Application for Access to Undertake Opencast Coal Mining and Related Activities on Public Conservation Land

18 December 2013

Prepared For

Te Kuha Limited Partnership

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Contents

1. Introduction

1.1. Purpose of Document

Te Kuha Limited Partnership (TKLP) proposes to mine a deposit of high quality coal that occurs on a ridge southwest of Mt Rochfort on an un-named range colloquially known as the Papahau Range, which lies immediately north of the Paparoa Range approximately 12km southeast of Westport and 2km north of the Buller River, at an elevation ranging from 650 m to 800 m above sea level (a.s.l).

TKLP has an authority to undertake the mining activity as the owner of the limited company that holds Mining Permit 41-289 which includes a coal resource known as the Te Kuha Deposit. The majority of the mining permit is located within a Water Conservation Reserve which is administered by the Buller District Council. However, a small area is located over Department of Conservation land. A light vehicle and coal haul road will also be needed to access the mine site from the railway siding. This access road traverses Department of Conservation land and private land.

TKLP therefore requires access agreements with the Buller District Council and with the Department of Conservation under Section 60(1) of the Crown Minerals Act 1991.

1.2. Background

TKLP is the owner of Rangitira Developments Limited (Rangitira), the company that holds Mining Permit 41-289. The mining permit covers approximately 860 hectares (ha), and contains coal referred to as the Te Kuha Deposit. The deposit is predominantly located on an area of Buller District Council (BDC) Water Conservation Reserve with a small area, approximately 13 ha, located on Department of Conservation (DOC) stewardship land.

In 1995, Rangitira purchased the Te Kuha Mining Permit and commenced the process of obtaining land access agreements and resource consents for the mining activity known as the Te Kuha Coal Project. In 1998, an application to access the land was made to the DOC, but subsequently placed on hold until 2000, when applications were re-lodged with both the DOC and the BDC. The application to the DOC was later withdrawn and the application to the BDC declined. A simultaneous application to the West Coast Regional Council (WCRC) was also declined.

Both resource consent applications were appealed to the Environment Court by Rangitira and, in 2002, a mediated agreement was reached between Rangitira, the BDC and the WCRC with respect to appropriate conditions of consent to mitigate, avoid or remedy adverse effects. Due to outstanding

land access issues, these agreed conditions were never formally presented to the Court and the consents were never formally granted.

In 2010, Stevenson Mining Limited joined with Rangitira in a joint venture to undertake further exploration of the Te Kuha Deposit which resulted in an analysis of geology, mine planning, surveying and resource management activities. In 2012, a detailed drilling programme and geological resource modeling work were carried out to establish and confirm the quality of the coal resource.

1.3. Project Description

The coal deposit at Te Kuha is situated at an elevation ranging from 650 m to 800 m a.s.l. It is located approximately 2km north of the Buller River and approximately 12km southeast of Westport.

The mining permit is located predominantly within the Water Conservation Reserve which is legally described as Section 14 Block VII Kawatiri Survey District (929ha) and Section 17 Block II Ohika Survey District (357ha). These are local purpose reserves administered by the Buller District Council. The permit area also includes approximately 13ha of public conservation land administered by the Department of Conservation (the DOC).

TKLP proposes to construct an opencast mine at the Te Kuha Coal Project site. The pit would cover approximately 70 ha near the Te Kuha ridgeline. The infrastructure associated with the proposed mine, such as coal handling and processing plant and coal stockpiles, will be located on privately owned land on the lower Buller River terrace and accessed from Nine Mile Road. The mine and the associated infrastructure will be connected by a new haul road to be built between the two locations. The new haul road will be approximately 9km in length and will cross privately owned land (for approximately 1.4 km) as well as public conservation land (for approximately 7.6 km).

1.4. Outline of Proposal

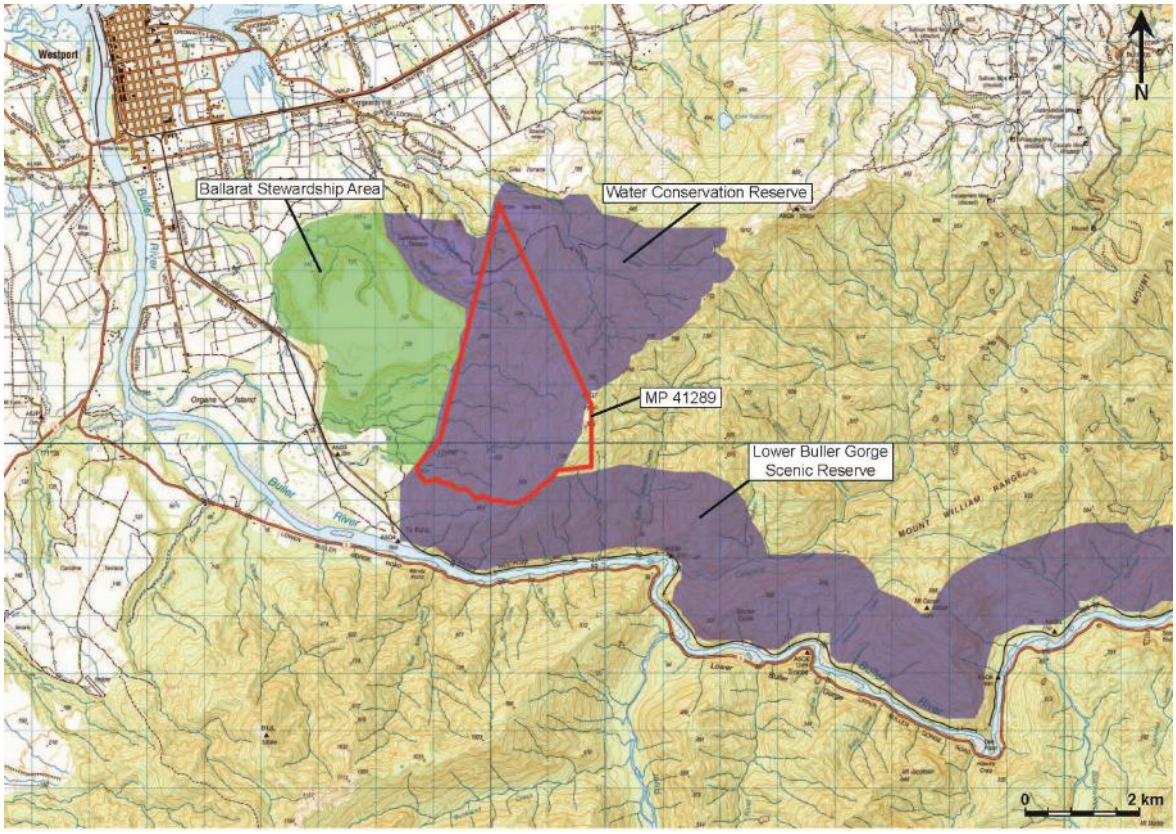
The applicant, Te Kuha Limited Partnership, under Section 60(1) of the Crown Minerals Act 1991, is seeking an access agreement with the Department of Conservation to undertake open-cast mining activities on Crown-owned land, although the main activity to occur on Department of Conservation land will be the formation and use of the main access route to the proposed mine. The access agreement is sought for a period of 10 - 25 years, which includes all stages of the operation, including rehabilitation and closure of the mine.

2. Description of Existing Environment

2.1. Site Location, Topography and Land Use

The Te Kuha Coal Project would be located at the top of the Papahau Range, approximately 12 km southeast of Westport in the Buller Region of the West Coast of the South Island.

Figure 1: Location of Mining Permit 41-289



It is predominantly located within an area of Buller District Council Water Conservation Reserve with a small area, approximately 13 ha, located within Department of Conservation "stewardship" land, either the Mt Rochfort Conservation Area or the Lower Buller Gorge Scenic Reserve. The mine would be located approximately 2 km north of the Buller River at an elevation between 650 m and 800 m a.s.l. The land is zoned Rural in the Buller District Plan.

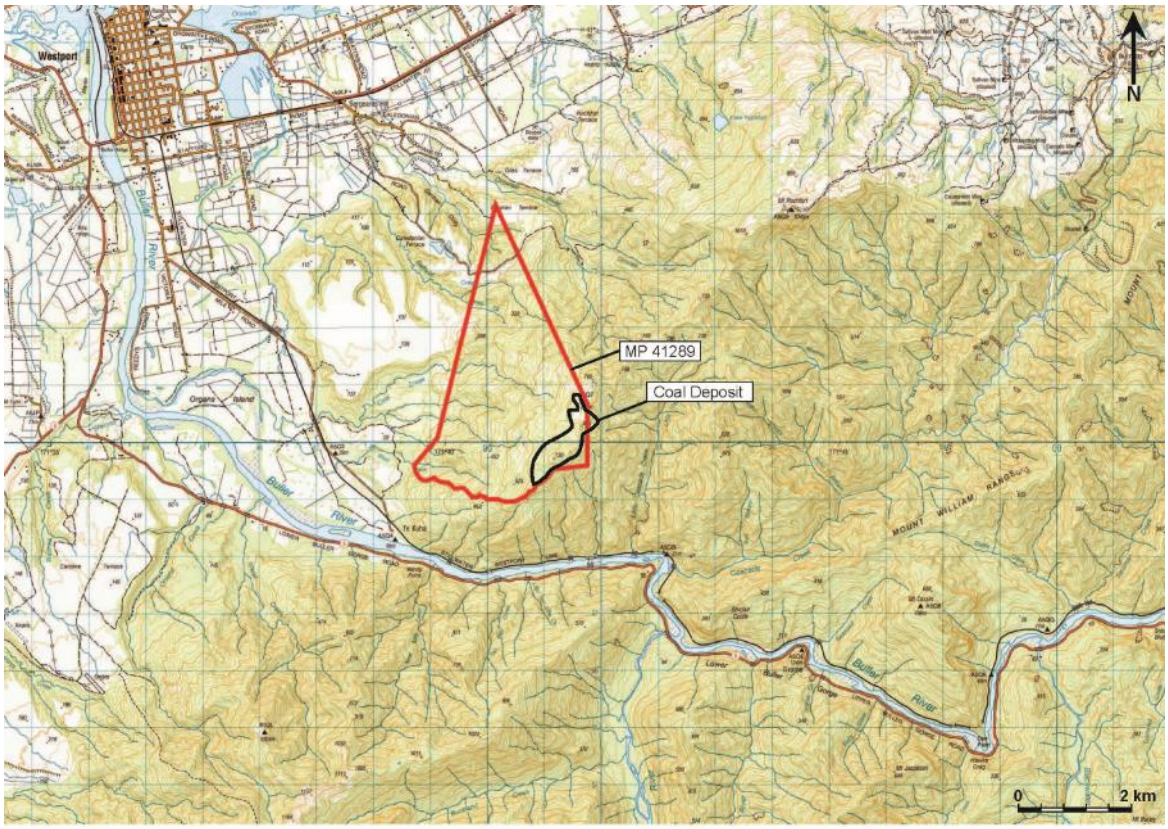
The legal descriptions of the site are Part Section 14 Block VIII Kawatiri Survey District, Section 17 Block II Ohika Survey District and State Forest Land situated in Block VIII Kawatiri Survey District, and

Block II Ohika Survey District as contained in Certificate of Title NL11D/2. A copy of the Gazette Notice and Mining Permit are appended as Attachment A.

Most of the mining permit is within the Coastal Hillslopes on Brunner Coal Measures and appears to intercept three Ecological Districts, being the Ngakawau, Buller and Foulwind Districts. In terms of the areas subject to this concession application, the access track is predominantly located within the Buller Ecological District, while the mine itself appears to be located within the Ngakawau Ecological District.

The Coastal Hillslopes generally comprise west-facing steep hillslopes and dissected gullies. The mining permit area culminates at a high point of 796 m a.s.l on a northeast-southwest asymmetric trending ridge which separates the Ngakawau Ecological District from the neighboring Foulwind Ecological District. The ridge reaches its highest elevation at Mt Rochfort (1040 m a.s.l), approximately 5km to the northeast of the high point in the mining permit area.

Figure 2: Location of the Te Kuha Coal Deposit



The topography of the permit area is dominated by fluvially-incised terraces and has slopes in the general range of 10 to 20 degrees as illustrated in the photograph below. Several named and unnamed creeks drain the permit area in a northwesterly direction. The named creeks are German Gully and Ballarat, Jones, Coal and West Creeks. While the latter two creeks merge and drain into the Buller River in the vicinity of Organs Island, the other watercourses drain into the Orowaiti River which, along with some other tributaries, has its origin on steep dissected hillslopes northwest of the mining permit area.

The Orowaiti River traverses a coastal plain within the adjacent Foulwind Ecological District before entering the Orowaiti Lagoon and, eventually, the Tasman Sea. The relatively small portion of the mining permit area on the southeastern side of the ridge is steep, having slopes between 30 to 40 degrees.

Below the permit area, these steep slopes are incised with several creeks, some of which drain southwards and directly into the Buller River near the western end of the Buller Gorge, while others drain eastwards into Little Cascade Creek which flows into the Buller River approximately 500 m downstream of an acute bend in the river at the confluence with Cascade Creek.

Photograph 1: General View Showing Topography of Mining Permit Area

Photograph 2: Steep Topography at the Southern end of the Mining Permit Area - South Eastern side of Ridge that defines Coastal Hillslopes

The majority of the mining permit area, and the active mine footprint lies within a larger area that has been set aside as Water Conservation Reserve vested in the Buller District Council. This part of the Water Conservation Reserve has never been used for water supply purposes.

The permit area forms a relatively small part of the overall Water Conservation Reserve, with the main land area within the reserve remaining largely undisturbed, although anecdotal evidence suggests that parts of the area may have been repeatedly burnt through the 1940's-1950's.

The land subject to the permit area is largely unmodified, and, apart from a hut associated with mine exploration activity located within the coal project area, the only other form of development within the mining permit area occurs in the northern apex where Waterworks Road cuts across prior to terminating at the Orowaiti River where the Westport Town's water supply intake infrastructure is situated.

The road within the mining permit area is approximately 3 km north of the proposed mine site and, before entering the permit area, passes water reservoirs located either side of Waterworks Road on

Caledonian Terrace. From Waterworks Road, or any other road or location, there are no tracks that afford access to the Te Kuha Coal Project site.

Photograph 3: Hut within the Te Kuha Coal Project Site

There are no sensitive receptors, such as residences or schools, within approximately 4km of the proposed mine area. To access the mine site, a haul road will need to be constructed starting at the end of Nine Mile Road. This will mean that the closest resident will be 2 km from any physical aspect of the proposed mining project.

The nearest catchments for the Westport community town water supply are over 2 km north of the mine site. The surrounding area is unmodified native bushland. The Lower Buller Gorge Scenic Reserve, which is a margin one mile (1.6 km) wide parallel to the true right bank of the Buller River, incorporates an area that framed the historic and important transportation route through the gorge.

Land to the north of the site is vested in the Buller District Council and designated as a Water Conservation Reserve, land to the southeast is owned by the Crown and designated as a Scenic Reserve, land to the west and southwest is owned by P & E Limited and other land also to the southwest is owned by Coleman Westport Limited (a Stevenson owned company).

2.1.1. Regional Context

The West Coast region extends 600 km from Kahurangi Point in the north to Awarua Point in the south, lying between the Southern Alps and the Tasman Sea. The West Coast is a region of mountains, forests, rainfall and rivers. These features, combined with the processes of uplift and erosion, have resulted in a landscape character similar to other parts of New Zealand where two-thirds is mountainous. The West Coast is considered to be remote and sparsely populated when compared to other regions within New Zealand.

The West Coast's history has been based on the utilisation of the region's natural resources, especially gold, timber and coal. Substantial deposits of coal, gold and industrial minerals are found in the region and some of these deposits are of national strategic and economic importance. Extensive bituminous and sub-bituminous coal-fields exist north of Greymouth. Currently, extraction accounts for a significant amount of the national coal production.

Recently, the dominance of mining on the West Coast has begun to change and other industries, such as farming and tourism, have become increasingly important aspects of the West Coast economy.

2.1.2. District Context

The Buller District is characterised by mountainous terrain and terraced valleys. Granite and sedimentary rocks dominate the Karamea region and a band of limestone contains many natural features including caves and arches. Further south are coastal ranges and alpine landscapes including the Paparoa Ranges and the coal plateau. The coastal environment has a significant influence on the character of the Buller District. The coastline comprises a combination of sandy beaches, cliffs and estuarine lagoons.

There are a number of complex river systems that flow through deeply incised gorges and arrive at alluvial plains with features such as marine and alluvial terraces and deltas. The Inangahua area contains the Inangahua Fault, a northern offshoot of the Alpine Fault and Main Divide, while alpine lakes and tarns exist in the Paparoa and Mt Victoria ranges. The district also contains two large valley floors and the Buller River is the biggest river, recognised for its wild and scenic values.

Agriculture is an essential component of the Buller economy and is largely confined to small discontinuous coastal strips, river valleys and alluvial terraces covering an area of over 131,000 ha. Dairying is the most common farming activity, followed by mixed livestock and beef farming. There are also areas of exotic production forest in the main located in the Mokihinui, Charleston and Reefton areas of the district.

Buller District is relatively well endowed with a variety of mineral resources, including coal, alluvial gold and mineral sand deposits. The vast majority of coal is taken from the Stockton mine and industrial minerals, in particular limestone, are currently extracted from other localities in economic quantities for agricultural fertilisation and cement production.

Buller is endowed with scenic and historic attractions and has significant land and water-based recreational assets.

Westport is the major town and population centre of the district and has gradually increased in importance as a tourist and holiday attraction. Reefton, to the southeast of Westport, is the second largest town. The smaller settlements display a diversity of land uses, with Karamea known as a dairying town, and Punakaiki a tourism town.

2.2. Soils

On the Coastal Hillslopes, soils are primarily podzols that have formed on the sandstones of the Brunner Coal Measures and are very infertile, acidic and tend to be extremely poorly drained.

At high altitudes, the soils become skeletal and, in many places, unweathered parent rock is exposed on the surface. At the Te Kuha Coal Project site, outcrops of bare sandstone rock are evident along the ridge crest and also on northwest-facing slopes below the ridge. Generally, the ground is very rocky and broken with large sandstone boulders present.

Photograph 4: Rock outcrops on the ridge crest within the Te Kuha Coal Project Area

The dominant soils found in the Ngakawau Ecological District comprise Eocene quartz sandstone, grit and conglomerate with coal seams.

2.3. Geology

Coal occurs in both Paparoa and Brunner Coal measures at Te Kuha. Paparoa Coal Measures have not previously been identified north of the Buller River, so their discovery at Te Kuha is geologically interesting. Brunner Coal Measures are the same sequence of rocks that host coal on the Denniston and Stockton Plateaus north of Te Kuha. Paparoa Coal Measures are Late Cretaceous (>66Ma) age and were deposited in lacustrine or river valley environments. Commonly Paparoa Coal Measures are unconformably overlain by Brunner Coal Measures (as at Te Kuha). Brunner Coal Measures are Eocene (~30-50Ma) age and were deposited in an estuarine environment.

These different sets of coal bearing rocks have different coal quality parameters and different environmental implications when disturbed by mining. The coal quality differences relate to ash content, sulphur content and the coke making properties of the coal, both types of coal are have properties that make them high value commodities.

2.4. Existing Hydrogeology

2.4.1 Surface Water

The two main water courses within the mining area are Coal and West Creeks as well as a tarn located North West of the mining site and several small tarn located within the mine site.

Four streams or tributaries drain off the top of the ridge down to the northwest. The northern most stream is Coal Creek. The two streams immediately south of Coal Creek join with each other and with a smaller stream at the bottom of the ridge to form a tributary of Coal Creek. The fourth stream on the ridge line, West Creek, flows in a predominantly westerly direction off the ridge to join Coal Creek downstream of the other tributaries. Coal Creek then flows to join the Buller River. In addition to the streams, there is a small ephemeral tarn near the top of the ridge that has no surface outlet.

Each tributary displays patterns of increased flow rate further downstream which is likely due to the additional runoff collected and groundwater inputs.

The large tarn within the permit area would be excluded from any mining activity. It is located west of the proposed mining areas and has a 100m radius exclusion zone around its perimeter.

Other streams drain off the ridgeline to the south, east and north. However, because the proposed mining activities will be limited to the northwest, these streams are unlikely to be affected so were not been subject to sampling undertaken in 2013. The streams within the proposed mine site are small, clean and weakly acidic streams. The streams are largely unmodified. However, due to the acidic nature of the aquatic environment, instream fauna is relatively limited in terms of species diversity but abundant in terms of species counts.

A water sampling programme was undertaken between 11 – 13 March 2013 across the water courses that are in, or close to, the permit area. The streams included hilltop sites which are characterised by full or partial shade environments with gradients rising from flat mountain tops down to the terraces at the bottom of the mountain and streams at lower altitudes (below 200m a.s.l) which are characterised by gentler gradients, with pool, riffle and run habitats common. When sampling was undertaken in these streams, they were either dry or in very low flow condition due to a prolonged period without rain and appeared to support macro invertebrate populations only. The sampling results observed are therefore not likely to be fully reflective of typical stream habitats within the area.

There is currently a programme of monthly sampling at the lowland stream sites and continuous monitoring of physio-chemistry at one of the low land sites.

Macro invertebrate sampling was undertaken at thirteen sites during the programme which characterised the natural community of aquatic invertebrates and indications of environmental quality as ranging from good to pristine. Eleven fish species were either captured or observed across the thirteen sites but sampling was varied, with no fish species found in the upper mountain sites, likely a result of steeper instream gradients making fish passage difficult. All identified species were found in the lower stream sites. Both types of sampling streams had juveniles present and the fish at the lower altitude sites were diadromous (migratory) species.

The Coal Creek site along the haul road route exhibited some of the lowest indicator scores and there was a discernible difference between the lower altitude sampling sites and the upper mountain sampling sites. At the small tarn site within the permit area, there was a reasonably abundant population of Koura.

Surface water quality was also sampled and, in general, upstream locations typically exhibited lower pH water compared to downstream locations. The increase in pH downstream may be due to dissolution of carbonate minerals present in the lithologies underlying the coal seam measures. Because the upstream locations drain coal seam measures, which contain sulphides, this contributes to acidic drainage and hence higher pH in the downstream sampling points. In support of this likelihood, calcium concentrations in the water increased as sampling sites moved downstream which is evidenced in the CRL report appended as Attachment B (Table 1 from CRL report, pg 8). In general, net acidity in the headwaters of the streams is neutralised resulting in net alkalinity downstream.

The sampling programmes enable establishment of a baseline water quality framework against which the monitoring and mitigation conditions of both the regional council and district council consents can be measured during and post mining activities.

2.4.2 Groundwater

The data collected to date suggests that there are two groundwater systems in the study area. The first is a discontinuous, perched, rainfall-driven, shallow system and the second is also rainfall-driven but is a deeper, more extensive system.

