Visual Impact Assessment

CEAL Limited trading as Multiquip Quarries

5152 Oallen Ford Road, Bungonia NSW 2580

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4Pillars
ENVIRONMENTAL CONSULTING

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Statement of capacity

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Acknowledgement of Country

4Pillars acknowledges the Traditional Owners of the land on which this site is located, the people of Gundungurra nation. We pay our respects to their Elders past and present.

1. Introduction

1.1 Background

4Pillars Environmental Consulting Pty Ltd (**4Pillars**) was engaged by CEAL Ltd (Multiquip Quarries) to conduct a Visual Impact Assessment (**VIA**) of Ardmore Park Quarry Project (**the Quarry**).

This VIA identifies privately owned residences that are likely to experience visual impacts during the construction and operation of the project and provides recommendations for additional mitigation measures (where necessary) that could be implemented to reduce visibility of the project.

1.2 Scope of assessment

This assessment focuses on the key visual issue of impacts on visual amenity at surrounding receivers. For the purpose of this assessment, visual impacts are those that arise from changes in the visual appearance of the landscape, causing impacts on visual amenity at privately owned residences.

The methodology followed in completing this assessment includes:

- Review of documentation relevant to the project;
- Description of visual character within the local area;
- Site visit and collection of photographic evidence;
- Identify points of visibility at surrounding receivers; and
- Describe a range of mitigation measures to reduce impacts on landscape and visual character.

Whilst there are no state or national guidelines for the preparation of a VIA, this report has been prepared by professional consultants with experience impact assessment professional, in accordance with current standard industry practice and the guideline prepared by Transport for NSW; *Guideline for landscape character and visual impact assessment EIA-N04* (August 2020).

1.3 Project Approval requirements

Project Approval for extractive industry and processing operations at the quarry was issued by the Minister for Planning on 20 September 2009. On 8 October 2010, Modification 1 was approved for the realignment of the entranceway to the quarry to Oallen Ford Road and Lumley Roads. On 11 December 2013, a second modification was granted for limited quantities of local sales of quarried products along specified local routes, and the principal haul routes. A third application to modify the quarry under Section 75J of the *Environmental Planning and Assessment Act 1979* was submitted on 10 January 2018 (**Modification 3 or Mod 3**).

The application was accompanied by an Environmental Assessment prepared by R. W. Corkery & Co Pty Ltd. In July 2020 Modification 3 was approved by the Department of Planning, Industry and Environment, allowing the site to increase extraction area, to increase permitted operating hours of product transportation and to increase the number of heavy vehicles permitted to dispatch from the quarry on a daily basis. This report has takes into consideration the requirements of Schedule 3, 32 (a)-(b) of the Mod 3 Approval.

2. Methodology

2.1 Desktop analysis

The first stages of this VIA involved describing the character and sensitivity of the landscape and the nature of the visual amenity to provide a point of comparison for assessing visual impacts. Following the establishment of visual character within the locality, receivers surrounding the quarry were identified, and further narrowed down to those that would experience visual impacts as a result of the project.

- Desktop study of existing documents and guidelines;
- Identification of potential receivers of visual impacts;
- Identification of viewpoints at receivers within the study area surrounding the quarry; and
- Determine the sensitivity receivers of visual amenity impacts.

Locality

Ardmore Park Quarry located at 5152 Oallen Ford Road, Bungonia NSW. The Quarry lies approximately 4km south of Bungonia village, and 25km south-east of Goulburn. The site is situated within the Goulburn Mulwaree Local Government Area. The predominant features of the landscape include grazing pastures and grassy woodlands. Characteristic landforms of the area include distinct plateaus amidst steep, deep margins on the Great Escarpment dropping into the Shoalhaven River to the east of the quarry. Strong linear ridges exist in sandstone and valleys in this area due to volcanic activity. Topography of the area is reflective of Ordovician to Devonian tectonic activity, causing the dominant features of this region are remnants of plateaus, granite basins with prominent ridges to the east and steeply entrenched streams and valleys.

