Montrose Quarry Stage 2 Extension

Landscape and Visual Impact Assessment – DRAFT 1

Landscape and Visual Impact Assessment – Technical Report
Prepared for Boral Resources (Vic) Pty Ltd

Tract
Level 6, 6 Riverside Quay,
Southbank, VIC 3006
(03) 9429 6133
www.tract.com.au
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Quality Assurance

Montrose Quarry Stage 2 Extension

Landscape and Visual Impact Assessment – Technical Report

Project Number

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Prepared By

Amanda van der Westhuizen

Reviewed By

Mark Reilly

Project Principal

Mark Reilly

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Revisions

Rev	Date	Details	Prepared By	Reviewed By	Project Principal
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Executive Summary

The Project

Boral owns and operates a quarry and associated processing plant, concrete and asphalt plants at 56-72 Canterbury Road, Montrose, VIC 3765. The site currently operates under Work Authority 100 (WA 100) issued under what is now the Mineral Resources (Sustainable Development) Act 1990. Boral is now seeking to extend the existing extraction boundary to increase the life of the quarry operation.

This Landscape and Visual Impact Assessment (LVIA) forms part of a Work Plan Variation (WA 100 Expansion) to be lodged by Boral in support of the proposed quarry expansion.

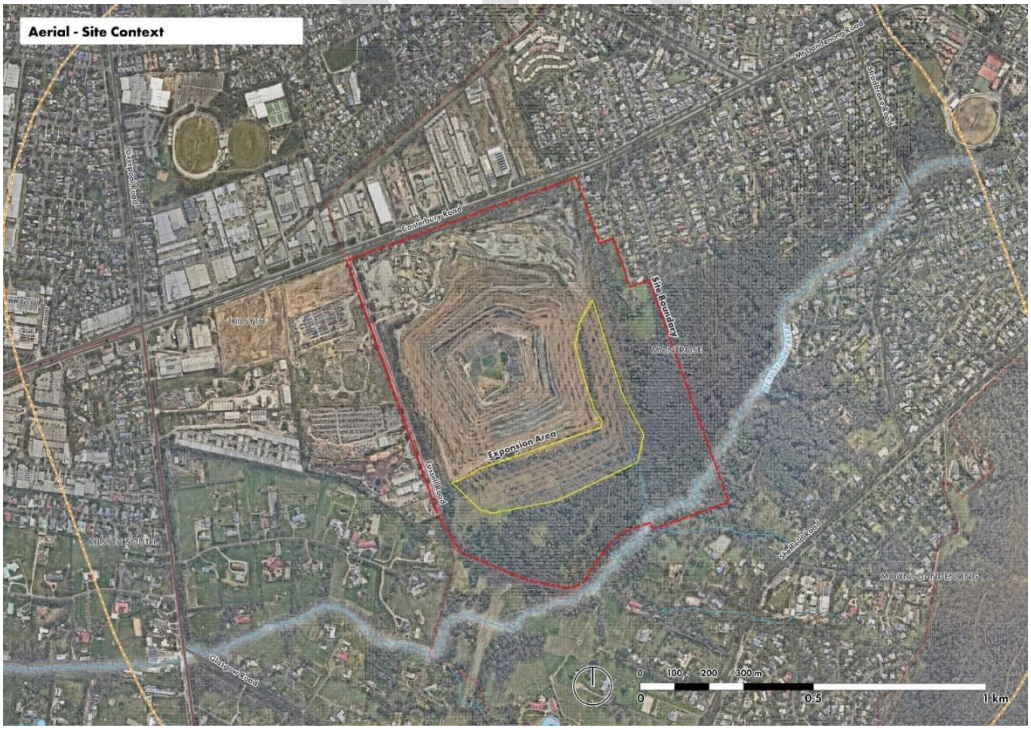
Study Area

The site is situated in Montrose, Victoria, an area located at the foothills of the Dandenong Ranges approximately 32 km east of Melbourne.

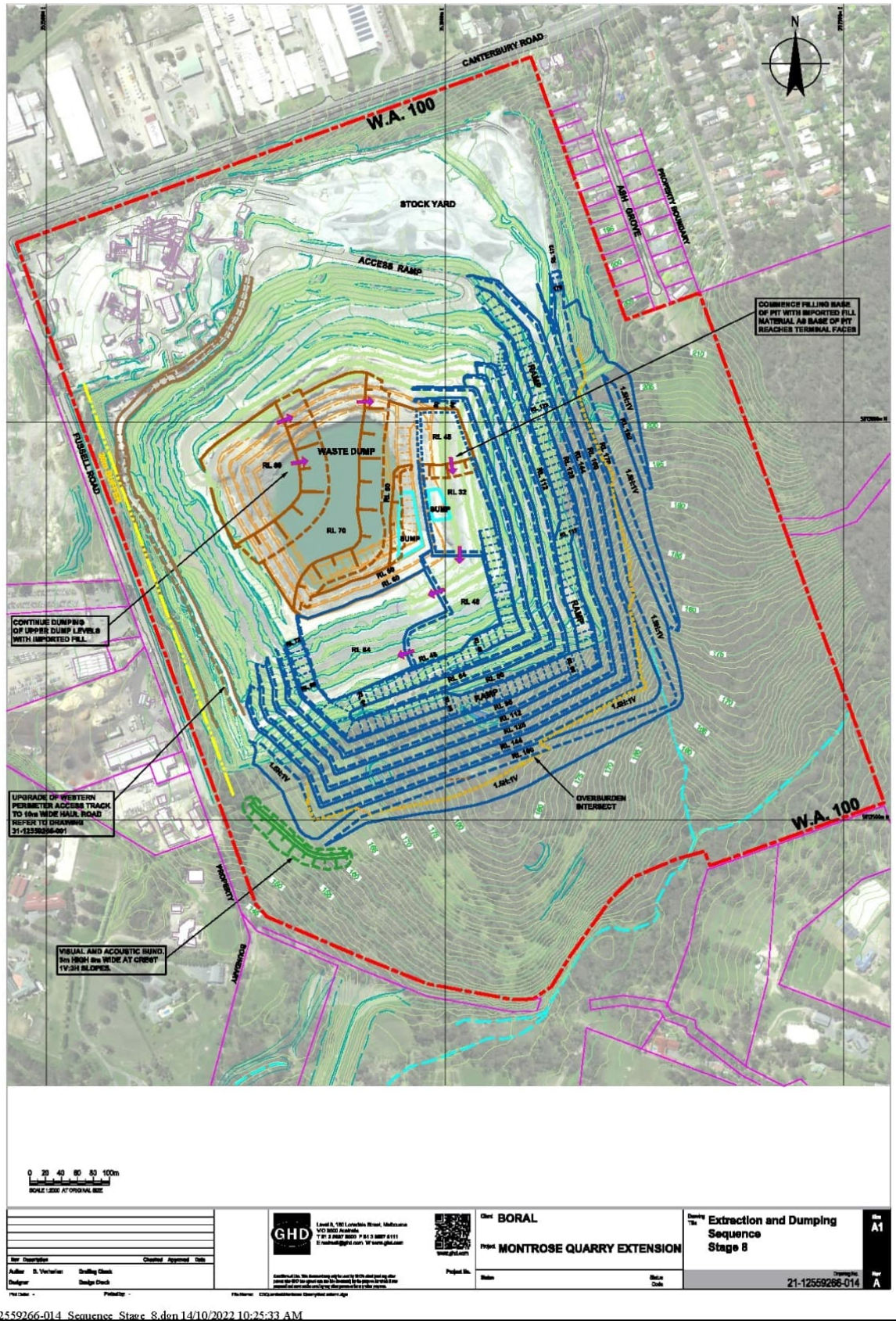
The study area is located within the Yarra Ranges Shire local government area and is positioned at the interface of various residential, rural agricultural, industrial, open space and major road land uses. The existing quarry has been in operation for a number of decades.

The site and the proposed expansion area is bound by Canterbury Road to the north, residential housing to the northeast, Dr Ken Leversha Reserve to the east and south, and Fussell Road to the west.

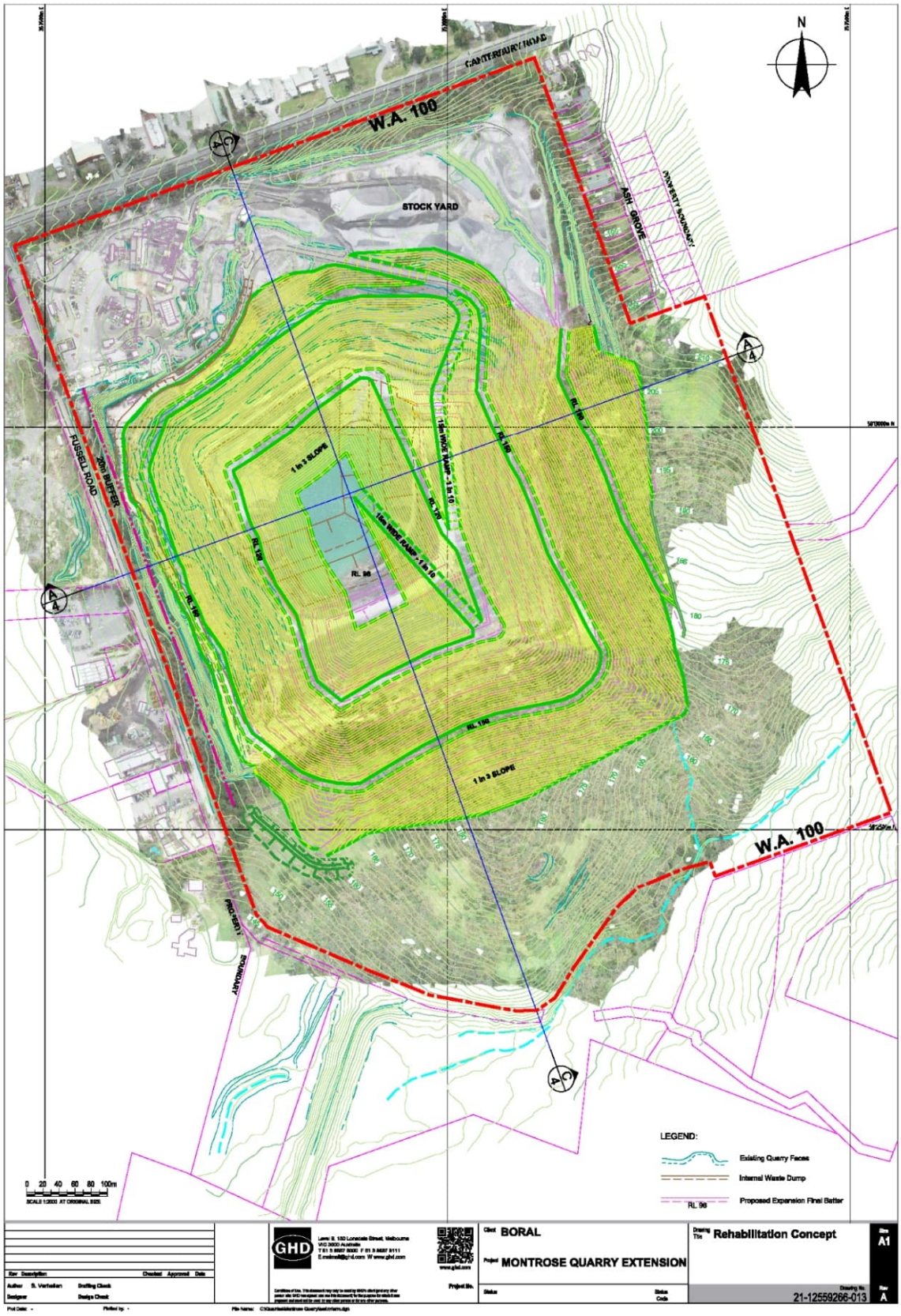
The Wurundjeri Woiwurrung Cultural Heritage Aboriginal Corporation is the Registered Aboriginal Party (RAP).



Montrose Quarry – existing operation & proposed stage 2 extraction area



Proposed Stage 2 – Final phase of extraction (Source: BORAL)



Proposed Rehabilitation Landform - plan (source: BORAL)

Baseline Conditions – Key Findings

Municipal Planning Strategy

The Municipal Planning Strategy (MPS) details contextual considerations and key issues for the municipality.

Clause 02.02 (Vision) seeks for the natural environment to remain the defining characteristic of the municipality.

Clause 02.03-2 (Environmental and Landscape Values) states that the natural environment including hills and trees is the defining characteristic of the municipality. The following strategies are highlighted:

- Avoid the incremental loss and further fragmentation of large intact remnant patches of indigenous vegetation.
- Sustainably manage habitat areas and improve connections between them.
- Offset unavoidable vegetation removal by revegetation or land management measures that achieve a net increase in key biodiversity assets.

Clause 02.03-5 (Built Environment and Heritage) describes scenic landscape as a key contributor to the identity of the municipality. Specifically, the provisions aim to 'protect and respect sensitive environments, significant landscapes and cultural and natural heritage.'

An important theme is the protection and enhancement of significant landscapes and open spaces that contribute to character, identity and sustainable environments. The scenic beauty and unique landscape features within Yarra Ranges is emphasised as a core component of its landscape quality. Within the study area, the foothills of the Dandenong Ranges and the visual amenity provided by the ranges represent a backdrop throughout the Shire. The planning scheme requires that these characteristics should be maintained and protected.

The Shire also supports the development and expansion of existing extractive industry resources while protecting environmentally sensitive areas. Specific mention is made of the requirement to prevent the expansion of existing quarry operations into established buffer areas that protect nearby residential areas and other sensitive land uses.

Zoning and Overlays

- The existing quarry pit lies within the SUZ1 and the proposed quarry expansion area lies within SUZ6. The purpose of SUZ6 is essentially the protection of properties in proximity from noise, dust and visual intrusion, and the preservation of the amenity of the immediate area. The purpose of this zone is also to preserve the option of future exploitation of stone resources, subject to due process and acceptable environmental standards.
- The proposed quarry expansion area is covered by an Environmental Significance Overlay, with an objective to ensure that any new development is sensitively designed and sited to reinforce the existing environmental characteristics of the area.
- The proposed quarry expansion area is also covered by a Significant Landscape Overlay (SLO1). Objectives relate to retaining a forest dominated landscape and maintaining the appearance of uninterrupted forest ranges when viewed from Melbourne's outer east and surrounds.
- Rural residential areas to the immediate south-west of the site are covered by a Significant Landscape Overlay (SLO6). Overlay objectives relate to allowing middle and long distance views from the valley and surrounding ranges and maintaining the appearance of an uninterrupted forested backdrop to views of the Dandenong Ranges.
- Residential areas along the foothills of the Dandenong Ranges National Park and to the north-east of the site are covered by a Significant Landscape Overlay (SLO22). Objectives relate to recognising the visual sensitivity of these residential areas and maintaining vegetation as a dominant visual element of the landscape setting.

Landscape policies

- Localised landscape planning policies seek to place restrictions on development in order to maintain iconic features such as the 'treed escarpments of the Dandenong Ranges and the visual amenity along main roads and tourist routes'. The emphasis of the policy is on the management of visual effects and landscape character, rather than the principle of change.
- The landscape significance of the Dandenong Ranges National Park and surrounding area has been recognised by the National Trust of Australia (Victoria). The Trust has classified a number of landscapes in the region, including the whole of the park and a number of locations within it. The plan states a requirement to maintain and upgrade existing viewpoints and encourages the application of environmental protection overlays when determining applications affecting land adjacent to the park. Although the Montrose quarry does not lie within the Dandenong Ranges National Park, the park landscape is relevant as a visual receptor and as a defining regional landscape feature.

Landscape Character:

- The non-urban vegetated slopes of the Dandenong Ranges National Park are of High scenic quality by virtue of landform and vegetation. These landscapes form an important visual backdrop to the study area and define the edge of the Melbourne metropolitan area.
- The Green Wedge areas and Rural Conservation areas south of the site and north of Montrose are of Moderate scenic quality by virtue of the landform, cultural landscape patterns and local roadside vegetation.
- Residential neighbourhoods east of the quarry site have a moderate to high scenic quality based on varying topography, tree canopy cover, well vegetated open space is abundant, visually recessive built form and visual connection to the Dandenong Ranges landscape.
- Industrial areas north and west of the quarry site are low scenic quality on the basis that vegetation cover is sparse and industrial / commercial building and road spaces are visually dominant.
- The active quarry site is an industrial use with a low scenic quality, although the scale of the pit is distinctive and with its own scenic qualities. The existing vegetated buffer areas to the south and east of the quarry pit have a moderate scenic quality based on the quality of existing landform and vegetation, and the visual connection to the rural residential areas and Dandenong Ranges reserve system landscapes to the south and south-west.

Landscape Condition

The landscape to the immediate north and west of the quarry site has developed as an industrial precinct, which extends down Canterbury Road to the south-west. With the exception of native street tree planting, the industrial setting generally has a minimal and fragmented landscape presence and is in a relatively poor condition.

The Canterbury Road landscape which forms a northern boundary to the site and the eastern Fussell Road boundary is generally a mixture of indigenous and native species. Street planting blends with the quarry site buffer planting to form a vegetated edge to the site.

The landscape of the site is formed by a combination of four land use areas:

- An active extraction pit, haul roads and stone processing area
- Concrete and asphalt plants and site administration facilities
- Perimeter native landscape buffer planting (refer Figure 29). This landscape buffer plantation is a combination of remnant indigenous planting and mixed native tree and shrub planting. The landscape buffer is in average condition as a result of 'edge effects', including weed intrusion.
- The indigenous woodland at the southern and eastern edges of the site. This landscape is a combination of remnant indigenous vegetation and some exotic tree planting and weed intrusion that is a legacy of past land uses. This vegetation varies from good to average condition, depending on the site location and the degree of disturbance that results from historic land uses, current and previous site uses and management practices. This site vegetation system adjoins the Dr Ken Leversha and Bungalook Creek Reserve systems and on that basis, forms a part of a locally important remnant vegetation network.

Landscape Value

Landscape value describes the relative value that is attached to the landscape by the community, although a landscape may be valued by different stakeholders for a variety of different reasons. It draws from both Landscape Character and Scenic Quality, but also considers the condition of the landscape (intactness) and the community / cultural associations and values placed on the landscape.

- The Yarra Ranges Planning Scheme recognises, through a series of Significant landscape Overlays. Landscape significance is attributed to locations south and east of the quarry site and to the woodland area within the quarry site. The SLO system recognises the specific qualities of each of the SLO landscapes as well as the visual relationship between each of the SLO landscapes, including the quarry site, and the Dandenong Ranges landscape from key eastern suburb and main road viewpoints.
- The Dandenong Ranges National Park is an important leisure destination and a conservation area of state significance. The value of the landscape for tourism and recreation is considered high, as scenic quality represents a drawcard for tourism. The Ranges landscape also provides a visual backdrop to nearby land use areas. The scenic quality of the mountain landscape and the views to the west over the city from designated scenic viewpoints are important features that reinforce the metropolitan value of the landscape.

Pattern of viewing

Two viewpoints provide a clear view of the existing quarry pit.

- Viewpoint 2 provides a distant road-based view of the pit, but the development is only seen as a colour change in a landscape that contains a mosaic of industrial and commercial land uses with similar light or contrasting colours.
- Viewpoint 12 (Burkes Lookout) provides the most prominent view of the quarry. The viewing distance allows for a detailed view of quarry features, plant buildings and related truck movements. The scenic lookout is based on a wide panoramic view that includes large scale industrial, retail and residential land uses. The diversity of land uses across the suburban area is the subject of the view and on that basis, the quarry is perceived as one component of a broader pattern of urban development, rather than as a visually discordant element. In that context, the quarry and its features and visible extent are less important in terms of view quality than its level of visibility suggest.

Two viewpoints provide slight views of the existing quarry pit.

- Viewpoint 9 provides a view of a thin layer of the quarry, but the development is seen as a small colour change within a dominant treed landscape.
- Viewpoint 13 provides a view of a thin layer of the quarry, but the development is seen as a small colour change within a dominant treed landscape. Foreground structures associated with the road system dominate the view and distract attention from the distant quarry element.

Three viewpoints provide views of the tops of existing quarry structures (concrete and asphalt plant buildings and related conveyor structure).

- Viewpoint 3 provides a clear view of the top half of the concrete and asphalt plant and conveyor structures, but these structures are seen as a part of a landscape that includes dominant views of industrial sheds and sport related structures. As a result, the visible quarry features provide visible, but not dominant elements within a visually complex landscape.
- Viewpoint 5 provides a slight view of the top of the concrete production building and adjoining conveyor structure. The most prominent view of on-site structures is from the south-western corner of Canterbury Road and Fussell Road. Planted bunds and site edge plantations screen the quarry facility from other viewpoints.
- Viewpoint 6 provides a slight view of the top of the concrete production building and adjoining conveyor structure. Although the view of the structures aligns with the edge of the road, the general road-based view is dominated by commercial structures which create a complex and visually dominant landscape.

Overall, the existing quarry is considered to have a low level of visibility within the study area. Where views of the quarry pit or building facilities exist, they are partial views only that are visually recessive as a result of the size of the view and the more dominant visual effect of other structures and land use patterns within the field of view.

The clearest view of the existing quarry operation is from Burkes Lookout, but the impact of the view is substantially lessened by the overall nature of the panoramic view which is based on a variety of land uses and development patterns. In this context, landscape patterns and variety are the basis of the view and do not in themselves, lessen scenic quality.

Landscape and Visual Impact Assessment – Key Findings

The proposed stage 2 works will result in an expansion of the extent of the current pit by approximately 25%, including 9.53 Ha of remnant vegetation and 4.5 Ha of already cleared land.

The proposed development will reduce existing landform levels along the eastern and southern edges of the quarry pit and remove vegetation in the new extraction area. Existing operational patterns and plant will remain the same.

Landscape impacts will be similar in nature to existing quarry impacts but cover a greater area. The reduction in vegetation and landform change is the major landscape impact. Landscape impacts are considered to have a relatively **Low level of significance** on the basis of the size of the change and the potential for at least partial mitigation (revegetation) over time as a result of quarry rehabilitation and likely future end use development.

Visual impact. The assessment indicates that:

- Nine viewpoints (3 – 8, 10 – 11 & 14) have no view of the existing quarry or proposed stage 2 works.
- Three sites (1, 9 & 13) have existing partial views of the quarry pit. These views will experience a change as a result of stage 2 works, but the change will be minimal and consistent with existing effects. On that basis the visual impact of stage 2 works is considered **Low significance**.
- Two sites will experience more significant levels of visual change as a result of stage 2 works.
  - Site 2 (Mt Dandenong Road) will experience clear views of the quarry pit, but the viewing distance (5km+) and the complexity of the existing visual field means that the changes are likely to be substantially visually absorbed, and on that basis, have a **low level of significance**.
  - Site 12 (Burkes Lookout) will experience clear views of the Stage 2 pit changes and operations. At a distance of 1.8km the changes will be clearly evident with only minimal screening potential. The panoramic view from this location is based on views of suburban development, including large scale industrial land uses. The visual complexity and changing nature of the view is itself the point of interest. It also acts to absorb visual changes. On that basis, the visual impact of stage 2 change is considered to be Moderate level of significance only and partly reversible with site rehabilitation over time.

Cumulative Impacts:

Assessment results indicate that across the study area, the overall nature of effects will remain consistent with existing conditions. Four sites will experience a change in the shape of the quarry extraction area, but those changes will occur within the existing seen area and on that basis, are not considered to represent a cumulative impact. The magnitude of change will be clearly evident at viewpoint 12 (Burkes Lookout), but this impact is likely to be seen as an isolated change and is not considered to trigger a cumulative change.

The urban landscape is likely to become more complex and built up over time, and as a result, more capable of absorbing visual changes. Given the existing industrial context, the isolated nature and the limited extent of visual impacts, the site specific visual impact is considered to be Moderate, but the potential for cumulative impacts is assessed to be low.

Landscape buffers and site rehabilitation

Existing on-site and offsite vegetation (street trees, shelter belt tree plantations and private gardens) function as the primary visual impact mitigation measure at this time and have the capacity to provide this function into the future.

- Retain as much of the existing EVC vegetation already existing on site, including remnant woodland vegetation and quarry buffer plantations. Ensure that all new or infill planting is based on local EVC species.
- Supplement existing vegetation with new EVC planting, remove weeds and manage vegetation to optimise growth and climate change adaptation.
- Retain and further develop the existing planting buffer along the Fussell Road western boundary and minimise the removal of vegetation during the construction of the Western Haul Road. Supplement the buffer with additional random spaced tree planting within the Fussell Road reservation where possible.
- Where possible, increase the level of street tree planting in Canterbury Road within 1km of the quarry site boundary.
- Develop tree planting where possible along the northern edge of the pit to visually isolate the processing area and concrete / asphalt plant areas and to offset effects from southern viewpoints.
- Progressively reinstate / rehabilitate quarry faces as these become available, to soften the visual contrast and improve the visual offering. The short-term rehabilitation of the upper benches on the northern and eastern faces in particular have potential to mitigate visual impacts likely to be experienced by sensitive receptors in close proximity to the site.

Evaluation

Based on the results of the landscape and visual impact assessment, the proposed Stage 2 quarry development proposal is likely to have a minimal effect on the surrounding environment and on that basis, is considered to represent an acceptable change.

With an optimal mitigation design treatment, the Stage 2 quarry proposal represents an **acceptable change to the landscape and scenic values of the Montrose study area**.

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Glossary of Terms

Amenity	A measure of scenic quality.
Analysis	Process of breaking down landscape or visual attributes into component parts to understand how it is made or valued.
Assessment	General term for description, classification and analysis of landscape or visual attributes.
Classification	A process of sorting the landscape into different types using selected criteria, but without attaching relative values to the different kinds of landscape.
Community values	Commonly held perceptions and values that the community attach to environmental attributes or qualities. These can include individual views.
Cumulative effects	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Duration of effects	Measure of both time and the reversibility of effects.
Effect	A consequence of change.
Impact	A positive or negative change to the landscape or the visual environment.
Landscape	A distinctive physical area as perceived by people, whose character is the result of the action and interaction of natural and / or human factors. Human perception of the land conditioned by knowledge and identity with a place.
Magnitude of effect	Combination of scale, extent and duration of an effect.
Mitigation	Measures to avoid, reduce or compensate for adverse landscape and visual effects.
Perception of landscape	The psychology of seeing and potentially attaching value or meaning to a landscape
Receptor	Physical landscape resource, viewer or special element that will experience an effect as a result of change.
Scenic quality	A relative judgement, based on common community perceptions, about the visual qualities associated with a landscape type or character area.
Sense of place	A relative judgement, based on common community perceptions, about the essential character and spirit of an area.
Sensitivity	The extent to which changes in landscape and visual resources can accept change without unacceptable, adverse effects on its character.
Significance	A relative measure of the importance of a landscape or visual change against a defined value system
Study area	Combination of the proposed development site and the surrounding area, typically to a radius of at least 5km.
Viewshed	A region visible to an observer, defined by reference to an actual view or area of theoretical visibility determined by a ZVI analysis.
Visual absorption capability	Index of an areas ability to accommodate changes without a significant reduction in landscape and visual quality or amenity.
Visual amenity	The value of a particular area or view in terms of what is seen.
Visual assessment	Deals with potential effects on the visual resources of the setting from changes in the composition and quality of views, people's response to likely changes and the overall effect on visual amenity.

Visual sensitivity	The extent to which a landscape can change without unacceptable adverse effects on its visual character or scenic quality.
Wireframe Visualisation	A computer simulation to illustrate the appearance of a proposed development.
Zone of Visual Influence	Commonly referred to as 'ZVI'. An area within which a proposed development may have an effect on visual amenity. This is also referred to as the 'Zone of Theoretical Visibility'.

1 Introduction

This Landscape and Visual Impact Assessment (LVIA) has been prepared by Tract Consultants Pty Ltd for Boral Resources (Vic) Pty Ltd (Boral).

Boral owns and operates a quarry and associated processing plant and equipment, along with concrete and asphalt plants at 56-72 Canterbury Road, Montrose, VIC 3765. The site currently operates under Work Authority 100 (WA 100) issued under what is now the Mineral Resources (Sustainable Development) Act 1990. The quarry was established as early as the 1950's.

Boral is now seeking to extend the existing extraction boundary to increase the life of the quarry operation. The proposal to expand the extraction boundary requires the following statutory approvals:

- An amendment to the Yarra Ranges Planning Scheme and a planning permit under the Planning and Environment Act 1987.
- A Work Authority and Work Plan Variation under the Extractive Industries Development Act 1995 for the extended quarry operations.
- A Works Approval and Licence under the Environment Protection Act 1970 for the increased water discharge volumes associated with the quarry activities.

This LVIA forms part of a Work Plan Variation (WA 100 Expansion) to be lodged by Boral in support of the proposed quarry expansion.

The assessment is based on the Boral Montrose Staging Plan and Rehabilitation Concept (GHD Pty Ltd, 2022). The proposed pit expansion has been modelled as a 3D block based on this Plan. There are no new buildings, plant or equipment proposed.

The image below shows the proposed expansion of the quarry (GHD Pty Ltd, 2022).

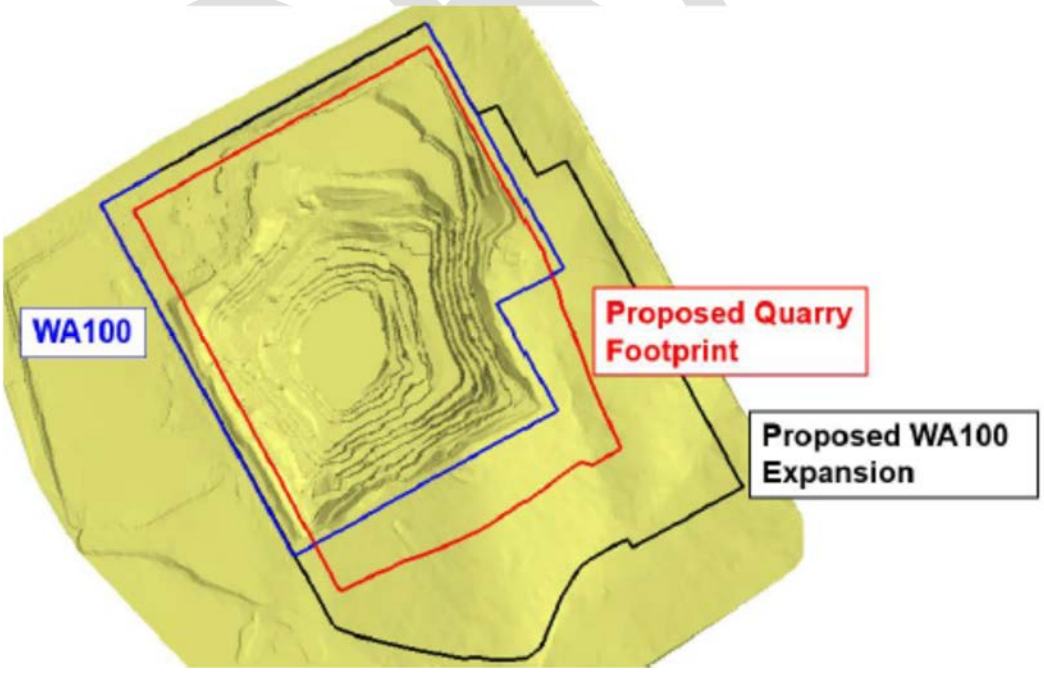


Figure 1: Proposed quarry expansion

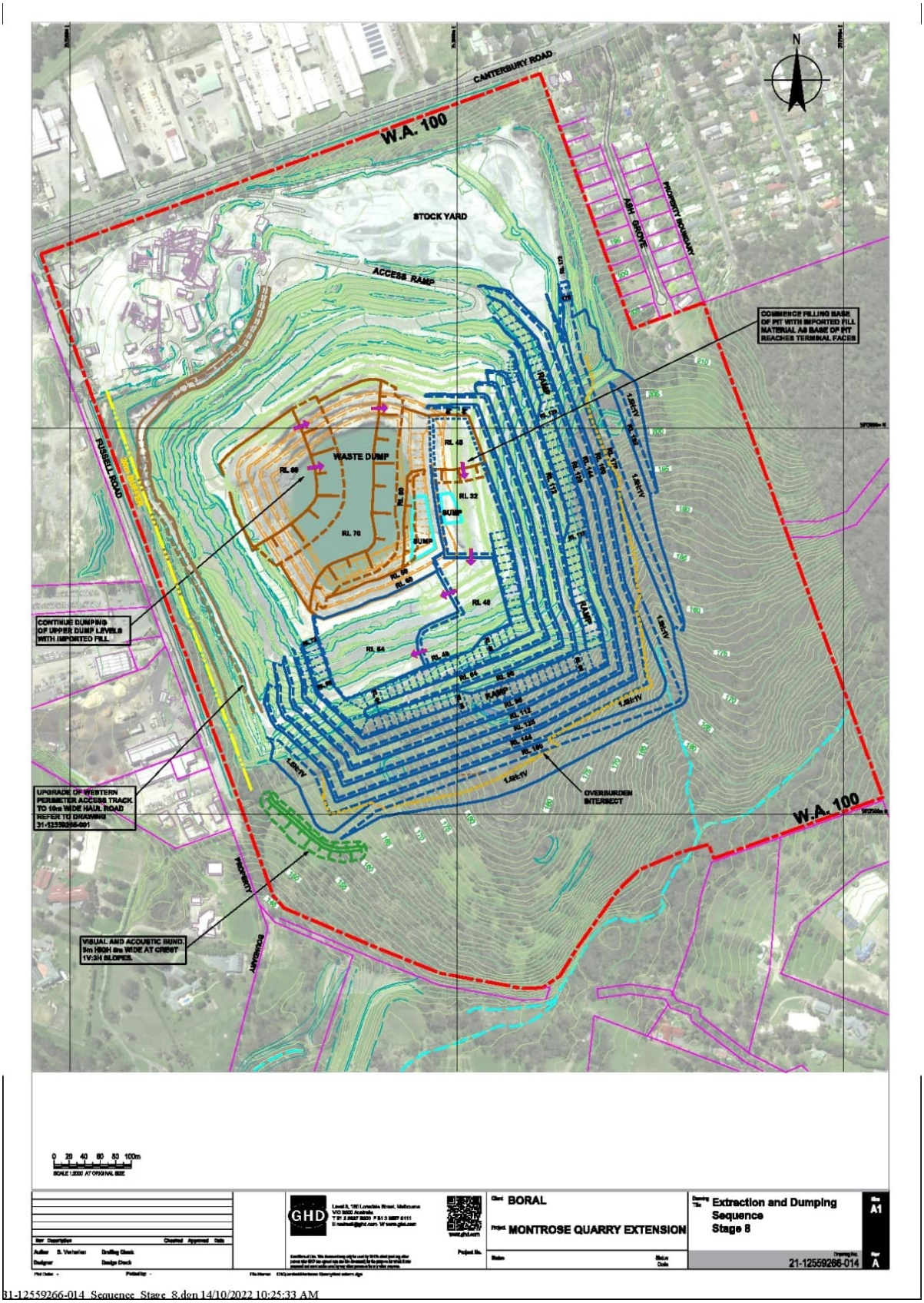


Figure 2: Stage 8 Proposed ultimate extraction area

1.1 Scope of Assessment

The purpose of this Landscape and Visual Impact Assessment is to evaluate the likely visibility of proposed new structures and key features within the site area, from surrounding viewpoints and the effect of the likely change on the landscape character and scenic quality of the landscape and surrounding areas.

The scope of this study has been informed by the information provided within the Boral Montrose Staging Plan and Rehabilitation Concept (GHD Pty Ltd, 2022) and includes the following:

- Description of the development proposal;
- Summary of the regional strategic context and landscape values;
- Baseline values of existing visual conditions and the surrounding landscape values;
- Modelling to determine the theoretical zone of visibility of existing conditions and of the new proposal;
- Key findings based on the theoretical ZVI modelling, site inspection and supporting indicative wireframe visualisations;
- Assessment of landscape and visual values related to the Proposal;
- Potential mitigation measures and recommendations;
- Evaluation of the Proposal in terms of landscape and visual effects.

