Escarpment Mine Project

Westport

Landscape Assessment

Prepared for L&M Coal Ltd

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Contents:

1.0 Executive Summary

The following is a summary of the salient points relating to the mining and rehabilitating of the site.

Access Road – The main access road from Waimangaroa to Denniston exists and no further development would be required, hence no further visual impact. The access road on the plateau is formed and requires further upgrading. A sensitive approach is required in its construction.

Mine – The mine is in a discrete location and is not visible from the coastal plain, Waimangaroa, Westport, the Buller Gorge and Denniston township.

Visibility of the mine is restricted to views from on the plateau itself (end of sealed road and southwards) and Mt Rochfort.

Heritage – Where possible heritage sites should be maintained as examples of earlier mine sites, but only if they are good examples and not repeated elsewhere on the plateau. The screening/slack bins at the Escarpment Mine unfortunately look like they will not be able to be moved or kept.

Rehabilitation – The method and success of rehabilitation measures is a vital issue. With respect to landscape values, reshaping the mined area using the overburden and the sandstone rocky outcrops, as close to the original formation as possible is recommended, aiming to reinstate the general drainage system as far as practicable.

Outstanding landscape – It is not one

Natural character – The site has moderate to high natural character. Initially there will be some loss of natural character to the site. In the long-term however, the loss on natural character will be minimised through rehabilitation work (see Mitigation Measures, section 10.0).

2.0 Introduction

The Escarpment Mine, located on the Denniston Plateau is part of a unique landscape with a colourful history. Located high up on the plateau, 15km from Westport, Escarpment Mine was one of a number of locations that have been mined in the locality. This mine operated for 20 years until its closure in 1982 and today L&M Coal Limited (L&M) currently has an exploration permit over the area.

Our role is to undertake a landscape assessment for the site which includes assessing the potential landscape and visual impacts of the opencast coal mine, and to recommend appropriate mitigation measures, so that the site becomes integrated with the surrounding landscape.

3.0 Background

3.1 History

It is thought that Maori may have travelled on the plateau as part of a route between the coast and the upper Buller. Some early European visitors to the Buller area used Maori guides and may have gained knowledge of the plateau from them. (Wright, 2008).

The Escarpment Mine is one of a whole cluster of mines that once existed as part of a thriving coal mining industry on the plateau. Associated with these mines were settlements that nestled themselves into this harsh environment. In 1860 Julius Haast and James Burnett first surveyed the district for coal deposits. The first mine however was not in operation until 1880 after a second survey of the Denniston Plateau in 1873 by William Cooper and R B Denniston. Denniston and Burnetts Face became the two main townships once mining operations became more established. The former became the larger of the two settlements with more facilities such as hospital, police station, high school, soccer field, bowling green and swimming pool.

Relics of the old coal mining operations in the area are well represented and provide a much-valued feature for public viewing, allowing for the rich history to be easily interpreted. The pioneering sense of place and the wild character

of this landscape has inspired many artists and well-known writers such as Jenny Pattrick that portrayed accurately the way a closely knit mining society endured life on the West Coast in the books ‘The Denniston Rose’ and its sequel, ‘Heart of Gold’.

3.2 Climate

The climate at Escarpment is mild and wet with approximately 6m of rainfall per year. Drizzle and cloud is a feature of the site environment along with intense rainfalls. The climate is influential as to how the restoration programme is undertaken. This will be taken into account in the restoration programme.

The plateau is exposed to winds from all directions and are generally cold, wet and bleak. Fog is common for much of the year on the plateau due to the moist ocean air ascending the escarpment and then cooling, with condensation, an increase in wind speeds and reduced sunshine (Overmars *et al*, 1998).

3.3 General Geology and Soils

The Denniston Plateau is a faulted plateau of metamorphic and sedimentary rocks. The metamorphic rocks form the basement in the area and are unconformably overlain by the Eocene Brunner Coal Measures which contain the high quality coal resources on the plateau. Poor soils and a harsh climate at 600-700 metres above sea level support tussock and scrub, with stunted trees in gullies. (Wright, 2008).

The soils on the quartzone sandstones of the Denniston plateau are very infertile, acidic (3.5-5.6) and poorly drained, with grey silica rich layers in the topsoil and iron pans in the subsoils, therefore only the hardiest plants survive. At higher altitudes the soils become skeletal and unweathered parent rock is sometimes exposed on the surface.

The project area is mapped mostly as 30% Recent or Raw Soils (also called Lithosols in a 1991 map), 30% Gley Soils & 30% Brown Soils (called Yellow-brown earths on the map) and 10% inclusions of other soil series. There is a possibility of minor areas of Perch-gley Podzols. Podzols are likely to cover only a tiny proportion of the proposed site (*pers comms.* Craig Ross, 2008).

The surface geology on the Denniston Plateau comprises the quartsoze Brunner Coal Measures, overlying basement comprised of Greenland Group greywacke, Berlins Porphory and Karamea Granite. The Brunner coal measures are exposed on a rising plateau from Chasm Creek in the north to near Te Kuha in the south with a thickness ranging from 20m to 270m+ at Mt Rochfort.