The site boundary covers an area approximately 286 ha in size, with the approved extraction area within the site boundary making up approximately 50.5 ha at between 605-615m AHD. The quarry site is adjacent to land predominantly utilised for agriculture, and is within the Southern Tablelands geographic region, to the west of the Great Dividing Range in New South Wales, Australia. Communities of mature Southern Tablelands Grassy Woodlands vegetation comprising of several Eucalypt species growing up to 20m at maturity exists around the site boundaries, except on the eastern boundary where land has been previously cleared for agricultural purposes. Deciduous pines at varying levels of maturity are currently established adjacent to internal access roads at the Quarry. Grassy pastures extend beyond the eastern boundary of the Quarry, continuing onto the adjacent property (Receiver 3). Due to the wide expanse of the rural land surrounding the Quarry, the study area is considered to be broadly homogenous in character and the designation of separate zones visual character zones was not deemed necessary for this assessment.

Six properties containing private residences were identified throughout the desktop assessment which were deemed to potentially experience visual impacts due to their proximity to the Quarry. The residential addresses, distance and direction in relation to the quarry extraction area are presented below in Table 1.

Receiver number	Name	Address	Distance to extraction area	Distance to processing area	Direction
Receiver 1	Reevesdale Station	346 Inverary Road, Bungonia	1.2 km	1.3	North east
Receiver 2	Inverary	590 Inverary Road, Bungonia	1.6 km	1.9 km	North east
Receiver 3	Inverary Park	550 Inverary Road, Bungonia	1.2 km	1.6 km	North east
Receiver 4	Darmar Lodge	5025 Oallen Ford Road, Bungonia	1.1 km	1.5 km	North west
Receiver 5	Olsiers	5028 Oallen Ford Road, Bungonia	0.6 km	1.3 km	North west
Receiver 6	Chapman Hill	5194 Oallen Ford Road, Bungonia	1.3 km	1.1 km	North

Table 1: Nearby receivers

Evaluation of Impacts

Sensitivity of receivers and magnitude of effect upon the surrounding landscape are used to rate the impact on individual receivers within the study area. The rating considers the location of the project, topography and heights of vegetation and visual screens. It is considered critical to find a balance between determining the level of impact based on reasonable outcomes for all stakeholders i.e., the receivers and the Quarry, as it is noted that sensitivity to visual impacts is a subjective to the individual experiencing them. Existing studies and regulatory requirements of the Approval have

previously considered the magnitude, extent and sensitivity around the project, these considerations have been taken into account to determine the visual impact rating assigned to receivers and to propose mitigation measures. Definitions for sensitivity and magnitude of impacts are provided below in Table 2 and Table 3. These classifications form a visual impact rating matrix (Table 4) which has been adopted to determine a level of impact upon relevant receivers.

Sensitivity	Definition
High	View of the project is experienced by a large number of receivers, and/or the view is of high importance to the receivers affected.
Moderate	The existing visual character is of some degree of quality across the landscape, with some elements of the project within the view. There are a medium number of receivers within the surrounding area.
Low	The visual character is of low scenic quality with a high number of viewpoints to the existing project. There are a small number of receivers within the area.
Negligible	The visual character is highly impacted by multiple surrounding developments and there are minimal or no receivers within the vicinity.

Table 2: Definitions for sensitivity classifications.

Magnitude of change on landscape character	Definition
High	The project causes obvious change in components of the landscape and is significantly different to the visual character of the surrounding area. Features of the project are the most highly perceptible viewpoints to observers.
Moderate	Changes in landscape due to the project are noticeable but not obviously different to the surrounding visual character. These changes form part of the view but are not distinctly different from the surrounding elements of the landscape.
Low	Minor changes in the landscape that are not noticeably different to the surrounding visual character.
Negligible	Imperceptible changes to visual character of the surrounding area.

Table 3: Definitions for magnitude classifications.

		Magnitude			
Sensitivity		High	Moderate	Low	Negligible
	High	High	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Table 4: Visual impact rating matrix.

Impacts that are considered to be short-term have not influenced the assessment of the magnitude of impact. This includes construction work that may be undertaken at the Quarry for periods of less than a week that are not permanent or indefinite in duration. It is of note that the visual impact rating matrix presented in Table 4 forms a vital starting point to assessing visual impacts, however assessment of visual impact is also based upon professional experience and consideration the of multiple factors. For the purposes of this assessment, **high**, **high-moderate**, **moderate** or **low-moderate** impacts are considered to be significant.

