

Appendix M

Visual impact assessment

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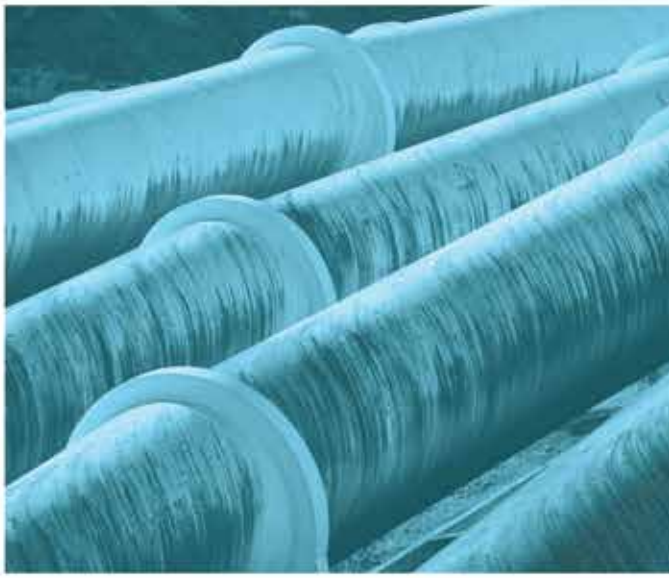
Visual Impact Assessment

Cowal Gold Operations Underground Development & Modification 16

Prepared for Evolution Mining
September 2020

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Visual Impact Assessment

Cowal Gold Operations Underground Development & Modification 16

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23 September 2020

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23 September 2020

Executive Summary

Evolution Mining (Cowal) Pty Limited (Evolution Mining) is the owner and operator of the Cowal Gold Operations (CGO) at Lake Cowal, approximately 35 kilometres (km) north-east of West Wyalong, New South Wales.

The mine operates under a development consent (DA14/98) which was initially granted in February 1999 by the then Minister for Planning. This visual impact assessment (VIA) considers the visual effects and significance of works proposed under a proposed modification of that consent, and also works proposed as part of the underground development Project.

Works addressed in this VIA are:

- the proposal to raise the height of the Integrated Waste Landform (IWL) by 1 metre (m); and
- the proposal to install a Paste Fill Plant (PFP).

The visual impact of the nominated activities is assessed to be in the negligible to low impact range.

The raising of the IWL by 1 m will create a visual impact of negligible significance. For two sensitive receptors, the impact may have low significance provided the placed material is reasonably similar in colour to the existing surrounds. It is also possible that works to create the IWL require temporary mounds or stockpiles to be established as the landform is created. If this occurs, it would only be a minor distinguishable feature in the viewshed existing temporarily until the landform is engineered. Lighting associated with the additional 1 m height is likely to have a negligible impact. There is scope for these impacts to be further mitigated.

The PFP has two potential visual effects, being the installation of surface infrastructure and the use of lighting.

The visual impact of the proposed PFP is limited to six sensitive receptors for whom the visual significance is negligible to low. The impact can be further mitigated by relatively simple design considerations at the installation stage and by the growth of screening vegetation in the longer term.

The proposed lighting associated with the PFP is an ephemeral effect which is an indicator of activity at the mine, rather than a permanent physical change. The cumulative impact of the additional lighting will be negligible as it will be a relatively small effect in the context of the scale of existing operations, including the approved lighting for the mine.

There is a known sensitivity to light spill, as evidenced by a small number of complaints prior to 2013 (which were rectified) and two further complaints in 2019 and 2020, and the conditioning of the CGO consent to require mitigation of potentially obtrusive light from CGO operations. The application of standard light spill mitigation measures (as per Australian Standard AS 4282-1997 *Control of the obtrusive effects of outdoor lighting*) is likely to reduce nightlight visual impacts to a low significance level.

It is also noted that conditions of consent for the mine require rehabilitation of the disturbed areas as soon as practicable, and the Rehabilitation Management Plan includes actions to establish Eucalypt and Riverine Woodland vegetation communities (similar to the surrounding landscape), which will further reduce visual impacts in the medium to long term.

Overall, the significance of the visual impact is assessed to be in the range of negligible to low and mitigation measures are available to further constrain any adverse visual impacts.

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1 Introduction

1.1 Background

Evolution Mining (Cowal) Pty Limited (Evolution Mining) is the owner and operator of the Cowal Gold Operations (CGO) at Lake Cowal, approximately 38 kilometres (km) north-east of West Wyalong, New South Wales.

CGO is an existing open cut mine site which has been operational since mining commenced in 2005 and has approvals in place to continue processing at a rate of 9.8 million tonnes per of ore annum (Mtpa) until 2032. The existing mine site is located immediately adjacent to the ephemeral lake, Lake Cowal.

The mine operates under a development consent (DA14/98) which was initially granted in February 1999 by the Minister for Planning under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and has been modified 15 times since it was granted.

Evolution Mining is seeking to construct and operate an underground mine, box-cut entry and paste fill plant (PFP). It also is seeking to modify existing surface infrastructure under a modification to DA14/98, pursuant to Section 4.55(2) of the EP&A Act.

1.1.1 Underground mine development

The proposed construction and operation of an underground mine includes the following components with potential for creating a visual effect:

- a box-cut entry to the underground workings;
- a decline from the box-cut to provide access for personnel and maintenance;
- six access points to the decline for access, ore haulage, ventilation circuit, underground services and emergency egress; and
- development of a PFP, and the delivery of paste fill via a borehole and the backfilling underground stopes with the paste.

Underground works and operations are not considered to have any visual manifestation at surface level.

1.1.2 Mod 16

The components of the proposed modification which have potential for creating a visual effect are:

- site water management infrastructure, including a pipeline from the tailings deslimer to the PFP and a return water pipeline from the PFP to the processing facility;
- augmentation of dam D5A and other on-site water storages;
- a height increase from 245 m AHD to 246 m AHD to the final rehabilitated height of the integrated waste landform (IWL); and
- ancillary surface infrastructure, such as offices, car parking, workshops, sheds, hard stands, access tracks, toilets and changerooms.

1.2 Matters considered in this visual impact assessment

Of the above-mentioned activities the subject of the underground development and Mod 16 applications, the proposed PFP and change to the IWL and are considered to have relevance to the visual impact assessment.

1.2.1 Increasing the height of the Integrated Waste Landform by 1 m

This activity proposes to iteratively raise the height of the integrated waste landform (IWL) by depositing additional tailings into the IWL. This means that the increase in height will be very incremental and not a sudden change in elevation for the existing buttress.

This component of the proposed development is the subject of more detailed assessed in this VIA.

1.2.2 Development of a paste fill plant

The PFP is surface infrastructure comprising a number of elements, including concrete batching facilities, mix tanks and storage sheds, materials silos, vehicle wash-down and parking.

This component of the proposed development is the subject of more detailed assessed in this VIA.

1.2.3 Box-cut, access points and associated surface infrastructure

In the immediate surrounds of the proposed box-cut, the southern rock emplacement has an elevation of approximately 250 m and the perimeter bund around the main pit has an elevation of approximately 220 m. The northern rock emplacement, further away, has an elevation of approximately 265 m.

The elevation around the edge of Lake Cowal is approximately 205 m. The nearest residential receptor to the west (Corringle Lane) has an elevation of approximately 227 m and there is an existing buttress around the intervening tailings ponds at 230 m AHD (approved to be 245 m AHD). The nearest residential receptor to the south has an elevation of 215 m.

The proposed box-cut, access points and associated surface infrastructure are shielded from views from outside the site by the southern waste rock emplacement and there is little prospect of any of these elements being visible beyond the work areas of the mine itself. These elements therefore not considered further in this VIA.