The deep groundwater system is estimated to be between 30 and 80 metres below the land surface with a directional groundwater flow to the northwest. Groundwater intersects surface water at approximately the 600 m contour coinciding generally with the location of streams evident on the topographical map of the area. This suggests that groundwater may discharge to the surface at around this elevation.

Within the deep groundwater system, primary permeability through the strata is less than secondary permeability through fractures in the rocks. The hydraulic connectivity is estimated to be between 0.21 and 3.48 m/d, based on recovery rate tests from a single borehole. The groundwater system has natural rainfall recharge.

The shallow groundwater system appears to have a discontinuous surface for an ephemeral perched groundwater system resulting from the fracture bound expanses of sandstone and areas associated with mass movements. These mass movements of slumps have created depressions which occasionally retain precipitation, such as the tarn and surface water bore hole. This groundwater system is rain-fed although is likely to have water storage in the humic soil layer, or sediments close to the surface, that sustains flow between rainfall events.

2.5. Climate

The Coastal Hillslopes within the Ngakawau Ecological District lie in an area characterised by a steeply rising rainfall gradient as one moves away from the coast. Rainfall at the Te Kuha Coal Project site averages between 3,500 mm and 4,000 mm per year.

For more than half the time rain is falling, it is generally of low intensity and manifests as long periods of mist and drizzle. Dry periods are relatively uncommon and, in general, wind speeds are low, with infrequent, high velocity gusts.

Westport, despite anecdotal evidence, has one of the mildest climates in New Zealand. The Westport region has a high annual quota of sunshine hours and, with the effect of the prevailing westerly winds

coming from the Tasman Ocean, generally high rainfall. Typically, summer temperatures reach average highs of 20˚C and average lows of 12˚C, with winter temperatures ranging between 5˚ and 15˚ C. Annually, Westport receives about 2,200 mm of rain (according to NIWA Climate Data).This is evident through rainfall records at the Westport airport between 1961 and 2010 that give a mean annual rainfall of 2,158 mm and an average monthly rainfall of 183 mm. The longest period without rain at Westport airport is recorded as 14 days.

The nearest meteorological station is located at the Westport airport, approximately 12 km northwest of the proposed mine site. The airport is located near the coast, west of Westport town, adjoining Carters Beach Township. It is climatically different to the mine site which is located inland on the Papahau Range.

NIWA provides climate data on the Water Resources Database for virtual weather stations. The annual rainfall calculated for the closest virtual station to the mine (Agent number 18934) between 1 January 1972 and 8 March 2013 was 2,500 mm. The virtual station is located at an elevation approximately 450 m a.s.l and 2.5 km to the southwest of the proposed mining area.

CRL Energy Ltd (CRL) has been employed to operate a meteorological station on the elevated terrain in the vicinity of the proposed coal mine since 1 January 2013. The station is located at an elevation of 460 m.a.s.l on a small ridge in an area that is free of tall vegetation and relatively clear of topographical influences. This station will record windspeed and direction as well as rainfall and will provide baseline climatic data for the mine site.

2.6. Vegetation and Wildlife

2.6.1 Vegetation

The West Coast region is dominated by indigenous forest cover, which accounts for approximately three quarters of the total regional land area. Much of the forest cover, which is characteristically podocarp, beech, other hardwoods or a mix of all three, is over Crown land administered by the Department of Conservation.

Large tracts of West Coast forests remain untouched by logging or fire and there are intact altitudinal sequences of vegetation from valley floors or the coast to the mountain tops represented in the region's national parks and numerous reserves. The vegetation of the West Coast is a major component of the region's natural beauty. Public conservation land, which comprises the bulk of the

region's habitats and landscapes and accounts for 78% of the region's area, is an economic contributor to tourism through tramping and walks.

At a district level, indigenous forest is the predominant land cover and 95% of the indigenous cover is under direct control of the Department of Conservation. Above the bush line, at approximately 1200m a.s.l, a belt of subalpine stunted trees and shrubs merge into alpine grasslands and herb field, bare rock and scree through to snow levels.

Wetlands in the area include natural and introduced pakihi, which are areas of wetland supporting a low stunted vegetation community on wet, generally infertile soils. Beech forests dominate both lowland and mountain forests throughout the central part of the district and are widespread in the Mokihinui catchment, the northern tributaries of the Buller inland from Inangahua and the central parts of the Paparoa Range.

Much of the dense coastal forest has been cleared. Lowland forest on fertile alluvial sites has also largely vanished from the coastal strip and along the Buller River, but stands of tall kahikatea and rimu forest still remain in some inland lowland basins.

Most of the mining permit area, including the Te Kuha Coal Project lies at the southern end of the Ngakawau Ecological District, which is one of eleven ecological districts within the North Westland Ecological Region. It is noted however that parts of the access road may also intercept the Buller and Foulwind Ecological Districts.

Ecological districts have been identified on the basis of topographical, geological, climatic, soil and biological features and are grouped based on similarities in cultural patterns and result in landscapes that have generic characteristics and similar biological communities. The Ngakawau Ecological District is the only ecological district in New Zealand defined by the presence of extensive elevated coal measure geology with its associated landforms, vegetation and flora.

Specifically, most of the Te Kuha Coal Project area is located within an area identified as Coastal Hillslopes on Brunner Coal Measures. A small portion of a ridge that defines the Coastal Hillslopes on Brunner Coal Measures area lies within the Buller Ecological District, which is also within the North Westland Ecological Region.

The Ngakawau Ecological District was surveyed as part of the Department of Conservation's Protected Natural Areas Programme (PNAP) to identify Recommended Areas for Protection (RAPs) in order to protect the full range of natural heritage within the ecological district in about 1987/88. At the time

the survey report was prepared, 81.7% (or 39,300 ha) of the Ngakawau Ecological District was administered by the Department of Conservation and protection of a further 11.2% was recommended in order to achieve a representative reserve network.

There were seven RAPs identified and the Te Kuha Coal Project lies within only one of these RAPs, being RAP 7, which is known as Part Westport Water Conservation Reserve and which has an area of 764 hectares. In PNAP Report No. 13, the coal measure associations in RAP 7 are noted as being of particular significance because of absence of recent fires and their degree of intactness.

In the PNAP report, DOC also noted that, should the Water Conservation Reserve ever be released from its reserve status, it should be added to the Lower Buller Gorge Scenic Reserve due to its contribution to the intact nature of vegetational sequencing.

Figure 3: Location of Lower Buller Gorge Scenic Reserve

Source: DoC website

The majority of the Ngakawau Ecological District has a cover of indigenous vegetation, principally forest and tussockland. Forests tend to be dense and display marked altitudinal sequencing. Shrubland and low forest, regenerating after fire, are also present, especially on coal measures.

Northeast of the mining permit area, in the upper Orowaiti catchment, there is abundant rimu/hard, red and silver beech/kamahi associations. On lower slopes within the area of the mining permit are associations of open canopy rimu/hard beech, miro, hinau/Hall's totara, southern rata/kamahi, quintinia with kiekie and supplejack.

On the northwest and southeast side of the ridgeline within the permit area's upper slopes, there is a mosaic of conifer-rich montane forest comprising mountain and silver beech, southern rata, yellow silver pine, pink pine, toatoa and mountain neinei. The northwest side of the ridge is also populated with coal measures shrubland species including manuka, mountain beech, inanga, mingimingi, kamahi, southern rate, yellow silver pine, quintinia, *Epacris Pauciflora*, mountain flax, umbrella fern and wire rush.

Figure 4: Montane forest and coal measures shrubland on the upper, northwest facing slopes of the Te Kuha Project Area

The Ngakawau Ecological District includes the distinctive coal measures vegetation and exposed sandstone pavement which characterise the Stockton and Denniston plateaus as well as large areas of pakihi, shrubland and forest and much smaller areas of tussockland, herbfield, boulderfield and wetland. The term "coal measures" refers to geological sediments laid down in a depositional environment in which coal can form (Overmars *et al*. 1998). Coal measures do not necessarily contain coal.

At Te Kuha, the distinctive coal measures vegetation includes low growing forests dominated by yellow-silver pine (*Lepidothamnus intermedius*), pink pine (*Halocarpus biformis*), mountain beech (*Nothofagus solandri* var. *cliffortioides*), mountain toatoa (*Phyllocladus alpinus*), *Dracophyllum* spp., mountain cedar (*Libocedrus bidwillii*) and small rimu (*Dacrydium cupressinum*) trees as well as communities dominated by stunted manuka (*Leptospermum scoparium* agg.), wire rush (*Empodisma minus*) and tanglefern (*Gleichenia dicarpa* and *G*. *microphylla*). Large blocks of fractured sandstone are present, particularly near the ridge top, and the forest vegetation forms a mat over this broken substrate.

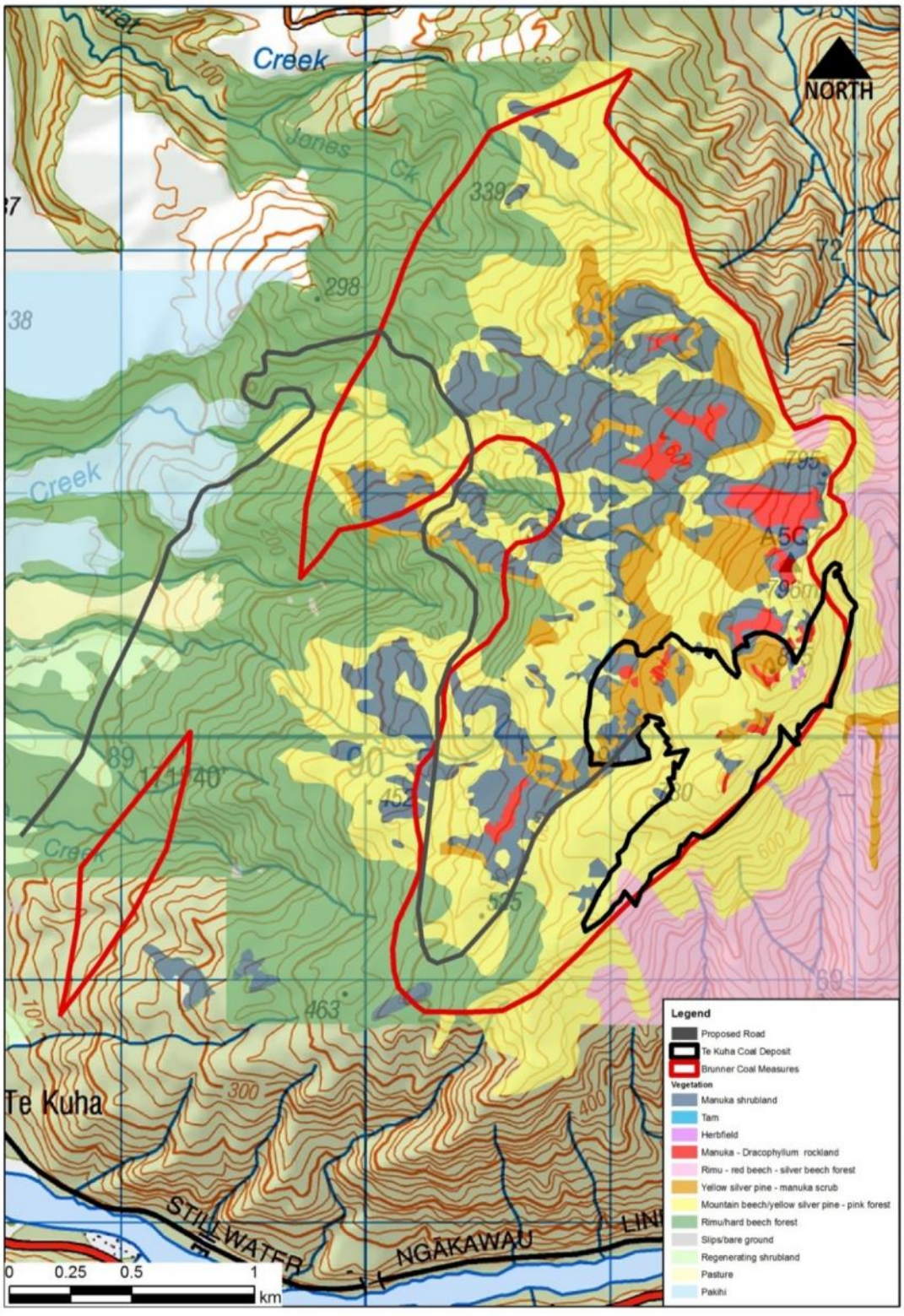
The location of the vegetation types present within the survey area is shown in Figure Y and the extent of each vegetation type, both overlying the coal deposit (61.8 ha) and within the larger patch of the local coal measures vegetation (471 ha), are provided in Table 1. The description of the vegetation types and the species present are listed in the Mitchell Partnerships Report dated October 2013 appended as Attachment C.

Table 1: Extent of vegetation types at Te Kuha

Vegetation Type	**Extent Overlying Coal Deposit (ha)**	**Extent Within Proposed Road Footprint (20 m wide)**	**Total Extent Within Local Coal Measures Vegetation**
Herbfield	0.3	0	0.3
Manuka - *Dracophyllum* rockland	2.0	0	15.7
Manuka shrubland	6.3	1.3	104.7

Mountain beech/yellow silver pine - pink forest	41.5	4.4	233.2
Rimu - red beech - silver beech forest	1.2	0	2.9
Slips/bare ground	0.08	0	0.2
Tarn	0.0003	0	0.07
Yellow silver pine - manuka shrubland	10.4	0.5	42.6
Pakihi	0	0.7	0
Pasture	0	0.4	0
Regenerating shrubland	0	0.7	0
Rimu/hard beech forest	0	7.3	0
Total	**61.8**	**15.3**	**470.6**

Figure 5: Vegetation Map of the Te Kuha Area



2.6.1.1 Threatened and At Risk Vascular Flora

Vascular plants species are known to have a localised distribution within the Ngakawau Ecological District. However, only three of these species have been identified at Te Kuha, being the *Actinotus novae-zelandiae*, *Celmisia dubia* and *Metrosideros parkinsonii.* In studies undertaken in 2001 by Mitchell Partnerships and Landcare Research Limited, two other species*, Dracophyllum pubescens* and *Drosera arcturi,* were identified as being locally distributed within this district.

There are two species also present that are identified as of conservation concern, being the *Dracophyllum densum,* considered to be declining, and *Euphrasia wettsteiniana,* considered to be "naturally uncommon". The threat ranking of both these species is in part due to the fact their distributions are mostly or entirely restricted to the North Westland Ecological Region (McEwen 1987). Both species are locally common to abundant within the North Westland Ecological Region.

2.6.1.2 Bryophytes

Bryophyte studies undertaken in 2001 by Mitchell Partnerships and Landcare Research found three mosses and fourteen liverworts of species significance. The results of this bryophyte survey are summarised in Table 2.

Table 2: Bryophytes known to be present at Te Kuha in 2001.

Species	Threat Status	Habitat	Notes
Mosses			
Pleurophascum grandiglobum var. *decurrens*	Not threatened		Taxonomically isolated.
Pulchrinodus inflatus	Not threatened	Pakihi. Found near Plot 1 at Te Kuha.	Taxonomically isolated and poorly understood. Found in Northland and southern Nelson/Westland. Scattered elsewhere. Would be affected by

Species	Threat Status	Habitat	Notes
			hydrological disturbance.
Rhizogonium pennatum	Not threatened	Terrestrial and epiphytic substrates including deeply shaded rotten logs, soil banks, tree trunks and thin humus over shaded boulder faces.	Scattered in New Zealand, Tasmania and Australia.
Liverworts			
Acromastigum cavifolium	Not threatened	Epiphyte of toatoa, yellow-silver pine and silver pine.	Rarely found in Coromandel, Westland and Stewart Island.
Cheilolejeunea novae-zelandiae	Not threatened	Open pakihi.	Known from five sites in Westland and Stewart Island.
Herzogianthus sanguineus	Naturally uncommon		Known from Mt Euclid, Mt Sewell and Te Kuha.
Lepidolaena novae-zelandiae	Not threatened	Epiphyte on rata, manuka and *Dracophyllum*. Found in three plots overlying coal deposit.	Found on Auckland Island, Stewart Island, Westland and Nelson. Locally abundant.
Megalembidium insulanum	Not threatened	Silver and yellow-silver pine forest on infertile soils.	Found between Stockton and Stewart Island.

Species	Threat Status	Habitat	Notes
Nephelolejeunea conchophylla	Not threatened	Epiphytic on manuka. Found in Plot 2 at Te Kuha.	Found at Karikari, Kaimai Ranges and Te Kuha.
Pseudocephalozia lepidozioides	Not threatened (was in 2007 list)		Known from six sites, including two in the North Island
Radula multiamentula	Not threatened		Shared with Tasmania.
Riccardia multicorpora	At risk (naturally uncommon)		Known from Coromandel and three sites in the North Island, including Stockton and Temple Basin.
Riccardia furtiva	At risk (naturally uncommon)	Tall manuka shrubland. Found in Plot 2 at Te Kuha.	Known from Mt Ruapehu and Westland.
Riccardia perspicua	Not threatened	Short yellow-silver pine shrubland. Found in Plot 5 at Te Kuha.	Endemic.
Saccogynidium decurvum	Nationally vulnerable	Pakihi and low yellow-silver pine forest.	Found in Tasmania, Fiordland and at Stockton.
Trichotemnoma corrugatum	Not threatened (was in 2007 list)	Pakihi and associated forest on low fertility soils.	Sole member of its family. Shared with Tasmania.
Zoopsis bicruris	At risk (naturally uncommon)	Low yellow-silver pine forest	Endemic. Known from two sites.

The 2001 survey plots from the Te Kuha mine area demonstrated a high diversity of species, including rare and threatened species and those that are taxonomically isolated or otherwise significant. One plot in particular, located within manuka – yellow silver pine shrubland within the coal deposit, was especially diverse with 51 species recorded there. This is significantly different to the surveyed plots at Stockton, where 39 species were found in a mountain beech rata and silver pine forest, and on the banks of Mangatini Stream, where 34 species were found.

Bryophyte surveys undertaken either within the coal deposit boundary or outside of it are currently very limited. Current industry knowledge indicates that the Te Kuha site is significant for bryophytes although there is no distinction between areas within the proposed pit and areas outside the proposed disturbance areas in terms of significance. Moreover, there is a significant population of these species outside of the mine footprint to sustain any potential effect caused by mining provided there are no substantial alterations to bryophyte fauna, hydrology, soils and vegetation outside of the mining area. No exotic bryophytes have been recorded at Te Kuha.

The 2001 Mitchell Partnerships and Landcare Research Limited studies identified two vegetation types that were particularly vulnerable for bryophytes at Te Kuha, which are the manuka-yellow-silver pine shrubland and manuka shrubland. Both of these are considered to be low growing and open habitats thought to have been affected by disturbance. The study highlighted several key outcomes - that the area sampled had a very high density of either rare bryophytes or bryophytes outside of their typical distributional area and that habitats with the greatest diversity at Te Kuha are the manuka-yellow silver pine shrubland and the open manuka shrubland. Also, many of the rare bryophytes are significant because they are taxonomically isolated or have unusual features, the stream community appears to harbour no particularly special bryophytes and the area is remarkable for its lack of adventive and weedy bryophytes which could change with the construction of the access road.

The sampling undertaken thus far is significantly limited and additional sampling will be undertaken to provide a more robust understanding of the bryophyte population and determine what actions will be required in association with mining to best protect any unique species.

2.6.1.3 Rare Ecosystem Types

Several rare ecosystems have been identified at Te Kuha including the manuka *Dracophyllum* rockland. While this manuka does not meet the definition of sandstone erosion pavement, it is believed to be important due to the nature of the Te Kuha community where exposed rock is characteristic.

There have also been a number of small tarns identified within the mining permit area itself. Mining and other activities will remove approximately 0.3ha of tarns. A small tarn, with an area of approximately 0.3 ha, within the permit area but outside of the mining footprint, was identified in the Mitchell Partnerships and Landcare study as "*Isolepis* wetland" and is mostly vegetated with *Juncus bulbosus* which is an introduced rush.

Further studies undertaken in March 2013 found there was no acidic boulderfields or significant seepages detected albeit there may be very small seepages not identified during the survey.

2.6.2 Wildlife

Mitchell and Partners in conjunction with Landcare Research undertook surveys to identify bird life, lizards and other fauna within the permit area. This was undertaken in 2013 and enabled the existing environment to be quantified prior to any mining taking place.

2.6.2.1 Birds

There were 40 bird species found within the survey area including 33 species of birds within the mining permit and 26 species in the area overlying the coal deposit. A complete list of the birds within the coal deposit area is appended to the Terrestrial Ecology Report. Based on five-minute bird counts, natural counts and recorded dawn/dusk chorus, bird numbers were considered to be low.

Of the 33 bird species that were found within the mining permit, 23 of these were indigenous (14 endemic) and 10 introduced. Two species detected within the mining permit, the spotted kiwi and the New Zealand falcon, are considered to be "threatened" and five species, the western weka, long-tailed cuckoo, rifleman, New Zealand pipit and South Island fernbird, are considered to be "At Risk".

A summary of the bird results are included in the table below:

Table 3: Summarised results of bird surveys undertaken at Te Kuha in March 2013.

Ecological Features	Species Present
Species of particular conservation importance	Great spotted kiwi, New Zealand fernbird, and South Island rifleman
Species with a wide distribution within the survey area	Bellbird, silvereye, tomtit, fantail, robin, fernbird, grey warbler and tui (diurnal surveys). Kiwi, weka, and morepork (nocturnal surveys).
Species showing a patchy distribution within the survey area	Kereru, brown creeper, and rifleman.
Localised records	Falcon, long-tailed cuckoo, pipit, shining cuckoo, black-backed gull, kakariki, harrier (flying over), kingfisher, and welcome swallow.
Indigenous species recorded in >50% of grid cells (Common species)	Bellbird, silvereye, tomtit, fantail robin, grey warbler and fernbird most common diurnal species. Morepork by far most frequent nocturnal species.
Indigenous species recorded in 20-50% of grid cells (Moderately common species)	Tui, weka, kereru and brown creeper from diurnal counts. Great spotted kiwi and western weka from dusk and nocturnal counts.
Indigenous species recorded in <20% of grid cells (Locally rare species)	Rifleman, harrier, pipit, welcome swallow, falcon, kakariki, long-tailed cuckoo, and kingfisher.
Undetected species which occur elsewhere in the Ngakawau Ecological District	Kaka and kea.

One falcon was identified during the site visit and it is possible that low numbers of falcons nest in the wider area. Grey ducks were also observed during the site visit however they were identified on one of the reservoirs near Waterworks Road which is outside of the mining permit. Grey ducks are regarded as "nationally critical" and it is possible that they may occupy parts of the small creeks within the mining permit in low numbers. Additionally, the South Island kaka may be seasonally present within the survey area, although this could not be confirmed as the assessment undertaken was out of season. South Island kaka are considered to be "nationally endangered".

