-term screen of transient views when leaving this property.	Moderate - Low	Adverse	Low	Adverse	• Establish shelter planting along the boundary of the Site adjoining Big Stone Road.
689 Big Stone Road	640 m	Glimpse	Frontal / Oblique	Small Amount	Transient / Fixed	Potential views towards the landfill will likely remain obscured by intervening landform presently managed as forestry. Planting established along the margins of Big Stone Road at the access to this property will provide an effective long-term screen of transient views when leaving this property.	Moderate - Low	Adverse	Low	Adverse	• Establish shelter planting along the boundary of the Site adjoining Big Stone Road.
513 Big Stone Road	1,380 m	Glimpse	Oblique	Small Amount	Fixed	Views towards the landfill will remain largely obscured by intervening forestry with additional planting established along the margins of Big Stone Road which will remain during the operation.	Low	Adverse	Low	Adverse	• Establish shelter planting along the boundary of the Site adjoining Big Stone Road.
108 McLaren Gully Road	250 m	None	n/a	Small Amount (Road Upgrade)	Transient	Views towards the landfill are entirely screened by intervening landform. Temporary effects associated with tree removal and earthworks required to upgrade McLaren Gully Road.	Low	Adverse	Low	Neutral	• Hydroseed exposed batter slopes along road upgrade works to integrate with adjoining areas.
109 McLaren Gully Road	150 m	None	n/a	Small Amount (Road Upgrade)	Transient	Views towards the landfill are entirely screened by intervening landform. Temporary effects associated with tree removal and earthworks required to upgrade McLaren Gully Road.	Low	Adverse	Low	Neutral	• Hydroseed exposed batter slopes along road upgrade works to integrate with adjoining areas.

[26] Distance taken from GIS and is an estimate between the identified dwelling and the boundary of the Proposed Landfill Extent
[27] Nature of available views: Open, Partial, Glimpse, None
[28] Angle of View Towards the Development: Frontal, Rear, Side, Oblique, n/a
[29] Proportion of Development Visible: Most, Partial, Small Amount, None

Address	Approximate Distance to the Proposed Development[26]	Magnitude of change				Description of visual change	During Operation (Without Mitigation)		Following Mitigation (after 10 years)		Mitigation (during Operation)
		Nature of available views[27]	Angle of View towards the Development[28]	Proportion of Development Visible[29]	Transient / Fixed		Level of effect	Nature of effect	Level of effect	Nature of effect	
ROADS											
McLaren Gully Road	0m	Partial	Frontal / Oblique	Partial	Transient	The central spur will contain infrastructure supporting the landfill whilst screening stages 1-3. Views of the Proposed Development will become increasingly enclosed by proposed planting along the central spur alongside the maintenance of ongoing areas of forestry.	Moderate	Adverse	Moderate – Low	Adverse	• Hydroseed exposed batter slopes along road upgrade works to integrate with adjoining areas. • Include permanent landscape mitigation along Site boundary and along internal spur within the Site • Hydroseed stockpiles with grass once established to reduce their raw worked appearance
Big Stone Road (Stage A Mitigation – Stages 1-3)	0m	Open	Frontal / Oblique	Partial	Transient	Open views into the Site will become increasingly concealed by planting established along the boundary and intervening forestry established in stages 4 -5 when approaching the Site from the west.	Moderate	Adverse	Low	Adverse	• Establish mitigation planting adjoining Big Stone Road and along internal spur within the Site • Retain plantation forestry on footprint of Stages 4 and 5.
Big Stone Road (Stage B Mitigation - Stages 4-5)	0m	Open	Frontal / Oblique	Partial	Transient	Following the removal of forestry within the footprint of Stages 4 and 5, screen planting will be re-established along the boundary of Big Stone Road to achieve an effective screen of the final stages of the landfill.	Moderate	Adverse	Low	Adverse	• Retain mitigation planting adjoining Big Stone Road and along internal spur within the Site • Replace forestry established in the footprint of stages 4 and 5 with screen planting adjoining Big Stone Road

About Boffa Miskell

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

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SMOOTH HILL LANDFILL

LANDSCAPE AND VISUAL AMENITY GRAPHIC SUPPLEMENT

August 2020 (Updated 26 May 2021)

Document Quality Assurance

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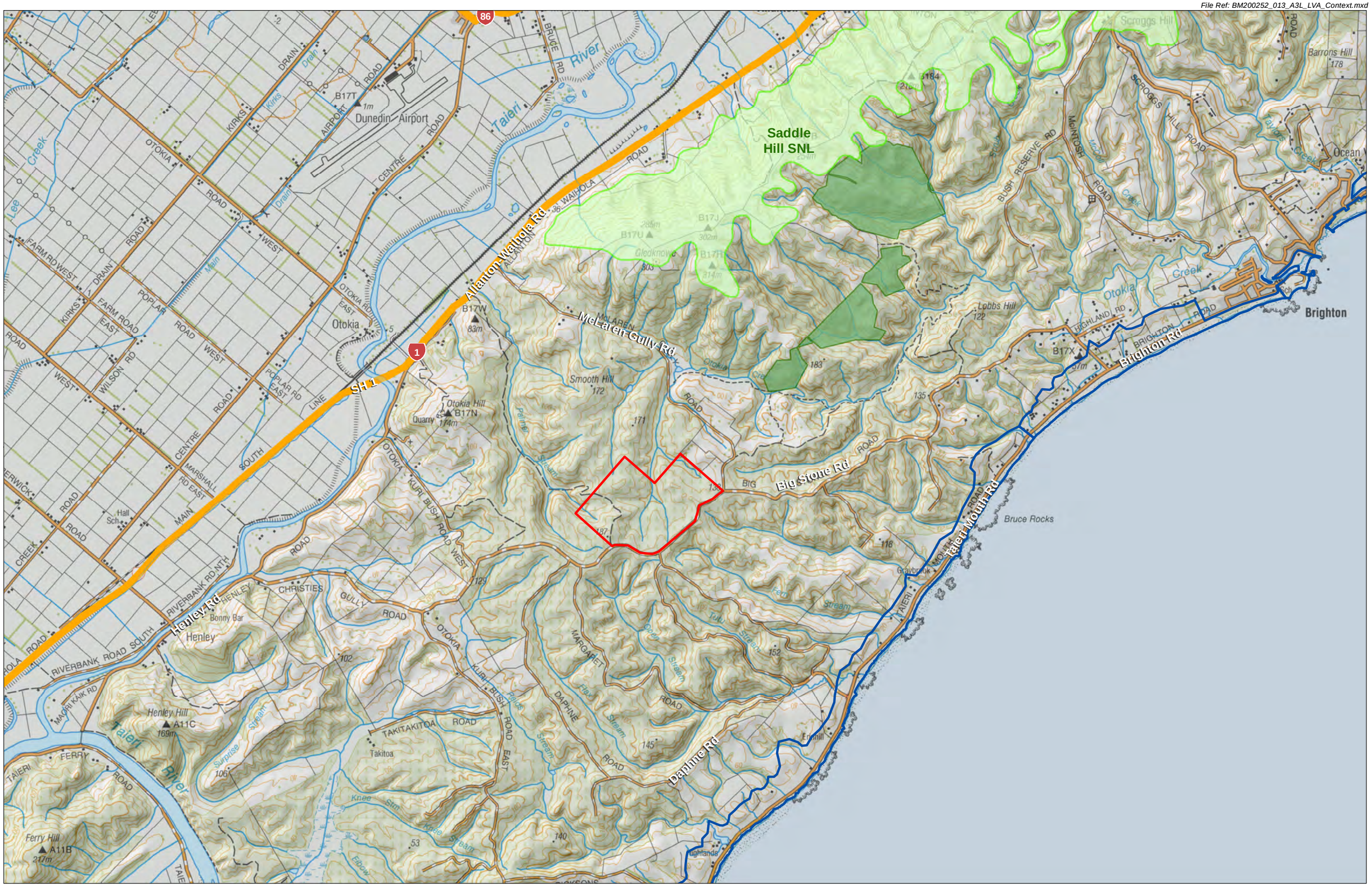
Prepared by:	Hannah Wilson Landscape Planner Corey Murray Visualisation Specialist Hamish Cochrane Landscape Architect Emma Taylor Landscape Architect	
Reviewed by:	Rhys Girvan Senior Principal Landscape Planner Julia Wick Associate Principal Landscape Planner Rachael Eaton Senior Principal	
Status: [FINAL]	Revision / version: 0	Issue date: August 2020 (Updated 26 May 2021)