1.2.4 Augmentation of dam D5A and other on-site water storages

Dam D5A and other on-site water storages are at ground level and are within the existing disturbed area which has elevated perimeter bunds preventing any line of site from surrounding non-mine areas. These works will not be visible beyond the work areas of the mine and are not considered further in this VIA.

1.2.5 Ancillary surface infrastructure

All of these additional structures and activities will be sited within the existing disturbed area which has elevated perimeter bunds preventing any line of site from surrounding non-mine areas. These works will not be visible beyond the work areas of the mine and are not considered further in the VIA.

1.2.6 Placement of additional waste rock

The placement of the additional waste rock from the underground mine is within limits which have been previously assessed and authorised and will not affect the approved height or shape of the waste rock emplacements. No additional assessment is required and this element is not considered further in the VIA.

2 Context

2.1 Purpose

The visual landscape is important because it provides:

- a public good;
- a setting for the day-to-day lives of local communities;
- habitat for flora and fauna;
- a sense of place; and
- opportunities for aesthetic enjoyment.

A visually attractive landscape can also provide economic benefits through recreation and tourism, plus indirect benefits to health and wellbeing.

The purpose of this visual impact assessment is to understand the likely interactions between the proposed development and visual receptors in the vicinity.

2.2 Study method

This assessment is consistent with the *Guidelines for Landscape and Visual Impact Assessment*, prepared by the Landscape Institute and the Institute of Environmental Management and Assessment (2013)

The VIA needs to establish the existing nature of the landscape and visual environment. This includes the range of authorised uses which have modified the environment, such as roads, resource extraction, infrastructure, etc, as well as the natural environment.

Importantly, the assessment seeks to assess only the proposed Project activities, not legacy issues or the impact of historical practices. In this regard, the existing mine, including the void, waste rock emplacements and the tailings storages, form part of the base case.

In the following chapters we describe the existing visual environment, and then consider the visual effect of the proposed development, before synthesising that information to assess the overall visual impact.

When assessing the visual effects, there are two high-level variables to be considered:

- the magnitude of the visual effect; and
- the sensitivity of the receptors to the visual effect.

Visual magnitude is concerned with the development which will generate a visual effect. It considers the size or scale of the change, the duration of the change, and reversibility of the change.

Visual sensitivity is concerned with the people or locations likely to have visibility of the development. It considers the planar distance between the receiver and the proposed development, relative elevations, the relationship of the receiver to the development, and any intervening or mitigating factors such as vegetation, and the ability of the landscape to absorb the change.

When combined, those two variables determine the significance (ie impact) of the overall visual effect.

3 Existing environment

3.1 Introduction

The Project site is located approximately 38 km north of the town of West Wyalong in central western NSW.

The existing Cowal Gold Operation surface activities (hereafter 'the mine') occupies approximately 16 square kilometres (km^2) of land and the landform has been highly modified, including a large open-cut pit.

The surrounding landscape is characterised by Lake Cowal, a large but ephemeral water body, and a patchwork of agricultural land generally used for sheep and producing grains.

3.2 Socio-economic character

The mine is within Bland Shire which is centrally located in regional NSW at the junction of the Newell and Mid-Western Highway, and Goldfields Way. Bland Shire covers approximately 3,248 km^2 and includes the towns of West Wyalong, Wyalong, Barmedman, Mirrool, Naradham, Tallimba, Kikiora, Ungarie and Weethalle.

The Australian Bureau of Statistics (ABS) census records indicate that the West Wyalong census district has a population of 3,141 (2016).

Aboriginal and Torres Strait Islanders comprise 4.7% of the population.

Agricultural activities undertaken locally include predominantly broadacre cropping and sheep grazing. Annual agricultural production value for the West Wyalong region is $22 million (2017). Bland Shire is one of largest cereal growing areas in NSW, producing wheat, barley, oats, triticale, cereal rye, chickpeas, lupins, canola and sorghum.

The key industries providing local employment are:

- gold ore mining;
- local government administration;
- supermarket and grocery store;
- secondary education; and
- grain-sheep or grain-beef cattle farming.

Dwellings are predominantly separate houses (91.8%).

Bland Shire represents itself to the tourism sector as a mix of the quirky and the rural. The attractions and events are extremely varied and include musical events such as Chickenstock, a tractor pull at Barmedman, art trails and murals, gardens, gold mining heritage, wetlands, and Aboriginal art and culture. The Bland Shire website nominates "community spirit" as the best part about living in Bland Shire.

3.3 Primary visual catchment

The primary visual catchment (PVC) represents the area within which views of the Project are located. Consideration of the views within the PVC is the focus of the visual impact assessment.

The approach has been to constrain the overall limit for setting the PVC at a radius of 8 km from the proposed development location. This is because, at 8 km, topographic features become background within a viewshed and this range conservatively represents the extent of the area from which the effect of the development could conceivably be evident in any detail[1]. The conventional limit to 'distant' views is 3 km but having regard to the scale of the mine within which these changes will occur and the horizontal extent of visual elements, and also the generally flat terrain on the region, we have included viewer locations up to 8 km from the proposed works.

The locality of Burcher, approximately 15 km to the north-west of the mine site, is not included because of the viewing distance, and it is noted that there are intervening vegetated ridges and the town is nestled within heavily vegetated land which obscures any view line to the Project site.

3.4 Visual character generally

The regional and local landscape comprises a mosaic of cleared farmland, State forest, vegetated ridges and the Lake Cowal wetland system. The landform is generally flat to undulating, with occasional rocky ridges. The highest point in the locality is Wamboyne Mountain, a ridge approximately 5 km north of the Project site at 407 m AHD, and there is a viewpoint named Billys Lookout, at 368 m AHD, approximately 7 km to the south-west of the Project site.

The rocky ridges typically run north-south and support remnant vegetation as the elevated areas are generally unsuited to cropping or grazing activity. This has produced a series of isolated uncleared pockets, along with areas of land set aside as State forest, as the main residual stands of mature vegetation.

The region is on the boundary of a semi-arid and temperate climatic region, and this has influenced the type of agricultural production which tends to be cropping and grazing.

The hydrological feature of Lake Cowal is a dominant landform and represents a distinct type of landscape which is at variance to the broader landscape which is otherwise generally characterised by rural land use.

Lake Cowal covers an area of approximately 13,000 hectares and is the largest inland lake in NSW. It is part of an ephemeral wetland system that includes Nerang Cowal to the north. The ephemeral nature of the lake means that the visual landscape changes when the lake fills or drains.

Lake Cowal is connected to a series of creeks which generally include a vegetated riparian corridor along the banks. The features include Manna Creek to the north, and Bland Creek, Barmedman Creek and Sandy Creek to the south.

[1] Tomko, M, Trautwein, F & Perves, R S (2009) Identification of practically visible spatial objects in natural environments, DOI: 10.1007/978-3-642-00318-9_1 · Source: DBLP

3.5 Significant topographic features

The significant topographic features for this locality are:

- Lake Cowal and associated creeks;
- elevated rocky ridge lines, including Billys Lookout and Wamboyne Mountain; and
- the mine site.

3.6 Significant vegetation areas

3.6.1 Ridges

Notable elevated ridges, generally vegetated, include

- Fellmans Hill (260 m AHD) situated approximately 1.5 km south of the Project site;
- Wamboyne Mountain (412 m AHD) situated approximately 5 km north of the Project site; and
- Billys Lookout (368 m AHD) situated approximately 7 km south-west of the Project site.

