ENVIRONMENTAL MANAGEMENT
of
COAL MINING

Office of the
PARLIAMENTARY COMMISSIONER FOR THE ENVIRONMENT
Te Kaitiaki Taiao a Te Whare Pāremata

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Preface

The fact that two statutory systems controlling coal mining activities will continue for 30 or more years is a distinct burden for public authorities administering resource management and Crown minerals allocation statutes. It is also confusing for the mining industry. Co-operation between all parties is essential if the environment is to be protected and coal mining is to prosper.

Analysis of coal mining activities in three different regions of New Zealand shows the West Coast activities to be distinctly different. Mining occurs under arduous circumstances in a region where local government is under-resourced to ensure effects are controlled. The fact that coal exists in a difficult site, with difficult climatic conditions may mean that achievement of sound environmental management is a formidable task. However, protecting the environment is a prudent investment by mining companies that will ensure the long-term acceptability of mining in a particular area.

The ability of a company to invest in high quality environmental management should not be a concern of public authorities. Appropriate environmental standards have been or have to be set, and public authorities have a responsibility to see that licence and resource consent conditions are adhered to, that the environment is protected, and that the well-being of their ratepayers is maintained.

The series of events which occurred on the West Coast whereby residents were affected by coal dust and polluted water supplies over a lengthy period of time are not events that should happen again. The implementation of the Resource Management Act 1991 should lead to better procedures for controlling environmental effects of mining. However, unless the resources are there, unless co-operation between agencies occurs and unless there is a political will to protect the environment and communities, mining will continue to have a poor reputation in certain districts. This is not to the advantage of the mining industry, nor to the public authorities.

There are compelling reasons to encourage the mining industry to take greater responsibility for environmental management through self monitoring programmes, self compliance reporting and preparation of environmental management plans. This should enable the consent authorities to check compliance with consent conditions more readily, given the resources at their disposal.

Responsible, sustainable resource management by miners and local government will benefit everyone.

Helen R. Hughes

Helen R Hughes
Parliamentary Commissioner for the Environment

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1.0 Introduction

1.1 Purpose of report

This report presents the results of an investigation by the Parliamentary Commissioner for the Environment into the government system of agencies and processes established for managing the environmental effects of coal mining operations.

1.2 Authority for investigation

The investigation was undertaken in terms of ss. 16(1)(a,b & c) of the Environment Act 1986. It concentrates on how compliance and enforcement is achieved in relation to privately owned opencast coal mines. Terms of Reference used for the investigation are as follows:

1. Review the effectiveness of current legislation controlling mining activities with regard to the maintenance and improvement of the quality of the environment.

2. Investigate the effectiveness of public authority environmental planning and management with regard to the monitoring and enforcement of conditions attached to statutory permits, consents, licences, etc for ensuring protection of the environment.

1.3 Background

During 1990/91 the residents of Roa (near Greymouth) and the Maruia Society complained to public authorities on the West Coast about the management of the mining operations at Roa.

The residents of Roa complained to the Commissioner in November 1990 about problems of dust, noise from loading operations, condition of roads, pollution of water supplies associated with the Roa Mine, the lack of a buffer zone between residential properties and the processing area, and the lack of action of local authorities to enforce the conditions set down for a mining licence awarded to Francis Mining Company Ltd (Francis Mining), and requested an investigation.

The Maruia Society independently informed the Office in January 1991 of two major concerns:

* that the public authorities had acted in a negligent manner in allowing Francis Mining to operate outside the conditions of

their licence to the extent that this had resulted in a detrimental effect to the environment;

* that opencast mining was not suitable at Roa given the physical nature of the terrain in which coal mining was proposed.

On 19/20 March 1991, a team of Investigating Officers from the Office made a preliminary examination into the issues surrounding the complaints made by Roa residents and the Maruia Society. The team met on different occasions with the West Coast Regional Council (WCRC), the Grey District Council (GrDC), the Mines Inspectorate of the Ministry of Commerce (MOC), the Department of Conservation (DOC), Francis Mining and residents of Roa community. A site visit of the coal mine was made in the company of WCRC and Francis Mining personnel.

Following the preliminary examination, a contract was let to the Department of Scientific and Industrial Research (DSIR) to carry out an independent investigation of the mining practices at the Roa site. Terms of Reference for the DSIR investigation were to assess:

(a) the environmental impact of the mining operations of Francis Mining at Roa and the appropriateness of opencast mining methods at this site;

(b) the appropriateness and adequacy of the conditions imposed on the mining licence(s) and associated authorisations to mitigate against environmental degradation;

(c) the adequacy of the implementation, monitoring and enforcement of the conditions.

As a result of conclusions reached in the DSIR report (appendix A), the decision was taken, early in 1992, to broaden the scope of the current investigation. A further two case studies were investigated and compared with operations at Roa and the associated performance of public authorities with respect to monitoring and compliance.

1.4 Approach and methodology

Choosing two additional case studies to complement Roa, West Coast, involved initially an examination of the Coal Research Institute's list of New Zealand privately owned coal mines. Choices were discussed with several public authorities to establish the current state of mine activity, ownership and any features which might inhibit the use of that mine for the investigation. Location of mines and public authorities was also taken into consideration to obtain a geographical spread.

1.4.1 Selection of case studies

Each case study was used to assess how public authorities in the area had carried out their responsibilities with respect to environmental monitoring and compliance.

The chosen three coal mining areas and their corresponding owners/ operators which came under investigation were:

(a) Roa Opencast Coal Mine, West Coast - Francis Mining Company Ltd
(b) Pirongia Opencast Coal Mines, Waikato - Glencoal Energy Ltd
(c) Newvale and Goodwin Opencast Coal Mines, Southland - Newvale Coal Company Ltd.

1.4.2 Legislative framework

The investigation has required an examination of "old" and "new" legislative regimes as they affect coal mining. This approach has been necessary as coal mining activities will continue to be managed under both regimes until all existing coal mining rights (issued under the Coal Mines Act 1979) expire.

1.4.3 Effectiveness of public authority procedures

A questionnaire (appendix B) was sent to each public authority in the three case study areas. The questionnaire was designed to ascertain public authority procedures for dealing with coal mining activities and related consents. Meetings were held with all public authorities and visits made to each mine site. Responses to the questionnaire and supporting comments from the public authorities appear as table 4.

Public authorities participating in this investigation were:

(a) **West Coast Region**
West Coast Regional Council, Grey District Council,
Ministry of Commerce (Greymouth Office),
Department of Conservation (West Coast Conservancy Office)

(b) **Waikato Region**
Waikato Regional Council, Otorohanga District Council,
Ministry of Commerce (Hamilton Office),
Department of Conservation (Waikato Conservancy Office)

(c) **Southland Region**
Southland Regional Council, Gore District Council,
Ministry of Commerce (Greymouth Office),
Department of Conservation (Southland Conservancy Office).

A much-condensed version of the questionnaire was also forwarded to a selected nine larger, privately and State owned coal mining companies for their comment (appendix C). The aim of this questionnaire was to obtain the views of the coal mining industry on the current government procedures for managing the effects of mining New Zealand's coal mineral resource. Responses were obtained from all but one of the mining companies who received the questionnaire.

2.0 Agencies and processes

2.1 Legislative and agency changes

Management of the environmental effects of coal mining in New Zealand is at present in a transition phase between two statutory regimes. The "old" regime comprised the Coal Mines Act 1979 which provided for the inclusion of conditions to protect the environment in coal mining licences, the Water and Soil Conservation Act 1967, the Clean Air Act 1972, the Noise Control Act 1982, and the Soil Conservation and Rivers Control Act 1941 under which rights and authorities to carry out various mining-related activities with environmental impacts were granted.

Under the "new" regime the Crown Minerals Act 1991 (largely replacing the Coal Mines Act 1979) governs the allocation of New Zealand's mineral resource. Management of environmental effects becomes the responsibility of local authorities exercising powers under the Resource Management Act 1991 and the Crown Minerals Act 1991 (in respect of licences granted under the Coal Mines Act 1979).

In recent years the public authorities responsible for administering the legislation have been restructured. This has meant that the former Mines Division of the Ministry of Energy has been incorporated in the Ministry of Commerce (MOC) and the environmental responsibilities of the former Coal Mines Inspectorate have been transferred to local government. With the passing of the Health and Safety in Employment Act 1992, the existing Mines Inspectorate group will be transferred to the Department of Labour and be responsible for health and safety matters only.

The local government restructuring which occurred in 1989 saw regional councils taking over the functions of catchment and regional water boards and the information and expertise associated with managing environmental impacts on water quality and soil stability. The Resource Management Act 1991, ss. 30-31, confirmed and consolidated responsibilities previously exercised by catchment boards and the Department of Health (for clean air and noise control). Regional and district councils now have the responsibility to carry out the monitoring and enforcement of environmental conditions on existing coal (and other) mining licences provided for by s.108 of the Crown Minerals Act 1991.

At the present time coal mining is controlled by both the "old" and "new" statutory regimes. Mining is a long term activity with individual mines continuing to be worked for up to 30 years, and transition

provisions of the Crown Minerals Act 1991 have protected the existing privileges granted under the Coal Mines Act 1979. This dual control situation will persist until all the licences issued under the Coal Mines Act 1979 have expired.

2.2 Coal mining rights, mining permits and related consents

The Coal Mines Act 1979 provided for the Minister of Energy to grant coal mining rights (or privileges) in the form of prospecting, mining and ancillary licences over defined areas. An ancillary licence was issued for activities associated with coal mining operations, such as access, buildings and processing facilities. These licences included conditions relating to environmental effects as well as extraction and mine safety. Local authorities had an opportunity to report to the Minister on possible environmental effects. However, consents relating to activities involving water and air were required separately.

When the Crown Minerals Act 1991 came into effect, existing coal mining licences and ancillary licences held under the Coal Mines Act 1979 became "existing privileges" (s.106). New applications for coal mining rights made under the Crown Minerals Act 1991 are now defined as "mining permits" and only cover the allocation of the mineral resource. A permit holder and a mining licence holder intending to carry out an activity not authorised by the licence will require resource consents under the Resource Management Act 1991. These consents may relate to land use, subdivision and coastal, water and air discharge permits.

Transitional provisions relating to minerals in Part II of the Crown Minerals Act 1991 provide that all existing coal mining applications and rights existing when the Crown Minerals Act 1991 came into effect continue as if that Act and the Resource Management Act 1991 had not been enacted (s.107 Crown Minerals Act 1991). These mining applications and rights are to be administered by public authorities under the Coal Mines Act 1979 until the term of the licence expires (s.108 Crown Minerals Act 1991). In the case of Newvale Coal Company Limited's Goodwin Mine licence near Gore, for example, the expiry date is 19 March 2062.

Rights to water use and discharge, and air and noise emissions that may be associated with existing mining activities, issued under statutes which were repealed by the Resource Management Act 1991, are now classed as resource consents under that Act.

Application for a resource consent under the Resource Management Act 1991 is made to the relevant local authority. Applications for consents relating to mining will require a description of the activity, which could include the mine work programme, and an assessment of actual or potential effects that mining activities may have on the

environment. Because the effects assessment is to be prepared in accordance with the Fourth Schedule of the Resource Management Act 1991, a description of a rehabilitation programme will also be required.

2.2.1 Conditions

Controlling the environmental effects of coal mining may be achieved by attaching conditions to mining licences, access arrangements and resource consents.

Approvals issued under the Coal Mines Act 1979 placed reliance on standard conditions drawn up by MOC and its predecessors. These conditions for underground, opencast coal and peat mining have been in use since 1985. The Conservation Act 1987 provided for the Department of Conservation (DOC) to set conditions on any leases and licences on land managed by DOC and a standard set of conditions has been prepared for the guidance of DOC officers.

The passing of the Resource Management Act 1991 and the Crown Minerals Act 1991 brought important changes to the administration of conditions on existing mining licences. Under s.108(1) of the Crown Minerals Act 1991, regional and local authorities became responsible for the environmental management of mining licence conditions, formerly the concern of the Minister of Energy. This included the ability to impose additional conditions on existing licences as per s.51 of the Coal Mines Act 1979 in relation to such aspects as the prevention or reduction of damage to land, damage to anything on the surface of that land, or preventing any conflict with the provisions of the Soil Conservation and Rivers Control Act 1941.

New mining permits issued under the Crown Minerals Act 1991 will not include conditions to control environmental impacts as the Resource Management Act 1991 placed these responsibilities with local authorities.

2.2.2 Rights of landowners

Under s.26 of the Coal Mines Act 1979 the consent of landowners was required where coal was not owned by the Crown or the rights associated with Crown-owned coal were inadequate for its extraction. This consent could be given subject to whatever terms and conditions the landowner considered desirable.

However, under s.27, if the owner or occupier of the land failed or refused to consent to the Crown-owned coal being worked, the licensee could seek to have the land declared available for coal mining as if the Crown owned the land.

The Crown Minerals Act 1991 strengthens the rights of a landowner or occupier in that mining permit holders are now required to enter

into an access arrangement with landowners and occupiers, including the Crown. An access arrangement may include actions required of the mining permit holder by the landowner or occupier to protect the environment. These may include:

* conditions to be observed by the miner (s.60)
* rehabilitation standards (s.60)
* compensation (s.60)
* a bond against satisfactory performance (s.27).

Section 76(1) of the Crown Minerals Act 1991 includes provision for the reimbursement of costs incurred in ensuring compliance with, and monitoring of, the access arrangement by the landowner or occupier. Enforcement of the conditions of an access arrangement is the responsibility of the landowner or occupier.

2.2.3 Work programmes

Both the Coal Mines Act 1979 (s.42) and the Crown Minerals Act 1991 (s.43) require that there be an approved work programme prior to the granting of a coal mining licence or mining permit, though provision is made in the latter for a work programme to be waived if the Minister is satisfied one is not required. Also there is a requirement for an annual work programme in the Coal Mines (Opencast Coal Mines) Regulations 1986.

Under both Acts the content of a work programme covers the proposed development of the mine and extraction of the coal, with more general plans for future development. Work programmes under the Crown Minerals Act 1991 are not required to cover management of environmental effects notwithstanding the fact that possible changes to the scale of operations could affect the environment.

DOC had an administrative arrangement whereby a company wishing to operate on DOC-managed land had to annually provide a copy of the work programme before DOC would grant permission.

The West Coast Regional Council advised they had required a copy of the work programme and sought to have included aspects of environmental management such as rehabilitation.

2.2.4 Fees and royalties

The administration of mining licences and the maintenance of MOC's mining information databases is supported by annual licence fees collected by MOC. Table 1 shows those fees, royalties and levies paid by the coal mining industry to MOC and the Coal Research Institute.

In addition to these payments, a levy is imposed on the coal mining industry for the maintenance of a fund concerned with the safety and

Table 1 Fees, royalties and levies paid by the coal mining industry

Type	Basis	Collection Agency
Annual licence fee	$11/ha	Ministry of Commerce
Inspection levy/rent	$0.20/tonne	Ministry of Commerce
Royalty opencast underground	 $0.50/tonne $0.25/tonne	 Ministry of Commerce on behalf of Crown
Energy Resources Levy	$2/tonne*	Ministry of Commerce on behalf of Crown
Coal Research Institute	$0.30/tonne**	Coal Research Institute

* $1.50/tonne for lignite
** $0.24/tonne for lignite

SOURCE: Ministry of Commerce, Head Office staff

welfare of the mine workers.

Local authorities are also setting fees to recover the costs of administration and inspection of resource consents relating to mining activities. An important consideration is whether the fees are realistic in relation to the administration responsibilities of the public authorities.

2.3 Bonds

Section 71 of the Coal Mines Act 1979 and s. 9 of the Coal Mines (Licensing) Regulations 1980 specified a monetary deposit or bond of $250.00 per hectare. This bond was to be applied by the Minister of Energy toward:

(a) the restoration or protection of any property affected by failure to comply with the terms or conditions of a licence, or
(b) the payment of any royalties due.

The Minister could also require forfeiture of all or part of the bond if, on termination of the licence, the Minister considered the licence holder had failed to comply "substantially" with the terms and conditions of the mining licence.

Bonds held by MOC for existing licences are covered by transitional provisions of the Crown Minerals Act 1991 (s.109). These provide

that for the duration of and on the termination of an existing mining right, the appropriate consent authority (as defined in the Resource Management Act 1991) shall be entitled to have first priority to one-half of the amount of any bond held in order to restore land. The Minister of Energy has first priority to the other half for the payment of any money due to the Crown.

The requirement for a monetary deposit or bond as security for compliance with the conditions of a permit is continued for new mining permits in s.27(2) of the Crown Minerals Act 1991. In contrast to the fixed sum set by the Coal Mines Act 1979, under the Crown Minerals Act 1991 the actual amount required will be set by regulations through an Order in Council (s.105(1)(k). MOC has chosen to consider each case on its merits.

Bonds set for new mining permits under the Crown Minerals Act 1991 are not available to local authorities for rehabilitation and restoration purposes. To provide for security of compliance, regional and local authorities can set their own bonds in relation to the performance of any one or more conditions of a resource consent granted under the Resource Management Act 1991 s.108(1)(b). This continues the provisions of previous legislation under which conditions requiring bonds could be attached to water rights and similar consents to ensure compliance with conditions having an environmental or rehabilitation focus.