Studies undertaken by Garrick (1986) recorded Australasian bittern, also considered to be "nationally endangered", just outside the survey area in wetland habitat and at the edge of rough pasture in 1986 although this was not recorded in the 2013 study.

There were five "At Risk" species identified within the mining permit, being the Western weka, South Island fernbird, South Island rifleman, long-tailed cuckoo and New Zealand pipit.

Long-tailed cuckoo are regarded as "naturally uncommon", whilst the other four species are regarded as "declining". The long-tailed cuckoo were encountered once during the assessment period in the forest above the end of Nine Mile Road. It is thought that the long-tailed cuckoo may be more common and widespread in midsummer as this is when migrant cuckoos are more conspicuous in New Zealand forests.

New Zealand pipits were only seen twice in a scree area on the main ridge and the mining permit area is thought to have sparse habitat for the pipit.

The Western weka was recorded at all nocturnal listening stations and acoustic recording sites, indicating that they are present throughout the mining permit. The weka population is more abundant at lower altitudes, with few recorded at the main ridge within or close to the proposed mine site. The majority of the population were heard from a site near lowland forest edge. Weka were rarely recorded in diurnal counts and although weka are widespread they do not appear to be particularly common at Te Kuha.

The South Island fernbird were found to be moderately common throughout the permit area. Of the indigenous birds recorded, the fernbird was the seventh most common. In general, the Te Kuha area and surrounds appear to provide particularly good habitat for the fernbird.

The South Island riflemen was encountered most often within higher altitude forest but also in low-altitude forest near Jones and Coal Creeks. Riflemen are becoming very rare in low-altitude forest on

the West Coast and potentially the rest of the South Island and therefore the presence of the riflemen at this location was unexpected. Riflemen counts were low and were only found at 5% of the count stations.

2.6.1.3 Herpetofauna

Four adult lizards – three forest geckos and one specked skink – and one forest gecko skin were identified during the 29 hour survey period. A summary of the lizards found is included in the table below:

Table 4: Capture details for lizards at Te Kuha, North Westland.

Species	Altitude (m ASL)	Notes (SVL = snout-vent length)
Forest gecko (skin only)	641	Short forest.
Forest gecko	656	Manuka shrubland. Adult male, 75 mm SVL, 9.5 g.
Forest gecko	737	Rock slab. Adult female, 88 mm SVL, 16.6 g, two embryos.
Forest gecko	650	Manuka shrubland. Adult male, 84 mm SVL, 13 g.
Speckled skink	563	Open manuka shrubland with boulders. Could not be extracted.

Both the forest gecko and speckled skink have a status of "declining". While the West Coast green gecko was not identified during the survey, potentially due to their behavioural patterns, colouring and weather sensitivity, there is suitable habitat in the mining permit area and anecdotal evidence suggests they may be present within the mining area.

2.6.1.4 Bats

Digital bat detectors were active for between nine and 17 nights per site. Temperature and weather conditions were suitable for bat activity during the survey, but no long- or short-tailed bats were detected in 116 nights of recording.

2.6.1.5 Invertebrates

In total, over 80 invertebrate taxa were identified from the sampling albeit the survey was undertaken in a particularly warm weather period when invertebrate activity reduces. A similar study, also by Mitchell Partnership & Landcare in 2001, identified that the terrestrial invertebrate community within the proposed Te Kuha Coal Project mine footprint area is similar to other known habitats in the Ngakawau Ecological District.

The majority of species found were native, with the exceptions of the introduced honeybee (*Apis mellifera*) and the European common wasp (*Vespula vulgaris*). The presence of these species is attributable to beech trees (*Nothofagus*) and their associated honeydew-producing scale insects.

The dipteran (fly) fauna found has a fairly high level of natural integrity and is typical of the wider region and only one introduced fly species , the common striped dung fly (*Oxysarcodexia varia*) which is commonly found in short stature vegetation throughout the Buller coal fields, was identified. There was also a high species richness of *Mycetophila* fungus gnats recorded, which are indicative of high levels of diversity common to northern West Coast forests. Amongst the other flies recorded, the picture-winged *Trupanea* species collected near a tarn is also common to wet habitats of the Denniston Plateau.

Three species of weta were collected, the West Coast tree weta (*Hemideina broughi*), Wellington tree weta (*Hemideina crassidens*) and a recently described species *Hemiandrus electra*. The West Coast tree weta is endemic to the northwest South Island, from about Greymouth and Reefton northward through Kahurangi National Park. The newly described ground weta *Hemiandrus electra* (M. Morgan-Richards and B. Smith, pers. comms.) is a Northwest Nelson endemic, having a similar distribution but including Abel Tasman National Park (B. Smith, pers. comm.). By contrast, the Wellington tree weta is distributed from the lower North Island, through the Marlborough Sounds, Nelson/Golden Bay and down the West Coast as far as Haast.

Six species of beetle were collected, although no specimens of some of the ground beetle known to occur at Denniston Plateau were recorded. Individuals of the carabid genus *Neoferonia* were collected, which is endemic to the South Island.

There were no snails counted on this survey, although a *Rhytida*-type land snail was observed and photographed by other experts undertaking studies within the area. In the 2001 studies, a snail identified as *Rhytida perampla* was found although it is unknown whether this is the same snail that was found in the most recent survey. The earlier studies undertaken at Te Kuha were also unable to detect *Powelliphanta* snails.

Leaf-veined slugs (*Athoracophorida*e) were found at one site and thought to be a new species aligned to a group of undescribed *Pseudaneita* species known from the northern South Island at Canaan, Stephens Island and Mt Stokes. The Te Kuha site is the only recorded site with this species although it is likely to be present at other sites. At this point the number of known undescribed species exceeds that of the 20 or so described species from the New Zealand mainland.

2.6.1.6 Other Fauna

Sign of deer, goat, pig and possum was found during the field surveys. Deer indicators were found in 100% of grid cells, goat signs in 13% and pig signs were recorded in 4% of grid cells. Occasional possum droppings (generally quite old) were also found. Stoats and rats are also assumed to be present.

2.6.1.7 Fish

Eleven fish species in total were identified. However, no fish were found at the upper mountain sites. Along the haul road, diadromous fish and juveniles were found at six sampling sites including longfin eel, redfin bully, koaro, banded kokopu and shortjaw kokopu. All of these species are climbing species and the absence of less capable migratory species was noted. The maximum size for the kokopu and whitebait were considered to be well below that recorded nationally.

In the lower reaches of Coal Creek, rare individuals, including bluegill bully, torrentfish, common bully and shortfin eels, were present. All of these species, apart from the shortfin eel, are migratory native fish which have limited ability to ascend steep sections of streams and cannot climb at all. Their presence in the lower reaches of Coal Creek indicate the relatively easy fish passage within this area.

A ford located along West Creek at Nine Mile Road acts as a fish barrier and it is thought that there may be further fish barriers downstream. This ford has a vertical fall on the downstream side and boulders have been placed to prevent erosion. At this site, juvenile redfin bullies were common

downstream of the road but considerably less common on the upstream side. All of the fish species found upstream and downstream of Nine Mile Road in West Creek are considered to be good climbers that are able to ascend steep slopes and only native fish were present, providing further indications that there is a barrier further downstream. The full impacts of this barrier, however, are unclear.

Four fish species found in the lower altitude sections of the proposed haul road are classified as at risk (declining), the shortjaw kokopu, koaro, redfin bully and longfin eel. Samples taken on the Department of Conservation estate along West Creek also had these four threatened fish present and banded kokopu was also present. In general, the numbers of shortjaw kokopu, banded kokopu, koaro and longfin eels was not high at the sites sampled.

The absence of large individuals of the three whitebait species was noted and shows that while the stream does support this species, the populations appear recruitment limited and large individuals are under-represented or absent from these populations. It is thought that periodic flood disturbance or the barrier at Nine Mile Road could be a contributing factor.

Additional fish species, common bully, shortfin eel, bluegill bully and torrentfish, were present at the sites along Nine Mile Road. The latter two species are also classified as declining. In the lower reaches of Coal Creek, above Nine Mile Road, where brown trout were found.

It is thought that the steep gradient of the streams, the presence of erosion at the mid-reaches of the Creeks and the lack of pool habitat could be contributing factors to the limitation of fish in the upstream areas of Coal and West Creeks. Therefore, given the steep nature of the streams and the lack of fish at the upper mountain Coal Creek sites, it is not expected that native fish are present in the upper section of West Creek near the proposed mine footprint.

2.6.1.8 Habitat

Riparian margins along the surveyed streams are unmodified, with stands of native vegetation present. Streams were lined with boulders, cobbles and gravels which provided good habitat for fish and invertebrates albeit the acidic nature of the streams is likely a limiting factor. In general, the streams supported good to high quality fish and invertebrate species and the macroinvertebrate community index showed that the majority of the sites surveyed indicate excellent water and/or habitat quality.

The two major Coal Creek tributaries, while in a natural state, had high water conductivity and elevated metal levels. This is considered to be a natural condition and the flora and fauna in these streams are therefore considered to be tolerant of these local conditions.

There were no fish found in the upper mountain and it is thought that the steep streams are unlikely to provide suitable habitat for fish.

Due to the lack of an obvious outflow source from the tarn it is considered to be a habitat only for invertebrate species and koura. The large tarn itself is considered to be a rare ecosystem type and it is not affected by the mining activity as it lies outside the proposed mine footprint. At the time of surveys being undertaken, small seepages were not found although they are likely to occur throughout the area, especially at times when the water table is high.

The fish and invertebrate densities did not appear high but the undisturbed riparian zones and lack of introduced aquatic species indicates these are intact, undisturbed streams of high value. The only modifications observed were in the lower reaches of Coal Creek, above Nine Mile Road, where brown trout were found. The macroinvertebrate indices indicate a decline in water or habitat quality at Nine Mile Road compared to that found in the lower and upper mountain sites.

2.7 Landscape

The landscape has been assessed by Peter Rough and a comprehensive report prepared with respect to the current landscape and the landscape should the mining permit be implemented. This section will highlight the key aspects of the Rough Report and the full report is appended as Attachment E.

The definition of landscape in the New Zealand resource management framework has been defined and shaped through the legal system and while in itself the meaning is fluid, there are some parameters that are used to encapsulate the definition of landscape. For example, the New Zealand Institute of Landscape Architects provides the following, relatively concise, definition of landscape as:

"the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations."(New Zealand Institute of Landscape Architects (2010). *Best Practice Note – Landscape Assessment and Sustainable Management* cited in Rough P; Te Kuha Coal – Landscape Assessment, November 2013).

In essence, landscape is the environment around us in which we live and interact with. Changes in the landscape can have a direct and immediately apparent effect on people's surroundings and the determination of landscape value can be based on particular characteristics that contribute to 'a sense of place' or influence the way in which a landscape is experienced. All landscapes, arguably, merit some management consideration under the 'sustainable management purpose of the RMA and the

requirement to avoid, remedy or mitigate adverse effects of activities on the environment (The Landscape Institute (2002). *Guidelines for Landscape and Visual Impact Assessment.* p. 15, cited in Rough, P; Te Kuha Coal – Landscape Assessment, November 2013)'.

The West Coast landscape contains mining modified landscapes visible north of Greymouth, north of Westport and east of Reefton.

In terms of how the term landscape applies to the Te Kuha Coal Project site, the landscape is derived from visibility, legibility and overall contextual relationship.

The site, while not readily accessible and therefore able to be viewed at a micro level, is readily visible from surrounding areas where it is seen as an element of the northeast – southwest trending ranges that form the backdrop to views from Westport looking inland, from the coast looking inland and from the coastal plains and marine terraces in the vicinity of Westport.

There are aspects of the permit area and mine site visible from high points across the mountain range, such as Mt Rochfort, Buckland Peaks in the Paparoa Ranges, and the south eastern slopes of the ridgeline. A small area of the site where mining is proposed is visible from within the Buller Gorge and especially apparent near Cascade Corner.

Mt Rochfort (1,040 m a.s.l) is a prominent feature northeast along the ridge from the Te Kuha Coal Project site and it is home to a substantial telecommunications tower that services Westport and western Buller. There is an existing access road to the telecommunications tower and mountain bikers also use the road as a popular mountain bike trail. From the summit of Mt Rochfort, views are afforded southwest along the skyline ridge of the Coastal Hillslopes to Trig M (776 m a.s.l) which is just inside Mining Permit 41-289, and approximately 1 km of ridgeline beyond the trig station *(Rough P; Te Kuha Coal – Landscape Assessment; November 2013).*

Mt Rochfort provides the view of the northern end of the Paparoa Range and, while the intact nature of the vegetation is clear, this is compromised by the very clear touches of human modification in the telecommunications tower and access road.

The mining area is visible from the coastal plain and marine terraces along SH6 but the view is of an indistinct area within a larger landscape context. The view overall provides a sharp distinction to the coastal plain environment in terms of vegetation, topography and human modification.

The Coastal Hillslopes area in general, despite the telecommunications tower, access road and pastoral modification on the lower slopes, affords a high natural character that contrasts sharply with the coastal plains.

Both Westport and Carters Beach have filtered views of the mining site through vegetation and buildings in the fore and middle grounds. Clear views from these locations are not achieved due to the nature of the mining site and layout. From locations in open space areas, such as Victoria Square in Lyndhurst Street and the foreshore at Carters Beach, the permit area and mine site are visible and the Coastal Hillslopes are seen more comprehensively and in the context of the extensive and more imposing section of the Paparoa Range that lies to the south of the Buller River and southeast of Westport. The range on the whole provides a continuous backdrop to views inland and the predominant indigenous vegetation cover conveys a sense of high natural character which combines with cloud formations and winter snow to provide year round high aesthetic value.

There will be potential glimpses of the mine site from the coastal plain north and from SH 67 similar small glimpses may be detected. Views may also be obtained from Sergeants Hill and Caledonian Terrace near the existing water reservoirs. Again, however, the water reserve status excludes public access some distance from the proposed mine which restricts views by distance, topography or vegetation.

Due to the comprehensive and vast nature of the Paparoa and Papahau Ranges as a whole, the mine site is largely only ever viewed as a small area within the larger whole, which at several vantage points displays human influences but that, by and large, is dominated by vegetation and topography. The dominance of the vegetation and topography, even when human induced change is evident, contributes a significant component to the high aesthetic values attributed to the landscape in this context.

The area of Buckland Peaks, which is at the northern end of the Paparoa Range and south of the Buller River (but not within Paparoa National Park), is the only other location on the seaward ranges inland from Westport, other than Mt Rochfort, which has defined public access and which affords views of the mining permit area and the proposed mine site. Access is via a sequence of trails and, for avid trampers, is an approximately 7 hour tramp from the State Highway and the view is set against a 9km distance from Buckland Peaks. Lesser viewpoints are achieved from lower altitudes on the trails as well as views across the Gorge at slightly closer distances.

When travelling westwards on SH 6 through the Lower Buller Gorge towards Westport, landform obscures views of the skyline ridge at the southern end of the mining permit area, except for approximately 300 m southeast of the confluence of the Buller and Ohikanui rivers in the vicinity of Cascade Corner.

The landscape from SH 6 is dominated by the forest clad mountain range and the ranges frame such views from every direction. Apart from the presence of the highway on the true left of the Buller River and the Stillwater Ngakawau Railway on the true right, the river and its bed and the surrounding unmodified forest-clad spurs are part of the overall Lower Buller Gorge landscape that appears to be high in natural character. The simplicity of the impressive, large-scale, landforms with their uniform cover of indigenous forest results in the landscape having very high aesthetic value.

With regard to the Te Kuha Coal Project site and in relation to the naturalness criteria (*Rough, November 2013),* it is evident that the landform is, in essence, unmodified and highly legible. There is little evidence of human influence apart from the small hut located at approximately 640 m a.s.l and some evidence, in several locations, of exploratory drilling. Within the mining permit area but beyond the proposed mine footprint, Waterworks Road passes through the northern apex of the permit area and on lower slopes on which the proposed access road will traverse, much of the vegetation is regrowth.

Within the mining permit area, the contribution of water to the area's natural character is apparent in the form of a number of streams as well as, in poorly drained areas, bogs and a tarn, which are relatively close to and below the Te Kuha Coal Project area. The extent and composition of indigenous vegetation cover over the proposed mine footprint is at the pristine end of the naturalness spectrum, largely as a result of the site's general inaccessibility due to it being within a Water Conservation Reserve. Trees up to 500 years old have been identified within the site and are part of the unique plant species distribution found in association with the existing coal measures. The overall level of natural character within the project area is therefore considered to be very high.

The Paparoa and Papahau Ranges, in landscape terms, provide the community at large with a sense of place as well as a means of orientation with Mt Rochfort distinctive as the high point on the range. From afar, the Coastal Hillslopes within and adjacent to the mining permit area appear to have a consistent cover of indigenous vegetation which contributes to them having a considerable measure

of aesthetic coherence that, in combination with the underlying natural landform, results in high visual amenity.

Rough summarises the visual amenity landscape as follows:

"In essence, the most readily appreciated visual amenity values attributed to the site are gained from beyond the site. That is not to say that there are no visual amenity values within the site itself but rather that they are not readily appreciated because of the site's general inaccessibility and exclusion from public use as a Water Conservation Reserve. From the site itself, visual amenity values are derived from the panoramic views at high elevations where the shorter pakihi scrub vegetation allows. The combination of large boulders and alpine vegetation the presence of clear creeks flowing through dense forest and the presence of the tarn also contribute to high visual amenity values. Overall, visual amenity values within the site are high."

In summary, the Te Kuha Coal Project site has very high/pristine natural values and very high visual amenity values.

The landscape values continue on down at a regional and district level, where large tracts of vegetation are tied up in conservation estates which preserves, almost artificially, the area as a whole. At each level of landscape, steeply rising dense forest vegetation contrasts with lower altitude landscapes to provide focal viewing points, dominant mountain ranges and landscapes with high natural character that imbibe a special sense of place. Human modifications, evident from several places, are almost swallowed into the landscape as a whole and simply appear as small intrusions in an otherwise intact landscape.

The mining permit areas on the Coastal Hillslopes and on indigenous forest-covered slopes above the Lower Buller Gorge are components of a very extensive indigenous forest-covered mountain landscape which, because of its mostly undeveloped nature, has a landscape and visual integrity that is important to the West Coast's predominant sense of natural character and high visual amenity value. While the Region's coal measures, some of which occur within the mining permit area, are of national strategic and economic importance, the visual amenity value of mountainous areas such as the Te Kuha Coal Project site and its surroundings, because of their intactness and obvious natural character and coherence, are important at the regional level in relation to tourism.

At the district level, the landscape and visual amenity values of the Te Kuha Coal Project site are similar to those at the regional level. Mountainous terrain is a predominant feature of the District and indigenous forest is the predominant land cover. The indigenous forest-covered mountain ranges are a major component of the district's natural beauty and public conservation land, on which the mining permit area is located, are important for their visual attributes in relation to tourism and, generally, as an extensive physical and visual resource for low impact recreation.

In all views, the permit area and proposed mine site appear as relatively small parts of an extensive mountain range landscape that exhibits very high natural character and which is high in visual amenity value. The high natural character of the mountain ranges appears in marked contrast to built development in the foreground of views from within Westport and Carters Beach and there is a similar contrast in views from coastal plains and terraces that have been highly modified by development for farming. In some views from coastal locations, such as the Tip Head near Westport and on the Cape Foulwind Walkway and from other locations such as from Mt Rochfort, the Buckland Peaks area and the Lower Buller Gorge, the mining permit area and proposed mine site are components of scenes in which, generally, the whole landscape (i.e. including the foreground and middle-distance) appears high in natural character and is high in visual amenity value (Rough *P; November 2013).*

2.8 Social Context

The West Coast region has a rich cultural context, with gold and then coal mining shaping the essence of the communities. Forestry has also contributed to the cultural context of the region.

2.8.1 Maori Context

The West Coast province stretches from Kahurangi Point in the north down to Awarua Point in the south, some 600km distant. The province as a whole was called Te Tai o Poutini and the southern part of the province was popular for Maori due to a considerable supply of pounamu.

Legend has it that Poutini was a taniwha swimming up and down the rough seas of Te Tai o Poutini protecting both people and the spiritual essence of the pounamu.

The name Te Kuha, from which the project draws its name, refers to the place on the flat down at the mouth of the Buller Gorge, with the ridge above colloquially known as 'The Ridge' (*Lucas, D cited in evidence to hearing for consents for mining)*. Earlier, Mt Rochfort and The Ridge were named Paparoa by Ngati Wairangi.

2.8.2 European Context

2.8.2.1 Gold Mining

During exploration of remote parts of the Nelson province in 1858, John Rochfort entered the Buller River from the sea in the cutter *Supply* and showed that it could be used as a port. After gold was discovered in the middle reaches of the Buller River, a small trading settlement grew up on the eastern side of the river mouth. About 80 people lived there at the end of 1861, in a township known as Buller. The name Westport was proposed for the settlement by J. C. Richmond in 1863, apparently because of its similarity to Westport in County Mayo, Ireland. At the height of the gold rushes in 1867 the population grew to 1,500.

The West Coast region itself was only occasionally visited by early Europeans until that discovery of gold near the Taramakau River in 1864 by two Māori, Ihaia Tainui and Haimona Taukau. Reflecting the surge in activity associated with gold mining, Hokitika, in 1866, became briefly the most populous settlement in New Zealand.

The West Coast Gold Rush was not lengthy, lasting from 1864 and 1867 but created numerous gold rush towns up and down the length of the coast, including Okarito which at one time was the largest town on the West Coast but then quickly almost vanished as miners moved on. This rush established the main towns on the West Coast, most of which still exist today.

During the gold mining period, there were no roads and diggers had to cut their way through the bush and consequently it took some time to establish facilities such as general stores. Early gold miners ate kereru (wood pigeons), potatoes, fern and konini berries. They explored the country between Greymouth and Hokitika and mined beach sands at Okarito, Addisons and Charleston. The gold mining history on the West Coast forms a significant part of the overall mining history of New Zealand, and with few women residing in the towns, this period of time on the West Coast was colloquially referred to as the 'wild west coast days'.

The discovery and development of gold-bearing quartz veins near Reefton around 1870 marked a shift from alluvial to hard rock mining and unique names are a remnant of the coast's hard-rock mining days. Crushington lies south east of Reefton and Quartzopolis was an old name for Reefton (shortened from Reef Town) where mines such as the Wealth of Nations and the Keep-It-Dark paid handsomely.

Once gold dredging proved itself in Otago it was also used on the coast to work river gravels and old river channels and sluicing was extensively used in places such as Kumara.

2.8.2.2 Coal Mining

Following greenstone and gold, the next mineral to make the West Coast valuable was coal. Discovered near the Buller River in the mid-1840s, mining began in earnest during the 1860s. By the 1880s, coal had become the region's main industry, with mines opening throughout the northern half of the region, especially around Westport. Coal is now the dominant industry in the Buller District.