File ref: BM200252_Graphic_Supplement

Cover photograph: Existing view from within the Site© BML, 2019
Contents Photograph: Existing view from Big Stone Road, © BML, 2019

Contents



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Data Sources:
Topo map sourced from LINZ Topo 50 map series
DCC 2nd Generation District Plan

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND
- Smooth Hill Designation (2GP)
- Hope hill scenic reserve
- Coastal natural character (2GP)
- Significant natural landscapes (2GP)
- State highway

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

Landscape Context

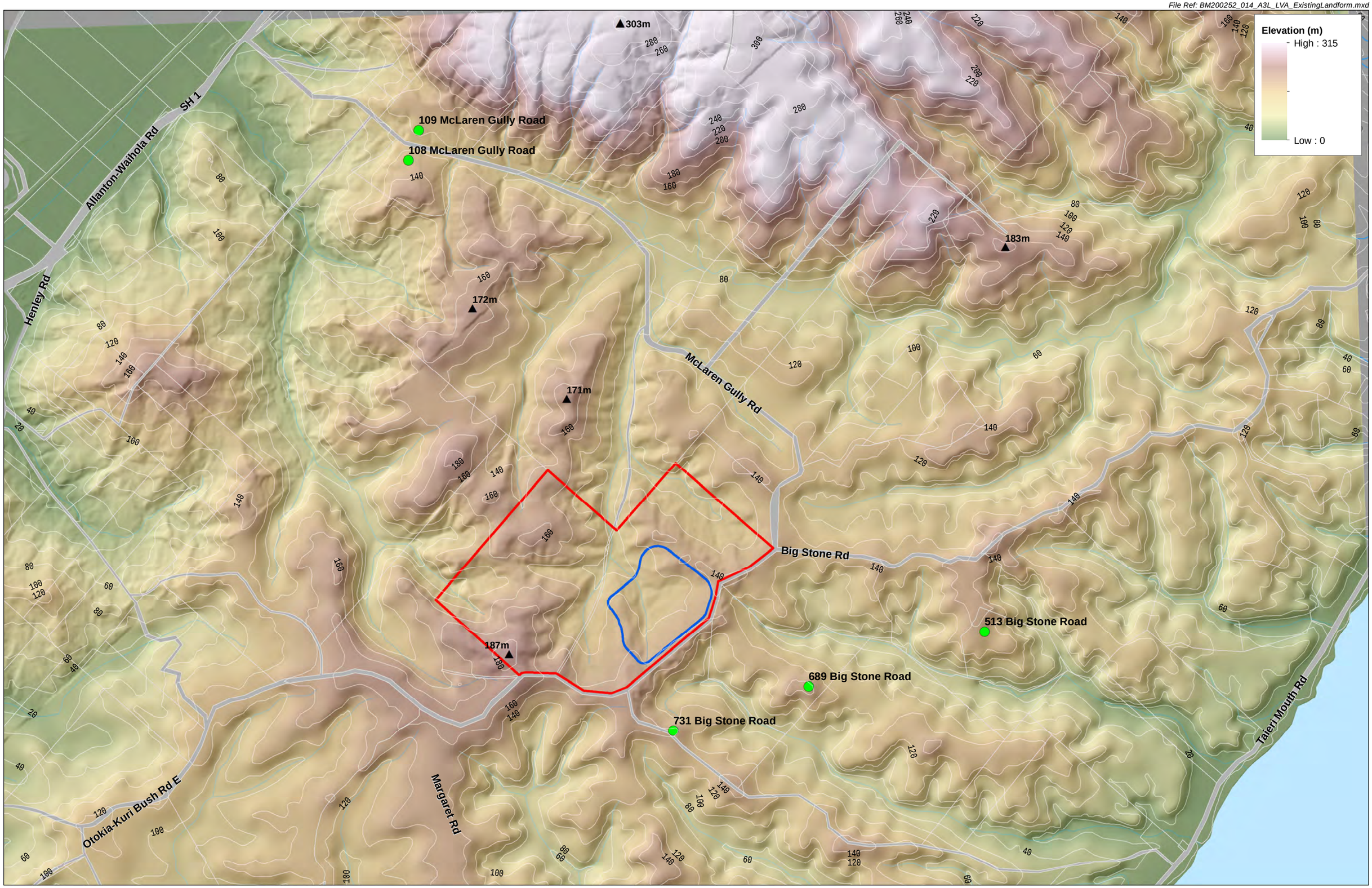
Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

Project Manager: **rhys.girvan@boffamiskell.nz** | *Drawn:* BMc | *Checked:* JWi

Figure 1

File Ref: BM200252_014_A3L_LVA_ExistingLandform.mxd



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Data Sources:
GHD design, LDS LiDAR and Contours
Topo 50 maps sourced from LDS

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Smooth Hill Designation (2GP)
- Landfill extent
- Houses

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

Existing Landform

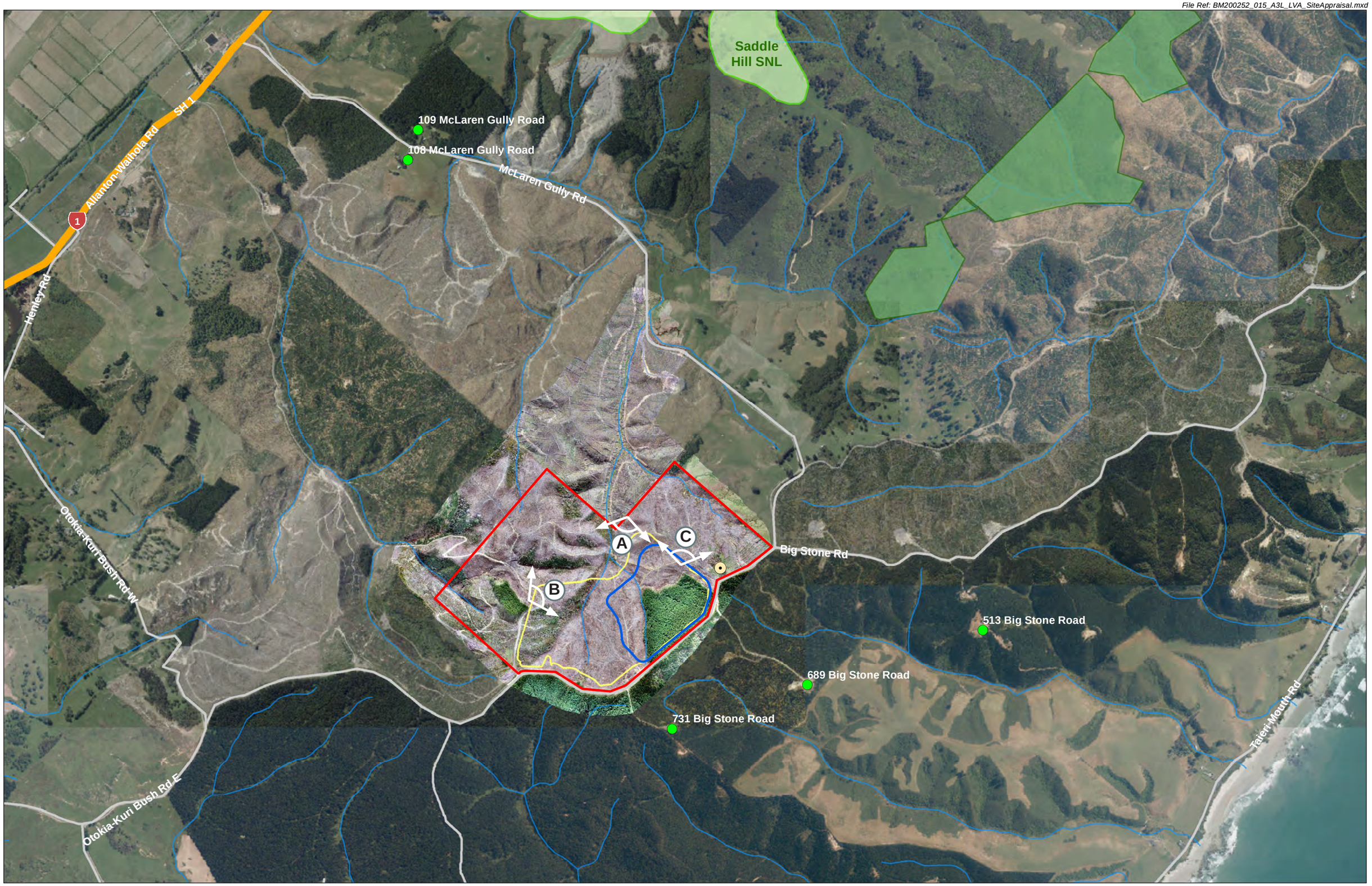
Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