Work for which a bond was given is to be completed to the satisfaction of the authority. When a consent authority is not satisfied, it may carry out the work and recover the cost from the bond. Should the expenses be greater than the amount recovered, the excess is a debt due to the authority by the consent holder.

2.4 Enforcement

In the past a licensee was expected to comply with the conditions specified under the Coal Mines Act 1979 and in the licence. Failure to comply with the provisions of the Act or the regulations was an offence which could be dealt with through the court. However, if the Secretary of Energy had reason to believe that a licensee failed to comply with any of the conditions attached to the coal mining right, a notice of compliance could be served on the licence holder (s.75). This notice required the licensee to take remedial action within 30 days. Failure to comply with the notice could result in forfeiture of the coal mining right.

The administration of the environmental matters imposed under the Coal Mines Act 1979 and in the conditions attached to a licence are now enforced by local authorities. Local authorities must exercise control of privileges issued under this Act as if all its provisions were still in effect.

Catchment Boards and the regional councils or unitary authorities which succeeded them had the ability under the Water and Soil Conservation Act 1967 to require any harm caused by an action in contravention of the Act to be remedied. Any costs incurred by the Board or Council in carrying out remedial work could be recovered by a charge against the consent holder or alleged offender.

With the enactment of the Resource Management Act 1991, enforcement of the environmental conditions that relate to coal mining permits under the Crown Minerals Act 1991, and associated resource consents under the Resource Management Act 1991, are now the responsibility of the relevant public authority. Strict enforcement provisions may be applied by local authorities to activities permitted under the new regime which are breaching consent conditions (ss.314-325).

Under the Resource Management Act 1991, any person can apply to the Planning Tribunal seeking an enforcement order to restrain (among other things) unlawful activity, restore the environment and/or claim reimbursement. Enforcement orders can apply to circumstances where significant environmental damage is occurring or is imminent. The Act also provides for interim enforcement orders as a means of dealing with emergency situations (s.320 Resource Management Act 1991).

Local authorities can issue abatement notices requiring environmental nuisances to be remedied within a stated period, but which can not be less than seven days from when the notice was served. Failure to comply with an enforcement order or abatement notice is an offence for which imprisonment or a fine up to $200,000 may be imposed upon conviction.

3.0 Public authority responsibilities

3.1 Introduction

In recent years there has been a period of intense change in local and central government agencies. The number of agencies in both areas of government has been reduced and many environmental responsibilities and activities have been consolidated. The Crown's commercial interests in coal mining have been transferred to a State Owned Enterprise.

3.2 Ministry of Commerce

Prior to the establishment of the Ministry of Commerce (MOC), environmental officers were employed in 1987 by the Ministry of Energy (MOE) to assist the Mines Inspectors. With the passing of the Crown Minerals Act 1991 and Resource Management Act 1991, the environmental responsibilities of these officers were transferred to staff of regional and district councils.

Problems inherent in such a transfer of responsibility were compounded when difficulties arose in detailing the location of mining applications and licences within local authority boundaries. MOC used the Land District boundaries from cadastral maps (261 Series) rather than the new local authority boundaries in preparing a mining location report. This report was sent to local authorities after reorganisation, asking them to amend the document as required. Very little feedback was received by MOC. Subsequently, an in-house computer package using this report data has been developed by MOC, Head Office, for mining applications and licences located in regional council and territorial authority areas across New Zealand.

The Department of Survey & Land Information (DOSLI) has a National Mining Index computerised database and maps. It includes "local authority" based information. The Index is updated daily from information provided by the Energy and Resources Division of MOC. However, the MOC and DOSLI figures for regional and district councils do not agree, as MOC data does not relate to current local authority boundaries.

Under the Coal Mines Act 1979, the regional offices of MOC had adopted a number of procedures with respect to environmental monitoring and compliance. For example, MOC, Hamilton, required Glencoal Energy Ltd (Glencoal), through conditions on the Company's mining licences, to monitor and record its noise levels at times and sites to be agreed with the Inspector (CML 37 149 is reasonably specific with its required times and duration over any working day).

These monitoring and inspection results were checked by MOC's Inspectors once every 2-3 months. Similar requirements do not appear on the coal mining licences granted to Francis Mining Company Ltd (Francis Mining) on the West Coast or Newvale Coal Company Ltd (Newvale) in Southland.

In terms of a complaints procedure both Hamilton and Greymouth staff of MOC have utilised on-site discussion, repeat inspections and warnings. Site inspection reports advising noncompliance issues and giving remedial advice have been sent to mine managers. Notices of compliance have been served on licence holders (s.75 of the Coal Mines Act 1979), requiring the licensee to take remedial action within 30 days. Failure to comply with the notice could result in forfeiture of the coal mining right (s.76). However, no prosecutions for breaches of the Coal Mining Act 1979, regulations or licence conditions have been taken to date by MOC staff.

3.3 Department of Conservation

The Minister of Conservation and the Department of Conservation (DOC) have an important role where coal mining licences are sought on DOC land. The Minister of Conservation can place Conditions of Consent on the licence. It has also been DOC's practice to impose additional, more detailed conditions by way of an annual work plan approval required of the licence holder. The procedure of using work plan approvals, however, has been discontinued and replaced by the access arrangement provisions of the Crown Minerals Act 1991 for new applications for mining permits.

With respect to mining licences operating on non-DOC land, under the Coal Mines Act 1979, DOC had authority to give advisory input only to the appropriate agency (eg MOC, regional council) on the setting of conditions. These agencies did not have to accept DOC's recommendations, nor were they required to consult with DOC on the review of the licence conditions. However, some attempts at consultative arrangements have been set up between staff of MOC, DOC, regional councils and mining companies with respect to mining activity on private land adjacent or near to DOC's estate.

In August 1991, DOC Head Office produced a guideline for its Conservancies outlining environmental information required by the Department in support of an application under the Crown Minerals Act 1991 for an access arrangement to conduct mining. This guideline is modified by the Conservancies to suit their regional requirements. It is applicable to all types of mining and is used by DOC to assist in the setting of conditions. Additional guidance to Conservancies has recently been given by DOC Head Office.

For coal mining licences issued under the Coal Mines Act 1979, DOC required a consent compliance bond when mining took place on DOC land. This bond was attached to the licence as a Condition of Consent of the Minister of Conservation.

An example of the use of DOC's consent compliance bond appears on Glencoal's CML 37 149 (the Southern Extension to the Company's Waitaheke Mine). This licence, issued in 1991, requires a bond to be lodged with the Hamilton Office of DOC as the licence area includes DOC land. Under the Conditions of Consent of the Minister of Conservation attached to the mining licence, a consent compliance bond of $150,000 is required. This bond acts as security against non-compliance with the terms and conditions of the Minister's consent and guarantees compensation to the Minister for any damage or loss caused by, or resulting from, the licensee's activities. An additional amount of $500,000 is also required from the company as public liability insurance.

DOC's complaints procedure has depended on whether the complaint related to mining on DOC land or on non-DOC land. In the latter case, DOC has advised the relevant public authority of the perceived breach of conditions with a request to enforce the mining licence or water right. DOC may adopt an advocacy role in assisting the relevant public authority. If a breach of licence conditions occurs on DOC land, DOC can suspend a licence holder's authority to operate as a means of enforcement.

3.4 Local government

The preparation of regional policy statements and plans, as required by the Resource Management Act 1991, will define each region's approach to the environmental issues posed by coal and other mining activities.

The local government restructuring of 1989 affected territorial authorities (district, city and county councils), changing boundaries and functions. Their responsibilities with respect to mining primarily concerned community environmental matters, and included roading, water supply, sewerage and dust control.

Further change for district councils came with the Resource Management Act 1991 when territorial authorities were given new responsibilities (s.31). District plans and rules required under this Act will control the effects of the use, development, or protection of land, and of the emission of noise, as they apply to existing coal mining activities.

The financial resources of the local authorities for each of the three regions are shown in table 2. These resources are applied to work related to all consent applications and monitoring. They provide an

indication of the capability of the public authority to carry out these tasks for coal mining.

3.4.1 Environmental monitoring and compliance procedures

Local authorities in Southland are currently preparing a Mining Protocol which will define the precise responsibilities of the regional and district councils with respect to mining in Southland. The management of the Southland coal resource at a more general level is also being addressed in the regional policy statement of the Southland Regional Council (SRC).

In the Waikato region responsibilities for mining and environmental related matters are being addressed by the Waikato Regional Council (WRC) through its regional policy statement process.

The West Coast Regional Council (WCRC) has produced a report entitled "Mining and Exploration: An Evaluation of the West Coast Regional Council's Role" (May 1992) as a basis for regional and district council discussion. The district councils have now formally transferred some of their powers under the Resource Management Act 1991 to WCRC.

Standard sets of conditions were used by the West Coast and Southland Regional Councils for their water rights, issued under the Water and Soil Conservation Act 1967. In addition, SRC attached specific water protection conditions to the coal mining licence issued by MOC. The internal philosophy of SRC in assessing the appropriateness of conditions is "the more specific the better but you must provide for some flexibility".

Complaints procedures adopted by the three regional councils for enforcing compliance are reasonably similar. WCRC and SRC indicated that they prefer to use negotiation, advice and persuasion as first options in cases of noncompliance, rather than prosecution. SRC considers prosecution as a last resort as it ties up valuable Council time and resources.

WRC has a policy of responding to all complaints within 48 hours. Subsequent action taken by the Council towards a specific site complaint varies, depending on such factors as environmental effects, history of complaints, whether the problem was foreseeable and site characteristics. A common approach employed by staff to ensure compliance is the use of media to publicise a breach.

Complaints received by SRC concerning noncompliance with consents and other environmental problems are responded to within two working days. The Council has adopted a formalised procedure to deal with complaints concerning water quality and discharge to waterways.

Table 2 Local government resources 1992-93 (estimated)

	WCRC	WRC	SRC	GrDC	ODC	GoDC
Area (ha) Population	2.3M 35,380	2.5M 338,960	3.26M 103,440	410,660 13,975	197,600 9,225	130,000 13,600
Total Staff (mining)	25 (2)	229 (0.5)	49 (0.3)	90 (0.5)	38 (0.5)	112 (0.2)
Total Existing Resource Consents (applications)	1700 (55)	6100* (528)	1500 (89)	-	-	-
Total Licences Admin-istered (coal)	610 (90)	139 (54)	54 (17)	188 (15)	4 (4)	11 (4)
Total Licence Appli-cations rec'd by MOC (coal)	304 (40)	62 (6)	17 (-)	118 (27)	-	-
Rating Revenue	$1.4M	$15.8M	$5.50M	$5.3M	$5.3M	$5.9M
Approved Central Govt Grant	$.85M	$7.0M	$2.0M	-	-	-
Resource Manage-ment Charges Recovered	$.318M	$1.9M	$.27M	-	-	-

Abbreviations used above:
GoDC: Gore District Council
GrDC: Grey District Council
ODC: Otorohanga District Council
SRC: Southland Regional Council
WCRC: West Coast Regional Council
WRC: Waikato Regional Council

* Includes 3,000 authorised dairy shed discharges.

Note: The Department of Survey and Land Information's National Mining Index was used to determine the number of mining licences and applications for each of the regional and district councils involved in this investigation. Figures quoted are current as at 14 October 1992. Regional and district councils administer only the environmental conditions of a licence. The rest of the licence is administered by the Ministry of Commerce.

No prosecutions have been taken against coal mining operators by the three regional councils since their inception in 1989. WCRC senior staff sought a prosecution last year against a local coal mining company but was overruled by councillors who preferred that a stern warning be given instead.

While the above regional councils have had extensive experience in mining related matters, no similar experience exists at the district council level. Both Otorohanga and Gore District Councils have had no experience in enforcing compliance of mining licence conditions, have received no coal mining related complaints, and are still in the process of formulating policy and procedures for mining. The Otorohanga District Council has also had no experience in processing coal mining applications or in the setting of conditions.

Procedures for dealing with complaints relate to resource management problems in general. The Gore and Otorohanga District Councils prefer to use consultation and persuasion for the resolution of problems before considering taking legal action. Warnings are given to "offenders" by the three councils. This approach, it is felt by district council staff, solves the majority of problems. If the problem requires further action by the council, Otorohanga and Grey District Councils, in relation to coal mining permits under the Resource Management Act 1991, would consider using the Abatement Notice provision under s.322 of the Resource Management Act 1991.

The Grey District Council has recently revised its in-house complaints procedure. They have developed a computer system to enable the monitoring of correspondence flow and responses to be matched to performance standards outlined in the Council's Annual Plan. The computer system acts as a back-up to a complaints register which records all resource management complaints (relating to the Resource Management Act 1991) received in writing or verbally over the Council's public counter. All written and counter-received enquiries are responded to within ten working days, 95% of the time.

4.0 Case studies

4.1 Introduction

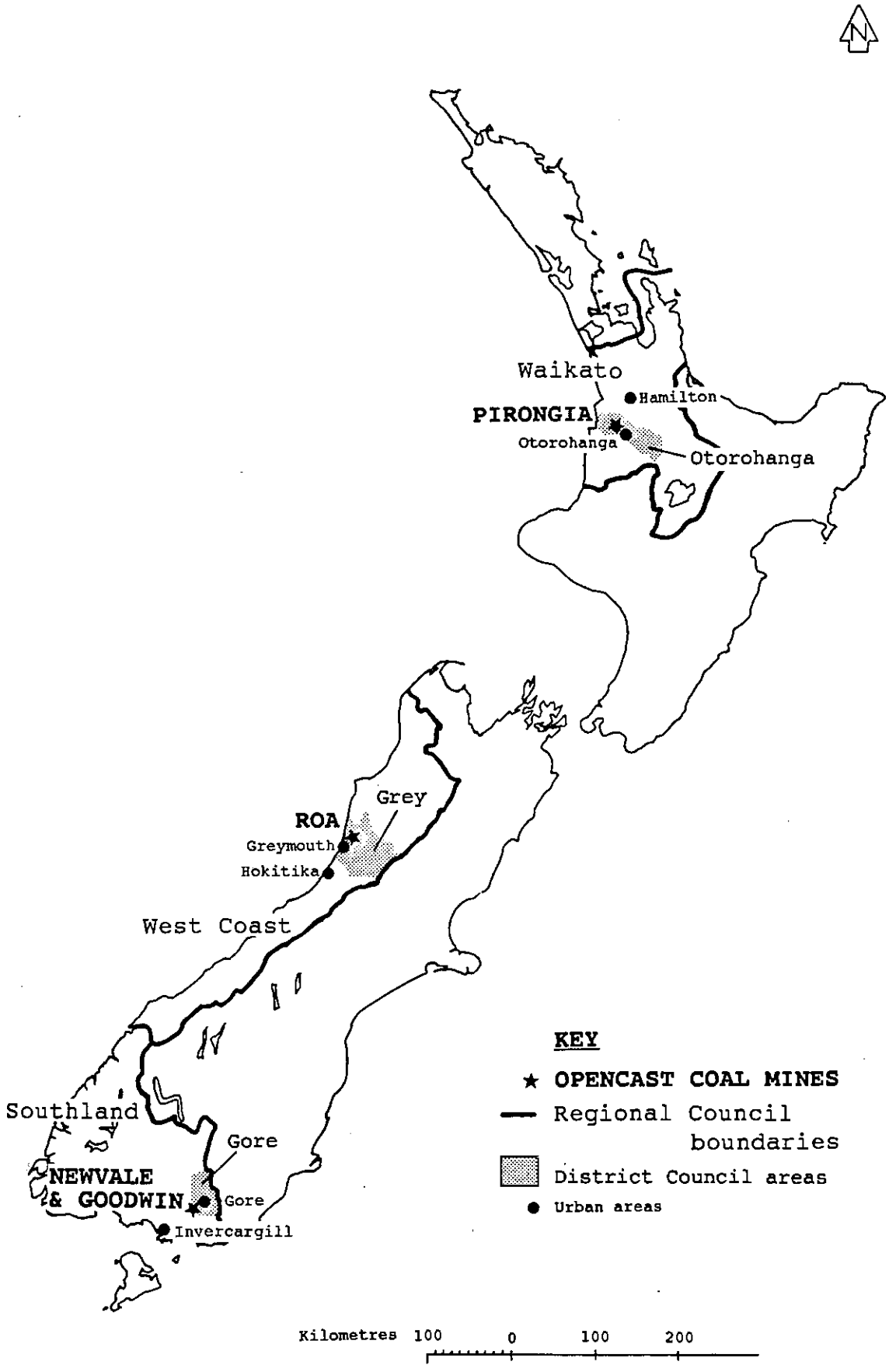
The three regional case studies (figure 1) are described in terms of the geographical setting of the mine under study, a history of mining in the local area, operational details of the mining company and comments on the company's perspective of the regulatory environment. The Waikato and Southland regions were investigated to see whether the conclusions reached regarding particular mining operations on the West Coast, where there was concern about environmental protection, applied to other coal mining activities in different parts of New Zealand. In particular, the investigation was to determine whether the problems being experienced on the West Coast were being repeated elsewhere.