3.6.2 State Forest Reserves

Local areas of vegetated land include State Forests.

i South

- Wyrra State Forest;
- Clear Ridge State Forest; and
- Boxalls State Forest.

ii West

- Corringle State Forest; and
- Lake View State Forest.

iii North-west

- Euglo South State Forest;
- Nerang Cowal State Forest; and
- Manna State Forest.

3.7 Towns

The main regional centre in this area is West Wyalong, approximately 38 km south of the Project site.

A smaller town of Ungarie is situated approximately 35 km to the west, and there is Burcher approximately 16 km to the north-west of the Project site.

None of these settlements have a line of sight to the Project site.

3.8 Roads and transport

The Newell Highway (A39), connecting Forbes and West Wyalong, is approximately 12 km to the east of the Project site. This is beyond the 8 km radius of the PVC.

A number of smaller sealed and unsealed roads transect the region. Lake Cowal Road is the access road to the CGO mine.

There is a short disused railway line between West Wyalong and Burcher. Use of the line was suspended in 2005. The stations along the rail line were closed in the 1970s.

3.9 Tourist sites

Lake Cowal is a regarded as a low-key tourist destination and it attracts visitation predominantly when the lake fills with water (and the birdlife returns). The tourism interest is predominantly focussed on observing birdlife. The majority of promoted tourist sites are in the towns of West Wyalong, Weethalle and Ungarie.

3.10 Recreational areas

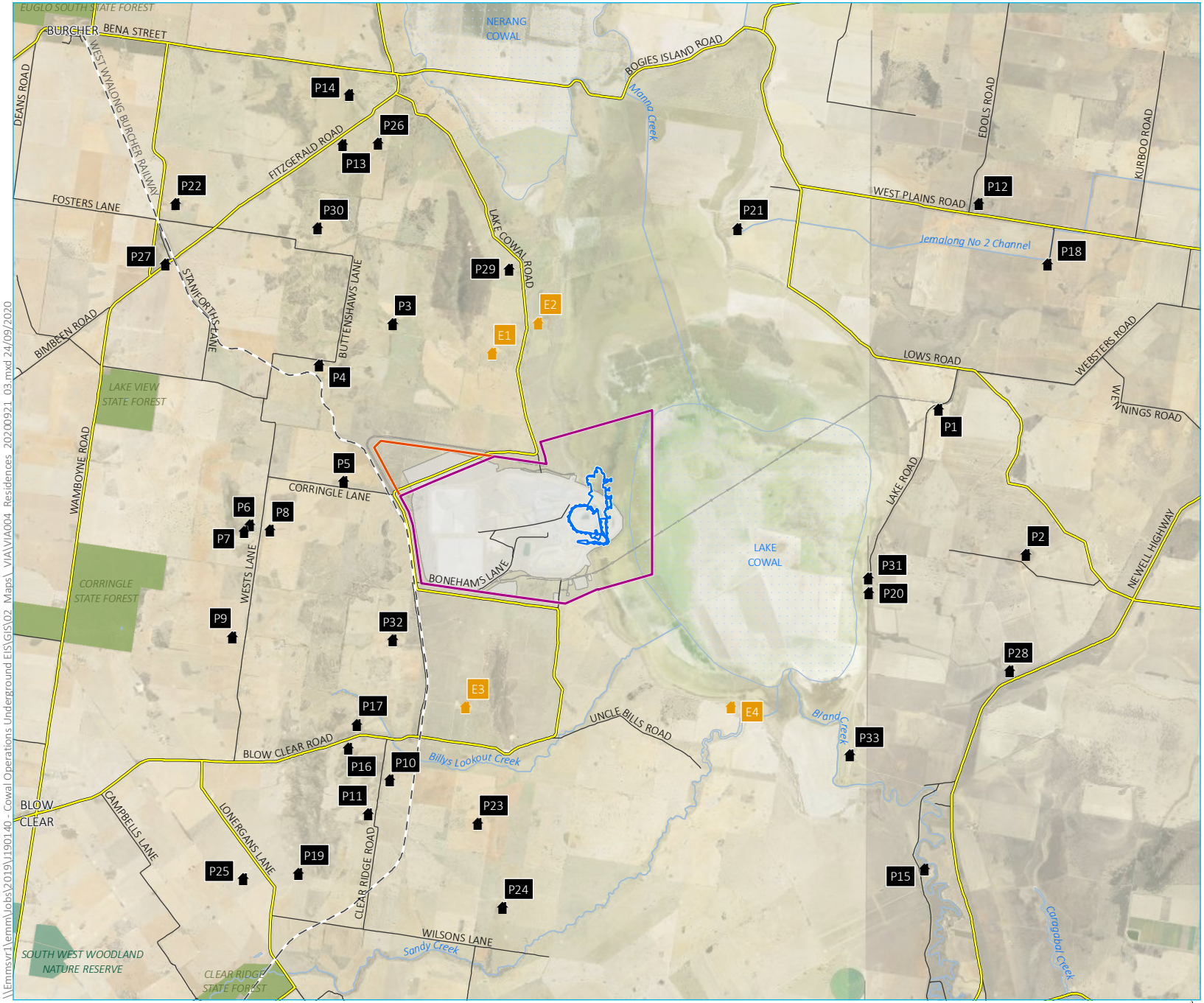
State Forest Lands, including Corringle State Forest and Lake View State Forest, are used by tourists and locals as fossicking areas. These areas are nominally at or beyond the boundary of the PVC.

3.11 Rural residences

There are 33 private rural residences and four residences owned by the applicant identified within the PVC (refer to Figure 3.1).

3.12 Rural land use

The dominant land use in the region is broadacre grazing and cropping. The rural agricultural uses tend to be on the flat land between rocky outcrops. Rural infrastructure, such as dams, fences, sheds and unsealed access tracks, are scattered sparsely throughout the rural lands.



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Source: EMM (2020); Evolution (2020); DFSI (2017)

Rural residences

Evolution Mining
Cowal Gold Operations
Visual impact statement
Figure 3.1

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4 Visual magnitude

4.1 Introduction

Visual magnitude is concerned with the development which will generate a visual effect. It considers the size or scale of the change, the duration of the change, and reversibility of the change

The proposed categorisation for magnitude is:

Category	Meaning
Negligible	Barely perceptible change. The change comprises an almost imperceptible element within a viewshed; and/or the duration of the change is brief (days); and/or the change is immediately reversible.
Minor	Noticeable change. The change comprises a small element within a viewshed; and/or the duration of the change is moderate (months); and/or the change is reversible with small effort.
Moderate	Considerable change. The change comprises more than 10% of a viewshed; and/or the duration of the change is material (years); and/or the change is reversible but unlikely.
Significant	Dominant change. The change comprises the dominant element within a viewshed which will fundamentally later landscape character; and/or the duration of the change is essentially permanent (decades); and/or the change is not reversible.

4.2 Surface infrastructure

The main new surface infrastructure component that would be visible is the PFP, which is proposed to be installed under the underground development Project. There are several prominent components of this facility, including a concrete batching plant, industrial sheds, mix tanks and storage areas. Lighting of the facility is also a consideration.

The effect will be to introduce structural elements to a landscape that is dominated by a rock emplacement. The rock emplacement, while subject to remediation and revegetation, is not a natural viewscape. There will; however, be a discernible difference with the introduction of the PFP and this component of the proposed development has the greatest potential visual effect.

The PFP site will be created by excavating some of the northern rock emplacement on the northern batter, and the arrangement of various operational plant will sit at a level slightly lower than a perimeter landscaping ridge (comprised of rock spoil and subject to revegetation). This perimeter ridge will result in most low-level surface infrastructure and vehicle movements being obscured from sensitive receptor viewsheds to the north. The highest structure is likely to be approximately 10 m high.