The coal measures are overlain by a sandstone-quartz layer with sandstone boulders protruding to create features throughout the site. The site is part of the large uplifted faulted and distorted table land of Brunner coal measures. This includes minor areas of bedrock and siltstone; sandstone pavements, hilltops, fault scarps and pools.

At higher altitudes the soils become skeletal and unweathered parent rock is sometimes exposed on the surface.

3.4 Ecology

Escarpment Mine is located within the Ngakawau Ecological District which is part of the North Westland Ecological Region. DoC administers most of the Ngakawau Ecological District and existing Protected Natural Areas on the elevated coal plateau include the Stockton, Denniston and Ngakawau Scenic Reserves. These reserves provide a substantial representation of mountain and inland basin eco-systems typical of the Ngakawau Ecological District. Coastal hill-slopes and shrub-tussock lands are distinctive components of the Stockton and Dennsiton coal plateau.

Recommended Areas of Protection (RAP's) have been identified in the district. The closest RAP's to the Escarpment site include: the Upper Waimangaroa Valley – Mt William, Mt Rochfort and Denniston Scenic Reserve Addition (see map 2.0 in the graphic supplement). The proposed Escarpment Mine is 3km west of the Upper Waimangaroa Valley RAP, approximately 1km east of the Mt Rochfort RAP and 2.5km south of the Denniston Scenic Reserve addition.

The Upper Waimangaroa Valley – Mt William RAP is identified by DoC as having *"the greatest ecological diversity in the least modified condition, particularly of the endemic coal measure communities. It is an outstanding*

and fragile, natural area (and landscape) and its values should be recognised in all future management.".

The Mt Rochfort RAP has the most complete altitudinal sequence of coastal slope coal measures forest, from lowland beech-podocarp to dense subalpine scrub below the summit of Mt Rochfort.

The Denniston Scenic Reserve addition (RAP) has similar plant communities to the Mt Rochfort RAP and its inclusion into the existing reserve would greatly enhance the ecology of the reserve. It has been burned off previously however, this RAP has a healthy biological condition and contains within it some uncommon plants to the Ngakawau ecological district (Overmars *et al*, 1998).

The proposed Escarpment Mine is not located on any of the above RAP's or on any existing protected natural areas (PNA's). The closest proximity of any RAP to the proposed Escarpment Mine site is the Mt Rochfort RAP at 0.5-1km to the west.

3.5 Vegetation

The plateau is a mosaic of subalpine shrubland and tussock communities with forest cover at lower altitudes, in gullies and basins. The flat pavements and undulations of the plateau are generally covered in stunted shrub-tussock-wire rush vegetation. On scarps and other steep slopes and exposed sites the principle species are stunted manuka, wire rush and *Chionochloa* species (eg: *C. juncea*). The plateau slopes are gentle in contrast to the steep forested gullies on the east side of the plateau. In these gullies a range of vegetation is found such as mountain and silver beech,southern rata, NZ broadleaf and mountain flax (Overmars *et al*, 1998).

In the damp and wet areas there are numerous montane and subalpine bog species, such as cushion plant, orchid, Mountain bog daisy and *Astelia subulata*.

4.0 Landscape Character

4.1 General Site Description

The Denniston Plateau ranges in height from approximately 600 to 1040m a.s.l. Access is by way of Denniston Road, which is part tarseal and part loose gravel. The road weaves through the higher eastern section of the plateau in a north/south direction and provides access to numerous derelict mining sites and eventually south-west to the summit of Mt Rochfort on which a communication mast has been built. A number of minor tracks, once providing access to what are now disused mines, branch off the road and have been signposted for recreational users.

A distinctive feature of the Denniston Plateau is the Whareatea River, which has formed a gully extending approximately two thirds of the way into the plateau in an east to west direction. Both landform and topography change noticeably at this point and therefore for the purposes of the assessment the plateau has been split into two distinct areas one to the north of the river and one to the south (see photographs 6.1 (Viewpoint 3) and 18.0 (View Point E).

4.2 Northern Area of the Plateau, north of the Whareatea River

This is a relatively level area ranging from approximately 620m to 690m asl. The landform is of a low, rolling nature in which substantial amount of rock is exposed at the surface some of which indicates twisting and bending.

Low-lying shrubs and grasses dominate the vegetation on this part of the plateau while larger shrubs exist where disturbance of the surface occurs or where the microclimate benefits growth. There are boggy areas throughout the site consisting of peaty soils. There is little topsoil or sign of naturally occurring soil horizons throughout the site.

Drainage and runoff is influenced by the geology dictating the path in which streams flow. In addition, dams and weirs have been constructed to store water creating small lakes.

A considerable amount of debris associated with past land use is evident throughout the area, including timber, metal, disused power poles and machinery parts.

Two significant features of the plateau are the high voltage lines that cross the site in an east-west direction, noticeable due to the light reflecting off the cables and pylon structures. The other notable feature are the tracks that cut into the surface and are visible due to the sparse nature of the vegetation.