This assessment focusses on the final expanded footprint as a worst-case scenario. Staging and sequencing of the works are considered in terms of the expected timeframe and duration of impacts as well as the benefits of ongoing and pre-emptive mitigation works.

1.2 Assumptions and Limitations to the Study

The assessment does not consider:

- Specific impacts from every possible viewing location. The aim of the assessment is to establish the baseline nature and magnitude of related changes and effect of those changes expected for typical, representative and worst-case scenarios.
- Targeted consultation relating to community values or visitor perceptions of landscape and visual quality. However, publicly available documents have been referenced to establish a baseline understanding in this regard.
- The potential impact on cultural heritage resulting from the Proposal.
- The effects of glint and glare on visual receptors resulting from the Proposal.
- The consideration of landscape and visual impacts resulting from lighting during night-time conditions, as no additional lighting beyond that which is already present is proposed.
- The effects of future land use changes such as new residential development, road development or tourist activities that are not defined at this time but may occur within the areas adjoining the study area.
- The consideration of rehabilitation plan and / or end of life plan options for the Montrose Quarry. This assessment deals only with the baseline final landform for closure as a worst-case scenario.

1.3 Study Area

The site is situated in Montrose, Victoria, an area located at the foothills of the Dandenong Ranges approximately 32 km east of Melbourne.

The study area of this assessment includes a study extent of approximately 6km from the edges of the existing pit on the site. This radial distance equates to 'background' views and is generally acceptable to capture the nature and magnitude of effects for this scale of development.

The study area is located within the Yarra Ranges local government area and is positioned at the interface of various land uses, including residential, rural living, agricultural, industrial and open space. The site and the proposed expansion area is bound by Canterbury Road to the north, residential housing to the northeast, Dr Ken Leversha Reserve to the east and south, and Fussell Road to the west.

The Wurundjeri Woiwurrung Cultural Heritage Aboriginal Corporation is the Registered Aboriginal Party (RAP).

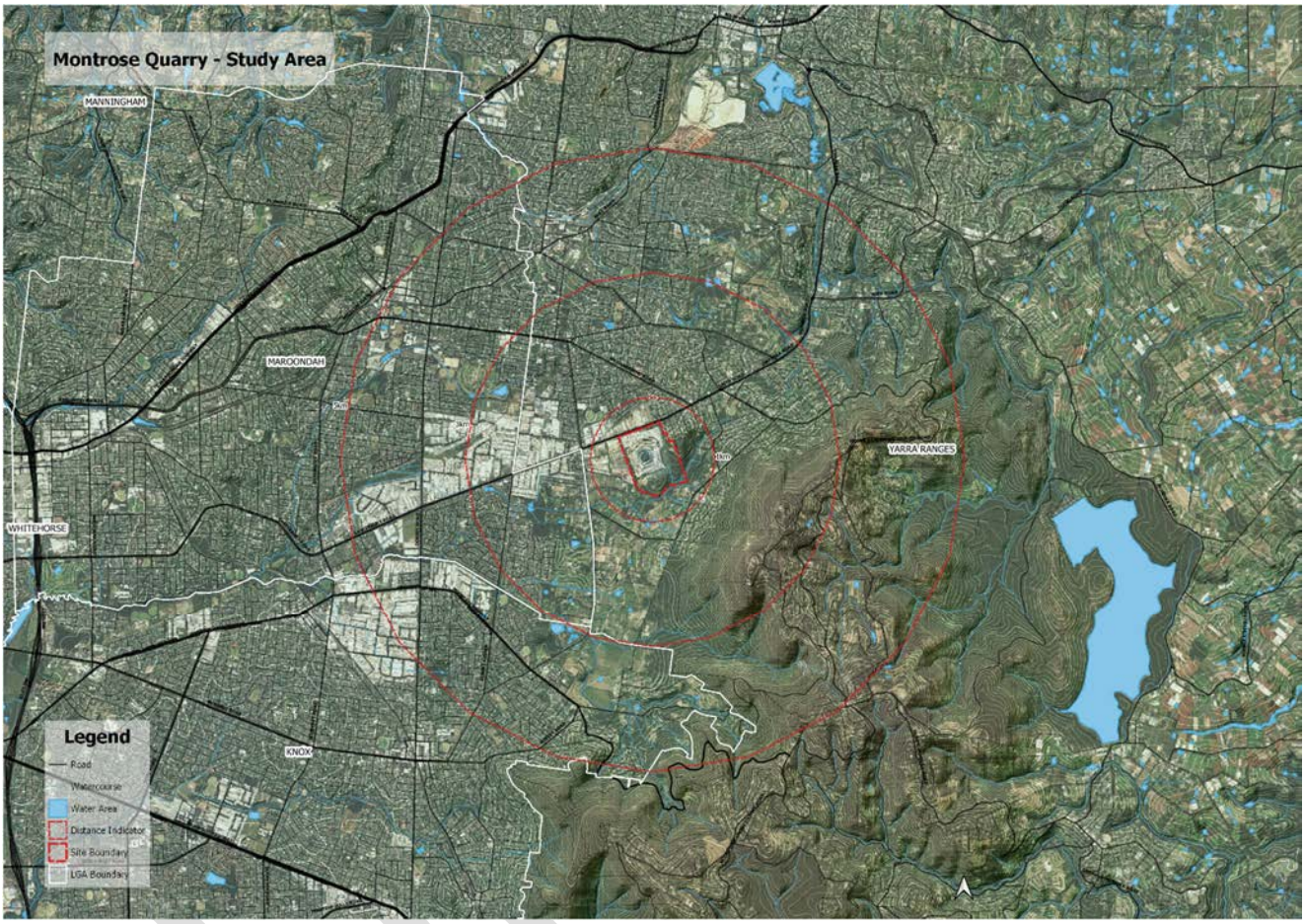


Figure 3: Study Area

Figure 4: Existing Montrose Quarry - context *Source: Google Earth September 2023*

Figure 5. :Montrose Quarry (Source: Nearmap September 2023)

2 Study Methodology

2.1 Assessment Methodology

General assessment methodology reference

The overall method applied to assess landscape and visual impacts of the existing landscape is based on principles outlined in Guidelines for Landscape and Visual Impact Assessment Third Edition (The Landscape Institute 2013), which represents a 'best practice' approach within the United Kingdom and has been extensively trialled since 1995 on an extensive range of project types including extractive industry projects, wind farms, property and road infrastructure development.

Refer to Figure 6: Landscape and Visual Impact Assessment for Tract's overall LVA methodology which informs the structure and content of this report.

Visualisation references

In terms of visual representation of effects (wireframe visualisation images), the methodology is based on the principles outlined in the following publications which are cross referenced within the Guidelines for Landscape and Visual Impact Assessment Third Edition (The Landscape Institute 2013):

- Visual Representation of Development Proposals, Advice Note 17/19 (Landscape Institute UK, 2019),
- Photography and Photomontage in Landscape and Visual Impact Assessment, Advice Note 1/11 (Landscape Institute UK, 2011) and
- Visualisation Standards for Wind Energy Developments (The Highland Council Scotland, 2013).

Professional judgement in LVIA

Structured professional judgement (qualitative assessment) is an integral part of the process and has been used in conjunction with quantitative based assessment procedures in this project. Tract has used a team-based approach to validate professional judgements.

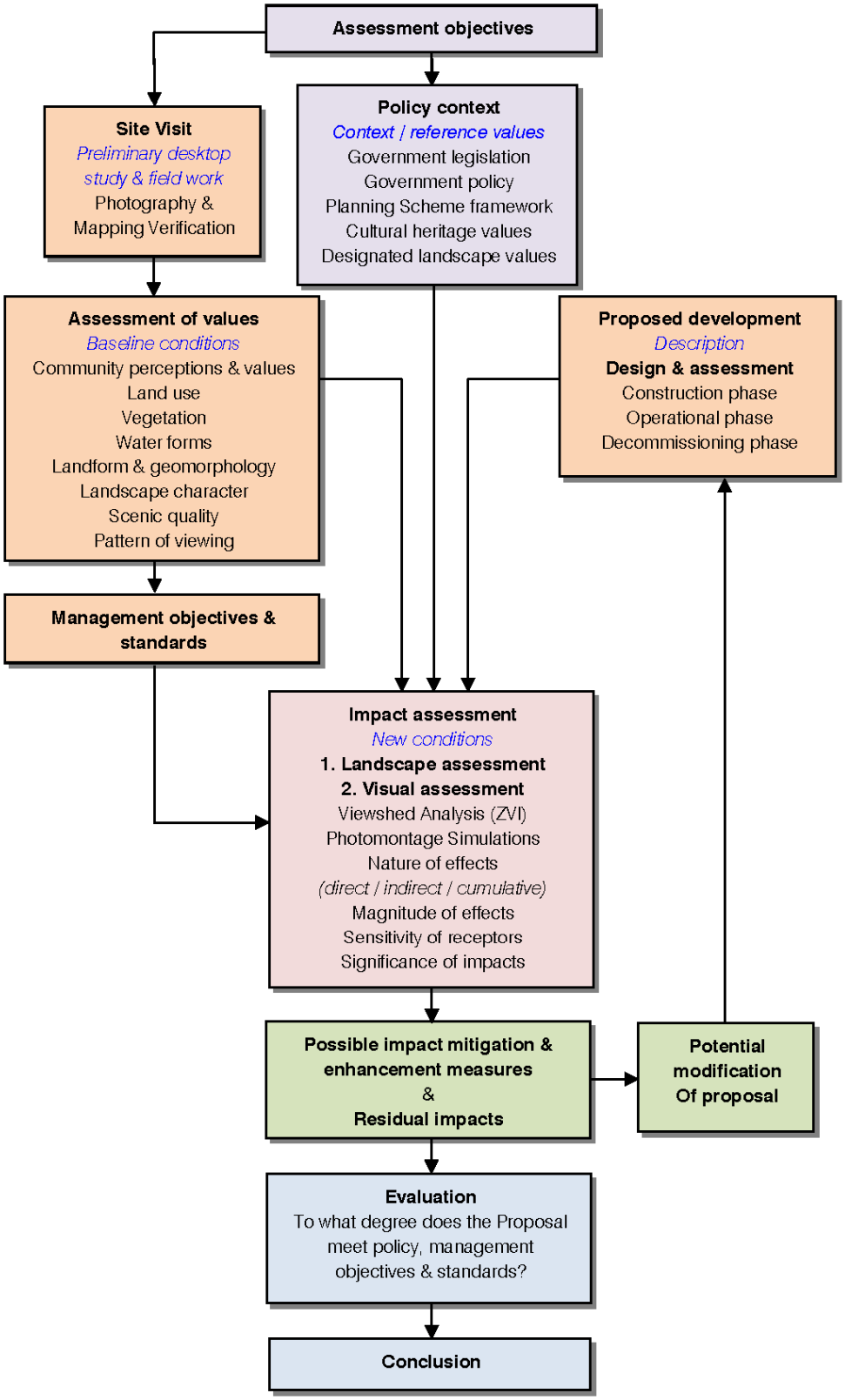


Figure 6: Landscape and Visual Impact Assessment process

2.2 Impact Assessment Definitions

Impact assessment has been based on the criteria of sensitivity of receptors including the landscape and its users (visual receptors), duration of impacts, nature and magnitude of impacts, and significance of impacts.

Nature and Magnitude of impacts

The nature and magnitude of impacts is the anticipated extent of change that will be experienced by receptors, refer to Section 2.2 for the definition of impact significance levels.

Visual Receptor

A visual receptor is a place, route, viewer or interest group. Receptor sensitivity is a measure of the direct or indirect effects that development changes may have on a receptor or their view, refer to Section 2.5 for the identified sensitivity levels within the study area.

Significance

The significance of impacts will be determined by a combination of sensitivity of the receptor (whether it is landscape or a visual receptor) and the magnitude of the predicted changes.

The ratings shown in Table 1 define the levels of significance of impacts expressed as three levels.

The impact ratings are made against the baseline values identified within Section 5.

The descriptive meanings of high, moderate and low significance impacts are explained in **Table 2.**

The significance ratings reflect an assessment of the overall importance of the predicted impact and also indicate mitigation priorities. A number of 'moderate' rating factors may collectively represent a relatively 'high' degree of change to a receptor (cumulative impact) and therefore mitigation measures may need to be considered for more than 'high significance' rated impacts.

Table 1: Impact significance matrix – the nature & magnitude of impacts

MAGNITUDE OF CHANGE	**high**	moderate	high	high
	moderate	moderate	moderate	high
	low	low	moderate	moderate
	negligible	low	low	low
		low	**moderate**	**high**
		RECEPTOR SENSITIVITY (Landscape / Viewers)		

2.3 Nature and Magnitude of Impacts

Table 2 defines the likely effects of the changes resulting from each level of predicted impact identified in Table 1 from major adverse (high) to major beneficial (negligible).

Table 2: Nature and magnitude of impacts – definition

Impact Significance Levels	Definition Visual Impacts on Landscape	Definition Visual impacts on Receptors
Major adverse **HIGH (6)**	Total or substantial alteration to key features of the baseline conditions. Effects are at considerable variance with the landform, scale and pattern of the landscape and cannot be substantially mitigated. Would cause a high quality or designated landscape to be substantially changed and its quality and values diminished.	Total or substantial alteration to key features of the baseline conditions. The Proposal forms a significant and dominant part of a view of high scenic quality. Other scenic elements become subordinate and diminished in value. The valued scenic character of the site is markedly changed. Sensitive visual receptors are adversely affected by the change.
Moderate adverse **MODERATE (5)**	Would be noticeably out of scale with the landscape and clearly at variance with key landscape attributes identified within the baseline conditions. Will leave an adverse impact on a landscape of recognised quality.	The Proposal forms a clearly visible and recognisable new element within the overall scene that is readily noticed by the receptor. The scenic character and quality of the site is diminished.
Minor adverse **LOW (4)**	Will have an apparent but not obvious or dominant effect on an area of recognised landscape character or its key attributes.	The Proposal constitutes a discernible but minor component of the wider view. Awareness of the element will have a negative but not a marked effect on overall scenic quality.
Neutral **NEGLIGIBLE (3)**	Only a very slight change to baseline conditions and maintains existing landscape character and quality. New features complement the scale, landform and pattern of the site landscape and its broader setting.	The Proposal or associated activity is hardly visually discernible. The activity or feature is visible but has an insignificant effect on the perceived values or scenic quality of the setting.
Minor beneficial **NEGLIGIBLE (2)**	Likely to enable the restoration of valued landscape characteristics or features lost or diminished through existing land use activities. Potential to contribute to the development of a new and higher quality landscape character.	The Proposal fits comfortably within the existing visual landscape. The Proposal helps to articulate existing visual character and amenity values. Potential for the Proposal to contribute to the development of a new and higher value visual character.
Moderate / Major beneficial **NEGLIGIBLE (1)**	Fits comfortably within the existing landscape character and clearly contributes to the development of higher landscape values. Results in a significant improvement to the quality of the landscape through the rehabilitation of damaged areas or the removal of features or activities that have a negative impact on landscape values. Results in a distinctive landscape feature that has the potential to add new values to the landscape without diminishing existing valued landscape characteristics.	Fits comfortably within the existing landscape character and clearly contributes to the development of higher landscape values. Results in a significant improvement to the visual quality of the landscape through the rehabilitation of damaged areas or the removal of features or activities that have a negative impact on scenic values. Results in a distinctive landscape feature that has the potential to add new visual or tourism values to the landscape without diminishing existing valued visual characteristics.

Table 3: Impact duration

Impact duration

The ***duration*** of impacts is defined as:

Short term	Project construction and establishment phase (<2 years)
Medium term	Early project operational phase (2 – 10 years)
Long term	Within projected operational phase (10 – 40 years)
Permanent	Beyond projected operational phase (40 years +)
Reversible	Physical potential for full rehabilitation to original baseline condition within feasible cost parameters and land use objectives
Irreversible	Permanent physical change to the baseline condition Beyond feasible cost parameters and land use objectives

Distance factors:

Table 4: Distance factors – dependant on the nature of the change

Distance	Definition of typical effects
Foreground (<1 km)	· Obvious or dominant visual change to the landscape and landform characteristics including Colour contrast and textural details are clearly perceived. · On-site movement is potentially evident · Landform characteristics and the relationship between landscape features are clearly discernible.
Middle ground (1 – 3 km)	· Potentially obvious visual change to the landscape and landform characteristics. · Colour contrast is evident but potentially not dominant · Views are more likely to be broken by foreground features. · Landform characteristics and the relationship between landscape features may be clearly discernible.
Background (3 – 5 km)	· Likely minimal visual recognition of strong colour and light contrasts and large -scale vegetation clearance only. · Minimal recognition of form and detail and no appreciation of vehicle movement. · Distance zone where different landscape elements or types are visually apparent.
Distant views (5 km +)	· Only landform features such as valleys, skyline and ridgelines are visible. · Depending on the scale of change, likely minimal visual recognition of strong colour and light contrasts and large-scale vegetation clearance only. · Minimal recognition of form and detail and no appreciation of vehicle movement. · Depending on the scale of the development, the visual scale of the change may be barely discernible and appear as a relatively minor visual element within a larger landscape complex.

2.4 Community Perceptions and Values

This LVIA process considers existing information sources, including Yarra Ranges Council's published strategies and guidelines, which make reference to landscape character values and visual quality of the surrounding area. In this context, these information sources are considered to generally represent the broader community values relating to the landscape and visual resources of the setting.

Many levels of perception will also be based on generic physiological factors that are broadly consistent for people across all communities. The common perceptions, listed below in Table below, create a basis for subsequent value judgements.

Common perceptions and values

Existing empirical research suggests that there are common physiological, visual and aesthetic factors affecting visual perception and that these factors are likely to be relatively consistent across communities.

These findings, in isolation are indicative only factors to be considered as a part of the assessment. The factors do not provide a quantitative measure or definitive analysis of likely perceptions of visual effects / impacts or the values that may be attached to those changes in the viewed landscape, as they do not consider elements such as context, cultural meaning and the manner in which the receptor views the landscape.

Table 5: Common perceptions & values

Visibility	The magnitude of visual impact is at least partly determined by the nature of that view and whether it is moving or static.
Field of view	Horizontal line of sight: The normal binocular field of vision (horizontal line of sight / width of view) is considered to be between 100° and 124°. Within the binocular field of vision, the viewer has depth perception. Either side of the binocular field is a monocular field of 42° for each eye (peripheral vision) which provides the viewer with awareness of movement speed and locational cues. Within the binocular field is a central field of view of around 10° which allows symbol recognition. Within the central field of view is a fovial field (zone of visual acuity) of 2.5° where viewed objects are sharply fixed and in detailed focus. Vertical line of sight: The normal vertical field of view is considered to be 120 degrees (50° above horizontal and 70° below horizontal) with the limit of colour discrimination at 55 degrees (25° and 30° below horizontal).
Method of Perception:	These fields of vision indicate a field of view and visual 'recognition' but in isolation, are not meaningful measures of scenic perception. The process of recognising and observing an object or scene (Dynamic Visual Acuity) is complex and involves constant scanning of the seen area, recognition and refocussing within the field of view; a process that is modified (narrowed and simplified) by viewer movement, the speed of movement of the viewer and secondary activities such as driving, but enhanced by colour contrasts, illumination, proximity, size, shape, symbol recognition based on expectation and other factors.
Occupied view area:	The nature and magnitude of the visual impact is likely to have a proportional relationship to the percentage of the available view taken up by development infrastructure, new activities or landscape interventions. Objects may be visible, but not dominant, particularly when they occur within landscapes that have been modified by human activity and where the context and complexity of the natural landscape has been significantly altered. A spread of built elements or landscape changes across a wide view or several viewable areas is likely to result in a perception of greater overall visual impact than a similar number of built elements within a more confined viewable area.
Horizontal field of view	As a general guide only, a visual element of less than 5° of a field of view may be considered insignificant, depending on the nature of background visual contrasts and the movement of the viewer. A field of view of between 5° and 30° may be potentially noticeable, depending on the nature of background visual contrasts and the movement of the viewer. A field of view of over 30° is likely to be highly noticeable and potentially dominant, depending on the vertical field of view.

Vertical field of view	As a general guide only, less than 0.5° of a field of view may be considered insignificant, depending on the nature of background visual contrasts and the movement of the viewer. A field of view of between 0.5° and 2.5° may be potentially noticeable, depending on the nature of background visual contrasts and the movement of the viewer. A field of view of over 2.5° is likely to be highly noticeable and potentially dominant.
Speed of movement	As the speed of movement increases, viewer concentration on a fixed area increases and peripheral vision diminishes, effectively shrinking the visual field. Foreground detail begins to fade.
Distance	The greater the viewing distance, the less detail is observable and the more difficult it is to distinguish between the site or object and its background, diminishing the impact.
Relative elevation	Objects viewed against a skyline silhouette or at the edge of a break in slope are likely to have a greater visual impact than objects or changes viewed from a location where features are viewed against a land backdrop. Colour contrasts may modify this outcome.
Size, colour & form	The greater proportion of a view occupied by new features or activities the greater the impact. Contrasting colours and forms increase the relative impact of change.
Illumination	Luminance contrast increases the visual definition of the shape, size and location of objects and potentially changes the context in which objects are re viewed. Lighting colour and movement increase the potential level of contrast.
Activity	Movement of objects, including vehicles and light reflection changing with movement will increase impact.
Complexity	Changes to a visually complex field of view with elements of varying scales and form are likely to result in lower impacts than changes to a relatively uniform field of view.
Context	The extent to which the proposed development is in character with the land use and landscape character of the site will affect the perceived level of impact.
Weather conditions	The overall clarity of the view, the angle of the sun and the degree to which skyline silhouettes are masked by clouds etc will affect visibility.
Change	The degree of change in the view and the process of change will affect the degree of impact on the viewer.
Familiarity	Changes to a familiar visual setting or where the viewer interacts with the setting is likely to have a relatively greater impact on the viewer than changes to a setting that is rarely seen or poorly understood.
Cultural context	Changes to a visual setting with significant cultural value or purpose is likely to have a relatively greater impact on the viewer than what may be considered a 'generic' landscape setting with no specific value.
Individual context	The perception of a visual impact or visual improvement within a landscape is likely to differ between communities, cultural groups and among individuals. Personal context and values strongly influence the manner in which visual effects are valued.

2.5 Visual Receptor Sensitivity

Visual receptor sensitivity is a measure of the direct or indirect effects that development changes may have on a view or scenic resource. Sensitivity factors could include physical elements, visual character and cultural values. For the purposes of the impact assessment viewer sensitivity is defined as a combination of the following factors:

- A direct relationship to or dependence on the visual environment
- Familiarity with the place and its landscape and scenic qualities
- The distance of the receptor from the potential impact and the available angle of view (field of view)
- The number of people that use that location and are likely to experience changes to scenic quality

Table 6: Visual Receptor Sensitivity includes a summary of receptor sensitivity values referenced in this study.

Table 6: Visual Receptor Sensitivity

Sensitivity	Receptors
High Sensitivity	· State level parks and scenic reserves, major recreation trails and formal scenic view locations · Parks and public spaces within towns · Rural residential properties
Moderate	· Highways and major regional roads · Secondary tourist roads and recreational driving routes · Urban residential properties · Schools, hospitals and residential care facilities
Low	· Local rural roads · Industrial land uses

2.6 Landscape Sensitivity

Landscape character and scenic quality is used as a basis to assess the landscape's sensitivity to change, which is used further to assess the visual impacts resulting from proposed development within the landscape. Landscape sensitivity refers to the extent to which a landscape can change without unacceptable adverse effects on its visual character and quality, independent of whether the proposed development is visible by receptors or not. Landscape sensitivity levels are described in **Table 7.**

Table 7: Landscape Sensitivity

Sensitivity Level	Definition
High	Key characteristics of the landscape are highly vulnerable to the type of change being assessed, with such change likely to result in a significant change in valued character.
Moderate	Some of the key characteristics of the landscape may be vulnerable to the type of change being assessed. Although the landscape may have some ability to absorb change, some alteration in character may result. Considerable care may be needed in locating and designing change within the landscape.
Low	Key characteristics of the landscape are less likely to be adversely affected by the proposed change. Change can potentially be more easily accommodated without significantly altering character and there may be opportunities to positively create new character. Sensitive design is still needed to accommodate change.

2.7 GIS and Computer-based Modelling

Visibility analysis:

Visibility analysis through Zone of Visual Influence (ZVI) modelling was used to produce a model identifying potential visual receptors and areas that may be subject to views of the Proposal. ZVI modelling produces a theoretical zone indicating all places with a line of sight to the modelled data points.

ZVI modelling was based on:

- Digital Terrain Model only and did not consider existing vegetation. This results in a 'worst case' scenario in terms of the theoretical extent of visibility.
- A modelling height of 1.6m above the predicted surface level of the future structure to simulate a typical viewer eye height.

The actual extent of visibility was verified by reference photographs and representative wireframe visualisations (photomontages), as described in Section 2.9.

Data limitations:

Modelling and assessment outcomes are limited by the following:

- LiDAR data provided by the client (2021-22 Montrose 1120 LiDAR Project MGA Zone 55, GDA2020 8pts/m2, Accuracy of 0.2m Horizontal, 0.1m Vertical), in combination with publicly available contour data of Metropolitan contour data 1 meter – Vicmap elevation data (DELWP).

- Boral Montrose Staging Plan and Rehabilitation Concept (GHD Pty Ltd, 2022).

It is considered that, given the scale of the Proposal, the size of the investigation area and the margins of accuracy applying to the modelling process, the modelling results are sufficiently accurate for the purposes of this assessment.

Best-practice modelling process:

As the first step in the process, several photo locations and GPS points were recorded during the site visit. Photos were taken with a DSLR Camera (Canon EOS R5) with a 50mm fixed lens focal length.

Conditions on the 3 days of photography were partly cloudy to cloudy with adequate long-range visibility for the purposes of the assessment.

Survey equipment (FLX100 GNSS antenna) used in conjunction with Zeno Mobile software operated from a Samsung Galaxy Tab S7 was used to establish the GPS location and elevation of viewpoints with and accuracy of less 100mm. The same survey equipment was used to position 2 reference point for each viewpoint for use in 3D software to match the virtual camera with the photos taken on site.

A 3D virtual model was developed in 3D software (3D Studio Max) including the 3D model of the existing quarry pit, and of the proposed expanded pit.

The viewpoint GPS locations were added into the 3D model to setup virtual cameras for camera matching. Once the views were matched, a wireframe render was produced to superimpose on the existing conditions photograph to create before and after conditions.

No mitigation measures were added to the views to show their potential effects, but their possible effects are generally described within the assessment.

Background

The photographic and imaging techniques adopted for this study are intended to produce visual representations that:

- Are as geometrically and aesthetically accurate as possible to permit decision makers, after suitable field inspections, to make a reasonable, balanced judgement of the effects of a proposed change;
- Are based on a transparent, structured and replicable procedure, to allow others to confirm the accuracy of the information presented;
- Are intended to present findings in a manner that is easily understood by non-technical people.

It is important to note that photographic images and simulations cannot provide the visual experience that a human observer would receive in the field. The detailed technical assessments and professional judgements presented in this study have been made on the basis of site inspections, modelling and available information.

2.8 Selection of Viewpoints

The potential viewpoints identified within this technical assessment are represented by photographed existing conditions from the site inspection (refer to Appendix 1 for selected viewpoints).

The viewpoints have been selected based on the following criteria:

- Locations have been nominated for testing based on a desktop assessment that were considered to be the most representative receptors.
- Viewpoints were identified and tested through the ZVI modelling process as being the most likely areas of potential visual impact. Within these areas, the most representative and the likely 'worst case' visual impact locations were selected to be tested during a site inspection.
- The selected viewpoints were all publicly accessible.

2.9 Photomontage (Wireframe) Simulations

The appearance of the Proposal was further assessed by means of wireframe-based simulations of selected viewpoints. These wireframe images are not photo realistic representations of new structures but do provide an accurate representation of the scale, shape and location of new structures within the site photographs. Different versions of the photographic model from each main viewpoint show:

- Existing conditions.
- Wireframe photomontage simulations of the infrastructure position, size and massing, inclusive of people making use of the infrastructure, as this would in many instances represent the most visible aspect.
- The likely extent of the infrastructure that would be seen from the viewpoint, along with those unseen parts of the structure that would be blocked by landform or other structures.

The potential mitigation measures such as vegetation are discussed within the assessment section but not modelled in the current wireframe images as they would be subject to a detailed design process.

Photo montage images have not been produced for this assessment as Zone of Visual Influence (ZVI) modelling, wire frame imagery and on-site assessment has been adequate to establish the likely nature and magnitude of impacts.

3 Project Description

3.1 Project Background

Boral is seeking to extend the existing extraction boundary of the existing quarry pit to the south and east in order to increase the life of the quarry operation by approximately 40 years. This will allow approximately 35 million tonnes of additional stone to be quarried.

The quarry is a significant strategic resource for Boral as it is located within a growth corridor with strong and steady demand forecast growth, driven by population and with potential upsides from planned infrastructure projects. In particular, the Victorian Government's pipeline of significant infrastructure projects (including the Metro Tunnel, North East Link, and West Gate Tunnel projects) are likely to increase demand for quarry materials in the future. The site also includes both concrete and asphalt batching plants which result in significant pull through.

The activities proposed are effectively a continuation of those currently undertaken in the current quarry extraction areas.

3.2 Site Development

3.2.1 Overview

The current quarry operation, located at 56 Canterbury Road, occupies 57.5 Ha out of Boral's 77.4 ha landholding at Montrose and supplies concrete aggregates for projects across the greater metropolitan Melbourne area. The proposed extension will increase the current extraction area by approximately 14Ha (consisting of 9.53 hectares of remnant vegetation and 4.5 hectares of cleared land).

The quarry's main approval is Extractive Industry Work Authority 100 (WA 100), issued under the Mineral Resources (Sustainable Development) Act 1990. This allows the operation of extractive activities at the site.

According to Boral, operations at Montrose Quarry are divided into the following categories:

- Pre-Processing (Blasting, drilling, transport and unloading), which takes place within the quarry pit:
  - Vegetation and waste rock are removed.
  - Soil and soft overburden is removed using earth-moving equipment.
  - Rock is extracted by drilling and blasting using a multi-level open pit extraction method.
  - Extracted rock is loaded onto dump trucks for transport to the Primary Crusher for processing.
- Processing (Crushing, screening and binning), which takes place within the processing area in the north-western part of the site:
  - The quarried stone is dumped by the haul trucks into a hopper at the Primary crusher.
  - The material then undergoes various stages of crushing, screening and binning into various stone size classifications.
  - Numerous conveyors are used to transfer material between the various stages of processing and finally to the finished product bins and / or to open area stockpiles and to the asphalt and concrete batching plants.
- Post-Processing (Material handling – stockpiling, transport and sales) which takes place in the north and north-eastern part of the site:

- Material handling in this category consists of the finished product that is transferred to open area stockpiles by truck operations, and the sale of material, which involves loading from the stockpiles (by sales-loader) and from overhead bins, followed by transport to the weighbridge and then off-site.

- Associated Activities (Asphalt and concrete batching plants) which takes place adjacent to the processing area in the north-western part of the site:
  - The concrete batching plant stores, measures and discharges concrete constituents into concrete mixers for transport to job sites. The raw materials are primarily delivered to the batch plant by conveyors, with sand and cement delivered by road. The concrete batch plant is enclosed, with emissions extracted to a baghouse.
  - The asphalt batching plant measures and mixes asphalt constituents for storage and transport offsite. The aggregate is delivered to the plant by conveyors, with the other constituents (e.g. sand, bitumen and fillers) delivered by road. The asphalt plant is enclosed, with emissions extracted and emitted to the atmosphere through a baghouse exhaust stack.
  - Material handling and the sale of material involves followed by transport to the weighbridge and then off-site.

Figure 7: Pit Operations

Figure 8: Processing Area 1 – Asphalt

Figure 9: Processing Area 2 – Concrete

Figure 10: Stockpile Area

Figure 11: Weighbridge

3.2.2 Quarry Pit

Existing development

GHD undertook a review of the November 2020 topography as part of the Boral Montrose Staging Plan and Rehabilitation Concept (GHD Pty Ltd, 2022). The existing pit and operations are summarised as follows:

- The current maximum depth of the quarry pit is in the order of 180 m below crest level, at approximately RL 21 m.
- Typical slope geometry consists of an overall slope angle in the order of 35° to 40°, batter heights occurring variably between 10 and 18 m and slope faces in the order of 75°.
- Bench widths along the North and South Wall were in the order of 10 to 15 m, and 5 to 10 m along the East and West walls. In some areas along the East Wall, bench widths were observed to be less than 5 m, with loss in berm width evident on some benches due to local batter scale instabilities.
- Quarrying operations are currently deepening the existing pit and where geometry allows additional trimming of the batters is conducted to maximise the extractable resource.
- Operations are conducted by pre-strip, drill & blast followed by truck & shovel. As required an excavator will follow the truck and shovel operations to scale walls and remove loose debris. All material is transported to the surface level primary crusher for processing.
- All extracted material is processed onsite with additional feed from Boral's Coldstream operations as required.

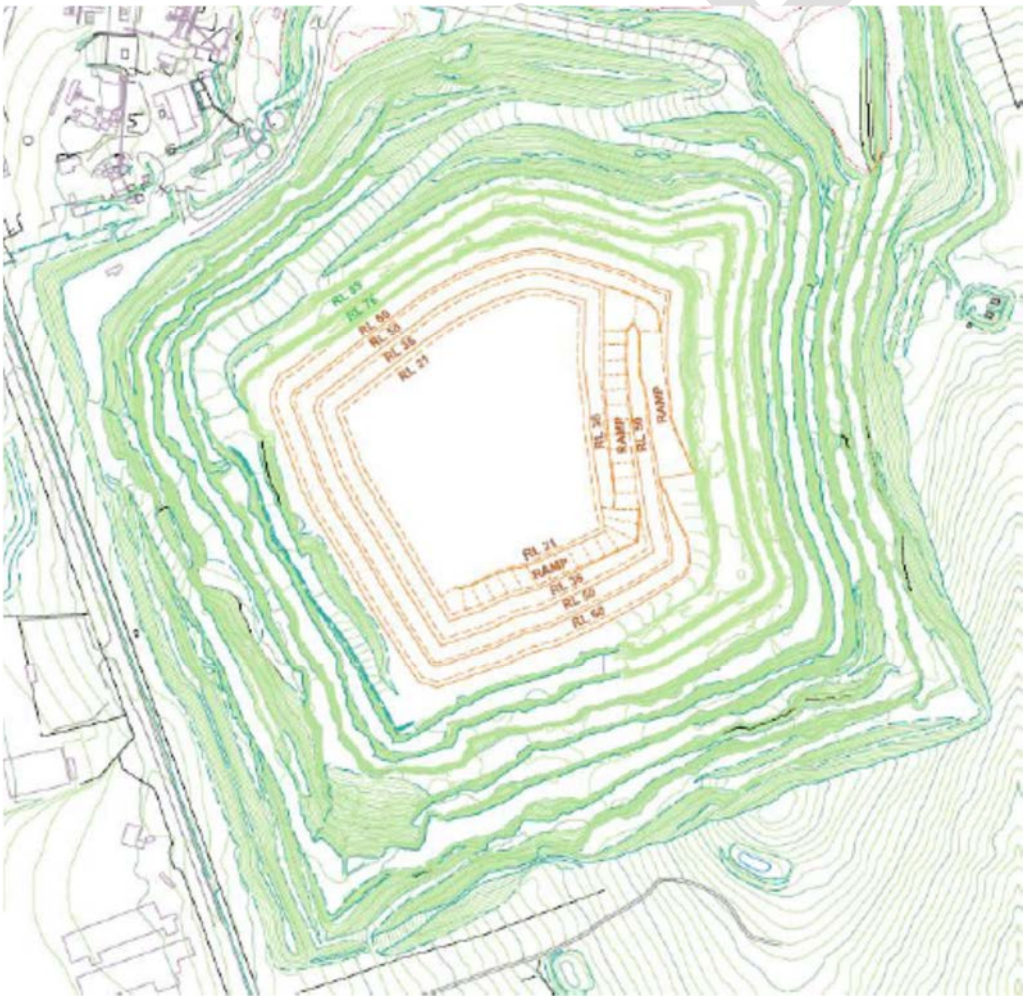


Figure 12: Current Final Pit Model (source GHD)

Proposed expansion

The proposed expansion of the pit has been detailed in the Boral Montrose Staging Plan and Rehabilitation Concept (GHD Pty Ltd, 2022). GHD has presented a 75m batter face with the following design parameters:

- Minimum pit level – RL 28m.
- Batter angle (resource) – 75 degrees
- Batter angle (rehabilitation) – 33 degrees
- Inter ramp angle (IRA) – 49-51 degrees
- Batter height – 16m
- Batter width – 12m
- Ramp width – 20m
- Ramp grade (permanent access ramp t base of pit) – 1:10

Of note is that the ridges to the east and to the south-east of the pit and including associated existing vegetation in this area will be removed as part of this operation.