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

Figure 2

File Ref: BM200252_015_A3L_LVA_SiteAppraisal.mxd



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Data Sources:
DCC 2nd Generation District Plan

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Smooth Hill Designation (2GP)
- Landfill extent
- Previous landfill extent (Aug 2020)
- Significant natural landscapes (2GP)
- Hope hill scenic reserve
- Houses
- Cob cottage (Archaeological Site)
- State highway
- Waterways
- Site Appraisal Photographs

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

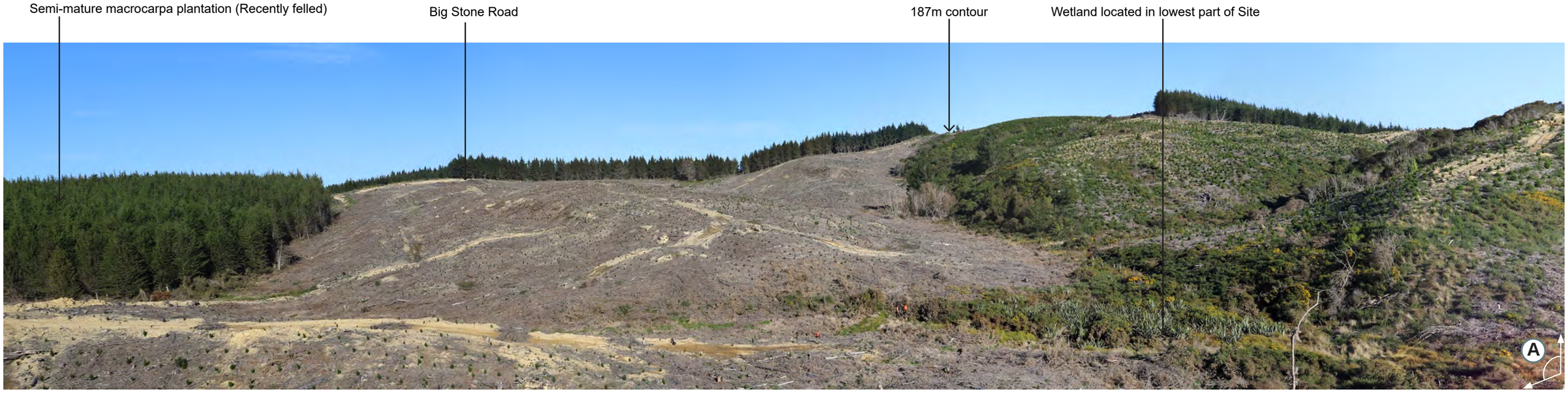
Site Appraisal

Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

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

Figure 3



Site Appriasal Photograph A: View from the centre of the Site looking south towards Big Stone Road.

Site Appriasal Photograph B: View of the Site looking north-east from an access track off Big Stone Road.

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Note: Each panorama has been stitched to represent a 90° horizontal Field of View, and 25° vertical Field of View.

Photos are to be viewed at a reading distance of 20cm at A3 or 40cm at A1.

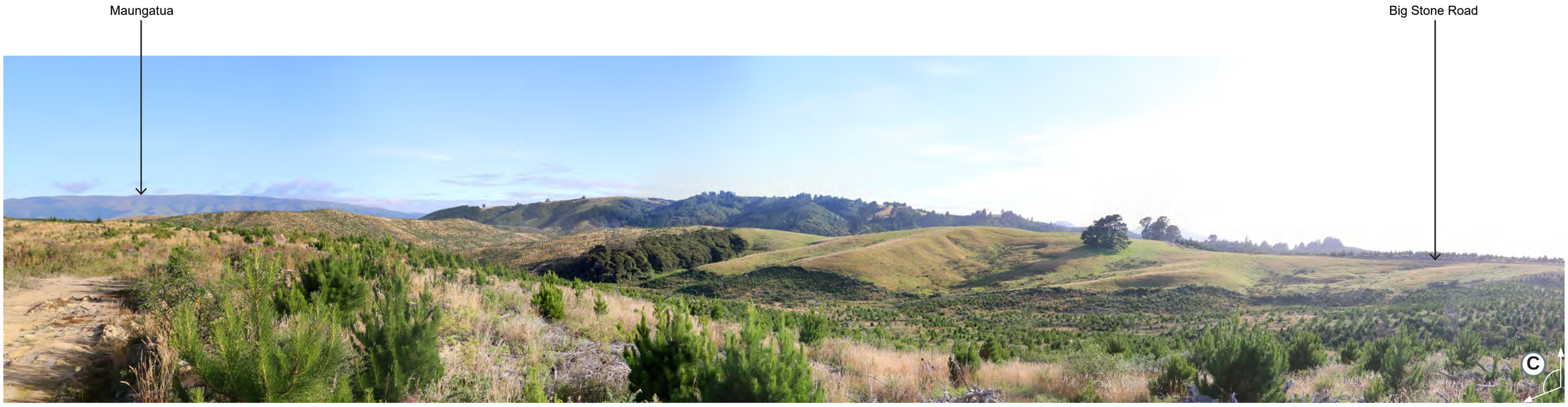
SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Site Appraisal Photographs A & B

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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



Site Appriasal Photograph C: View from the centre of the Site looking north-east towards Big Stone Road.

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Note: Each panorama has been stitched to represent a 90° horizontal Field of View, and 25° vertical Field of View.

Photos are to be viewed at a reading distance of 20cm at A3 or 40cm at A1.