ArcGIS Pro Viewshed Analysis

ArcGIS Pro software was used to determine the area in which quarry related activities can theoretically be seen at the viewpoints from residences identified in Table 1. A viewshed analysis was performed utilising topographic and elevation data was to determine the visibility of the Quarry at defined observer points (i.e., the location of residential receivers), while also taking into account height of an average observer (1.75 m). Viewshed outputs provide a useful indicator of how visible locations across landscapes and horizons are to observers from ground level. The viewshed analysis was conducted to determine the visibility of the quarry if there are no visual mitigations in place. Receivers with a viewshed output which indicated potential views of the Quarry were further assessed through 3-dimensional line of sight modelling for further assessment.

Field survey

Field work was conducted by an environmental scientist (T. Nguyen) who is suitably qualified and experienced in conducting impact assessments on 24 March 2021. An extensive inspection of vantage points at locations surrounding the Ardmore Park Quarry Project was conducted. GPS coordinates and a series of individual photographs were captured in panoramic view to document the visual landscape and assess the degree of visibility within the vicinity of the project site from the perspective of residential receivers. Photographs were captured with a 6 mm lens, equivalent to a 52 mm lens on a full-frame camera. These lens specifications are generally considered comparable to the degree of vision to the average human eye.

Data sources

Data sourced from the following organisations was used to complete this VIA:

- Transport for NSW *Guideline for landscape character and visual impact assessment EIA-N04* (August 2020);
- Multiquip Quarry Pty Ltd;
- Kooringaroo 8828-2S Topographic (1:25000) Map, Geoscience Australia (October 2020);
- Geospatial datasets, Esri (Maxar, GeoEye, Earthstar Geographics, CNES, USDA, AeroGRID, IGN, 2021).

3. Visual Impact assessment

3.1 Existing points of visibility

The Quarry is spread across a naturally existing ridge which extends from the east to north east direction across the extraction and processing area. Due to the ridge and undulating landscape, visibility varies widely at the nearest receivers and is largely dependent upon the orientation of building structures that are places of residence in relation to the extraction, processing and waste storage areas of the Quarry.

Following extensive desktop and field studies, the nearest receivers to the Quarry (Receivers 1, 2, 3 and 4) located to the north-east and north-west were generally found to have restricted views of the majority of the quarry, and no significant view of the extraction area due to the rolling topography, bunds and existing vegetation providing visual screening. However, due to the orientation of residential building at Receiver 3 and 4, gaps in visual screening were identified, providing points of visibility to the Quarry.

Figure 1 demonstrates points of visibility at Receiver 3. Receiver 3 has a medium to distant view of the extraction area when facing west (additional photograph of line of sight provided in Figure 5). The viewshed analysis presented in Figure 2 indicates that a section of the eastern portion of the Quarry is visible to Receiver 4. This area is currently utilised for materials storage and dewatering, part of which can be observed at Receiver 3 when facing north east (Refer to Figure 6 for photograph).

3.2 Traffic Movements

Traffic movements are restricted prior to 7:00 am and after 6:00 pm at the Quarry. Truck movements at the site on any given day are not permitted to exceed 88 movements per day. The level of visual impact associated with truck ingress and egress to the Ardmore Park Quarry property is expected to be low magnitude due to the short duration of visibility during these times. This is further mitigated by the existing vegetation planted along the main driveway of Ardmore Park Quarry. It is noted that the canopies of vegetation along the driveway will increase in size with maturity, and a denser visual screening barrier will be achieved over time.

3.3 Proposed Mod 3 Visual Amenity Bund

R.W Corkery & Co. Pty. Ltd were engaged to undertake an Environmental Assessment in December 2017 to support a development application for modification of the Approval to expand the extraction area towards the east. This assessment included consultation with surrounding landowners, the local community representatives and groups, and government agencies and authorities and was approved in late 2020. A detailed assessment of the visual impacts of the development on private landowners in the locality, and identification of key vantage points was undertaken throughout this process. At this time, it was proposed that the establishment of additional visual amenity bunding on the eastern portion of the Quarry at 2-3m in height would ensure that extractive activities would be adequately obscured from residential vantage points to the east of the Quarry.