The approach by the public authorities in implementing the new legislative regime was also assessed. The public authority procedures and comments on coal mining privileges and associated consents are summarised in table 4 at the end of this chapter.

The potential environmental impact of mining in the three regions is marked by the considerable contrast in their physical and climatic features, their land tenure and their mining production (table 3). On the West Coast, topography, climate, vegetation and geology have placed constraints on mine access, transportation of coal, site placement for overburden dumps and sedimentation ponds, and water discharge. Nearly two-thirds of its coal mines are small operations producing less than 7,000 tonnes per year and are located on the sides of steep, thickly vegetated mountain slopes.

In comparison, Waikato and Southland regions have relatively flat to rolling topography, and the annual average rainfall is a third to a half of that on the West Coast. There is relative ease of access between mine site and coal market and the majority of mines are producing over 20,000 tonnes of coal annually.

FIGURE 1 LOCATION OF COAL MINING CASE STUDY AREAS



Prepared by Statutory Operations, Head Office, Department of Survey and Land Information, November 1992

Table 3 Mining area and company profile

	Glencoal	Newvale	Francis
Rainfall	1900 mm	910 mm	3435 mm
Topography	Rolling hill country	Rolling hill country	Steep mountainous
Land Tenure	DOC & farm lease = 50% Company owned = 50%	Company owned	Crown-Coal Reserve
Date mining commenced	1930s	1912-1960s: pick & shovel 1970s: mechanisation	1890s - 1960s Reactivated 1980s
Expiry date of Licence	CML 37 149: 1998 CML 37 044: 2001 CML 37 021: 1993 CML 37 166: 2011	CML 37 042: 2019 CML 37 024: 2062	CML 34 056: 2010 CML 34 066: 2012 CML 34 071: 2010 CML 34 076: 2012
Land Use Post Mining	Forestry Wetlands	Pastoral	Regenerated native bush
Production (tonnes/year)	80,000 - 90,000	120,000	40,000 5 months only (100,000 - 120,000 t/year projected for 1994)
Ownership	NZ Dairy Group	Family Company	Family Company
Proximity of nearest settlement	10 km	10 km	2 km

4.2 The Roa Opencast Coal Mine, West Coast

The Roa Coal Mine of Francis Mining Company Ltd (Francis Mining) is located on the Greymouth coalfield on the eastern slopes of the Paparoa Range overlooking the Grey River valley. Access to the Roa Mine is by a narrow, winding and unsealed road from the Roa settlement, which is at the head of a narrow valley some three kilometres northeast of Blackball.

Underground mining took place from the 1880s to the 1960s when the main mines closed. During the period of virtual mining cessation a number of families moved into the existing houses at Roa, establishing a small community and two plant nursery enterprises.

A small scale opencast operation commenced in the 1980s. Since 1986 Francis Mining have steadily increased the output of the Roa Mine and have also made applications for new licences to allow both opencast and underground mining to proceed on a larger scale and to extend the area used for coal processing at Roa.

Figure 2 illustrates the geographical location of the coal mining licences (CMLs) and applications at the Roa Mine pertaining to Francis Mining. The various existing licences including ancillary licences extend over 43 hectares.

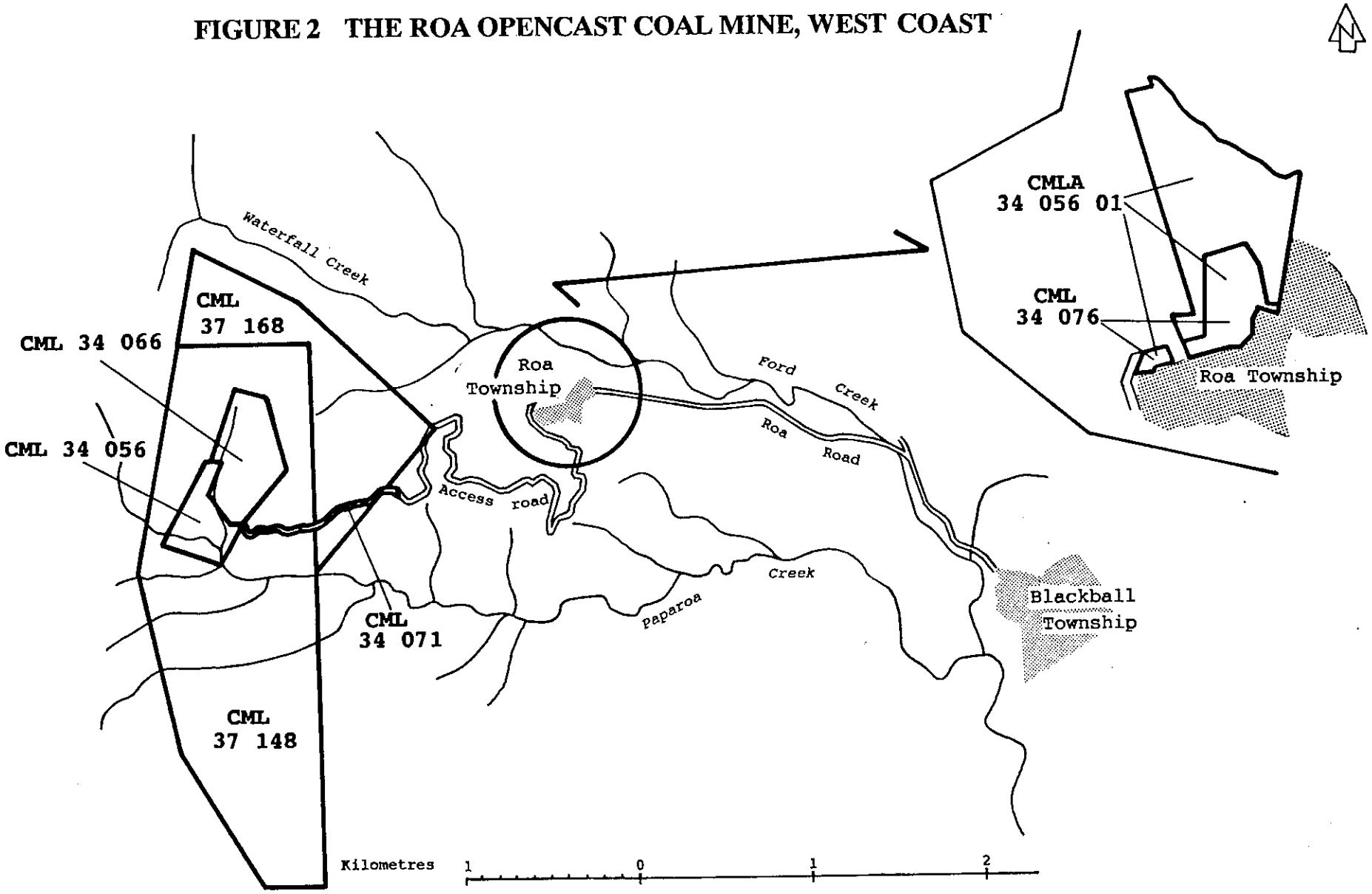
In addition, three applications (covering 336.9 hectares) from Francis Mining are currently being processed by the Ministry of Commerce (MOC). These include an area totally surrounding and extending the existing mining licences area southward, an area for an underground mine and an expansion of the area for the Company's coal processing and stockpiling purposes.

Francis Mining, Greymouth-based with a head office in Christchurch, is one of the larger private coal mining companies in New Zealand. The Company manages six mines based at Reefton and the Roa Mine near Blackball.

Francis Mining did not produce any coal at Roa from 1 June 1991 until July 1992 while the Company awaited the outcome of its applications for new licences. Coal production recommenced in July 1992, with the Company projecting production of 60,000 tonnes for the period July 1992 - June 1993.

Prior to June 1991 and the temporary cessation of coal extraction, Francis Mining employed approximately 25 staff at the Roa Mine. When coal extraction resumed in 1992, the Company contracted out the coal extraction, processing and cartage to the railhead at Stillwater. The mine manager is now the only employee of Francis Mining working at Roa.

FIGURE 2 THE ROA OPENCAST COAL MINE, WEST COAST



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Additional expertise has been retained to assist Francis Mining with rehabilitation.

The mine management noted in March 1991 that the application procedure for a licence would be enhanced if there was an informal procedure for consultation between the miner, the West Coast Regional Council (WCRC), the Mines Inspectorate of MOC and the Grey District Council when setting conditions. One of the problems perceived by Francis Mining was that the Mines Inspector had to monitor the environmental conditions on the coal mining licence but it was often the regional council staff who raised the issue of noncompliance. Provisions in the Resource Management Act 1991 for new resource use applications, and in the Crown Minerals Act 1991 for the removal of responsibility for the control of environmental impacts of mining from MOC to local authorities, will largely overcome these problems and encourage co-operation between agencies.

4.2.1 Concerns expressed over Francis Mining's operations at Roa

A record of some of the correspondence between the local community, environmental groups, government departments and Francis Mining concerning the Company's operations at Roa is given in appendix D.

As far back as February 1984, concerns over "unstable slopes" and the need for on-going revegetation were made known to the Minister of Energy. By 1989, the Westland Catchment Board was concerned that overburden was polluting Paparoa Creek and that revegetation was not occurring. From then on, damage to the environment was identified by the Department of Conservation, the Minister for the Environment, the West Coast Area Health Board, the Minister of Energy, the Maruia Society and the residents of Roa.

The West Coast Area Health Board (WCAHB) in July 1990 notified the Grey District Council of dust and noise problems associated with the Roa Mine. Water supplies were reported as polluted and diesel fumes required control. The WCAHB advised the district council that Francis Mining required a Clean Air licence for its coal processing operations.

Complaints from Roa residents had begun approximately mid 1990, five years after Francis Mining commenced its operations. During 1990/91 Roa residents, some of whose houses are immediately adjacent to the coal processing area used by Francis Mining under its ancillary licence CML 34 076, were concerned with:

* coal dust drifting into their homes
* pollution of the Ford Creek by run-off from the processing area
* disruption and pollution of water supplies
* noise from coal screening and loading operations

* diesel fumes during the winter
* heavy vehicle traffic using local roads.

The residents lodged repeated complaints with public authorities on the West Coast regarding the coal processing operations and were concerned with the perceived lack of action taken by the authorities themselves towards enforcing compliance of the mining licences and associated consents. In November 1990, the residents of Roa sent a written request to the Commissioner to undertake an investigation into local authority performance and the suitability of opencast mining near the settlement of Roa.

Concern about the operations at the mine site was also expressed by the Maruia Society as a consequence of the Society's objection to Francis Mining's coal mining application lodged in January 1990 (37 148). The Society had sought information from WCRC on compliance to keep the overburden out of the creek (Letter of 27/2/1990). They had also lodged a complaint with the Minister of Energy on the Company's recent coal mining application and on the existing operations of Francis Mining (alleging possible erosion and pollution problems were occurring) (letter of 29/4/1990).

In March 1991, after continuous complaints and perceived breaches of licence conditions, WCRC stated Francis Mining's actions now complied with the Council's water management policy, and that the Council had no intention of prosecuting the Company for its past performance. Two months later, MOC decided not to present a prosecution case against Francis Mining as their legal advice was that a breach of conditions contained in the Company's ancillary licence CML 34 076 was not a breach of the Coal Mines Act 1979.

4.2.2 Independent assessment of impacts

In view of the concerns expressed and the history of the Roa Mine, DSIR consultants were engaged to assess the environmental impact of both past and continuing mining operations of Francis Mining at Roa and report on the appropriateness of opencast mining methods at this site.

The consultants were also asked to examine the conditions attached to the coal mining licences and other authorisations related to Francis Mining's Roa mine site and the processing site at the Roa settlement and report on their appropriateness, adequacy and enforceability.

The resultant report from the DSIR, entitled "Environmental Assessment of Roa Coal Mine, Greymouth Coalfield", September 1991, appears as appendix A in this report.

At the mine

The consultants summarised their observations at the mine by concluding that the conditions in the existing mining licence were inade-

quate for achieving enforceability and environmental protection and that if opencast mining continued at Roa, severe local environmental damage was inevitable. They noted that, although the visual effect of opencast mining in steep heavily-bushed areas was irrefutable, it should be possible to continue mining with less short and long term environmental damage than had occurred through adherence to certain factors. These included:

1. Having a predetermined general plan of development of the mine, including the sequence of mining and disposal of spoil;

2. Well-planned surface drainage co-ordinated with batter design and incorporating efficient sediment retention;

3. A method of placing spoil such as benching which enhances stability and reduces spilling into water courses and undisturbed forest;

4. The establishment of a professionally researched vegetation rehabilitation programme.

The consultants considered the mining operation showed deficiencies in these aspects, particularly on the area south of Paparoa Creek, but that the operation to the north of the creek showed much better design and control.

When commenting on the suitability and adequacy of licence conditions, the consultants considered that some of the conditions were not relevant and some were unrealistic in terms of preventing environmental damage at this site, eg no depositing of soil, rock or debris in any watercourse, no significant alteration of the natural colour and clarity of the "natural" water, replacement of topsoil on overburden spoil, grading of spoil dumps to a maximum slope of one vertical in five horizontal. If they were strictly enforced, it would have been impossible to operate the mine. The consultants observed that conditions set out in mining licences should be site-specific, realistic and enforceable.

At the processing site

The consultants noted that due to the proximity of the coal processing facilities to the houses, some environmental effects were unavoidable. They considered that these could be reduced by upgrading the dust suppression procedure, planting trees along the boundary between the coal processing yard and the houses, and suggested that public safety would be enhanced if there was a secure fence around the site. However, they also noted that the residents' concerns would be solved if the coal processing facilities were moved out of the settlement and the traffic hazard removed.

They considered that the regulatory and monitoring authorities were ineffective in ensuring the company worked within the licence area. They noted that with the granting of a water right, the West Coast Regional Council still needed to ensure the sediment retention system was adequate to prevent future contamination of Ford Creek.

4.2.3 Advice to Minister of Energy

A draft copy of the consultants' report on the environmental impacts of Francis Mining's operations at Roa was referred to the Minister of Energy in September 1991, when the Minister was considering further licences for the Roa Mine (Applications 37 148 and 34 056 01). A supporting letter from the Parliamentary Commissioner for the Environment accompanied the report.

In the letter (dated 20 September 1991, to Hon John Luxton, Minister of Energy), the Commissioner put forward a number of suggestions. These included:

* that the licence approval be deferred until remedial work as suggested by the consultants in their report was done,
* that consideration be given to amalgamating the existing mining licences and the current application into a single mining licence,
* that conditions attached to licences needed to be site-specific,
* that consideration be given for an independent peer review panel to monitor work, and
* that adequate consultation should take place among all parties.

MOC subsequently advised that conditions could not be imposed on the new licence which related to the performance of the existing licence. Further, licences could not be amalgamated as this would require the withdrawal of the existing licence and lodgement of a new application.

4.2.4 Action by Francis Mining

Francis Mining have moved their coal screening and processing operations to the mine site, thereby removing the main source of noise and dust. A specialised spray system to lay the dust by dampening down the coal and cleaning the trucks before they pass through the settlement has been installed at the old processing site. This site is being used for short-term stockpiling of coal prior to trucking to the railhead. Francis Mining have not planted a buffer strip next to the houses but have indicated they still intend to do so. Consultation is now occurring among all parties.

4.3 The Pirongia Opencast Coal Mines, Waikato

The Pirongia Mines are of similar size to the Roa Mine. A study of the Pirongia Mines was made to ascertain whether their situation and history was different and whether a similar record of public concern existed.

The Pirongia coal mines of Glencoal Energy Ltd (Glencoal) are located mainly on pasturelands. Relative ease of access exists between the mine site and coal markets.

Glen Afton Colleries (the former name for Glencoal Energy Ltd) commenced prospecting in the Pirongia area in 1966 and mining in 1968.

Although Glen Afton owns the minerals associated with its Okoko Road mining licence - CML 37 044 (known also as the main Pirongia mine), it owns only 50 per cent of the land surface. The balance is leased from a local farmer or is under the ownership of DOC (transferred from the New Zealand Forest Service). Of DOC's portion, 2.5 hectares is to be mined. The Te Rauamoa Scenic Reserve, owned and managed by DOC, is adjacent and to the west of the mine. Glencoal has undertaken an active rehabilitation programme on "mined-out" areas (including the reintroduction of pastureland and tree planting, forestry being the final end use consistent with the surrounding area) within the current licence area (figure 3).