The tawny/ochre colour of the vegetation is a dominant element of the landscape.

4.3 Southern Area of the Plateau, south of the Whareatea River

The southern part of the plateau is where the proposed mining site would be located. This area is characterised by the northern slope of Mt Rochfort, which steadily rises in one continuous sweep from approximately 680m to 1040m a.s.l. The Whareatea River collects the majority of the plateau's runoff which discharges into the Tasman Sea between Fairdown and Waimangaroa. Lake Brazil and a few other minor tributaries discharge into Cascade Creek south of the site. Like the northern part of the plateau the paths in which streams flow are affected by the location of rock outcrops. The alignment of the drainage channels and the pattern within the landscape are a unique feature of the plateau.

The height of the ridges and the depth of the corresponding stream gullies in this part of the plateau appear more extreme than those to the north. Much of the area is covered by more stunted vegetation including shrubs and trees probably due to the exposure and slightly higher altitude. As a result the colour range is more diverse, ranging from the tawny and ochre through to

oranges on gentle slopes and olives and greens in gullies. In addition, the landscape appears less stark.

5.0 Escarpment Mine

5.1 History

The Escarpment Mine site is located in the southern area. It was so named because of its location on an escarpment overlooking the Cascade Valley. In 1960 work began with an underground mine which lasted until 1982. A dam was then built outside the mine entrance to store water for the Whareatea hydro operation.

The mouth of the Escarpment Mine is now blocked and a smaller adjacent entrance is what remains, both of which date from when hydro methods were used.There are some remains of a flume and conveyor between the mine and the main bin. The airway return is now blasted closed on the hillside and the fanhouse has partially collapsed. The building foundations in front of the mine that were for offices, electrical switching shed and workshop etc are in poor condition, and both the screening bins and slack bins are over grown with gorse and in a decayed state as well (Wright, 2008).

The Escarpment Mine was the last State mine and first hydro mine on the plateau. Relics of all major installations are evident. In the Denniston Heritage Management Plan prepared by the Denniston Heritage Charitable Trust it states that "*Its bins are a rare feature, the only set left on the plateau and among very few on the West Coast*".

Gorse and vegetation regeneration has occurred since the mines closure. While remnants remain, some are at poor state of repair.

6.0 Site investigation

A site visit was made to the proposed Escarpment Mine with the multidisciplinary team to gain an overview of L&M's intention on 19 June 2008.

A second visit was made of the area, both on foot and by helicopter on 8 and 9 July 2008. This was a detailed site inspection and allowed for an understanding of the topography, vegetation and cultural features, to assess the quality of landscape, and whether this quality would be diminished from mine exploration when viewed from various viewpoints. A number of detailed and panoramic photos were taken from the ground and air. The helicopters flight and photographic locations were recorded by GPS.

Vegetation

There are two vegetation associations within the site. These are:

Mountain Beech/Yellow Silver-Pink Pine Forest

A stature forest type, canopy attaining 9 metres. Mountain beech dominates the canopy, with yellow silver pine, pink pine and southern rata. These species along with quintinia, kamahi, inanga, manuka and mountain toatoa are prominent throughout the lower tiers. Mingimingi, *Pittosporum rigidum* and *Gabnia procera* are common in the understorey.

This forest association forms an upper belt on the coastal bedrock slopes and is part of the upland forest in the Mt Rochfort sequence and on the other coal measures coastal slopes. Pink pine with mountain beech is prominent in the midslope belt of the forested gullies. There, the forest grades into taller southern rata-mountain beech down slope while on upper gully slopes stunted forms grade into manuka scrub.

Hymenophyllum armstongii, uncommon in the district, is sometimes present in this community. There are a variety of orchids (*Aporostylis bifolia, Corybas acuminatis, C. oblongus, Pterostylis banksii, P. venosa,* and *Thelymitra pulchella*) which are uncommon elsewhere in the ecological district. *Gentiana spenceri* is present (Overmars *et al*, 1998).

Manuka, Wire Rush – *Chionochloa juncea* Tussock – Rushland

Prostrate manuka provides open shrub cover over *Chionochloa juncea*, wire rush, cushion plant, *Carpha alpina* s.s., *Celmisia dubia, Lycopodium laterale*, and *Oreobolus strictus*.

This association has generally dense cover, with a dominance of *Chionochloa juncea* and *C. australis*, and less cover of *Dracophyllum politum*. Other species include *Dracophyllum palustre*, and the hybrid yellow silver pine x pigmy pine and a range of species commonly associated with montane and subalpine bogs and seepage areas (e.g., *Utricularia novae-zelandiae*, combfern, *Drosera arcturi, Celmisia alpina, Liparophyllum gunnii* and the monocotyledonous *Microlaena thomsonii, Oreobolus pectinatus, Centrolepis ciliata, Gaimardia setacea, Herpolirion novae-zealandiae* and *Astelia subulate*. The orchids *Thelymitra venosa,* and *Prasophyllum colensoi* are present (Overmars *et al*, 1998).