The coal discovered at Burnetts Face in 1860 was found to be high-quality bituminous coal and this led to the discovery of thick coal seams at several nearby localities. It was gradually realised that the Buller coalfield extended more than 30 kilometres along a high plateau (500–600 m.a.s.l) from Denniston to Seddonville. The presence of coal-bearing rocks was evident on the ground, with only stunted vegetation able to establish over much of this area.

This discovery and mining of the high-quality bituminous coal near Westport led to the progressive development and expansion of the port. Breakwaters confined the river to a defined channel, with a minimum depth of 4 metres at low tide. Until the railway through the lower Buller Gorge was completed in 1944, all coal was exported by sea.

As the coal mining industry grew, communities established in close proximity to the mines, albeit often in remote localities. Seddonville developed on the river flats in the lower reaches of the Mōkihinui River some 50 km northeast of Westport. Seddonville derived its name from the then Prime Minister Richard Seddon who visited the area in 1893. Seddonville was home to New Zealand's first state mine which opened in 1903 but closed in 1914 due to mining difficulties. Mining continued at Seddonville until the 20th Century.

Millerton was a high-altitude settlement located 31km north-east of Westport and named after H.J. Miller, a director of the Dunedin based Westport Coal Company. Millerton was opened as a company town for miners at the nearby Millerton mine in 1896 and a small community still exists attracted by cheap land and housing.

The Granity, Ngākawau and Hector settlements established on a narrow coastal flat near the mouth of the Ngākawau River some 32 km northeast of Westport. Specfically, Granity was located at the bottom of the hill road to Millerton, Ngākawau was located on the south side of the river and derives its name from the shags that nest nearby, and Hector was located on the north side of the river and named after James Hector , a 19th century geologist who studied the Buller coalfield. This open, boulder-strewn part of the coast is one of the best places on the West Coast to collect wave-polished stones.

Denniston, a small almost abandoned coal town 27 km northeast of Westport, and Waimangaroa, a small mining and milling town 17 km north of Westport at the foot of the winding road up to Denniston, also emerged as a result of mining activity.

Denniston was named after R.B. Denniston, the manager of the first major mine to open in the 1870s and who was later a director of the Westport Coal Company. Denniston was located on a bare plateau at an altitude of 600 m.a.s.l and this altitude and sparseness meant it was the bleakest of the coal mining towns, often shrouded in fog. The nearby town of Burnetts Face was squashed into a narrow valley, close to the original coal discovery.

The 1911 census figures show that a substantial population was living in these coal towns, with Westport having a population of 3900, Denniston (including Burnetts Face) 1469, the Granity/Ngākawau/Hector area having 882 people, and smaller settlements at Millerton (708), Waimangaroa(362) and Seddonville (525). The population of Westport peaked in the 1950s with over 5,500 residents.

Coal was transported from the Denniston plateau down to a branch railway line by the Denniston Incline, a spectacular cable railway. This was considered one of the eight wonders of the engineering world.

With the advent of motorised transport, the relative isolation of mining communities, coupled with bleak living conditions saw mining families gradually move down to coastal locations with improved climates.

The West Coast mines contain virtually all New Zealand's bituminous (coking) coals. Compared to overseas coals, ash levels are low and, in some seams, exceptionally low. Sulphur within the Paparoa and Rotokohu coal seams is mostly low, but the Brunner coal seams tend to have an overall higher sulphur content, with variability in sulphur occurring with geographical differences.

The bituminous coals of the Greymouth, Buller and Pike River coalfields contain some very high swelling coal and, as with most New Zealand coals, there are high levels of reactives (vitrinite) present.

2.8.2.3 Present Day Coal Mining

Prior to 1980, West Coast coal was used within New Zealand mainly for domestic and industrial purposes (steam raising and gas works). Most West Coast coal is now exported for use as metallurgic coke in the steel making industry but other uses include the production of activated carbon (water, air purification), silicon metal and ferro-silicon.

Domestically West Coast coal is used for industrial and household heating, steam raising at dairy factories and as a fuel at the Cape Foulwind cement works.

Although the output of coal from the Buller coalfield has increased since 1990, the number of people employed in coal mining has declined. Almost all the coal is now transported out of the region by train.

Similarly, as mines have closed, populations have dwindled, with the population of Westport now being less than 4,000 people.

Opencast mines from the plateau behind Millerton continue to provide a large proportion of the bituminous coal produced in New Zealand. The coal is transported on an aerial cableway to storage bins at Ngākawau, then taken by rail to Lyttelton.

The coal that is mined from Te Kuha has properties or ash content, Sulphur, rank and other coking properties that make it valuable within a New Zealand context as well as within an international context. It is likely that the Te Kuha coal could be sold as a blending coal for larger mines to use in their

export products for steel making. Or the Te Kuha coal might be marketed as a high value standalone product for specialist uses. The high value of the Te Kuha coal for blending purposes is established through the testing that has been completed and the signs are promising for specialist uses. However, additional testing and marketing is required before a specialist market and client are identified.

Timber has also long been a major industry in the region, although in recent years there has been an uneasy balance between forestry for wood and forestry for conservation. Much of the region is public land administered by the Department of Conservation and the region has some of the best remaining stands of native forest, along with a wealth of rare wildlife. Ecotourism is now an important industry in the region, and this goes hand in hand with the conservation efforts.

3. Description of Proposed Activities

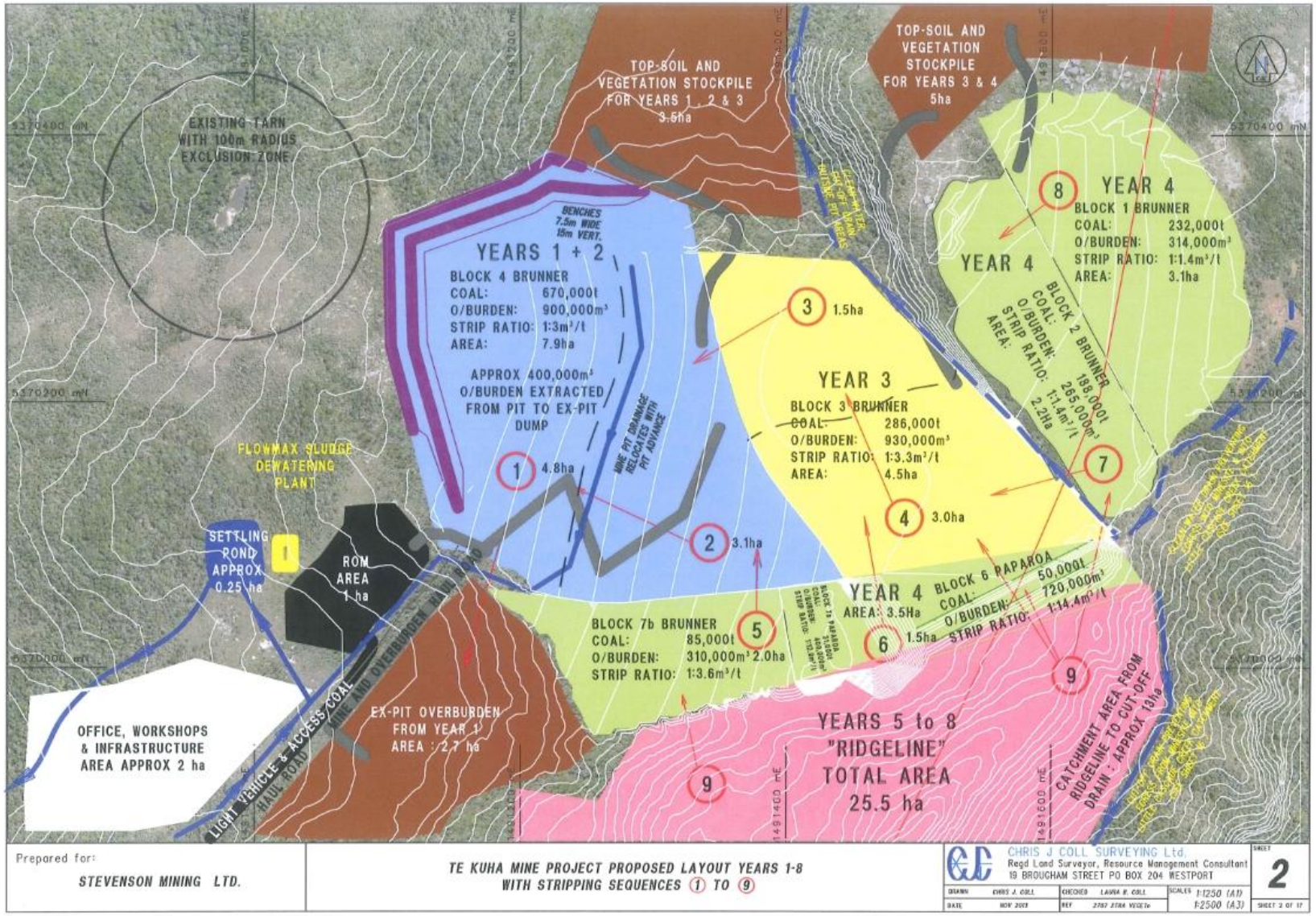
3.1 Overview of Activities

Mining Permit 41-289 covers an area of approximately 860 hectares, with the total mine footprint expected to be approximately 70 hectares in area. The permit area will be exposed incrementally, with mining and rehabilitation occurring progressively near the Te Kuha ridgeline.

Coal measures at Te Kuha comprise 490 ha in two discrete patches. The larger patch (471 ha) includes around 59.6 ha which would be affected by the current proposal. The coal measures vegetation present at Te Kuha includes low growing shrublands and forest.

Infrastructure associated with the proposed mine includes a coal handling and processing plant, office, workshop and infrastructure area and coal stockpiles. The office, workshop and infrastructure area is to be located at the entrance of the mine. In this area, there would also be a settling pond and water treatment facilities as required, ROM pad and ex-pit overburden from year 1 works. The processing plant and coal storage is proposed to be located off-site on privately owned land on the lower Buller River terrace and accessed from Nine Mile Road.

Figure 6 below shows the proposed mine design and sequence for the first four years of mining works proposed to be undertaken.



Prepared for:

STEVENSON MINING LTD.

TE KUHA MINE PROJECT PROPOSED LAYOUT YEARS 1-8 WITH STRIPPING SEQUENCES (1) TO (9)

CHRIS J COLL SURVEYING Ltd.
Regd Land Surveyor, Resource Management Consultant
19 BROUGHAM STREET PO BOX 204 WESTPORT

DRAWN CHRIS J. COLL | CHECKED LAURA R. COLL | SCALES 1:1250 (A1) 1:2500 (A3) | SHEET 2

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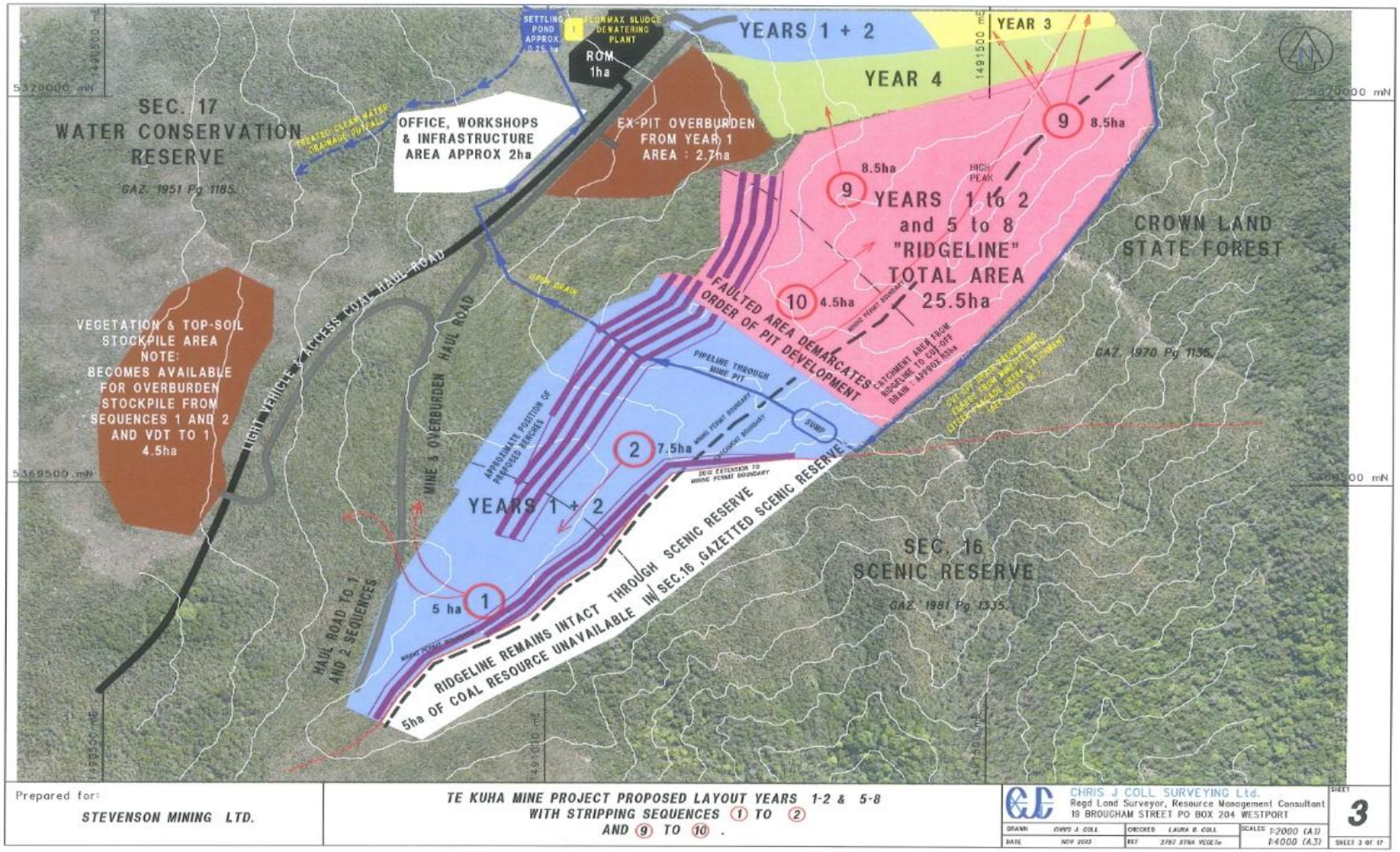


Figure 6: Proposed Mine Design and Mining Sequence Plans Years 1-4

Currently there is no public access to the Te Kuha Coal Project site and helicopters have been used to transport people in and out of the proposed site. An access road off Nine Mile Road, crossing both private land and public conservation land within the Ballarat Stewardship Area, is proposed to be built to provide access to the mine site.

The mine will be operated as a "truck and shovel" operation with works being undertaken Mondays to Fridays on day shift rotations. TKLP intends to, where possible, employ local employees and current estimates indicate a workforce of 40 – 50 personnel will be required.

It is estimated that the annual tonnage of coal extracted from the site will be less than 500,000 tonnes per year and overburden will be between 800,000 BCM and 2.4 million BCM per year. Trucks will be used to transport the unprocessed coal to the processing and storage facility to be located at Te Kuha via the proposed access road.

The site will be mined using opencast mining methods including stripping and stockpiling of soil and vegetation, with material to be classified for dumping or capping depending on its acid producing potential. The nature of the mine is such that there will be areas of the mine in different phases of the process, with some areas being pre-stripped, some actively being mined and some being backfilled for rehabilitation.

As far as is practicable, disturbed areas of land will be minimised. Rehabilitation will occur on a progressive basis. Once the mine is established, rehabilitation will advance at approximately the same rate as mining so that the area of disturbance is relatively constant throughout the life of the mining activity.

3.2 Proposed Timeframes and Duration

Mining is intended to be undertaken during weekdays on a rotational shift basis. The life of the mine is estimated to be between 10 and 25 years.

3.3 Access

The site is currently only accessible via helicopter and therefore an access road formation is a critical part of the pre-mining process. A haul road approximately 9km long will be constructed from Nine Mile Road and over about 1.4 km of private land before crossing the Ballarat Stewardship Area. The road will be constructed to a standard that adequately carries road trucks and will be subject to applications of water to minimise dust from vehicles using the road.

The main use of this road is to provide access to the Te Kuha site, but it will also be used to transport coal from the site down to the bottom of the hill where the coal wash and processing plant will be located. The processing area, which is adjacent to the Stillwater – Ngakawau Rail line, comprises flat land and is owned by Coleman Westport Limited.

The coal processing area has an existing railway siding corridor and a coal loading facility is proposed to be constructed to facilitate transportation of coal to Lyttleton by rail for export. The layout of the railway siding and proposed loading facility is outlined below in Figure 6.

Workers will be transported to and from the mine by bus from Westport, with shifts being from 7am – 6pm.

Figure 7: Proposed Footprint of Railway Siding and Coal Handling Facility

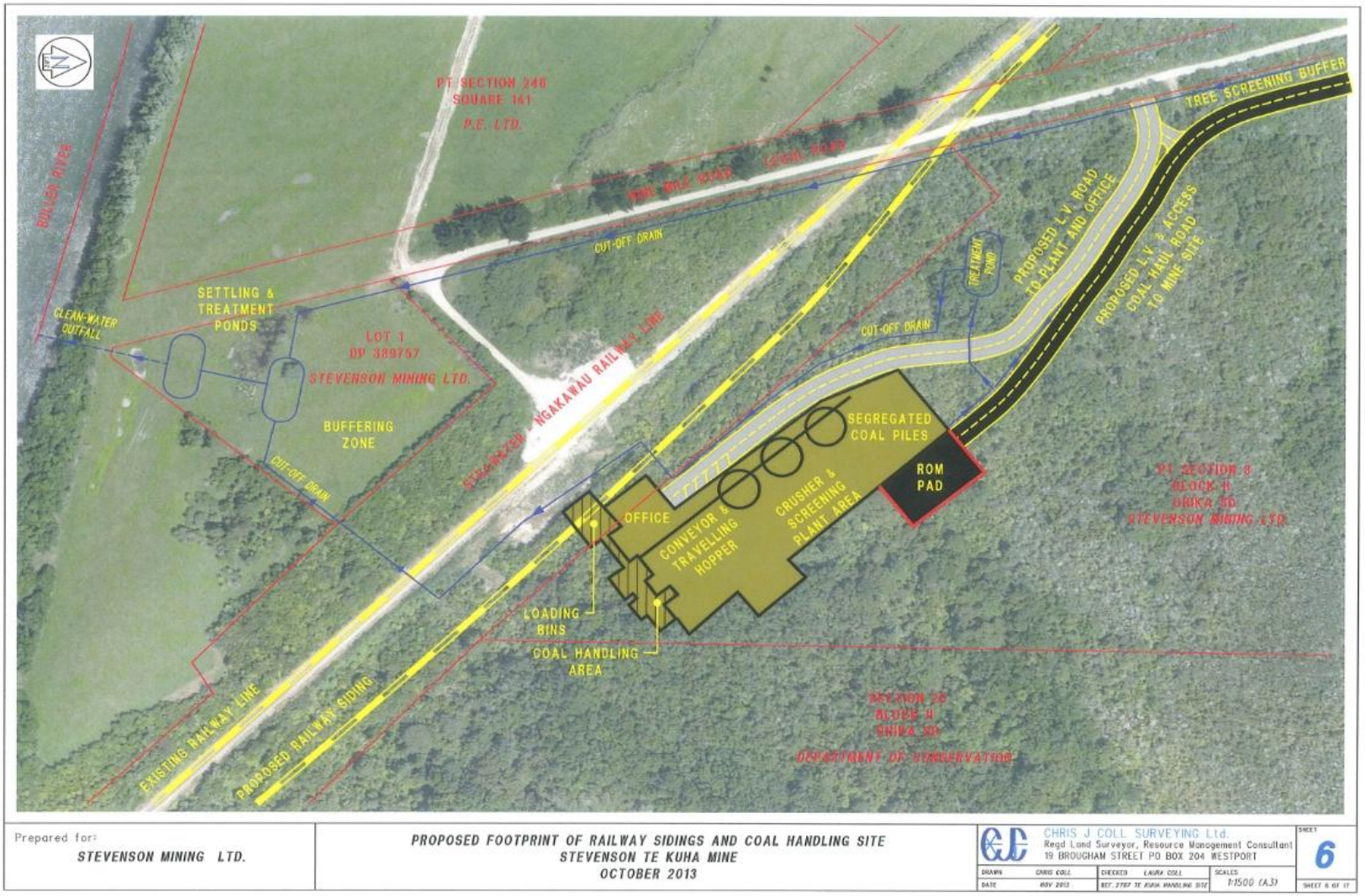
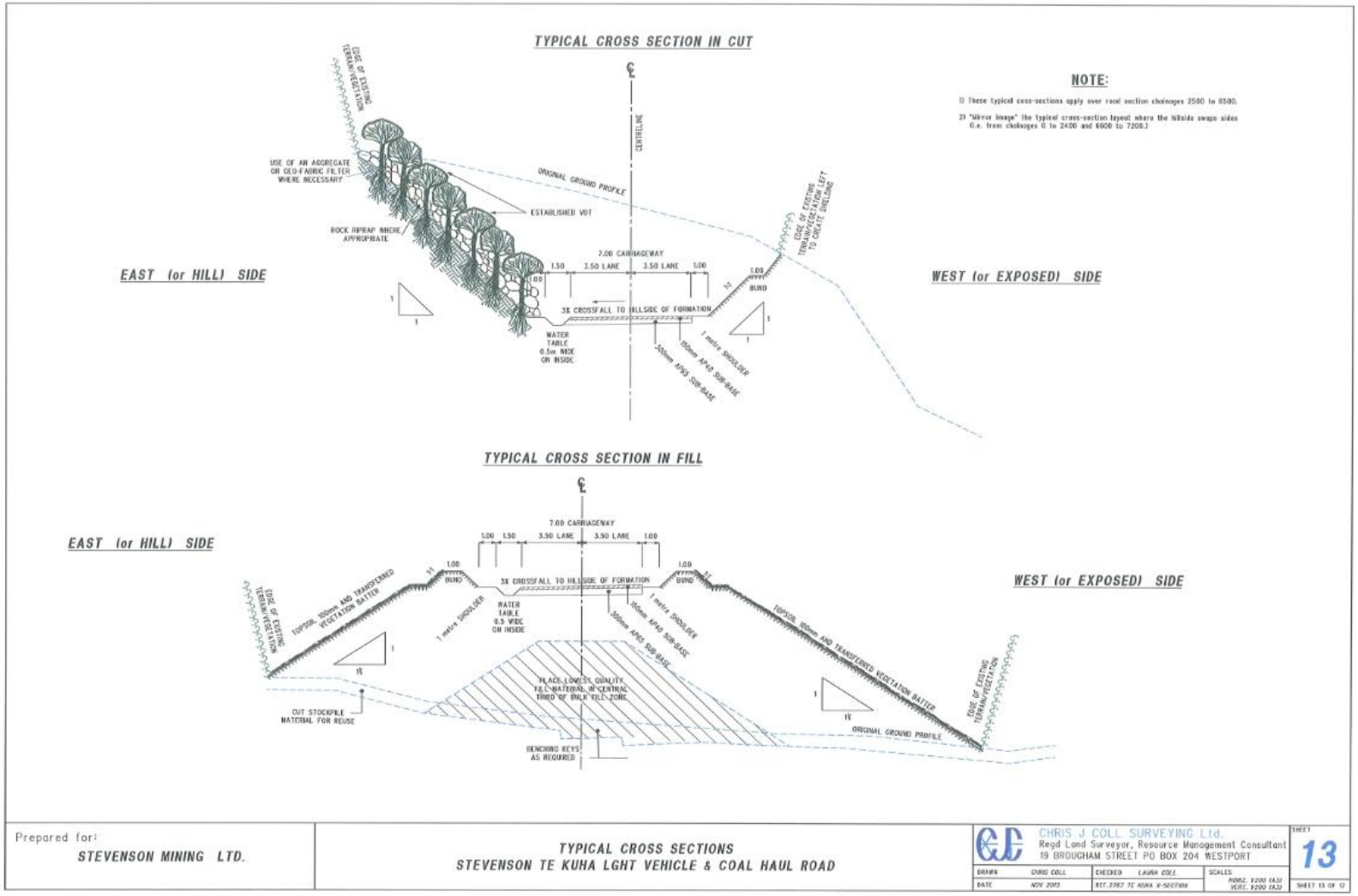


Figure 8: Typical Cross-Section - Te Kuha Haul Road Concept Plan



3.4 Services

Power is an integral component of mining and onsite power will be achieved from generators, with no new power lines intended to be installed.