4.3 Integrated Waste Landform

Modification 14 to DA 14/98 in 2018 approved the modification of the existing tailings storage facility (TSF) to form the Integrated Waste Landform (IWL) as part of the final site rehabilitation activities. The IWL has an approved final maximum height specification of 245 m AHD.

Prior to commissioning the IWL, the existing Northern Tailings Storage Facility (NSTF) and Southern Tailings Storage Facility (STSF) will continue to be used to store tailings. The final heights of the buttresses at these tailings facilities will be raised to 248.4 m AHD for STSF Stage 7 and to 240.5 m AHD for NTSF Stage 6, as approved. This means that, from a visual impact assessment perspective, there will be a small increase in the visible form of the IWL at the northern tailings facility area (~+5.5 m instead of ~+4.5 m) and a small decrease in the visible form of the IWL at the southern tailings facility area (~-2.4 m instead of ~-3.4 m). The matter being considered is the additional metre in height for the IWL, not the relative heights of the IWL and the approved tailings facility buttresses.

Condition 1.2(c) of the development consent (DA 14-98) for the mine sets a maximum height for the IWL at 245 m AHD – proposed under this modification to be 246 m AHD. The approved height relative to the surrounding landscape varies due to the undulations in the local topography but the height of the land immediately outside the current tailings facilities is generally 215 m AHD to the north, 225 m AHD to the west, and 220 m AHD to the south.

This means the approved IWL height relative to the immediate surrounding landform is in the range of 20 to 30 m. An additional 1 m to the approved height of the IWL represents, at most, a 5% increase.

It is noted that at the end of mine operations the IWL will be revegetated as described in the Mining Operations Plan (MOP). Rehabilitation objectives which include:

- to establish permanently stable landforms;
- to establish vegetation communities which are suited to the hydrological features and substrate materials of the top surface of the landform; and
- to exclude grazing and agricultural production.

These rehabilitation and revegetation activities will also ultimately render the additional 1 m in height to be visually insignificant.

4.4 Lighting

Part of the visual impact of the proposed surface infrastructure is lighting.

Lighting is a signifier of activity rather than a physical impact on landscape, and is therefore treated as an ephemeral impact.

Lighting is already used for the mine operations within the Project area. Existing sources include operational lighting for work areas, and mobile plant and machinery. The lighting is generally observable at night as a glow near the operational areas. The proposed operations for the box -cut and the PFP are expected to require lighting of a similar intensity to other existing surface operations.

There is some record of complaints related to lighting. Two complaints were received regarding light scatter in March 2008 and the matter was corrected by moving the offending light sources. One complaint was received in 2012 and the matter was corrected by relocating the light source. The most recent complaints about lighting were received in April 2019 and in June 2020. These complaints were successfully resolved.

In accordance with Condition 6.5 of Schedule 2 of the development consent (DA 14/98), Evolution is required to take all reasonable and feasible measures, in consideration of Australian Standard AS 4282-1997 *Control of the obtrusive effects of outdoor lighting*, to mitigate visual and off-site lighting impacts of the mine. Several mitigation measures are currently deployed, including:

- scheduling of mining operations, where practicable, so that evening and night-time operations on the northern and southern waste rock emplacements would be located to reduce the potential for direct lighting impacts to locations outside of the site. This may include arrangements for limiting bund creation during day shift and works behind the bund occurring during night shift, if feasible;
- restriction of night-lighting to the minimum required for operations and safety requirements, where appropriate;
- use of unidirectional lighting techniques; and
- use of light shields to limit the spill of lighting.

Lighting is likely to be associated with the PFP, the box-cut and with the addition of material to the IWL. Placement of material to create the IWL is expected to take place during a range of hours within the permitted 24 hours per day, seven days per week. The consent for the mine, as modified, provides that 'Supplementary IWL activities' (as defined), being "construction of water management infrastructure, removal of soil and soil stockpiles, and placement of clay materials at the IWL" can occur from 7:00 am to 6:00 pm, seven days per week. All other IWL activities can be undertaken 24 hours per day, seven days per week. The formation of the IWL – ie the formation to the additional 1 m in height - is not considered a 'supplementary IWL activity'.

Whether lighting is required will therefore be guided by the nature of the activities – being either supplementary IWL activities or other activities. It is assumed that some lighting will be necessary, including for supplementary IWL activities, noting that the authorised operational periods include dusk when lighting may be required.

Unlike the PFP and the box cut, the location of the lighting will vary depending on where the operations are taking place. This in turn means that the magnitude of the lighting impact will vary as the locations for the task of adding additional material to the buttress will be at times within a viewshed for rural residences, and at time not within a viewshed.

4.5 Scale and size of the effect

The footprint of the IWL is approximately 9 km^2. In a vertical sense, the increase in elevation of the upper level of the approved IWL landform by approximately 1 m, is regarded as minor.

4.6 Duration of the effect

The development consent provides for the carrying out of mining operations until 31 December 2032 and, subject to the determination of the proposed modification, the mine life may be extended to 2040. This is considered the duration of the visual effect although the progressive rehabilitation of disturbed land (as required by DA14/98) will reduce the visual effect as and when vegetation is re-established.

In terms of the lighting for the creation of the IWL, the duration will be intermittent due to the operations occurring at all points of the IWL area, some of which will be within a line of sight for nearby sensitive receivers, and some which will be not directly observable.

4.7 Reversibility of the effect

The effect is not considered reversible other than at the end of the life of the mine when the full rehabilitation of the site will be undertaken.

4.8 Cumulative effects

The cumulative effect of the proposed works is considered to be not significant. Given the existing surface footprint of the mine at approximately 16 square kilometres, including the open pit approximately 1 km wide, the installation of a PFP within the disturbed area and the 1 m increase in height for the IWL will not increase the range (ie distance) of the visual impact of the mine nor the consequential cumulative impact (ie the duration). Noting the visibility and scale of the existing surface infrastructure, the additional impact of the proposed works is relatively minor.

4.9 Finding

The magnitude of the visual impact of the proposed IWL works (increased height of 1 m) is considered negligible for all receptors. It represents an increase in height of, at most, 5% of the approved height (245 m AHD) relative to the immediately adjacent landform.

This is based on the assessment that the change comprises a small element within a viewshed. For the closest rural residences, at approximately 2 km, the ability to distinguish the additional 1 m in height for the IWL is very marginal.

The landscape of the mine represents a significant landscape feature in and of itself. The addition of the additional 1 m in height for the IWL, being relatively imperceptible in terms of the difference between the authorised tailings facility buttresses and the additional 1 m of the IWL height, would be difficult to distinguish as a change from any residential receptors.

The construction of the PFP introduces a more noticeable change, including both surface infrastructure and lighting where none currently exists.

Surface infrastructure includes a concrete batching facility or similar infrastructure, and this includes silos and delivery systems generally to a height of approximately 10 m.

Visibility of the surface infrastructure is limited to six receptors for the PFP (ranked negligible to low sensitivity) to the north of the mine, and 17 receptors for the IWL (ranked negligible to low sensitivity) (refer to Table 5.1 and Table 5.2).

The lighting has the potential to be a detectible but is considered an ephemeral change which can be observed in surrounding areas and that diminishes with distance. The mine currently uses lighting for operations and the lighting associated with the proposed works is expected to be of a similar intensity but at a lesser scale.

The mitigating factor for lighting at the IWL is the intermittent nature of the impact and the shifting location of any operations associated with the raising of the height by 1 m. The IWL works differ from the PFP works in that the PFP works will be fixed in a location for the life of the mine, and the IWL activities will shift in location by a factor of kilometres.

The magnitude of the PFP visual effect is considered to range from negligible to minor, depending on the location and proximity of the rural residence.