Species found on or adjacent to the site and suitable for a revegetation process are:

Nothofagus menziesii	silver beech
N. solandri var. cliffortioides	mountain beech
Metrosiderous umbellata	southern rata
Griselinia littoralis	NZ broadleaf
Hebe salicifolia	koromiko
Leptospermum scoparium	manuka
Weinmannia racemosa	kamihi
Myrsine divaricatus	
Coprosma foetidissima	
Cassinia leptophylla	cottonwood
Cortaderia richardii	toi toi
Phormium cookianum	mountain flax
Chionochloa rubra	red tussock
C. juncea	
C. flavescens	

7.0 Statutory Documents

7.1 Resource Management Act

The Resource Management Act promotes sustainable management of natural and physical resources. There is a need to consider part II matters in order to integrate the proposed coalmine into the landscape.

7.1.1 Natural Character of the Coastal Environment

Landscape is not defined in the RMA. It is interpreted to be not just the visual resource, but to include the physical and the perceptual. The landscape has its own unique character and identity which reflects the area's physical, biological and cultural formation.

Peoples experience and perception of the landscape differ between individuals. The values people place on different landscapes can be subjective, but many values can be widely shared and recognised by the local communities.

In assessing the coalmine location and its effects, it is useful to understand the broad scope of the landscape and the linkages which characterise the ecosystems.

Under S6(a) of the RMA, it is of national importance to preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development. An assessment is made of the natural character of the coastal area between the site and coastline in order to determine the potential effects the coalmine may have on natural character.

While the view from the ridgeline does incorporate the coastline, the distance is approximately 10 km from the site to the coastline. In between a plateau ridge restricts views to the coastline. It therefore does not form an intrinsic part of the coastal environment.

The natural character of the streams and lake is limited to a few ephemeral streams and Lake Brazil (which is man-made). The streams will be affected with the mining operations but they are not of any real

significance in the overall context. The stream edges do have a more dense and complex vegetation pattern due to the better quality soils.

Reshaping once mining operations are complete to create a drainage system is recommended.

Lake Brazil could will be affected by the mining operations. The whole area will be opencast mined and the lake could be restored later if required.

Summary of Natural Character

The site does not form an intrinsic part of the coastal environment.

7.1.2 Outstanding Natural Features and Landscapes

Section 6(b) requires "the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development". The Environment Court (WESI vs QLDC c. 180.99) defined relevant criteria for assessing outstanding landscapes as being:

"The natural science factors – the geology, topography, ecological and dynamic components of the landscape; its aesthetic values including memorability and naturalness; its expressiveness (legibility); how obviously the landscape demonstrates the formative processes leading to it; transient values; occasional presence of wildlife; or its values at certain times of the day or of the year; whether the values are shared and recognised; its value to Tangata whenua and its historic associations."

This criteria clearly shows that landscape is not restricted to the visual and is not merely the picturesque and scenic. The perception of the landscape and the effects of aspects such as noise, culture and history on appreciation of the landscape are relevant. The landscape may thus be considered both as a biophysical entity and as a cultural resource. In considering the various landscape criteria, "natural science criteria and legibility landscape criteria" should be given weight over all other criteria. When considering a natural feature, a feature can be identified

as a “distinctive or characteristic part of the landscape”. (WESI vs. QLDC c. 180).

The Buller District Plan does not define the Denniston Plateau as an outstanding landscape.

Natural Values

There are important geological formations and vegetation values attached to the Denniston Plateau, as already described. However, much of the landscape has been modified and only pockets of good stands of vegetation exist. The formation is impressive in parts but it is also found elsewhere from Te Kuka to Stockton reducing its significance as a unique feature. The coal mining industry has transformed the natural values of the locality, including at and around the Escarpment Mine area.

Shared and Recognised Values

The plateau is a recognised geomorphological formation. It assists to define the western limit of the mountain ranges before reaching the coastal plain and separating the coastal landscape from the hinterland. It offsets the horizontality of the coastal plain and defines it. However, it is more about the mining operations that defines its notoriety. The plateau has a recognised historic value and the Escarpment Mine is part of this heritage. It is mentioned in the ‘Heritage Management Plan’ by the Denniston Heritage Charitable Trust.

Aesthetic Values

The plateau assists to form a dramatic backdrop to the coastal plain north of Westport. The aesthetic quality of the location is compromised by the man- made intrusions of the industry and forestry which alter the land cover and colour of the landscape as well as introducing new land uses, which in turn, can change the character of the locality. Most of these deviations have created a working landscape.

The Escarpment Mine shares the same result from past activity and has an aesthetic quality when viewed by visitors and recreationists using the area, as it appears undisturbed from a distance. The aesthetic quality when viewed at close range is one of considerable character and contributes to the areas mining heritage.

Landscape Legibility

The Denniston Plateau is a very legible landform due to it being a singular formation with a very defined edge and a relatively flat top.

The proposed Escarpment Mine area is physically less obvious when viewed from a distance due to its location being set further back from the main access track and is therefore not very visible from the track. The site is not as legible from a distance. When on site some landscape features appear more pronounced and modified from past activities. With the mine being at a slightly higher altitude and on the edge of an escarpment, the site becomes more legible at close proximity.