Potable water will be trucked in and grey water will be sourced from the settling ponds established on site.

Compressed air will be used, as required, from a mobile compressor and aerial masts for Radio Frequency Communications will be installed on top of the workshop building by a local service provider to ensure good communication is available across the mine site.

3.5 Accommodation

No specific onsite accommodation is proposed as the employees will be sourced from the local area which has a strong history of mining and a readily available and experienced workforce.

3.6 Surface Structures

There will be a workshop and office onsite to facilitate day to day management. These will be located outside of the coal winning areas and will be removed at the end of the mining project.

The processing plant is to be located on the flat land owned by Coleman Westport Limited. This area is ideal for the processing activities to occur as it is adjacent to the main railway line and facilitates easy transportation of coal out of the area. The processing plant is also intended to be removed at completion of mining. At this stage, it is intended for the plant to be designed by Brightwater Engineering Limited who have particular expertise in the mining industry. Coal is intended to be processed via a 100 tonne dump hopper that will be fed by rear dump trucks. Water, power and telephone services will all be available at the processing site.

3.7 Water Management

3.7.1. Changes to Hydrogeology as a result of Mining

Removal of surface and groundwater to be used as part of the mining process will invariably have some impacts on the hydrological systems within the permit area. The current mining activity intends to remove the headwaters of both Coal and West Creeks and although the sampling was undertaken in drought conditions which appears to have altered the natural state of these creeks, under typical

conditions they will be supporting macroinvertebrate populations. These creeks will be reinstated in the final landform in a manner as similar to pre mining as possible.

The large tarn will be retained in-situ and not affected by the mining activity as a 100 m exclusion radius zone around the tarn is proposed.

The dewatering of the mine site will modify flow regimes within Coal Creek and West Creek and result in changes to stream habitat and baseflows and a likely increase in low flow periods. Sediment may also build up as a result of less flushing flows naturally occurring so all mine water will be cleaned through a series of settling ponds before being discharged back to the creeks. These catchments will be restored as close as practicable to original catchment areas during rehabilitation so that stream flows are returned close to current levels after mining.

The proposed mine site is located approximately 2 km above the Westport town water supply. The mine site will be managed and monitored to ensure that there is no alteration in the quality or quantity of water available to the town supply as a result of the Te Kuha Coal Project.

The natural variation in the existing streams, with little modification at the top end and highly modified environments at the lower end means that any changes in the top end of the creeks will be undertaken where possible in such a manner that does not impact on downstream users, or the overall quality of the creeks.

Sediment control dams will be built and maintained in areas where there is disturbance and potential for sediment to be mobilised. These structures will be built and disestablished as required during mining and rehabilitation. A surge pond will be constructed in the pit to contain impacted drainages from a 1:20 year flood event. From the surge pond, treatment will be adopted as required (geochemical studies are in progress) and a settling pond will be constructed downstream of treatment.

3.7.2 Water Use

Water use within mining sites generally performs two vital tasks – the first is to wash coal as part of the extraction process and the second is to water roads, exposed areas and stockpiles to minimise windborne dust effects. Coal washing is not expected to occur at the Te Kuha Mine, but may be required at the site processing facilities located adjacent to the railroad.

Water used within the mine site is generally returned back to surface water bodies via a series of settling ponds which act as natural filters and trap contaminants to maximise the returning water

quality. Any water discharged back to surface water bodies will comply with relevant conditions of consent and rules contained within the Regional Plan.

Geochemical investigations related to leachate from rocks that will be mined at the proposed Te Kuha mine site are underway at CRL Energy. These tests will be used to identify acid forming and non-acid forming rocks, predict mine drainage chemistry and identify management options for waste rock where possible.

Diversion drains will be in place to prevent clean water run-off mixing with water from disturbed sites to minimize the amount of mining-impacted water. These drains will be emplaced on the flow side of pits and highwalls or where pits and highwalls intersect the small upland catchments.

Mine drainage treatment will be completed as required and geochemical testing to predict mine drainage chemistry is underway. The mine intersects both Brunner (typically acid forming) and Paparoa (typically acid neutralizing) Coal Measures. This is likely to provide opportunities to mitigate acid formation with waste rock management techniques. Therefore, it is likely (pending final analysis) that minimal active treatment will be required. However, at this stage, a surge pond, a small lime dosing plant and settling pond are planned for the site.

3.7.3 Wastewater Disposal

Three main types of site water will be managed as part of typical mining operations and these are:

- clean water which will be diverted away from operational and roads through a network of diversion drains. These will progressively include water from rehabilitated areas once it meets discharge criteria.
- water that has contains excess sediment and which will be diverted through sediment retention structures and retained on site or treated until it meets discharge criteria
- water that contains excess sediment and acid or excess chemical components which will be retained on site and treated until discharge criteria are met.

It is anticipated that modifications to the catchment, drains, sediment traps, retention ponds and pumps are designed to cater to a 1:20 year flood event with about redundant (20%) capacity built in as a factor of safety. Our overburden management plan will include most rapid practical achievement of final landform which will provide the best opportunity to prevent excess sediment, acid or other dissolved components in the mine impacted drainages. During mining operations the flows in creeks will change as the operations move through the deposit, in general an effort will be made to keep

flows in creeks as natural as possible and catchment areas will be reinstated as closely as possible once the final land form is established.

Water discharge criteria will be designed to have minimal impact on downstream ecosystems and ultimately to restore a similar geochemical and biological environment to pre-mining rapid in rehabilitated areas. The specifics of these criteria, and the tolerances that are acceptable will be proposed after the base line monitoring programme is complete. Cumulative effects of the variability or tolerance in discharge criteria will be assessed if several tributaries are disturbed.

Management plans will be put in place to minimize adverse extra environmental effects at times of bad weather including:

- heavy rainfall
- fog
- freezing conditions
- snow fall
- blockages to drain or pipe infrastructure

A complete water balance of the permit area will be compiled once additional data has been collected and analysed and this, in conjunction with surface and ground water data and rainfall records, will form the basis of the Water Management Plan. The Water Management Plan will outline the effects on the baseline water flow rates and water quality and will also outline the required infrastructure to ensure effects are mitigated. The water management plan will be supported by a set of environmental management plans from waster rock classification and handling prior to mining through to weeding and rehabilitation after mining. These plans will also ensure compliance with site discharge criteria during operations. Other Site Management Plans (SMP's) may also include;

- Site Operations Plan
- Water Management Plan
- Rehabilitation Plan
- Biosecurity Management Plan
- Direct Transfer Plan
- Acid Mine Drainage Plan
- Traffic Management Plan
- Dust Management Plan

In terms of dust mitigation, the Gas and Petroleum Guidelines for Dust recommends an hourly application rate of 1 litre/m². Although this is not necessarily required for every exposed surface on every given day or hour, it is important that sufficient water is available to provide effective mitigation over a significant portion of the exposed areas on any day. Dust mitigation watering could be required at any of the coal load out facility, haul road, stockpiles, or exposed areas and also during earthworks, construction and material handling activities.

3.8 Mine Sequencing

The mine will require changes to the landscape as mining is undertaken and progresses. There are four principal areas that are proposed to be mined for coal as shown on the mine plan as Years 1 – 2, Year 3, Year 4 and Years 5 -8.

The sequence of mining is proposed to be such that, initially, vegetation in the Year 1 areas to be mined would be stripped and, after logs removed, most would be mixed with soil and stockpiled in an area designated Topsoil and Vegetation Stockpile for Years 1, 2 and 3 for later use in the rehabilitation of mined and back-filled areas. Short vegetation (1-2 m high) of high ecological value would be salvaged and, where appropriate using a 'direct transfer' technique, relocated to access road batters, bunds surrounding the proposed settling and treatment ponds, edges of the proposed office, workshops and infrastructure area and the ex-pit overburden from the Year 1 area.

Once the vegetation from the Year 1 area has been stripped, overburden will be stockpiled and, if required, will be utilised as backfill for rehabilitation. If not required, it will be retained as a revegetated area that will be shaped and sited to naturally meld with the surrounding landform.

Mining will essentially progress through the remaining stages as for Stage 1, with vegetation being cleared, some vegetation, especially short vegetation with high conservation value sorted and/or stockpiled for rehabilitation or direct transfer and overburden being used to backfill the pit from the previous mining.

Progressively clearing vegetation and excavating overburden before mining seams of coal, as well as backfilling, spreading mixed vegetation and topsoil, directly transferring short vegetation and establishing plants specifically grown for the Te Kuha Coal Project onto sites within the project area that have been mined, will be undertaken throughout the life of the mine. Mining and rehabilitation of the project site will thus occur simultaneously. In addition to vegetation to be retained, boulders

will be salvaged and used as part of the rehabilitation process to ensure the post-mining landscape replicates the pre-mining landscape as far as practicable.

The access and haul road, approximately 9 km in length, will have a gradient of no more than 1 in 10 and will not have significant landscape effects. The road will follow the path as described above, crossing several land tenures and vegetation covers as well as several watercourses which will have either bridges or culverts constructed.

The access road will be single lane, with a 7 metre wide carriageway and several 25 metre long passing bays in accordance with NZS4404:2004. The passing bays will be located where it is most practicable to rehabilitate road batters for best recovery. Cut-to-fill batters and exposed rock faces will be rehabilitated with a mixture of seeds and soil from the site and, potentially, with hydra-seeding to establish initial slope stability. Based on the results of similar approaches at other mine sites, it is anticipated that even rocky faces will rehabilitate relatively easily and vegetation on the downhill side will form the screen from distant views of the access road. Gravel for the road surface will be obtained from local sources to ensure it blends with the colour and texture components within the area. The gravel pit is located on private farmland and is well concealed by both landform and vegetation from public viewpoints.

Coal to be extracted will be mined from seams and stockpiled at the Run of Mine (ROM) area. Generally, ROM areas are required where the rate of extraction exceeds the ability to trucks to transport the coal away. The ROM area is developed by removal of vegetation and soil, then levelled and surfaced with compacted road metals and bunded for stormwater control. The ROM area is partially concealed by landform from most views and, where it is visible, the ROM pad will be seen as a small part of the overall mine site, not discernible or remarkable on its own. The ROM pad will be removed post-mining by removing the metals and bunding, reinstating some natural topographical shaping, topsoil and then revegetating.

The site office and general administration and infrastructure area will be located near the ROM area and is anticipated to occupy approximately 3,200m². This area will be levelled, enclosed with a bund and partially concealed from views. Any buildings will have exterior colours suited to the vegetation cover surrounding the area. The site office and associated infrastructure will be removed at the completion of mining and the landscape will be revegetated and naturalised.

Treatment ponds will be constructed in one of the lowest parts of the mine site where stormwater and runoff naturally moves. The ponds are designed to remove silt and suspended material from mine water and/or stormwater before returning it to surface water bodies. The ponds are lined and bunded and will be operated in conjunction with a sludge dewatering plant in order to recover as much solid material as possible. Post-mining, the pond lining will be removed and the depressions filled and vegetated.

The access road will also provide access to the coal handling area which is to be located on privately owned land. The area will have coal loading bins which will be located on a siding adjacent to the main trunk line. The siding will be constructed on scrub covered land within an existing designated Railway Reserve as shown in Figure 6.

These facilities are to be located at the base of the mine access road because it is the most logical position taking advantage of existing external infrastructure. The actual design of these facilities has not yet been undertaken although the proposed general layout is shown. It is expected that the facilities will be similar to those for the Stockton opencast mine. A second ROM pad will be constructed at the siding/handling site and additional settling and treatment ponds will be constructed to process the stormwater and runoff from this area before discharge. It is intended that all facilities will be removed post-mining.

3.9 Waste Processing

The production of waste materials is a natural consequence of mining activities and all mining waste material will be stockpiled at the mine site and used during the rehabilitation phases. Waste will be classified prior to stockpiling and materials.

These stockpiles comprise both soils and overburden which are returned back to the pit as mining progresses forwards.

Waste that enters mine site water will be removed via the settling ponds which act as a bio filter to ensure that when water is discharged back to the surface water bodies it is the same quality, if not better, as the abstracted water.

Ablution facilities will be provided at the mine, including toilet and shower blocks. It is currently expected that waste of this nature will be directed to tanks, and removed from site on an as required basis for disposal at an approved facility.

3.10 Consents

There are no current consents held to undertake the mining activity from either the Buller District Council or the West Coast Regional Council. Applications to both Councils will be prepared following completion of the data collection phase and detailed consultation with the DOC and BDC.

4. Statutory Context and Non-statutory Provisions

4.1 Resource Management Act

The Resource Management Act 1991 (RMA) promotes the sustainable management of natural and physical resources such as land, air and water.

Section 5 RMA, describes *"sustainable management"* as;

'managing the use, development and protection of natural and physical resources in a way, or at a rate which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while-

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystem; and

(c) Avoiding, remedying or mitigating any adverse effects of activities on the environment.'

In terms of the overall context of this proposal, the Resource Management Act is one of the key Statutory Documents which shall be considered. In this instance, Part 2 of the RMA will be of relevance, specifically Section 6, 7 and 8 RMA.

Section 6 lists matters of national importance that shall be 'recognised and provided for' in achieving the purpose of the RMA. These matters include;

- natural character of the coastal environment:
- outstanding natural features and landscapes:
- significant indigenous habitats and vegetation:
- public access to waterbodies:

- Maori culture, traditions, ancestral lands, water, sites, waahi tapu, and taonga:
- historic heritage:
- recognised customary activities.

An assessment of the relevance of Section 6 will be made as part of a resource consenting process with the WCRC and the BDC.

Section 7 is a list of matters that all decisions 'shall have particular regard to' in achieving the purpose of the RMA, while Section 8 "*Treaty of Waitangi*" outlines that in achieving the purpose of the RMA, 'account shall be taken' of the principles of the Treaty of Waitangi.

An assessment of these matters will be made at the time of application for resource consent.

4.2 West Coast Regional Policy Statement

The West Coast Regional Policy Statement (RPS) is the overarching Resource Management Act document for the Region. It has guided the development of regional plans, and will be relevant to the Te Kuha Project in terms of overall project planning and development. This document will be addressed in more detail in the Resource Consent Applications to the West Coast Regional Council and the Buller District Council, but is outlined here for completeness.

The RPS for the West Coast outlines a number of matters which must be considered, including;

- Matters of Significance to Poutini Ngai Tahu
- Heritage Matters
- Soils and Rivers
- Water
- Habitats and Landscapes
- Coastal Environment
- Natural Hazards
- Solid and Hazardous Waste
- Air Quality
- Energy
- Network Utilities and Transport Services
- Minerals

Those sections of the RPS with particular relevance to this project include Matters of Significance to Poutini Ngai Tahu; Heritage Matters; Soils and Rivers; Water; Habitats and Landscapes; Air Quality; and Minerals.

The RPS outlines issues, policies and objectives for the region in relation to each of the topics detailed above.

4.3 Buller District Plan

The Te Kuha Project lies within the Rural Zone of the Buller District, and is therefore subject to the matters of the Buller District Plan. This document controls all matters relating to landuse, and will be of relevance in terms of seeking resource consent for the project. Again, this document is identified for completeness, and will be addressed in more detail in the application for resource consent.

4.4 Crown Minerals Act

The Crown Minerals Act 1991 (CMA) sets the broad legislative policy for prospecting, exploration and mining of Crown-owned minerals in New Zealand. These include all naturally occurring gold and silver and substantial amounts of coal and other metallic and non-metallic minerals and aggregates, on land and offshore in the Exclusive Economic Zone and extended continental shelf.

The CMA sets out the requirements for accessing land for the purposes of prospecting, exploration and mining, and it is under this legislative framework that the application for an access agreement is made to all landowners over whose land the Te Kuha Project is located.

Section 60 details matters in relation to requesting access over Crown Land. Any final agreement in relation to access will have to have consideration to the requirements of the CMA.

4.5 Conservation Management Strategy

The Conservation Act (1987) requires the Department of Conservation to prepare a Conservation Management Strategy ("CMS") for each conservancy. The CMS applies to conservation land administered by the Department of Conservation and, hence, will only apply to a small part of the mine footprint in the event that the mining permit extension is granted by New Zealand Petroleum and Minerals (NZPAM). The Te Kuha coal resource is predominantly located within a local purpose reserve

administered by Buller District Council, therefore the CMS largely only applies to the parts of the proposed access road which are located on public conservation land. Because of the large amount of public conservation land in the vicinity, the CMS does set the tone for ecosystem management in the surrounding environs. The CMS relevant to Te Kuha establishes objectives for the integrated management of natural and historic resources, including species managed under a number of different Acts (including the Wildlife Act 1953) and for recreation, tourism and other conservation purposes within the West Coast Tai Poutini Conservancy over a 10 year period between 2010 and 2020 (Department of Conservation 2010).

In the event that the Westport Water Conservation Reserve status were revoked over part or all of the existing reserve, it is most likely that the land would pass to the Department of Conservation in accordance with the recommendation by Overmars *et al*. (1998). The site is surrounded by public conservation land and could be expected to be managed in a similar way to neighbouring land, even if it remains a water conservation reserve. Hence, the CMS for the area is a relevant consideration.

Te Kuha is located within the Kawatiri Place management unit identified by the Department of Conservation (Department of Conservation 2010). Te Kuha is not located within the Buller Coal Plateau priority site (see Map 8 of the CMS) and has an assumed lower management priority for that reason.

The goal of the CMS for the Kawatiri Place is for natural heritage values to be maintained and, where practicable, protected and enhanced. Goals relating to coal measures vegetation in 2020 are:

- Rehabilitation is actively pursued on coal measure ecosystems and related freshwater ecosystems that were mined in the past.
- The infertile, acidic, often waterlogged soils support distinctive open moorlands of specialist tussock and shrubland communities. These communities are dominated by the endemic coal measure tussock *Chionochloa juncea*, red tussock, and low shrublands of prostrate manuka, yellow silver pine and pygmy pine.
- A representative sample of viable coal measure ecosystems and landscapes on the Buller Coal Plateau priority site is legally protected.
- The natural character of previously modified areas is improving as invasive weeds, including gorse, broom and *Juncus squarrosus* are controlled and four-wheel driving is confined to existing formed roads.

- The Buller Coal Plateau priority site (which includes part of the Denniston Plateau) supports viable populations of locally endemic giant land snails, including *Powelliphanta patrickensis* and *P.* "Augustus *(Walker; 2008)*", the great spotted kiwi (roroa) and a high diversity of bryophytes.

In the absence of specific goals for the Te Kuha site in the CMS, another goal that could be considered applicable to coal measures vegetation at Te Kuha is that the gently rolling terrain at altitudes of 600-900 m a.s.l continue to be dominated by non-forest vegetation communities. The CMS articulates this goal for the Denniston and Stockton plateau.

The establishment of a coal mine at Te Kuha is consistent with the goals articulated within the CMS provided that rehabilitation is completed to a high standard and weeds are prevented from expanding across the site. The intention, post-mining, is to return the site to as close to the pre-mining state as practicable, to ensure biodiversity is consistent by localised sourcing and translocation of both flora and fauna and removal of all built elements including the haul road.

5. Assessment of Environmental Effects

5.1 Landscape Effects

The West Coast region is known for its mountains, rainfall and rivers. These features, combined with the processes of uplift and erosion, have resulted in a landscape dominated by mountainous terrain.

Features of the Te Kuha Coal Project that will give rise to potential landscape and visual effects are comprehensively identified in the Rough report and outlined below. The components of the mining project are:

- Coal mine excavation areas
- Expit overburden from Year 1 excavation and vegetation stockpile areas
- Access road
- ROM coal stockpiles
- Office, workshop and infrastructure area
- Settling and treatment pond area
- Coal handling/siding area

Specifically in terms of landscape effects of the above, the Rough report has identified and classified those affects in terms accepted in an RMA context. These aspects above will have effects from different

viewpoints. The effects on naturalness range from no or negligible effect, low effect, moderate effect, or substantial effect, or a combination of these.

With regard to the effects of the Te Kuha Coal Project on visual amenity values, the following hierarchy of descriptive terms to convey a definition of magnitude and degrees of effects on visual amenity is used:

None	*No part of the development, or work or activity associated with it, is discernible.*
Negligible	*Only a very small part of the proposal is discernible and/or it is at such a distance that it is scarcely appreciated. Consequently, it has very little effect on the scene.*
Low/Slight	*The proposal constitutes only a minor component of the wider view, which might be missed by the casual observer. Awareness of the proposal would not have a marked effect on the overall quality of the scene.*
Moderate	*The proposal may form a visible and recognisable new element within the overall scene and may be readily noticed by the observer.*
Substantial	*The proposal forms a significant and immediately apparent part of the scene that affects and changes its overall character.*
Severe	*The proposal becomes the dominant feature of the scene to which other elements become subordinate and it significantly affects and changes its character (Rough, November 2013).*

The Rough report was aided by Digital Terrain Modelling (DTM) simulations and photo-simulations from six publicly accessible viewpoints and modelled based on a realistic and distant visual observation. These are attached as an appendix to this report.

5.1.1 Effect on views from Mt Rochfort

The effect of mining on views from Mt Rochfort will be a lowering of the naturally occurring and more simplified profile. The intention, post-mining, is to backfill the area and enable the vegetation cover to re-establish and blend back into the surrounding landscape as far as practicable. Once the modified topography within the mining permit area has been revegetated, from Mt Rochfort the proposed mine will appear to have had only a low effect on the site's natural character as both topography and land cover will be natural in appearance. Because the modified and remediated area will constitute a major component of the wider view and will not have a marked effect on the overall quality of the scene, the long-term effects of the Te Kuha Coal Project on visual amenity will be slight.