The development of 8 staging plans over the proposed extended operation of the quarry was based on extraction and backfill rates supplied by Boral. These staging plans consider access and dumping options and align with Boral's site practices. GHD calculated that all overburden would be stripped within 8 years of commencing stage 1 and all available resource will be extracted within 22 years from commencement.

The following is a breakdown description of the proposed staging and sequencing:

- Stage 1 (0.5 years): Initial eastern ramp access, OB excavation at RL 192. Upgrade of western haul road. Initial southern access ramp; at RL 192 and RL 160; visual and acoustic bund.
- Stage 2 (0.5-2.3 years): Advance eastern batter face at RL 192. Advance southern OB and resource faces from RL 192 to RL 144. Complete first tier of dump at RL 36 and begin second tier at RL 50.
- Stage 3 (2.3-5.5 years): Eastern batter, complete RL 192. Advance southern OB and resource faces, introduce bench level RL 128. Complete second tier of dump at RL 50 and commence third tier at R L70.
- Stage 4 (5.5-7.3 years): Eastern batter, excavate RL 176. Southern batter, Advance benches RL 126 to RL 160 eastwards. Complete third tier of OB dump at RL 70 and begin fourth tier at RL 88
- Stage 5 (7.3-10.2 years): Eastern batter, complete RL 176 and 160, establish RL 144. Complete OB excavation to RL 128. Finish dumping to RL 88 (fourth / final tier).
- Stage 6 (10.2-14-7 years): Eastern batter, complete RL 144 and RL 128, establish RL 112. Southern batter, complete RL 128 and establish RL 112.
- Stage 7 (14.7-21.8 years): Eastern batter, continue RL 112 and establish RL 96. Southern batter, continue RL 96 and establish RL 80. No access from western haul road, access now from eastern haul road.
- Stage 8 (21.8-29.3 years): Completion of levels RL 96 & RL 80. Commencement of levels RL 64, RL 48 and RL 32 via extension of access ramp on southern and eastern sides. Potential to commence placement of imported fill material.

This LVIA is based on an assessment of the condition that will exist at the completion of all extraction stages.

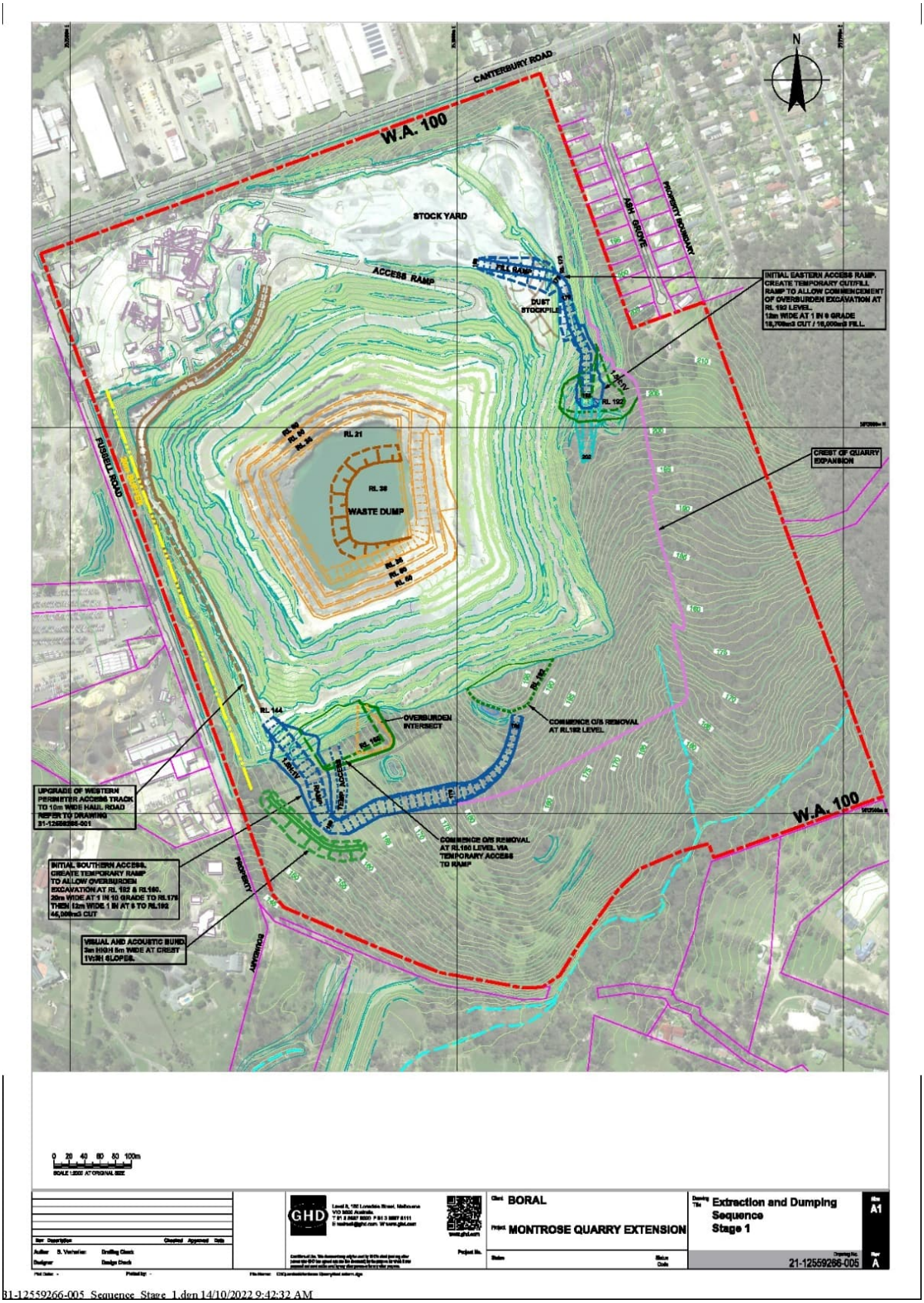


Figure 13: Proposed Expanded Pit – Stage 1 (source GHD)

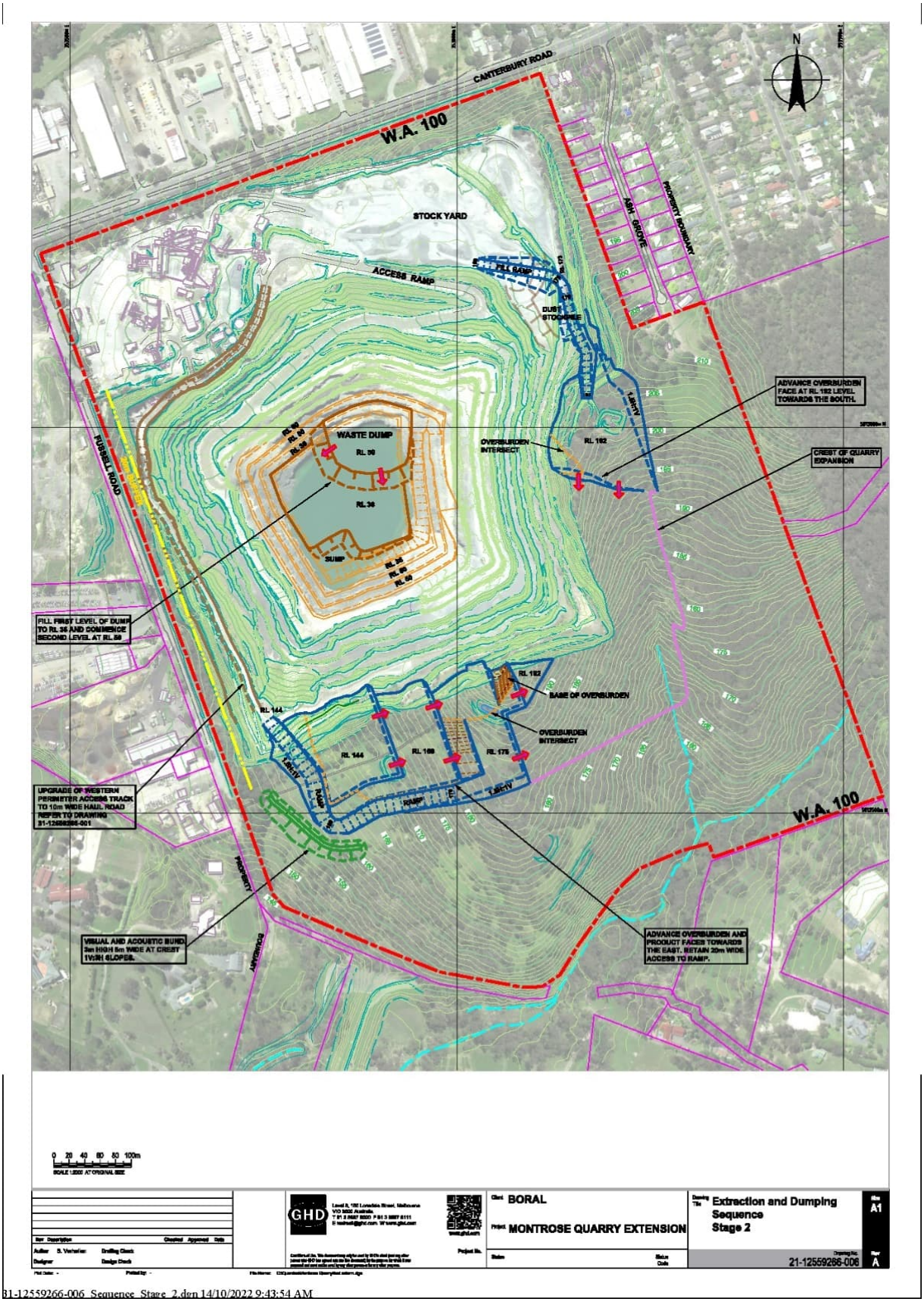


Figure 14: Proposed Expanded Pit - Stage 2 (source GHD)

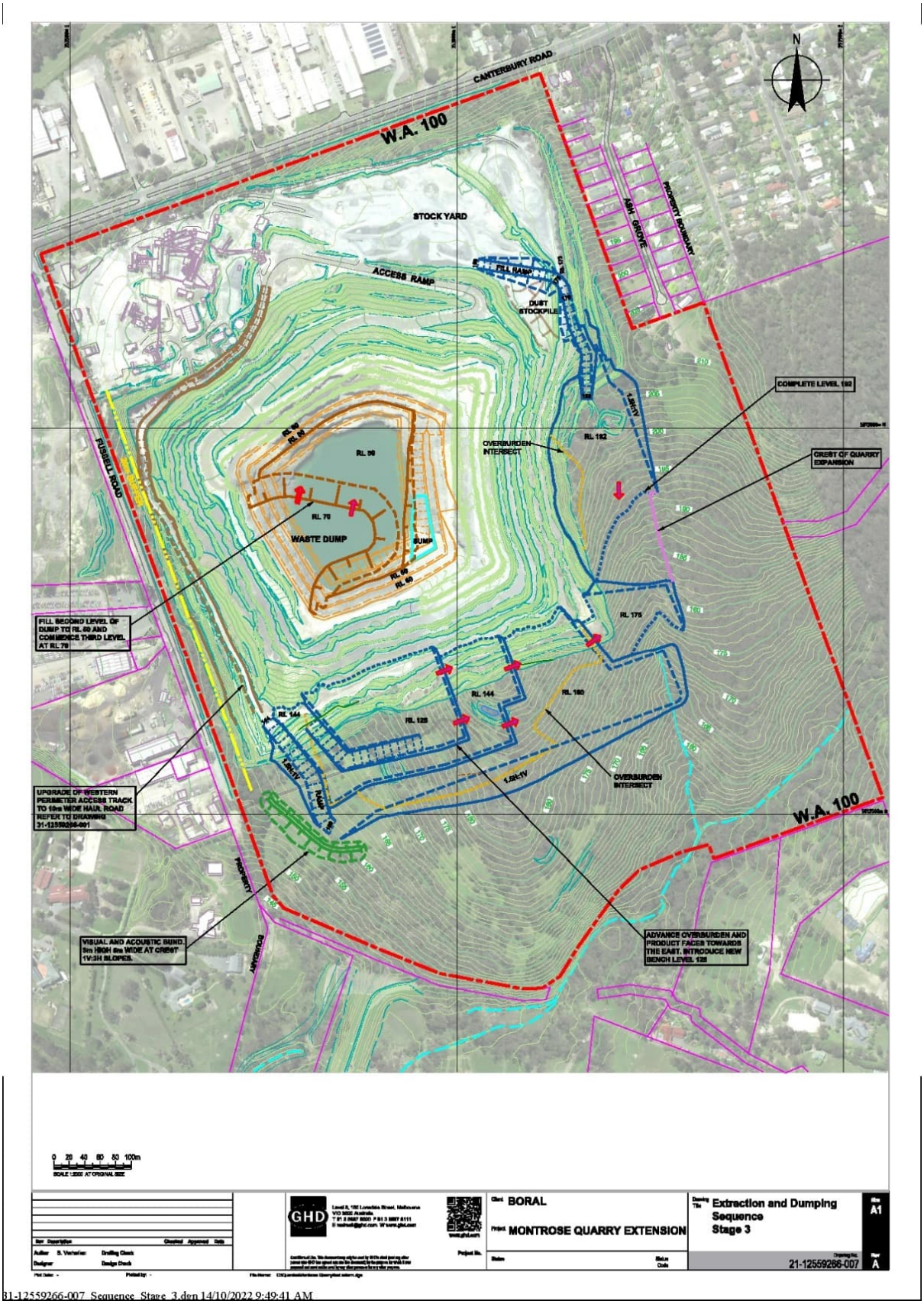


Figure 15: Proposed Expanded Pit - Stage 3 (source GHD)

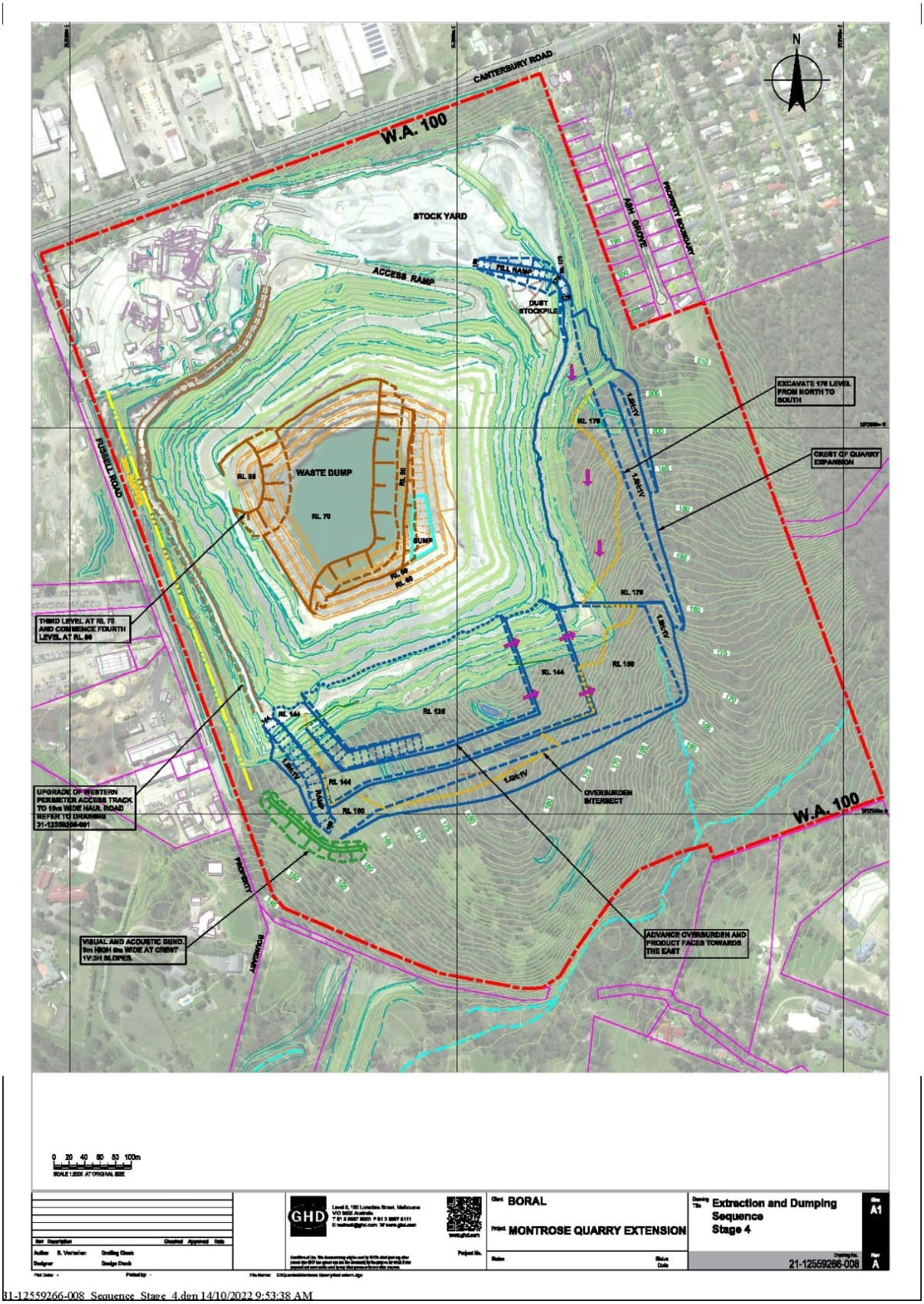


Figure 16: Proposed Expanded Pit – Stage 4 (source GHD)

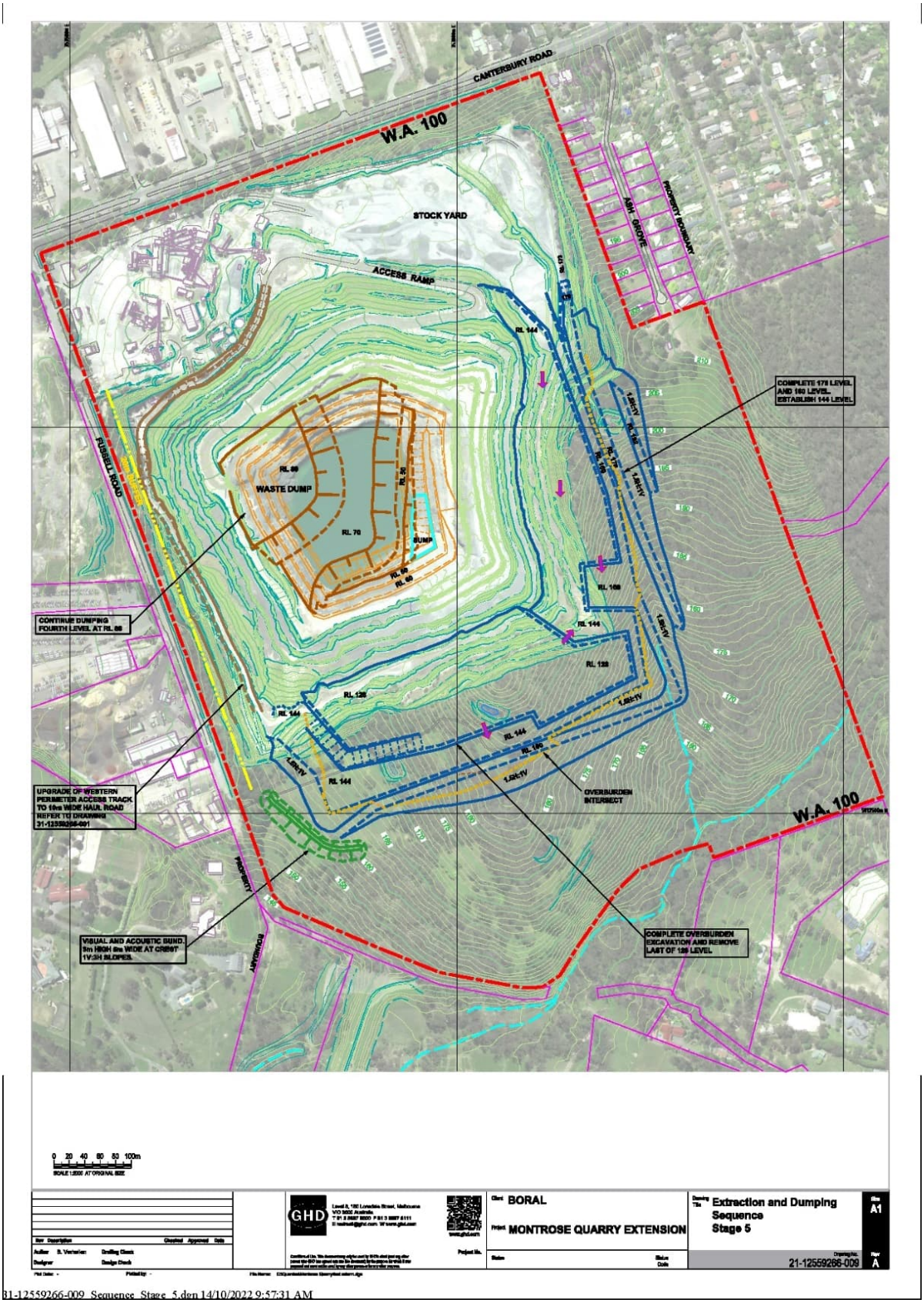


Figure 17: Proposed Expanded Pit – Stage 5 (source GHD)

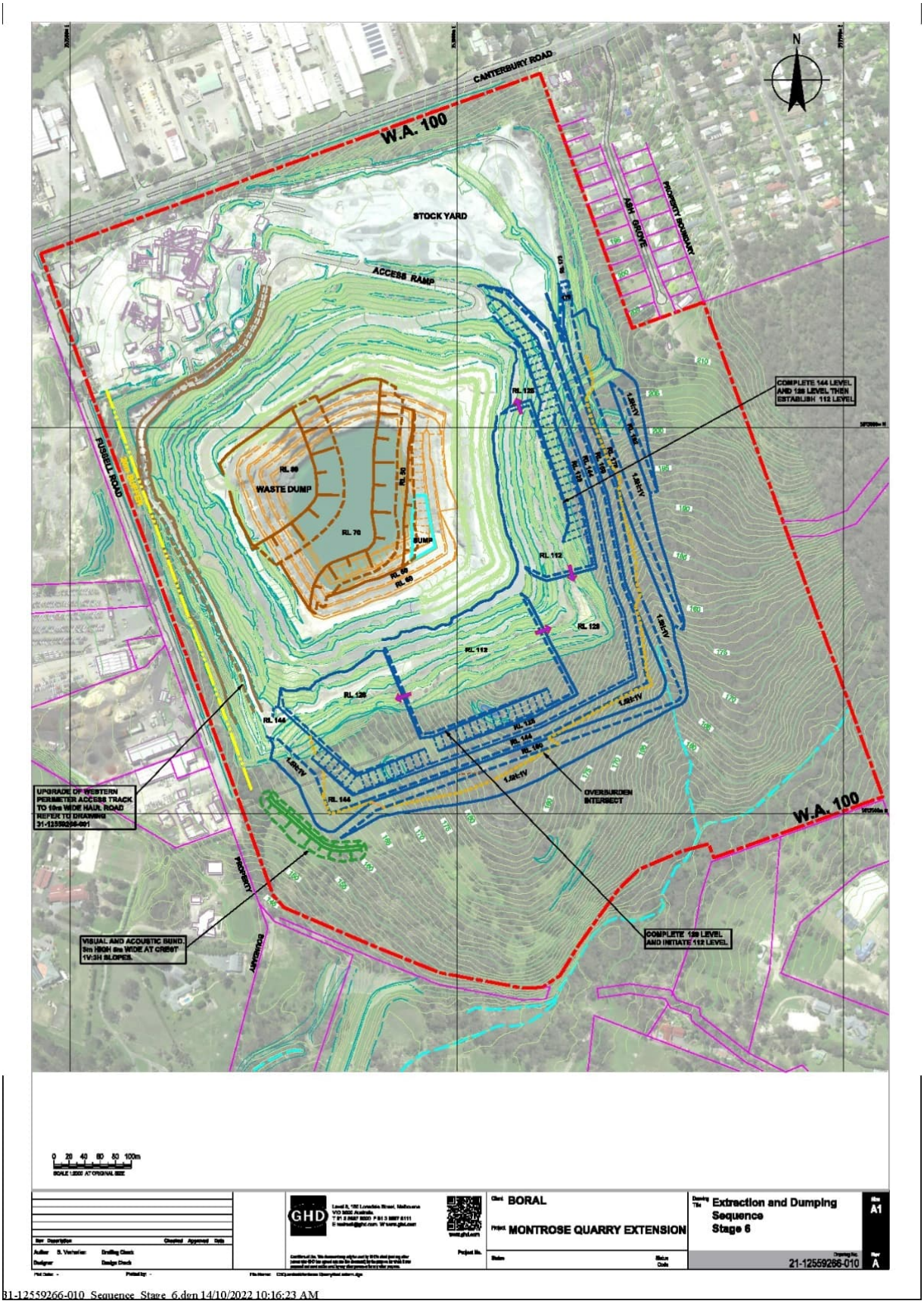


Figure 18: Proposed Expanded Pit – Stage 6 (source GHD)

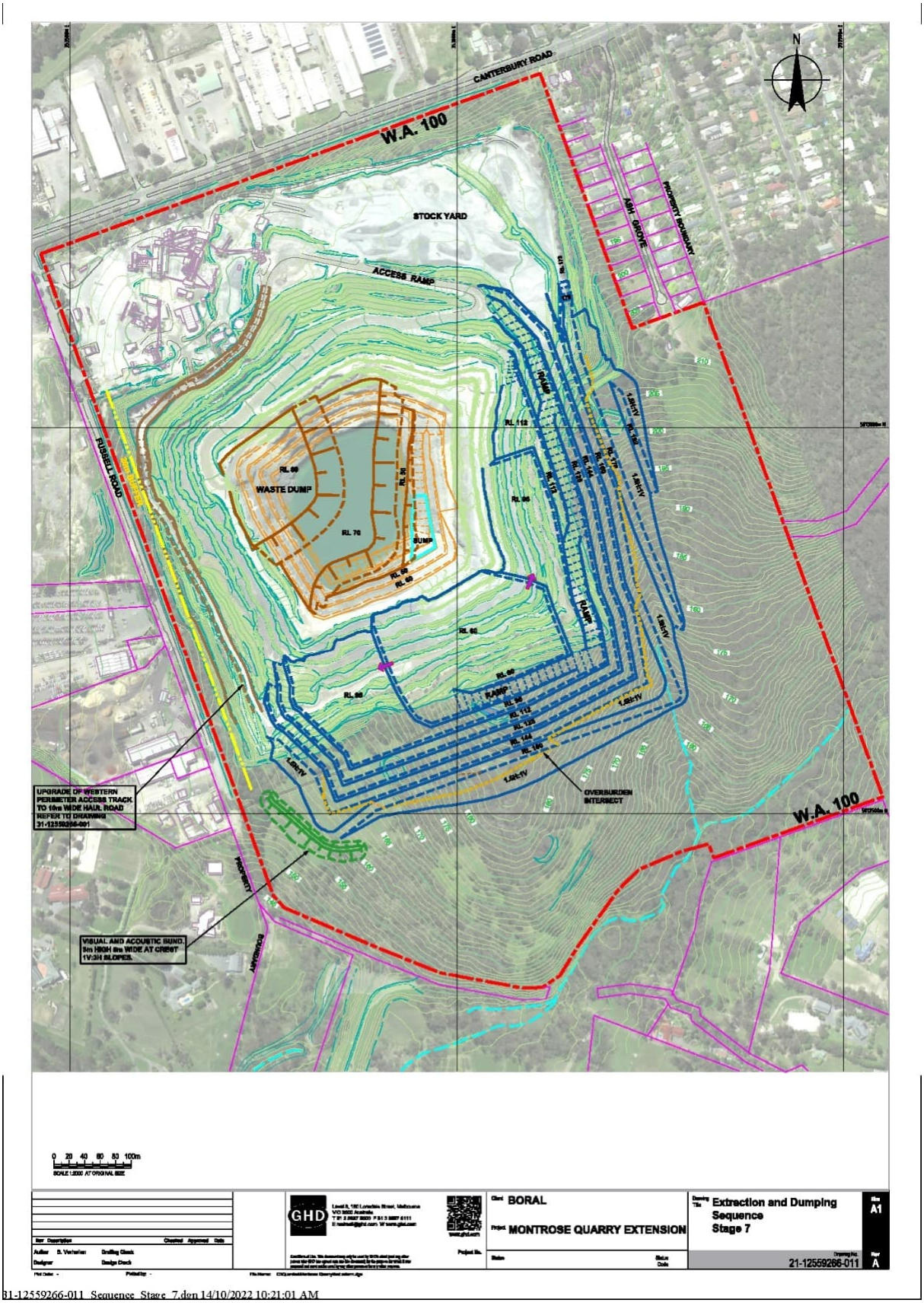


Figure 19: Proposed Expanded Pit – Stage 7 (source GHD)

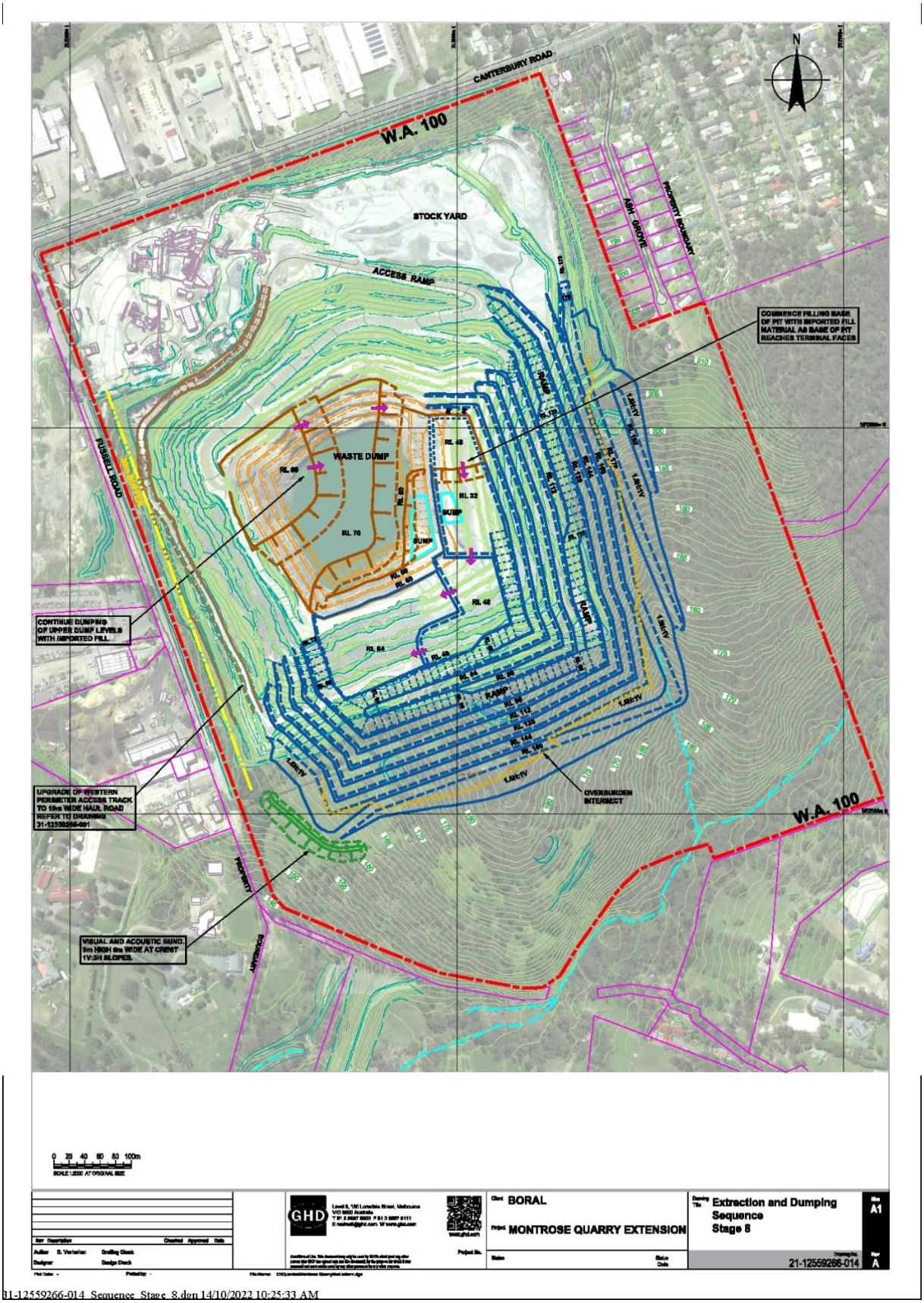


Figure 20: Proposed Expanded Pit – Stage 8 (source GHD)

3.2.3 Overburden and Stockpiles

Existing development

Most of the overburden is located under the location of the existing stockpile yard which was previously the active quarry. The images below (source: Boral, 2023) shows the locations and management of the stockpiles on the site.