5 Visual sensitivity

5.1 Introduction

Visual sensitivity describes the nature of the host environment (comprising locations and receptors) likely to be affected, relative to the nature of the effect likely to occur (ie the magnitude). It addresses overall ability of the existing environment to accommodate the proposed change.

Importantly, when dealing with long distances, such as in a rural setting, it is noted that human-scale objects are resolvable as extended objects from a maximum distance of approximately 3 km.

There is a negative exponential effect on the perceived size of an object that occurs with increasing distance. An object that appears 10 m high at a distance of 100 m will appear as 5 m high at a distance of 200 m, then 2.5 m high at 400 m, and 1.25 m high at 800 m. By convention, distances between 100 m and 1 km are considered to be the 'medium' range and distances from 1 km to 3 km are considered to be the 'distant' range[2]. Noting the horizontal extent of the proposed works it is considered reasonable to extend the maximum distance for consideration of sensitivity to 8 km for 'distant' range. Beyond 8 km, the viewer would not be able to discern any detail of the proposed change.

A key consideration is the distance between the view point and the proposed development because sensitivity decreases with distance, however there are secondary considerations such as the value attached to the landscape or view that is the subject of the change. The other key consideration is the visual compatibility of the proposed development. Compatibility describes the extent to which the change conforms with or is absorbed within the mine site and surrounds.

The proposed categorisation is:

Category	Meaning
Negligible	Virtually no visual effects would be experienced as a result of the proposed change. A negligible sensitivity is either as a result of a proposed activity integrating successfully with the existing environment; and/or there are no sensitive receptors with potential views of the proposed activity; and/or the receptors have only momentary or predominantly obscured views.
Low	Very few visual effects would be experienced as a result of the proposed change. A low sensitivity is either as a result of a proposed activity integrating efficiently but not fully with the existing environment; and/or there are limited, or no, sensitive receptors with potential views of the proposed activity; and/or the receptors have very brief or partly obscured views.
Medium	Some visual effects would be experienced as a result of the proposed change. A medium sensitivity is either as a result of a proposed activity only partially integrating with the existing environment; and/or there are a few sensitive receptors with potential views of the proposed activity; and or the receptors have short term or filtered views.
High	Significant visual effects would be experienced as a result of the proposed change. A high sensitivity is either as a result of a proposed activity having no integration with the existing environment; and/or there are numerous sensitive receptors with potential views of the proposed activity; and or the receptors have sustained or uninterrupted views.

[2] Richard Lamb and Associates (2016) Visual Impact Assessment, Amended Rocky Hill Coal Project.

5.2 Rural residences

The primary visual catchment has been set very broadly and captures some rural residences up to 13 km from the Project site. This broad catchment has been used due to the generally flat to gently undulating topography, and also to ensure that all potentially affected rural residences are captured and considered. Refer to Figure 3.1 for location of identified rural residences.

Occupiers of rural residences are the receptors most likely to be provided with long viewing periods within close proximity to the Project.

There are several key matters to consider

- whether there is a line of sight to the proposed developments from the dwelling;
- whether there is any filtering or obstruction of the view; and
- the integration of the change within the landscape.

The integration of the change within the existing visual landscape is effectively achieved with the proposed increase to the height of the IWL. The 1 m increase in the height of the IWL will be visually absorbed due to the matching of texture and materials relative to the remainder of the landform. The PFP is visually absorbed due to the nesting of the structures and activities, to a large extent, behind perimeter embankments. Some elements will remain visible at a medium visual range (up to 3 km to the north) but are considered to be efficiently integrated.

Distances greater than 8 km are considered sufficient to render any of the changes proposed to be indistinguishable from the existing viewscape and are therefore treated as nil visibility.

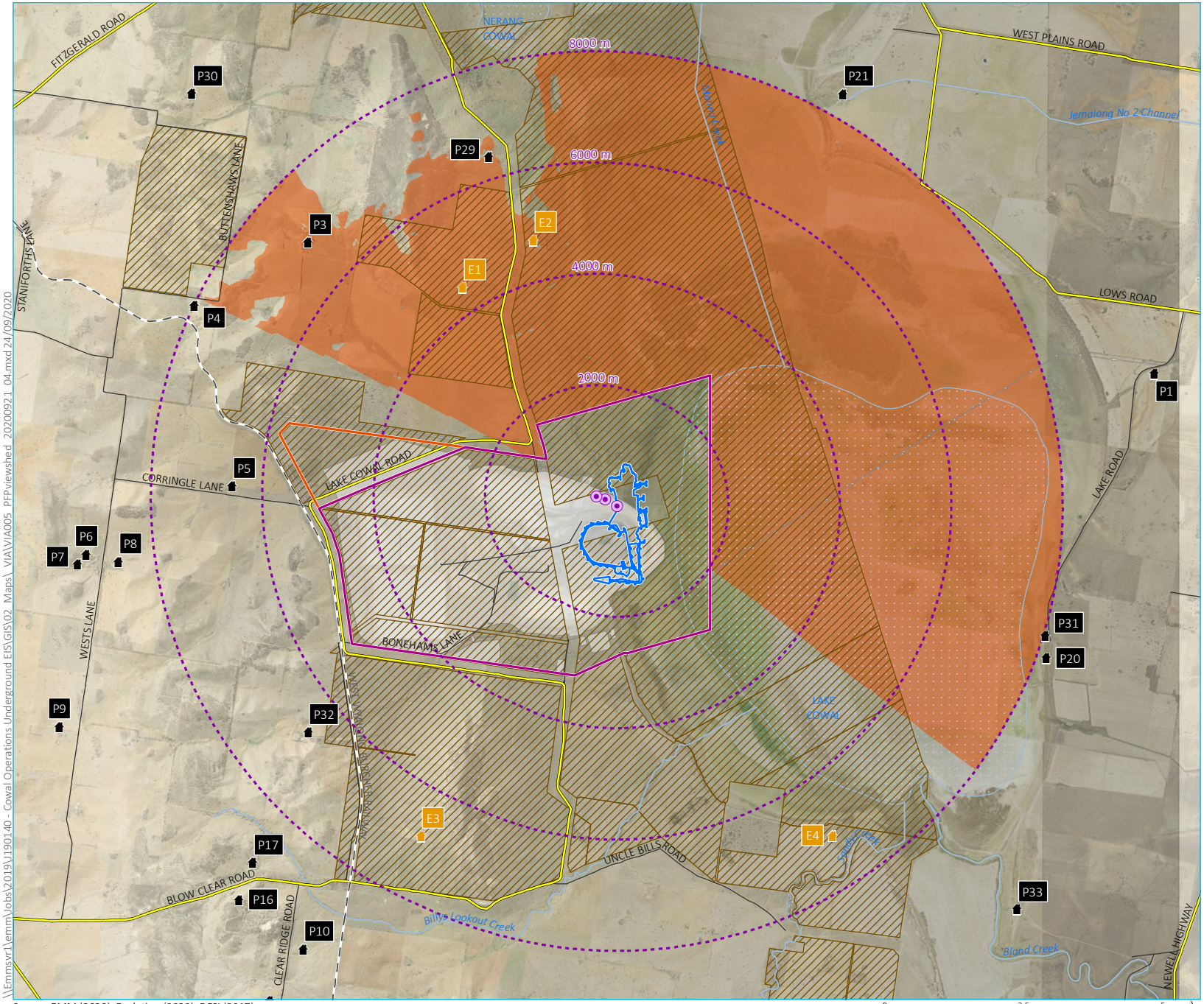
Importantly, there should be some discounting of sensitivity for rural residences which are occupied by Evolution employees or contractors. People who work at the mine will perceive the presence of the mine and the activities associated with the mine in a way that is fundamentally different to the occupants of a rural residence for whom the mine is more of an irregular feature unrelated to their own personal attachment to the landscape. This 'cultural' compatibility is a more subjective judgement but is also a valid consideration[3].