Three-dimensional modelling of the proposed bunding from Receiver 3's vantage point has been undertaken to assess the adequacy of the specifications for proposed visual amenity bunding. At the time of writing, it is understood that the construction of this bunding has commenced. The outcome of three-dimensional modelling has found that Receiver 3 would still experience a minor degree of visibility to the extraction area if the visual amenity bunding was lower than 3m in height.

3.4 Conclusions

This assessment has taken into account key landscape and visual amenity issues of the Ardmore Park Quarry Project on the landscape and visual amenity of surrounding residences. The purpose of the proposed mitigations presented below are to avoid, reduce and/or remedy impacts on the surrounding environment arising from the project. The proposed mitigations are considered medium to long term measures.

Receiver 3

Receiver 3 is deemed to be affected by a **low-moderate** level of visual impact. Receiver 3 has a long-range view of the Quarry when looking directly west from their property. Receiver 3 is oriented in a position that observers from this location are likely to experience moderate visibility of the quarry due to the elevation of the property in relation to the quarry. The existing topography between the receiver and the site consists of rolling ridges, covered mostly by grassland. The construction of vegetated visual amenity bunding between approximately 3.5 to 4.5m in height is deemed appropriate to mitigate the level of visual impact. It is expected that during the construction of visual amenity bunding, Receiver 3 will experience a short-term impact on visual amenity, however, following the establishment of vegetated visual amenity bunding, the degree of visibility the quarry will be adequately mitigated.

Receiver 4

The viewpoint at Receiver 4 is deemed to experience a **moderate** level of visual impact. This receiver has a long-range view to the designated dewatering area of the Quarry where materials are stockpiled on an ongoing basis. The reddish clay waste is stockpiled at an elevated location in relation to the receiver. Due to the colour contrast between the waste material and surrounding vegetation, observers will tend to notice the presence of the Quarry at Receiver 4. The horizon upon which the quarry is located is largely vegetated, however a small gap in vegetation exists providing a clear line of sight from the viewpoint of Receiver 4. The level of visibility of the Quarry is expected to be adequately mitigated with