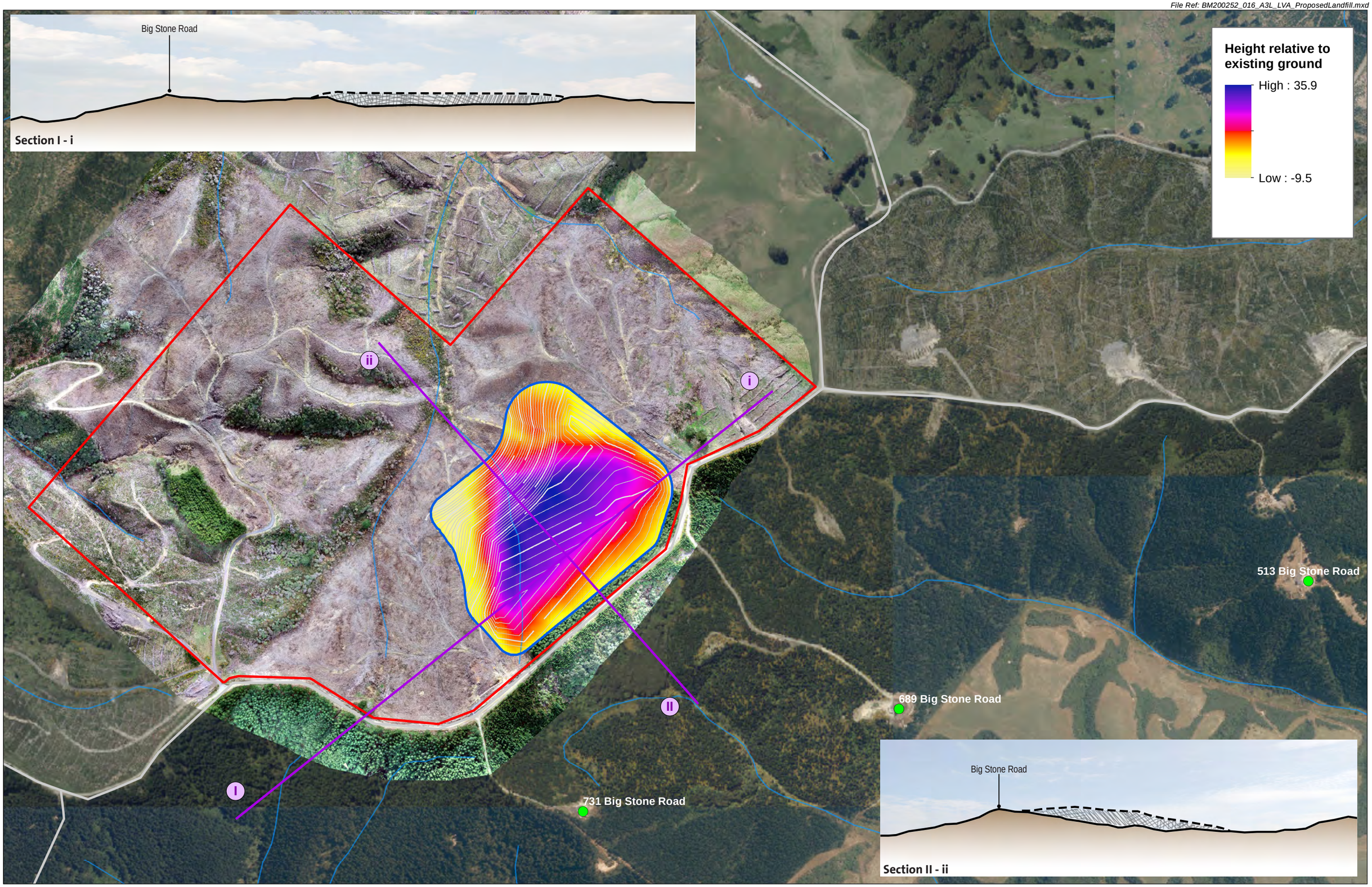
SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Site Appraisal Photograph C

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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



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Data Sources:
GHD design, LDS LiDAR and Contours

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Sections
- Smooth Hill Designation (2GP)
- Landfill extent
- Houses
- Finished contours (5m)
- Finished contours (1m)
- Waterways

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

Proposed Landfill

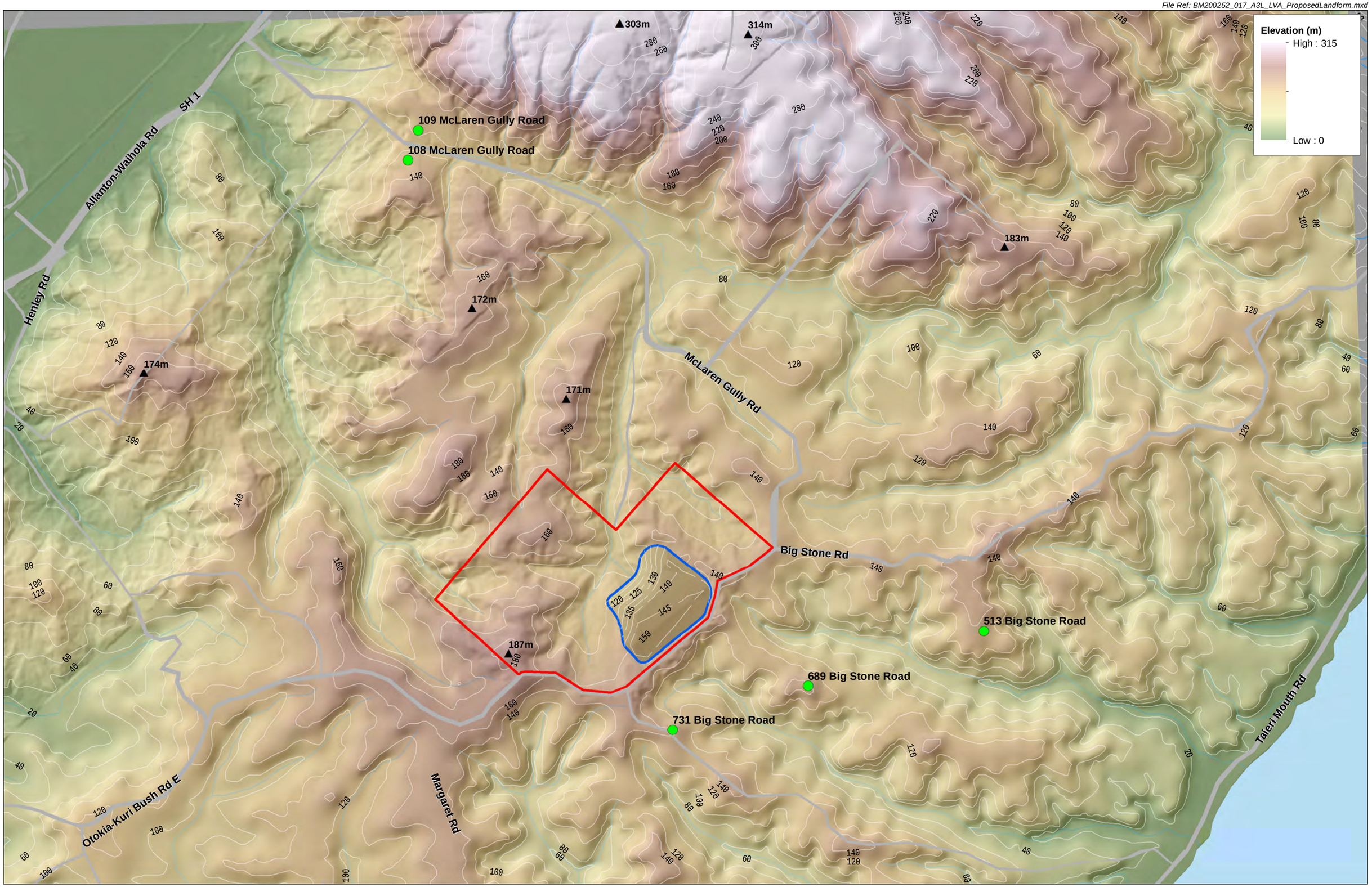
Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

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

Figure 4

File Ref: BM200252_017_A3L_LVA_ProposedLandform.mxd



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Data Sources:
GHD design, LDS LiDAR and Contours

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Smooth Hill Designation (2GP)
- Landfill extent
- Houses