5.1.2 Effect on views from Sergeants Hill

Sergeants Hill is located on SH 67, immediately northwest of the Stillwater-Ngakawau Railway. From this viewpoint, the Coastal Hillslopes have a high natural character and provide a contrasting background to the highly modified coastal plain which is dominated by roads, railways, buildings and other human-induced change. The contrast gives the view a high aesthetic value.

During mining activity, portions of the access and haul road, portions of the vegetation and soil stockpile areas and two of the mining areas will be readily visible, especially when the vegetation and soil stripping processes are underway. The effects of this during mining activity are considered to be moderate on the Coastal Hill's natural character from this vicinity as it will form a new element within the overall scene that will be readily visible to an observer. This will collectively result in a moderate effect.

It is anticipated that post-mining rehabilitation will result in a slightly modified skyline from this viewpoint. Long term, it is anticipated that revegetation will result in a negligible effect on the Coastal Hillslopes' natural character and negligible effects on visual amenity when viewed from Sergeants Hill.

5.1.3 Effects on Views from Victoria Square, Westport

From Westport, views of the Coastal Hillslopes and the Paparoa Range are variously visible as buildings and trees tend to curtail clear views inland. The best views are afforded from the town's north-south oriented streets and from areas of reasonably significant open space such as Victoria Square. Although some of the lower slopes of the Coastal Hillslopes in the scene have been cleared of indigenous

vegetation and established in pasture for grazing, in general, the hill slopes in the view appear high in natural character and this, in conjunction with their reasonably interesting form and ephemeral characteristics such as associated cloud formations and winter snow, results in the backdrop ranges having high aesthetic value.

There will be various elements visible from within Westport town itself, including mining areas, the haul/access road, the site buildings and vegetation and soil stockpile areas. In the context of the human field of view, it is anticipated that the Te Kuha Coal Project will have moderate effects on natural character and visual amenity prior to revegetation taking place.

Again, from views in the town, the post-mining areas will display a slightly modified skyline. The haul road is anticipated to successfully rehabilitate, based on recent rehabilitation at the nearby Denniston Road which resulted in vegetation on the upper and downslope batters successfully transferring. The upper and downhill slopes of the proposed haul road will also be revegetated to achieve similar results.

Although the skyline within the mining permit area will have changed slightly from Westport, it will appear natural in character, as will the rest of the project site once revegetation has taken effect. In essence, from Westport, the Te Kuha Coal Project has been determined to have negligible long-term effects on the natural character and visual amenity of the site and the Coastal Hillslopes.

5.1.4 Effects on views from Westport Bridge, SH 67

The Westport Bridge crosses the Buller River approximately 1.6km southwest of the town centre. From the bridge, the view of the Coastal Hillslopes including the mine site is clearer and more readily apparent than from the town centre, with no visual obstruction from built form. It is envisaged that the temporary and long-term effects of the Te Kuha Coal Project on natural character and visual amenity, as they will be experienced from the bridge over the Buller River, will be virtually identical to those experienced from Victoria Square and other central locations within Westport. That is, effects during mining activity will be moderate, and post-mining effects will be negligible provided rehabilitation and recontouring is successful.

5.1.5 Effects on the view from the Tip Head

From the Tip Head at the mouth of the Buller River, the Coastal Hillslopes and the Paparoa and Papahau Ranges are components of a very expansive scene which appear high in natural character due to low

levels of modification and little built development being apparent. The natural associations of landform, the sea, the Buller River (albeit channelled over its last reach) and vegetation results in components of the view having high aesthetic value.

Some aspects of modification are apparent in the form of vegetation clearance for pasture conversion for farming purposes. However, in general the view presents an intact overall landscape.

From the Tip Head, the access road will be visible as well as some of the mining areas, then buildings, ROM pad and vegetation and stockpile areas. In the context of what is a very expansive view from the Tip Head, the Te Kuha Coal Project will have a moderate effect on natural character and a moderate effect on visual amenity prior to revegetation taking place.

Post-mining, with the removal of a knoll on the skyline, the resulting profile will be simplified and will not be able to be re-established back to its pre-mining shape. The change in skyline will be naturalised and with vegetation establishing following rehabilitation, the appearance overall is expected to be natural in character. The assessment has determined that the revegetation with indigenous species will restore the visual integrity of the project site as it will be seen from the Tip Head and, in terms of the overall long-term effects of the project, it will have negligible effects on the site's and the Coastal Hillslopes' natural character and visual amenity value from this viewpoint.

5.1.6 Effects on views from Carters Beach

Carters Beach is a small coastal settlement located approximately 6 km west of Westport. Views from Carters Beach are similarly restricted by buildings and trees as for Westport but there are clear expanses visible from the golf course and the nearby Westport Airport. As for previously discussed existing views, the Coastal Hillslopes and the Paparoa and Papahau Ranges appear high in natural character and high in visual amenity value in the view from the foreshore at Carters Beach.

The viewing distance from Carters Beach is almost identical to that from the Tip Head. From Carters Beach, the haul road and mining areas will be readily apparent as mining activity is undertaken.

Following revegetation of the access/haul road and the mine site, the principal difference will be the slightly modified skyline ridge within the mining permit area. From Carters Beach and its vicinity, the skyline will, however, look natural and the overall long-term effects of the project on the project site and the Coastal Hillslopes will be negligible on both natural character and visual amenity.

5.1.7 Effects on views from Lighthouse Track, Cape Foulwind

The Cape Foulwind Walkway passes the Cape Foulwind Lighthouse approximately 11 kilometres west of Westport. Current perspectives from near the lighthouse afford a panoramic view to the northeast along the coast and inland to the Paparoa and Papahau Ranges.

From this view, the overall impression is of an intact area with high natural character values and high visual amenity values despite some elements of built form such as the Holcim Cement Plant and the coastal terraces and plains being evident.

From the general lighthouse area, most of the access road, including a small part that is located outside of the permit area, as well as large parts of the mining activity including stockpiles would be visible. The views however are seen in the context of what is a very extensive panorama and with a viewing distance to the project site in the order of 20 km. The effects therefore have been assessed as having a moderate – low effect on the natural character of the inland ranges and a moderate – slight effect on their visual amenity value.

The post-mining effects will result in a slightly modified skyline. However, once revegetation has occurred, it is anticipated that the mining area will be barely discernible and, overall, there will be no long-term effects of the project on the natural character of the project site and Coastal Hills and, similarly, there will be no adverse effects on their visual amenity value.

5.1.8 Effect on views from the Cape Foulwind Walkway

From near the Cape Foulwind Lighthouse, the walkway skirts southwards around the tip of coastal cliffs for approximately 3.4 km before terminating at Tauranga Bay. From the walkway, views of the Coastal Hillslopes and the Paparoa and Papahau Ranges are variously afforded. The foreground and the distant backdrop of the Paparoa and Papahau Ranges and the Coastal Hillslopes appear very high in natural character and high in visual amenity value.

There are areas on the walkway where views will present with very little obvious modification compared to other parts of the walkway but, overall, the effects in terms of natural character and visual amenity are very similar. Views from this perspective are filtered by some 20km of sight distance.

Again, the post-mining experience will be of a slightly modified albeit natural-appearing skyline with re-establishing vegetation and an overall slight effect on the visual amenity values.

5.1.9 Effects on views from Tauranga Bay

Tauranga Bay is a popular destination approximately 16 km west of Westport. From foreshore areas, foreground topography curtails views inland but, from near the end of Tauranga Bay Road, the Paparoa and Papahau Ranges and Mt Rochfort and the tops of the Coastal Hillslopes within the mining permit area are just visible. Although only very small portions of the Coastal Hillslopes are visible from near the end of Tauranga Bay Road, its skyline will, nonetheless, appear very slightly altered as a result of the Te Kuha Coal Project. Because of the viewing distance, it will be very difficult to discern changes to the skyline and, in essence, the long-term effects of the project on natural character and visual amenity will not be apparent in views from Tauranga Bay.

5.1.10 Effects on views from Entrance to Crossroads Subdivision, SH 67

The views from the junction of SH 67 and SH 6, approximately 4.75km south of the Westport Bridge, provide an aspect that has very high natural character and apparently intact vegetation cover combined with interesting landform which culminate in high visual amenity values. In both respects, this is in contrast to the modified landscape in the foreground at other viewpoints along SH67.

Activity within the mining permit area will be visible from this general vicinity. The short and long-term effects on the natural character and the visual amenity of the project site and the Coastal Hillslopes, will be somewhat similar, but lesser, than what will be apparent from the SH6 view described below. The views from the Crossroads subdivision entrance and Norris Creek have a similar aspect but the effects from the Crossroads entrance will be less because of the fact that it is approximately 1.2 km further away from the project site than Norris Creek. The landscape and visual effects of the Te Kuha Coal Project on the view from SH67 near the intersection with SH 6 will be moderate in the short – medium term and reducing to negligible over time. Effects will be more significant for regular viewers of the Papahau Range. The effects from this viewpoint are closely aligned with the effects from Norris Creek (as outlined below).

5.1.11 Effects on views from SH6 at Norris Creek

Views from SH 6 vary from distant to relatively close and clear views, especially in the area southeast from the bridge. In comparison to the river terrace in the foreground, which has the obvious presence of the highway and has had its land cover modified for farming, the Coastal Hillslopes and the project site (to the right of Trig M), with their cover of indigenous vegetation, appear very high in natural character. The general visual integrity of the cover of vegetation, combined with interesting landforms, engenders the hills and project site with high visual amenity value.

All aspects of the mining activity will be evident at some point during the life of the mine, but due to its progressive nature, not all elements will be visible at the same time. Some features, such as the office, workshops and infrastructure area, the settling and treatment ponds and the ROM area, will remain in place for the life of the mine although bunds and batters associated with these features will be revegetated as soon as is practicable once they have been constructed. As soon as the access/haul road has been constructed, revegetation of cuts and fills and land generally disturbed as a result of forming the road will be undertaken, thus enabling the road to be concealed from public view well before mining activity ceases. With a viewing distance to the proposed mine of approximately 5 km and a somewhat more focused view than will occur from other viewpoints, the Te Kuha Coal Project will give rise to reasonably substantial effects on the natural character and visual amenity of the Coastal Hillslopes.

Post-mining, a subtle but obvious change to the skyline will result but the most significant topographical change is associated with a large area evident on the left hand side when looking from this perspective. A reasonably prominent knoll on the skyline reduces in height and prominence and the skyline from Norris Creek will lose some of its existing natural character and become more subdued in its appearance. Notwithstanding these points, it will appear to be have a natural profile.

The former position of the access road will be discernible for a time after mining is completed, but as earlier noted, it is anticipated that over time, even from the closer views at Norris Creek, the previous road alignment will not be readily apparent. It is also anticipated that broad areas that have been revegetated (such as the mined and backfilled areas, the office, workshops and infrastructure area, overburden and vegetation and soil stockpile areas and the ROM area) will, for some time, have a somewhat different appearance, in terms of colour and texture, to adjacent undisturbed areas of

indigenous vegetation. For a time post-mining, this is likely to result in the Te Kuha Coal Project having a moderate-low effect on the natural character of the mining permit area.

Over time and as the areas of revegetation mature, lasting effects of the Te Kuha Coal Project on natural character, as experienced from this viewpoint will reduce to negligible. While the true natural character of the skyline will have been affected as a result of its topographic change, it will appear to be natural from the Norris Creek Bridge. Once revegetation has taken effect, the change in the outline of the skyline is only likely to be appreciated by those who are very familiar with this particular view.

It is not anticipated that an awareness of revegetated project areas within the mining permit area having different colours and textures to adjacent undisturbed areas will have a marked effect on the overall visual quality of the scene and, in fact, may not even be discerned by casual observers. For those that are aware of a certain unnaturalness in the cover of vegetation within the permit area, the Te Kuha Coal Project will have a slight adverse effect on the area's visual amenity value. Over time and as the areas of revegetation mature, the long-term effect of the project on visual amenity will reduce to being negligible to no effect.

5.1.12 Effects on views from Buckland Peaks

Views from Buckland Peaks are available to experienced trampers via an approximately 7 hour tramp from the highway.

Areas of mining (including site buildings and overburden areas) will be visible but views will be variable as mining and rehabilitation occurs concurrently. The Rough report identifies that a portion of the area to be mined to the southeast of the Coastal Hillslopes' ridgeline within the mining permit area lies within the catchment of the Lower Buller Gorge and is within what has been identified as the Paparoa and Mt William Inland Ranges area of Outstanding Natural Landscape.

The natural character and visual amenity values of the range where the mine is located are very high and the mining activity will be a focus of attention in the middle distance of views to the northeast from Buckland Peaks. The mining activity will, from this perspective, have a moderate – reasonably substantial effect on the natural character and visual amenity value of the Coastal Hillslopes' landscape.

As for many of the post-mining views, the view from Buckland Peaks will result in the skyline ridge appearing somewhat simplified and having a less distinctive character. The main difference from Buckland Peaks, when compared to other viewpoints, is that the viewing direction is down rather than up which would make the altered ridgeline more difficult to distinguish.

From the Buckland Peaks, it is possible that sections of the access/haul road will always be discernible if the sites is not revegetated appropriately. For a considerable period of time, the revegetated areas of the Te Kuha Coal Project will appear different, in terms of their colour and texture, to adjacent undisturbed areas of indigenous vegetation. The most significant contrast will occur on the southeastern side of the skyline ridge where regenerating shrubland will abut mature forest. The visual contrast between disturbed and undisturbed areas will lessen over time and eventually have negligible effects on natural character and visual amenity as experienced from the Buckland Peaks. In the short and medium term after revegetation has taken place, the effects of the project on natural character and visual amenity are anticipated to be in the slight – moderate range.

5.1.13 Effect on view from Buller Gorge near Ohikanui River

From a stretch of SH 6 near the confluence of the Ohikanui and Buller rivers and from an adjacent stretch of the Buller River, part of the mining permit area that extends over the skyline ridge of the Coastal Hillslopes and into the catchment of the Lower Buller Gorge is visible. The Gorge and the slopes that encompass the permit area are also within what has been identified as the Paparoa and Mt William Inland Ranges Outstanding Natural Landscape unit. Notwithstanding the presence of SH 6 and the Stillwater-Ngakawau Railway, the landscape, including the forested slopes within the permit area, is very high in natural character and aesthetic value.

From these views, the area to be mined obviously encompasses a high point on the skyline that is a reasonably distinctive topographic feature and, again, several components of the mining activity will be visible.

The post-mining view will again encompass a more simplified ridgeline profile and there is potential to further restore the pre-mining ridge with further and more detailed backfill design to increase the topographic relief which will add more character and visual interest.

During the principal mining and backfilling phase of the Te Kuha Coal Project that will be visible, the project will have moderate to substantial effects on natural character and visual amenity value. This will be due, in part, to the fact that a prominent skyline section of the landscape, which is very high in natural character and aesthetic value, will be disturbed and modified. Such effects will also be due, in part, to the focal point nature of the skyline ridge within the permit area. From SH 6 and the Buller River near the Ohikanui River, the indigenous forest-clad mountain range, which the ridge crowns, is a focus of attention in views. Forest-clad spurs in the middle-distance, which descend to the Buller River, frame views of the range and its ridgeline at the southern end of the mining permit area and tend to intensify its focal point character.

There will be temporary adverse visual effects resulting from varied vegetation colour which will be more obvious in clear weather conditions but over time, as the revegetated area attains maturity, the contrast between the two areas will reduce.

Taking into account the modified skyline and the change in the vegetation within the mining permit area that will be apparent for some time, the Te Kuha Coal Project will have a moderate effect on the natural character of the landscape as it is viewed from the Buller Gorge. Over time, this effect can be anticipated to reduce to being low. In regard to effects on visual amenity, the new skyline will appear reasonably natural and, once revegetation of the backfilled area has taken effect, the Te Kuha Coal Project will not have a particularly marked effect on the overall quality of the scene and its effect on visual amenity will be slight – an effect that will reduce to negligible over time as the area of revegetation matures.

5.2 Overall Landscape and Visual Effects within the Mining Permit Area

In addition to the adverse effects from the most obvious public view points, which will occur day to day and be readily apparent, there are also additional landscape and visual effects that will occur within the site. These effects will occur in spite of no readily available public access to the mining area while the Water Conservation Reserve is in place. Nonetheless, there will be lasting landscape and visual effects as a result of the Te Kuha Coal Project. The landscape report has outlined such effects including the long term visual effects of the access/haul road albeit bridges and culverts will be removed, the lowering and simplification of the skyline ridge, the retention of cut off drains to control unwanted runoff and slightly artificial gradients of backfilled areas which will be designed to avoid land slumping and washouts.

Some existing rock outcrops and boulder fields will be lost permanently, although, where practical, boulders will be stockpiled and reused to replicate areas of boulder field. Post-mining, all areas of disturbance will be rehabilitated and recontoured to simulate natural-looking landforms as far as practicable. However, the true lie of the land will invariably be different to the pre-mining condition.

Vegetation differences as rehabilitation establishes will be evident in the medium – long term as colour, texture and composition of species re-establish and blend with the existing undisturbed areas. Over time, as the areas of revegetation mature and the composition of plant species perhaps becomes naturally enriched, the apparent differences between revegetated and untouched areas will lessen.

The Rough report, having considered the short, medium and long term effects, permanent effects and temporary effects, has assessed the landscape effects from within the site as moderate to substantial in terms of the natural character values. In terms of the visual amenity values, these are assessed as visible and recognisable effects that will be readily noticed by an observer at the site and, as such, the effects on visual amenity could be described as moderate.

5.3 Landscape Conclusions

The proposed mine occupies a small area of land at the southern end of the Buller Coalfield. Mining, by its very nature, gives rise to unavoidable landscape and visual effects and West Coast mines are often obscured by topography from nearby settlements and highways. Te Kuha is different in this respect as it is visible from Westport, Carters Beach, SH 6, SH 6A and SH 67 to various degrees and extents.

While the extraction of coal and other mineral resources are a significant economic activity on the West Coast in general and within the Buller District in particular, also significant are tourism and recreational activities that rely on the landscape and visual qualities of large tracts of indigenous forest-covered mountain ranges, most of which is under the direct control of the Department of Conservation. The Te Kuha Coal Project site occupies indigenous forest-covered land on the crest and either side of a ridge of Coastal Hillslopes which form a backdrop for Westport and its surrounding coastal plain, terraces and coastline. The bulk of the mine site lies within a Water Conservation Reserve administered by the Buller District Council and, because public access to the reserve is restricted, the area of the mine site has been subject to very little human activity and is thus very high in natural character. By being part of an extensive, relatively untouched backdrop, which extends north-eastwards to Mt Rochfort and the Denniston Plateau and incorporates the also relatively untouched

Paparoa Range to the southwest, the mine site is part of a mountain range that is high in visual amenity value.

A relatively small part of the mine site lies on the southeastern side of the Coastal Hillslopes' ridgeline and is part of an extensive landscape that is also very high in natural character and visual amenity value and which has been identified as an Outstanding Natural Landscape (ONL) - the Paparoa and Mt William Inland Ranges ONL. This part of the mine site is visible from a short section of SH 6 and the Buller River in the Lower Buller Gorge. In essence, the mine site lies in a visually sensitive location that is, and lies within a broad landscape that also is, very high in natural character and visual amenity value.

An assessment, with the aid of photo and digital terrain model simulations, indicates that from a series of salient and representative viewpoints at publicly accessible locations, the Te Kuha Coal Project will have moderate effects on natural character and visual amenity prior to revegetation taking place. Following its removal and revegetation, it is unlikely that the access/haul road will be discernible. Following backfilling and revegetation of areas to be mined and remediation of other features of the project such as the office, workshops and infrastructure area, the overburden, vegetation and soil stockpile areas and the run-of-mine coal stockpile area, the discernible landscape and visual effects from most viewpoints will be negligible. Although the skyline ridge within the mining permit area will be simplified, it will appear to be natural in character and only those observers who are very familiar with views of the skyline will appreciate that its topography has changed.

It is from two elevated viewpoints (namely Mt Rochfort, which is principally accessible to only four wheel drive vehicles and mountain bikers, and the Buckland Peaks, which is principally accessible to only experienced trampers) and two SH 6 viewpoints (namely Norris Creek bridge and in the Lower Buller Gorge near Ohikanui River) that the effects of the Te Kuha Coal Project will have effects on natural character and visual amenity that are more than negligible following revegetation. From these viewpoints, for a considerable period of time, there will be an obvious difference between colour and texture of the revegetated areas and adjacent areas of undisturbed indigenous vegetation. From the Lower Buller Gorge, this contrast will be most apparent and it is from this viewpoint that the change to the skyline ridge will appear to be most significant.

Over time, as the revegetated areas mature, the contrast between the revegetated and undisturbed areas will lessen and, accordingly, the effects of the project on visual amenity will also lessen. Notwithstanding this point, from the above-mentioned four closest publicly accessible viewpoints and

following revegetation taking effect, while many causal observers may detect variety in the pattern of vegetation on the site of the mine, it is expected that many others may be completely unaware that the site was indeed once an open cast mine.

In terms of the three key landscape-related provisions of the RMA, the Te Kuha Coal Project will have the following effects:

- In regard to Section 6(a), an existing tarn below the mine site will have a 100 m radius exclusion zone and while the natural character of streams will be somewhat compromised with the construction of bridges or culverts where the access/haul road crosses water courses, at the end of the life of the mine such structures will be removed and the integrity of the streams at the crossing points will be restored.

- In regard to Section 6(b), mining on the area of the site that lies on the southeastern side of the skyline ridge will adversely affect a very small area on the western edge of an ONL. While a distinctive topographic feature on the skyline will be lost, remediation of the skyline involving backfilling will create a natural-looking new section of ridge. Revegetation will somewhat restore the integrity of this part of the ONL. In the context of the very extensive ONL, the adverse effects arising from the Te Kuha Coal Project will, however, be negligible.

- In regard to Section 7(c), proposed remediation involving backfilling and the revegetation of mined areas and recontouring and the revegetation of stockpile and other areas will ensure the maintenance, but not necessarily the enhancement, of visual amenity values (*Rough, P; Te Kuha Coal – Landscape Assessment; November 2013)*.

5.2 Nature and Conservation Values and Biodiversity

5.2.1 Effects on Habitat

Due to the intactness, representativeness, diversity and abundance of vegetation found at Te Kuha, it is believed that this reflects positively with regard to available habitats for fauna present in this area, although based on anecdotal evidence that the area of the proposed mine was subject to extensive fires in the 1940's and 50's, it is possible that this may also reflect the adaptability of the area in terms of revegetating itself. From the studies undertaken, it was concluded that there was higher species richness where vegetation was more diverse. This is thought to be a result of a greater variety of plants providing a wider potential food source and, additionally, more complex habitat architecture provided

by taller vegetation. Nonetheless, each habitat has its own specialist species so that the change from open, heath-like sites to forested sites will be accompanied by changes in the invertebrate species present as well as an increase in the number of individuals. Key invertebrate groups, such as moths, reflect the plant species present. Moths collected during the survey include both generalist feeders and specialists on plants such as *Hebe*, *Juncus*, *Phyllocladus* (toatoa), *Dracophyllum* and ferns.