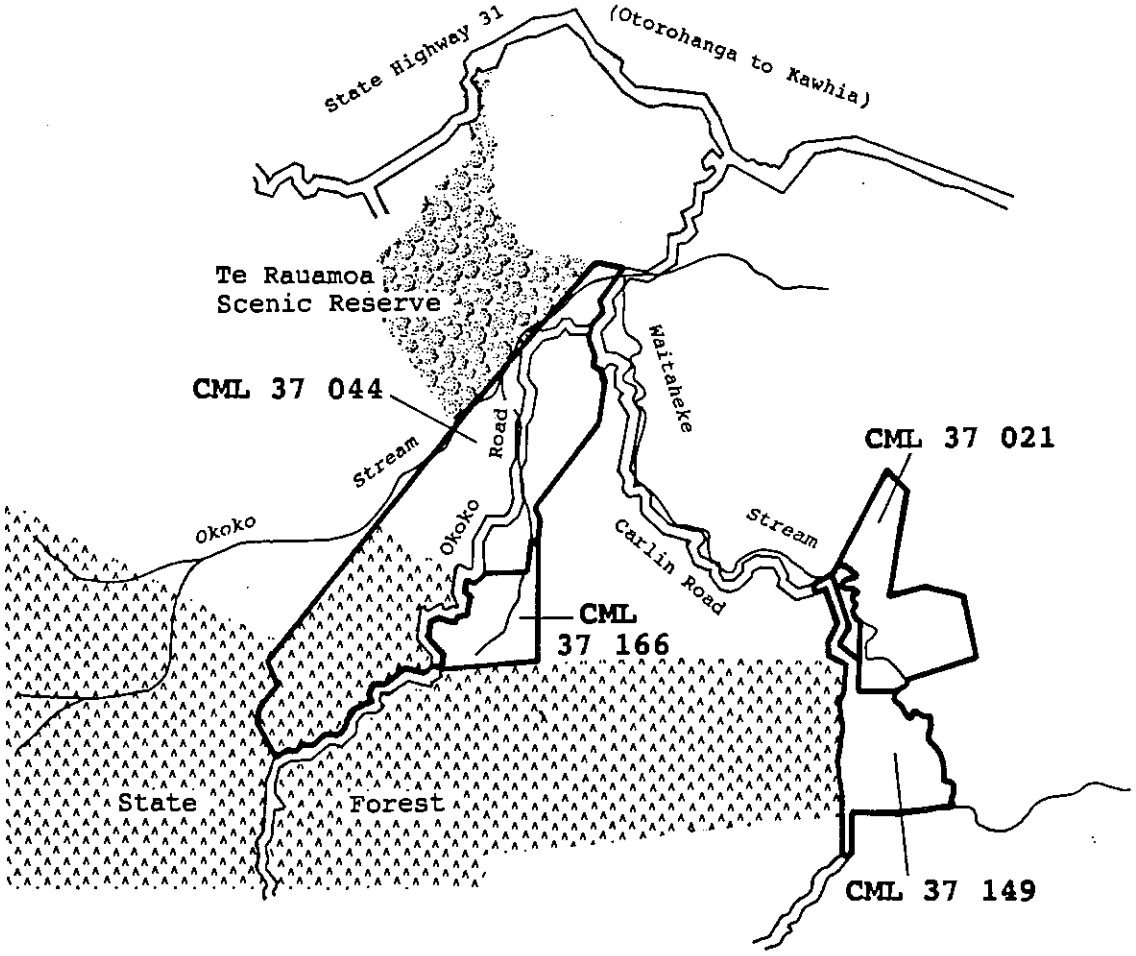
Glen Afton Colleries opened its Waitaheke Opencast Mine (Briggs Block) at Pirongia in 1983. Expiry date of the licence (CML 37 021) is 1993. Situated 5 kilometres to the east of the main Pirongia mine (figure 3), the Briggs Block licence area at Waitaheke is 34 hectares in size. It has much lower overburden ratios and more favourable costs of extraction than Okoko Road. However, the coal seam is thinner, and the coal is of poor quality and is high in sulphur.

By mid 1992, the Briggs Block had been "worked out" with landscape rehabilitation proceeding. A programme of replanting a riparian margin with local indigenous plant stock and establishing fish passages in stream diversions has been undertaken by Glencoal, the Waikato Regional Council and DOC.

A southern extension to the Waitaheke Mine of 17 hectares was added in 1991 (figure 3). Of the total area involved, 13 hectares are owned by the Tapuwae-o-Hounuku Maori Land Trust (including the minerals), two hectares are owned by DOC as part of its Pirongia State Forest Park and the remaining two hectares (an unformed road) are owned by the Otorohanga District Council. Under formal arrangements existing between Glencoal and the Trust, royalties are used by the Trust to fund a number of Maori development programmes.

CML 37 149 is currently being worked, with rehabilitation in progress

FIGURE 3 THE PIRONGIA OPENCAST COAL MINES, WAIKATO



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on DOC's portion of the licence area. On completion of mining a total of 1.25 hectares of wetland are to be developed, including the creation of additional wetland areas to that existing prior to coal extraction activities.

Granted also in 1991 to the Company was Scotts Prospect (CML 37 166), a proposed extension to the Pirongia Okoko Road Mine of 18 hectares, enabling a further 20 years of coal extraction (figure 3). Both Scotts Prospect and Briggs Block are on private land.

Although only required as a condition of two of its four mining licences at Pirongia (CML 37 149 and CML 37 166), Glencoal produces annual rehabilitation reports for all of its opencast coal mines to DOC (Hamilton), district councils in the Waikato area and the Waikato Regional Council. These reports provide for each mine a description and appraisal of work completed during the year with associated landscape sketches updating the Company's rehabilitation concept (Brown, 1992).

Glencoal considers that in not owning all of the land surface of its Pirongia and Waitaheke Mines, there may be difficulties in long-term rehabilitation and land management. There is, according to Company personnel, potential for a conflict of interest to exist between a landowner and a company when one party does not own the land and minerals. In the case of Pirongia and Waitaheke, agreements were drawn up between Glencoal and landowners to establish desired end use before the commencement of mining activities. Much of the mined out area will revert to its former pastoral use. However, where Glencoal owns the land and minerals in other areas of Waikato, mine restoration has provided for more diverse land uses, including forestry and wetlands.

A question raised by Glencoal concerned the likelihood of different environmental standards being established across the regions generating different responses from companies within the mining industry.

A further concern raised by Glencoal was the need for consistency of public authority staff interpretation of mining and environmental procedures.

4.4 The Newvale and Goodwin Opencast Coal Mines, Southland

The Newvale Mine is of similar size to the Roa Mine and, although there was no record of general public concern, there is a record of public authority concern over restoration of abandoned mine sites in Southland.

The Newvale and Goodwin Mines are situated approximately ten kilometres southwest of Gore. Access to the mines is of a high standard, with a sealed surface to within 400 metres of the mines. The Hedgehope Stream, into which the water from the mines eventually discharges, is approximately one kilometre from the mines.

The 354 hectare property on which the Newvale Mine is situated has a complex legal history of land tranferrance and mining rights stretching back to 1911. In May 1912, the then owners, while selling the property, reserved to themselves and others the right to mine lignite and to retain access across the land to and from the mine. After 1931, there were two certificates of titles for the one property: one title for the land and the other title for the coal resource.

In June 1977, Newvale Coal Company Ltd (Newvale) purchased the ownership of the coal. Up to this point, no attempts had been made to restore past mine workings. Newvale assumed responsibility for restoration of the Larking Mine, a disused opencast mine sited 500 metres to the south of the present Newvale Mine, and several other adjacent pit areas.

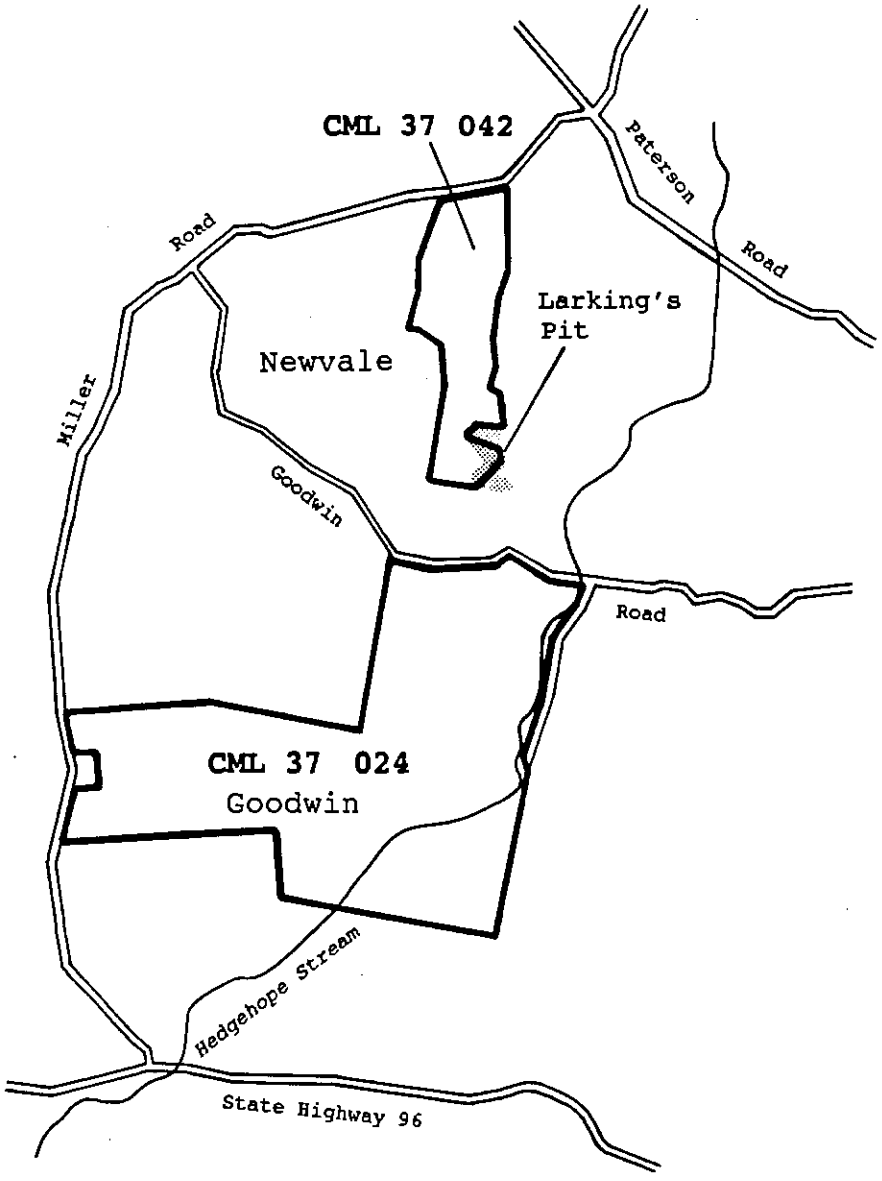
Planning permission was granted under Section 72 of the Town & Country Planning Act 1977 in November 1978 to extend the Company's opencast coal mine. This approval was subject, however, to the preparation of a management plan requiring the approval of the Southland County Council and Southland Catchment Board. It took a further 3-4 years before the management plan was finally produced, and until April 1983 before the Southland Catchment Board gave its approval.

Newvale purchased the land on which the coal was being mined in November 1979. The Company now owned the land rights and the coal rights which had been separate since the 1930s.

In April 1985, Newvale was issued with a coal mining licence (CML 37 042) to extract a minimum of 60,000 tonnes of marketable coal per year from the Newvale Mine. The term of the licence expires in March 2019.

The Company owns a second opencast coal mine approximately two kilometres southeast of the Newvale Mine (figure 4). Transferred in October 1991 from Southland Frozen Meat Ltd (Alliance Group) with an existing mining licence, the Goodwin Mine covers an area of 90 hectares. Goodwin's licence, CML 37 024, was issued in October

FIGURE 4 THE NEWVALE AND GOODWIN OPENCAST COAL MINES, SOUTHLAND



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Prepared by Statutory Operations, Head Office, Department of Survey and Land Information, November 1992

1982 and does not expire until 19 March 2062, an effective term of 80 years.

On 19 November 1991, Newvale applied to the Southland Regional Council (SRC) for a Discharge Permit under the Resource Management Act 1991 to discharge pond treated mine water from its Newvale Mine into a tributary of the Hedgehope Stream. Submissions to the application closed 15 June 1992. The application is currently being processed.

In March 1992, the existing Clean Air licences for both mines expired. The Resource Management Act 1991 s.385(5) allows the Company one year from the date of expiry of its existing licence to apply for a Discharge Permit from SRC.

It is the aim of Newvale to return mined land to its original pastoral state for farming or leased grazing. Details of the proposed reinstatement of landforms and pasture are contained in the 1982 Management Plan prepared by consultants for Newvale Coal Company's Newvale Opencast Coal Mine.

Newvale Mine is a high production opencast operation from a 17 metre thick lignite seam. In comparison, Goodwin Mine's lignite is produced from three seams totalling 12 metres in thickness.

Coal extracted from Newvale and Goodwin provides for both domestic and industrial markets in the Southland region, including dairy companies, local limeworks, freezing companies, wool scours, tanneries, hospitals and a local swimming baths.

Southland coal mined at Newvale has a very high inherent moisture content. As a result, the Company considers it has to take care when watering down mine areas when hot, dusty conditions prevail.

The Company believes the changing responsibilities of public authorities with the Resource Management Act 1991 and the Crown Minerals Act 1991 have created an environment of instability. The Company considered MOC Inspectors did a good job as they knew the mining industry, but there was scepticism that regional and district councils would have the same required knowledge and expertise.

This might reflect the perception that the Mining Inspectors were there to assist mining while local authority responsibility is to protect the environment. Tougher conditions on new mining permits/resource consents are anticipated by the Company.

Table 4 Public authority procedures and comments on coal mining privileges and associated consents

WAIKATO REGION

CRITERIA	WAIKATO REGIONAL COUNCIL	OTOROHANGA DISTRICT COUNCIL	MINISTRY OF COMMERCE (HAMILTON)	DEPT OF CONSERVATION (WAIKATO CONSERVANCY)
1 CONDITIONS Agency procedures used to set and assess appropriateness of conditions	Determined in liaison with consent holder, internal and external expertise and reviewed internally.	N/A at this time.	Have standard set of conditions each for underground, opencast coal, peat mining. Additional conditions proposed by WRC, DCs, DOC and landowners. On-site meetings. Responsibility now transferred to WRC.	DOC standard set of conditions is modified to suit individual applications. More detailed conditions set in work plan approvals (for DOC land). Internal staff review.
Agency identified problems	MOC's standard set of conditions under Coal Mines Act is not appropriate to all mines in NZ. Subjective values difficult to measure.	Identified lack of performance measures within conditions. Transfer of knowledge and interpretation from previous administering agency with Resource Management Act/Crown Minerals Act changes.	Some of DOC's conditions seen as too onerous. Subjective values can't be measured. Some conditions considered unenforceable.	Conditions on licences under Coal Mines Act very general. DOC not a formal party to many licences (including those on land it manages).
Rehabilitation policy	Rehabilitation success is when land is returned to a state where stable productive soils can be developed.	No policy.	Consider rehabilitation inadequate and bonds insufficient under Coal Mines Act. No rehabilitation monitoring responsibility under RMA and CMA.	Restoration of abandoned mine sites a financial liability. Bonds can now be set for new mines on DOC land.
2 MONITORING Procedure for inspection, sampling, etc	Glencoal's consents require them to do water quality and discharge sampling. Inspections carried out as appropriate and when resources permit - usually random and unannounced. Results filed and computerised; company advised of inspection and sampling results. Identified "conservation" issues are discussed with DOC.	Random and unannounced inspection visits. Additional visits if complaint received. Inspections recorded.	MOC requires Glencoal to monitor noise levels and carry out 6 hourly safety inspections. MOC visits all opencast mines in region on average 8-12x/year - smaller operations have more problems and require more attention. Inspections announced, some random. Results recorded and copied to mine manager. Assist WRC with rehabilitation inspections.	Inspections average 3-4x/year/licence as resources allow. Inspections announced. Photographic record taken. Follow-up letter sent to Company. Results copied to WRC.

WAIKATO REGION

CRITERIA	WAIKATO REGIONAL COUNCIL	OTOROHANGA DISTRICT COUNCIL	MINISTRY OF COMMERCE (HAMILTON)	DEPT OF CONSERVATION (WAIKATO CONSERVANCY)
3 COMPLIANCE Recording of complaints	Complaints register in monitoring section. Copy of relevant complaints on site file.	All complaints documented on register. Prefer written complaints. Received no coal mining complaints.	Notebook of staff member records problem and response. No formal complaints record and response.	Where licence on DOC land, complaints registered on file (but none received to date).
Action process following complaint	All complaints responded to within 48 hours. Action taken varies - depends on, eg environmental effects, was problem foreseeable, mechanisms available for resolution, history of complaints, response from the site.	Two warnings of problem given following breach of conditions. Then final notice and report to Council. Rely on communication and persuasion for resolution of majority of problems. Complainant advised. Would use Abatement Notice (RMA) if complaint not serious or not requiring urgent attention.	Encourage compliance through repeated inspections and warnings. Complainant advised of non-compliance and action required to rectify. Have had problems with securing finance and approval from Wellington for a prosecution. No prosecutions taken to date. One Abatement Notice only - for mine safety.	Complaints received on non-DOC land referred to WRC.
4 WORK PROGRAMMES (Coal Mines Act, Crown Minerals Act)	Consider work programme ensures Company makes adequate provision for future rehabilitation and protection of downstream uses. Useful for showing environmental site constraints and site activities. May identify activities which require consents.	Haven't received any from MOC. Consider they would have been helpful. Glencoal sent ODC copy of their work programme, on their own initiative.	Prior to preparation, work programme requirements discussed with Mine Manager. Have no formalised checklist for adequacy.	Generally have not been satisfied with initial work programme attached to mining application to MOC as consider they have given insufficient protection to important conservation values. Respond by directing preparation of another work programme through Minister of Conservation's consent. Minister's consent also requires mining company to prepare a work plan which is approved by DOC.