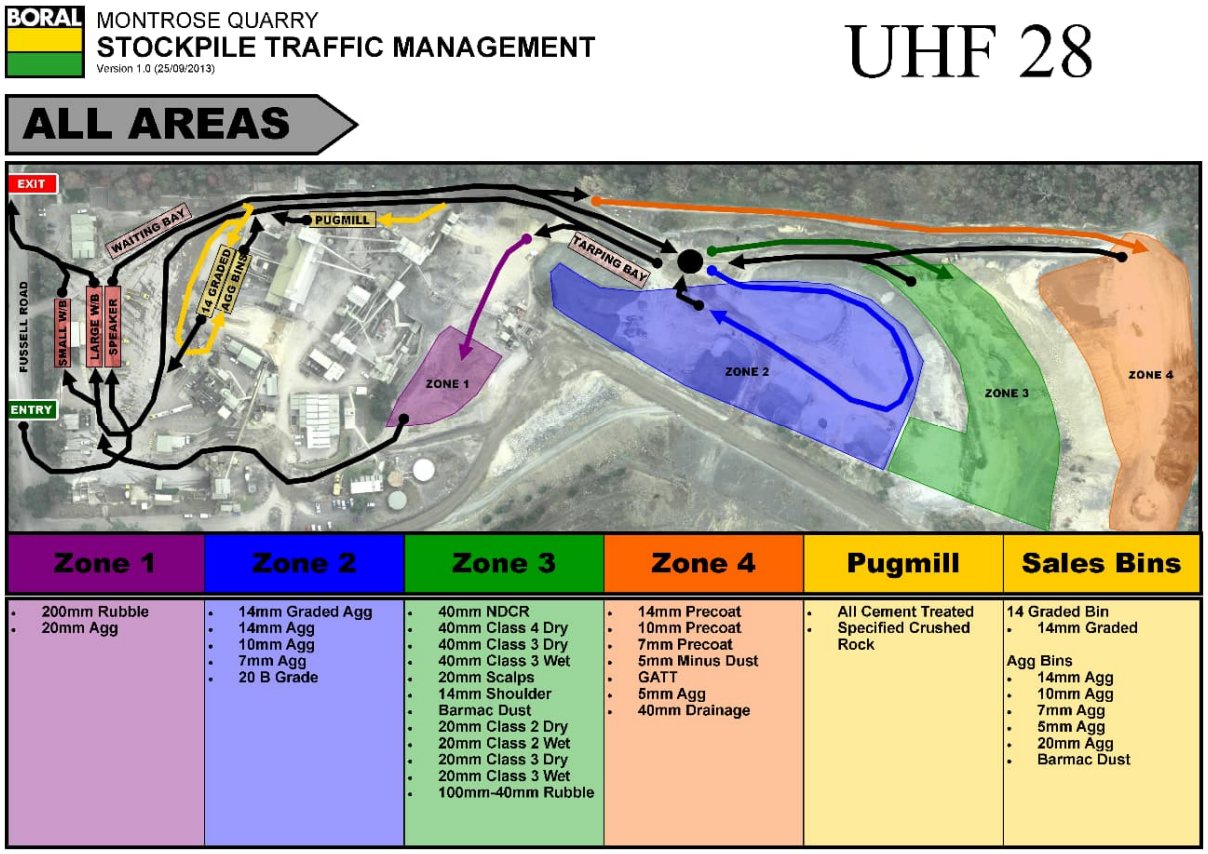


Figure 21: Stockpile Traffic Management (source: BORAL)

Proposed development

Management of material stockpiles will remain largely unchanged, with operations remaining in current locations and at current operational levels. The overburden required to be removed in the quarry expansion will be placed in an internal dump at the base of the pit and progressively filled in layers up to a final level, nominally RL 88 (GHD Pty Ltd, 2022).

3.2.4 Processing and Batching

Existing development

The processing area is located in the north-western part of the site and consists of the following:

- Quarry Plant;
- Primary Crusher;

- Asphalt Plant;
- Concrete Plant;
- Workshop;
- Office and Weighbridge;
- Roads and parking.

Off-site vehicle movement

- Off-site, trucks transport materials off Fussell Road via Canterbury Road.
  - Average of 180 to 230 (day) road truck movements both Tandem and Truck & Trailer.
  - 35 Light vehicle in courier / employees / visitor (on-site each day)

Proposed development

Extraction and processing rates will remain largely unchanged.

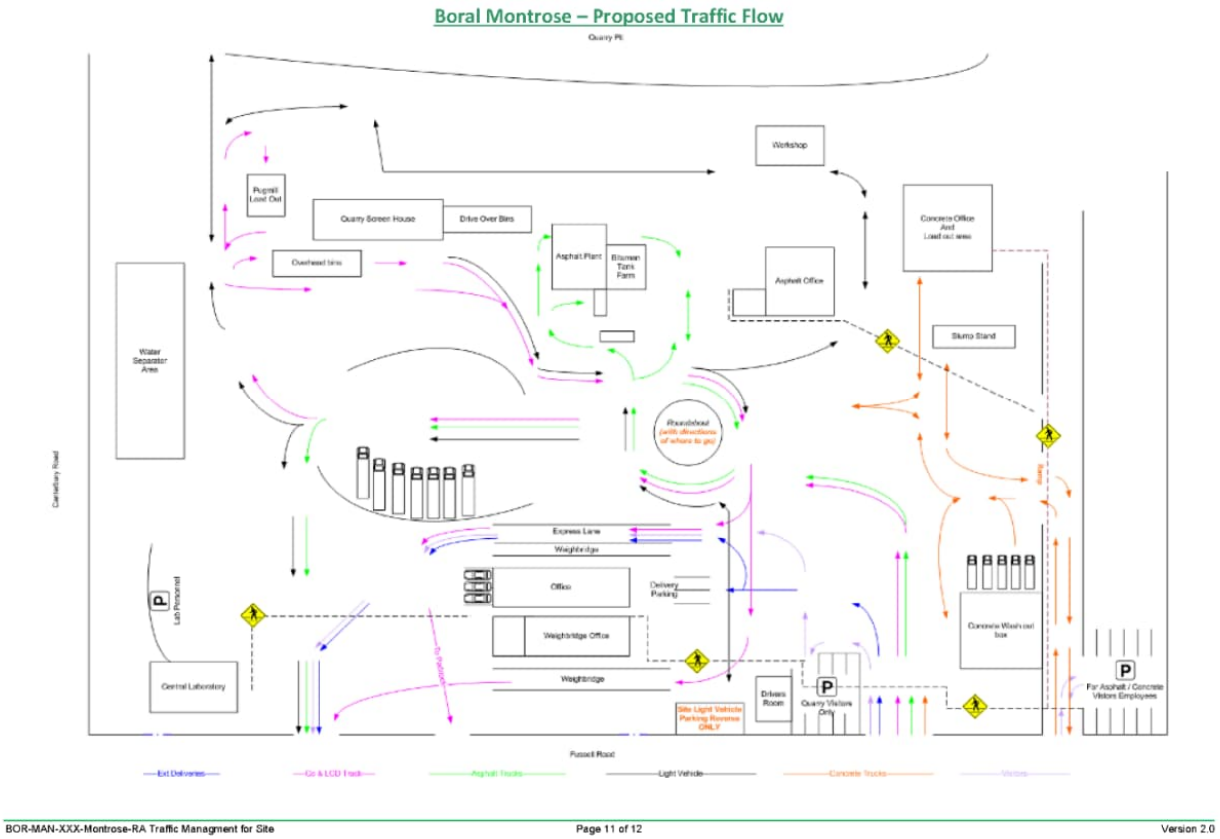


Figure 22: Proposed circulation within the Processing Area (source: BORAL)

3.2.5 Roads and Infrastructure

Existing development

Access to the Work Authority site is off Fussell Road via Canterbury Road. Proposed traffic movement circulation within the processing area is shown on the image below (source: Boral, 2023).

Proposed development

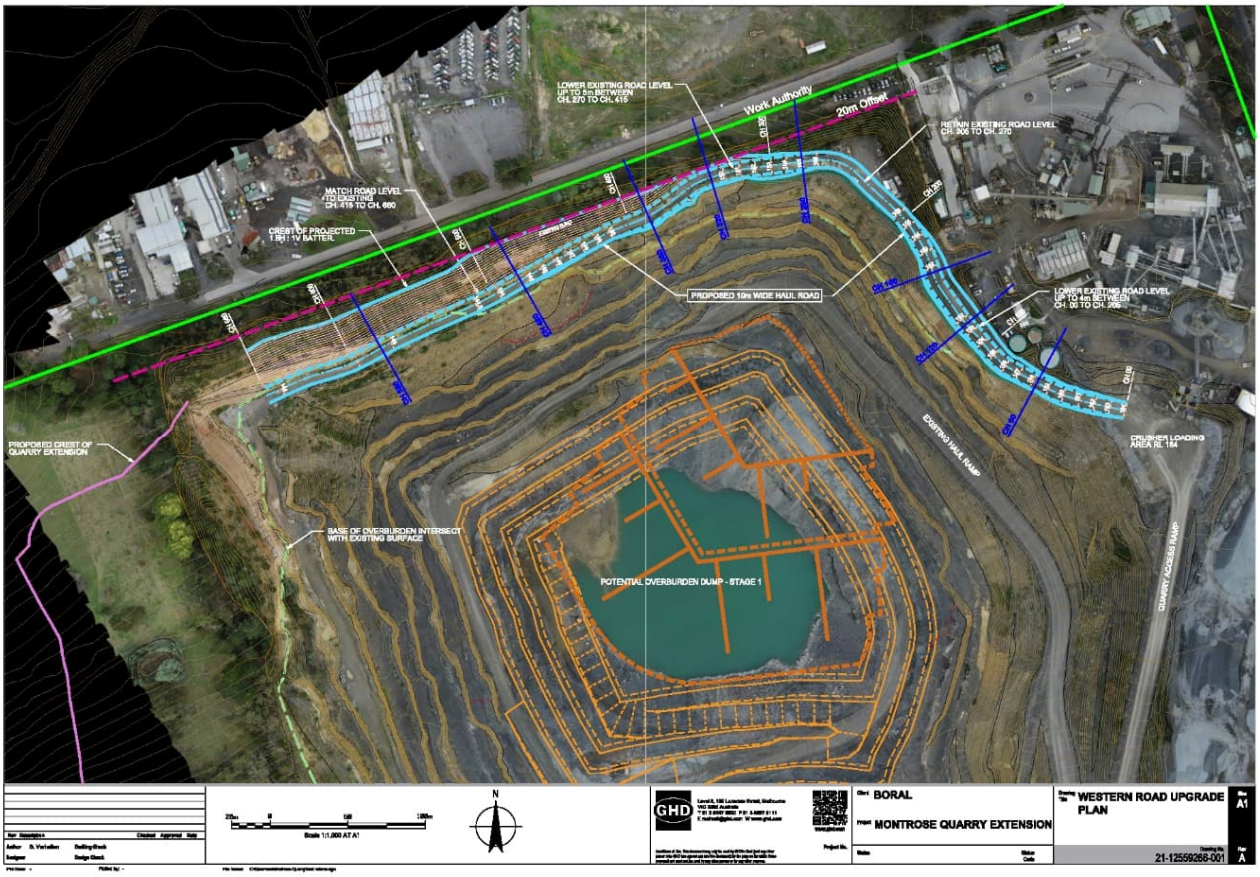
Site operations will remain largely unchanged, with vehicle movement and circulation onto, off and within the processing area remaining as is. Consideration may be given to improving access and circulation off Fussell Road in the west, but this has not yet been designed. Any changes to access is anticipated to be within the existing access area.

In terms of internal access into the pit, GHD has proposed the following:

- An eastern access ramp:
  - Designed as a 12 m wide cut / fill ramp at 1 in 8 grade, from the RL 160 stockyard area up to RL 192 to allow excavation of the uppermost overburden benches.
- The existing western perimeter track:
  - Upgraded to create a haul route that will allow access to the southern region of the expansion.

Figure shows the proposed western haul road (source GHD). Road construction would require clearing of vegetation along Fussell Road buffer but existing vegetation within the 20m road edge buffer would be retained.

Figure 23: Existing Haul Road into the Pit



31-12559266-001 Western Haul Upgrade PLAN.dgn 5/09/2022 4:34:59 PM

Figure 24: Proposed New Western Haul Road (source: GHD)

3.2.6 Screen Bunds and Planting

Existing development

Currently (10 January 2023) vegetated bunds are located mostly around the perimeter of the quarry. Existing 20m offset zone boundary vegetation provides an additional visual screen to site boundaries.

Figure 25: Existing Screening Vegetation to the West (along Fussell Road) direction of view

Figure 26: Existing Screening Vegetation to the North (along Canterbury Road) direction of view

Figure 27: Existing Screening Vegetation to the South direction of view

Figure 28: Existing Screening Vegetation to the East of the pit direction of view

Proposed expansion

The proposed quarry pit expansion will entail the enlargement of the pit to the south and east and the associated development of new temporary and permanent haul roads as well as visual and acoustic bunds along the new pit edge in the south west.

3.2.7 Buffer areas

Existing development

The work authority buffer zones include the following, as indicated in the image below (source: Boral, 2023):

- 45m along Canterbury and Fussell Roads.
- 20m along the eastern and southern boundaries.

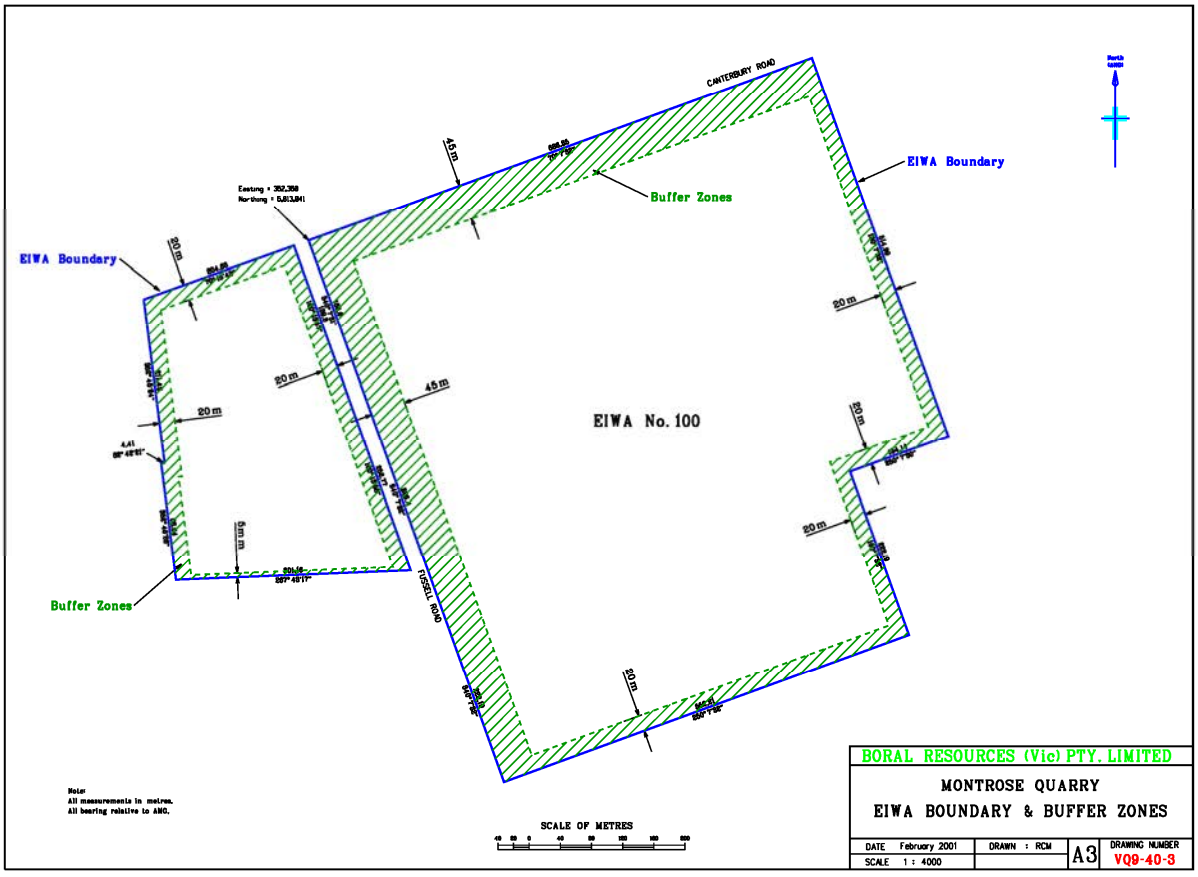


Figure 29: Current Buffer Areas (source: BORAL)

Proposed expansion

GHD has applied a minimum buffer between the crest of each pit wall and the WA 100 boundary. In addition, buffers relating to sensitive receptors, open space, roads and ecological concerns have also been applied. The resulting batter geometries negotiate both buffer zones and noise attenuation bunding as required.

Boral are seeking to reduce the buffer along Fussell Road to 20m to allow for the new haul road. All future buffers are proposed to be a minimum of 100m in relation to existing sensitive receptors (i.e. residential property boundaries).

3.2.8 Hours of Operation

Existing development

The extraction, sales, processing operations and truck movements commence from 6:00am and operate continuously through to 6:00pm from Monday to Saturday.

Blasting takes place between 8:00am and 5:00pm Monday to Friday and from 8:00am to 1:00pm on a Saturday. No site operations or truck movements occur on Sundays or Public Holidays. Works outside of these hours will only be for essential maintenance unless otherwise authorised in advance by the Responsible Authority (Yarra Ranges Council) and the Department of Primary Industries (DPI).

Proposed development

Operations will remain largely unchanged, with hours of operation remaining as is.

3.2.9 Lighting

Existing development

There is limited operational lighting within the processing area for maintenance, when required, which will usually be complete by 12am. Vehicles operating within those times will use headlights.

There is no other lighting within the site or its surroundings. Light sources are static and shielded to minimise light spill beyond the operational area.

Proposed development

Site operations will remain largely unchanged, with lighting of plant and equipment remaining as is.

3.2.10 Rehabilitation Landform

Existing development

The current approved Reclamation Plan for Montrose Quarry (January 1994) involves the placement of overburden and tree planting. This plan notes the following:

- Only those faces above RL 159 are exposed to have views outside the quarry perimeter, therefore only those faces will require tree screening.
- Intermediate benches will be created above the RL 159 bench that will halve the face heights on final faces and allow for overburden placement and tree planting. This will (reportedly) ensure that tree screens will effectively cover exposed rock faces. This will affect those faces associated with the RL 159, RL 172 and RL 190 benches, where they exist.
- Overburden placement on main bench levels is to allow for a 3.4m wide vehicular access track adjacent to the face crest. An access track of nominal 1.5m width is to be maintained for intermediate benches after placement of overburden.
- Fences are to be erected on the crest of all faces above RL 144, including intermediate benches, for safety purposes. These will be farm type fences with steel posts.
- Catch drains are to be constructed, by either trenching or mounding techniques, so that runoff is diverted from faces.

Some of the upper benches on the eastern face of the existing pit have already been rehabilitated.

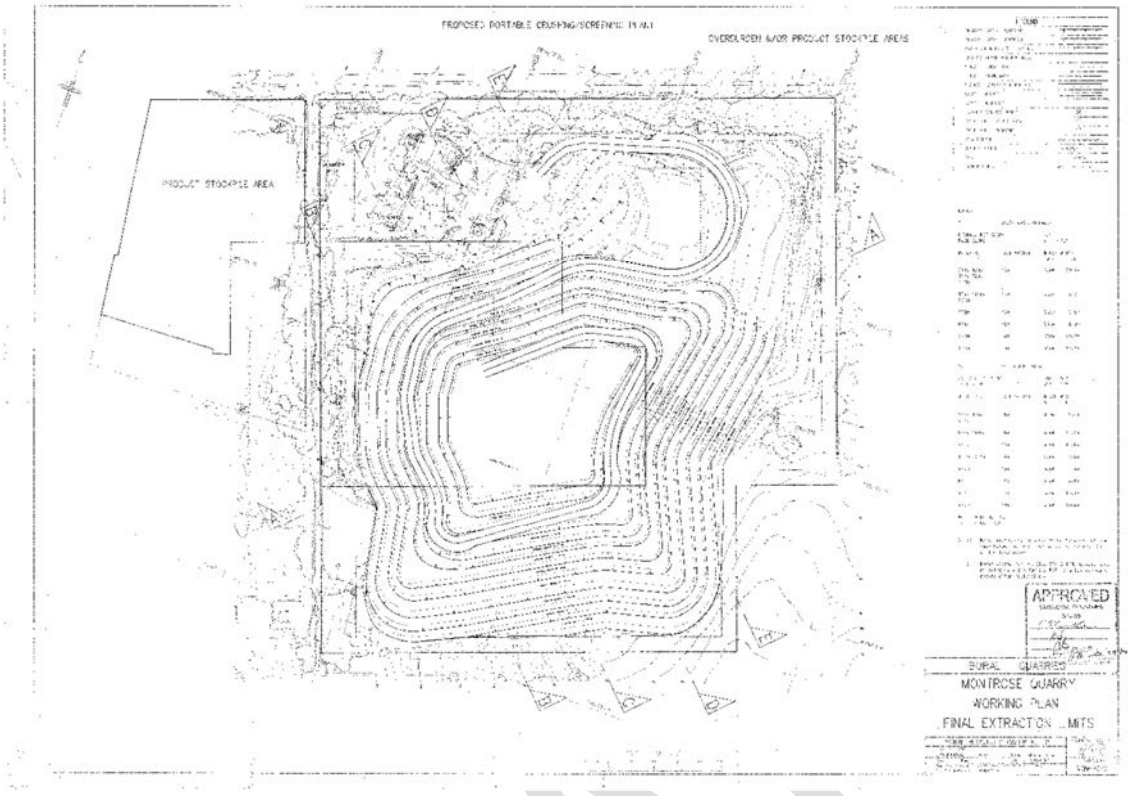


Figure 30: Current Approved Rehabilitation Landform (source: BORAL)

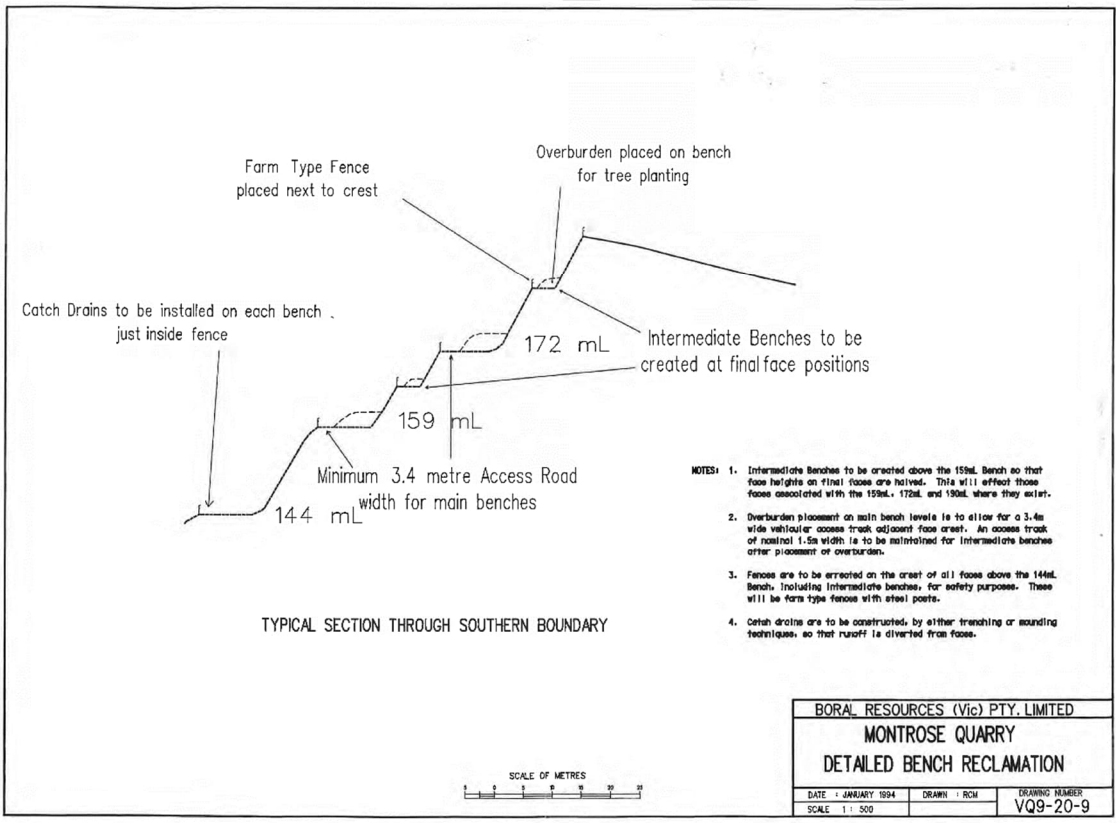


Figure 31: Current Approved Rehabilitation Landform – Typical Bench Reclamation (source: BORAL)

Proposed development

In response to the proposed expansion of the existing pit (measuring some 57.5Ha) by approximately 14Ha, and to a minimum depth of RL 28.

GHD has designed a final landform which would see the pit void filled with material from external sources in addition to the development of an internal overburden dump to manage mining waste from operations:

- This landform proposes to fill the final void to RL 98 (an additional 10 m in dump height above the nominal internal dump design as shown in staging plan 7).
- Further filling of the pit is required to take place from RL 98 to the pit crest at a slope of 3H:1V.
- Intermediate berms at nominal 30 m vertical intervals would confine the slope lengths to no more than 100 m lengths.
- A 15 m wide ramp on the eastern side (maintained from extraction operations) would provide access to the RL 98 level.
- This concept covers an area of 38 ha.

3.2.11 End Use Planning

At the time of writing, End Use planning for the quarry was underway but not complete.

End use options being considered are based on various scenarios involving filling the void. Filling of the void would commence as soon as practicable towards the completion of the extraction process. It is currently proposed that Boral will source the additional material required to complete the rehabilitation concept from external sources on the open market or from other Boral sites as required / available.

Boral currently assumes a possible quarry void backfill rate of 500,000 m3 per annum. At this rate, backfill of the remaining 15,000,000 m3 of void space would take approximately 30 years to complete.

A range of end use options, including different fill scenarios, are being considered within a separate project.

The specific effects of various end use options within the pit area have not been considered within this LVIA.

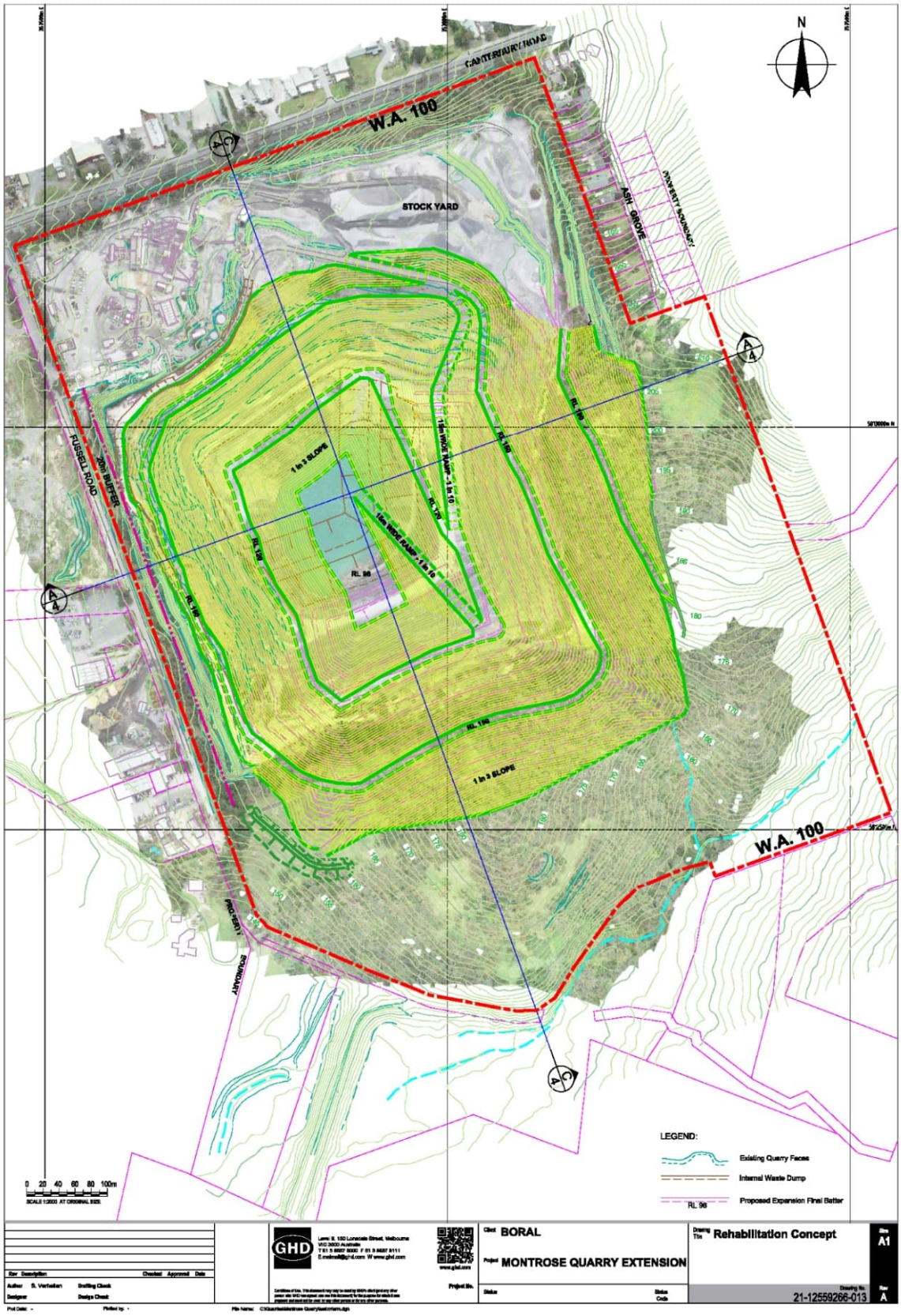


Figure 32: Proposed Rehabilitation Landform - plan (source: BORAL)

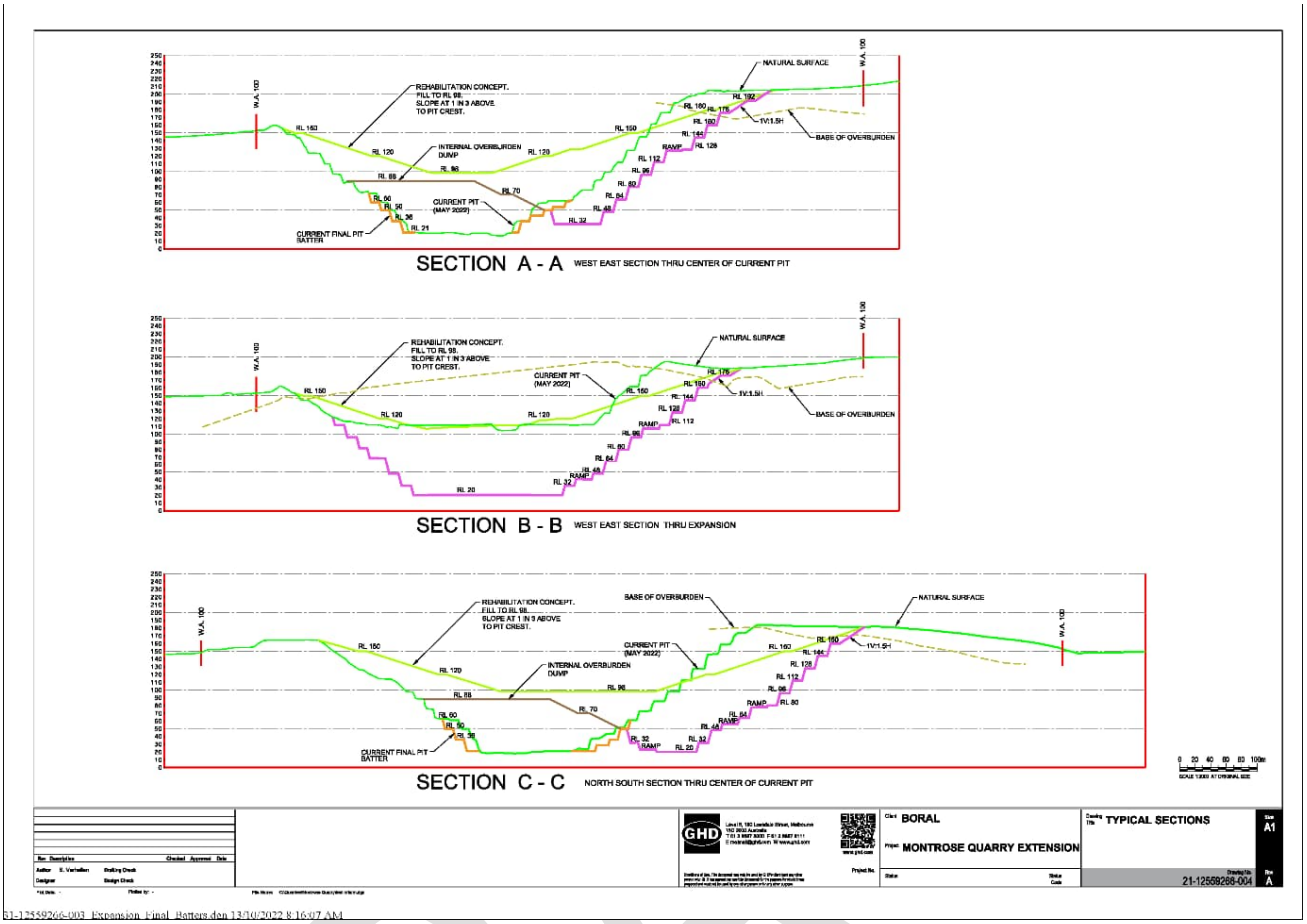


Figure 33: Proposed Rehabilitation Landform – alternative fill option sections (source: BORAL)

4 Planning Policy and Strategic Context

The purpose of this section is to provide an overview of the study area and its surroundings in terms of the planning policy and controls that most directly expresses community values that can inform the landscape and visual impact assessment process.

The site area is located within the municipal area of the Yarra Ranges Council.

4.1 Existing Planning Controls

4.1.1 Municipal Planning Strategy

The Municipal Planning Strategy (MPS) details contextual considerations and key issues for the municipality. This vision is accompanied by a strategic framework plan.

Clause 02.02 (Vision) seeks for the natural environment to remain the defining characteristic of the municipality.

Clause 02.03-2 (Environmental and Landscape Values) which states that the natural environment including hills and trees is the defining characteristic of the municipality. Yarra Ranges includes patches of remnant trees and vegetation which provides for habitat connectivity. There is also considerable bushland comprising native vegetation. The following strategies are highlighted:

- *Avoid the incremental loss and further fragmentation of large intact remnant patches of indigenous vegetation.*
- *Sustainably manage habitat areas and improve connections between them.*
- *Offset unavoidable vegetation removal by revegetation or land management measures that achieve a net increase in key biodiversity assets.*
- *Protect biodiversity assets on public land and areas that are accessible to the public.*

Clause 02.03-4 (Natural Resource Management) seeks to 'support development of existing extractive industry resources while protecting environmentally sensitive areas.'

Clause 02.03-5 (Built Environment and Heritage) describes scenic landscape as a key contributor to the identity of the municipality. Specifically, the provisions aim to 'protect and respect sensitive environments, significant landscapes and cultural and natural heritage.'