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

Proposed Landform

Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

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

Figure 5

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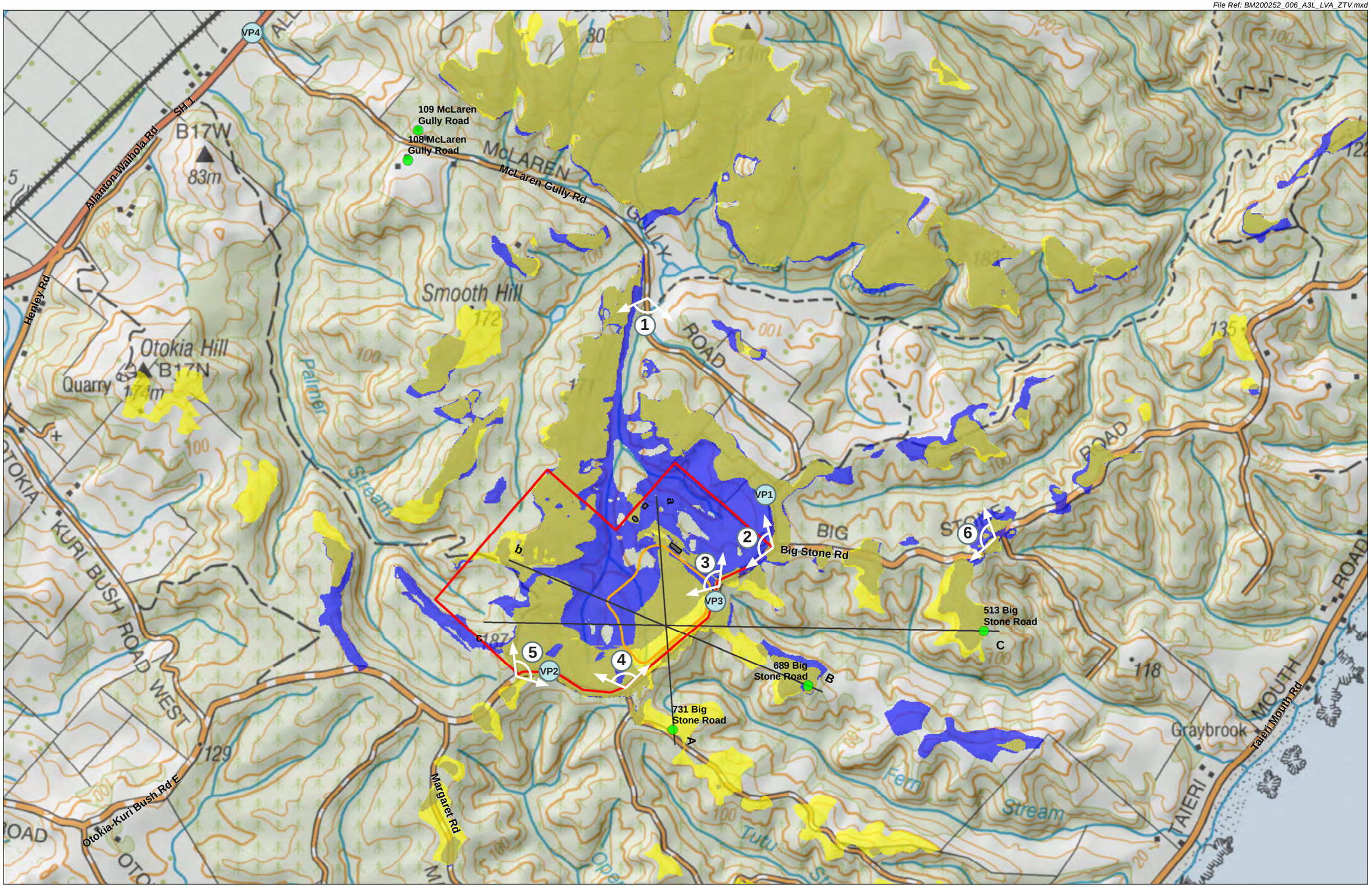

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Data Sources:
GHD design, LDS LiDAR and Contours
Topo 50 maps sourced from LDS

Projection: NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Designation
- Landfill Extent
- Potential Landfill Visible
- Potential Infrastructure Visible
- Infrastructure
- Cross sections
- Houses
- VP1 Simulation Viewpoint
- ① Site Context Photographs

SMOOTH HILL LANDFILL AND VISUAL ASSESSMENT

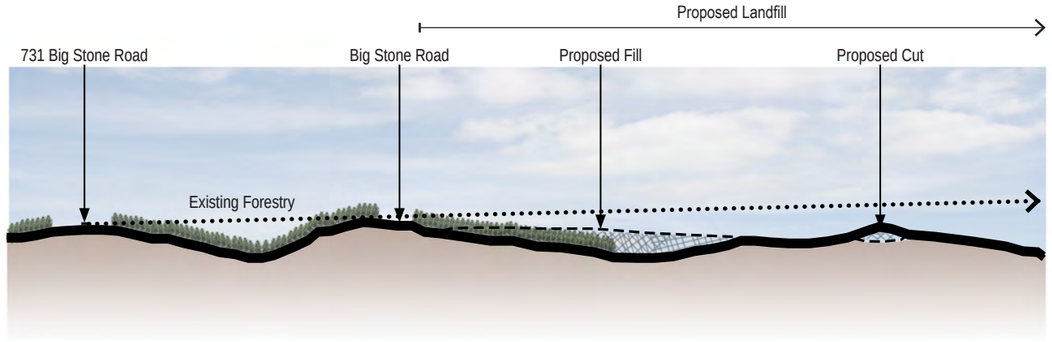
Visual Appraisal

Date: May 2021 | Revision: 0

Plan prepared for DCC by Boffa Miskell Limited

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

Figure 6



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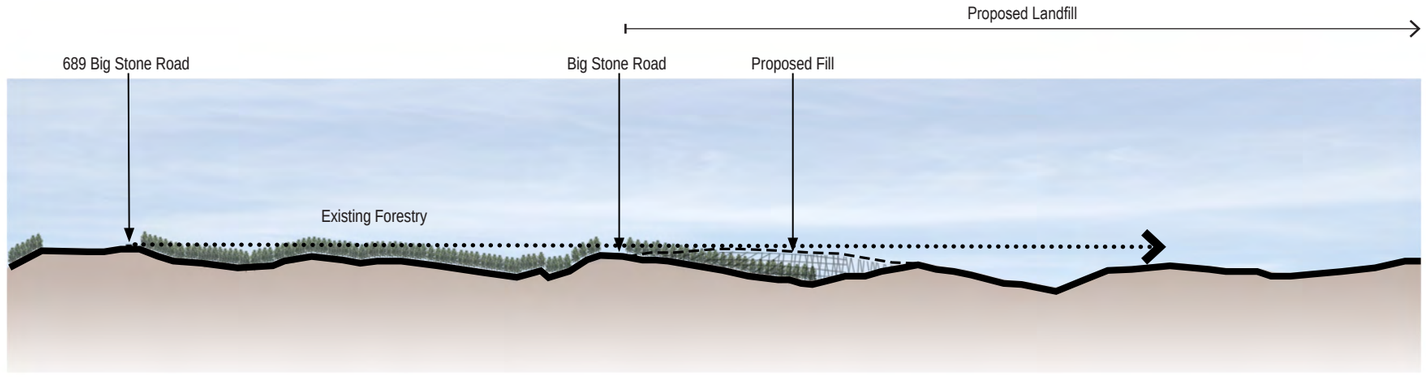