Te Kuha area itself is well connected to surrounding habitats, including the forests of the Lower Buller River to the south, the Mt Rochfort Conservation Area to the north and east, and pakihi on German and Caledonian Terraces within the Ballarat Stewardship area to the west. Connectivity ensures ease of movement of species to other habitats which may better suit them.

5.2.2 Effects of Vegetation Clearance

The mining activity will not cause significant effects on vegetation as a result of clearance activities. Due to the large amount of land currently under the DOC ownership and control, there is inherently a high level of protection of all species, including those that will be cleared as a result of mining, that are present in other parts of the Ecological District.

Some of the vegetation types to be cleared will still be represented in other areas within the Ngakawau Ecological District. Additionally, over 20% of the vegetation types will remain within the larger (471 ha) patch of coal measures vegetation at Te Kuha. Adverse effects at the population level are therefore unlikely given that there are significant examples of species represented throughout the area.

The main concern in regard to vegetation clearance is weeds, especially gorse (*Ulex europaeus*) and the exotic heath rush (*Juncus squarrosus*). Both these weed species are a common feature of previously mined areas in the Buller District but are notably absent at Te Kuha. These and other weeds, such as montbretia (*Crocosmia* x *crocosmiiflora*) or broom (*Cytisus scoparius*), are readily introduced on roading material or vehicles and, if allowed to seed, produce a seed bed (or corms in the case of montbretia) which persist in the soil for prolonged periods. The use of soil and other material in rehabilitation means that the potential exists for these weeds to establish and spread across the site when the soils are re-spread in rehabilitation. This has the potential to compromise mine closure and to affect surrounding natural habitats, if not properly managed. The risk of weed invasion will be minimised according to identified best management practices.

Repopulation of plants and small fauna from surrounding areas and from directly transferred vegetation will be promoted. In addition to the species-led proposals, additional ecosystem

management of the wider area would assist in maintaining local species during mine life to ensure they are available to recolonise the site as rehabilitated habitats become suitable.

Biosecurity protocols will be in place for machinery and materials brought onto the site to ensure that weed propagules do not enter site. This would include such activities as cleaning machinery prior to bringing it onsite and ensuring other materials, including gravel, are free of seeds or pieces of vegetation. The use of local gravel, isolating the mine site and operating vehicles onsite will help reduce this risk further.

Furthermore, the reduction of exposed ground and establishing dense, weed-resistant shrubby vegetation along site boundaries, along the road and near waterways will help reduce opportunities for weeds to establish.

Weed control and biosecurity will be a top priority onsite to ensure that rehabilitation is undertaken as soon as practicable in areas where disturbance has occurred. The overall mine plan of disturbing small areas at a time will also be an advantage at minimising the spatial and temporal window for invasion.

Monitoring and management of weeds will determine the overall success of this aim at both onsite and offsite levels to ensure that weeds do not invade this area. It is proposed that a weed and site biosecurity plan would provide guidance as to how this should be undertaken.

The rehabilitation proposed at Te Kuha is detailed, evidence based and achievable. Comprehensive rehabilitation will limit the effects of the project on local biodiversity and it is anticipated that species will return to the site within 20 years of the project completion, based on historic habitat regeneration on the West Coast.

5.2.3 Effect on Locally Important Species

Identified species which are considered to be locally endemic, *such as Dracophyllum densum*, *E. wettsteiniana, Celmisia dubia, Actinotus novae-zelandiae* and *Metrosideros parkinsonii,* will be protected to ensure their survival over the period of mining. It is proposed that the *D. densum* and *E. wettsteiniana* be transplanted to a suitable location until it is appropriate to return the plants back to the Te Kuha mine site to be used as part of the rehabilitation process. *Celmisia dubia* has a light, wind-dispersed seed which does not persist long in the seed bank but readily colonises in rehabilitated areas, including areas of directly transferred vegetation. *Actinotus novae-zelandiae* is currently quite

widespread with records from Mt William North, Mt William Range, Marshall's Mine and at Denniston and no adverse effects are expected at the population level due to its geographically diverse spread.

Metrosideros parkinsonii is present and commonly encountered at Te Kuha where it occurs as an element of shrublands and forest vegetation. Due to its abundance in the area, seeds will be available for recolonisation of the site. Overall, the effects on locally important species is considered to be less than minor due to their ability to recolonise and their widespread availability for rehabilitation.

5.2. 4 Edge Effects

Surrounding the forest, a natural transition occurs between open habitats and taller vegetation with an edge of smaller shrubs and canopy which acts as an armour to protect the forest from climatic variables. Sudden changes in vegetation caused by human activity can modify daily fluctuations in climatic variables, such as wind speed, temperature and humidity in the exposed forest, the extent of which depends in part on the type of vegetation present and the degree of exposure of the new edge. These effects are termed edge effects.

The existing vegetation is a complex mosaic with a high proportion of natural edge. The removal of vegetation will create approximately 21.2 km of new cut edge around the site. New edges will be created around the perimeter of the pit and along the proposed roadsides and will be more abrupt and more clearly defined compared to the existing habitat edges. This will also remove the existing buffer, resulting in newly exposed vegetation.

The tall rimu and hard beech forest are considered most susceptible to adverse edge effects which can be mitigated through concurrent rehabilitation and preserving the residual integrity of the environment by avoiding exotic species invasion. The consequences of additional edge areas are potential losses in suitable surrounding habitats that can compromise ecosystem variability, for example moisture-requiring bryophytes and invertebrates may relocate due to increased exposure to wind and sun which dries out previous areas of habitat. Given that the mining is being undertaken over a relatively small area of the larger ecosystem and the uniformity of species diversity at Te Kuha which is representative of the broader ecological district, it is anticipated that such species will be able to relocate and re-establish in other areas outside the mining area. Overall, therefore, potential edge effects are considered to be no more than minor.

5.2.5 Effects of Dust on Vegetation

The degree of effects caused by dust on vegetation depends on the deposition rate, meteorological conditions, vegetation characters, size of dust particles, dust chemistry and the distance from the source of dust. Dust can have physical or chemical effects on vegetation which can lead to changes in species composition over time.

Wetlands are considered to be particularly sensitive to heavy dust deposition due to the fact that they accumulate sediment. Undertaking rehabilitation concurrently with mining activities will reduce dust effects, but because the haul road will be operational for the life of the mine, the habitats surrounding the road and coal handling and processing plant are considered those most likely to be affected by dust.

There have been no species identified that are particularly sensitive to effects of dust and, coupled with the high rainfall of the area and the proposed rehabilitation program, it is believed that the effects of dust on habitats and vegetation will be no more than minor. It is expected that dust will be a significant issue only during dry periods at the mine as rain will act to settle dust and wash accumulated dust away from plant surfaces. Dust management measures are proposed to be implemented, such as a spray truck, to ensure that dust levels are reduced especially when prolonged dry spells occur. Provided that dust management measures are followed no adverse effects on vegetation or fauna are expected.

5.2. 6 Effects on Hydrology and Drainage

The site dewatering is likely to change the existing hydrology and drainage located within the proposed mining area. Post-mining, the hydrological environment will be rehabilitated. However, it is not practical to replicate the pre-mining condition and, as a result, the vegetation community may alter as some plants adapt and others populate elsewhere. Undertaking monitoring of the hydrology of those habitat communities most susceptible, such as the herbfield wetland, prior to mining commencing will help to better understand the pre-mining hydrology of the site, which will then aid with replication of the ecosystem dynamics during rehabilitation. Pre-mining monitoring of hydrogeology is being completed by Aqualinc Research Ltd and includes monitoring of water levels in drill holes and groundwater-fed surface features such as tarns.

5.2.7 Effects on Bryophytes

It is believed that approximately 10 hectares of land that contains bryophyte vegetation will be affected by the proposed mine. However, due to the abundance of bryophytes outside of the proposed mine footprint, there will be significant opportunities to relocate species during rehabilitation. The transfer of bryophytes will maximize the retention of this population at the site and ensure any adverse effects are only temporary in nature and duration.

5.2.8 Effects on Rare Ecosystem Types

In total, it is estimated that mining activities at Te Kuha will remove about $3m^2$ (0.0003 ha) of tarns, although the largest tarn in the area will be unaffected. Technically, it is achievable to recreate tarns during the rehabilitation processes of the mine site and these methods will be employed by Te Kuha to re-establish the tarn environment that existed pre-mining as closely as practicable.

5.2.9 Effects on Conservation Values

The Te Kuha area has values associated with lack of disturbance. The lack of access has contributed to the degree of intactness. This has been confirmed through survey and the PNAP report.

The site is located within a Recommended Area for Protection (RAP 7). The ecological units that comprise RAP 7 are widely present elsewhere in the Ngakawau Ecological District and generally well represented in the Mt Rochfort RAP.

The proposed mining activity at Te Kuha will not remove the only examples of the vegetation types found there, with the exception of the herbfield vegetation. Most vegetation types are well represented within either the Mt Rochfort Conservation Area or the Westport Water Conservation Reserve or both. Small areas of coal measures vegetation also occur within the Lower Buller Gorge Scenic Reserve. Of the approximately 471 ha of coal measures vegetation at Te Kuha, around 390 ha would continue to be represented within reserves if the project were to proceed. A further approximately 15 ha of similar vegetation would remain outside the reserve network.

The Te Kuha site is currently well buffered from surrounding land uses by surrounding conservation land. In the absence of coal mining, the likely threats to the vegetation and fauna include accidental fire and the chronic pervasive effects of introduced mammals and weeds. Active pest management will be employed on the site to ensure the integrity of the natural habitats is protected.

The secondary vegetation regenerating after the mining disturbance would predominantly comprise native species and would be such that natural ecological succession would assist in the long term restoration of community intactness and diversity across the site. Such vegetation would still contribute to maintaining indigenous biodiversity even though it has been modified.

5.2.10 Effects on Fauna

Mining has both direct and indirect effects on fauna. The nature and magnitude of these effects varies with the habits of the particular species concerned but their significance tends to increase during breeding seasons.

With regard to fauna, the main concern at Te Kuha is the loss of habitat due to stripping of vegetation and soils on the mine surface and along the proposed road. Changes caused to the current environment caused by human activities, such as dust, noise, blasting, lighting, edge effects and increased human activity will also affect fauna, but these effects will generally be local in their influence and can be minimised.

Due to the fact that this site was previously undisturbed, the site has increased risk of fire, slope or hydrological (culvert and dam) failure and chemical spills which could cause an invasion of pests and weeds if these risks are not adequately managed. The effects of the proposed activities on the key fauna species known to be present are outlined below.

5.2.10.1 Effects on Great Spotted Kiwi

The effects of mining on the great spotted kiwi at Te Kuha are considered to be no more than minor as long as measures are put in place to protect this population. The effects of habitat loss, noise disturbance, lights and an increased presence of people and machinery on the kiwi population located within the area will require mitigation especially given that habitat restoration upon the closure of the mine would take approximately 30 – 50 years. This may compromise the survival and reproduction of the birds.

Lights will be less of an issue for this proposal given that the mine will only operate day shifts and the nocturnal nature of the kiwi.

Management of individual birds during mining can potentially reduce the risk. However, the population of great spotted kiwi is considered geographically diverse enough throughout the greater West Coast region (including the Orikaka Valley, Mt William Range, Ngakawau Valley and Paparoa National Park) to ensure no particular adverse effects on the population as a whole.

The population of the kiwi at Te Kuha is small and, given that there are larger numbers in other areas that have more suitable habitats (including higher rainfall and lower temperatures which act as predator controls), it is anticipated that the kiwi may be able to adjust to relocation. The disruption associated with the translocation of kiwi will have some negatives although the benefits are believed to outweigh these.

5.2.10.2 Effects on Other Birds

The abundance and distribution of avifauna varies considerably throughout the Buller District and surrounding areas due to the variety of habitats present and the variable degree of human disturbance from mining, farming and other activities. At Te Kuha there is a relatively high number of native species which is considered to be a consequence of the intact nature of the vegetation, altitudinal sequence of habitats and the extensive connectivity with adjacent habitats.

The main effects on native birds associated with the proposed mining activity is potential habitat loss through the removal of soil and vegetation, loss of seasonal food sources, direct mortality of individuals when areas are cleared, reduced breeding success and indirect mortality due to stress as a result of enforced emigration and disturbance. The removal of habitat can result in fragmentations and loss of connectivity. Dust, vibrations, noise and the use of bright lights at night during mining operations have similar effects.

Ground dwelling birds, including the western weka and spotted kiwi, are considered to be susceptible to vehicle strike on the road although given kiwi are nocturnal, vehicle strike is less likely with the absence of night time operations ensuring less vehicles on the road at night. The absence of night operations will avoid potential effects associated with lights.

New Zealand falcons have been observed within the area and while bush falcons are widely spread throughout the Buller Region, they are infrequently recorded. An individual or pair of falcon within such a low density population are unlikely to be adversely affected by removal of around 75 ha of habitat within their territory as they would likely adjust their boundaries accordingly.

There have been four bird species present within the mining area regarded as “At Risk (declining)”, the western weka, South Island fernbird, New Zealand pipit and South Island rifleman. The western weka are found in moderate density at Te Kuha and are more common at lower altitudes. Weka are widespread elsewhere in the Buller region, where they are mainly found in lowland coastal areas near forest, farm or scrubland edges. Weka have up to four breeding attempts per year with up to four eggs

per clutch although predation is high. There is potential for some weka to be lost although this potential is considered to be low given the birds' ability to mobilise nests elsewhere. As with kiwi, whether or not re-occupation of rehabilitated surfaces occurs will depend largely on the availability of dispersing juveniles at the time the habitat is able to support them.

The South Island fernbird is mostly restricted to the western and southern South Island and is particularly common at Te Kuha in dense shrublands and fernlands. Since the species has been recognised as "At Risk", their widespread distribution in the Buller District and local high density is notable. Fernbird habitat includes low, dense vegetation interspersed with emergent shrubs in swamps, pakihi, rushes and tussocklands. It is thought that approximately 20 ha in total of this habitat will be removed for the proposed mine and access road. Fernbirds in sub-alpine coal measure habitats are not particularly well studied but, in general, fernbird pairs will occupy 6 ha of land and lay two clutches of three eggs per year. Again it is anticipated that some fernbirds may be lost at egg or juvenile stage, but future fernbirds will nest in the wider ecological area outside the mining area.

New Zealand pipits are present in low to moderate numbers throughout open and low-scrub areas along the ridgeline at Te Kuha. Pipits are present throughout the Westland region, typically in high-altitude open habitats and areas of rough pasture. Because pipits prefer open habitats, mine rehabilitation could create suitable habitat quite quickly, perhaps within 15 years.

Other threatened or at risk species that have been identified at Te Kuha include South Island kaka and kea. Kaka are thought to be seasonal and there is sufficient habitat for these species. There are extensive areas of beech forest habitat with high proportion of podocarps of the types favored by kaka found in the Orikaka valley and particularly in the South Branch of the Mokihinui. It is believed that predators are a limiting factor for kaka. Kea, which are not considered to be naturally uncommon, have been recorded within this area although they are thinly spread throughout the mountains to North West Nelson and northern parts of the West Coast.

Neither species of cuckoo are likely to be affected at the population level by habitat removal at Te Kuha since they are dependent on common hosts to rear their young (grey warblers (*Gerygone igata*) in the case of shining cuckoos and brown creepers (*Mohoua novaeseelandiae*) in the case of long-tailed cuckoos).

5.2.11 Effects on Lizards

The proposed Te Kuha Coal Project site reaches a maximum elevation of approximately 800 m a.s.l, which is within the altitudinal limits of the three lizard species likely to be found there. Any arboreal geckos (living in the forests and shrublands) and skinks (inhabiting the vegetation that falls within the pit area) would be affected by habitat disturbance during the course of the mining operation and may be killed. Other factors such as noise and light are not likely to have significant effects on these species. Lizards will recolonise in suitable habitat in disturbed environments as demonstrated by the presence of West Coast green gecko found in short, regenerating vegetation at Marshall Mine in the upper Waimangaroa valley. Overall, therefore, the effects on lizards are not considered to be significant.

5.2.12 Effects on Invertebrates

The invertebrate community is not considered to be significantly different from similar habitats within the Ngakawau Ecological Area and no terrestrial invertebrates were considered to be threatened although undescribed species were discovered including the *Rhytida*-like snail and the *Pseudaneita* leaf-veined slug whose conservation status is unknown.

The proposed mining activity is not believed to pose a specific threat to most individual invertebrate species present at the mine site due to the abundance of similar habitat within the surrounding area. Both the *Rhytida*-like snail and the new *Pseudaneita* species were found in taller woody vegetation which is well-represented outside the project footprint.

It is expected that, over the life of the mine, the invertebrate community will change as a result of new habitats becoming available. An example of this would be the clearing of trees for the mine and road would mean an increase in species specializing in the use of dead wood in the short and medium term. This effect occurs naturally within indigenous forests as trees fall due to weather or natural causes. The invertebrate community will adjust back to a more normal composition once available resources return.

5.2.13 Mitigation of Habitat Effects

Habitat is a crucial factor in species survival for fauna and it is imperative that the mining activity is undertaken in such a manner that retains sufficient habitat to sustain existing populations within the area.

Translocation is one means to achieve species survival and, given that the Te Kuha environment is replicated throughout the Ngakawau Ecological District, there should be enough habitats suitable to support translocated species.

Edge effects will also be mitigated if translocation occurs as species will be able to adapt to new but similar habitats rather than adapting to new and different environments.

In order to ensure that local species persist until mine closure is achieved and are available to recolonise rehabilitated surfaces, ecosystem management will be required to protect flora and fauna for the life of the mine to enable successful rehabilitation.

The main cause of decline of many of New Zealand forest birds is caused by predation by introduced mammals, including stoats, ferrets, weasels, possums and rats. The removal of these is an effective agent at increasing productivity and restoring populations. These species also have an adverse effect on plant communities through consumption of leaves, seeds and fruit or by reducing pollinators and seed dispersers. Management of brush-tailed possums occurs within the area although it suggested that this is extended to include all introduced mammals. Appropriate predator management controls will contribute significantly to mitigating potential adverse effects on habitat and species survival.

As a means to protect some of the species that will be affected by the mining project, it has also been proposed that translocation occurs as proposed for fauna. The translocation of *Powelliphanta* species, either *P. patrickensis* or *P. augusta*, to suitable habitats within managed sites at Te Kuha will be able to provide additional security for these species. Any translocation would be undertaken under the guidance of appropriately qualified personnel, including the DOC.

A separate Biodiversity Management plan will be prepared to address the wider ecosystem management requirements.

5.2.14 Conclusion

Te Kuha contains a number of intact and undisturbed flora and fauna communities which contribute to its ecological composition. It should be noted that the species diversity found is not unique or rare, with limited numbers of risk classified flora and fauna. Indeed, the habitat composition is replicable across the general coal measures environment outside of the proposed mining area. The mine footprint occupies a relatively small area of the total ecological area in this instance and does not contain any unique habitats or plant communities that are not found elsewhere within the Ngakawau Ecological District.

Coal measures are a habitat type which is known to be declining in extent and the current proposal is thought to remove approximately 60 ha of the local coal measures vegetation with a smaller area, approximately 22 ha, affected by edge effects. Construction of the road and other disturbance activities may also increase the presence of weeds and pests. Effective weed and pest control is vital throughout the site and immediate surrounds. This includes effective biosecurity to prevent weeds reaching the site and effective site management to prevent their establishment and spread. Offsite contractors such as nurseries will also require biosecurity protocols.

It has been suggested that as a means to protect certain species found at Te Kuha, such as bryophytes, invertebrates and *Euphrasia wettsteiniana*, direct transfer would be an effective method.

As a means to reduce the overall impacts of the mine site itself, disturbed areas will be kept to a minimum and rehabilitated as soon as practicable. This will help to reduce invasion of weeds, dust and other negative impacts. Management plans have also been recommended to ensure that mining activities are undertaken in accordance with "best practice" to ensure that effects are mitigated and managed in a responsible manner.

Historic mining that has been undertaken on the West Coast, including Denniston Plateau, has shown that natural communities can return after mining disturbance. Provided that mining at this site is undertaken according to the proposed methods, it is believed that the effects of open cast mining at Te Kuha can be managed appropriately to protect the values of the coal measures habitats locally and ensure a return to a self-sustaining, natural community once rehabilitation is completed.

5.3 Effects on Aquatic Ecosystems

The mining activity proposes to remove the headwaters of Coal Creek and West Creek and interference with lower reaches of Coal Creek and West Creek will occur to allow the haul road to provide access to site. At the time that sampling was undertaken, these streams were either dry or of poor condition and only supported macroinvertebrate populations.

While mining has the potential to impact on stream and tarn habitat, fish passage, the presence of pest species and the introduction of contaminants or sediments into the streams, there will be conditions of resource consent from both local authorities that avoid, remedy or mitigate these concerns.

There are a number of other small waterways which traverse the proposed Te Kuha Coal Project site. It is understood that the proposed development could have negative impacts on the aquatic

environment throughout the construction and operation of the mine. The key activities posing potential impacts to watercourses and associated values are:

- Loss of aquatic habitat
- Developing stream crossings for the access haul road
- Earthworks that lead to the addition of sediment of watercourses
- Contaminant runoff from access roads, vehicle movements and other infrastructure
- Potential modification to downstream stream flows

Water management planning and treatment to appropriate discharge criteria will mitigate negative most negative environmental impacts. Rehabilitation to a final landform that resembles the pre-mining landform as closely as practical will minimize most long term impacts.

5.3.1 Effects on stream habitat, flora and fauna

Mining activities at the Te Kuha site will require the removal of the tributaries of Coal Creek and West Creek at the headwaters. The removal of waterways within the mine footprint will result in the loss of aquatic flora and fauna which inhabit these waterways. Koura are located within these waterways and it is thought that there is the potential to lose large numbers of this threatened species. As a means to mitigate this effect, a koura rescue programme will be implemented prior to any construction activity be undertaken.

Dewatering of the mine site would result in modifications to flow regimes within Coal Creek and West Creek. The potential impact of modified flows and/or any spring or seepage inputs are unknown at the time of writing but the impact of flow modifications to West creek include:

- Potential reduction in stream habitat and minimization of wetted area.
- Potential increase or reduction in baseflow.
- Increase in length of periods of lower flow.