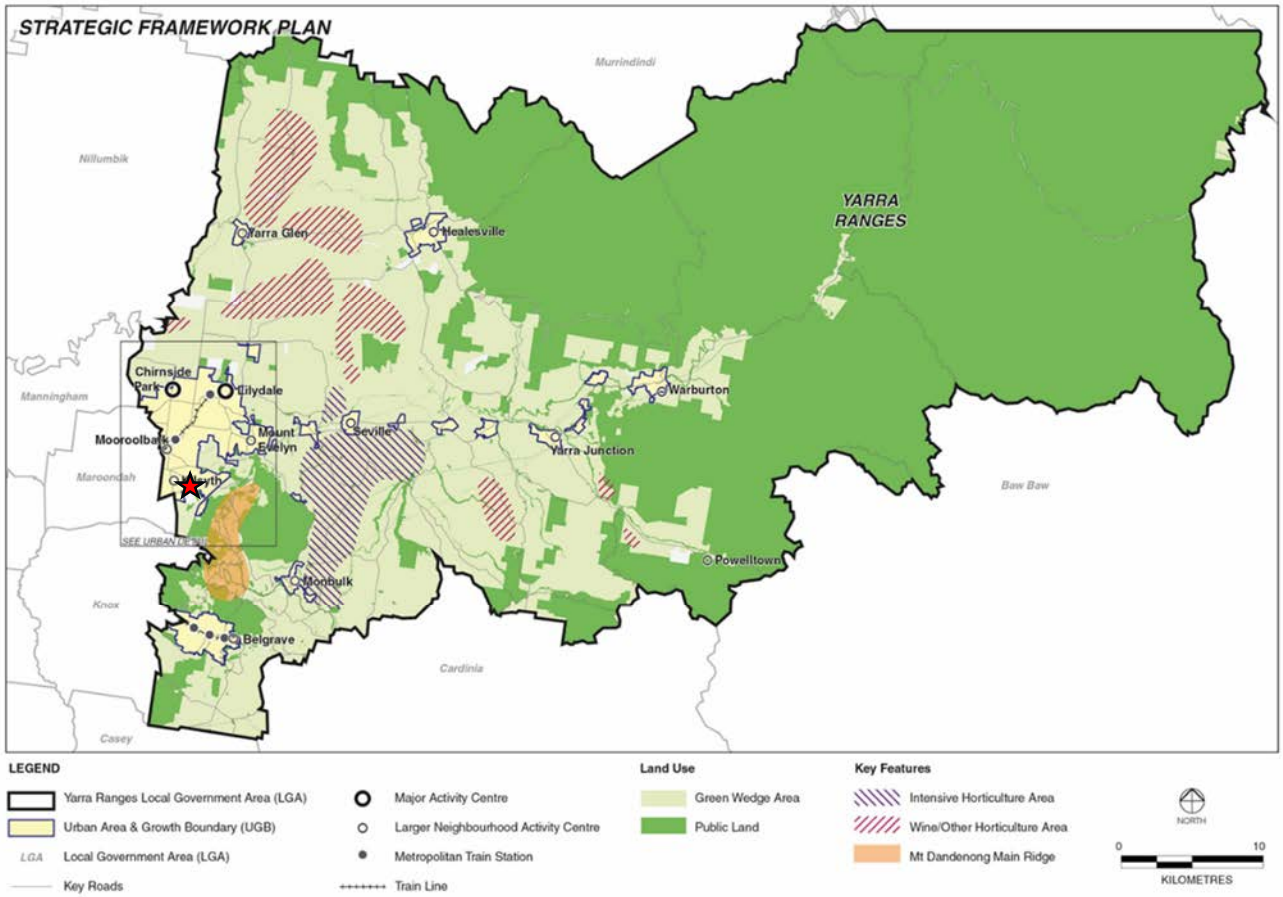


Figure 34 Yarra Ranges Strategic Framework Plan

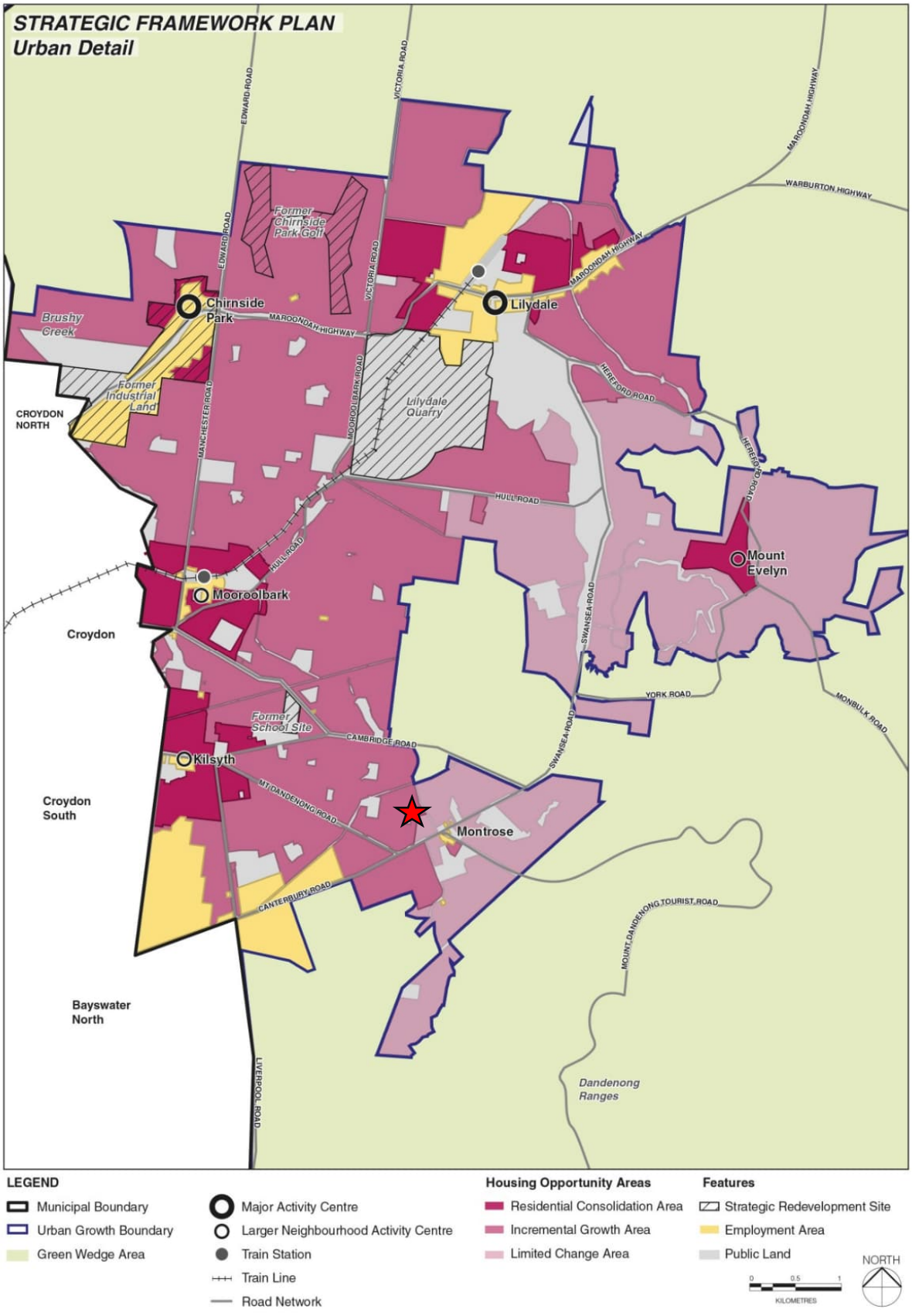


Figure 35 Urban Strategic Framework Plan

4.1.2 Planning Policy Framework

The Planning Policy Framework (PPF) establishes key themes related to planning in Victoria. Specific clauses of relevance to this Site as well as landscape values are detailed below.

Clause 11.01-1R **(Green Wedges – Metropolitan Melbourne)** aims to 'protect the green wedges of Metropolitan Melbourne from inappropriate development.' It includes the following relevant strategies:

- *Promote and encourage the key features and related values of each green wedge area.*
- *Protect areas of environmental, landscape and scenic value such as biodiversity assets, national and state parks, Ramsar wetlands and coastal areas.*
- *Protect significant resources of stone, sand and other mineral resources for extraction purposes.*

Clause 11.01-1L-04 **(Green Wedge)** seeks to protect green wedge land through supporting the following values:

- *Maintaining a healthy biodiversity.*
- *Protecting valued rural landscapes.*
- *Supporting sustainable agriculture.*

Furthermore, this policy supports development adjacent to the Urban Growth Boundary to provide for a suitable transition. Developments should avoid adverse impacts on agricultural land, retain the rural landscape character, appear unobtrusively in the landscape, and retain significant habitats. Additionally, rural industry should be discouraged if it does not relate to the agricultural or rural use of the land. Buildings should be screened and separated to avoid impacts on sensitive uses.

Clause 11.03-5S **(Distinctive Areas and Landscapes)** seeks to 'recognise the importance of distinctive areas and landscapes to the people of Victoria and protect and enhance the valued attributes of identified or declared distinctive areas and landscapes.' Specifically, this policy aims to:

- *Recognise the unique features and special characteristics of these areas and landscapes.*
- *Implement the strategic directions of approved Localised Planning Statements and Statements of Planning Policy.*
- *Protect and identify key values and activities of these areas.*
- *Enhance conservation of the environment, including the unique habitats, ecosystems and biodiversity of these areas.*
- *Support use and development where it enhances the valued characteristics of these areas.*

Clause 12.05-2S **(Landscapes)** seeks to 'to protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments.'

- *Ensure significant landscape areas such as forests, the bays and coastlines are protected.*
- *Ensure development does not detract from the natural qualities of significant landscape areas.*
- *Improve the landscape qualities, open space linkages and environmental performance in significant landscapes and open spaces, including green wedges, conservation areas and non-urban areas.*
- *Recognise the natural landscape for its aesthetic value and as a fully functioning system.*
- *Ensure important natural features are protected and enhanced.*

Clause 14.03-1S **(Resource Exploration and Extraction)** seeks to 'encourage exploration and extraction of natural resources in accordance with acceptable environmental standards.' Specifically, it seeks to:

- *Provide for the long-term protection of natural resources in Victoria.*

Clause 14.03-1L **(Extractive Industry)** states the following strategies:

- *Ensure any new extractive industries in areas of natural significance and environmental sensitivity are prohibited.*
- *Prevent the expansion of existing quarry operations into established buffer areas that protect nearby residential areas and other sensitive land uses.*
- *Facilitate the preparation of a site rehabilitation strategy for any quarry that is expected to cease operation in the foreseeable future.*

4.1.3 Site Zoning

Special Use Zone

The Site is partially located within the Special Use Zone (SUZ). Broadly, the purpose of the SUZ is to provide 'for the use and development of land for specific purposes as identified in a schedule.'

It is affected by two schedules namely Schedule 1 'Earth and Energy Resources Industry' (SUZ1) and Schedule 6 'Extractive Resource and Environmental Buffer' (SUZ6).

The purpose of SUZ1 is:

- *To recognise or provide for the use and development of land for earth and energy resources industry.*
- *To encourage interim use of the land compatible with the use and development of nearby land.*
- *To encourage land management practice and rehabilitation that minimises adverse impact on the use and development of nearby land.*

The purpose of SUZ6:

- To protect properties in proximity to an extractive industry use from noise, dust, visual intrusion and other *adverse impacts.*
- *To maintain the amenity of the immediate area, by protecting remnant vegetation and by using extensive landscaping and visual screening.*
- *To preserve the option of future exploitation of stone deposits and ensure the detailed environmental and other assessment of any future stone extraction proposal through a planning scheme amendment process.*
- *To prevent the intrusion of uses into the area which are incompatible with an extractive industry use.*

Green Wedge Zone

A small section of the Site in its south-west corner is within the Green Wedge A Zone (GWAZ). The purpose of GWZ is:

- *To provide for the use of land and agriculture*
- *To protect, conserve and enhance the cultural significance and the character of rural and scenic non-urban landscapes.*
- *To recognise and protect the amenity of existing rural living areas.*
- *To protect, conserve and enhance the biodiversity, natural resources, scenic landscapes and heritage values of the area.*

The provisions of this clause specify decision guidelines specific to maintaining the character and appearance of the area in terms of 'architectural, scientific or cultural heritage significance, or of natural scenic beauty or importance.' Further environmental issues are noted including impact on flora and fauna, natural features, soil and water quality. Biodiversity such as riparian buffers along waterways as well as gullies, ridge lines and property boundaries.

Areas to the west of the UGB form part of the metropolitan growth area.

- To the immediate north and west of the site are Industrial Zones, which form part of the Bayswater and Bayswater North Industrial nodes in the centre of the study are. These nodes extend along Mountain Highway and Canterbury The following land uses are relevant within the Green Wedge area east of the UGB:
- The Montrose Quarry site is zoned for Special Use as a quarry operation.
- The areas to the immediate south as well as a corner of the site are zoned as Green Wedge areas and for Public Use. Similar zoning occurs north of Montrose and in the far east of the study area.
- The Dr Ken Laversha Reserve to the immediate east of the site is zoned for Public Conservation and Resource, as is the Dandenong Ranges National Park east of the site and in the far south of the study area.
- East of The Basin in the south of the study area, zoning is Rural Conservation.

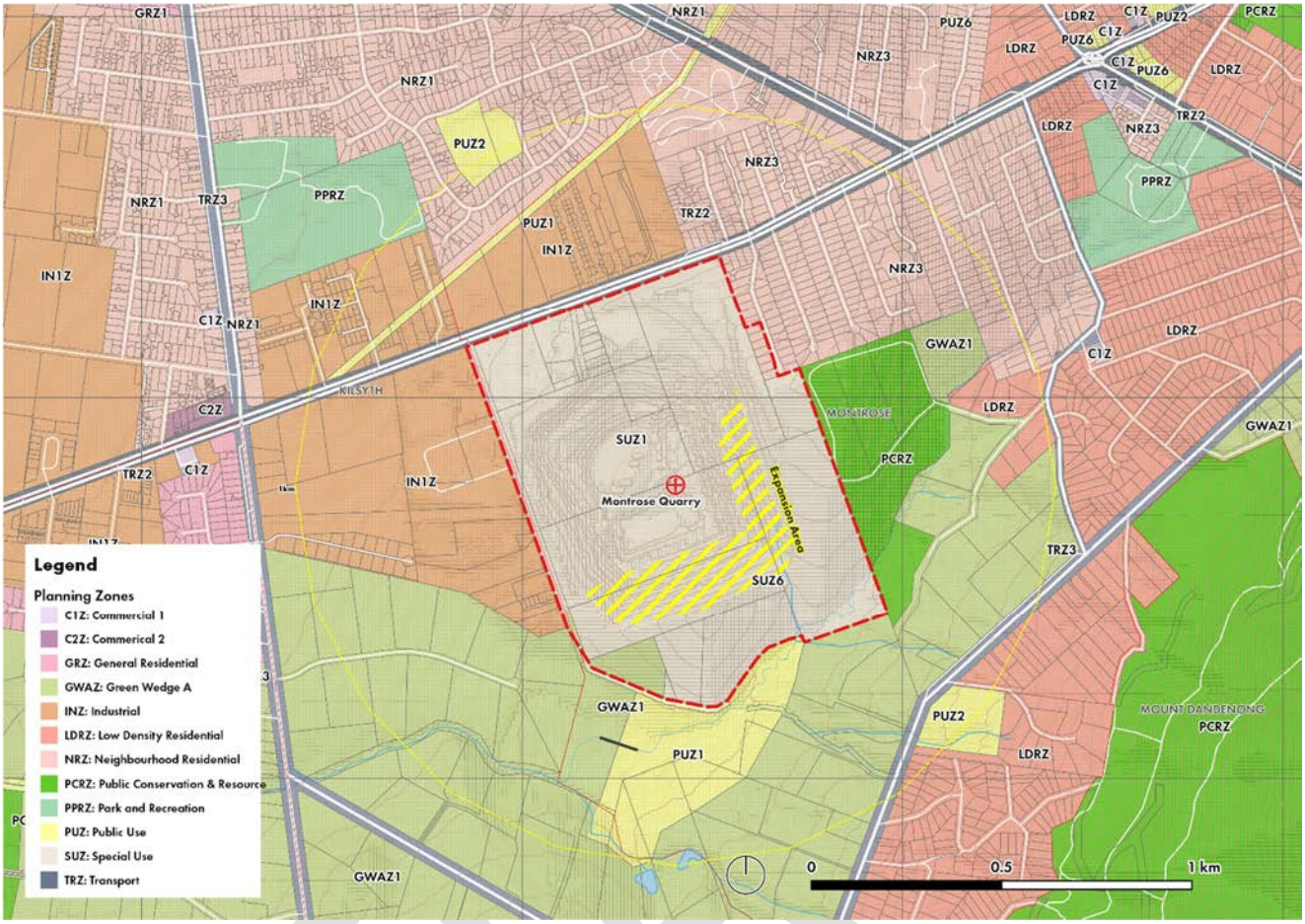


Figure 34: Land Use Zones

4.1.4 Overlays

Bushfire Management Overlay

The majority of the southern and eastern section of the Site is affected by the Bushfire Management Overlay (BMO). The purpose of the BMO is to ensure that development of land prioritises the protection of human life and strengthens community resilience. However, the provisions of this overlay are not of relevance to the subject matter.

Environmental Significance Overlay

Environmental Significance Overlays characterise large areas east of the UGB, including (but not limited to) the Dandenong Ranges National Park and a Significant Landscape Overlay is applicable to most of the study area except for the industrial nodes.

A Vegetation Protection Overlay is in place for several large sites in the western part of the study area and most of the eastern part of the study area is covered by a Bushfire Management Overlay.

Parts of the Site in the south, along the eastern boundary and for a short stretch along the northern boundary are affected by the Environmental Significance Overlay 'Highest Biodiversity Habitat Areas and Biolink Corridors' (ESO1). The purpose of the ESO is:

- *To identify areas where the development of land may be affected by environmental constraints.*
- *To ensure that development is compatible with identified environmental values.*

More specifically, the Site is affected by B29 of Schedule 1 to the Environmental Significance Overlay (ESO1-B29).

The statement of environmental significance notes that the municipality includes large areas of remnant bushland which contribute to its landscape and environmental character. Significant locations, often along roadsides and waterways, also provide for ecological processes and wildlife habitat.

The Site is identified within 'Dr Ken Leversha Reserve' which holds botanical significance. The environmental objectives include:

- *Ensure the long term protection of the wildlife habitat and other conservation values of sites of botanical and zoological significance.*
- *Recognise the importance of sites of botanical and zoological significance as core habitat areas.*
- *Ensure that the habitat value of the sites is not diminished by the incremental removal of remnant vegetation or inappropriate development.*
- *Protect the natural resources and maintain the ecological processes and genetic diversity of the region.*
- *Ensure that any new development is sensitively designed and sited to reinforce the existing environmental characteristics of the area.*

Significant Landscape Overlay

Southern and south-eastern parts of the quarry site are subject to the Significant Landscape Overlay, Schedule 1 'Dandenong Ranges Landscape' (SLO1) (refer Fig 35). A small section of the Site in its north-eastern corner, and the residential areas to the immediate east of the site are affected by the Significant Landscape Overlay, Schedule 22 'Foothills and Rural Townships' (SLO22) (refer Fig 37). Areas to the immediate south-west of the site are affected by the Significant Landscape Overlay, Schedule 6 'Rolling Hills and Bushy Agricultural Landscape' (SLO6) (Refer Fig 36).

The purpose of an SLO is:

- *To identify significant landscapes.*
- *To conserve and enhance the character of significant landscapes.*

The landscape character objectives for **SLO1** include:

- *To retain a forest dominated landscape in which large canopy trees and understorey vegetation soften the distinction between private and public land, and to provide a sense of enclosure.*
- *To retain the mix of indigenous, native and exotic trees which contribute to the landscape.*
- *To ensure that dwellings, commercial buildings and other structures are inconspicuous elements within the landscape.*
- *To maintain the appearance of an uninterrupted forested range as seen from Melbourne's outer eastern suburbs and other surrounding areas.*
- *To ensure that development is responsive to the natural characteristics of the land including slope and remnant vegetation and associated wildlife habitat.*

The landscape character objectives for **SLO6** include:

- *To maintain a comparatively open rural landscape of farmland and bushland patches in which houses, farm buildings and tourist facilities are generally inconspicuous.*
- *To ensure that the siting and design of new buildings complements their setting and reinforces the rural landscape character of the area.*
- *To retain established trees and patches of indigenous vegetation as an important element of the rural landscape and habitat for wildlife.*
- *To allow middle and long distance views from the valley to the surrounding ranges.*
- *To maintain the appearance of an uninterrupted forested backdrop to views.*

The landscape character objectives for SLO22 include:

- *To recognise and conserve the environmental and visual sensitivity of residential areas.*
- *To maintain vegetation as a dominant element of the landscape and encourage retention and regeneration of native vegetation.*
- *To ensure development is sensitive to the natural characteristics of the land including slope, terrain and any existing vegetation.*
- *To ensure setbacks are generous, consistent with nearby dwellings and allow sufficient space for mature plantings.*
- *To ensure site cover maintains the ambience and sense of spaciousness.*
- *To ensure that buildings and works retain an inconspicuous profile and do not dominate the landscape.*
- *To ensure that the health of existing trees is not jeopardised by new development.*
- *To maintain an absence of front fences and informal rural character with either open style front fencing or an absence of front fencing.*
- *To protect and preserve the riparian areas along waterways.*

Figure 35: Planning Overlays – SLO1

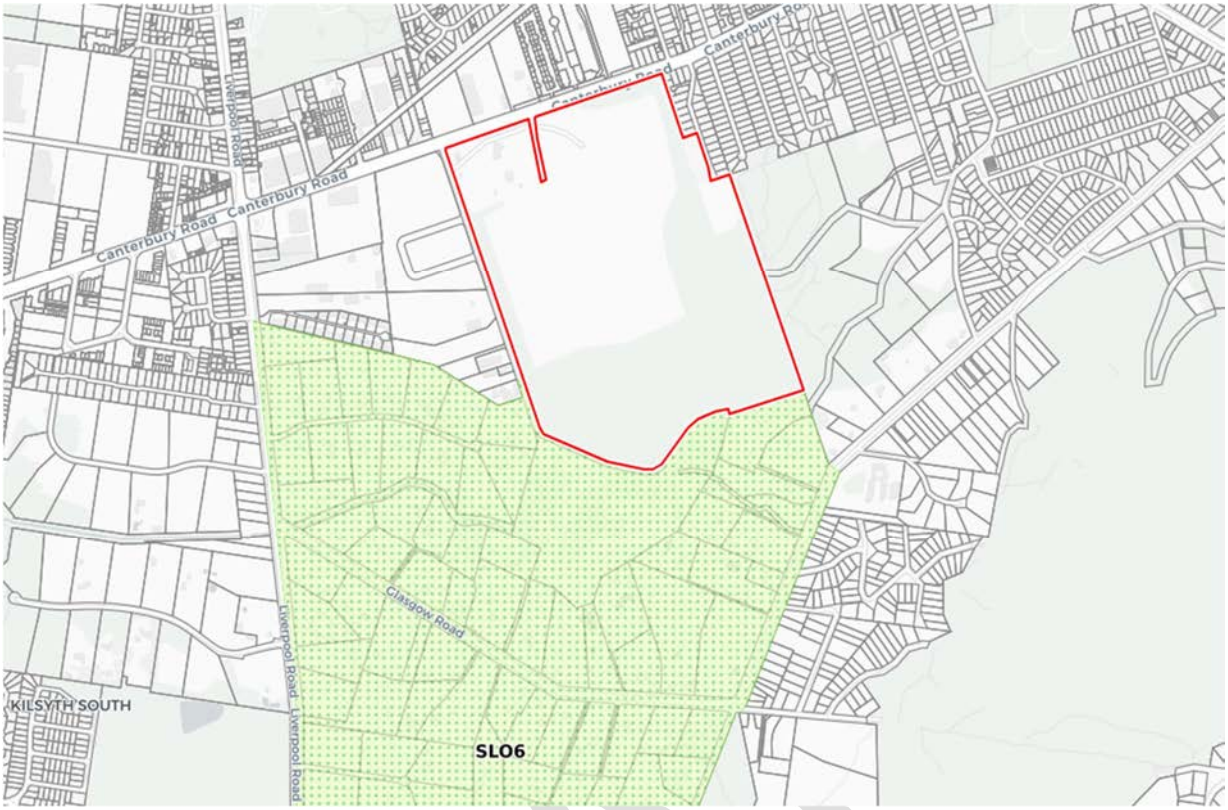


Figure 36: Planning Overlays – SLO6

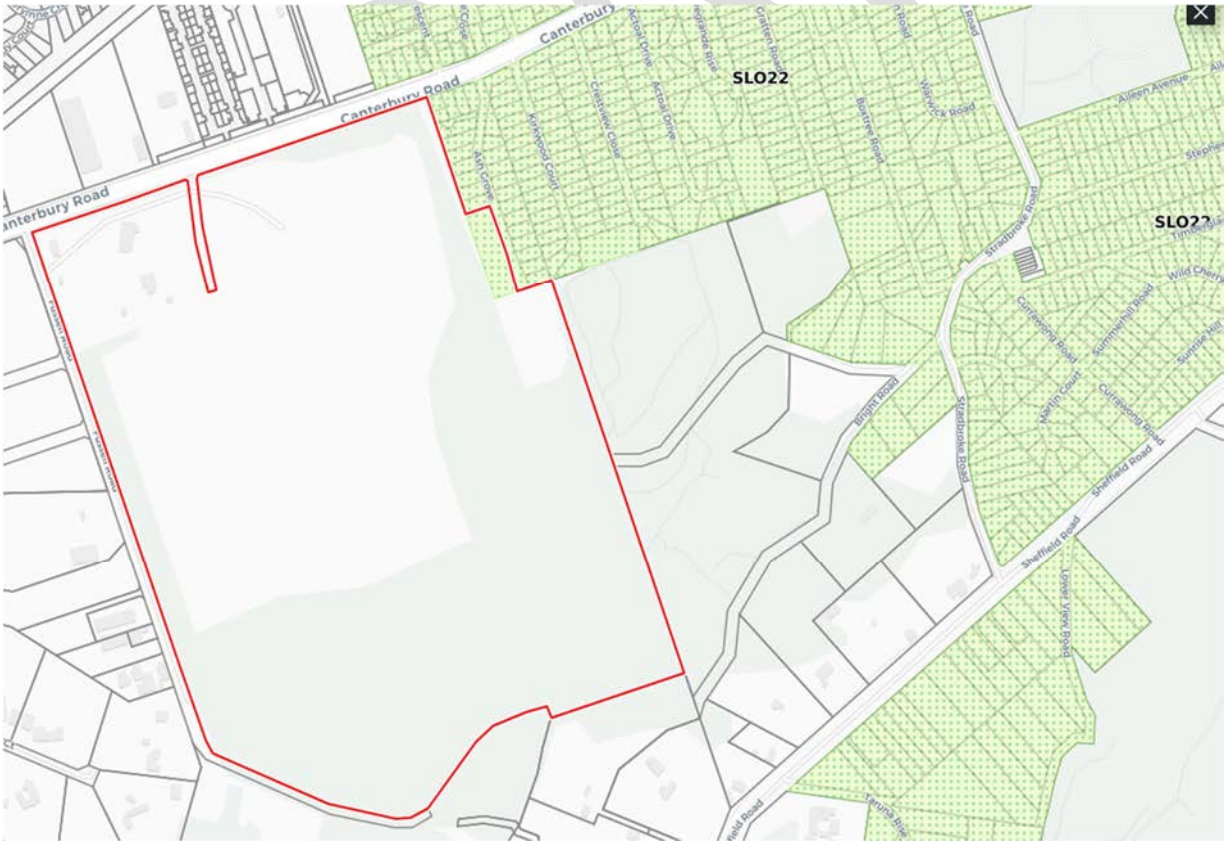


Figure 37: Planning Overlays – SLO22

4.1.5 Particular Provisions

Energy and Earth Resources Industry

The purpose of Clause 52.08 is:

- *To encourage land to be used and developed for exploration and extraction of earth and energy resources in accordance with acceptable environmental standards.*

Extractive Industry and Extractive Industry Interest Areas

The purpose of Clause 52.09 is:

- *To ensure that use and development of land for extractive industry does not adversely affect the environment or amenity of the area during or after extraction.*
- *To ensure that excavated areas can be appropriately rehabilitated.*
- *To ensure that stone resources, which may be required by the community for future use, are protected from inappropriate use and development.*

The decision guidelines of this clause note considerations including effects on native flora and fauna, cultural heritage values, and the compatibility with natural systems and visual appearance.

4.2 Regional and Strategic Documents

4.2.1 Yarra Ranges Localised Planning Statement

A Localised Planning Statement applies to the Yarra Valley and Dandenong Ranges, alongside other areas of significant and distinctive geographic and physical features in Victoria. This document was published in 2017 by Yarra Ranges Council in collaboration with the Victorian Government.

Policies specific to extractive industry prioritises management to avoid adverse impacts and to prevent expansion of existing quarries into environmentally sensitive areas.

4.3 Other Planning Considerations

4.3.1 Dandenong Ranges National Park Management Plan

The Management Plan for the Dandenong Ranges National Park, prepared by Parks Victoria, was approved for implementation in 2006, and then amended in October 2017. The purpose of the management plan is to drive all aspects of management of the park.

Strategies for Natural Values Conservation recognise that the landscape of the park is a crucial component of the scenic backdrop of metropolitan Melbourne, and highly significant to the contemporary Wurundjeri people.

The landscape significance of the area has been recognised by the National Trust of Australia (Victoria). The Trust has classified a number of landscapes in the region, including the whole of the park and a number of locations within it.

Of specific importance are the following Management Strategies relating to landscape:

- *Encourage and support the Shire of Yarra Ranges and the City of Knox in continuing to actively apply the requirements of the landscape overlays in their planning schemes when determining applications that may affect landscape values.*
- *Maintain existing viewpoints and provide information and interpretation material at these sites.*

Additionally, the following Management Strategy relating to Boundaries and Adjacent Uses has relevance:

- *Encourage the Shire of Yarra Ranges and the City of Knox to continue to actively apply the requirements of the vegetation protection overlays in their planning schemes when determining applications that may affect flora values of land adjacent to the park.*

The following plan extracted from the Dandenong Ranges National Park Management Plan (Parks Victoria, 2006, ammended 2017) shows the Dandenong Ranges National Park and other conservation land uses associated with the park.

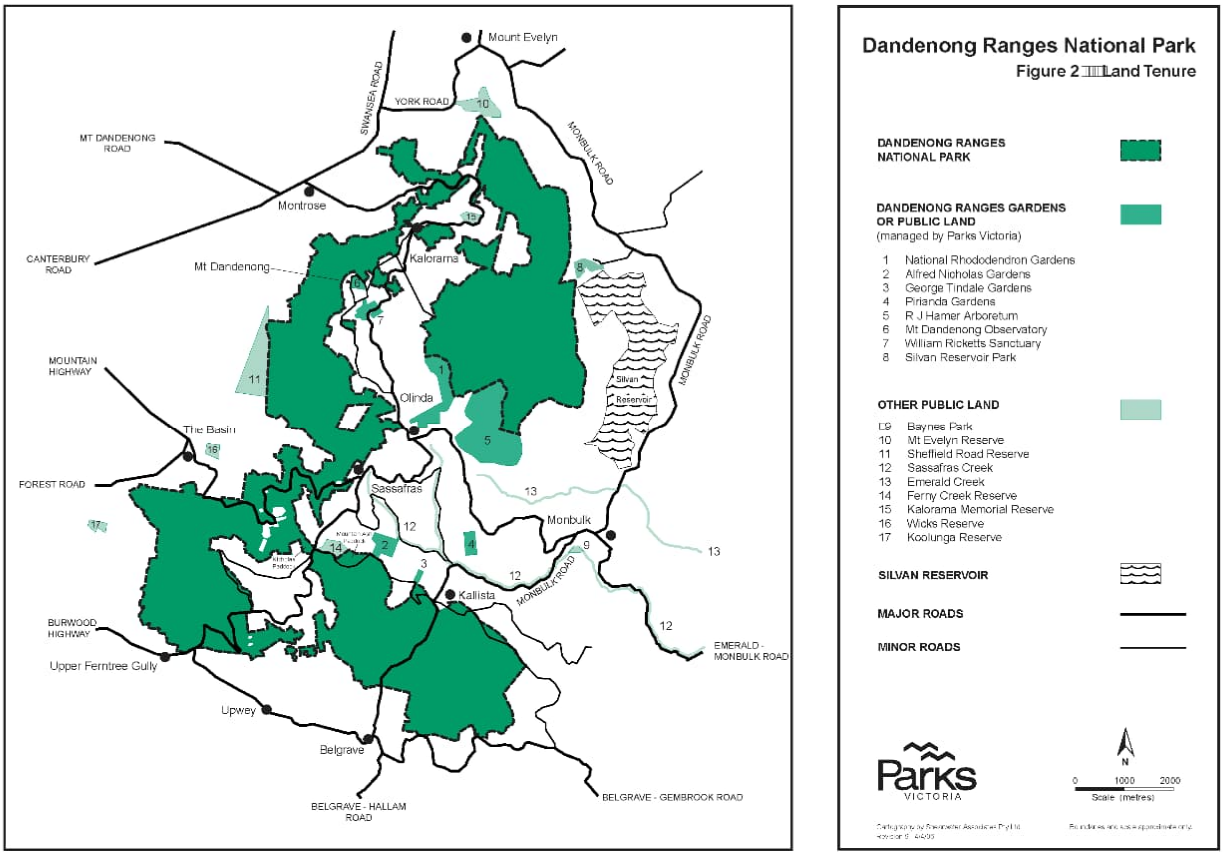


Figure 38: Dandenong Ranges National Park & allied public land

4.4 Planning Policy - Key Findings

- The Municipal Strategic Statement recognises the significant value of the environment and landscape within the Shire, and specifically identifies the natural environment with its mountain ranges, valleys, forests, waterways and canopy trees as the defining characteristic of the municipality. The vision of the Shire is to retain this as the defining characteristic by protecting and respecting sensitive environments, significant landscapes and cultural and natural heritage.
- An important theme is the protection and enhancement of significant landscapes and open spaces that contribute to character, identity and sustainable environments. The scenic beauty and unique landscape features within Yarra Ranges is emphasised as a core component of its landscape quality. Within the study area, the foothills of the Dandenong Ranges and the visual amenity provided by the ranges represent a backdrop throughout the Shire. These characteristics should be maintained and protected.

- The Shire also supports the development and expansion of existing extractive industry resources while protecting environmentally sensitive areas. Specific mention is made of the requirement to prevent the expansion of existing quarry operations into established buffer areas that protect nearby residential areas and other sensitive land uses.
- In terms of Zoning and Overlays
  - The existing quarry pit lies within the SUZ1 and the proposed quarry expansion area lies within SUZ6. The purpose of SUZ6 is essentially the protection of properties in proximity from noise, dust and visual intrusion, and the preservation of the amenity of the immediate area. The purpose of this zone is also to preserve the option of future exploitation of stone resources, subject to due process and acceptable environmental standards.
  - The proposed quarry expansion area is covered by an Environmental Significance Overlay, with an objective to ensure that any new development is sensitively designed and sited to reinforce the existing environmental characteristics of the area.
  - The proposed quarry expansion area is also covered by a Significant Landscape Overlay (SLO1). Relevant objectives relate to retaining a forest dominated landscape and maintaining the appearance of uninterrupted forest ranges when viewed from Melbourne's outer east and surrounds.
  - Rural residential areas to the immediate south-west of the site are covered by a Significant Landscape Overlay (SLO6). Relevant objectives relate to allowing middle and long distance views from the valley and surrounding ranges and maintaining the appearance of an uninterrupted forested backdrop to views.
  - Residential areas along the foothills of the Dandenong Ranges National Park and to the north-east of the site are covered by a Significant Landscape Overlay (SLO22). Relevant objectives relate to recognising the visual sensitivity of these residential areas and maintaining vegetation as a dominant element of the landscape.
- Localised landscape planning policies seek to place restrictions on development to maintain iconic features such as the 'treed escarpments of the Dandenong Ranges and the visual amenity along main roads and tourist routes. The emphasis of the policy is on the management of visual effects and landscape character, rather than the principle of change.
- The landscape significance of the Dandenong Ranges National Park and surrounding area has been recognised by the National Trust of Australia (Victoria). The Trust has classified a number of landscapes in the region, including the whole of the park and a number of locations within it. The plan states a requirement to maintain and upgrade existing viewpoints and encourages the application of environmental protection overlays when determining applications affecting land adjacent to the park. Although the Montrose quarry does not lie within the Dandenong Ranges National Park, this landscape is relevant as a visual and landscape receptor.

5 Baseline Values

This report section provides a description and analysis of the conditions of the landscape and visual conditions that currently exist within the study area.

5.1 Context

The study area is located at the foot of the Dandenong Ranges, 35km east of Melbourne, and represents a transition from the urban areas of Boronia, Croydon and Mooroolbark in the west, through the rural residential areas of Kilsyth South and Montrose, to the conservation area of the Dandenong Ranges National Park in the east. The site lies on the edge of Melbourne's Urban Growth Boundary, with the Green Wedge zone extending eastwards and southwards from the quarry site boundary.

