

# Pike River Coal – quality environmental management

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## Abstract

A major new mine to be developed at Pike River during 2005 has been designed to have a minimal impact upon the environment, and an overall net conservation gain. The Pike River Coalfield is located on the West Coast of the South Island of New Zealand on the top of the Paparoa Range approximately 46 km north east of the coastal town of Greymouth. Pike River Coal Company Ltd (PRCC) holds a 40 year mining permit over the coalfield.

In October 2004, the Minister of Conservation granted PRCC access through 1.25km of Department of Conservation land via an access agreement, and the Environment Court issued a number of consents for the development and operation of the mine, in addition to some existing consents.

The underground mine at Pike River is located under land administered by Department of Conservation, and has been designed to avoid or mitigate adverse environmental effects, and integrate into the natural bush surroundings. The mine process has been designed to operate within an environmentally sensitive area, and will incorporate technologically advanced methods of mining and processing. The mine process involves hydro mining of the coal, and transportation via a 12 km coal water slurry pipeline, to a dewatering complex located on PRCC land. This will ensure that traffic in the Pike River Catchment up to the mine is minimised.

An extensive series of management plans and monitoring programmes will be used to ensure that the environmental effects of the mine activities are minimised, by evaluating the performance of managerial procedures, and physical mechanisms in place to avoid or mitigate the effects. Trial mining and substance management plans in conjunction with an orthophoto and surface monitoring protocol will ensure that surface features, and water ways are protected from any adverse effects. The Blue Duck enhancement, and pest and predator control programme will help ensure that an overall net conservation gain is achieved.

Developing transparent working relationships and good communication with Department of Conservation, Iwi (Ngati Waewae and Ngai Tahu), and local environment groups has been and remains very important in the development of this project.

## Introduction

A major new coal mine is to be developed at Pike River on the West Coast of the South Island, approximately 46 kilometres northeast of Greymouth. The Pike River mine will produce 1.3 million tonnes per annum of hard coking coal.

The mine is situated in Department of Conservation (DOC) stewardship land including the Paparoa National Park, and access is via a *ca.* 12 km access road, which is to be constructed through private land, and predominantly DOC stewardship land.

PRCC has over a period of several years, refined the development plan for the Pike River mine in consultation with DOC and various interest groups, to ensure the project is environmentally benign. The proposed underground mine will have little surface impact, will not affect the neighbouring national park and through extensive pest eradication measures, is expected to enhance local native ecology. The Commissioners for local councils recognised in granting resource consents to PRCC in May 2003, that “indeed the proposed mine may even offer an opportunity to provide overall environmental gains”.

This paper describes the management procedures that PRCC has adopted since granting of the resource consents in August 2004 and a DOC Access Agreement in October 2004. Some of the discoveries in presenting information in the most effective manner that PRCC has made, subsequent to granting of consents and an access agreement as a result of completing final detailed design are also detailed.