Rural residences (four) are distinguished in the VIA by the prefix E to identify rural residences owned by Evolution and which provide accommodation for staff associated with the mine. All other rural residences within the PVC are identified by the prefix P.

5.2.1 Sensitivity to paste fill plant

The rural residences with a potential line of sight to the proposed PFP are shown in Figure 5.1. Six residences are assessed to have negligible or low sensitivity to the PFP. The sensitivity of each rural residence is assessed in Table 5.1.

[3] Richard Lamb and Associates (2016) Visual Impact Assessment, Amended Rocky Hill Coal Project.



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Source: EMM (2020); Evolution (2020); DFSI (2017)

Viewshed for paste fill plant

Evolution Mining
Cowal Gold Operations
Visual impact statement
Figure 5.1

EMM
creating opportunities

Table 5.1 Paste Fill Plant

No.	Nearest road	Sensitivity	Reason / Notes
P1	Lake Road	Nil	Distance is ~10 km
P2	Lows Road	Nil	Distance is ~12 km
P3	Buttenshaws Lane	Low	Distance is 4.5 km
P4	Buttenshaws Lane	Nil	Distance is ~8 km; Topography obscuring
P5	Corringle Lane	Nil	Distance is ~6.5 km; Topography obscuring
P6	Wests Lane	Nil	Distance is ~9 km; Topography obscuring
P7	Wests Lane	Nil	Distance is~9 km; Topography obscuring
P8	Wests Lane	Nil	Distance is ~9 km; Topography obscuring
P9	Wests Lane	Nil	Distance is~10 km; Topography obscuring
P10	Clear Ridge Road	Nil	Distance is~9.5 km; Topography obscuring
P11	Clear Ridge Road	Nil	Distance is~10 km; Topography obscuring
P12	West Plains Road	Nil	Distance is ~13 km
P13	Fitzgerald Road	Nil	Distance is ~10 km
P14	Fitzgerald Road	Nil	Distance is ~14 km
P15	Newell Highway	Nil	Distance is ~13 km
P16	Blow Clear Road	Nil	Distance is ~9.5 km; Topography obscuring
P17	Blow Clear Road	Nil	Distance is ~9 km; Topography obscuring
P18	West Plains Road	Nil	Distance is ~14 km
P19	Lonergans Lane	Nil	Distance is ~11 km; Topography obscuring
P20	Lake Road	Negligible	Distance is ~8 km
P21	Lows Road	Nil	Distance is ~8.5 km
P22	Livingstone Road	Nil	Distance is ~13 km; Topography obscuring
P23	Wilsons Lane	Nil	Distance is ~9 km; Topography obscuring
P24	Wilsons Lane	Nil	Distance is ~11 km; Topography obscuring
P25	Lonergans Lane	Nil	Distance is ~11 km; Topography obscuring
P26	Fitzgerald Road	Nil	Distance is ~10 km
P27	Wamboyne Road	Nil	Distance is~12 km; Topography obscuring
P28	Newell Highway	Nil	Distance is ~12 km
P29	Lake Cowal Road	Negligible	Distance is ~6 km; Topography partially obscuring
P30	Buttenshaws Lane	Nil	Distance is ~10 km
P31	Lake Road	Negligible	Distance is ~8 km
P32	Bonehams Lane	Nil	Distance is ~6.5 km; Topography obscuring
P33	Newell Highway	Nil	Distance is ~10 km
E1	Lake Cowal Road	Low	Distance is ~3.5 km; discounted due to Evolution occupants

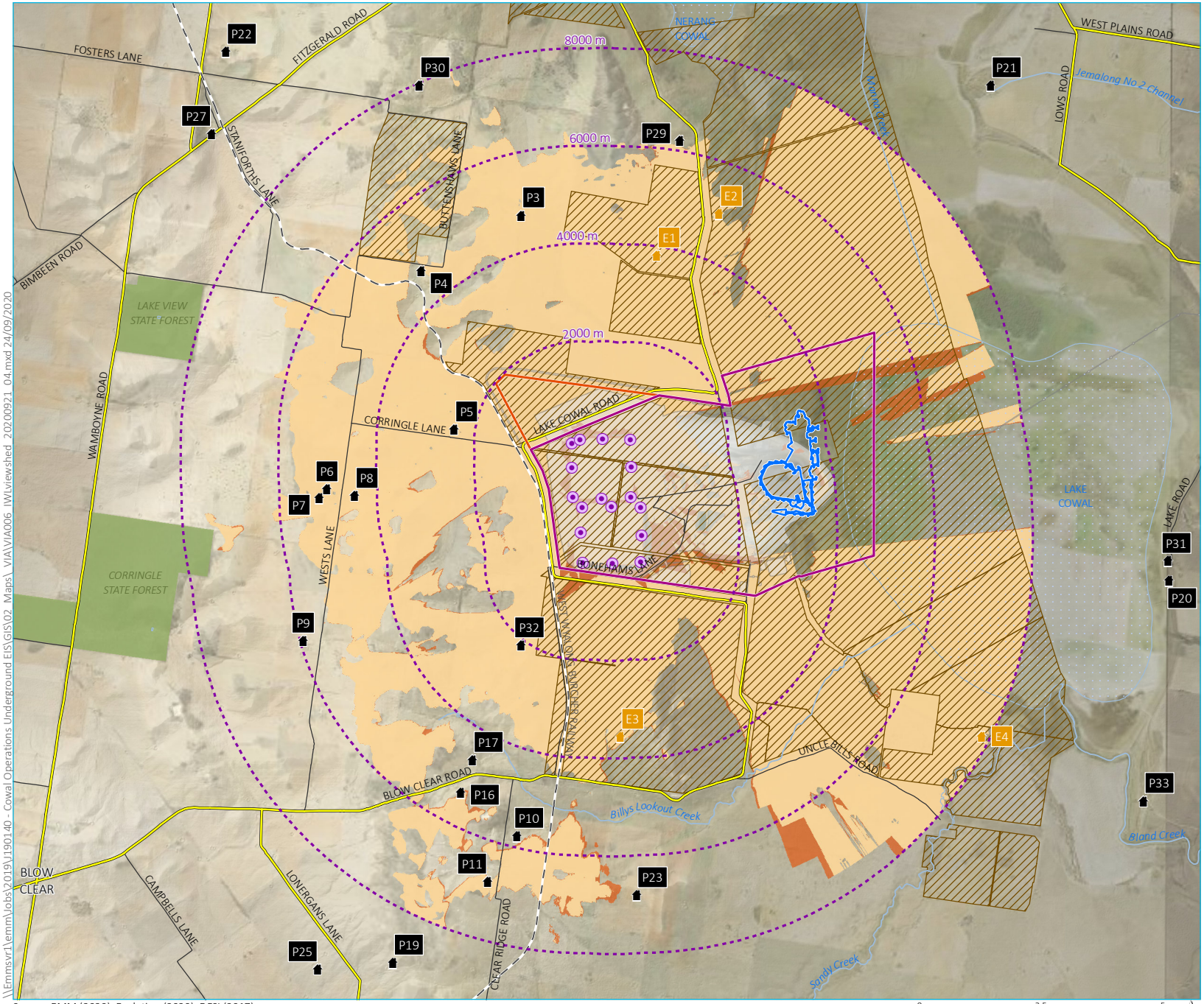
Table 5.1 Paste Fill Plant

No.	Nearest road	Sensitivity	Reason / Notes
E2	Lake Cowal Road	Low	Distance is ~4.2 km; discounted due to Evolution occupants
E3	Blow Clear Road	Nil	Distance is ~6.8 km; Topography obscuring
E4	Uncle Bills Road	Nil	Distance is ~7.8 km; Topography obscuring

5.2.2 Sensitivity to Integrated Waste Landform

The rural residences with a potential line of sight to the IWL are shown in Figure 5.2 below.