Situated within the 'Foothills' Landscape Character Type (Leonard & Hammond, 1984), the areas to the north, west and south-west of the site are gentle and undulating, with the slopes of the Dandenong Ranges National Park rising up steeply to the south-east. Suburban residential areas are typically well vegetated with generous open space and conservation areas.

The site lies within an industrial setting. Industrial land uses flank Canterbury Road and Mountain Highway. These areas are poorly vegetated with large scale and visually dominant built forms with parking, service areas and signage that generally results in a cluttered, low visual quality. The existing Montrose Quarry and associated processing operation lies on the eastern extremity of the industrial node along Canterbury Road.

The forested slopes of the Dandenong Ranges National Park represent a constant backdrop within the greater study area and contribute to the landscape character and identity of the place.

5.2 Climate

The study area location at the foot of the Dandenong Ranges means that Montrose is wetter than nearby Melbourne, with an annual rainfall of 838mm. Average annual temperature is around 13.9 °C. The climate and soil conditions generally result in relatively high vegetation growth rates.

5.3 Landform and Hydrology

The broader study area is characterised by gentle undulating topography in the north, west and south-west, and steeper slopes in the east and south-east where Mount Dandenong and Mt Corhanwarrabul rise up to an elevation of 630m asl.

Locally, the site lies within a broad, largely flat valley, bounded on its south side by the Bungalook Creek. Low hills surround the site to the immediate south and east and beyond Mt Dandenong Road to the north. The terrain of the quarry site falls from east to west.

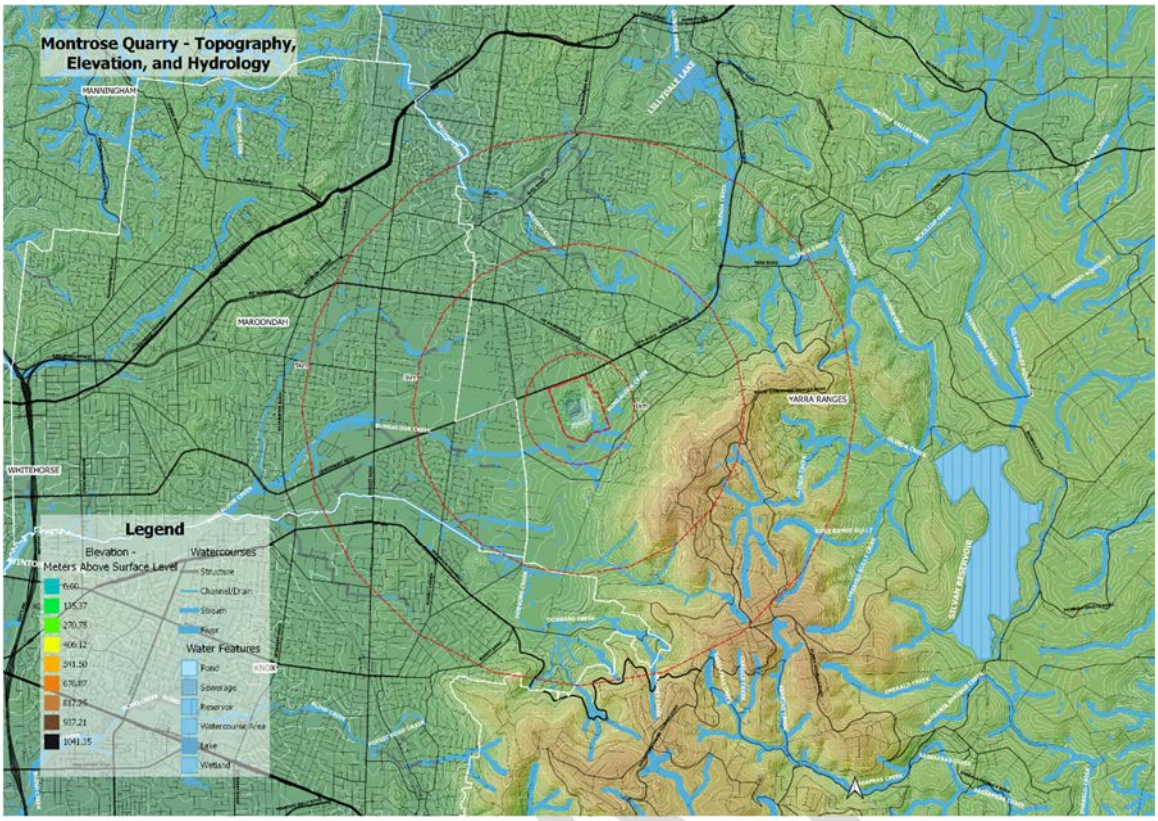


Figure 39: Topography, Elevation and Hydrology

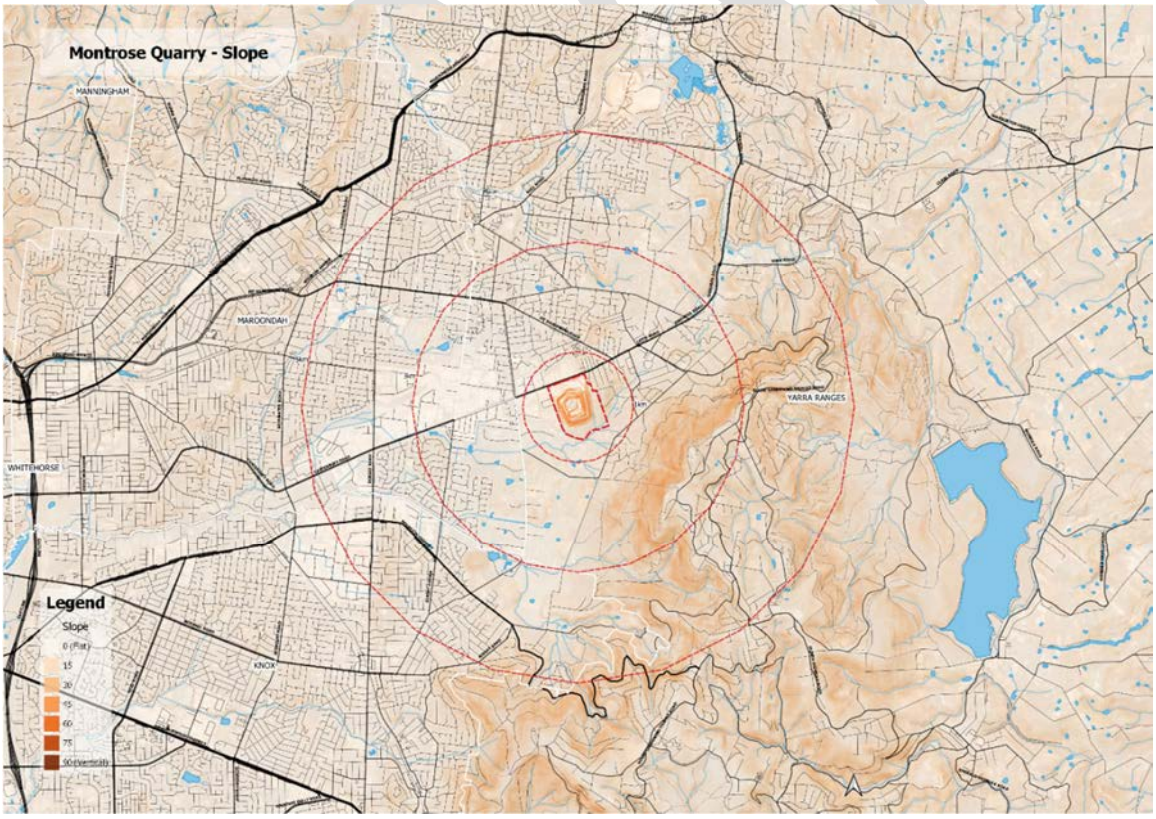


Figure 40: Slope Analysis

5.4 Vegetation

The broader study area is subject to a mosaic of Ecological Vegetation Classes (EVC) types that reflect changes in topography, elevation, soil type, aspect and rainfall.

EVC's remain mostly intact in the east of the study area on the steeper slopes and within the Dandenong Ranges National Park. EVC's in the western part of the study area are present but more fragmented by development patterns.

The quarry site sits at the boundary between four EVC types:

- EVC 22: **Grassy Dry Forest** that covers most of the quarry site, along with areas to the north and east of the site.
- EVC 127: **Valley Heathy Forest** on the western part of the site and beyond to the south-west of the site.
- EVC 17: **Riparian Scrub /** EVC 126 **Swampy Riparian Woodland Complex** within creek lines to the south and west of the quarry site.
- EVC 29 **Damp Forest** to areas adjoining creek lines and low-lying areas to the west and north of the quarry site.

Existing information suggests that the existing site includes 4.3 ha of remnant (indigenous) vegetation and some 3.6 ha of non-native vegetation. This land has been previously used for agriculture and there is remnant pasture, fruit trees and remnant garden plantings evident within the non-native vegetation areas.

Distance zones are not relevant to these plans

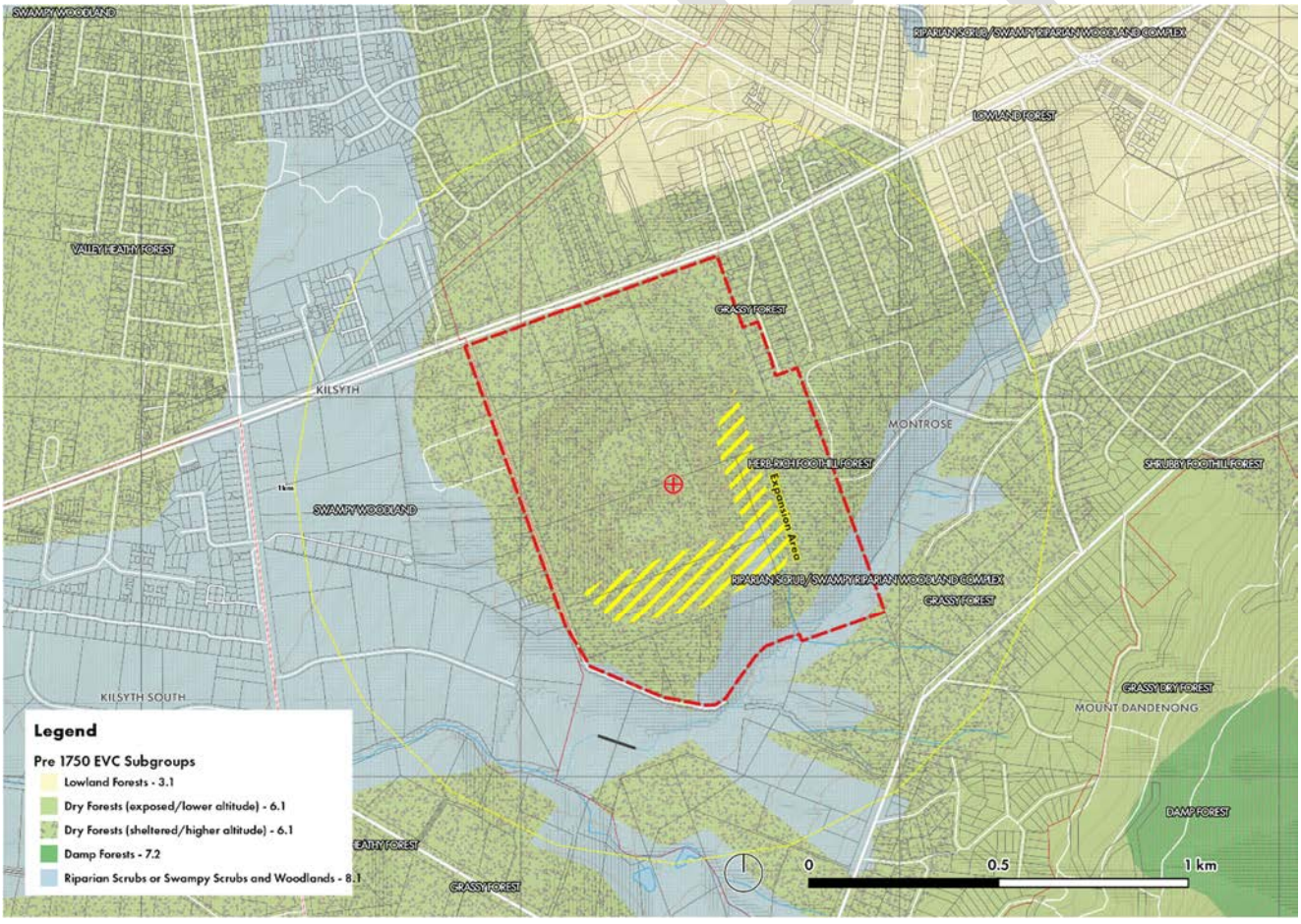


Figure 41: Pre 1750 distribution of Ecological Vegetation Classes

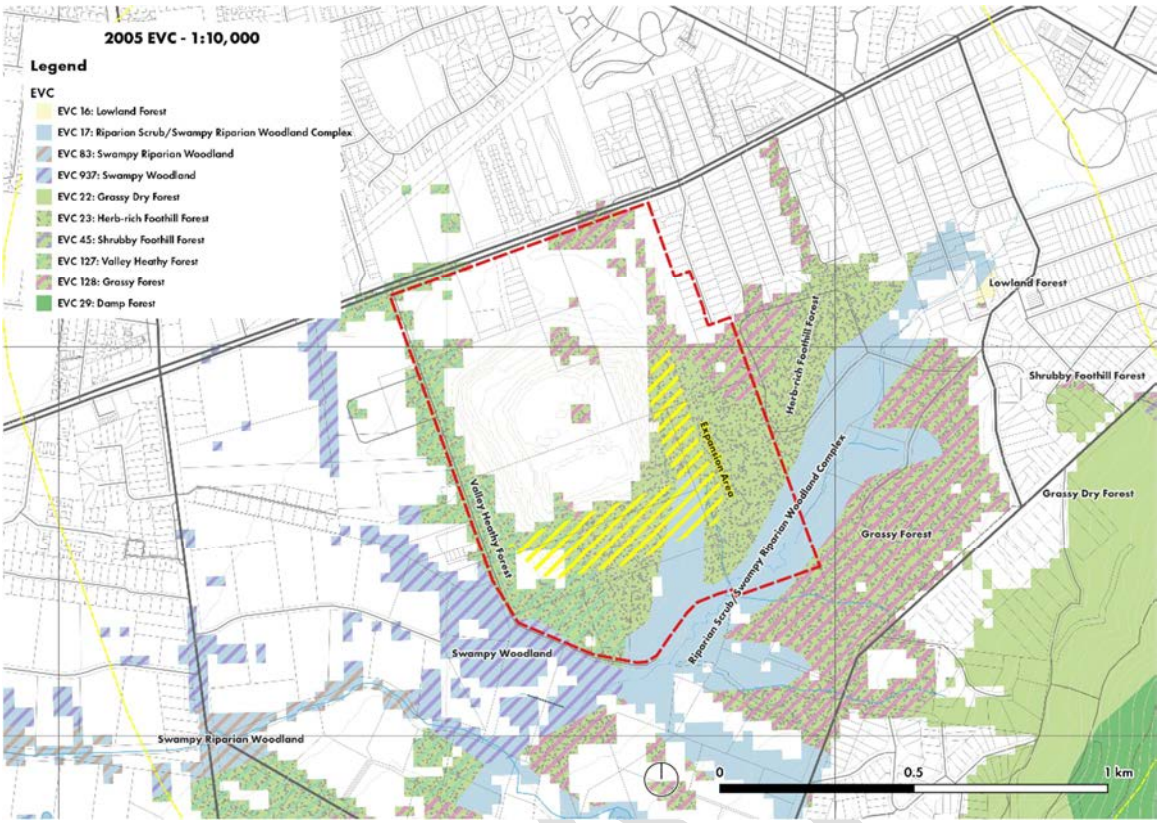


Figure 42: 2005 Ecological Vegetation Class distribution

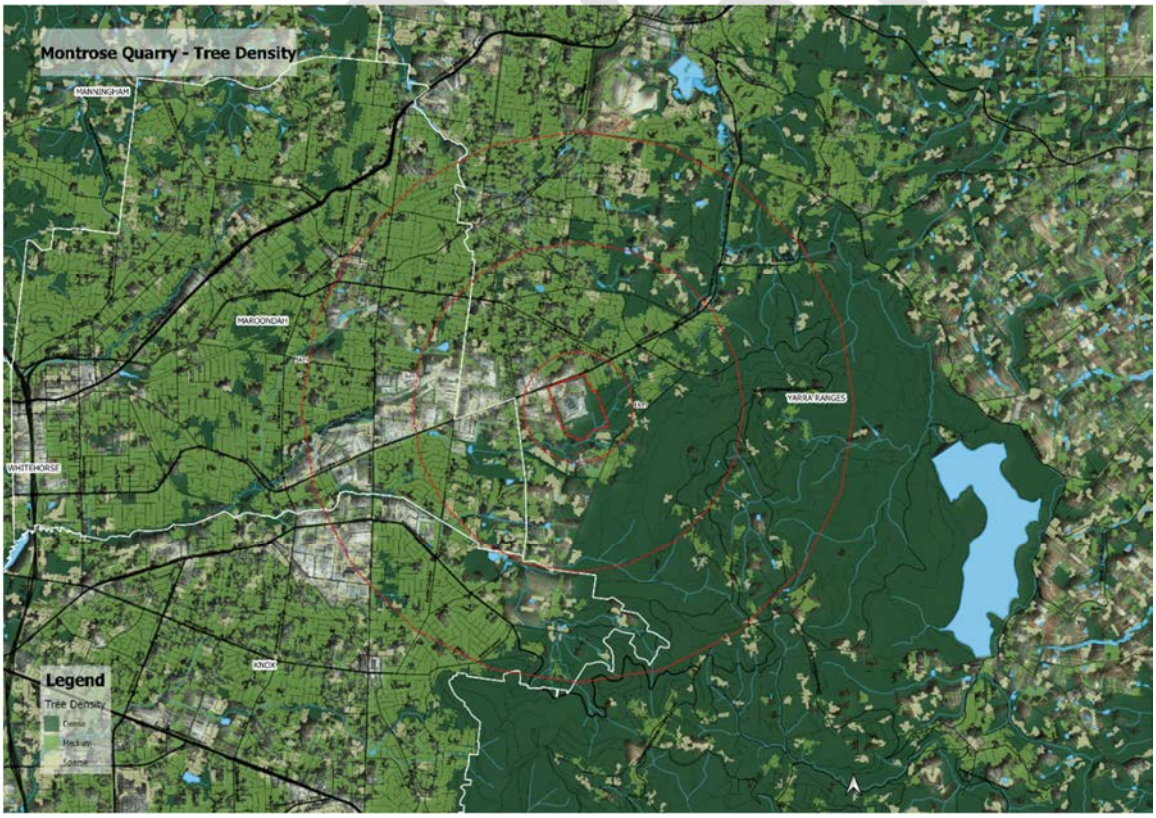


Figure 43: Tree Density

5.5 Traffic and Transport

A number of major access roads traverse the study area:

- Canterbury Road runs past the northern boundary of the quarry site and becomes Swansea Road as it heads north towards Lilydale.
- Mount Dandenong Road connects Ringwood with Montrose.
- Mountain Highway to the south of Canterbury Road links Wantirna in the west (beyond the study area) to The Basin.
- Boronia Road in the south of the study area links Wantirna with The Basin.
- The Maroondah Highway passes through the north-western corner of the study area.

The Mount Dandenong Tourist Road winds through the Dandenong Ranges National Park east of the site from Montrose in the north to Olinda, Sassasfras and The Basin in the south. This road is a scenic route through the forest and gives access to these small towns as well as to rural residences, tourism destinations and lookout points as well as agricultural areas beyond the study area to the east.

The northern and eastern parts of the study area are dominated by residential land uses. Industrial and commercial land uses are focussed on Canterbury Road west of Mount Dandenong Road and the Mount Dandenong Tourist Road. On that basis, people moving through the wider study area represent a range of interests from residential, industrial and commercial users through to tourists and day leisure seekers accessing the north-western end of the Dandenong Ranges National Park.

5.6 Tourism and Recreation

The easy accessibility of the Dandenong Ranges National Park to Metropolitan Melbourne makes it a popular tourist destination for day visits and short stays.

In terms of European heritage, the Management Plan reports that:

…The park is an important component of the landscape backdrop of metropolitan Melbourne as well as being the major landscape feature of the Dandenong Ranges. The community's attachment to landscapes in 'the Dandenongs' adds a layer of cultural value to their environmental values…' (Parks Victoria, 2006, ammended 2017). The Dandenong Ranges landscape separates the Montrose Quarry study area with its residential and industrial elements from the Yarra Valley landscape to the north and east.

The following map extracted from the Dandenong Ranges National Park Management Plan (Parks Victoria, 2006, ammended 2017) shows visitor facilities forming part of the Dandenong Ranges National Park.

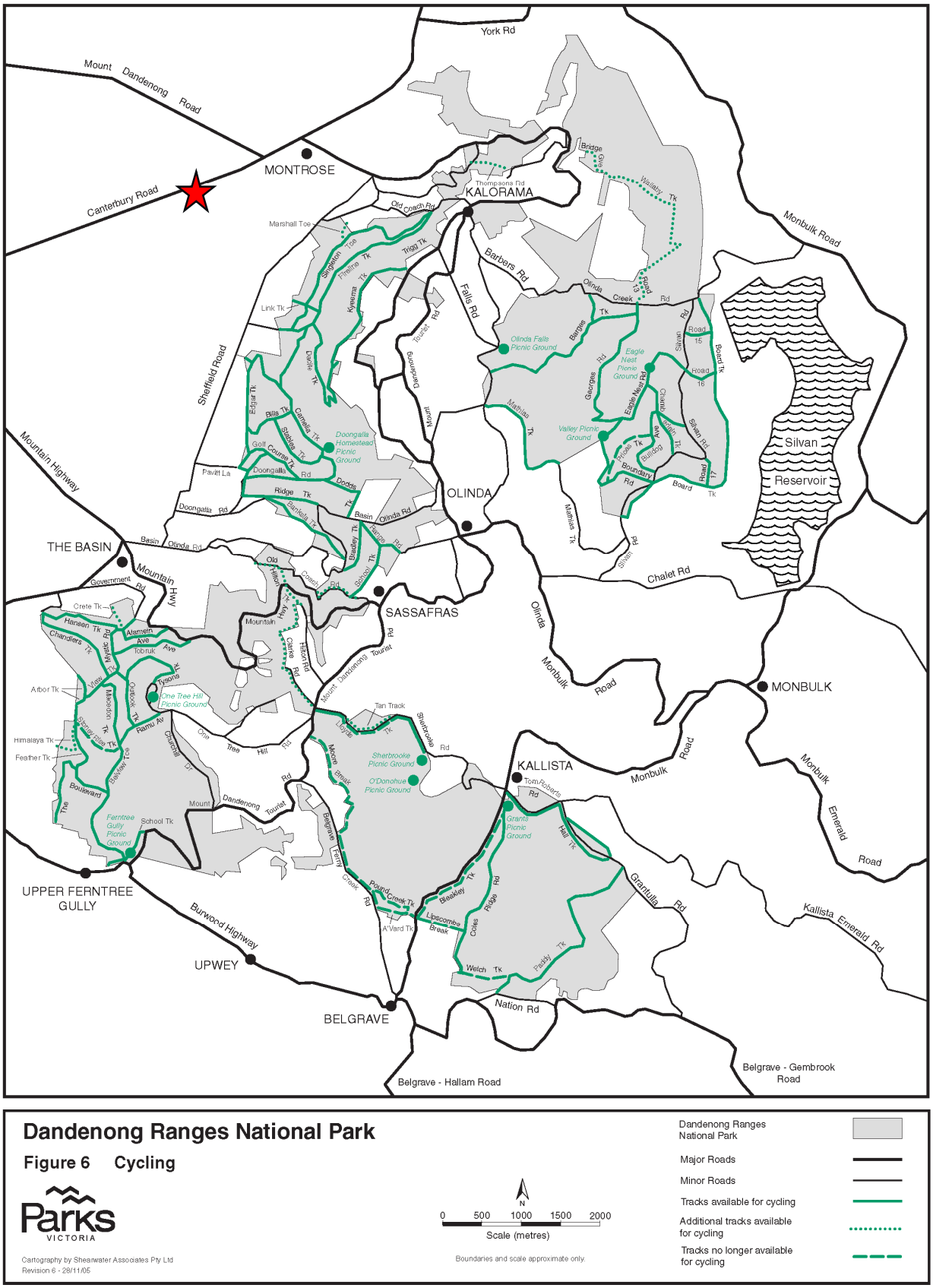


Figure 44 Dandenong Ranges National Park Visitor Facilities

5.7 Landscape Status

The status of the area is defined in terms of whether the landscape is recorded or listed landscape of National, State, Regional or Local importance on the basis of its formal natural, cultural heritage or scenic value.

Two parts of the quarry site landscape are covered by Significant Landscape Overlays (refer to section 4.1.4) and is therefore classified as having Local importance. SLO designations extend beyond the quarry site boundaries. On that basis, the broader residential and rural residential setting east and south also has local level significance in terms of landscape character and quality.

The Built Environment Framework undertaken for the Shire of Yarra Ranges (Planisphere with Planning Collaborative Pty Ltd, 2008) notes that the location of the shire is where the state's most attractive and significant landscapes meet the edge of the metropolitan area. The importance of this landscape lies in that it is as an edge of the developed urban area of Melbourne, and a landscape resource for the metropolitan population as a whole, as well as for its own inhabitants.

'... *Along with the Mornington Peninsula, it includes arguably the most attractive scenery to be found in a metropolitan municipality. The Shire is custodian of a landscape that needs to be maintained and enhanced not only as a home for many and a place of agricultural production but also as an escape from the city, as a place of beauty, as an opportunity for recreation, and as a location of continuing attraction to visitors and tourists from a wide catchment...*' (Planisphere with Planning Collaborative Pty Ltd, 2008).

On that basis, the landscape of the Dandenong Ranges, including the National Park is considered to be of **state-wide importance**. The Western Face of the Dandenong Ranges has National Trust classification.

Under the SLO system, the landscape of the study area (quarry site) and its residential and rural residential landscapes to the east and south are intended to visually complement the landscape qualities established by the Dandenong Ranges landscape and maintain the Ranges as a visual 'boundary' to the metropolitan area.

5.8 Landscape Character and Scenic Quality

The classification of representative landscape character types and related scenic qualities is derived through the definition of common distinguishing visual characteristics – landform, vegetation, water-form and cultural land use pattern. Under this system of classification, each landscape type establishes its own benchmarks for scenic quality.

The Built Environment Framework undertaken for the Shire of Yarra Ranges (Planisphere with Planning Collaborative Pty Ltd, 2008), provides a landscape character classification of the study area. This framework distinguishes between Rural, Business and Commercial, Green Wedge Settlements and residential Landscape Types, of which the following are applicable to the study area:

Rural Landscape Character Type – Dandenong Ranges

- Dandenong Ranges Landscape Type, applicable to the western slopes of the Dandenong Ranges National Park:

  The Dandenong Ranges are the most prominent hills close to Melbourne, with dense forested slopes and fern gullies that function as a tourism and recreation destination and provide an iconic visual backdrop to most long-distance easterly views from Melbourne's eastern suburbs.

  Key attributes:

  - Dense forested landscape character.
  - Distinctive landform that is clearly different from the Melbourne basin
  - Infrastructure and built form generally hidden amongst vegetation.

Business & Commercial Area Types (Metropolitan Area)

- Street based local town centres such as Montrose, The Basin and Kilsyth:

  Street based business and commercial development forms part of the urban structure of the Shire's metropolitan area. Buildings and activities front directly onto traditional streets (roadways with footpaths) that link directly to adjoining residential areas.

  Key attributes:

  - Retail Centres are physically integrated with their local communities and readily accessible on foot.
  - Building is typically low-scale
  - The size of centres is relatively small and walkable.

- Industrial Areas and Highway Strips including the Bayswater and Bayswater North Industrial nodes flanking Mountain Highway and Canterbury Roads respectively, as well as along Dorset Road. The Montrose Quarry site lies at the north-eastern edge of the Bayswater North Industrial node but falls outside of the Industrial Character Type classification (adjoining sites south and west of the quarry).

  Industrial Areas and Highway Strips typically take the form of agglomerations of factory or warehouse or shed-style buildings often with storage or works yards and often spread in linear fashion along highway edges.

  Key attributes:

  - A range of commercial and industrial services and uses in one location.
  - Large scale building with diverse forms and colours. Visually prominent signage
  - Limited or no on-site landscape
  - Setting designs based around vehicle access.

Residential Area Types:

- Urban Residential Areas covering most of the western study area within the Urban growth Boundary.

  Key attributes:

  - The Garden Suburban character type is based on relatively large residential lots in a garden setting with a modified grid street pattern, or a curving street pattern with courts.
  - The Foothills / Bush Suburban character type is based on irregular street patterns that are shaped by topography, with larger lot sizes which allow a landscape dominated residential area.
  - Street tree planting adds to the landscape character and visual quality of residential settings.

Existing quarry site:

The existing Montrose Quarry with its concrete and asphalt plant facilities is an established industrial land use that sits at the intersection of the Canterbury Road industrial precinct, an Urban Residential housing area and a Green Wedge low density development area.

The site forms part of the visual foreground to the Dandenong Ranges foothills and the Significant Overlay planning controls that exist over the eastern part of the quarry site and adjoining land uses to the north, east and south reinforce the role of the site as a part of the Dandenong Ranges foothills landscape. The Overlay system is intended to preserve the overall visual character and amenity of the Dandenong Ranges landscape and its role as a visual boundary to the metropolitan area.

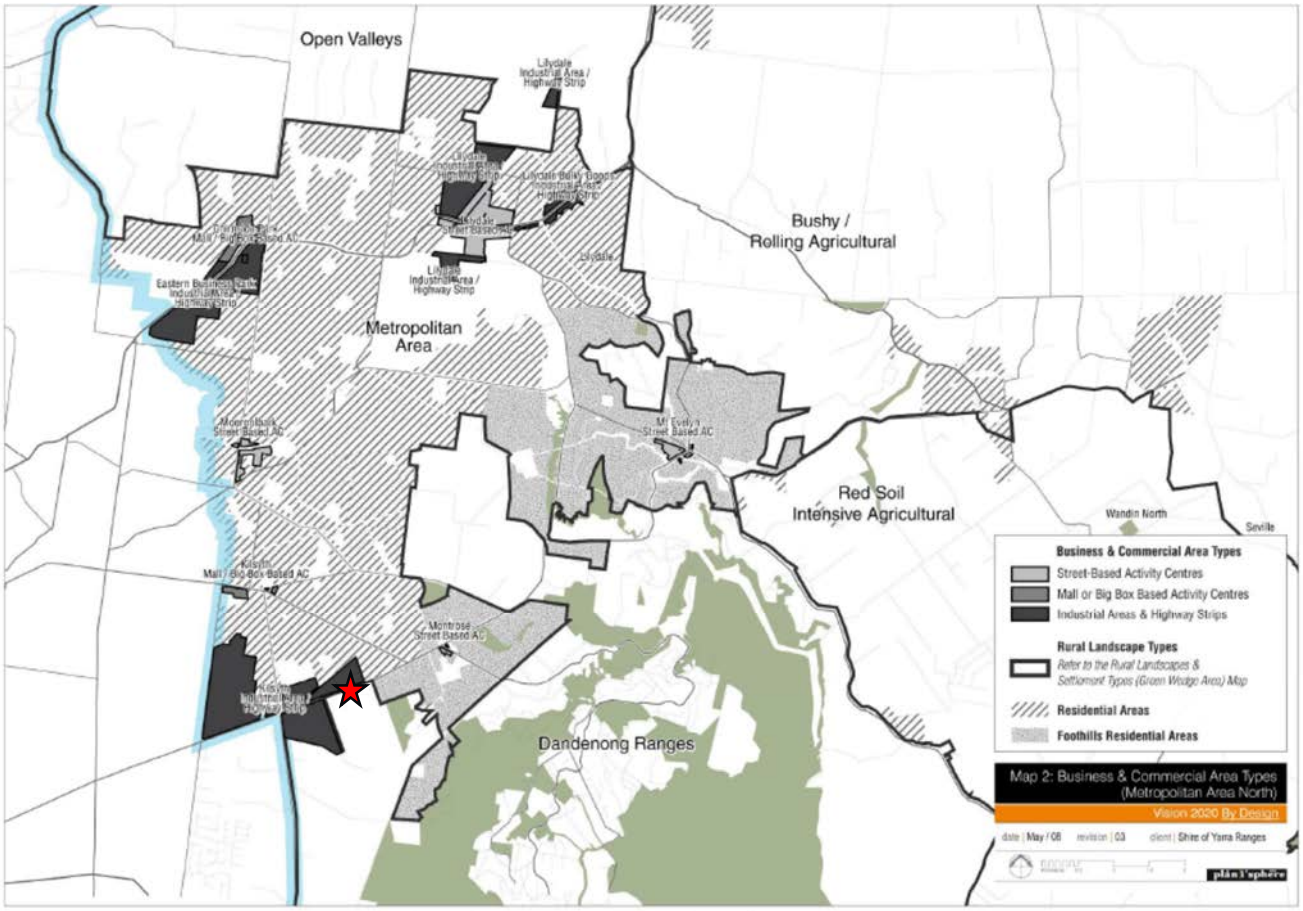


Figure 45: Business and Commercial Area Types (Planisphere with Planning Collaborative Pty Ltd, 2008)

Based on the standards for scenic quality within the Foothills Landscape Character Type (Leonard & Hammond, 1984), the vegetated slopes of the Dandenong Ranges National Park are considered to be of High scenic quality by virtue of landform and vegetation characteristics.

Based on the standards for scenic quality within an Altered Agricultural Landscapes, the Green Wedge Areas and Rural Conservation areas south of the site and north of Montrose are considered to be of Moderate scenic quality by virtue of the landform of the area, development patterns and local roadside and remnant vegetation.

Within the developed industrial areas, scenic quality is considered to be Low as vegetation cover is absent or sparse and the industrial and commercial land uses are large scale and visually dominant.

Within the residential neighbourhoods, scenic quality is considered to be **Moderate to** High. Road alignments respond to undulating topography, tree canopy cover is high, well vegetated open space is abundant and built form is of a human scale and sits within a dominant landscape framework.

5.9 Landscape Sensitivity

The landscape of the wider study area surrounding the quarry site fits into broad land use types. Industrial, commercial and residential land uses adjoining the main road system occupies flatter land at lower elevations. These areas have a landscape character that is more built form dominated and generally less sensitive to change.

Residential and rural residential land uses that occupy the Dandenong Ranges foothills area east of the quarry site have a more visually dominant and connected landscape that forms a visual foreground to the Dandenong Ranges National Park landscape. This visual relationship between different land use settings is recognised by Shire of Yarra Ranges Significant Landscape Overlay planning controls.

The following descriptions highlight the sensitivity of key landscape settings and the relationship between those settings.

Dandenong Ranges

The forested western and southern slopes of the Dandenong Ranges National Park (Dandenong Ranges Landscape Type) are characterised by a continuous dense vegetation cover on steep slopes. The elevation of the Ranges landform results in a clearly defined visual edge to the landscape system.

The Dandenong Ranges, viewed from the west, south-west and south, creates a visual backdrop and edge to metropolitan development in Melbourne's east. These views are sensitive to changes in the vegetation cover of the Dandenong Ranges reserve system as well as the lower foothills landscapes that are more fragmented by development, but still visually connected to the Ranges landscape.