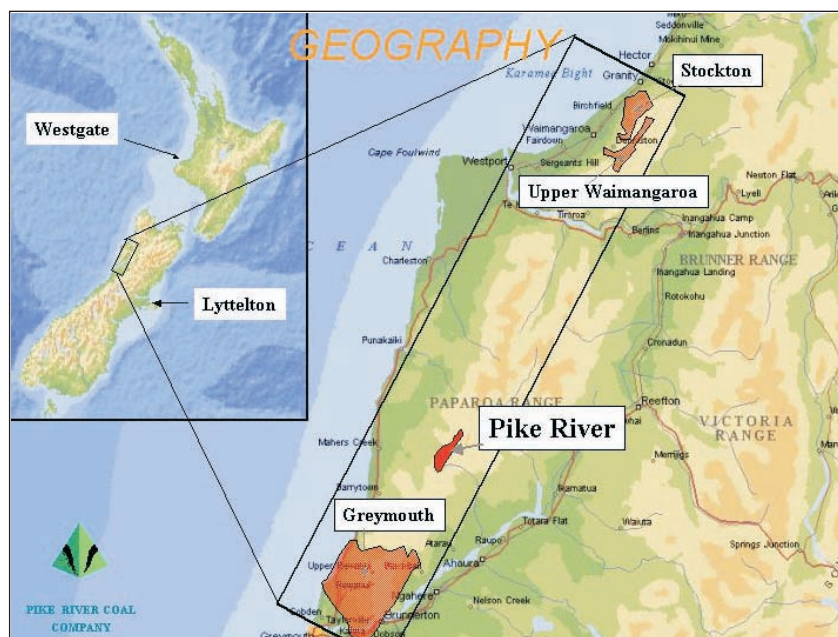


Figure 1. Project location Map

## Geographical setting

The Pike River coal field is located within the Paparoa mountain range between Mt Anderson and Mt White Knight (refer to Figure 1). The maximum altitude of the coal field is about 1,000 metres. The coalfield is the eroded remnant of the eastern limb from an anticlinal structure that is truncated by an easterly dipping reverse fault, (the Hawea Fault). The Paparoa Range intersects a predominantly westerly airflow of moist air from the Tasman Sea that drops up to 6.5 metres of rainfall per annum on the Pike River area. Rainfall is the highest in spring peaking at 1200 to 1600 mm per month.

## Ecological setting

The upper Pike River area has not been developed, although lower Pike has been extensively logged. The streams and flora in the unlogged area are in pristine condition. Bird life has been decimated by introduced mustelids, rats and possums in the whole area.

The vegetation on the coal field displays an altitudinal variation with tussock land at the higher altitudes that grade toward gymnosperms at lower altitude and finally into beech forest at the lowest altitude.

## **Proposed development**

The development will involve a single lane access road up Pike Stream, an uphill inclined stone drive (2.2 km long) to intersect the coal seam close to its lowest point, underground development, ventilation shaft, and coal preparation plant. Service facilities for the underground mine will be located at an amenities area (workshops, bathhouse, and administration offices) to be located 1.2 km from the stone drive portal on flat land. Coal preparation, dewatering and coal stockpile facilities are located 7.2 kilometres downstream on PRCC owned land.

Underground mining of the coal will utilise continuous miner, roadheaders and hydromining techniques. The coal water slurry will move under gravity to a slurry conditioning sump where the coal will be fed into a slurry pipeline at 30% by weight slurry density. The slurry pipeline located next to the single lane road will permit the transport of coal and water from the mine without any disturbance.

Mining will be conducted under a conservative mining plan to minimise surface effects. The significant western escarpment, permanent streams, and significant steep slopes and significant vegetation will be protected by the use of protection barriers and leaving extensive coal pillars underground.

## **Consents and access agreements**

PRCC has a 40 year mining permit No. 41 453 under the Crown Minerals Act 1991, three access agreements (private land owner, DOC, and Timberlands which is administered by DOC), and 41 resource consents. Resource consents and the main DOC Access Agreement were granted in August 2004 and October 2004 respectively.

## **Management practises**

The following section describes the management procedures that PRCC has adopted since granting of the resource consents in August 2004 and a DOC Access Agreement in October 2004. Improved presentation of information that PRCC has established subsequent to granting of consents and an access agreement as a result of completing final detailed design are also detailed.

### **DOC liaison person**

An independent contractor (Liaison Person) was appointed as a requirement of the DOC Access Arrangement and reports to the Conservator. This position is neither an employee of PRCC or DOC and is funded by PRCC. The purpose of this position is for:

- Reviewing annual Work Plans and other documentation submitted to the Conservator either under this Access Arrangement, or in respect of resource consent requirements, and making appropriate recommendations to the Conservator based on those documents;
- Monitoring compliance by the Permit holder with Work Plans, Access Arrangement, and any other requirements of the Conservator; and
- Monitoring compliance with the rehabilitation plan, monitoring and liaising over the success or otherwise of ongoing restoration works and making recommendations to the Conservator regarding successful progressive and long-term restoration and rehabilitation of the mine site and the Land.

The position of Liaison Person has been useful in assisting DOC to understand some of the technical engineering issues related to the construction of the project. The difficulty with the position is to ensure that the person remains independent of both parties.

### **Regular liaison meetings**

PRCC set up fortnightly meetings with DOC, and the DOC Liaison Person to share information on the development of the project. These meetings have been useful in building a relationship of trust between the organisations. Quarterly combined compliance meetings are scheduled to be held with the regional and district councils, and regular community liaison meetings including local Iwi are scheduled to be held. Separate consultation meetings are also regularly held with local Iwi to address issues identified in a cultural impact assessment report.

### **Compliance registers**

PRCC put together three compliance registers to track compliance of the resource consents and access agreements. The three registers are as follows:

- Register of potential non-compliance;
- Register of resource consents and access agreements, and
- Compliance spreadsheet of conditions.