Transient Values

The site has no special transient values.

Summary of Landscape Values

Having applied the criteria to the assessment it is very evident that the landscape of the Denniston Plateau is not of an outstanding quality. This is because of the modified nature of the landscape manifested in the form of industry and settlements. It is a distinctive ridgeline but it is the association with coalmining that contributes to this landscape.

7.1.3 Amenity Value

Under section 7(c) of the RMA, regard must be shown for *"the maintenance and enhancement of amenity values."* Amenity values are defined as: *"those natural or physical qualities and characteristics of an area that contribute to peoples appreciation of pleasantness, aesthetic coherence and cultural recreational attributes."*

Visual effects relate to the changes that arise in the composition of available views due to changes in the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.

The Escarpment Mine site has moderate amenity value. It is a mixture of land cover and exposed rock and shrub vegetation and old buildings, none of which have been recognised as having significant heritage value. Because of the location of the proposed mine on the south-eastern side of the plateau, there will be only minor visual amenity issues associated with the locality. It will be necessary to determine the visibility of the site from the surrounding locality and viewpoints and the effects it has on visual amenity values. Visual amenity issues will be discussed in the following section.

Visibility

To assess the potential effects on amenity values it is important to know about the visibility of the proposal, who will be affected, and how significant any adverse effects shall be.

Visibility is a determination of how easily and regularly a landscape is seen by people. This can contribute to the importance of a particular landscape.

The visibility of an object can determine the visual effect. This need not necessarily be a negative effect, but new objects in the landscape can influence the amenity value of an area. It is often how well a new object can be integrated into a landscape that determines whether a negative effect is created.

The Escarpment Mine site is not visible from the coastal plain, the main access route (already formed as a public road) or the Buller Gorge. It is therefore only visible from the Denniston Plateau (see plan of viewpoints in the Graphic Supplement). The first sign of visibility being at the end of the sealed road, and even then only the southern and upper part of the mine is visible.

Those who frequent the plateau are visitors enjoying the areas amenity value and with particular interest in the Denniston mine, and

recreationalists using the mountain bike tracks. One track passes through the mine area and this will be closed during the mine operation. It will be reinstated once the mine has been rehabilitated.

Summary of Amenity Value of the site

The amenity values of the site include the scenic, heritage and recreational values. The Escarpment Mine site has moderate amenity value due to its limited visibility from public areas and is only a small part of a larger recreational resource.

7.2 West Coast Regional Policy Statement

Policy 9.1 of the Regional Policy Statement outlines criteria to consider when making an assessment regarding whether an area is outstanding. These include:

(a) Its use, value or degree of representativeness of/for scenic, amenity, recreational, heritage, intrinsic and scientific purposes;

(b) Its association with areas of significant indigenous vegetation and significant habitats of indigenous fauna (see policy 9.2);

(c) The significance of its association with the coastal environment, wetlands, lakes and rivers and their margins;

(d) The relationship of Tangata whenua and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga; and

(e) The inclusion or exclusion of a water body from a water conservation order.

Having regard to these criteria, it is considered that the area is not an outstanding natural feature or landscape.

8.0 Viewpoint Assessment

The elements of a coal mine which could create landscape and visual effects include access road, the mine faces, earthworks, overburden, buildings and structures, stockpiles of materials and vegetation, powerlines and masts. The following is an analysis of those effects and an outline of mitigation measures to counteract potential effects.

8.1 View Points (Refer to viewpoints map in Graphic Supplement)

View Point 1- Elevation 659m, view south/southwest from access road

Foreground

This consists of low rolling and incoherent landscape in which rock formations appear randomly throughout the landscape. A sparse covering of grasses and stunted shrubs are the dominant vegetation types. Larger plant species including flax and hebe are found within suitable microclimates or where the surface has been disturbed. The smooth surface of a nearby reservoir that has a weir at the north-western end provides a contrast to the overall ruggedness of the landscape. It also creates a microclimate suitable to sustain larger shrubs. There is little sign of bird life and the area is quiet.

Several outcrops within the area partially obscure views to the south of the plateau.

Middleground

High voltage pylons are very noticeable. Rolling low rock outcrops and corresponding low ridgelines. Gravel tracks are noticeable within the landscape.

Background

Closer outcrops obscure views to the southeast and the overall rolling nature of the area screens the location of the proposed site.

Mt Rochford forms the dominant ridgeline to the southwest and south.
Mt William forms a second dominant ridgeline to the east, which contrasts with the colour of the plateau due to the difference in vegetation cover.

Comment

This is a very exposed landscape consisting of rock outcrops and distinct rock formations. It is a rolling landscape, which is incised with relatively shallow gullies allowing runoff from the escarpment mainly to the west. In general these gullies have more complex plant communities compared to the more exposed parts. Scarring of the landscape by current and past land use practices is prevalent and the scattered remnants of habitation can be readily seen. This viewpoint highlights how discrete the proposed Escarpment mining area is from the end of the tarseal where a lot of visitors may park their car.