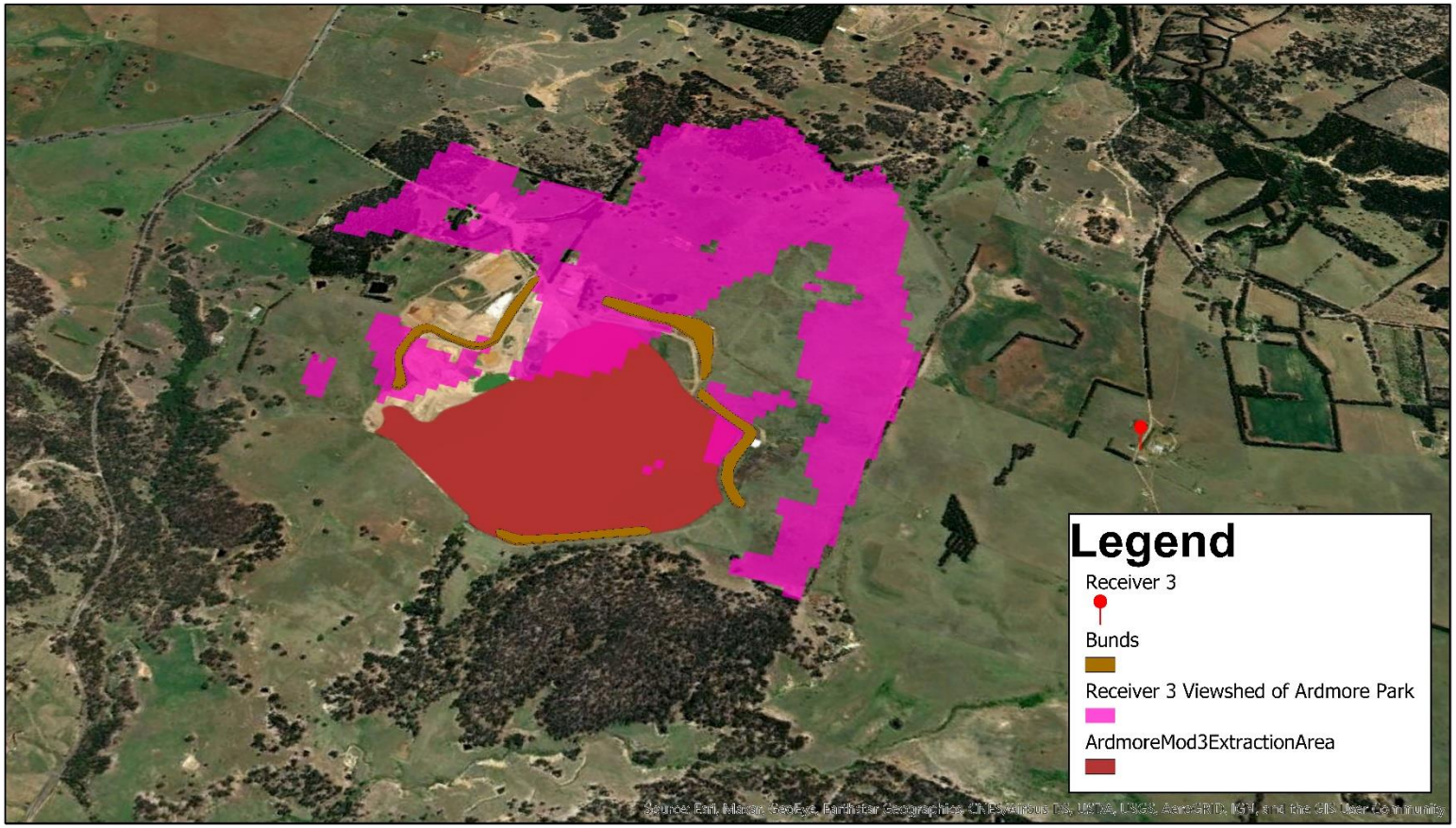
the planting of visual amenity screening vegetation. It is recommended that vegetation be planted at Receiver 4's premises, at the location denoted by the red line in Figure 6. Further to this, vegetation should be planted adjacent and as close to the waste dewatering area as practicality allows. Vegetation should be a mix of densely growing shrub and trees which grow to approximately 15m at maturity. It is recommended that the planting of vegetation starts at the western corner of the dewatering area (Coordinates: -34.898627, 149.947677), extending due north in a linear arrangement for a minimum of approximately 75m.

3.5 Summary of recommendations

- Construction of visual amenity bunding on the eastern side of the quarry extraction area between 3.5 to 4.5m high;
- Planting additional vegetation at Receiver 4 to screen distant view of the waste dewatering area; and
- Establishment of vegetation to serve as a visibility screening at the Quarry premises on the western side of the waste dewatering area.