SOUTHLAND REGION

CRITERIA	SOUTHLAND REGIONAL COUNCIL	GORE DISTRICT COUNCIL	MINISTRY OF COMMERCE (GREYMOUTH)	DEPT OF CONSERVATION (SOUTHLAND CONSERVANCY)
1 CONDITIONS Agency procedures used to set and assess appropriateness of conditions	Standard set of conditions used for Water Rights. Internal staff review. DOC, DCs, local Fish & Game Council and DSIR notified for comments/consultation. Internal philosophy: "The more specific the better but must provide for some flexibility".	Internal staff review.	Standard sets of conditions.	DOC standard set of conditions is modified for Conservancy use (DOC land only). Advise SRC and SDC on resource consents.
Agency identified problems	Consider MOC's conditions (under Coal Mines Act) are vague and difficult to measure. SRC has added specific water protection conditions.	Consider MOC standard set of conditions is inappropriate as doesn't allow for site variation. Uncertainty with requirements of MOC & SRC on some of their conditions and what state of end land use is desired.		Consider MOC's conditions on existing licences are very general.
Rehabilitation policy	Rehabilitation philosophy = restore to what it was like before. Problems with inadequacy of bonds under Coal Mines Act. Problem of historical abandoned mine sites in region (approx 20) - uncertain whose responsibility it is for effective management.	No involvement to date. Need to enforce bonds. (Requirement of former Southland County Council for a Management Plan from Newvale - included reinstatement of landform, soils and pasture - 1982).	Need to consider end use.	Areas inspected by staff and to DOC's satisfaction for rehabilitation before release of bond to mining operators (SRC holds bond).
2 MONITORING Procedures for inspection, sampling, etc	No requirement for Newvale to monitor water quality - done by SRC. Inspections unannounced. For discharge permits, visit 4x/year, other mining licence conditions = once/year and extra if need identified. Procedure for reporting results not formalised. Compliance monitoring programme to be implemented by 30/9/92. Mining Protocol expected to introduce new procedures, including encouraging industry to do own monitoring. "Conservation" issues referred to DOC.	Gore District Council hasn't established its requirements for monitoring (eg funding, recovery of charges, standards, staff).	No requirement from MOC for Newvale to monitor noise levels in mining licence conditions.	Concentrate on DOC land and illegal operations on DOC land. Operators need an annual work plan approval from DOC before activities commence, area inspected on commencement and during operation. Compliance monitoring programme to be developed for current activities.

SOUTHLAND REGION

CRITERIA	SOUTHLAND REGIONAL COUNCIL	GORE DISTRICT COUNCIL	MINISTRY OF COMMERCE (GREYMOUTH)	DEPT OF CONSERVATION (SOUTHLAND CONSERVANCY)
3 COMPLIANCE Recording of complaints	All complaints registered.	All complaints registered. Prefer written complaints. Received no coal mining complaints.	Complaints recorded as received.	All complaints on DOC land registered but have received no coal mining complaints. If not DOC responsibility, would notify relevant agency.
Action process following complaint	Complaints responded to within two working days. Formalised procedure to deal with complaints on water quality and discharge to waterways. Prefer discussion and negotiation - consider prosecution is a 'last resort' as ties up SRC time and resources. No prosecutions taken to date. Policy to advise subcommittee of Council in officer's monthly report.	No formalised procedure. Prefer consultation and persuasion for resolution. Consider legal costs and work involved deter use of prosecution. Complainant and "offender" advised of action taken.	Discussion with miner. Complainant advised of investigation. Defects notice can be issued. No prosecutions ever taken.	If complaint dispute is over the detriment of conservation values DOC may be involved in an advocacy role.
4 WORK PROGRAMMES (Coal Mines Act, Crown Minerals Act)	Under Coal Mines Act, found information was inadequate and provision for SRC comment not guaranteed. Under CMA/RMA, work programmes require RC & DC approval. Useful for indicating rehabilitation and showing Company response to environmental management.	Have had no involvement or input with work programmes to date. Consider they should be attached to all new applications and deal with ecology, drainage, hazardous wastes, alternative sites, landscaping and rehabilitation, and water supply.	Advice to Newvale on safety, tidiness and rehabilitation aspects of their work programme.	Consider work programme required by MOC under Coal Mines Act to have problems with vagueness. Work programmes should be detailed and show responsibility to environmental values under RMA.

WEST COAST REGION

CRITERIA	WEST COAST REGIONAL COUNCIL	GREY DISTRICT COUNCIL	MINISTRY OF COMMERCE (GREYMOUTH)	DEPT OF CONSERVATION (WEST COAST CONSERVANCY)
1 CONDITIONS Agency procedures used to set and assess appropriateness of conditions	Modified standard set of conditions for individual sites. Internal staff review.	Internal staff review. Consult with DOC and MOC.	Standard sets of conditions.	Internal staff review. Standard conditions for access arrangement.
Agency identified problems	MOC conditions too vague.	Vague conditions unenforceable.	DOC and West Coast Regional Council conditions difficult to interpret and impractical.	Problems with conflicting values between mining and conservation legislation.
Rehabilitation policy	No erosion on slopes above 12°. Encourage revegetation for end land use.	Productive end land use should be agreed between miner and landowner.	Progressive rehabilitation required. Need to consider end use.	Responsibility for restoration of former State Coal mines unclear.
2 MONITORING Procedure for inspection, sampling, etc	No requirement for Francis Mining to monitor activities on licences. Aerial survey 2/3 times a year for water discharges. Priority to areas with competing water use. Summary of inspection reports provided at Council meetings.	No regular inspections due to lack of resources. Negotiating for West Coast Regional Council to do Grey District Council inspections.	Inspections at Inspector's discretion are unannounced unless access or presence of Mine Manager required.	Inspections on DOC land average 4x/year.
3 COMPLIANCE Recording of complaints	No comprehensive complaints register.	Complaints registered and computer filed.	Complaints recorded as received.	
Action process following complaint	Revised formal procedure to be included in Regional Policy Statement. Persuasion and advice preferred course of action.	Prefer to use Abatement Notice (RMA).	Discussion with miner. Complainant advised of investigation. Defects Notice can be issued. No prosecutions ever taken.	An Authority to Operate may be withheld until problem resolved. Court action may be initiated for serious breaches.
4 WORK PROGRAMMES (Coal Mines Act, Crown Minerals Act)	Useful for information on land disturbance and water diversions.	Useful if includes environmental effects.	Jointly approved with West Coast Regional Council.	Used as a condition for annual access on DOC land. DOC ensures work programme includes conservation requirements.

5.0 Evaluation

5.1 Introduction

Public authorities have a responsibility to ensure management of the effects of mining activities is environmentally sound. This in part is dependent on the legislative framework which defines each authority's powers and responsibilities.

The conclusions of consultants who inspected the Roa coal mining operations identified that some of the conditions on existing licences were inadequate for achieving enforceability and environmental protection, and that severe local environmental damage was inevitable if mining continued.

This state of affairs was not found in either the Waikato or Southland case studies. However, several common constraints which affected the performance of public authorities and the ability of the mine owner to protect and restore the environment were identified.

These constraints related to a number of administrative procedures, the quality of the conditions placed on licences and permits, the monitoring and compliance arrangements, and the initial uncertainty and confusion in interpretation of recently enacted legislation.

5.2 Administrative procedures

Before sound environmental management of mining activities can take place, all consent granting authorities need to be clear about their responsibilities, have staff with appropriate training, and have access to relevant and efficient information systems. They are assisted when administrative procedures, community standards and mining methods remain consistent over time.

5.2.1 Responsibilities

The change in administrative responsibilities imposed by new legislation (Resource Management Act 1991 and Crown Minerals Act 1991) has incurred a cost on local authorities who have had to obtain the details of existing licences and consents from the agencies formerly responsible. In the West Coast Regional Council (WCRC) case a grant was received from the Ministry for the Environment towards meeting the cost of new mining functions, including the cost of duplicating the Ministry of Commerce (MOC) licence files. There still remains the identification of precise responsibilities in relation to each licence and formulation of a monitoring programme to give effect to those responsibilities. It may be useful for the various

agencies in a region to work together to prepare a set of guidelines, such as the Southland Mining Protocol, which would define their respective responsibilities.

Each regional council will be concerned about rehabilitation to ensure the effects on soil conservation and water quality issues are addressed. There was some doubt as to the precise responsibilities of the Grey and Gore District Councils with respect to rehabilitation. These are issues which need to be resolved between each regional council and its constituent district councils and may find a place in the regional policy statements and regional and district plans.

At the present time no assessment of the environmental values of different ecosystems within the region has been made or identified in regional policies and this type of information is required so that appropriate conditions to control effects may be developed.

5.2.2 Human and financial resources

Sound administration requires sound human and financial resources. None of the case study local authorities had staff training programmes related to environmental effects assessment and, more specifically, to mining issues. Staff with relevant experience and qualifications and with responsibilities in these areas were expected to learn on the job or from guidance and coaching by other staff members. In addition, few guidelines or formalised procedures for dealing with applications and resource consents were identified.

A more systematic approach to the potential problems of mining management would benefit all local authorities and could be assisted by guidelines and training programmes.

Information greatly assists a consent authority trying to ensure the environment is protected. Access to relevant information may be constrained by the way it is recorded. Arranging resource consents so that all information for a single mining operation is held together would seem to be a fundamental requirement for ensuring that a comprehensive picture of environmental effects can be obtained.

The quality of information an applicant can provide in an environmental effects assessment is governed by their interest in maintaining and improving protection of the environment, the resources available and the guidance provided by the regulatory authorities. In recent years there has been an effort by MOC to upgrade the quality of information received on a mining application by producing "Guidelines for Assessing the Impacts of Mining on the Environment" (MOC, 1991). This publication was prepared to pass on MOC experience in managing the effects of mining to local authorities who now have this responsibility. It is up to local authorities to ensure all relevant information is obtained from an applicant in an environ-

mental effects assessment. This information should assist in the formation of realistic conditions on resource consents (see s.42 Coal Mines Act 1979, and s.88 Resource Management Act 1991 and Fourth Schedule).

Related records of information are complaints registers. Sound environmental management requires knowledge of the type of complaints received on a particular operation. Access to this information can assist staff preparing conditions attached to new resource consents for similar operations.

Administration of mining licences and resource consents is assisted by the fees collected by both MOC and local government. Local authorities have recently increased fees while fees set by MOC have been reduced. This is due in part to the transfer of responsibilities for enforcing environmental conditions from the Coal Mines Inspectors to the local authorities.

The regional councils in the case studies all recover from the miner the cost of monitoring the environmental conditions on coal mining privileges. They do not consider this will be particularly onerous, as most mine sites will have an associated resource consent which requires monitoring anyway. Where associated resource consents provide for the miner to carry out a monitoring programme, as with Glencoal, the task of the council is to check data rather than initiate data collection.

The WCRC with a potential 900 mining licences with environmental conditions and associated resource consents to administer has a revenue from rates and grants of about $2 million while Waikato with 200 licences or permits has a revenue of $23 million. The greater resources of the Waikato Regional Council enable access to expert advice and more resources to administer fewer licence areas. Significantly, Waikato has initiated more effective monitoring programmes which are the responsibility of the miner. A public authority must assess the resources it requires to ensure compliance with licence conditions when these conditions are being determined.

All case study agencies were considering how to make more effective use of resources by minimising the number of different inspections that might be required. For example, the regional council can carry out the district council's responsibilities in relation to mining under a delegated authority (s.33 Resource Management Act 1991).

5.2.3 Liaison and co-operation

Of the three case studies, the West Coast has the largest number of licences and the more difficult terrain and climate. Public authorities may not have the resources to undertake a detailed appraisal of each resource use application and maintain their monitoring and enforce-

ment activities. In order to compensate for lack of resources and maximise the use of total resources available, co-operation and liaison is taking place between the regional and district councils. A single resource application form for mining related consents has been devised for all West Coast regional and/or district consent applications. The WCRC takes a leading role with these applications including responsibility for public notification on behalf of both itself and the affected district councils.

The case studies have shown that regular liaison among authorities and between regional councils and MOC occurred but took place irregularly with the Department of Conservation (DOC). Authorities need to be more proactive in developing this liaison.

5.3 Control of effects of mining

The key mechanism used by public authorities to control the environmental effects of coal mining is the imposition of conditions on resource consents. The expectation of the miner is that the controls on environmental impacts should be objective, measurable and able to be applied in an unbiased way. The public will be expecting conditions to cover the actual or potential effects which may occur in the exercise of a coal mining licence or other resource consents and that they are practicable and enforceable.

5.3.1 Public participation

The public were able, under the Coal Mines Act 1979, to have some influence on conditions through the objection process when applications for mining licences or associated resource consents were advertised (ss. 65-66). In the case of the Roa Mine, the mining licence for the existing mine area was granted before many of the current residents settled in Roa. The potential scale of the mining operation (hidden in a remote gully) or impact likely to occur at the settlement processing site if mine production was expanded was probably not appreciated, and there was little or no local community input during the application process. This raises the question as to whether resumption of activities after a long time interval or a change in technology or scale of operations should require further consultation with the public.

The Resource Management Act 1991 provides for greater public participation in procedures for setting appropriate conditions to secure environmental protection. Notwithstanding these provisions, it is suggested that community groups with concerns about possible unwanted environmental effects can reach an agreement with a mining company as to how such effects might be monitored or mitigated. A Heads of Agreement can be formalised between a miner/mining company and a community liaison group. This has the advantage of improving public relations and may assist with access arrangements under the Crown Minerals Act 1991 in situations

involving new applications for coal mining permits.

5.3.2 *Access arrangements*

The environmental effects of mining can also be controlled with access arrangements negotiated under the Crown Minerals Act 1991. An access arrangement provides a landowner/occupier with the opportunity (which was not available under the Coal Mines Act 1979) to set conditions for protecting land and other interests likely to be affected by extraction activities. The responsibility of either party for monitoring rehabilitation could be clearly set down in a formal contract between the landowner and miner as part of an access arrangement.

Grey District Council appeared to strongly support the use of access arrangements to ensure rehabilitation. As the Southland Regional Council indicated, however, it may not be in the landowner's interests to place onerous requirements for rehabilitation on access arrangements for long-term benefit, especially if a costly civil action would be required to enforce compliance.

There are advantages to the land owner/occupier to specify in access arrangements conditions relating to monitoring, subsidence, rehabilitation, compensation, or a bond repayable on satisfactory performance. It would be logical where a number of owners and occupiers are involved for them to form a Landcare group and negotiate access arrangements collectively before signing individual contracts. In such cases the regional council could act as the facilitator and co-ordinator.

At the present time there are no guidelines for landowners who are approached by a mining company wanting access. This is an area that could be addressed by local and central government and the industry.

5.3.3 *Conditions on licences and permits*

The controls attached to the coal mining licences in the various case studies were largely in the form of standard conditions with little attempt to develop conditions specific to the particular site. "Standard conditions" have very general wording (being subjective rather than objective) and regional councils, district councils and offices of DOC involved in this investigation have found interpretation of MOC's standard conditions difficult. Relying on standard conditions which were not site-specific contributed to the situation at Roa where conditions were inappropriate and unenforceable.

Ideally, conditions should be based on a standard set of conditions modified after consultation between the applicant and the various public authorities concerned, including the Mining Inspectorate.

To provide some consistency for the industry between regions it may be appropriate for the Ministry for the Environment to improve on the guidelines issued by MOC through the development of standards

and performance measures. This in no way should avoid the necessity for regional councils to ensure that conditions are site-specific.

The viability of conditions controlling environmental effects may need to be tested by officials with some mining knowledge to confirm their practicality. The possible loss of this advice which could be provided by the Mines Inspector is of concern and needs to be addressed by both regional councils and DOC. Either expert advice should be obtained or some administrative arrangement made with the Department of Labour once the Mining Inspection Group of Head Office and the Mining Inspectorate personnel of MOC are transferred.

5.3.4 Rehabilitation

A particular aspect of conditions which has been a problem is that relating to rehabilitation on the completion of mining. Successful rehabilitation of a mine site requires:

* early determination of a concept of final land use at the completion of mining and the management of topsoil and overburden to achieve this **before** mining starts, and

* planning for the integration of mining activities with rehabilitation requirements.

A rehabilitation plan should be capable of enabling complete restoration at any stage of the project, but flexible enough to respond to changes in conditions found during mining. There should be minimal residual environmental risk at the conclusion of mining.

The Waikato case study provides an example of how a rehabilitation plan can be designed to achieve a specified end land use. The environment is being enhanced by providing a greater variety of plant species, replanting with native species from the area and improving reinstated waterways.