View Point 2 - Elevation 667m, view south/southwest from access road and pylons

Foreground

Pylons are a dominant feature of the fore, middle and background views.
There is mainly shrubby vegetation to the south, which includes rata and manuka.

Numerous rock outcrops are evident, some of which screen part of the plateau from view.
A galvanised gate across a gravel track intended to stop vehicular traffic does not integrate with the landscape.

Middleground

Mt William forms a prominent ridgeline to the east and dominates the eastern side of the plateau. The landscape up to the base of Mt Rochfort, and plateau boundary is of a rolling nature.

Background

The edge of the plateau which abruptly drops away to the south can be seen.

The northern slope of Mt Rochfort is exposed and there are several stream gullies visible on the slope. Views to the south west of the Tasman Sea include the very distant coastal landscape near Westport.

Comment

The landscape rises in an increasing slope angle from the southern side of the Whareatea River to the Mt Rochfort summit and the access track to the summit of Mt Rochfort is a prominent feature of the slope.

The escarpment in general is a very quiet place with little indication of wildlife, however fantail and other unidentified native birds were observed. The overall dominant colour of the landscape remains a tawny ochre.

View Point 3 - Elevation 815m, view north/northwest from Mt Rochfort access track

Foreground

Grass cover, loose rock and low voltage power lines comprise the landscape elements and a nearby ridgeline to the east screens the proposed site location from view.

Middleground

The Whareatea River is the dominant feature and signifies where an increase in the elevation of the plateau occurs. Within the river gully larger shrubs are visible.

Gravel tracks and pylons are prominent features of the landscape and the landscape is exposed to westerly and north-easterly winds. To the east Mt William ridgeline dominates the view.

Background

The tawny colour of the landscape covers most of the plateau.

South facing slopes of the mountains to the northeast of the plateau are covered in forest, which contrasts with the closer tawny colours. Both the Tasman Sea and low-lying coastal land is visible to the north.

Comment

In general the landform is of a rolling nature in which the exposure of rock material dictates the appearance, types of vegetation and drainage of the escarpment. The environment appears to be fragile as well as harsh, indicated by the stunted growth of plants.

View Point 4 - Elevation 652m, view north/southwest near lake Brazil

Foreground

V8 Creek has a relatively dense covering of vegetation on the southern slopes comprising of grasses, stunted manuka and rata.
Exposed rock formations dominate the view to the west. They are of a low rolling nature with shallow gullies and sporadic pockets of vegetation. This area is particularly exposed.

Middleground

The ridgeline of V8 Creek is a prominent feature to the north which falls away to expose Lake Brazil. It obscures all of the plateau from view leaving only the ridgeline of the neighbouring mountains visible behind it. To the northwest the landform has no particular pattern to it and the rock formations, show the results of geological activity as well as weathering. For this reason this part of the plateau is visually more enclosed. To the southwest, the ridgelines of the upper plateau obscure views of the landscape beyond. The slopes and base of the gullies are well vegetated with mature plant communities to the southwest.

Background

To the north, the upper part of the neighbouring range is visible.

Comment

The landform of this area is more dramatic than the northern part of the plateau. It has noticeably larger rock formations and deeper stream gullies

resulting in a greater sense of enclosure. The variety of plant species is also greater and many have reached a stage of maturity possibly due to less exposure to extreme climatic conditions and/or as a result of increased moisture levels. A notable feature of this part of the escarpment is Lake Brazil, which is significantly larger than the other water bodies. It's location within the rock formations mentioned above result in a landscape of contrast in which irregular shapes and patterns contrasts with the smooth horizontal plane of the water surface. There is very little indication of complex soils and plant growth appears to be sustained by a peat mix.

View Point 5 - Elevation 734m, view east/west from ridge near Escarpment Mine

Foreground

A prominent ridgeline obscures the landscape for approximately 50% of the view and rises above the access road to Escarpment Mine. The slope is covered in mature vegetation including beech, rata and other species. A second ridgeline merges with this to obscure all views of the northern part of the plateau.

The dominant species within the area include grasses and manuka, which cover the more exposed areas. Other species such as flax and hebe are located sporadically throughout the area and take advantage of cracks within the rocks to gain a footing.

Middleground

Ridgelines create a sense of enclosure to this area, obscuring the medium and distant views of the plateau.

Background

The ridgeline of Mt William is visible to the east and the landform of these mountains differs significantly to the low-lying rolling type of the plateau.

To the north the exposed slopes of the distant landscape is visible.

The north face and summit of Mount Rochfort is visible. It is likely therefore that part of the proposed mine would be visible from the summit of Mt Rochfort.

Comment

This part of the plateau provides a good indication of how the landform in this area is more abrupt than that to the north. Also, there is substantially more vegetation and the plant communities appear more complex.

Viewpoint 6 - Elevation 812m, view east/north from south-western corner of site boundary

Foreground

This viewpoint is situated near the western corner of the proposed site and takes in much of the area that would be mined. From east to north, grasses, low shrubby plant communities and rock formations form much of the foreground landscape up to the edge Trent Stream. This stream has relatively steep sides of approximately 30-degree angle. Plant communities can be found on both sides and in the bottom of it, and include trees and shrubs such as flax, rata, beech and manuka. The tops of the slopes are mainly covered in grasses with few large species of shrubs.