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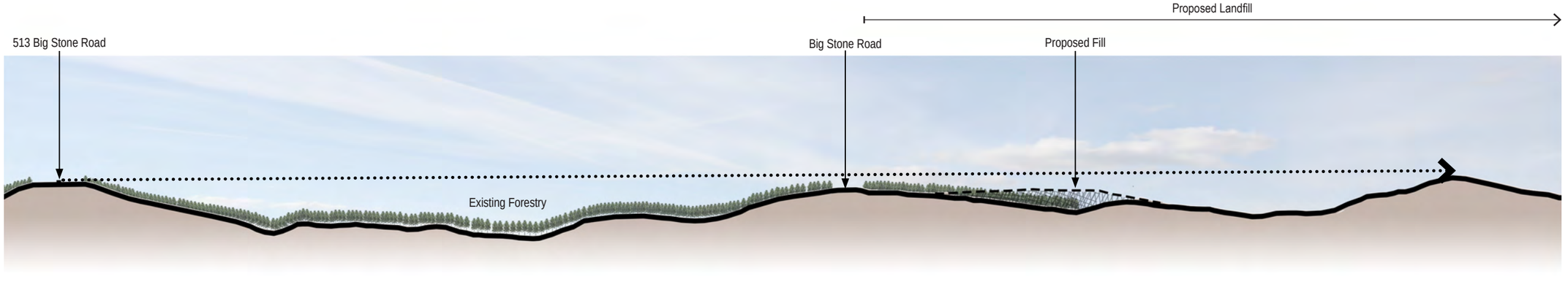

Section C - c : 513 Big Stone Road

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Data Sources:

Topo map sourced from LINZ Topo 50 map series

Projection: NZGD 2000 New Zealand Transverse Mercator

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

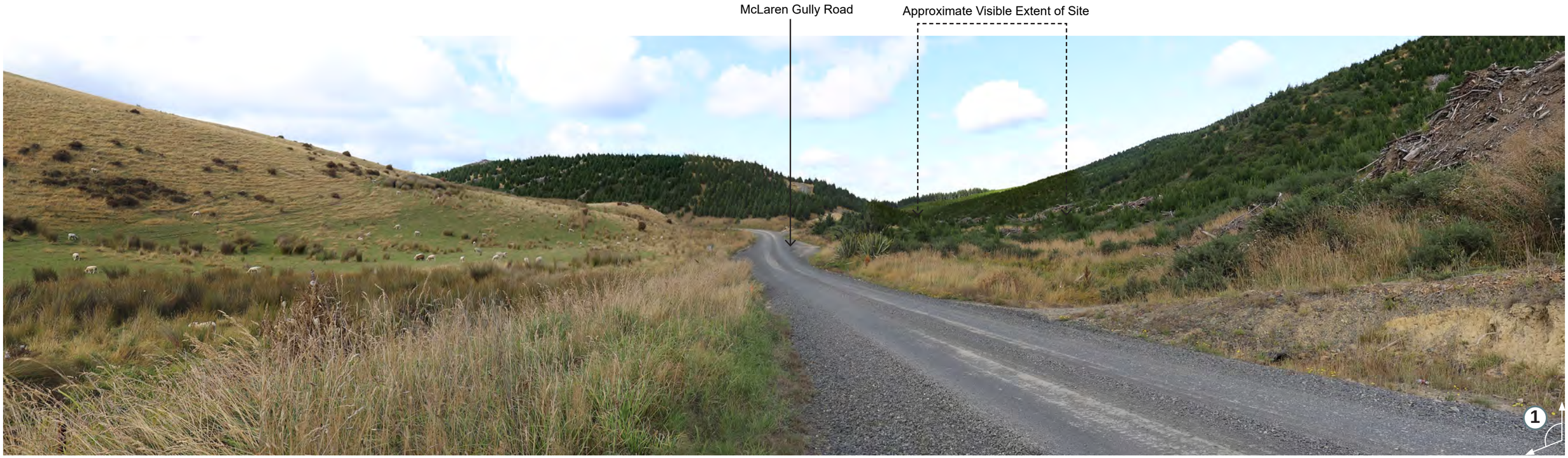
Visual Appraisal: Sections

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 7



Site Photograph 1: View approaching the Site along McLaren Gully Road over a distance of 1 km.

Site Photograph 2: View looking accross the Site from the intersection of McLaren Gully Road and Big Stone Road

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Note: Each panorama has been stitched to represent a 90° horizontal Field of View, and 30° vertical Field of View.

Photos are to be viewed at a reading distance of 20cm at A3 or 40cm at A1.

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Site Context Photographs 1 & 2

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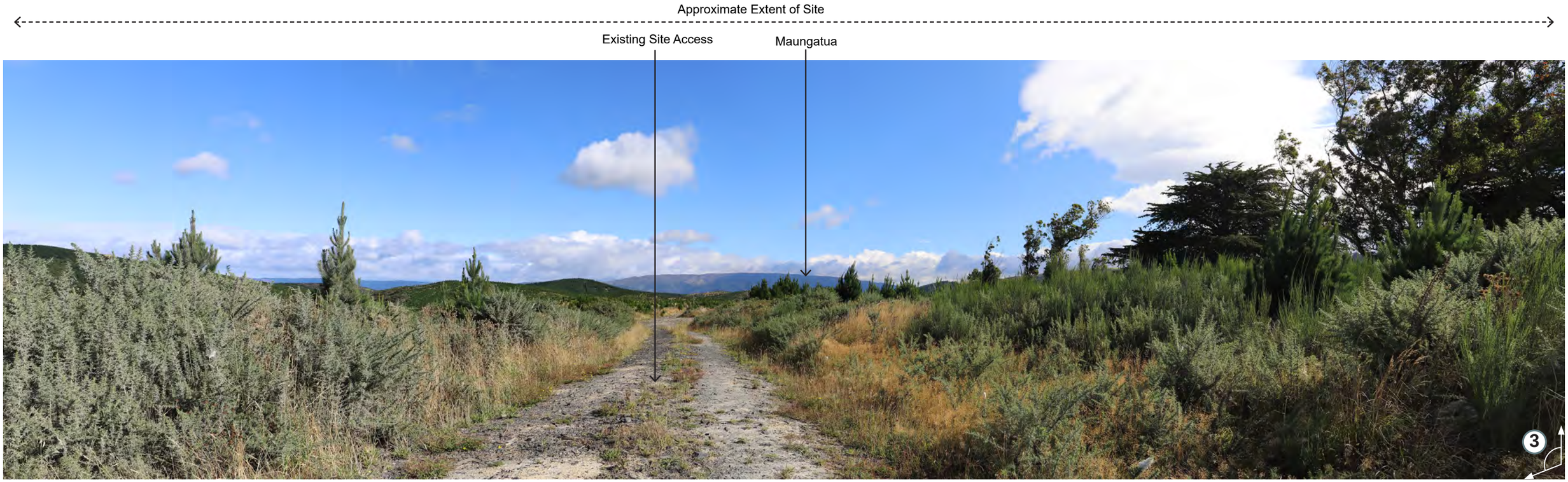
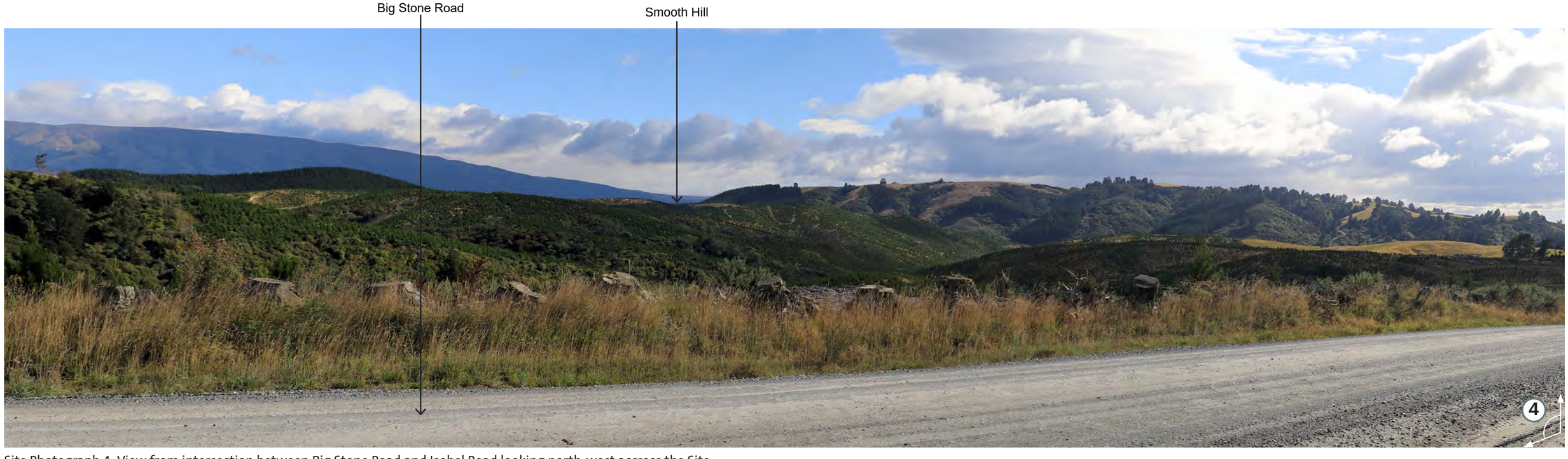