Generally conditions in coal mining licences have been vague in terms of rehabilitation. There are no criteria for identifying satisfactory rehabilitation or the standards required. Conditions which specify end use in terms of economic productivity may discount alternative forms of land use such as wetlands. In Southland, Newvale Coal Company are reinstating land to pastoral production while at Roa, in the broken bush clad hills of the southern end of the Paparoa Range, it is assumed that natural revegetation and regeneration of the bush will occur. There are no plans that indicate the final appearance of the landscape.

5.3.5 *Work programmes*

The Coal Mines Act 1979 (Regulation 57 of the Coal Mines [Opencast Coal Mines] Regulations 1986) required annual work programmes for the Minister's approval, but there was no requirement for these to be sighted by regional councils unless specified in a condition. Had the West Coast Regional Council required copies of the annual work programme, the potential effects of increased production at Roa might have been recognised sooner and more detailed monitoring implemented or the conditions reviewed, as provided for in the first schedule of CML 34 056.

Under the Crown Minerals Act 1991 annual approval of work programmes by the Minister of Energy can be made a condition of any new permit (s.25). Such work programmes may identify changes to mining scale and technology. However, there is still no requirement to notify these changes to the local authority. This may result in the local authority failing to require necessary changes to conditions on resource consents which control environmental effects.

There would be merit in having the annual work programme lodged with the regional council, district council and, where appropriate, DOC as well as with the Minister of Energy. There would also be merit in having details of plans and work practices to mitigate environmental effects as an integral part of the work programme or provided in a separate environmental management plan.

Consideration should also be given to the concept of a long-term work programme which would indicate how mine development and mitigation and control of adverse environmental effects is to be managed over the life of the mine. Post mining land use and rehabilitation should also be provided at this stage. This information could be provided in the required environmental effects assessment that accompanies applications for resource consents associated with a mining operation.

The concept of an environmental management plan should not pose too many problems for medium and large scale operations. However, small scale operations may find the task difficult. While such plans should assist a small mining company and avoid problems later on, it may only be necessary to submit plans at two or five year intervals.

5.4 Enforcement of licence and permit conditions

The community at large now has expectations that the Resource Management Act 1991 and the Crown Minerals Act 1991 will provide an assurance that changes to the environment and their way of life resulting from the activities of others will be planned and managed with due regard to community values and aspirations. It also expects that their elected representatives will uphold the legislation in protection of the individual's rights. These expectations require consent

authorities to see that compliance with conditions set on licences and permits is verified by way of monitoring programmes.

5.4.1 Monitoring

A commitment by the miner to minimise environmental damage is of prime importance. Where the miner carries out a monitoring programme, this can ensure early recognition of potential problems. However these programmes need to be checked.

Priorities must be continually set for implementation of effective monitoring systems, and it seems the approach of the Waikato Regional Council in this regard provides a useful model for other regions. The Waikato staff have given each of their sites holding a resource consent a priority rating based on the potential environmental impact of the activity and the effectiveness of the licensee's management. Using this priority listing, their monitoring programme is devised so the higher priority sites are visited more frequently than lower priority sites. The West Coast may find it has a greater proportion of sites in the "high" priority category because of the local climate and the physical conditions.

The ability of the Waikato Regional Council to maintain a monitoring programme was enhanced by the separation of resource use monitoring and consent granting activities. A time constraint on processing consent applications, depending on their nature, is specified in the Resource Management Act 1991, and where staff have responsibility for processing resource consent applications as well as monitoring (as is the case in the West Coast Regional Council) there is a danger that monitoring will be deferred.

This creates a problem for the West Coast because of the large number of mines within the region and the WCRC's limited resources. The lack of resources is also reflected in the planned twice yearly frequency of inspections. In contrast, the Southland Regional Council planned for four inspections per year and the Waikato Regional Council specified the frequency in terms of the priority rating. It is doubtful whether the West Coast authorities have sufficient resources to implement effective monitoring programmes.

Roa residents contend that West Coast public authorities have not identified environmental problems as a result of monitoring activities. Although the relevant authorities did respond once the residents' concerns had been formally reported, inadequate performance by the mining company continued. This was still not being identified in any monitoring programme being carried out by the district or regional council. For instance, the fact that a Clean Air licence was required in one case was not recognised by the Grey District Council; even after the licence was issued and limits placed on dust emissions, dust problems continued. This lack of awareness of legislative requirements and a failure to ensure the requirements are

carried out is not something that should be tolerated in public authorities.

The overriding factor in these concerns seems to be the lack of anticipation of the potential impacts on the local community resulting from the expansion of mining activity and hence identification of appropriate controls which may be imposed and subsequently monitored.

5.4.2 Compliance

Commitment by the miner to comply with all conditions should remove the need for enforcement. One Australian initiative is to require consent holders to develop an Environment Management Plan to detail their programme to achieve compliance. The Plan is to be approved by the consent authority and be available to the public (Department of Resource Industries, 1991; Ricketts, 1992).

To enforce compliance requires a clear definition of what constitutes compliance and a willingness to impose sanctions available in law that are sufficient to deter further breaches of the controls established.

If conditions are stated in ambiguous or subjective terms there are bound to be conflicts in interpretation between the concerned parties. The claim by the Maruia Society that mining licence conditions were not being enforced at the Roa Mine, particularly with regard to side-casting and deposition of material in waterways, were substantiated by DSIR consultants. The fact that some of the conditions were unenforceable emphasises the importance of ensuring appropriate conditions are placed on mining licences and permits. This type of situation does not lead to a willingness to prosecute breaches of conditions.

The ability of the Mines Inspector to enforce conditions under the Coal Mines Act 1979 was limited (s.75). Licences could be forfeited for failure to comply (s.76). Although this was a major incentive for operating sites to comply with licence provisions, it was thought to be very draconian and seldom used. There were also onerous standards of proof required to show no reasonable action had been taken to achieve compliance. Efforts to take court action by the Greymouth Inspectorate did not proceed because of legal advice within MOC suggesting that breaches of conditions were not a breach of the Coal Mines Act 1979. It appears that there have been no prosecutions for breaches of coal mining licence conditions ever carried out by the Mining Inspectorate.

Under the Coal Mines Act 1979, although the regional councils have taken over responsibility for environmental conditions, a council is unable to enforce the conditions by way of an Abatement Notice under the Resource Management Act 1991. The Council is in theory able to use the provisions of the Coal Mines Act 1979 to vary condi-

tions relating to prevention or reduction of damage to land. However, these are particularly cumbersome and forfeiture of licence is the only sanction that can be applied for persistent noncompliance with licence conditions. As some licences issued under the Coal Mines Act 1979 have 20 or more years to elapse before their expiry date is reached, there should be a limit placed on the time during which the transitional provisions of the Crown Minerals Act 1991 apply. Thereafter the provisions of the Resource Management Act 1991 which confer more effective enforcement powers on consent authorities should apply.

Persuasion by public authorities to obtain compliance is to be commended as is the use of embarrassment when the Waikato Regional Council reports breaches to the media. However, failure to prosecute flagrant breaches will result in environmental degradation and should not be tolerated.

5.4.3 Bonds

Bonds provide an incentive for ensuring compliance by licence and permit holders with conditions designed to protect the environment and restore or rehabilitate the land during and after mining ceases.

Unfortunately, bonds set by MOC under the Coal Mines Act 1979 were limited by regulation to $250 per hectare. This meant that in many cases the bond would be insufficient to meet the cost of any major rehabilitation. It would be cheaper for a mining company, once it had depleted the resource, to walk away from a site and forfeit the bond rather than carry out rehabilitation work.

Under the transitional provisions of the Crown Minerals Act 1991, existing licences continue with the same bond value, except that the bond is now split between the Minister of Energy for any arrears in terms of levies and royalties that may be due and the local authority responsible for ensuring restoration of the site (s.109). While the licence is valid, the miner is liable for rehabilitation costs so there is a reluctance to initiate forfeiture procedures if the bond is considered inadequate to cover the rehabilitation costs.

Local authorities have also been concerned that when a licensee wishes to surrender a licence there has been insufficient consultation between MOC and the local authority. If MOC's levies and payments are up to date the bond may be refunded although the local authority may consider the site has not been left in an appropriate state and finds it is too late to call on the bond provisions to meet the reinstatement costs.

Public authorities could simplify their procedures for release of a bond if the miner was required to submit an assessment of the residual risk which may arise after the completion of mining. If an identifiable

risk remains in the foreseeable future, some of the bond could be retained to cover further medium-term corrective measures.

Bonds required for new mining permits under the Crown Minerals Act 1991 (s.27) are not available to local authorities for rehabilitation and restoration unless made a permit condition. Regional and district councils can set their own bonds in relation to the conditions of a resource consent granted under the Resource Management Act 1991 (s.108).

The Waikato Regional Council considers that it would be appropriate for a bond to remain in existence for a number of years after the cessation of mining and/or the surrender or termination of the licence in order to provide long-term rehabilitation and management of a mine site. Alternatives to the current bond system have been suggested, such as the industry providing its own indemnity fund or the government invoking some levy provision to provide funds. These approaches tend to shift the responsibility from the individual company to the industry and do not encourage responsible performance by a company. The possibility of a caveat on the sale of land until rehabilitation conditions had been carried out was also suggested.

Under the Resource Management Act 1991 and Crown Minerals Act 1991, affected public authorities will be more able to match the value of their respective bonds to the costs and risks of managing the **effects** of an activity on the environment, as attention is turned away from the **activity itself.**

The gold mining industry (PCE, 1988) has recognised that a bond needs to be sufficient to ensure rehabilitation of the licence area at any stage of the project. An annual bond liability covering the estimated cost to make good any damage at any time throughout the life of the mine can be calculated. With this information the bond could be varied as the rehabilitation liability changes over the life of the project. A provision to review the bond at say three yearly intervals would allow adjustment on the basis of rehabilitation experience to date, continuing rehabilitation liability and also allow for inflation indexing. Such adjustments would ensure the bond is capable of guaranteeing rehabilitation at all stages throughout the life of the project.

The new legislative regime has the potential to increase the number of bonds which a licensee must pay to public authorities before consent is given for a mining permit. This could result in some smaller mining operators being unable to afford, or reluctant to provide, multiple bonds. There is a need for better co-ordination and sharing of resources between regional and district councils and MOC in the area of setting and enforcing bonds to ensure compliance with mining permit and resource consent conditions.

The regional council could co-ordinate an assessment of the bond liability with the appropriate authorities to propose a total bond sum of money apportioned appropriately to cover the concerns of each authority.

5.5 Legislative framework

A large constraint affecting the performance of public authorities has been the uncertainty and confusion about interpreting the new legislation and identifying appropriate responsibilities. This is a matter that needs to be worked through in all regions and in most cases should be initiated by the regional council. In general the new legislative arrangements provide for better environmental controls for mining than the previous regime.

However, the transition arrangements in the Crown Minerals Act 1991 are of concern. Responsibility for monitoring conditions of existing licences which were designed to control mining effects on the environment has passed to regional and district councils. The ability to enforce the conditions by means of an Abatement Notice issued under the Resource Management Act 1991 (s.322) has been denied to local authorities. This is an untenable situation and should be rectified.

Also of concern are the long licence periods of 40-70 years with conditions that, under the Coal Mines Act 1979, can only be reviewed and added to by the Minister of Energy for the purpose of preventing or reducing damage to the land surface.

Since a coal mining licence may have a term of up to 40 years (in one case a Newvale licence has 70 more years to run), it is impractical to expect that the conditions attached to the licence should never vary. Not only may the scale of operation change but technological innovation may necessitate amendment of conditions during the term of a licence.

Regrettably, there is no specific requirement to review licences issued under the Coal Mines Act 1991 or their conditions at regular intervals at any stage of a licence.

The regulatory authorities, whether acting under the old or the new legislation, need to have a policy of regularly reviewing the effectiveness and practicability of the conditions attached to mining rights which they administer. A review should be automatic when there is a change of ownership and where work programmes indicate a change of scale or technique. Had this occurred when Francis Mining moved into Roa and enlarged the scale of mining operations, it is possible that many of the residents' concerns could have been addressed much earlier. Soil stability and rehabilitation issues at the mine could have been followed through with more vigour.

It is possible under the Crown Minerals Act 1991 to include a variation of the conditions on existing licences so that a requirement for regular review is one of the conditions. Certainly all new permits and consents should allow for this, but since the licensee can appeal against a change to existing coal mining licence conditions, local authorities seeking to amend environmental conditions under the authority of s.51 of the Coal Mines Act 1979 need to ensure that there are justifiable reasons for setting revised conditions.

A further problem relates to applications for additional licences for areas which are adjacent to an existing licence or in fact totally surround an existing licensed operation. A licence application by Francis Mining surrounds their existing mining operation. It seems logical that consideration should be given to amalgamating the existing mining licences held by Francis Mining for their Roa Mine and the current application into a single mining licence, thus ensuring rationalisation of the mining activities and a single set of specific conditions.

It would seem appropriate for the Minister of Energy to be able to require an applicant to surrender an existing licence in order to amalgamate licences. Permits granted under the Crown Minerals Act 1991 can be extended in this way if allowed in the permit or subject to the consent of the permit holder (s.36).

In general the various plans, regulations, permits and rights approved under legislation repealed by the Resource Management Act 1991 have been carried over by the transitional provisions of that Act, and they are considered to be part of a regional or district plan deemed to be constituted for the region or district. There would be merit in stipulating in a regional plan relating to mining that every permit should have a condition requiring an annual environmental management work programme. This would ensure integration of mining development and environmental protection.

Local authorities may also need to consider the effects of activities that were specified as "scheduled processes" under the Clean Air Act 1972 to confirm, for example, whether the dust caused by an activity such as coal screening is recognised as a discharge, which needs a resource consent.

5.6 Mining liabilities

Waikato, West Coast and Southland each have a number of "redundant" mining areas needing attention, for which responsibility has not been determined. Abandoned mines are a problem of particular concern to DOC which inherited "mining liabilities" following the central government environmental management changes of 1987.

DOC Waikato Conservancy staff identified the main problem of such "mining liability" areas is the absence of a bond system or public liability cost incorporated in the conditions of "older" mining licences. It has been suggested that many of the residual problem mines were left over after the transfer of State coal mines to the State-Owned Enterprise, Coal Corporation of NZ Ltd (CoalCorp). The sale agreement indemnified CoalCorp from any liabilities arising from coal mining operations prior to 1 April 1987. MOC believes it has identified all residual State coal mine responsibilities for which it may be liable. Mines abandoned in Crown lands such as the former State forests were not necessarily operated by the former State Coal Mines. It is not clear whether at the time of their abandonment they were all secured to the satisfaction of the Mines Inspector and in accordance with any conditions attached to the licence.

As the Crown has licensed these operations it is suggested that the Crown retains a responsibility to deal with the problem. It seems unfair that the landowner should bear any restoration costs since under the Coal Mines Act 1979 the owner had few rights to oppose mining or set conditions on the miner.

Identification of abandoned mine sites to assess any environmental risk is required. This should be followed by plans to remedy or mitigate any adverse environmental effects.

6.0 Conclusions and recommendations

6.1 Introduction

Comparison of mining activities in the West Coast, Waikato and Southland regions identified that mining on the West Coast occurs in difficult terrain and with difficult climatic conditions. In addition, the West Coast has many smaller mines (producing less than 7,000 tonnes per year) compared with those in the two other regions. This necessitates a different degree of control to that required in other regions.

The approach adopted by the various local authorities was found to be constrained by the uncertainties created through recent restructuring of central and local government and the advent of new legislation. The Crown Minerals Act 1991 and the Resource Management Act 1991 will make controlling the environmental effects of mining easier. However, a number of legislative and administrative procedures could be improved.

6.2 Capability of the resource management system

Provisions in the Resource Management Act 1991 greatly improve the ability of regional councils, district councils and other public authorities, exercising powers and duties under the Act, to obtain information on the environmental effects of mining proposals. Wide opportunities are provided by the Act for the public to participate in proceedings for the making of policy statements, plans and rules to control the effects of mining and for the consideration of resource consent applications for mining proposals. The Act also empowers local authorities to require an environmental effects assessment on a mining proposal to form part of the documentation accompanying applications for resource consents. The information provided from the exercise of these powers enables public authorities to develop, coordinate and monitor strategies for identifying and controlling the effects of mining operations from exploration to land rehabilitation.

NB ***Although recommendations are made to the West Coast Regional Council and/or the Grey District Council, these recommendations may also have relevance for other regional and district councils with responsibilities for managing the environmental effects of coal mining.***

6.2.1
Regional policy statements, regional and district plans

The Resource Management Act 1991 requires regional councils, unitary authorities and territorial authorities to avoid, remedy or mitigate any adverse effects of activities on the environment. It is through the regional policy statement and regional and district plans that policies and controls are set to deal with adverse effects. The impacts of coal mining on the environment should be dealt with in the context of policies and environmental standards which are set out and given effect to in the regional policy statement and regional and district plans.