Middleground

To the east the landform consists of low rolling formations incised with several minor drainage gullies, which are covered in mature plant communities. The lower lying northern part of the plateau are visible as are parts of the main access track. To the east the edge of the plateau is clearly definable. The ridgeline of Trent Stream screens much of the view.

Background

To the east Mt William ridgeline is the dominant landform. Much of the escarpment is visible from this viewpoint and clearly indicating the nature of the topography. Distant ranges to the north and the Tasman Sea are visible

above the Trent Stream ridgeline. To the west, a second ridgeline screens the remainder of Mt Rochfort.

Comment

This is the highest point of the proposed site and is visible from parts of the main access road. The colour of the landscape is predominantly tawny and while it has been described as a rolling landscape there is a definite irregularity caused by the unique geological formations and old mine workings. The formation of Trent Stream and the location and types of plant communities are indicative of many of the gullies on the escarpment.

Viewpoint 7 - Elevation 708m, view east/southwest from north-west corner below site

Foreground

The position of this viewpoint is on the edge of Trent Stream. Plant communities within the location are of the type found on wet, poorly drained ground and include grasses and stunted broadleaf varieties.
The dense vegetation cover disguises the irregularities of the ground surface. Colours associated with plants in the area reflect the difference in communities and range from tawny, ochre and olive greens.

Middleground

The same as the foreground in which the pattern of vegetation is repeated. Mt William ridgeline dominates the view to the east and again the dark colour contrasts with the lighter. Ridgelines from the southeast to the southwest obscure any distant views. Tree and shrub communities exist in the gullies while grasses and other groundcover species are on the more exposed faces.

Background

The distant ranges are visible to the southeast, however all other views are obscured.

Comment

The difference in plant growth, colour and species is noticeable and the area is also relatively flat and wet due to impervious drainage. Vegetation cover differs substantially from the more sparse areas to the north of the plateau. Plant communities also appear more complex.

8.2 Summary of landscape from the viewpoints

The plateau is a unique landscape because unlike many parts of the region that are covered with a thick blanket of vegetation accompanied by a cacophony of intriguing sounds, this area is vast, exposed and rugged. Under close examination, the most basic structural elements may be undertaken at a glance. This is largely a rock landscape with numerous formations that clearly reveal the geological stresses and strains that have been exerted upon them. In addition, the climatic elements can ravish the surfaces constantly, the results of which are clearly visible.

The scale and exposure of the escarpment may be intimidating to some but this is offset by the fact that many of the elements within it are almost of a domestic scale. The upper gullies are not deep, however, the Whareatea River below the Rochfort Road and the Cascade catchment are deep, impassable and dangerous in places. The areas of small bodies of water contribute to a distinct place.

Access around the site is possible due to the network of tracks created during the mining era and which now provide recreational opportunities for those wishing to explore and enjoy the location.

A feature of the escarpment are the disused mines and the relics of building foundations, storage sites, dams, weirs, mine shafts and rusting and rotting materials. While these have been discarded and abandoned long ago they now provide a window to the past and a haunting reminder of what it may have been like to live and work on the Denniston Plateau.

9.0 Assessment of Potential Landscape and Visual Effects

The Denniston Plateau is one of moderate to high natural character. There are many undisturbed areas which exhibit the natural formation, basement rock and vegetation. However it is a place which has seen significant change due to the various mining operations.

These have reduced the quality of the natural character across the plateau. Escarpment Mine is one of those areas where there are roads, buildings, structures, cut over areas and weedy growth. The potential landscape and visual effects are assessed after the mining and rehabilitation operation are completed. This will be a gradual process and will not occur immediately with parts of the mine still operating while rehabilitation measures are taking place.

The effects will be localised. No view of the site can be gained from beyond the plateau (apart from the adjacent mountain ranges), and whilst on the plateau, views to the site are limited to elevated ones or close at hand. Therefore the effects on the amenity value will be minimal. Some vegetation clearance may be required to accommodate wider roading through to the mine. This will also have minimal effects on landscape values and will make vehicle access to Mt Rochfort and the mountain bike tracks more accessible.

Restoring the natural character of the site will be determined by the success of landform contouring and ability to create a land drainage system, as well as a vegetative process. This is a lengthy process, as gaining back a good vegetative cover on the plateau is slow due to the climatic and site conditions. The process could be faster than normal due to the penetration of the basement material and pans, which exist on the plateau due to the mining process, and when rehabilitated, will assist drainage and revegetation.

The existing disused mines on the plateau provide an interesting and graphic reminder of the past mining exploits which formed a significant part of the West Coast industry. With the advent of time, these are worthy amenity features, along with the interlinking tracks. Once rehabilitated, Escarpment

Mine will also be part of this reminder, forming part of the heritage value of the Denniston Plateau. The landscape effects associated with the rehabilitation of the site will exist over many years. These effects will gradually reduce until the vegetation becomes established. The overall effects will not be adverse.