Seventeen residences are assessed to have sensitivity to the IWL ranging from negligible to low. Note that visual sensitivity is not the same as visual impact. Visual sensitivity needs to be considered relative to the visual magnitude of the proposed changes, and in combination these allow a judgment to be made regarding the overall impact of the proposed changes. The sensitivity of each rural residence is assessed in Table 5.2.



KEY

- Viewpoint location
- Viewpoint buffer (2000 m increments)
- Currently visible project infrastucture - bare earth surface
- Visible project infrastucture (assumed 1 m height increase) - bare earth surface
- Proposed underground development
- Mining lease (ML1535)
- Mining lease (ML1791)
- Approved surface disturbance
- Rail line
- Main road
- Minor road
- Named watercourse
- Named waterbody
- State forest
- Evolution-owned land

Rural residences

- Evolution-owned
- Privately-owned

Source: EMM (2020); Evolution (2020); DFSI (2017)

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Viewshed for integrated waste landform

Evolution Mining
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Visual impact statement
Figure 5.2

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Table 5.2 Integrated Waste Landform

No.	Nearest road	Sensitivity	Reason / Notes
P1	Lake Road	Nil	Distance is ~13 km
P2	Lows Road	Nil	Distance is ~15 km
P3	Buttenshaws Lane	Negligible	Distance is ~4.5 km
P4	Buttenshaws Lane	Negligible	Distance is ~4.2 km; Vegetation and topography filtering
P5	Corringle Lane	Low	Distance is ~2.2 km; Light spill
P6	Wests Lane	Low	Distance is ~5 km; Light spill
P7	Wests Lane	Low	Distance is ~5 km; Light spill
P8	Wests Lane	Low	Distance is ~4.5 km; Light spill
P9	Wests Lane	Negligible	Distance is ~6 km; Vegetation and topography obscuring
P10	Clear Ridge Road	Negligible	Distance is ~6 km; Vegetation obscuring
P11	Clear Ridge Road	Negligible	Distance is ~7 km; Vegetation obscuring
P12	West Plains Road	Nil	Distance is ~15 km
P13	Fitzgerald Road	Nil	Distance is ~9.5 km
P14	Fitzgerald Road	Nil	Distance is ~11 km
P15	Newell Highway	Nil	Distance is ~16 km
P16	Blow Clear Road	Negligible	Distance is ~5.5 km
P17	Blow Clear Road	Negligible	Distance is ~4.5 km
P18	West Plains Road	Nil	Distance is ~17 km
P19	Lonergans Lane	Nil	Distance is ~9 km
P20	Lake Road	Nil	Distance is ~10 km
P21	Lows Road	Nil	Distance is ~10 km
P22	Livingstone Road	Nil	Distance is~10.5 km
P23	Wilsons Lane	Nil	Distance is ~7 km
P24	Wilsons Lane	Nil	Distance is ~9 km
P25	Lonergans Lane	Nil	Distance is ~10 km
P26	Fitzgerald Road	Nil	Distance is ~9.5 km
P27	Wamboyne Road	Nil	Distance is ~9.5 km
P28	Newell Highway	Nil	Distance is ~15 km
P29	Lake Cowal Road	Negligible	Distance is ~6 km
P30	Buttenshaws Lane	Nil	Distance is ~8 km; Topography obscuring
P31	Lake Road	Nil	Distance is ~10 km
P32	Bonehams Lane	Low	Distance is ~2.2 km
P33	Newell Highway	Nil	Distance is ~11 km
E1	Lake Cowal Road	Low	Distance is ~3.8 km; Light spill

Table 5.2 Integrated Waste Landform

No.	Nearest road	Sensitivity	Reason / Notes
E2	Lake Cowal Road	Negligible	Distance is ~5 km
E3	Blow Clear Road	Low	Distance is ~3.5 km; Light spill
E4	Uncle Bills Road	Negligible	Distance is ~8 km

5.2.3 Specific rural residences

i Lakeview, Lakeview II and Lakeview III

Rural residences P6, P7 and P8 - known as Lakeview, Lakeview II and Lakeview III - are a cluster of dwellings located on Wests Lane and are within 400 m of each other.

The existing view include the southern and northern rock emplacements, and the tailings facility which is proposed to be raised by 1 m.

At a distance of approximately 5 km, the additional height of the IWL will be within view but imperceptible as it will be created over a prolonged period and is a difference in height which would be virtually impossible to distinguish from an IWL landform at the currently approved height of 245 m AHD. Considering even the final landform which will be 1 m higher, relative to the current approved height which is 20 m to 30 m above the existing adjacent ground level, the additional material will be well integrated into the existing viewshed and the sensitivity to that change is considered low.

The other works, including the PFP, will not be visible from these dwellings.

Lighting from any works associated with the western precinct of the IWL may be visible when works occur on that side of the IWL. Any lighting associated with the elevation of the IWL will be limited to the duration of works for that section of the IWL. It is therefore a temporary impact and likely to be mitigated by the standard measures specified in the development consent.

Source: EMM (Robert Morris)

Photograph 5.1 View from Lakeview, at gate (50-mm lens)

Source: EMM (Robert Morris)

Photograph 5.2 View from Lakeview, at gate (zoomed in 400-mm lens[4])

[4] Provided as detail. Not representative of human view.

Source: EMM (Robert Morris)

Photograph 5.3 View from Lakeview, at office (50-mm lens)

Source: EMM (Robert Morris)

Photograph 5.4 View from Lakeview, at house (50-mm lens)

Source: EMM (Robert Morris)

Photograph 5.5 View from Lakeview, at tennis court (50-mm lens)

ii Laurel Park

Rural residences P3 – known as Laurel Park - is located on Buttenshaws Lane.

Source: EMM (Robert Morris)

Photograph 5.6 View from Laurel Park, at gate (50-mm lens)

Source: EMM (Robert Morris)

Photograph 5.7 View from Laurel Park, at gate (zoomed in 400-mm lens[5])

[5] Provided as detail. Not representative of human view.

Source: EMM (Robert Morris)

Photograph 5.8 View from Laurel Park, at house (50-mm lens)

5.3 Roads and transport

i North

Local access roads, such as Staniforths Lane and Buttenshaws Lane provide glimpses of the Project site but the lanes are generally lined with remnant trees, and this filters the view to the mine.

It is also noted that roads, other than those travelling directly towards the mine, are unlikely to provide a prolonged line of sight to the proposed works, and traffic volumes are expected to be low.

Lake Cowal Road and Bonehams Lane provide access close to the Project site. The roads come within 200 m of the proposed works associated with the IWL and the works would be clearly visible. The sensitivity however is ameliorated by the integration of the Project with the existing viewscape from those close proximity points. The viewshed from Bonehams Lane is also generally filtered by vegetation on the road verge. Lake Cowal Road has some view-filtering vegetation but to a lesser degree. Most mature vegetation on the verge of Lake Cowal Road is on the western side of the road.

ii South

Local access roads, such as Blow Clear Road and Uncle Bills Road provide glimpses of the Project site, although in some sections the rise of Fellmans Hill blocks view lines northwards from Blow Clear Road.