The Dandenong Ranges Landscape Character Area has a high sensitivity to landscape changes as any large-scale, visually contrasting development or changes to vegetation cover on the steeply sloping faces of the Ranges, particularly at higher elevations, would be clearly visible from a wide metropolitan area and potentially change perceptions of the nature of the landscape.

Panoramic westerly and north westerly views from lookouts within the Dandenong Ranges reserve network, including the Observatory Lookout and Burkes Lookout, provide views over Melbourne's eastern suburbs as far as the city skyline. These suburban views typically include a complex visual mosaic of distant land uses and landscape features, rather than a single view destination. Atmospheric conditions and sun angle constantly change and affect the clarity of the view.

As the focus of the panoramic view is on the wider Melbourne metropolitan area, a diversity of land uses and landscape patterns are characteristic of the view. Larger, single land uses, including industrial and commercial are clearly evident, but are seen as a component of a larger overall landscape and land use pattern. On that basis, the quality of views is not dependant on any one land use or area. Land use diversity and patterning is a feature of the view. Change within the field of view is a constant.

Foothills Landscape / Green Wedge areas

Rural residential areas to the immediate south and south-west of the quarry site are covered by a Significant Landscape Overlay (SLO6). SLO objectives relate to allowing middle and long-distance views from the valley and surrounding ranges, and maintaining the appearance of an uninterrupted forested backdrop to views from the east.

The foothills area on the lower western slopes of the Dandenong Ranges National Park are characterised by rural lifestyle and small-scale agricultural lots on moderate to gentle slopes. This landscape character area has been clearly altered through low density rural-residential development and rural related development. The landscape has been substantially cleared but retains patches of native vegetation, windrow plantations and other cultural landscape features. The area retains a dominant treed character and an irregular subdivision pattern that visually complements the Dandenong Ranges landscape system. The nearby forested slopes of the Dandenong Ranges National Park form a physical and visual connection to the foothills landscape.

The Foothills Landscape has the capacity to absorb a degree of physical and visual change as long as the landscape maintains the subdivision scale, vegetation patterns and vegetation connectivity across the area. On that basis, this landscape character area has a low sensitivity to small scale landscape changes that match existing conditions, but a moderate level of sensitivity to larger scale change, particularly at higher elevations that directly connect to the Dandenong Ranges landscape.

Foothills Landscape / Suburban Residential

Residential areas along the foothills of the Dandenong Ranges National Park and to the north-east of the quarry site are covered by the Significant Landscape Overlay (SLO22). SLO objectives relate to recognising the visual sensitivity of these residential areas and maintaining vegetation as a dominant feature of the residential landscape.

The suburban residential areas to the north-east of the quarry site have a vegetation cover and established tree canopy as a result of private gardens and roadside planting. These areas are made up of predominantly freestanding dwellings interspersed with open space. Background views of Mount Dandenong create a visual backdrop and reference point.

The landscape has the capacity to absorb a degree of physical and visual change as long as the landscape maintains vegetation 'connectivity' across the area. This landscape character area has a low sensitivity to small (residential) scale landscape change that is consistent with existing development patterns, but a moderate level of sensitivity to larger scale visual changes.

Industrial land use areas

The road-based industrial and commercial land uses within the western and south-western part of the study area generally have large-scale, visually inconsistent and dominant built forms with large areas of hard surface and limited vegetation or established tree canopy. Large native street trees provide an important, but not dominant visual element. These areas have a low sensitivity to change.

Existing Montrose Quarry site

The proposed quarry expansion area (not the existing quarry operation) is covered by a Significant Landscape Overlay (SLO1). SLO objectives relate to retaining a forest dominated landscape and maintaining the (distant) appearance of uninterrupted forest when the location is viewed from Melbourne's outer east and surrounds.

The area that is subject to the SLO is a mixture of remnant indigenous Eucalypt Woodland and exotic tree species with large, grassed openings that reflect the historical use of the site. The wooded area is on elevated terrain on the high point of the site, so this adds to the visual presence of the woodland. As the purpose of the SLO is the preservation of a forest dominated landscape that maintains a continuous visual connection with the Foothills and Dandenong Ranges landscape character areas from the eastern suburbs, landscape sensitivity is measured in terms of visual connectivity of the woodland and the potential effect of any new views of the quarry operation that may change the woodland aesthetic quality.

Existing vegetation within the mandatory quarry boundary setback areas, street trees on the roads adjoining the quarry site and landscapes within the adjoining SLO areas each contribute to the role of the site landscape and its visual connection to the Dandenong Ranges landscape. On that basis, the quarry landscape is considered to have a relatively low landscape sensitivity to change as the majority of the existing on-site woodland will be retained along with the existing high point terrain levels.

The specific effects of the new quarry design, including visual effects will be assessed in the new conditions assessment.

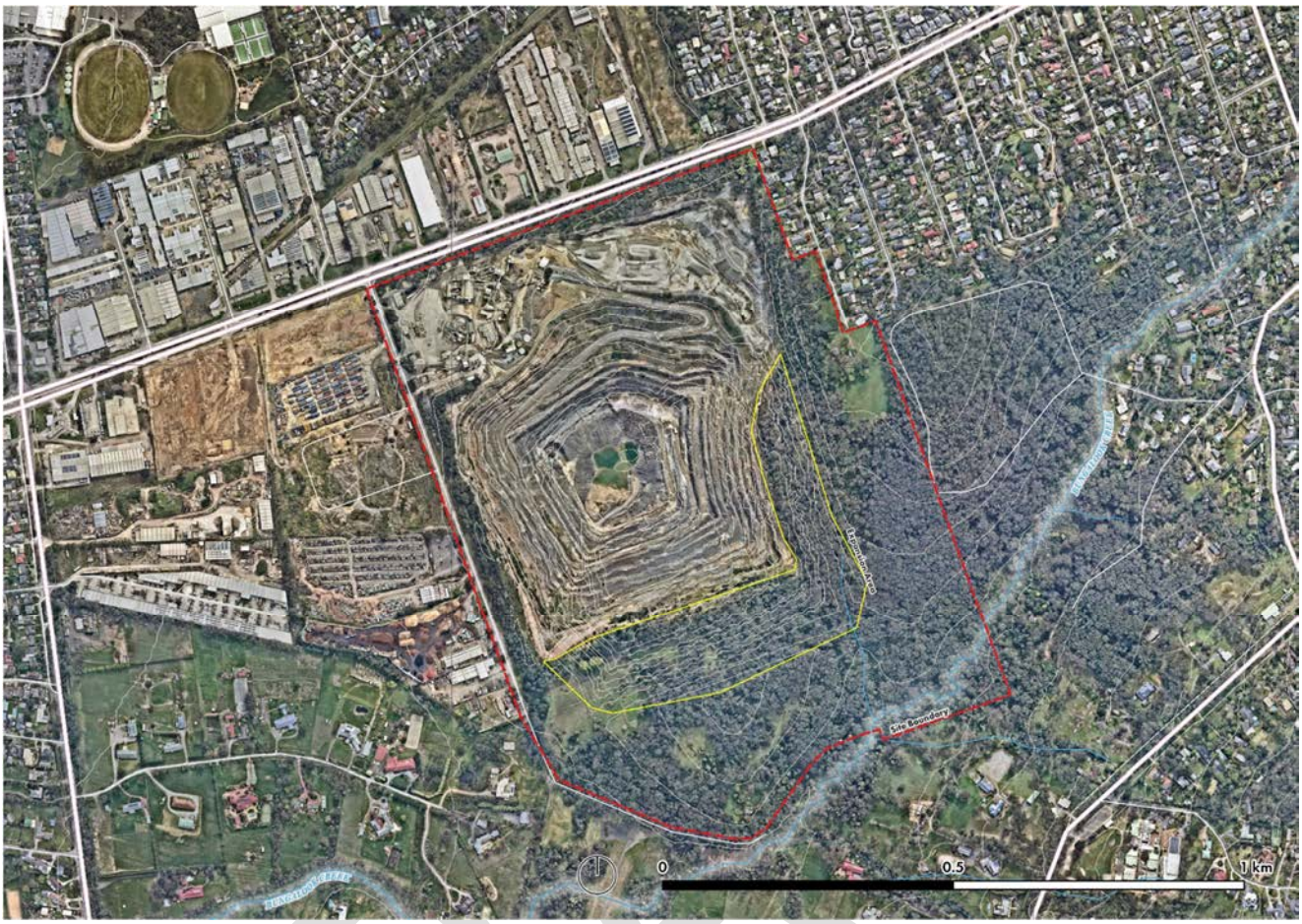


Figure 46: Montrose Quarry existing site & proposed additional extraction area 2023 (Source Nearmap)

Add main road names / creek name / north arrow / subdivisions within 500m bar

5.10 Landscape Condition

Landscape condition is a measure of the physical status of the site and factors which may influence landscape changes over time.

- The landscape to the immediate north and west of the quarry site has developed as an industrial precinct, which extends down Canterbury Road to the south-west. With the exception of native street tree planting, the industrial setting generally has a minimal and fragmented landscape presence and is in a relatively poor condition. The industrial landscape is subject to further change over time as a result of pruning, paving, poor growing conditions and on-site development.
- The Canterbury Road landscape which forms a northern boundary to the site is a mixture of indigenous and native species. Street planting blends with the quarry site buffer planting to form a vegetated edge to the site. Street planting is generally in an average condition that is the result of the effects of paving and poor growing conditions.
- The quarry site appears as a part of the adjoining industrial precinct and main road landscape. The landscape of the site is formed by a combination of four land use areas:
  - An active extraction pit, haul roads and stone processing area
  - Concrete and asphalt plants and site administration facilities

- Perimeter native landscape buffer planting (refer Figure 29). This landscape buffer plantation is a combination of remnant indigenous planting and mixed native tree and shrub planting. The landscape buffer is in average condition as a result of 'edge effects', including weed intrusion.
- The indigenous woodland at the southern and eastern edges of the site. This landscape is a combination of remnant indigenous vegetation and some exotic planting / weed intrusion that is a legacy of past land uses. This vegetation varies from good to average condition, depending on the site location and the degree of disturbance that results from historic land uses, current and previous site uses and management practices. This site vegetation system adjoins the Dr Ken Leversha and Bungalook Creek Reserve systems and on that basis, forms a part of a locally important remnant vegetation network.

5.11 Landscape Value

Landscape value addresses the relative value that is attached to the landscape by the community, bearing in mind that a landscape may be valued by different stakeholders for a variety of different reasons (Landscape Institute and Institute of Environmental Management and Assessment, 2013). It draws from both Landscape Character and Scenic Quality, but also considers the condition of the landscape (intactness) and the community and cultural associations and values placed on the landscape.

- The Yarra Ranges Planning Scheme recognises, through a series of Significant landscape Overlays. Landscape significance is attributed to locations south and east of the quarry site and to the woodland area within the quarry site. The SLO system recognises the specific qualities of each of the SLO landscapes as well as the visual relationship between each of the SLO landscapes, including the quarry site, and the Dandenong Ranges landscape from key eastern suburb and main road viewpoints.
- The Dandenong Ranges National Park is an important leisure destination and a conservation area of state significance. The value of the landscape for **tourism and recreation** is considered **high**, as scenic quality represents a drawcard for tourism. The Ranges landscape also provides a visual backdrop to nearby land use areas. The scenic quality of the mountain landscape and the views to the west over the city from designated scenic viewpoints are important features that reinforce the metropolitan value of the landscape.

5.12 Pattern of Viewing

The pattern of viewing within the study area and the visual relationship between different development settings has been specifically recognised within the Local Planning Scheme through the application of Significant Landscape Overlays.

- The southern and south-eastern edges of the quarry site and adjoining low density residential and reserve areas to the east are considered significant 'forest dominated' landscapes (SLO1) that form an uninterrupted visual connection between Melbourne's outer eastern suburbs and the Dandenong Ranges landscape.
- General residential and low-density residential areas east of the quarry site (Foothills and Rural Townships SLO22) are classified on the basis of a visually dominant landscape and related environmental values.
- Green Wedge areas to the south of the quarry site (SLO6) is classified on the basis of its rural landscape and bushland mosaic characteristics that allow middle and long distance views from the valley to the Dandenong Ranges.

Each of these landscape types, as a result of landform, irregular pattern of development, vegetation height and density, are largely 'immersive landscapes' that have the capacity to contain on-site views and to visually absorb small scale changes. In these settings, road corridors and elevated locations provide the major opportunities for longer distance views that connect local landscape settings with the Dandenong Ranges landscape backdrop.

The Significant Landscape Overlay system acknowledges the specific visual relationship between local landscape character settings and the Dandenong Ranges landscape. On that basis, views that connect foreground and background landscapes, particularly from high volume major east-west road corridors and open space areas are important as they are seen to define the overall visual character of the suburban edge.

View-point elevation, road orientation, vegetation height / density and the placement of structures are each major factors that allow connected views of foreground and background landscapes. These factors are more important than viewing distance.

The pattern of viewing has been assessed through ZVI modelling, indicating a theoretical 'seen area from the existing quarry site, and through on-site inspection and photography of possible viewing locations. Selected viewpoints relate to the existing quarry site (baseline condition) and to the proposed new conditions assessment that is described in the following section. These viewpoints are representative of potential static and / or moving filtered views from regional roads and static views from residential development areas and rural residential locations. The selected viewpoints represent what are considered to be:

- Viewpoints that represent the 'most typical' viewing conditions across a range of settings and viewing distances.
- Viewpoints that represent potential 'worst case' visibility situations under all possible conditions.

Zone of Visual Influence (ZVI) modelling

Zone of visual influence modelling indicates a theoretical 'line of sight' between a location, in this case a string of ground level points around the top edge of the existing quarry pit, and the surrounding area. The ZVI model is intended to identify locations and areas that may experience views of the existing quarry and any changes resulting from potential future development.

- The model is based on terrain only and does not consider structures, vegetation, minor terrain changes or other features that may block views to and from the site. Actual views are established by on-site photography and wireframe modelling.
- The modelling represents a 'seen area'. A higher number of seen points potentially, but not necessarily, represents a more substantial view. The purpose of the modelling is to identify candidate visual receptor points only. Actual views from representative viewing locations and related visual impacts are established by on-site inspections and the use of site photography and wireframe modelling.
- The modelling extends to a distance beyond a 5km radial distance from the site boundary. That distance is considered to represent a 'distant' view within the context of this project and a point at which any visual effects related to the quarry are likely to be minimal or not evident.
- Representative viewpoints are selected from a range of distances and in locations that are likely to represent 'most typical' and 'worst case' viewing conditions for both the existing quarry and the proposed change.

  Distance perception factors are described in Section 2.3 Table 4.

Zone of Visual Influence (ZVI) – overall existing pattern of viewing

The cumulative ZVI model results are heavily influenced by landform. The results shown in Figure 47 indicate:

- The existing quarry occupies the north-western face of a low ridgeline. This landform effectively controls views of the existing quarry pit and processing facilities. On that basis, the majority of possible existing site views are available from the western half of the study area which has a flatter terrain than areas in the eastern half. Landform elevation and aspect are the key variables.
- The possible extent of views (the number of seen points within the top edge of the existing quarry) generally increases with distance from the quarry site as a result of the change in viewing angle or elevation. While the extent of the view may increase with distance, the viewing distance is likely to substantially reduce the apparent visibility of the quarry site.
- The greatest extent of potential viewing is available from the steeper and elevated western edge of the Dandenong Ranges formation, particularly in the area of Burkes Lookout and the Mount Dandenong Observatory.

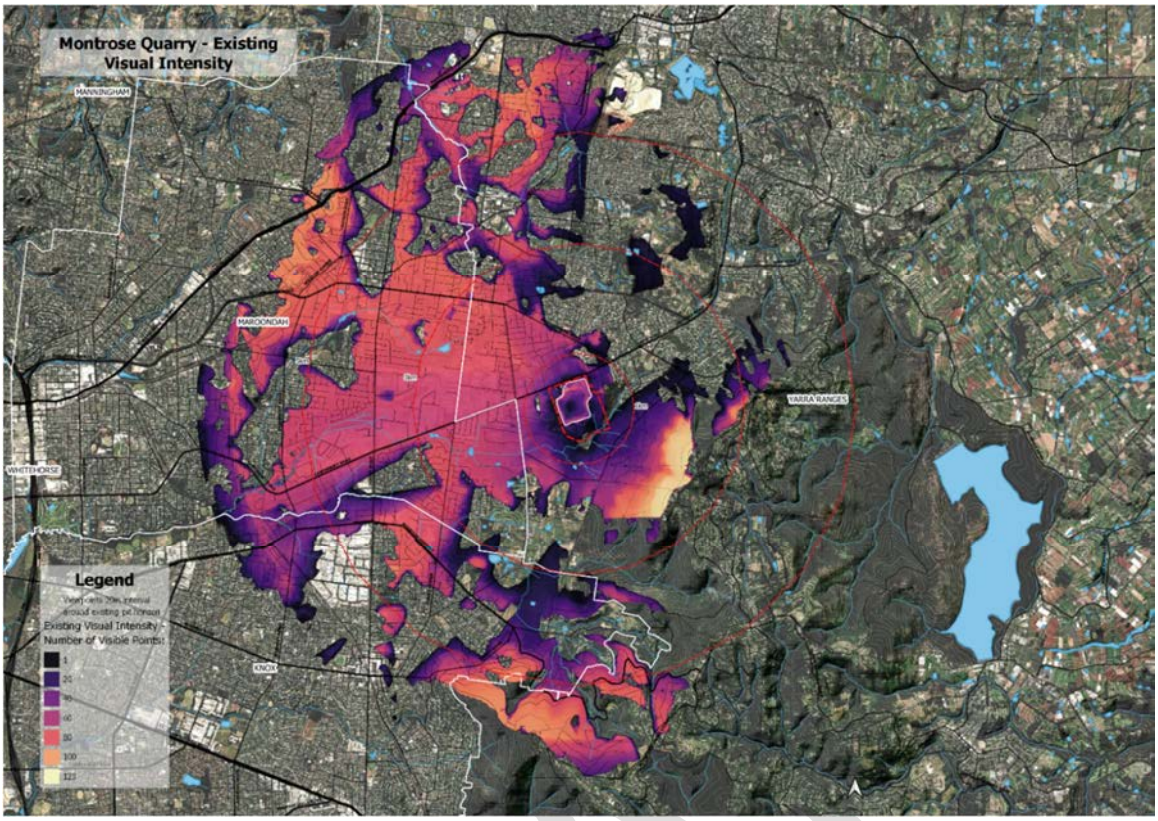


Figure 47: Cumulative ZVI – outward line of sight visibility from points around the edge of the existing quarry pit title

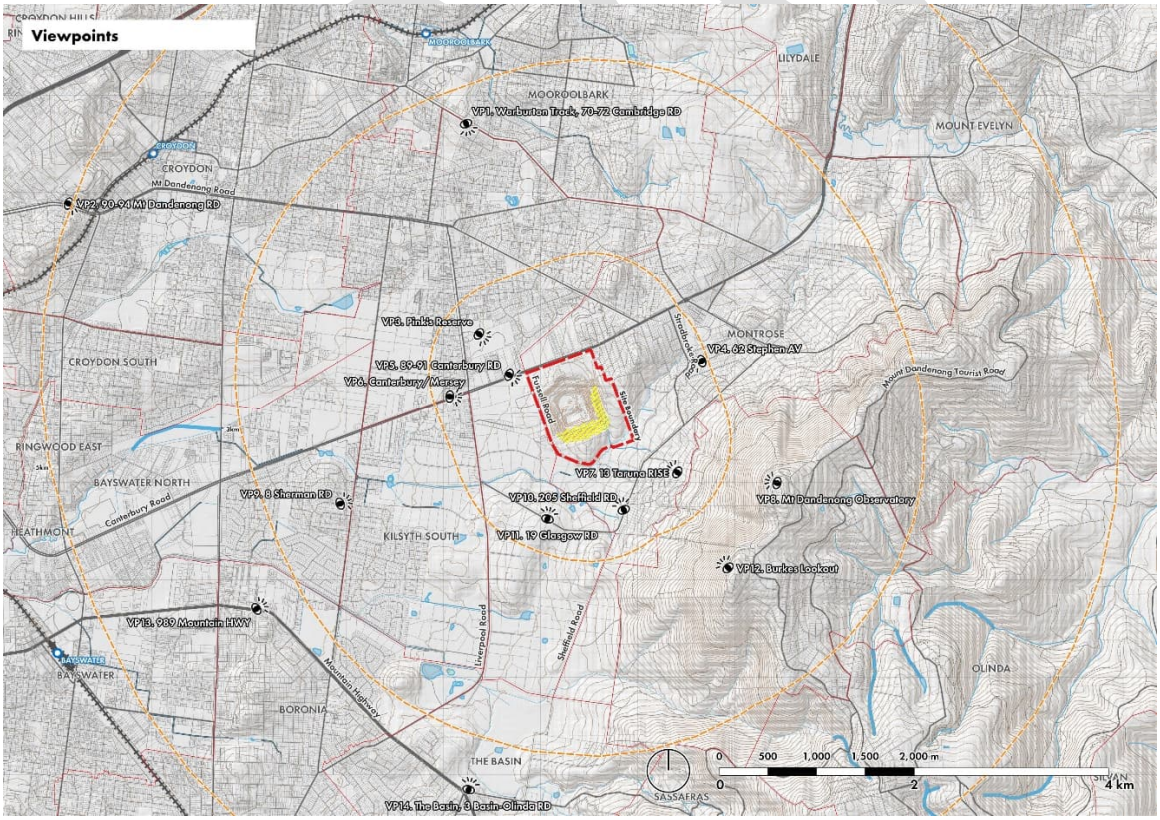


Figure 48: Pattern of viewing – selected representative view-points

5.13 Existing conditions assessment – representative viewpoints

Refer to the separate Appendix document for full scale (A3) images of all site photographs, ZVI modelling and wireframe modelling.

Photo images with wireframe modelling for existing and proposed future conditions are provided in two formats:

- An 80° photo panorama sequence. This format is intended to illustrate the visual context of the development within a wider field of view.
- A standard single full frame 50mm lens photograph which is intended to provide a true visual scale image of the existing and proposed conditions. (Based on an A3 sized printed image held at arms length, as shown in the Appendix).

The following data highlights the theoretical extent of visibility (ZVI) from each representative viewpoint and the actual view from those locations, shown as a wireframe image. Findings are described in Table 8.

VP1 Warburton Track @ 70-72 Cambridge Road

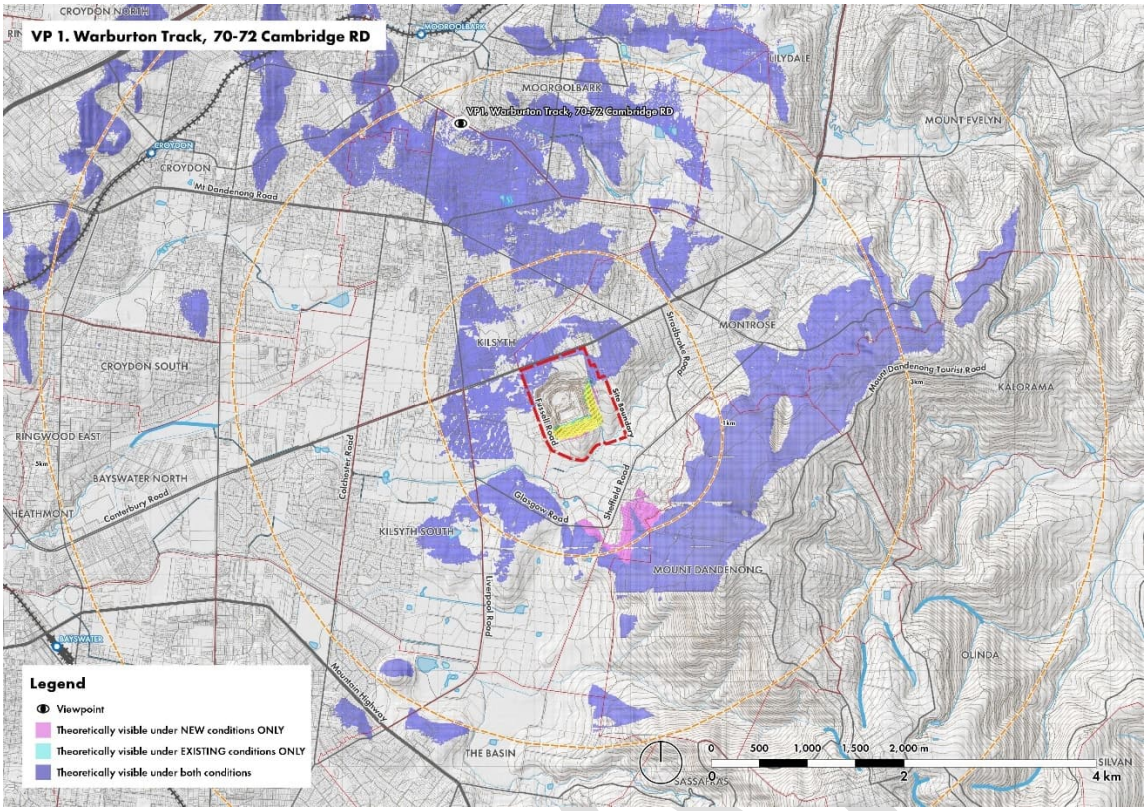


Figure 49: VP1 ZVI – inward line of sight visibility

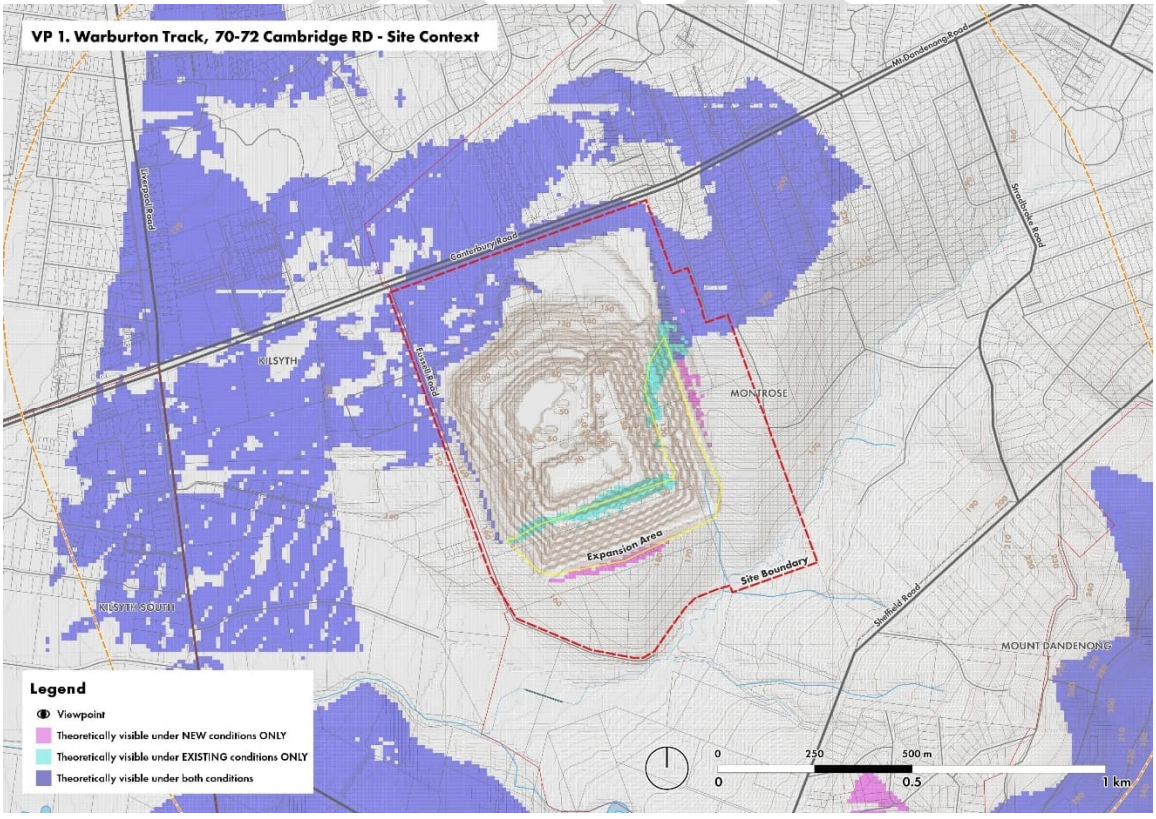


Figure 50: VP1 ZVI – inward line of sight visibility – enlargement

Figure 51: VP1 existing 80° panoramic view

Figure 52: VP1 existing view (full frame photo)

VP2 90 – 94 Mt Dandenong Road

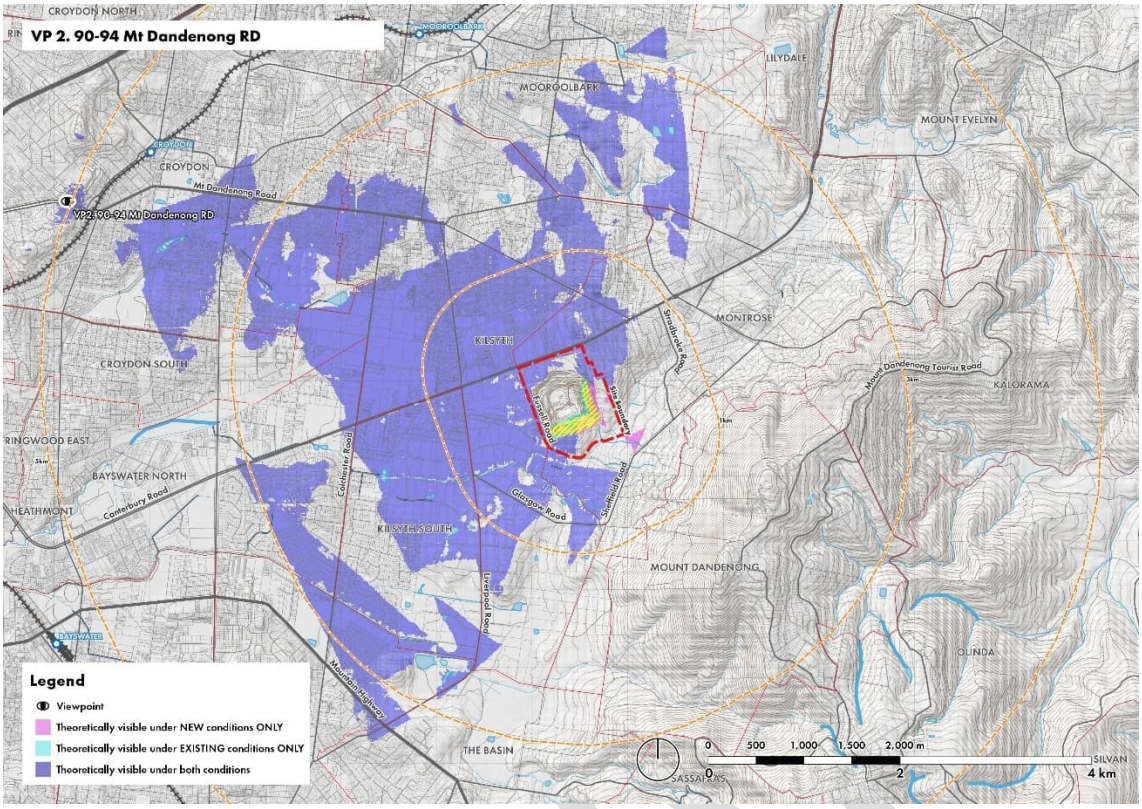


Figure 53: VP2 ZVI – inward line of sight visibility

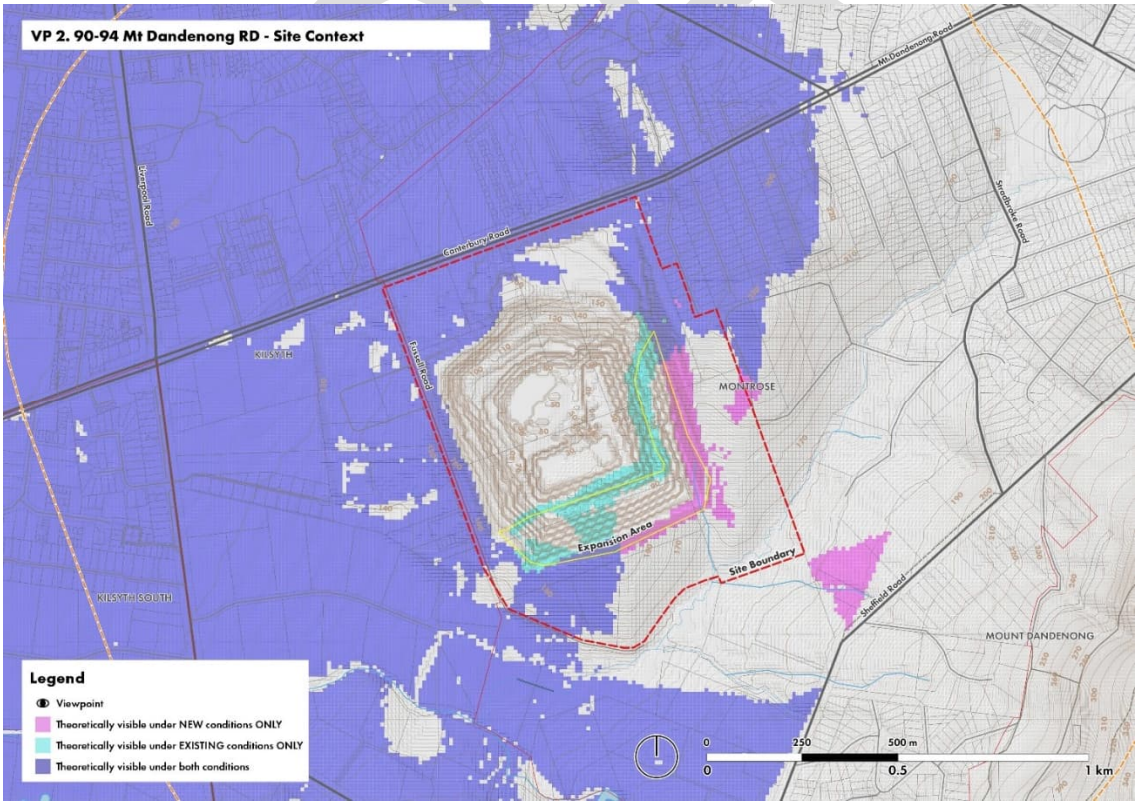


Figure 54: VP2 ZVI – inward line of sight visibility - enlargement

Figure 55: VP2 existing 80° panoramic view

Figure 56: VP2 existing view (full frame photo)