Recommendation to the West Coast Regional Council and the Grey District Council

1. The West Coast Regional Council, through its regional policy statement and regional plans, and the Grey District Council, through its district plan:

   (a) Recognise and provide for the adverse effects of coal mining (which have been identified as impacts on the environment from mining at Roa and may occur from coal mining in other areas) on the following:

   - water quality
   - soil conservation
   - land stability
   - protection of indigenous vegetation and habitat for indigenous fauna
   - noise abatement
   - dust control
   - traffic hazard from coal transportation

   (b) Specify

   (i) the above matters for which regard is to be given in an environmental effects assessment; and

   (ii) the consultation and review procedures to be followed in the preparation of an environmental effects assessment;

   (c) Define the procedures which will be followed for monitoring and enforcing compliance with the conditions of resource consents for mining operations. *(section 5.4.2)*

6.2.2 Crown Minerals Act 1991 - Transitional provisions

Under the Crown Minerals Act 1991 regional councils, unitary authorities and territorial authorities took over the monitoring of conditions on mining privileges granted under the Coal Mines Act 1979 where the conditions relate to the council's or authority's functions under the Resource Management Act. The conditions have to be monitored as though the old legislation was still in place until the licences expire.

Recommendation to the West Coast Regional Council and the Grey District Council

2. The West Coast Regional Council and the Grey District Council define and document procedures which will be followed in the administration of responsibilities assumed under the transitional provisions of the Crown Minerals Act 1991. *(sections 5.2, 5.5)*

6.2.3 Administrative procedures

The regional councils involved in this study have developed a number of procedures for the administration of mining licences and related resource consents. These have proven effective in reducing the time taken to process applications and monitor compliance with licence and resource consent conditions.

Recommendation to the West Coast Regional Council and the Grey District Council

3. That administrative procedures ensure:
   (a) All information pertaining to a particular mining operation is held together; *(section 5.2.2)*

   (b) Information held on complaints registers is available to staff dealing with resource consent applications; *(section 5.2.2)*

   (c) Formalised procedures are adopted for dealing with applications and resource consents; *(section 5.2.2)*

   (d) The responsibility within each Council for considering and approving resource consent applications is separated from the responsibility for resource use monitoring and enforcement; *(section 5.4.1)* and

   (e) Training on environmental effects assessment and management of the effects of mining is provided to staff. *(section 5.2.2)*

Recommendation to the West Coast Regional Council

4. That the Regional Council convene meetings with other public authorities administering statutory approvals and the mining industry in order that:

   (a) Responsibilities of all agencies are clearly defined, possibly in a mining protocol; *(section 5.2.1)*

   (b) Resources are used to best effect by exploring possible transfer of powers, liaison and co-operation arrangements between authorities for
   (i) inspections and monitoring programmes;*(section 5.2.3)* and
   (ii) receiving and processing resource consent applications; *(section 5.2.3);* and

   (c) Communication between the community and mine operators be improved through facilitating
   (i) the co-ordination, where appropriate, of landowner access arrangements *(section 5.3.2);* and
   (ii) consultation with community liaison groups. *(section 5.3.1)*

6.2.4
Early planning

A number of aspects in the management of mining operations would be greatly improved if they were considered when assessing environmental effects. One of these is the rehabilitation and restoration or other use proposed for the site at the cessation of mining.

Recommendation to the West Coast Regional Council and the Grey District Council

5. That a rehabilitation plan should be an integral part of an environmental effects assessment accompanying an application for mining related resource consent(s). *(section 5.3.4)*

Significant changes in the scale and direction of activities and in operating technology often occur over the life of a coal mine. These can require corresponding significant changes in the management of environmental effects. Early advice about these changes would assist local authorities with coal mining related environmental management responsibilites.

Recommendation to the West Coast Regional Council and the Grey District Council

6. That a process for ongoing environmental effects management, with reports submitted for consent authority approval in advance of work occurring, be a condition of resource consents granted for mining activities. *(sections 5.3.5, 5.5)*

6.2.5 Controlling effects of mining

Controlling the effects of a specific mining operation is dependent on the related licences or consents having conditions which have been established with due regard to the environmental values and constraints of the site and which are capable of reasonable compliance by the mine owner, employees and contractors.

Recommendation to the West Coast Regional Council and the Grey District Council

7. That all conditions proposed for mining related resource consents are:

   (a) site-specific; *(section 5.3.3)*
   (b) assessed for their relevance and practicality of compliance; *(section 5.3.3)*
   (c) provide for the review of conditions at specified intervals or whenever there is a specified change in the scale and method of extraction where the mine is intended to have a long life; *(section 5.5)*
   (d) provide for a residual risk report prior to conclusion of mining and abandonment of the mine site. *(section 5.4.3)*

Recommendation to the Minister for the Environment

8. That consultations be held with appropriate local authorities and representatives of the mining industry and an information publication be produced that provides advice to landowners on the negotiation of mining access arrangements. *(section 5.3.2)*

6.2.6 Compliance

The West Coast Regional Council has a large number of mining licences and resource consents to administer but limited staff and financial resources for compliance monitoring and enforcement of mining licence and resource consent conditions. These resources would be used to the best effect by prioritising resource consents according to the level of environmental risk presented by the mining operation and having mine operators carry out self monitoring programmes and report on their environmental management.

Recommendations to the West Coast Regional Council

9. That, where appropriate, a self monitoring programme with an annual compliance report, signed by the chief executive of the organisation owning the mining operation, be a condition of resource consents. *(section 5.4.2)*

10. That criteria be established for determining the acceptability of compliance reports *(section 5.4.2)* and residual risk reports. *(section 5.4.3)*

11. That a programme of Council audits of self monitoring programmes be drawn up with priority given to high risk areas. *(section 5.4.1)*

6.2.7 Mining licences, permits and resource consents

Mining operations often involve owners wanting to extend mining to areas not covered by existing mining licences, permits and resource consents. Under current legislation a miner is able to make applications for new permits, licences and consents resulting in a single mining operation having multiple permits and consents. This can cause difficulties with compliance monitoring and achieving uniform environmental management over the mine site.

Recommendation to the Minister of Energy and the Minister for the Environment

12. That the Ministers jointly consult with the mining industry and local authorities to review ways and means of ensuring uniform environmental management of mine sites subject to multiple licences and/ or permits and associated consents by providing for the amalgamation of multiple coal mining licences and permits where applicable. *(section 5.5)*

6.2.8 Enforcement

When compliance with permit or resource consents is not occurring, enforcement should be carried out by the relevant authorities. However, there is no effective sanction available for authorities to use if a mine operator persistently breaches or fails to comply with conditions of a licence granted under the Coal Mines Act 1979.

Recommendation to the Minister of Energy and the Minister for the Environment

13. That s. 107 of the Crown Minerals Act 1991 be amended to:
    (a) Empower local authorities, exercising functions under s.108 of the Crown Minerals Act 1991, to use the provisions of Part XII of the Resource Management Act 1991; *(sections 5.4.2, 5.5)*

    (b) Provide for existing coal mining licences (including licences held by the Coal Corporation of New Zealand Ltd) to contain a condition to the effect that all conditions in licences relating to environmental effects expire on 1 October 2001 and thereafter holders of licences shall be required to apply for resource consents under the Resource Management Act 1991. *(section 5.4.2)*

6.2.9 Bonds

The procedures for setting bonds could be rationalised to assist all affected parties, including the miner. Bonds are effective when they cover the likely risk and provide an incentive for mine operators to practice good environmental management.

Recommendation to the Minister for the Environment

14. That consultations be held with appropriate local authorities and representatives of the mining industry to establish a process for determining and managing bonds required as a condition of resource consents.

    This process will require local authorities to co-ordinate their environmental risk assessments and to provide for the following matters to be addressed when resource consent applications in respect of the same mining operation are being considered:

    (a) The level of total bond monies required each year to cover the overall environmental risk imposed by the mining operation in that year; *(section 5.4.3)*

    (b) A sliding time scale and criteria for varying the bond so as to reflect the total environmental risk imposed at the time

by the mining operation; *(section 5.4.3)*

(c) Establishing an estimate of residual environmental risk to be covered at the end of mining; *(section 5.4.3)*

(d) Whether bond monies required at the commencement of the mining operation should cover maximum environmental risk and be rebated as the risk diminishes or whether the total sum required be assessed at three year intervals so bond monies reflect the risk for the three year period immediately following the assessment; *(section 5.4.3)* and

15. That the agreed procedure for determining bonds is disseminated as a guide to local authorities. *(section 5.4.3)*

Recommendation to the Minister of Energy

16. That the appropriate local authorities be consulted before bonds provided as a condition of a coal mining licence are refunded. *(section 5.4.3)*

6.2.10
Mining liabilities

The effects of abandoned mine sites are a residual concern for public authorities. Because the Crown licensed these mines there remains a Crown responsibility to deal with the problem, particularly where no bonds were set to ensure restoration. Regional councils need to identify the location of these sites and the degree of environmental risk they impose. Sites with significant risk require a strategy as to how restoration might be achieved and who should pay.

Recommendation to the Minister for the Environment

17. That a policy is formulated for restoration of abandoned mine sites with significant environmental risk. *(section 5.6)*

6.3 Performance of public authorities on the West Coast

The concerns expressed by Roa residents and the Maruia Society, regarding the actions taken and not taken by public authorities on the West Coast with statutory responsibilities affected by coal mining and processing operations at Roa, have been found by this investigation to be justified. The authorities failed to take appropriate action to identify, evaluate and manage the effects of these operations when the scale of activity increased significantly. They also failed to carry out appropriate monitoring programmes and to respond promptly to concerns expressed by other public authorities and by the local community.

Since advice was given to the Minister of Energy on these failings, improvements in mitigating environmental effects have been made by the company operating the Roa Mine, and the West Coast Regional Council and the Grey District Council have shown a greater awareness of their responsibilities. A proposal under consideration at the time this report was in preparation, for the Grey District Council to transfer resource consent application processing and monitoring powers to the West Coast Regional Council, would, if implemented, assist environmental planning and management (as would implementation of recommendations made in section 6.2 above).

Recommendation to West Coast Regional Council and Grey District Council

18. That in controlling the environmental effects of existing coal mining and processing operations, the Councils take advantage of the provisions of s. 108 of the Crown Minerals Act 1991 which authorise the appropriate local authority as defined by s.30 or s.31 of the Resource Management Act 1991 to vary the terms and conditions of an existing licence in accordance with s.51 of the Coal Mines Act 1979. *(section 5.5)*

The Resource Management Act 1991 provides opportunities for improving public authority management of coal mining operations that were not available under previous legislation.

Recommendation to the West Coast Regional Council

19. That in controlling the environmental effects of future coal mining and processing operations the Council take advantage of provisions of the Resource Management Act 1991 which:

    (a) Impose a duty on any person, including a mining operator, to avoid, remedy or mitigate adverse effects on the environment (s.17 Resource Management Act 1991); *(section 5.4.2)*

    (b) Enable the Council to serve an abatement notice requiring the cessation of any mining or processing activity that is in contravention of any resource consent or which is objectionable to such an extent that it has adverse environmental effects (s.322 Resource Management Act 1991). *(section 5.5)*

Recommendation to the Grey District Council

20. That in controlling the effects of future coal mining and procesing operations the Council take advantage of s. 33 of of the Resource Management Act 1991 which authorises the transfer to the Regional Council of powers for processing resource consent applications and the enforcement of conditions attached to resource consents. *(section 5.4.2)*

In considering the exercise of their statutory responsibilities in relation to resource consents for mining activities, both Councils should note the provisions in the Resource Management Act 1991 which enable any person to apply to the Planning Tribunal for an enforcement order requiring compliance with the Act or a resource consent.

Glossary of terminology

Public Authority: Environment Act 1986 s. 2

(a) A Minister of the Crown
(b) A government department
(c) Any instrument of the Executive Government of New Zealand
(d) Any local authority

Public Authorities

DC	District Council
DOC	Department of Conservation
DOSLI	Department of Survey and Land Information
DSIR	Department of Scientific and Industrial Research
GoDC	Gore District Council
GrDC	Grey District Council
MFE	Ministry for the Environment
MOC	Ministry of Commerce
MOE	Ministry of Energy
ODC	Otorohanga District Council
RC	Regional Council
SDC	Southland District Council
SRC	Southland Regional Council
WCAHB	West Coast Area Health Board
WCB	Westland Catchment Board
WCRC	West Coast Regional Council
WRC	Waikato Regional Council

Coal Mining Companies

Francis Mining	Francis Mining Company Ltd, Greymouth
Glencoal	Glencoal Energy Ltd, Hamilton
Newvale	Newvale Coal Company Ltd, Gore

Miscellaneous

CMA	Crown Minerals Act 1991
CML	Coal Mining Licence (Coal Mines Act 1979)
RMA	Resource Management Act 1991

Lignite (or brown coal) is a soft, brown coal which has a high moisture content

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This report also obtained information from the Annual Plans, Annual Reports and Corporate Plans of the regional and district councils involved in this investigation.

Appendices

A. DSIR Report - Environmental Assessment of Roa Coal Mine, Greymouth Coalfield

B. Public authority questionnaire

C. Coal mining industry questionnaire

D. Chronology of correspondence and actions concerning Francis Mining's Activities at Roa Mine, West Coast

NEW ZEALAND
DEPARTMENT OF
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Geophysics

APPENDIX A

ENVIRONMENTAL ASSESSMENT OF ROA COAL MINE, GREYMOUTH COALFIELD

CONTRACT REPORT 1991/80

Prepared for

Parliamentary Commissioner for the Environment

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September 1991

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Appendix 1 Terms of reference and assessment outline for the Roa coal mine investigation.

Appendix 2 List of persons interviewed during the visit to Greymouth and Roa on 15-16 August, 1991.

Appendix 3 Analyses of water samples collected during the Roa coal mine inspection on 16 August 1991.

Analyses by DSIR Geology and Geophysics Groundwater Quality Research Laboratory, Christchurch.

ENVIRONMENTAL ASSESSMENT OF ROA COAL MINE, GREYMOUTH COALFIELD

Brian Paterson and Hugh Thorpe
(DSIR Geology and Geophysics, P O Box 29-181, Christchurch)

SUMMARY

An environmental impact assessment of the Roa coal mining operation was carried out by DSIR Geology and Geophysics for the Parliamentary Commissioner for the Environment as part of a comprehensive study of the extent to which existing regulation and control of coal mining in New Zealand are adequate to protect the environment and have been effectively administered by public authorities. Information has been received by the Commissioner indicating that the Roa opencast coal mine and the coal processing facilities were having adverse affects on the environment to an extent that warranted an investigation under provisions of the Environment Act 1986.

Investigation of the Roa coal mining operation involved assessment of:

a) the environmental impact and the appropriateness of the mining operation.

b) the adequacy and suitability of the conditions imposed on the mining licences to protect against environmental damage.

c) the effectiveness of monitoring enforcement and implementation of the conditions.

Documents supplied by the Commissioner were examined, a site inspection was made of the coal mine and associated coal processing site, and interviews were held with representatives of the Greymouth Mines Inspectorate, West Coast Regional Council, Department of Conservation, Francis Mining Co. Ltd and the Roa community.

Documents examined include existing licences for the Roa coal mine and the coal processing facilities, as well as applications for new licences at both sites for large-scale, future development of the mine.

It was concluded that the conditions in the existing mining licence are inadequate for achieving enforceability and environmental protection, and the conditions for the licence application, although an improvement, need revision and clarification.

If mining continues at Roa, severe local environmental damage is inevitable, particularly if opencast methods are used. However, it should be possible to minimise long-term environmental damage by well-planned mining, appropriate regulation and enforcement.

To minimise environmental damage the key issues are:

- batter design
- stability of spoil dumps
- control of surface water
- restoration of vegetation
- control of suspended sediment

Some improvement in all these aspects will be required to reduce the environmental impact of future mining. A scientifically-based restoration programme will be essential to enhance rehabilitation.

The environmental impact of the coal processing facilities is mainly restricted to the effects on the Roa residents who live nearby. These effects consist of:

- noise from machines and trucks
- coal dust from the site and from trucks travelling through the settlement
- traffic hazard of laden trucks on the narrow road between Roa and Blackball
- fumes from machines and trucks
- contamination of Ford Creek

Close proximity of the facilities to houses causes severe environmental effects although some effects could be reduced by improving some corrective measures and by implementing additional measures. If the processing plant and stockpile yard were moved further from the houses, only a minor reduction in noise and dust would be expected. The traffic hazard will increase if output of the mine increases.

1. INTRODUCTION

The Parliamentary Commission for the Environment is preparing a report for Parliament and appropriate public authorities on the extent to which legislative and administrative measures available for the allocation and management of coal mining licences and other associated resource management consents:

(i) are adequate to maintain and improve the quality of the environment;

(ii) have been effectively administered by public authorities.

As part of this study DSIR Geology and Geophysics was contracted to undertake an independent investigation of the Roa opencast coal mine to assess:

(a) the environmental impact and the appropriateness of the mining operation;

(b) the adequacy and suitability of the conditions imposed on the mining licences to protect against environmental damage;

(c) the effectiveness of monitoring, enforcement and implementation of the conditions.