Site Photograph 3: View of access into the Site from Big Stone Road



Site Photograph 4: View from intersection between Big Stone Road and Isobel Road looking north-west accross the Site

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Note: Each panorama has been stitched to represent a 90° horizontal Field of View, and 30° vertical Field of View.

Photos are to be viewed at a reading distance of 20cm at A3 or 40cm at A1.

Site Context Photographs 3 & 4

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Site Photograph 5: View from Big Stone Road looking north-east across the Site from near the 187 m high point along the western boundary

Site Photograph 6: View Big Stone Road looking west approximately 1.1km from the Site

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Note: Each panorama has been stitched to represent a 90° horizontal Field of View, and 30° vertical Field of View.

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Site Context Photographs 5 & 6

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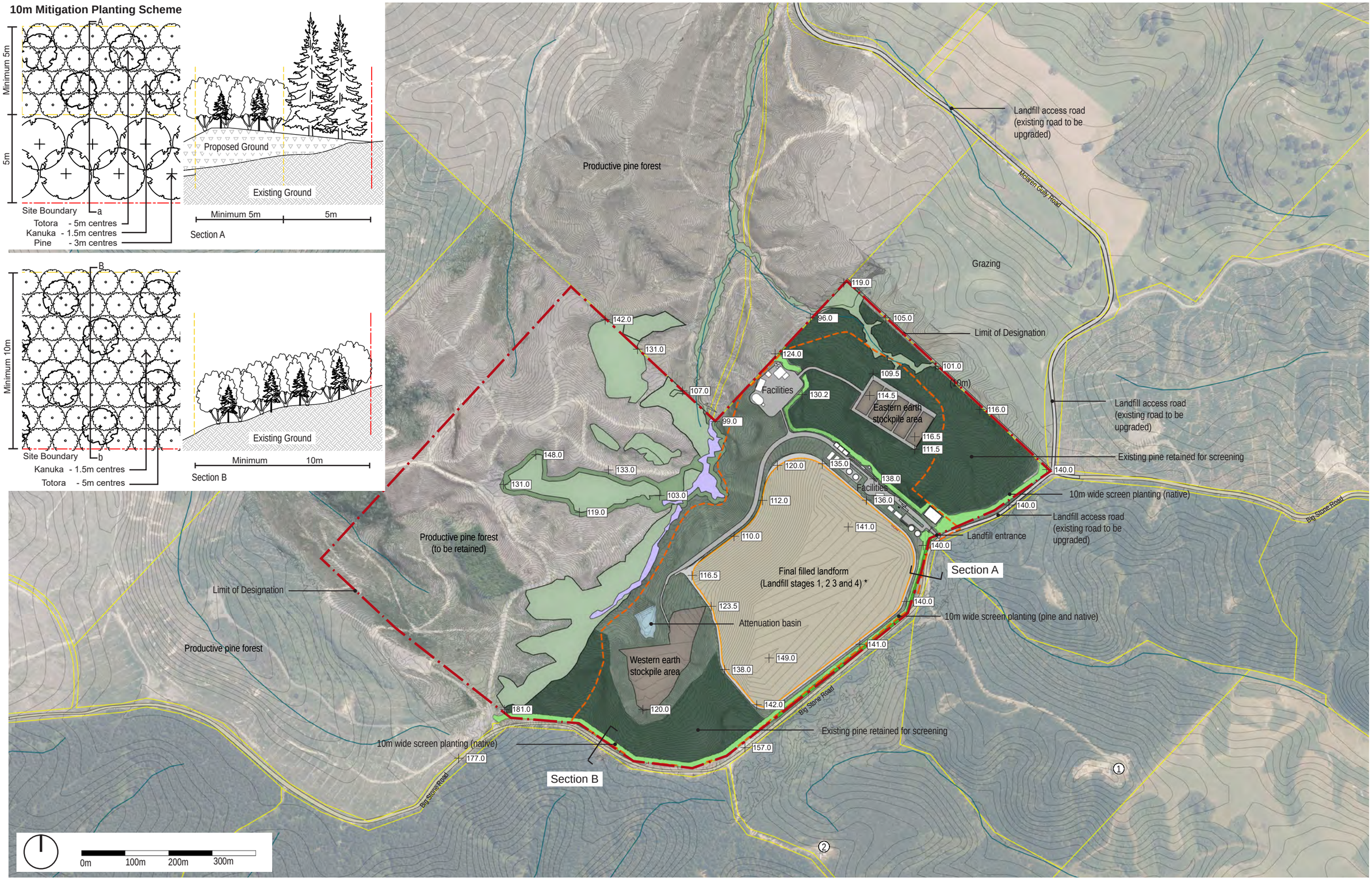
10m Mitigation Planting Scheme



LEGEND

- Cadastre boundary
- Designation Boundary (Incorporating stopped road)
- Landfill - operational extent
- Landfill - final cap extent Stages 1-4 (~40 year life)*

* Refer to GHD Drawings C210-C214 for staging plans

- Water Courses
- Existing wetlands (to be retained)
- Existing native vegetation (to be retained)
- Proposed native revegetation/enhancements

- Screen planting - native (planted at Stage 1)
- Screen planting - pine (planted at Stage 1)
- Existing pine retained for screening
- ①-② Rural- Residential Neighbours

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Landscape Mitigation Plan

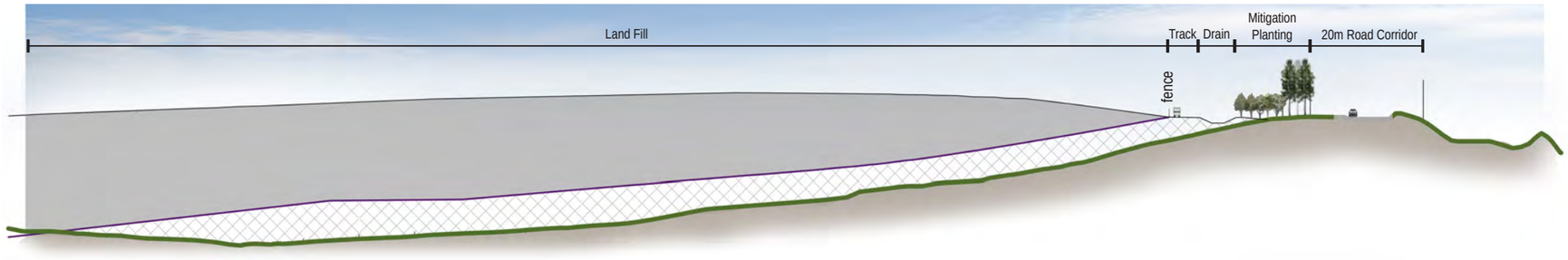
Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