VP3 Pink's Reserve

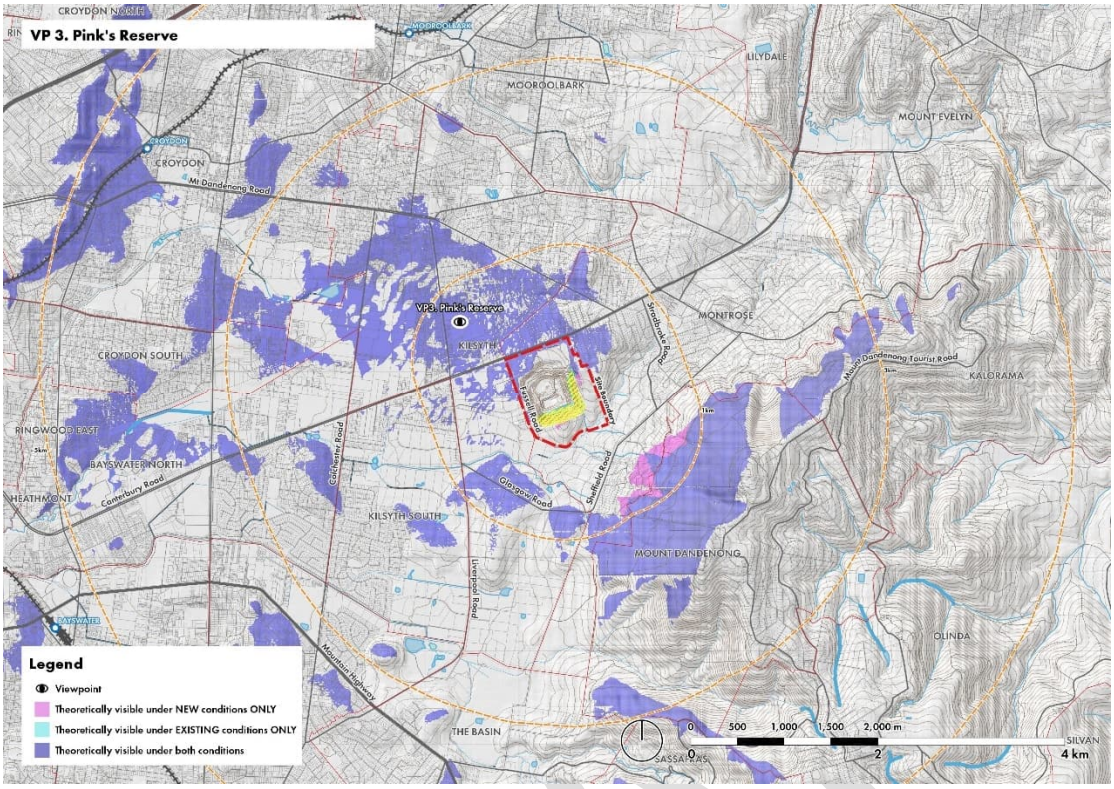


Figure 57: VP3 ZVI – inward line of sight visibility

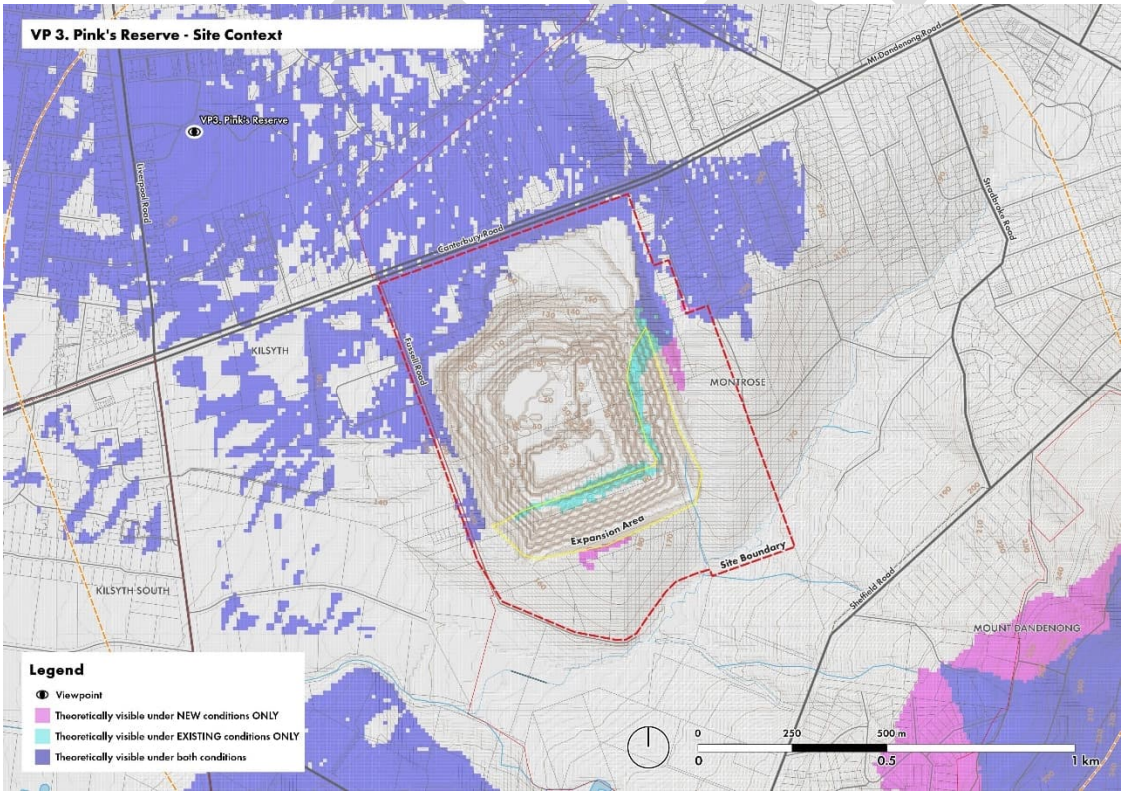


Figure 58: VP3 ZVI – inward line of sight visibility – enlargement

Figure 59: VP3 existing 80° panoramic view

Figure 60: VP3 existing view (full frame photo)

VP4 62 Stephen Avenue

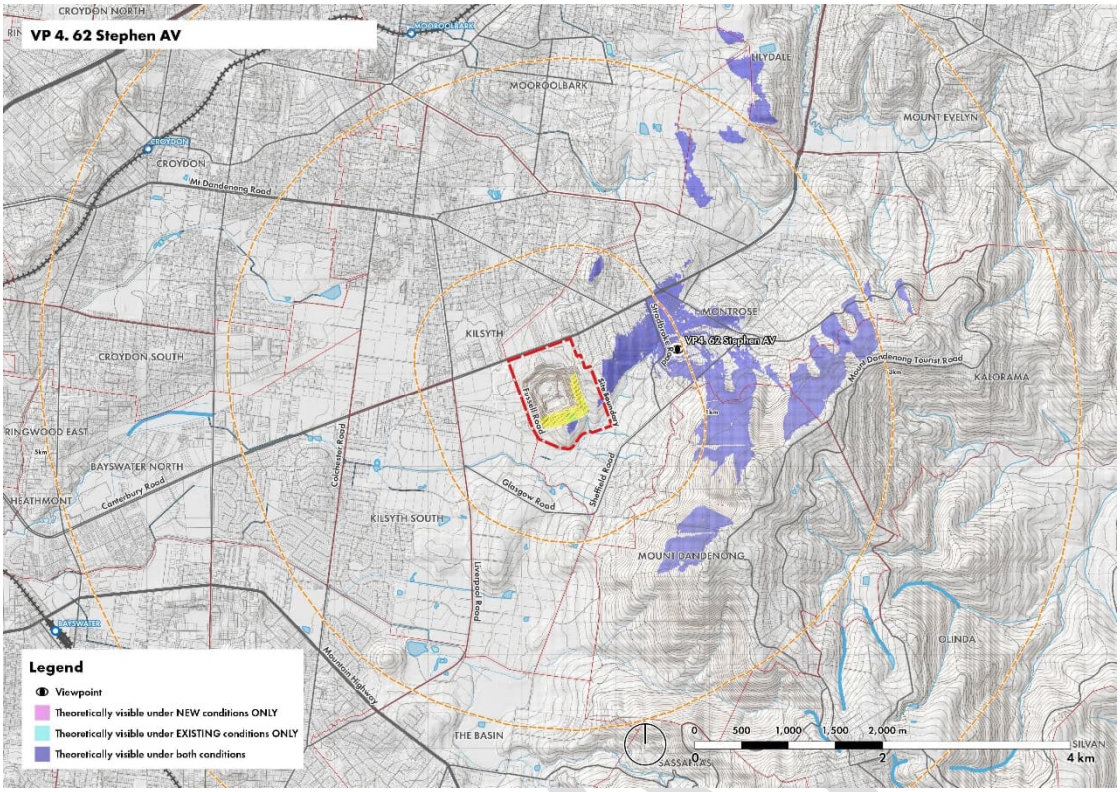


Figure 61: VP4 ZVI – inward line of sight visibility

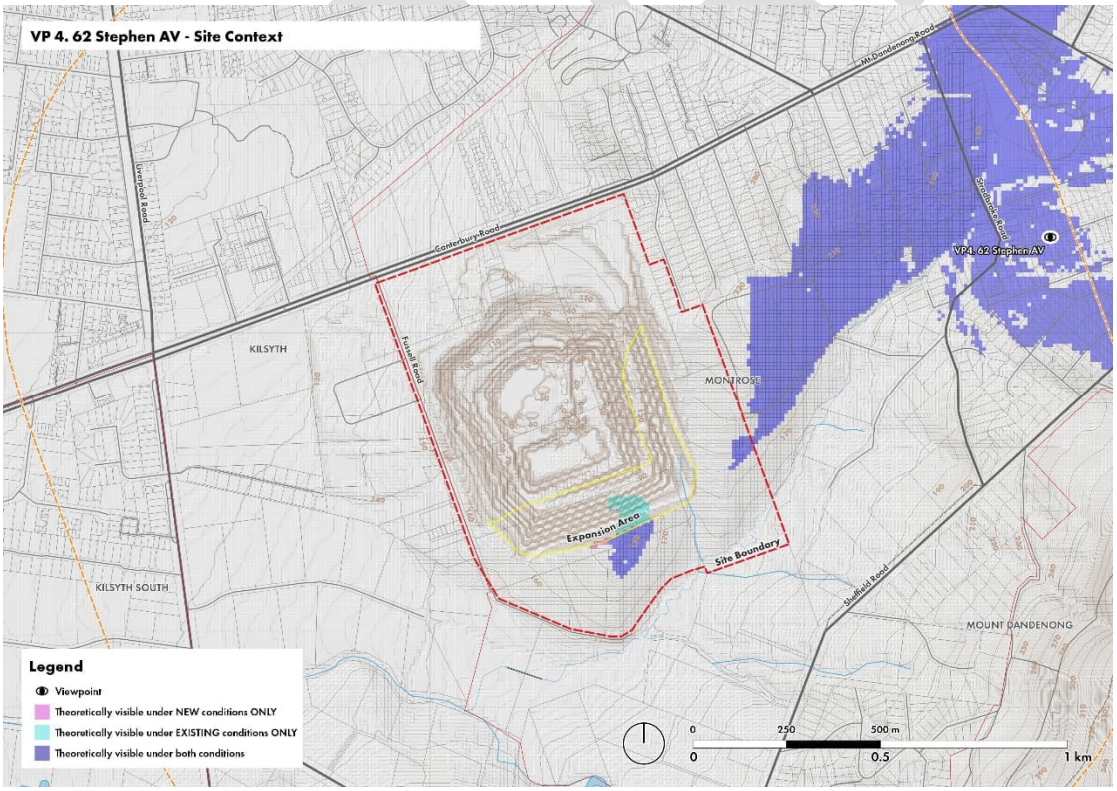


Figure 62: VP4 ZVI – inward line of sight visibility – enlargement

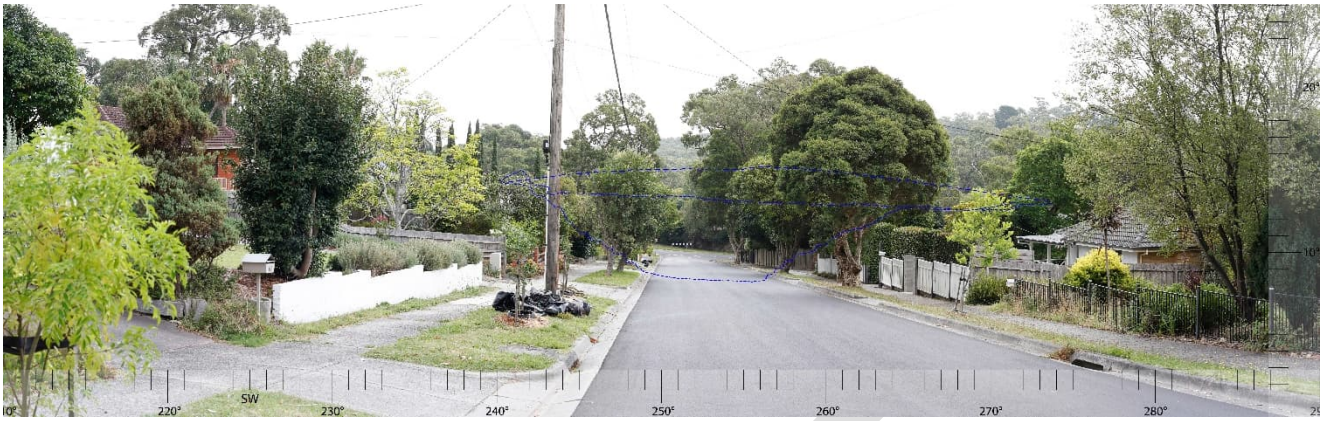


Figure 63: VP4 existing 80° panoramic view

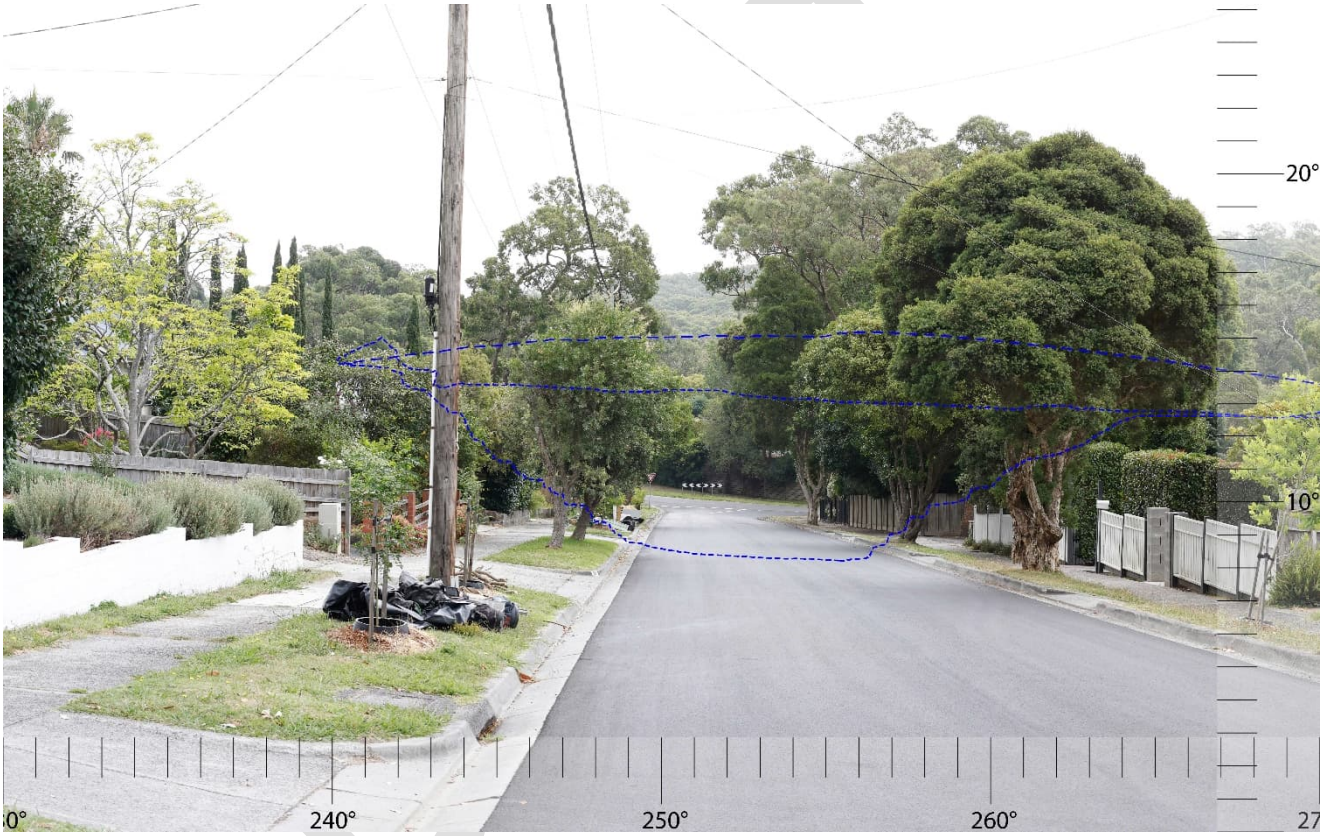


Figure 64: VP4 existing view (full frame photo)

VP5 89 – 91 Canterbury Road

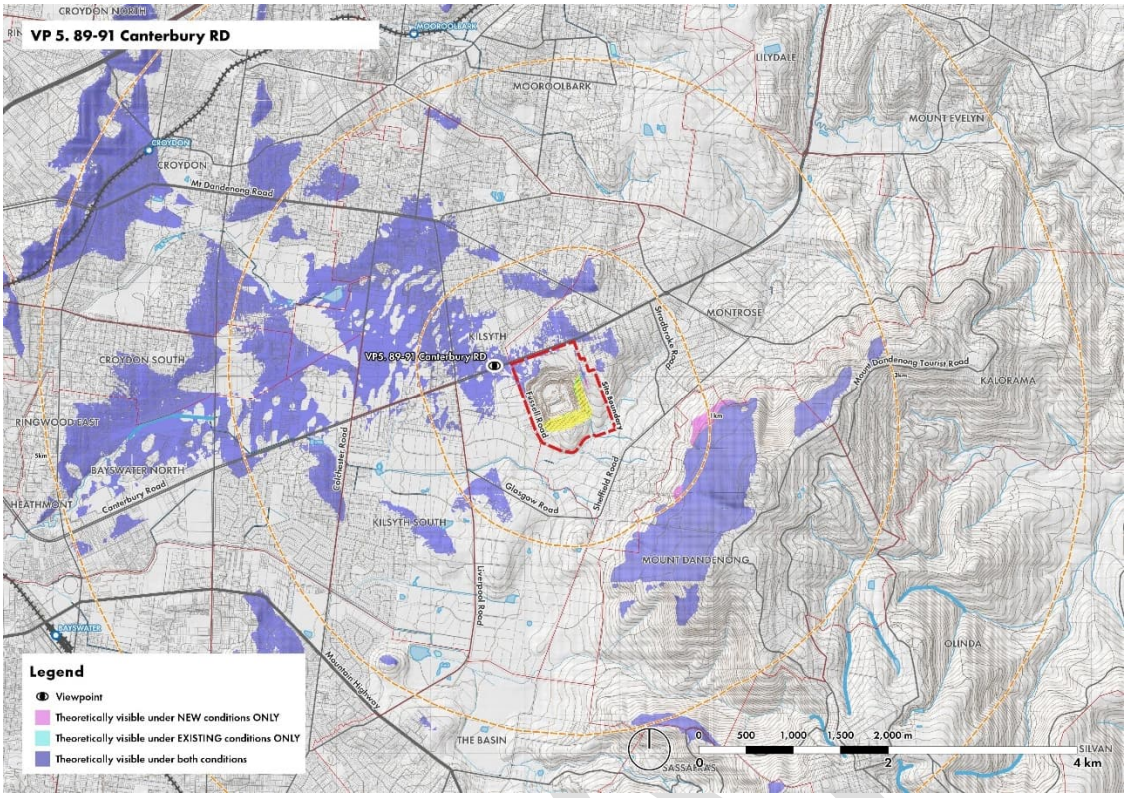


Figure 65: VP5 ZVI – inward line of sight visibility

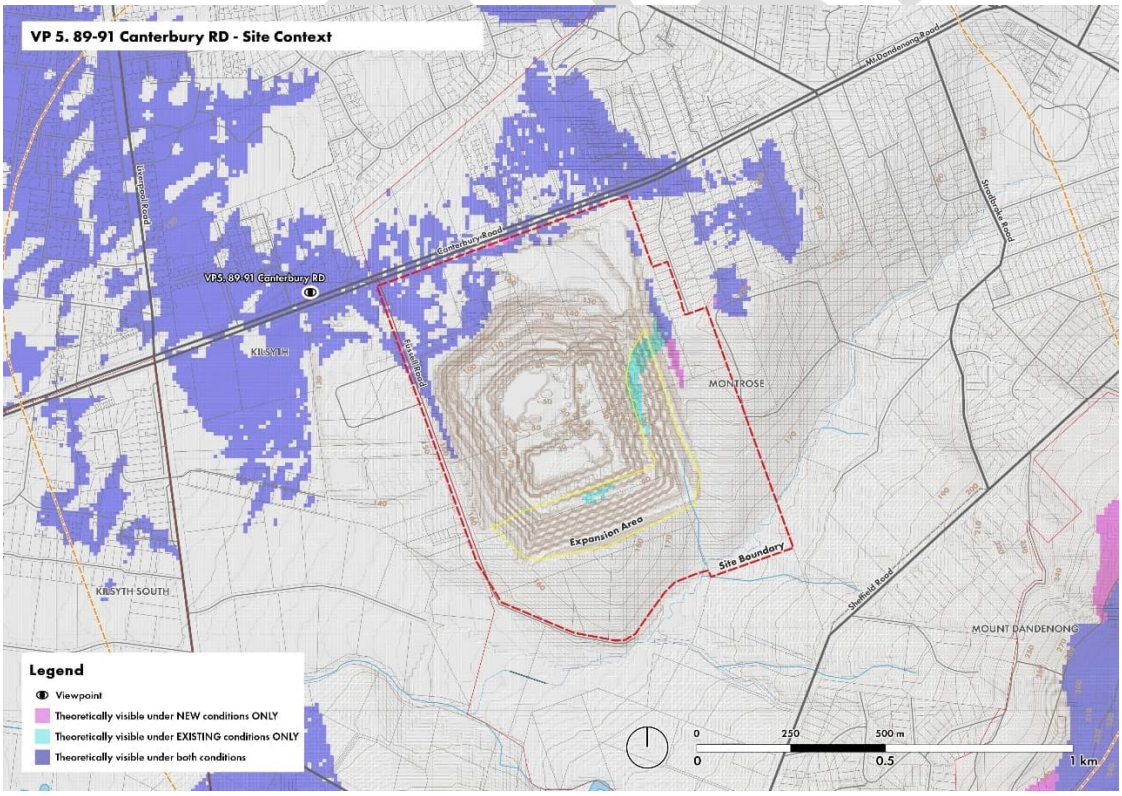


Figure 66: VP5 ZVI – inward line of sight visibility – enlargement

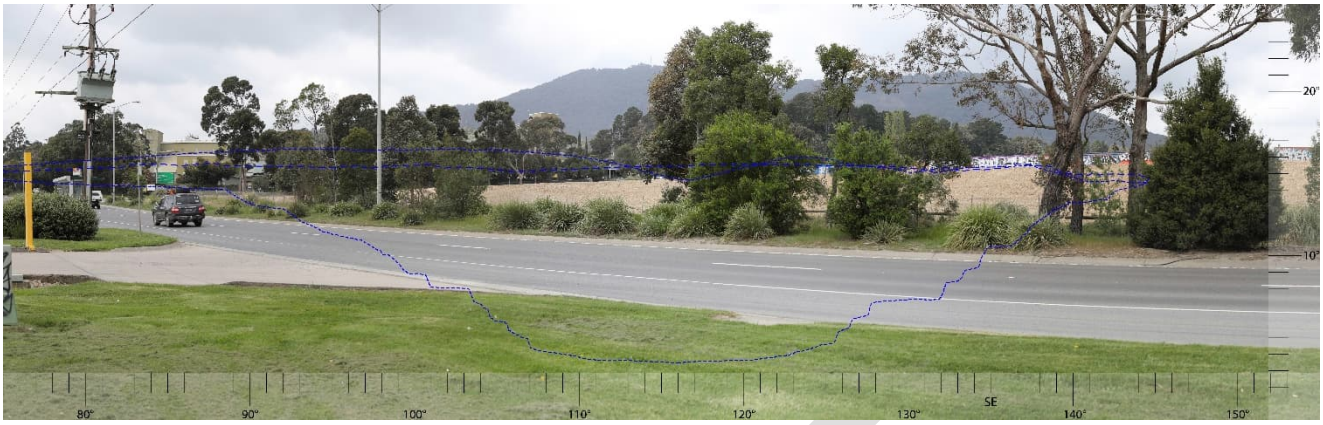


Figure 67: VP5 existing 80° panoramic view

Figure 68: VP5 existing view (full frame photo)

VP6 Corner Canterbury Road & Mersey Road

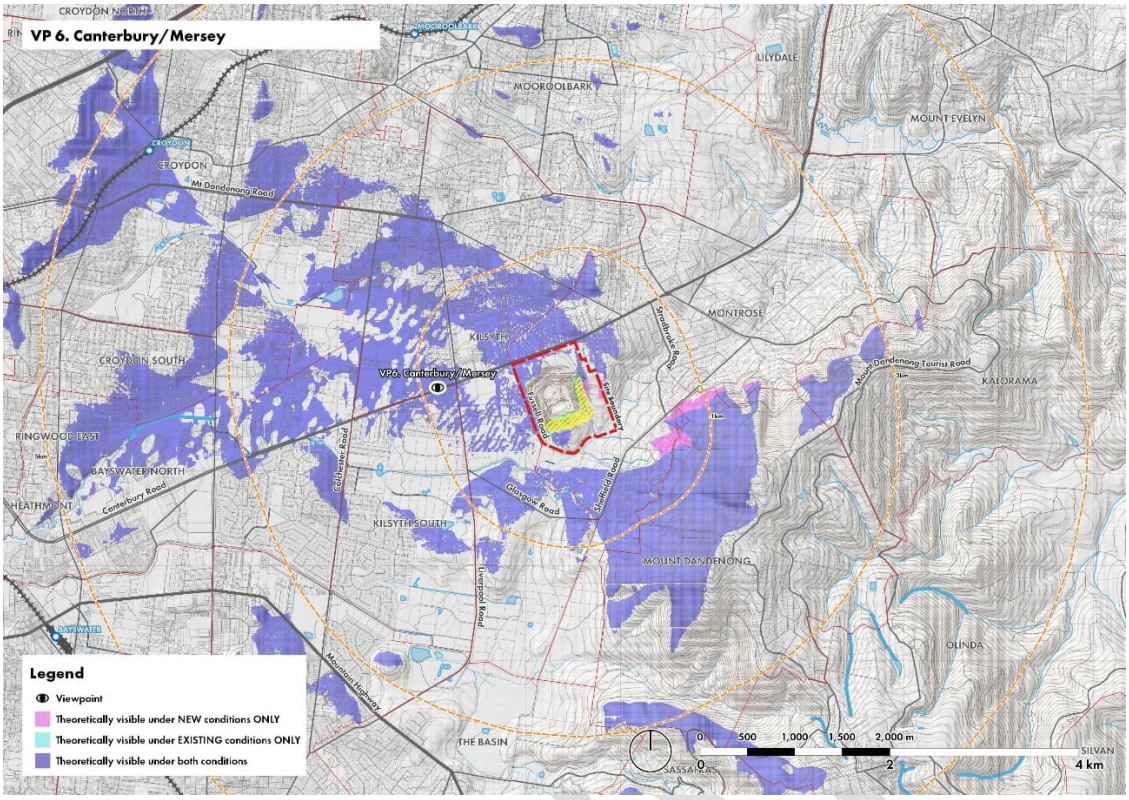


Figure 69: VP6 ZVI – inward line of sight visibility

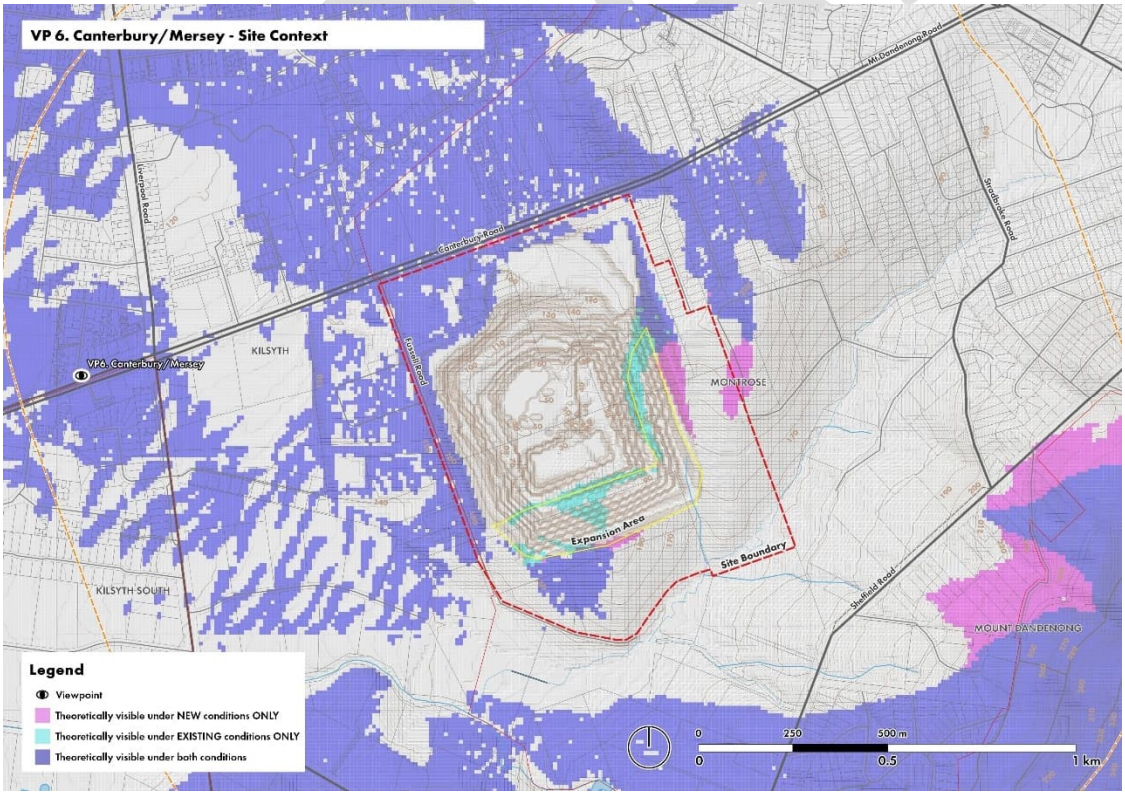


Figure 70: VP6 ZVI – inward line of sight visibility – enlargement

Figure 71: VP6 existing 80° panoramic view

Figure 72: VP6 existing view (full frame photo)

VP7 13 Taruna Rise

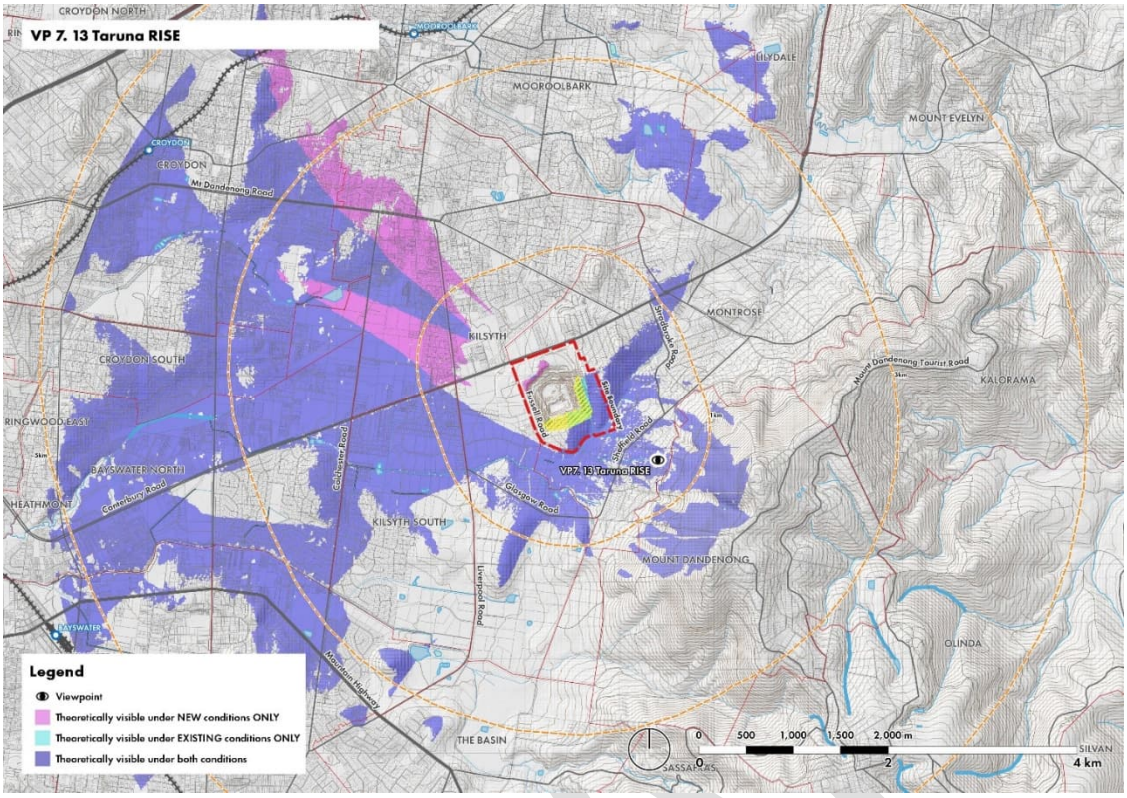


Figure 73: VP7 ZVI – inward line of sight visibility

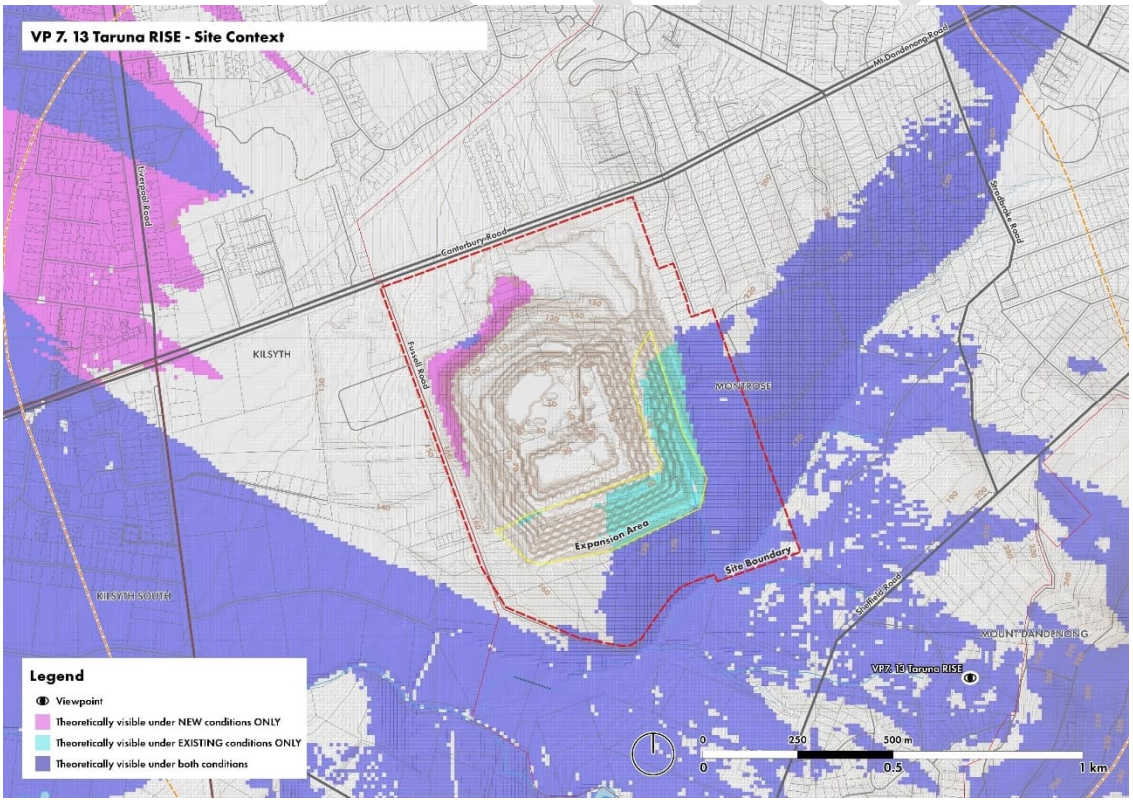


Figure 74: VP7 ZVI – inward line of sight visibility – enlargement