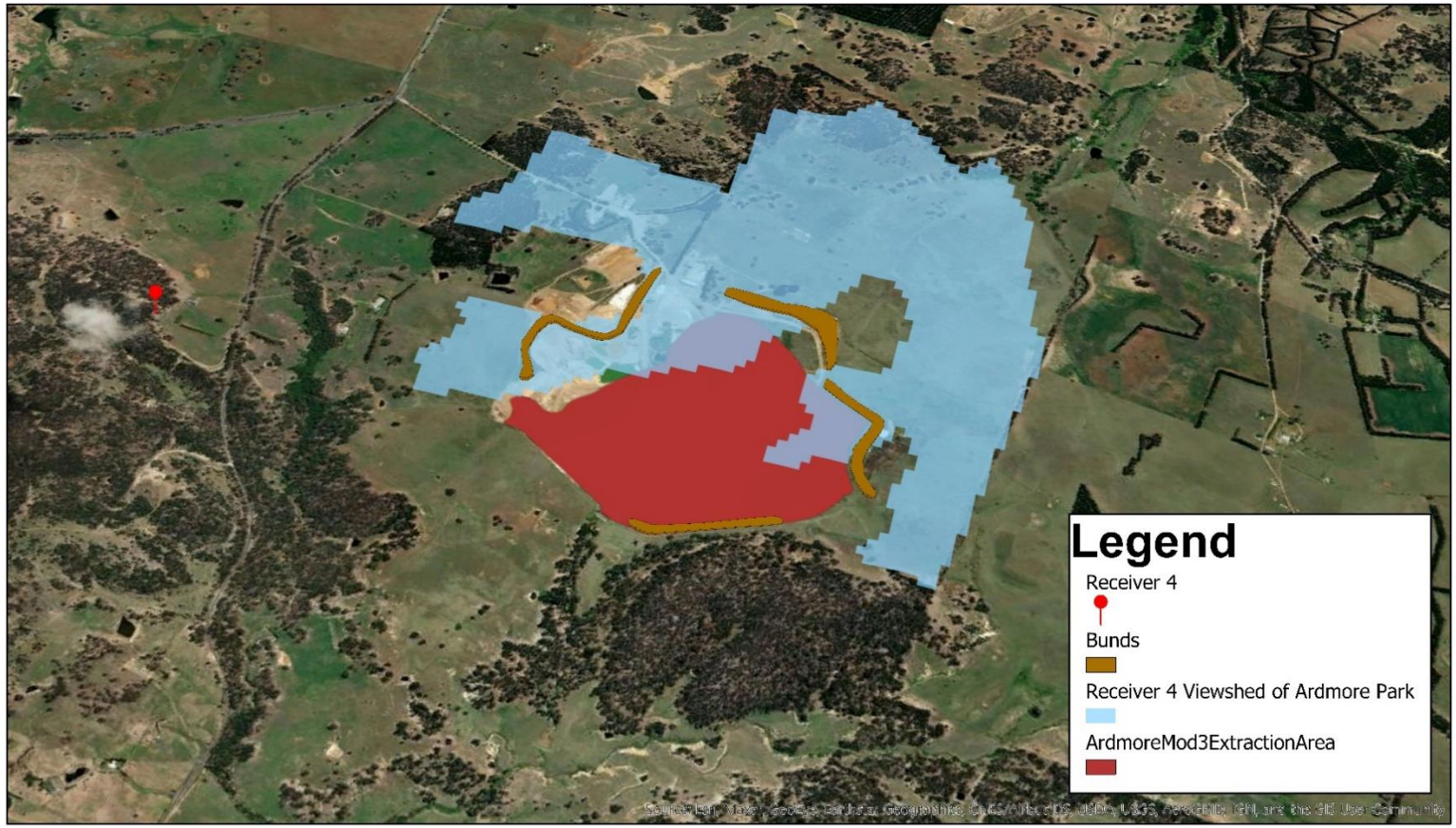
The mitigation measures proposed are considered proportionate to the existing level of impact experienced at the two receivers identified within this report. The adoption of these mitigation measures is likely to result in a medium to long term visual amenity improvement at the Ardmore Park Quarry Project. This assessment has taken the requirements of the Approval into consideration. This includes the identification of privately owned residences that are likely to experience significant visual impacts during the construction and operation of the project, and a description of mitigation measures that are recommended to reduce visibility of the Quarry.

Figure 1: Receiver 3 Viewshed



Drawn by:	TN	**Report reference:** 2021MUL – Visual Impact Assessment	**Key:**	Refer to legend.
Date:	25/03/21	**Image source:** 4Pillars Environmental Consulting		