10.0 Mitigation Measures

Mitigation measures will assist to reduce the impacts of the following activities:

(i) open-cast mine including- earthworks and vegetation clearance
(ii) stockpiling of coal, overburden and vegetation
(iii) handling and hauling of coal
(iv) water management and drainage
(v) mine restoration
(vi) installation of structures eg: offices, site buildings, workshop e.t.c
(vii) Clearance of gorse around heritage sites and access etc

Sensitive development and rehabilitation are the key issues in mitigating the site during and after the mining operations. Successful rehabilitation involves land contouring to create a catchment drainage system and reinstating soil profiles. Mitigation measures could include:

10.1 Roading

The existing gravel road on the plateau itself will be upgraded and widened to accommodate large vehicles. There may be some vegetation clearance to accommodate this, however the effects on amenity values will be minor.

10.2 Contouring

The landform of the mine areas will be reinstated and will be later contoured in a manner that is sensitive to the adjacent landforms. It is important that the transition areas between the existing and restored areas are treated appropriately and that there are minimal abrupt changes in landform.

10.3 Building and Structures

All buildings should be located in less visible areas, grouped together and painted in recessive colours. Any pipelines will be at least partially buried, probably one power/phone line installed and there will be no pylons. These are structures which cannot be entirely mitigated because they form part of a practical operation. Careful location and placement of these structures should be ensured.

10.4 Recreational facilities

There may be a need to reinstate or redirect any mountain bike tracks that cross over proposed mining areas. This could be undertaken at the completion of the mine rehabilitation process.

11.0 Summary of Landscape Assessment

Landscape Values

The mine site is only a small part of the much larger landscape of the Denniston Plateau. It has no peculiar or unique values that don't exist elsewhere on the plateau. The gentle landforms, drainage system, the rock outages and underlying basement rock, heritage features and vegetation are also found elsewhere. Where mining operations have occurred elsewhere on the plateau they now form important heritage sites and have added a cultural value to the landscape enjoyed by many tourists and recreationalists.

Influence of the project on landscape values

The mine will have an influence/impact on the landscape values. This influence will be negated somewhat due to the fact the mine is not visible from the coastal plain and only partly visible from southern end of the Plateau. The landform and vegetation will be impacted, but this will lessen during the rehabilitation period from the end of the mine life and the landscape values of this site significantly restored. Given that a land drainage pattern will be formed and vegetation reinstated then this will integrate with the remainder of the Plateau. An added value will be the heritage value of an opencast mine,

adding to the ensemble of previous mining techniques exhibited on the Plateau.

Amenity Values

The effects on the amenity value will be minor. This is due to the fact that the site is not visible from most public locations. It is not visible from the coastal plain and only comes into view at the southern end of the Denniston Plateau. The recreationalists, either 4-wheel driving or mountain biking, will be the most affected parties during the mine operation.

Natural Character

The effects on natural character of the Denniston Plateau will be minor given the small scale of the mine. The effects on natural character of the site will be significant during the mine operation but this will diminish over time due to land contouring restoration and establishment of a sward of vegetation. This may take up to 20 years to achieve.

Mitigation measures

A number of measures will be put in place to reduce potential landscape and visual effects. These include:

- judicious placement of buildings and structures to avoid high impact
- recessive colour scheme for building and structures
- sensitive treatment to road improvements
- sensitive removal and stockpiling of soils and vegetation
- contouring to replicate a land drainage system
- placement of soil structure and vegetation back onto the mined sites
- revegetation scheme
- maintenance programme
- monitoring programme

Positive effects –post mitigation

The main effect will be that the site will exhibit heritage qualities contributing to the overall cultural display on the Plateau. There have been mines during

various eras and this will be the most recent one undertaken using modern techniques. Interpretation and tracks could be developed on site.

12.0 Conclusion

The Escarpment Mine is a discrete site in an isolated location on the Denniston Plateau. Set well back from the western edge of the Plateau, the visibility of the site is restricted to viewpoints, which are at the southern end of the Mt Rochfort Road. Parts of the area have been mined in the past and mine remnants still remain. It is therefore, in parts, a modified environment. The most significant factor with the mine operation is the need to successfully rehabilitate the site. Given the harsh climatic and physical conditions, every effort must be made to utilize the existing soil structure and vegetation so as to circumvent the long time period required to get new plants established. This will be followed up with a substantial monitoring and maintenance programme.

The effects on the amenity value will be minor. This is due to the fact that the site is not visible from most public locations. The effects on natural character of the Denniston Plateau will be minor given the small scale of the mine. The effects on natural character of the *site* will be significant during the mine operation but this will diminish over time due to land contouring restoration and establishment of a sward of vegetation.

13.0 References

Overmars, F.B. Kilvington, M.J., Gibson, R.S., Newell, C.L., Rhodes, T.J. (1998), Ngakawau Ecological Report – Survey Report for the Protected Natural Areas Programme. Department of Conservation. Hokitika.

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14.0 Appendices

See Graphic Supplement