Bonehams Lane and Lake Cowal Road provide access close to the Project site. The roads come within 600 m of the tailings facility Project and the IWL works would be clearly visible. The sensitivity however is ameliorated by the integration of the Project with the existing viewscape. The new elements are consistent with the existing mine landform and are efficiently absorbed in terms of visual effect.

iii East

Local access roads, such as Lows Road and Lake Road hug the foreshore of Lake Cowal on the eastern side. There is no visibility of the proposed works due to the lake protection buttress (approximately 95 m above the lake edge) along the perimeter of the mine void at the lake foreshore. The buttress was created from waste rock emplacement and is be revegetated.

Newell Highway (A39) provides only limited glimpses of the Project site due to intervening topography and the presence of mature vegetation along road verges. Rest areas (notably Marsden Rest Area near the junction with the Mid-Western Highway (B64)) has a screen of planted eucalypts which obscure view lines towards the Project site.

iv West

Local access roads, such as Wamboyne Road and Wests Lane provide glimpses of the Project site but the lanes are generally lined with remnant trees, and this filters the view.

Corringle Lane and Lake Cowal Road provide access close to the Project site. The roads come within 600 m of the tailings facility and IWL area, and the works would be clearly visible. The sensitivity however is ameliorated by the integration of the Project with the existing viewscape from those close proximity points.

5.4 Tourist sites

5.4.1 Billys Lookout

Billys Lookout is accessible from Blow Clear Road but data is not available regarding visitation. This is expected to be low. The distance from the Project site is also a consideration. At 6 km, the likely visual impact would be negligible.

5.4.2 State forests

State Forest Lands, including Corringle State Forest and Lake View State Forest, are used by tourists and locals as fossicking areas. The heavily timbered character of the State Forests would render any sight lines impossible. These are also on the western perimeter of the PVC and approximately 8 km from the nearest proposed works.

5.4.3 Lake Cowal Public Reserve

The reserve is approximately 5 km south-east of the proposed development and the view line from the reserve is partly obscured by the feature known as Fellmans Hill and there are stands of vegetation which further filter the viewshed.

6 Visual impact and mitigation

6.1 Introduction

The overall visual impact of the proposed changes is ranked according to the schedule illustrated in Table 6.1.

As noted previously, the impact is determined after considering the magnitude of the visual effect and the visual sensitivity of locations and receptors.

Table 6.1 Impact rating schedule

IMPACT	MAGNITUDE				
SENSITIVITY		Significant	Moderate	Minor	Negligible
	High	Major	Moderate to major	Moderate	Minor to moderate
	Medium	Moderate to major	Moderate	Minor to moderate	Minor
	Low	Moderate	Minor to moderate	Minor	Minor to negligible
	Negligible	Minor to moderate	Minor	Minor to negligible	Negligible

The magnitude of the visual effect of all receptors in the study area was assessed against four potential categories – negligible, minor, moderate or significant. The finding is that the visual magnitude for all receptors was ranked as either negligible or minor.

The sensitivity of the locations and receptors within the study area was assessed against four potential categories – negligible, low, medium or high. The finding is that the sensitivity for all receptors was ranked as either negligible or low.

The combined ranking of both magnitude and sensitivity is shown in a matrix in Table 6.1 and indicates the visual impact of the proposed works. The impacts are therefore considered to be in the range of negligible to minor significance (red border in Table 6.1).

Distance between the proposed works and the range of sensitive receptors is an effective mitigation measure in itself but there are nevertheless impacts associated with the proposed works which can be further reduced to deliver low to negligible significance for visual impacts. These are discussed below.

6.2 Paste fill plant

There are two forms of visual impact associated with the PFP:

- surface infrastructure; and
- lighting.

6.2.1 Surface infrastructure

The visual effect of the PFP surface infrastructure derives primarily from the bulk and height of key elements, such as the large work sheds and the concrete batching plant.

Items of this size can be distinguished against an otherwise blank landform, such as a rock emplacement or earth buttress, unless steps are taken to promote visual integration.

Suggested methods would be to ensure the finish on external cladding is a muted and neutral colour which matches the palette of the surrounding landscape; and to ensure that surfaces have low reflectivity.

Screening plants can also be used but these will take several years to mature and achieve the desired visual filtering benefit, but can be a positive contribution in the mid to long term.

6.2.2 Lighting

Lighting will, to some extent, blend with other light glow associated with the operation of the mine but can nevertheless be mitigated to reduce the cumulative effect.

The risk of light spill was acknowledged and addressed in the conditions associated with development consent DA 14/98. Evolution is required to take all reasonable and feasible measures to mitigate visual and off-site lighting impacts of the mine.

Several mitigation measures, consistent with Australian Standard AS 4282-1997 *Control of the obtrusive effects of outdoor lighting*, are already deployed at the mine.

- scheduling of mining operations, where practicable, so that evening and night-time operations on the northern and southern waste rock emplacements would be located to reduce the potential for direct lighting impacts to locations outside of the site;
- restriction of night-lighting to the minimum required for operations and safety requirements, where appropriate;
- use of unidirectional lighting techniques; and
- use of light shields to limit the spill of lighting.

6.3 Integrated waste landform

The visual impact of an additional 1 m in height for the IWL is negligible for all sensitive receptors other than the closest two rural residences where the assessed impact is considered to be low.

The ‘low’ significance would only result where the IWL works create temporary mounds or stockpiles which may, for a period, be a distinguishable feature in the viewshed.

The mitigation measures that are available are therefore:

- ensure reasonable matching between the existing buttress material and the additional material to be added; and
- establish any stockpiling in locations where viewlines to the nearest rural residences are obscured or filtered.

7 Conclusion

Of the activities the subject of the application, the following are considered to have relevance to the visual impact assessment:

- the increased final rehabilitated height of the Integrated Waste Landform (IWL) by 1 m; and
- the development of a PFP.

Other proposed works are considered to have no visual effect beyond the mine, or were previously assessed, and are not assessed as part of this VIA, including:

- the box-cut access and associated surface infrastructure;
- augmentation of Dam D5A and other on-site water storages;
- ancillary surface infrastructure (sheds, workshops, car parking, etc); and
- placement of additional waste rock.

The visual impact of the nominated activities is assessed to be in the negligible to low range.

The raising of the IWL by 1 m will create a visual impact of negligible significance for 15 receptors. For two sensitive receptors, the impact may have low significance provided the placed material is reasonably similar in colour to the existing surrounds. It is also possible that works to create the IWL require temporary mounds or stockpiles to be established as the landform is created. If this occurs, it would only be a minor distinguishable feature in the viewshed, existing temporarily until the landform is engineered.

The PFP has two potential visual effects, being the installation of surface infrastructure and the use of lighting.

The visual impact of the proposed PFP is limited to six sensitive receptors for whom the visual significance is negligible to low. The impact can be further mitigated by relatively modest design considerations at the installation stage and by the growth of screening vegetation in the longer term.

The lighting associated with the PFP is an ephemeral effect which is an indicator of activity at the mine, rather than a permanent physical change. The cumulative impact of the additional lighting will be negligible as it will be a relatively small effect in the context of the scale of existing operations, including the approved lighting for the mine.

There is a known sensitivity to light spill, as evidenced by a small number of complaints prior to 2013 and in 2019 and 2020, and conditions in the mine consent which require mitigation of potentially obtrusive light from mine operations.

The application of standard light spill mitigation measures (as per Australian Standard AS 4282-1997 *Control of the obtrusive effects of outdoor lighting*) is likely to reduce visual impacts of lighting to a low significance level.

It is also noted that conditions of consent for the mine require rehabilitation of the disturbed areas as soon as practicable, and the Rehabilitation Management Plan includes actions to establish Eucalypt and Riverine Woodland vegetation communities (similar to the surrounding landscape), which will further reduce visual impacts in the medium to long term.