Figure 2: Receiver 4 Viewshed



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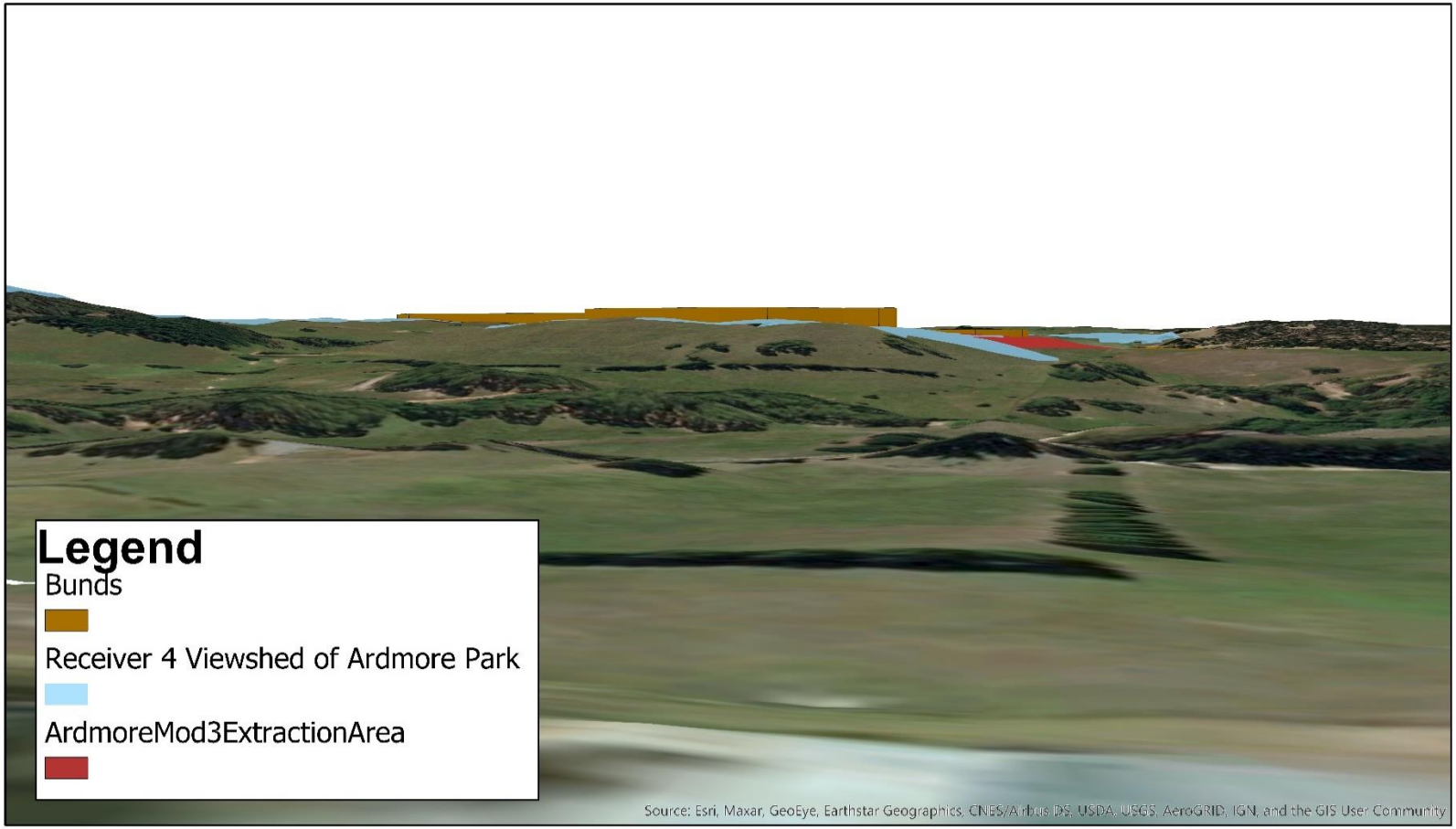
Date:	25/03/21	**Image source:** 4Pillars Environmental Consulting		

Figure 3: Three-dimensional modelling of proposed eastern visual amenity bund

Drawn by:	TN	**Report reference:** 2021MUL – Visual Impact Assessment	**Key:**	Refer to legend.
Date:	25/03/21	**Image source:** 4Pillars Environmental Consulting		

Figure 4: Three-dimensional modelling of western visual amenity bund



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Basemap Imagery: MapBrowser, © Nearmap [01/01/2005]

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Date:	25/03/21	**Image source:** 4Pillars Environmental Consulting		

Figure 5: Photograph of view from Receiver 3 (facing west)	Figure 6: Photograph of view from Receiver 4 (facing north east)
	

Captured by:	TN	**Report reference:** 2021MUL – Visual Impact Assessment	**Key:**	Red line: denotes recommended location of visual amenity vegetation at Receiver 4.
Date:	24/03/21	**Image source:** 4Pillars Environmental Consulting		