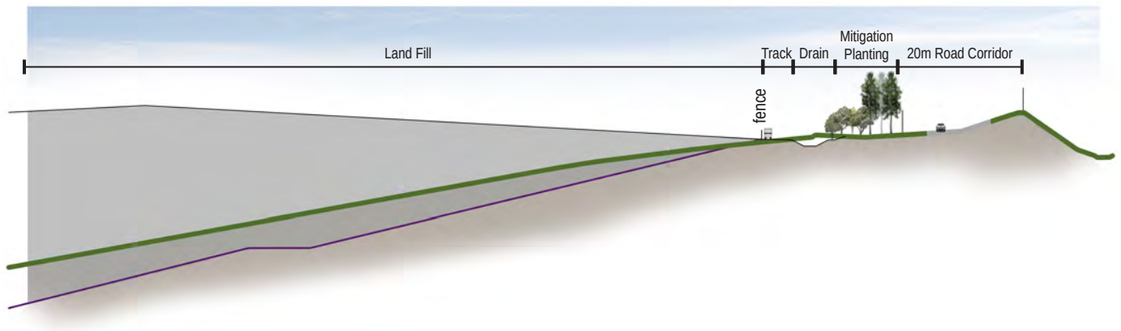
Project Manager: rhys.girvan@boffamiskell.co.nz | Drawn: ETa | Checked: RGi

Figure 8

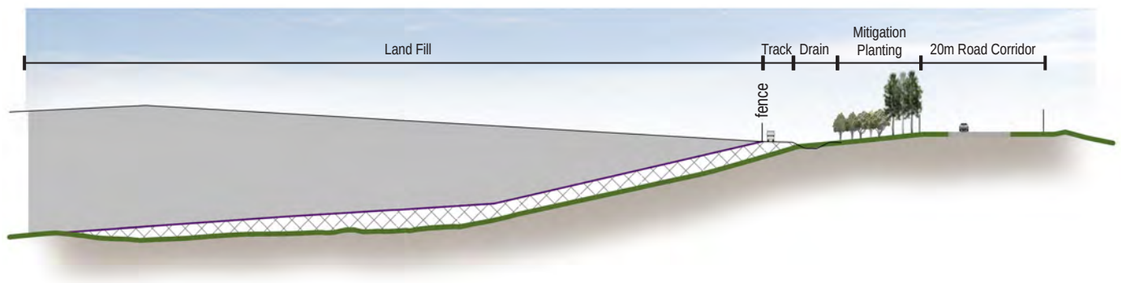
Section A



Section B



Section C



*NOTE: Cross sections based on CAD data from GHD (received 25 May 2021)

Location Plan

LEGEND

- Existing surface level
- Base liner
- Landfill surface level

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Landscape Cross Sections

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Figure 9

Existing View

Proposed View after 1 year

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Viewpoint Details

MP2K Easting	: 397 251 mE	Horizontal Field of View	: 90°
MP2K Northing	: 788 354 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 142.9 m / 144.4m	Projection	: Rectilinear
Date of Photography	: 9:17am,16 March 2021 NZDT	Image Reading Distance @ A3 is 20 cm	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 1A - Year 1

Date: August 2020 (Updated June 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 10

Existing View

Proposed View after 10 years

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Viewpoint Details

MP2K Easting	: 397 251 mE	Horizontal Field of View	: 90°
MP2K Northing	: 788 354 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 142.9 m / 144.4m	Projection	: Rectilinear
Date of Photography	: 9:17am,16 March 2021 NZDT	Image Reading Distance @ A3 is 20 cm	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 1B - Year 10

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 11

Existing View

Proposed View after Year 1

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Viewpoint Details

MP2K Easting	: 395 979 mE	Horizontal Field of View	: 90°
MP2K Northing	: 787 511 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 176.3 m / 177.8m	Projection	: Rectilinear
Date of Photography	: 9:45am,16 March 2021 NZDT	Image Reading Distance @ A3 is 20 cm	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 2A - Year 1

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 12

Existing View

Proposed View after 10 Year

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Viewpoint Details

MP2K Easting	: 395 979 mE	Horizontal Field of View	: 90°
MP2K Northing	: 787 511 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 176.3 m / 177.8m	Projection	: Rectilinear
Date of Photography	: 9:45am,16 March 2021 NZDT	Image Reading Distance @ A3 is 20 cm	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 2B - Year 10

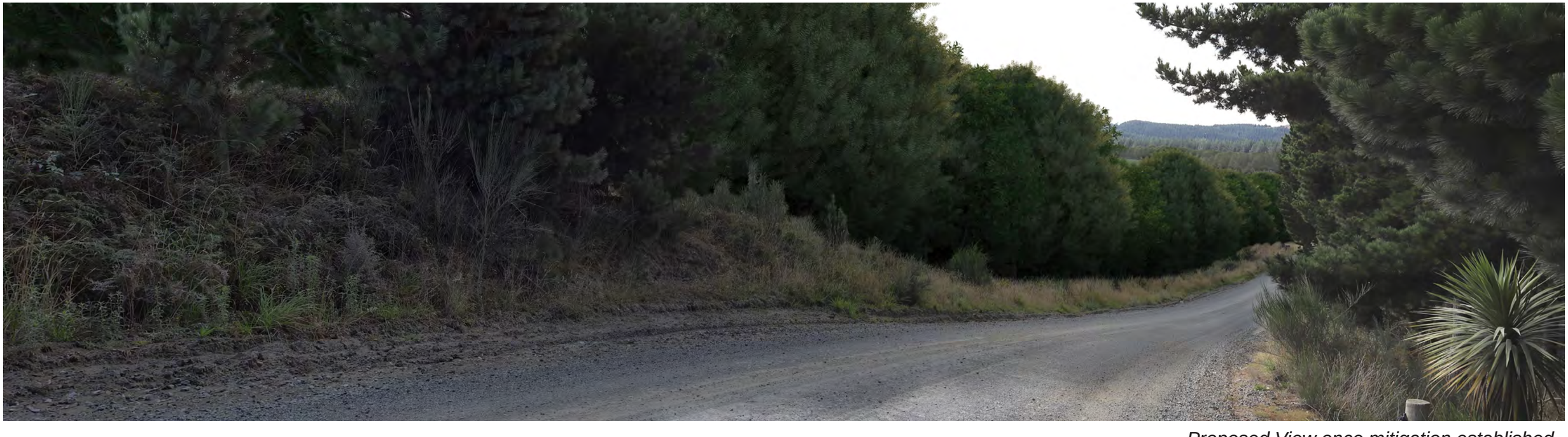
Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 13

Existing View



Proposed View once mitigation established

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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	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 2C - Established Mitigation

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 14

Existing View

Proposed View after 10 Year

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Viewpoint Details

MP2K Easting	: 396 964 mE	Horizontal Field of View	: 90°
MP2K Northing	: 787 860 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 139m / 140.5m	Projection	: Rectilinear
Date of Photography	: 9:30am,16 March 2021 NZDT	Image Reading Distance @ A3 is 20 cm	

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 3A - Year 10

Date: August 2020 (Updated June 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 15

Existing View

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Viewpoint Details

MP2K Easting	: 394 707 mE	Horizontal Field of View	: 90°
MP2K Northing	: 790 844 mN	Vertical Field of View	: 30°
Elevation/Eye Height	: 6.2 m / 7.7m	Projection	: Rectilinear
Date of Photography	: 8:59am,16 March 2021 NZDT	Image Reading Distance @ A3 is	20 cm

Data Sources:

SMOOTH HILL LANDSCAPE AND VISUAL ASSESSMENT

Visual Simulation: Viewpoint 4

Date: August 2020 (Updated May 2021)

Plan prepared for Dunedin City Council by Boffa Miskell Limited

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

Figure 16

About Boffa Miskell

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

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