The affected waterways will be part of the rehabilitation programme upon completion of mining activities and rehabilitation of these upper reaches will include the construction of drainage pathways that reflect the existing drainage pathways as far as practicable. The majority of rehabilitation will occur in the Coal Creek catchment and it will be necessary to create new stream habitat similar to that found prior to the undertaking of works. The disturbance and rehabilitation of West Creek is thought be limited to a small area in the upper reaches.

Despite the low flow conditions observed during the study of the area, it is believed that fauna will re-establish as winged adults migrate upstream to lay eggs and recolonise the dry reaches when wetted. A similar process or pattern of behaviour will occur once new stream courses are established during the rehabilitation process, with natural recolonisation occurring.

Streams found adjacent to the mine site will provide good colonies for the winged insect species. For the less mobile species, such as koura, recolonisation is expected to be slower but equally viable. Riparian planting will also be undertaken to restore shade to the stream courses in the mine area and also provide habitat for adult aquatic insects to aid with the establishment of post-mine aquatic fauna.

Monitoring is proposed to ensure that the waterways that may be impacted by mining at Te Kuha are managed. Monitoring of water quality, including the presence of acid or trace element rich mine drainage and suspended sediment deposition, will be undertaken to detect any associated reduction in flora and fauna. Biomonitoring methods are available to monitor these parameters and data collected from the surveys will provide baseline information. Furthermore, fisheries and fish passage monitoring is required for stream crossing along the haul road to ensure fish passage and the upstream populations are maintained.

5.3.2 Effects on tarns

Small tarns will be removed by the mining activity but the largest tarn lies outside of the mine footprint. The smaller tarns were not surveyed but might be expected to be habitat for koura which were evidently abundant in the larger tarn. A koura rescue programme prior to construction activity will be undertaken for any smaller tarns affected by the mine.

It is understood that there is now sufficient information that will enable the re-construction or construction of a tarn. The re-construction of tarns that will be removed through the mining operation is believed to be an achievable option to help restore the site.

5.3.3 Effects of sediment addition

Sediment enters streams at the mine site during weather events and other naturally occurring processes. Additional sediment is likely to enter local watercourses during the construction and operational stages of the mine which has the potential to give rise to adverse effects.

Construction sediment can also become suspended in stormwater and all water discharged from the site is considered to be turbid compared to the natural waterways that it is entering. This can result in the reduction in water quality and health of downstream aquatic ecosystems. Sediment generation

can result in the smothering and infilling of the streambed which results in the loss of habitat, clogging and covering of the gills of invertebrates and fish reducing efficiency of oxygen uptake, modified fish feeding behavior, cessation of interstitial flow which provides oxygenated water to fish and eggs and larval fish, smothering of aquatic plants resulting in loss of habitat for algae and benthic fauna and reduced light penetration and visibility through the water column.

However, due to the high frequency of sudden onset rain events that result in flushing flows through the creek, it is anticipated that sediment build up will be unlikely to occur. Any suspended sediment loads in mine-waters can be reduced by the use of settling ponds. Settling ponds effect the removal of suspended sediment by reducing flow velocities, which results in heavier particles settling out of the water. Increased residence times, which are achieved by constructing larger ponds, enhance this removal process.

5.3.4 Effects of Site Access

The access road will cross West Creek, Coal Creek and three Coal Creek tributaries as well as several smaller unmarked streams. Due to the presence of migratory fish species within these water bodies, bridges will be installed at the larger water courses and culverts at the smaller courses to ensure that fish passage is not compromised.

Culverts have such potential effects as physical disturbance to the waterway during construction and placement, scour and sediment intrusion as water velocities increase at the outlet, and prevention of upstream passage for migratory fish and other aquatic organisms between upstream and downstream sections of the waterway. Care around the design and placement of culverts as well as monitoring of fish passage will help ensure that adverse effects are mitigated against. Additionally, the placement of mussel spat ropes through the culvert will aid both swimming and climbing species access to upstream of the culverts.

Any effects as a result of bridge construction will be temporary and minor in nature as minimal disturbance to the physical waterway will be required.

Sediment as a result of runoff from the haul road is another potential issue that will be managed through the channeling of this water to stormwater treatment soak pits.

The lower reaches of West Creek are potentially affected by suspended sediment runoff which will be exacerbated with the addition of the haul road. For Coal Creek, several stream crossings will occur and therefore increase sediment outputs within the catchment. It is thought that sediment entering

waterways will mainly occur during rain events and therefore sediment will be flushed out and avoid any effects on high quality habitats. These effect can be further minimized with the installation of storm water cut-off drains that direct stormwater away from the crossing points.

5.3.5 Conclusion

The streams surveyed were found to be generally small, clean and acidic water bodies. Overall, there was a low diversity of macroinvertebrate communities, no fish found in the upper mountain streams and the tarn in the upper mountain was found to be a good habitat for koura. All of the fish found were native migratory fish and all but one fish species present was classified as declining.

All of the streams sampled on the upper mountain and along the haul road were considered to have unmodified riparian margins with native vegetation. Streams were made up of boulder, cobbles and gravels which provide a good habitat for both fish and invertebrates. The streams are unmodified although the upper reaches of the streams may be limited due to the acidic environment. The stream in general supports good to high quality invertebrate fish fauna.

The proposed mining will remove the headwaters of Coal Creek tributaries and West Creek. At the time of sampling, these streams were either dry or very low condition and only supported macroinvertebrate communities. Other effects associated with access to the site will occur on the haul road but fish passage can be maintained to upstream areas and suspended sediment inputs managed with appropriate storm water management.

As part of the overall site management and adherence to best practice, a Water Management Plan will be prepared to ensure that future conditions of consent are adhered to and that adverse effects are adequately avoided, remedied or mitigated.

5.4 Archeological and Historic Sites

Te Kuha is known historically for having a punt which connected Westport to the south bank of the Buller River although the building of the “black bridge” put an end to this service. Te Kuha also had a passenger train service which opened in 1912 and, although passenger services are no longer provided, the train line is still used, mainly for the transportation of coal. Today there is little evidence that Te Kuha existed as there are no remaining buildings. Te Kuha itself is not recognised as a historic site.

There are no identified archaeological or historical sites within the mining permit.

5.5 Employment Effects

Any new employment opportunity provides direct and indirect benefits for the local community. In this instance, the West Coast has a highly skilled workforce with significant expertise in the mining sector. For this reason, the Te Kuha mine will provide direct benefits by opening up employment opportunities for the local community as well as spin-off for local businesses through increased cashflow in the local economy. The mine would operate on a normal Monday to Friday roster with occasional Saturday morning work. It would close for annual holidays over the Christmas period. Weekday operating hours would be day-shift only 7am to 6pm, to enable employees to live and fully participate in the local community. The mine would employ approximately 54 people.

5.6 Use of the Area by Visitors

Most of the mining permit area lies within the larger area that has been set aside as the Westport Water Conservation Reserve. As such, the permit area, and especially the area that would be affected by the Te Kuha Coal Project, is essentially undisturbed and public access is discouraged. Apart from a hut associated with mine exploration activity that is located within the Te Kuha Coal Project area, the only other form of development within the mining permit area occurs in the northern apex of the permit area where Waterworks Road cuts across prior to terminating at the Orowaiti River. The road within the mining permit area is approximately 2 km north of the proposed mine site and, before entering the permit area, passes water reservoirs which are located either side of Waterworks Road and Caledonian Terrace. From Waterworks Road or any other road or location, there are no tracks that afford access to the Te Kuha Coal Project site. Therefore, use of the area by visitors in unlikely, although construction of the haul road will open up an area previously not accessible and may result in hunters and fishers accessing previously remote areas. In the long-term, public access will return to being limited at best due to the removal of the haul road at the completion of the mine project.

5.7 Noise Considerations

Noise will occur as a result of the machinery used to undertake the mining activities. However, it is anticipated that all noise will fall within the permitted levels set by the Buller District Council. Rule 7.8.1 of the District Plan outlines the following maximum noise levels measured at the stated times at the boundary of any land used for a residential activity:

Monday to Friday – 8.00 am to 11.00 pm	*55dBA L 10*
Saturday – 8.00 am to 6.00 pm	*55dBA L 10*

At all other times including any public holiday *45dBA L 10*

Lmax 75dBA

There is one residence located on Nine Mile Road approximately 2.3 km from the proposed loading facility. This is the only human sensitive receptor within the environment. The distance from the coal loading facility is such that no adverse effects are likely on these residents. The dwelling is also 2.5 km from the intersection of the haul road and Nine Mile Road and, given the coal is intended to be trained out, the coal trucks, in general, will not go passed the dwelling and create noise nuisance.

While the rural area in general has a high level of background noise, the nature of this environment means current noise is limited to that associated with bird life in forested areas and there is a general absence of human-induced noise activities. The addition of a mining activity will change this noise environment and will have some effects on fauna in the area. However, given the intended relocation programme and species ability to self-relocate, it is anticipated that any effects will be no more than minor.

5.8 Disturbance of Existing Environments

5.8.1 Increased fire risk

The introduction of human based activities, especially mining, have inherent potential to result in fires occurring on site. This risk results from machinery failure, machinery rock strike and electrical sources.

Resistance to fires is increased through use of natural products such as rock, boulders, flax and, at lower altitudes, broadleaf. Direct transfer (DT) retards fire as the sods retain high quantities of water effectively. Flammable plants such as long-lived, summer-dry, non-native grasses (brown top, Yorkshire fog) and native grasses Cortaderia (toetoe) and large Chionochloa will not generally be used except on lower slopes in small areas.

5.8.2 Introduction of noxious weeds

With disturbance and removal of indigenous species and ground cover, there is the potential for new weed species to establish. Initial steps to reduce invasion opportunities include ensuring clean equipment and machinery is used. Further, the maintenance of the surrounding environmental integrity will ensure that weeds have more difficulty introducing themselves.

Progressive rehabilitation with locally sourced and appropriate species is also critical to prevent noxious plants from establishing as less area exposed provides less opportunities to invade.

In order to neutralize the risk of weeds being spread, soil and roading material likely to be contaminated with seeds should be prevented from entering the site. When weeds establish at the site, soils known to be contaminated should either be removed from the site altogether, disposed of appropriately or deposited in accessible sites that are known to be insensitive to weeds (e.g. distant from waterways). The site will be monitored and any problematic areas will be regularly treated with herbicide until such a time as new weeds fail to germinate.

The management response to minimise the potential for weed establishment can be controlled through identification of weeds that should not be tolerated on site because of their aggressiveness or persistence. Adequate site biosecurity is required for machinery and materials brought onto the site to ensure that weed propagules do not enter the site. This involves cleaning machinery prior to bringing it on to the site and ensuring that other materials brought on to the site, including gravels, are free of seeds and vegetation. Using locally sourced gravel and soils, or other materials where possible may reduce the potential for the introduction of new weeds to the area. Isolating the mine site and operating vehicles only on this specific site (or between the coal handling plant and the mine) after their initial sanitising will assist in this regard.

Minimising the creation of bare ground and establishing dense, weed-resistant shrubby vegetation along site boundaries, along the road and near waterways will help reduce opportunities for weeds to establish. A plan to rehabilitate road batters and other edges with suitable vegetation will be developed.

Protocols to monitor and manage weeds will be required and will extend to nurseries and other site contractors. On site management will include monitoring of the existing habitats to detect changes in vegetation or weed abundance (signalling management is required) and monitoring of rehabilitated habitats to determine if further intervention is required. A weed management and site biosecurity plan will be implemented.

As the long term intention for the site is to try and restore the ecological integrity after mining, it will be necessary to remove the proposed access road formation and rehabilitate it. This will prevent 4WD and other unrestricted vehicle access which would contribute to introducing and maintaining weeds at the site and further degrade ecological values.

5.8.3 Dust and airborne pollution

Activities that generate dust include construction and land rehabilitation, excavation, including stripping of overburden and topsoil, vehicle movements on the roads, loading and unloading of materials and wind generating dust from dry exposed surfaces. The greater the area of exposed material, the greater the potential for dust emissions and dust emissions vary according to size, shape and density of particles. Effects can be categorized as nuisance and amenity effects, or health effects.

Nuisance and amenity effects are generally associated with deposited dust and the coarser fraction of total suspended particles (TSP) while health effects are generally associated with particulate matter (PM_{10}), as these finer particles are able to penetrate the nose and mouth, if breathed in, and can enter the lungs.

Dust discharges from earthworks and mining activities typically fall into the larger particle size categories, generally referred to as 'deposited particulates'. Deposited particulates have minimal physical health effects, but may cause nuisance in sensitive areas due to soiling. These effects can be mitigated by water application which adheres particles together and reduces their windborne ability.

In addition to consideration of dust sources and factors that may influence dust generation, any assessment of effects of dust must consider the distance that any dust may travel from its source. In general, although mining activities can generate dust with a wide range of particle sizes, it is the larger particles that tend to be associated with 'dust nuisance' from mining activities. However, the larger the particle size, the less distance it will travel in light to moderate winds.

For an area such as the proposed mine, which may be subject to high wind speeds at times, the dense surrounding vegetation will act as a natural filter to capture dust and it is not anticipated that areas beyond 500 metres of the mining activities will be affected by dust. This assumes worst case weather conditions with no mitigation measures implemented.

The closest sensitive receptors to the proposed mine are the residences on Nine Mile Road. These residences are more than 4 km from the proposed mine and are beyond the distance at which adverse effects would be expected to arise.

Dust generated by vehicles transporting coal from the mine to the coal load-out facility on the haul road has the potential to cause nuisance effects at the residences on Nine Mile Road if appropriate dust control methods are not employed. The closest residence on Nine Mile Road will be approximately 2.5 km from the intersection of the haul road with Nine Mile Road. Haul road trucks will not travel

passed the residence on Nine Mile Road. Consequently, the nearest residence is beyond the distance which nuisance effects due to dust are likely to result.

Dust generated on the haul road has the potential to be visible from a distance especially on elevated sections of the road. Provided the surface of the road is adequately maintained, kept damp and speed limits are reduced, the visible effects of dust should be minimal. Retention of as much vegetation as possible will also reduce the visibility of the road to the public and aid as natural filters for airborne dust.

High levels of dust deposition have the potential to adversely affect vegetation by interfering with plant photosynthesis, promoting weed or disease incidence and impacting on the application of pesticides or fertilizers. In addition to potentially impacting on vegetation, dust may also affect agricultural activity through the promotion of disease or health problems in stock animals.

The deposition from the proposed mining operation is expected to be less than that commonly experienced near unsealed roads with moderate to heavy traffic due to the vegetation surrounding the wider area. Observation of farmland and native and exotic forests in such situations indicates very little effect on vegetation beyond the immediate boundary of the road. Furthermore, with the high rainfall in the mining area, any dust deposited on vegetation will be quickly washed off. Provided that standard dust suppression techniques are employed, it is expected that dust deposition surrounding the mine should result in adverse effects being less than minor.

There is little knowledge about effects of dust on birds. However, as the dust deposition levels due to the mining operation are expected to be less than some natural environments, the effects on birds is expected to be minimal.

The proposed mine is located approximately 2 km from the catchment area for the Westport town water supply. The catchment area is considered to be beyond the distance that dust generated from the mine is expected to travel. The dust deposition levels due to the mining operation are expected to be less than some natural environments. It is therefore considered that the potential adverse effects on the water supply catchment are negligible.

5.8.4 Effect on locally important species

Dracophyllum densum is found from the southern Paparoa Ranges north to Mt Gouland (inland from Kahurangi Point). *D. densum* is locally common at Stockton and Denniston, including in areas protected from mining. Given the presence of the population at Mt Rochfort and other examples of the species

in similar habitats, removal of around 13% of the *D. densum* habitat at Te Kuha is unlikely to affect the persistence of *D. densum* populations in the wider area. Both *D. densum* and *D. pubescens* survive transplanting well and this method could be used during rehabilitation to ensure these species persist at the site.

E. wettsteiniana is endemic to west Nelson and north Westland and is largely confined to boggy ground. *E. wettsteiniana* is a tiny plant with insignificant leaves which is easily overlooked except when flowering. Its preferred habitat is well represented within the poorly drained rushland sites and pakihi of German Terrace and Caledonian Terrace but these habitats might be vulnerable to removal due to natural succession. Intact transfer of herbfield vegetation is the method most likely to ensure some individuals survive since this species is hard to propagate. Direct transfer could help to maintain this species at the site but the outcome of this method for *E. wettsteiniana* remains unknown. We can confirm that the herbfield vegetation will be prioritised for direct transfer and *E. wettsteiniana* be monitored to determine its survival. Details and protocols relating to this will be addressed in appropriate site management plans.

Celmisia dubia is locally common throughout the shrubland and open habitats at Stockton, Denniston and Te Kuha. *C. dubia* has a light, wind-dispersed seed which does not persist long in the seed bank but readily colonises rehabilitated areas, including areas of directly transferred vegetation. The removal of large numbers of *C. dubia* has the potential to affect the local population but this will be mitigated by the large amount of habitat remaining as well as by minimising the amount of active works at any one time and the prompt availability of rehabilitated landforms after mining is completed. This is expected to allow *C. dubia* to colonise newly created landforms without further assistance. No adverse effects at the population level are expected.

Actinotus novae-zelandiae has a localised distribution in New Zealand, confined to montane, subalpine bogs and herbfields throughout the South Island and Stewart Island (Overmars *et al*. 1998). It occurs throughout coal measures vegetation, including at Te Kuha, where it prefers cushion bogs and flush areas in forest and scrub. This species appears to be quite widespread with records from Mt William North, Mt William range, Marshall's Mine and at Denniston (Mitchell Partnerships & Landcare Research 2001, Mitchell Partnerships Ltd 2011, 2012, Overmars 2011). No adverse effects at the population level are expected.

Metrosideros parkinsonii is present and commonly encountered at Te Kuha where it occurs as an element of shrublands and forest vegetation. The removal of vegetation which might include *M.*

parkinsonii could affect a significant number of individuals but the abundance of this species at Te Kuha means that seeds will be available to recolonise the site. Supplementary planting of *M*. *parkinsonii* will assist in this regard.

5.8.5 Acid mine drainage

There are two main types of coal measures (coal-bearing sedimentary rocks) being late Cretaceous to earliest Tertiary Paparoa Coal Measures and Eocene Brunner Coal Measures. Both Paparoa and Brunner coalfields contain seams up to 12 metres thick. Paparoa coals are characterised by low ash and sulfur contents and Brunner coals have lower ash and varying sulfur content.

A key aspect of the rehabilitation is the management of any acid mine drainage originating from the mine site. Currently water courses in the upper mountain have an acidic pH and it has been noted that some New Zealand stream invertebrates are well adapted to living in acidic environments and rehabilitation should seek to retain this habitat. Therefore, rehabilitation should seek to maintain the water quality at pHs similar to those currently observed.

Geochemical tests are currently underway to predict mine drainage chemistry and develop appropriate waste rock handling procedures to minimize or prevent acid formation. Data gathered to date indicates that there are substantially more non-acid forming rocks at the Te Kuha deposit compared to other coal deposits in the Buller region. This means that good waste rock management practice might prevent acid formation completely or substantially reduce acid formation compared to other mines in the Buller region. Once the geochemical studies are complete, a waste rock model and management plan will be developed and integrated into the mine schedule. Prior to initial stripping operations, waste rock will be classified in detail from blast hole drilling and appropriate management procedures will be implemented for waste rock handling and mine drainage treatment during excavation of the first cut if necessary. It is likely that initial mine operations will involve a programme where field methods of waste rock classification will be developed and these will be integrated into operations as rock types become increasingly predictable and as operators become adept at identification and management of different rock types.

Mine drainage management and treatment for the first cut and early mine operations will be integrated into the water management plan as the data to support this plan are collected and finalized. Identification of appropriate mine drainage management and treatment if necessary will be facilitated through a surge pond and settling ponds locally near pits, a lime dosing plant (as required) and a settling pond as the water exits the mine site.

All water that occurs onsite will be collected and channeled to the settling ponds where it will be treated prior to discharge.

Rehabilitation methods

5.8.6 Land subsidence

To minimize the potential for land subsidence and to ensure minimal delivery of sediment to water courses surface contour and cover will be controlled. Unlike at other sites, brown top, Yorkshire fog or legumes are not proposed as temporary covers at this highly natural site as they are tolerant of low fertility and are likely to persist; Rough surfaces will be enhanced in most areas by using recycled logs and wood from clearance of the access road. These will need to be stored along the access road, with stockpiled topsoil managed to ensure minimal weed establishment during storage and reuse. Soils stripped from upper areas are likely to have a high rock component – these soils are unlikely to require additional wood as they create rough surfaces.

The requirement for a stable surface under climate with very intense, high rainfalls means most landforms need to be benched to prevent runoff building up to erosive strength. The benches also provide efficient vehicle access for initial revegetation, then monitoring.

5.8.8 Reinstatement and Rehabilitation

The ability of the site to be reinstated and rehabilitated is clearly addressed in the Rough report and outlined in the Landscape section above.

There are areas of the mining site that will be more problematic to remediate than others but, in general and over time, all disturbed areas, including the path of the haul road, are anticipated to be able to be rehabilitated to a standard similar to pre-mining conditions.

The landscape report identifies that there will be discernible evidence of mining through difference in vegetation size, shape, density and colour as rehabilitation establishes.

Rehabilitation will be aided by direct transfer of indigenous species and the use of locally appropriate and indigenous vegetation to ensure continuity in foliage dispersal, coverage and species representation.

The exact skyline ridge will not be able to be replicated to pre-mining form. The overall finished elevation profile will appear subdued and smoother but still analogous to what occurs naturally.

Progressive mining also aids with reinstatement as this allows succession planting and ensures that species diversification is maintained as areas are able to be established progressively with difficult species being paid particular care. Progressive rehabilitation also provides stabilisation of surfaces and prevents sediment from entering waterways as vegetation acts as a trap.

6. Summary

Mining on the West Coast is not an activity that is out of place and it continues to play an important role in shaping the social, cultural, physical and economic environment of the West Coast community.

The mining activity at Te Kuha has the potential to extract good quality coal from the Buller Coalfields. In addition to extracting coal that is not available elsewhere in New Zealand, the mine will provide excellent employment opportunities for the local community which has a highly skilled and specialised work force.

The proposal will be subject to rigorous consenting processes from the regional and district councils which will address the potential adverse effects that can occur when mining activities are undertaken.

There will be adverse effects associated with the mining activities, especially in relation to short to medium term landscape effects. Long term it is anticipated that landscape effects will be significantly mitigated down to as little as negligible.

The area, while having landscape qualities and flora and fauna species with special characteristics, is broadly representative of many other areas within the Ngakawau Ecological District and, as such, will not result in adverse effects that are not able to be avoided, remedied or mitigated in the long term.

ATTACHMENTS

Attachment A – Certificate of Title & Mining Permit

Attachment B – Draft Baseline Hydrology Report

Attachment C – Draft Terrestrial Ecology Report

Attachment D – Draft Aquatic Ecology Report

Attachment E – Draft Landscape Assessment Report & Visual Supplements

Attachment F – Draft Roading Layout & Mine Schedule Plans