The register of potential non-compliances identifies issues that PRCC may have difficulty complying with and the corrective action required to ensure compliance such as a consent variation, concession application, or exchange of letters. This register has been effective in demonstrating transparency to the regulatory authorities, and has helped build a relationship of trust. The regulatory authorities have been pragmatic and cooperative in helping find solutions to the issues. The causes of the potential non-compliances result from the following mechanisms:

- Insufficient detail established at the feasibility stage of the project resulting in the Councils having insufficient or incorrect information to write detailed consent conditions; and
- Conditions being prescriptive rather than based on actual effects and results. A small change in engineering design could result in a non-compliance due to the detailed engineering criteria written into the consent conditions;
- The high level of detail that was provided in the AEE was directly transferred into the access agreements and consents. Any small change in project scope can result in a potential non-compliance. Providing engineering standards rather than detail to the regulatory authorities in the AEE and DOC Access Arrangement application aids mitigation of this issue.

The register of resource consents and access agreements allows PRCC to track which consents have been exercised, when consents are going to expire, and the period PRCC has to give effect to the consent before expiry under the Resource Management Act (1991).

The compliance spreadsheet of conditions is subdivided into sections to delineate activities required prior to and after exercise of the consent, activities prior to and after entry onto the land, and the specified compliance limits. Two separate spreadsheets for monitoring programmes and management plans were also developed.

# **Areas of improvement associated with DOC access agreements and consents**

## **Duplication and overlap between DOC, Regional and District Councils**

The resource consents (resource and land use) and access agreements have considerable overlap in scope which causes additional unnecessary monitoring and report writing. For example the DOC Access Agreement has a different water quality monitoring programme to that of the regional council consent for the same discharges. Cash bonding required for environmental risk associated with the project has been duplicated by the regional council and DOC.

Specific wording of certain conditions is repeated for the same activity by the different regulatory authorities. For example there is a requirement to obtain permission for the location of rock dump sites from the district council and the DOC.

This issue of overlapping responsibility has been addressed by the most appropriate regulatory authority taking a lead compliance role for a certain area of compliance. The other regulatory authorities take a secondary compliance role, and work from the guidance of the lead regulatory authority.

## **Allowance for construction and commissioning activities in consents and access arrangement**

It is important to consider and include the construction and commissioning phase of the project when obtaining consents and an access arrangement. There are a number of ‘one-off’ activities associated with construction and commissioning that will cause a non-compliance with a specified limit, or condition. For example the operation of the coal slurry system requires pit bottom development to be completed to allow for water storage, and sufficient space underground to install the slurry system (pumps etc). Consequently an alternative means of transport (trucking) is required for the first development coal until the coal slurry system is commissioned.

## **Management plans**

There is a requirement to provide a large number of management plans to the DOC prior to obtaining an Access Permit and the regional and district councils prior to exercise of consents. These plans include an Annual Plan; Rehabilitation Plan; Vegetation Plan; Weed, Pest, and Predator Plan; Weed Pest and Predator Strategy Plan; Threatened Species Contingency Plans; Water Quality and Biological Plan; Subsidence Management Plan; Construction Management Plan; Baseline Studies into Slope Behaviour; Trial Mining Management Plan; Emergency Response Management Plan; AMD and Water Management Plan; Dust Management Plan; and Visual and Noise Management Plan.

These management plans overlap in content and the same plan is often required to be submitted to DOC and regional and district councils. This overlap results in unnecessary compliance costs and delays in time to get the management plans authorised. The level of detailed required often seems inappropriate for a management plan or strategy document.

PRCC’s approach to obtaining an Access Permit has been to sign-off on as many management plans as possible, and where specific points are not addressed in management plans, these will be included in the Access Permit as conditional requirements. This essentially makes access a staged process where certain points are required to be clarified before an activity can occur, but allows the project to commence. For example the ventilation shaft location has not been finalised, and is not required to be constructed in the first 12 months of construction. This item will be tagged in the Annual Plan and Access Permit and will be addressed after additional information is obtained on pit bottom, and the location of the ventilation shaft is finalised.

## **Conclusions**

The design and initial development of an underground coal mine within the framework of the Resource Management Act (1991) and Conservation Act (1987) has required all parties to work closely together with a common goal. The objective has been to develop the mine with the least environmental impact while maintaining and potentially enhancing conservation heritage of the area. All parties have been committed to this goal, and have been both pragmatic and forthcoming in providing solutions to issues that have been raised during the design and initial development.

## **Author**

Ivan Liddell is an Environmental Manager with Pike River Coal Company Limited, a subsidiary of New Zealand Oil and Gas. Ivan graduated from Waikato University of Hamilton with BSc and MSc degrees and worked for ten years in environmental management in the dairy industry with Fonterra before joining Pike River Coal Company.