Advice and recommendations were also sought on the necessity and methods of remedial measures.

A similar assessment of the coal processing facilities at Roa settlement was also included in the investigation brief.

1.1 Outline of the Investigation

This report is restricted to the coal mining and coal processing facilities at Roa operated by Francis Mining Co Ltd. No comparison has been made with coal mining operations elsewhere.

The findings of the investigation are based on observations made by the writers during a visit to the site and discussions with the mine manager on 16 August 1991, and information received on 15 August from discussions at Greymouth with representatives of the Ministry of Commerce Mines Inspectorate, the West Coast Regional Council and the Department of Conservation (Hokitika). A meeting was also held at Roa on 15 August with a group of local residents.

Background information including copies of coal mining licences etc, and correspondence from various sources relating to the Roa coal mining operations were provided by Mr D Gibbs from the Office of the Parliamentary Commissioner for the Environment. Representatives of the Maruia Society, Grey District Council and Francis Mining Co Ltd were also contacted by telephone prior to, or after the site visit.

This investigation is an independent assessment based on personal observations and interpretation of existing data -it does not include legal scrutiny of licences and related documents.

1.2 Site Description

The Roa coal mine is located on the Greymouth coalfield on the eastern slopes of the Paparoa Range overlooking the Grey River valley. The Roa settlement where the coal processing facilities are located is approximately 3 km northwest of Blackball township, in a narrow valley at the foot of steep slopes. An access road to the mine winds up steep forest-covered slopes along a ridge separating the Paparoa Creek (to the south) and Waterfall Creek catchments.

Paparoa Creek flows through the southern portion of the mine area. The terrain surrounding the mine is rugged and the streams have very steep courses. During the removal of overburden to extract coal an area of approximately 500 m x 250 m of forest has been cleared.

The geology of the Greymouth coalfield has been described in detail by Gage (1952). A more recent but less detailed geological map of the area was completed by Nathan (1978) who also carried out a comprehensive study of sedimentary basins (where coal measures accumulated) throughout the West Coast region (Nathan et al. 1986).

During development of the mine a more detailed picture of the complex site geology has emerged which has been documented by Francis Mining Co Ltd. The two main coal seams (Kimbell and Morgan) have a more complex outcrop pattern than previously envisaged due to folding and to a less extent, faulting. The steep dip of the coal seams and tight folding have led to a local concentration of coal near the ground surface favouring opencast mining methods.

1.3 History of Roa Coal Mine

Coal mining has been the main activity in the Roa-Blackball area since the 1880s. Most of the mining was underground. After closure of the main mines in the 1960s, mining was suspended until the Roa opencast mine commenced a small- scale operation in the 1980s. Since 1986 Francis Mining Co Ltd has increased the output of the Roa mine and have made an application for a new licence to allow opencast and underground mining to proceed on a larger scale. An application has also been submitted to extend the area used for coal processing at Roa.

Operations at the mine (except for periodic inspections and minor remedial work) and at the coal-processing site were suspended in March 1991 until the applications had been processed. It was not possible, therefore, to assess directly some of the effects of the operation such as noise, dust and the

use of heavy trucks at the Roa coal- processing site.

When the mine was operating, coal loaded at the mine with a hydraulic excavator was transported in 20-tonne truck loads to the Roa coal-processing site where it was screened, crushed, blended (when required) and stockpiled. It was then loaded on 35 tonne truck and trailer units and carted to the railhead at Stillwater. The route to Stillwater passes through the Roa and Blackball settlements, and to reduce the amount of coal dust given off in transit, the loads were damped down with water at Blackball.

During the period of underground mining, coal was transported from the mines to coal-handling facilities at Blackball and Roa via aerial ropeways and endless-rope inclines. A railway linked the coal-handling facilities at Roa and Blackball with Ngahere and Stillwater on the southern side of the Grey River valley.

The present coal-processing facilities at Roa are sited at the same location as the earlier establishment - the old shower block is incorporated in the existing building. Also, the portal of the West Tunnel and the site of the old Braeton settlement are located close to the opencast mine.

2. ENVIRONMENTAL IMPACT OF ROA OPENCAST COAL MINE

Comments on the environmental impact of the Roa opencast coal mine are based on observations by the writers during a site inspection on 16 August 1991. We were shown over the site by Brett Moynihan, Roa mine manager, who described the mining operation to date and plans for future mining.

Prior to the site visit, the area had been subjected over a two or three week period to high rainfall, which continued throughout much of the visit. This permitted observation of the effectiveness of the surface drainage during a period of high water runoff.

A description of the mine and its effects on environmental factors are as follows:-

2.1 Vegetation

Loss of vegetation throughout the mining area is the most significant effect, starkly contrasting with the surrounding native forest (Photo 1). Undisturbed forest extends up to the edge of the excavated batters around the perimeter except along the downslope side where spoil has encroached into the forest and some trees have been toppled.

During the site visit the writers did not enter the forest around the mine site. However, it was noticeable that although the forest growth is luxuriant, the upper stand of trees appear to be immature.

Disturbed ground in the southwest corner of the mine had a faint greenish tinge, the result of attempts to re-establish vegetation using lotus as a "nursery" plant. There were a few scattered seedlings of native plants on disturbed ground near the western boundary.

2.2 Soil

A thin layer of soil covers the undisturbed area outside the mine perimeter. The thickness of soil appears to be uniform irrespective of the nature of the source rock, i.e. coal measures rock, colluvium (slope debris), or fan alluvium (gravel). There was no recognisable soil on the surface of the spoil dumps, which indicates that the original top soil was not stockpiled and respread.

2.3 Surface Drainage

To date mining has extended across Paparoa Creek in the south, and has intersected a tributary of Soldiers Creek near the eastern tip. There is no doubt that side-cast material has entered these water courses, but the rainfall is so high and the water velocities so rapid that fine-grained material would be washed away immediately. Material remaining in the bed of Paparoa Creek consists of boulders which are quite stable even on the steep slope of the stream bed. The bed of Soldiers Creek was not inspected.

A water right was obtained to shift a short reach of Paparoa Creek to allow coal to be mined. A series of drainage paths have been established along excavated benches to collect run-off water and divert it via settling ponds into Paparoa and Soldiers Creeks. Run-off is rapid because of steep slopes and the lack of vegetation.

An intercepting channel across the northwestern slopes diverts seepage into the Paparoa Creek upstream of the mining area - this drain follows a high excavated bench for part of its length (Photo 2). Two drains established mainly across areas of spoil divert run-off into a settling pond with short overflows into Paparoa Creek on the western side of the mine perimeter (Photo 3). A long drain collects water from the northern sector , and together with several short drains, feeds into a small settling pond adjacent to the Kimbell coal seam near the eastern boundary. Overflow from this pond follows the main access road to the mine in a poorly-defined channel, and spills uncontrolled into Soldiers Creek near the hut.

Run-off from the batters south of Paparoa Creek collects on the main bench and spills over the edge

of the spoil dump into the creek. Downstream from this point during high run-off, several flows emerged from the spoil dump about mid way up the slope. These flows had been active in the past, eroding gullies and causing local slumping of the spoil heap. The resulting instability of the bank can be compared with the more stable opposite bank of Paparoa Creek.

The western settling pond is large and deep (Photo3) and it appears to cope with the minor sediment inflow. The smaller eastern settling pond which has a higher inflow, is completely filled with sediment - to be effective it needs to be enlarged considerably and maintained regularly.

Despite the heavy rain and high run-off during the site visit, the suspended sediment load of the drains was lower than expected, apart from a highly discoloured minor flow from a gully near the northwestern corner (Sample 1). In general, the spoil appears to break down to a sandy grit with only minor silt/clay content. Despite the generally coarse-grained nature of the spoil, water drains across the spoil surface without noticeable infiltration. However, the drains with steep profiles are eroding the spoil in some areas, causing blockages of the channels, and diversion of the flow over the edge of benches. Regular maintenance of the drains is required to prevent further erosion.

With a few minor exceptions, the water draining the mining area was only moderately discoloured. As a general indicator of sediment content, water samples were collected from Paparoa Creek at the upstream (Sample 2) and downstream (Sample 3) boundaries of the mining area. All water samples were analysed for pH, alkalinity, total suspended solids and conductivity. Results of the analyses and visual estimates of flow rates are given in Table 1.

The results indicate that the mine drainage is not acidic, and although the highly discoloured sample from the mine has a high suspended sediment content, it is highly diluted, as indicated by the relatively moderate increase in suspended sediment load downstream of the mine. However, the suspended sediment load of 137 g/m^3 for sample 3 would be of concern to West Coast Regional Council (pers. comm. P. Hill).

After the site inspection, water samples were taken from Paparoa Creek (Sample 4) and Ford Creek (Sample 5) at the confluence near Blackball to compare the amounts of suspended sediment (Table 1). Water from Ford Creek which drains an area north of the mine was slightly less discoloured than the Paparoa Creek sample - this is confirmed by the analyses in Table 1.

Table 1. Analyses of water samples

Samples	pH	Alkalinity (as HCO_3) g/m^3	Conductivity Ms/m @25 C	Total Solids g/m^3	Flow Estimate l/s
1.	6.2	4.3	1.4	5200	trickle
2.	6.5	3.7	3.1	12.8	300
3.	6.6	5.5	3.4	137	300
4	6.7	9.2	5.4	23.6	1500
5.	6.5	8.5	8.2	17.3	2400

1 = Minor flow on Roa mine

2 = Paparoa Ck at mine entry

3 = Paparoa Ck at mine exit

4 = Paparoa Ck at Blackball

5 = Ford Ck at Blackball

The outcome of the sampling is only a general indicator of the amount of suspended sediment being generated in Paparoa Stream by the mine. A more rigorous survey would be required to obtain more meaningful results - other factors such as water chemistry and the effects on stream fauna would need to be assessed. Also, the sampling was carried out after a significant period without mining.

2.4 Slope Stability

The stability of the highwall and spoil dumps are important considerations at the mine site.

I) Highwall stability

The highwall varies in height and batter design according to the nature of the rock-mass and to some extent the proximity of the coal seams. The influence of rock-mass properties on batter design can be observed along the Kimbell coal seam, where steep high batters have been constructed in competent sandstone, whereas adjacent batters in mudstone are prone to block failure, necessitating the construction of benches. The highest batters above the coal seam appear to be stable, and are free of loose blocks that would pose a threat to workers

extracting coal at the base of the slope. These slopes are unlikely to present a long term hazard to recreational users of the area when mining has ended.

Elsewhere on the site, batters constructed in coal-measures rocks appear to be stable except for slope debris exposed in the highwall between Soldiers Creek and the Kimbell coal seam which has slumped locally, indicating its low shear strength. If further mining takes place in this area, the extent of similar material should be delineated during surface geological mapping so that the mine plan can be modified accordingly.

(ii) Stability of spoil dumps

North of Paparoa Creek, the only noticeable sign of spoil instability was along the edge of a bench in the vicinity of the western settling pond where material had slumped down the batter, forming longitudinal tension fractures. Surface water was draining into one of the fractures in the underlying mass of spoil. This local area of instability probably resulted from undercutting of the batters below, for construction of a bench drain, and excavation of an access track across the batter face between the benches. This is a localised slope failure which probably doesn't require remedial treatment.

The surface of the spoil was slightly spongy, but this was interpreted as an effect of a recent snowfall and prolonged rainfall. Despite the assortment of grain size and the apparent lack of clay in the spoil, surface runoff on the spoil was high. This could be due to effective sealing by fine-grained surface material and/or good compaction of the underlying spoil.

In the sector south of Paparoa Creek, one of the earliest areas mined, the side-tipped spoil extending down-slope to Paparoa Creek is the area most affected by erosion and slumping. This is probably due to the lack of a well-designed system of benches and surface drainage, and consequent erosion from inadequately controlled run-off and subsurface seepage. The method of side-tipping with apparently no benching of the spoil or control of run-off has probably exacerbated the problem.

2.5 Summary of Observations at the Mine

Site conditions indicate the importance of several factors in reducing the environmental effects of opencast mining at Roa. These are:

a) A pre-determined general plan of development of the mine including the sequence of mining and disposal of spoil.

b) Well-planned, surface drainage co-ordinated with batter design and incorporating efficient sediment retention.

c) A method of placing spoil, e.g. benching, which enhances stability and reduces spilling into water courses and undisturbed forest.

d) The establishment of a professionally researched vegetation rehabilitation programme.

The mining operation has shown deficiencies in these aspects, particularly in the sector of the mine south of Paparoa Creek. Although lotus is growing on the spoil in this area, additional measures will probably be required to establish vegetation that would be both compatible with the surrounding native bush, and successful in stabilising the spoil.

The more recent operation north of Paparoa Creek shows a distinct improvement, particularly in batter design, spoil dumping, surface water disposal and sediment control.

2.6 Comments on the Appropriateness of Opencast Mining

Opencast mining at this site has been successful in extracting the near-surface coal and it could continue to be successful in association with underground methods. If the factors a) to d) mentioned above are adhered to, it should be possible to continue mining with less short and long-term environmental damage than has occurred, given that as mining proceeds there is greater flexibility on a larger site to dispose of spoil in a more acceptable manner.

The visual effect of opencast mining in steep, heavily-bushed areas is irrefutable. However, if rehabilitation is successful, the short-term damage may be acceptable to allow exploitation of the coal, provided that effective methods are used to restore vegetation. Results of current research on rehabilitation of areas affected by mining should be applied where appropriate and this should be supplemented by site-specific research by recognised authorities (Mew and Ross, 1991).

3. LICENCE CONDITIONS FOR ROA OPENCAST COAL MINE

In this section an assessment is made of the suitability and adequacy of conditions imposed on the mining licences as well as their implementation and enforcement.

The coal mining licences examined are:-

i) Licence 34-056 issued to McMahon and Fischer on 30 July 1985.

ii) Licence 34-066 issued to Roa Coal Mines on 23 March 1987.

iii) Licence application 37-148 by Francis Mining Co. Ltd and Blackwater Coal Co. Ltd.

Local-authority authorisations relating to the coal mining licences such as water rights were also examined.

3.1 Suitability and Adequacy of Licence Conditions

The schedules of conditions for licences 34-056 and 34-066 appear to be identical whereas significant changes have been introduced in the conditions for licence application 37-148.

In general terms, some of the conditions listed in all licences are not relevant to the Roa mine, and some other conditions are unrealistic in terms of restricting environmental damage. In the first case, it appears that a number of standard conditions are included in all mining licences whether or not they are relevant to each mine, e.g. ensuring safety of livestock. However, licence conditions (34-056 and 34-066) such as the following are considered to be unrealistic with regards to prevention of environmental damage, e.g.

i) no depositing of soil, rock or debris in any watercourse.

ii) no significant alteration of the natural colour and clarity of any natural waters.

iii) replacement of topsoil on overburden spoil.

iv) grading of spoil dumps to a maximum slope of one vertical in five horizontal.

If these conditions outlined in licences 34-056 and 34-066 were strictly enforced it would be impossible to operate the Roa opencast mine. With such a conflict between site conditions and licence conditions, the latter were unenforceable. It was then left to the mines inspector to use personal judgement on the acceptability of the performance of the mining company. A revision of the conditions is necessary to address this problem.

An attempt was made in licence application 37-148 to formulate conditions more appropriate to the

site and methods of mining. The number of conditions was increased from 32 to 42, which led to some repetition and overlap. However, the main effect has been to be more specific and more detailed about the standard required, particularly in the important aspects of the disposal of spoil and site rehabilitation. In some other aspects for which conditions are difficult to define in realistic terms, they are formulated in more general terms.

The conditions attached to the licence application are more realistic than for the earlier licences, and should result in better control of the environmental effects, provided that the regulating and monitoring agencies exercise their control. However, there is a need to remove repetition and overlap, and to consult with the regulating authorities on their ability to monitor the operation effectively and on the adequacy of the controls.

Comments on specific items of concern in the mining application are outlined below:-

i) Soil salvage and replacement - The detailed conditions may not be entirely realistic in view of the minimal thickness of soil on the present site. However, a thicker mantle of soil may occur in parts of the extended area of future mining so it may be advisable to retain the conditions.

ii) Control of suspended sediment - It appears that the regulating authorities recognise that some suspended sediment will reach natural water courses (condition 25) and that a water right will be required to control change of the quality of natural water (condition 23c). It is inevitable that some change of water quality will result from mining in this area - hence it follows that a water right will be required before mining can proceed. However, the necessity for sediment retention ponds is not explicit in the conditions (except by inference in condition 28) - this omission should be rectified by including a condition similar to 28 from licence 34-056.

As there are no definitive controls of sediment content mentioned in the conditions, it is assumed that such controls will either be excluded, or they will be stipulated in the water right. Establishment of definitive levels could be beneficial - consultation would be required, however, to ensure that the levels and sampling procedure are realistic for the Roa environment.

iii) Deposition of spoil in and near water courses - To avoid material encroaching into water courses as a result of dumping of spoil, the practice of indiscriminate side-casting will need to be banned or controlled, e.g. with establishment of benches etc. Condition 2 indicates that side-casting may be permitted under certain circumstances - presumably the conditions outlined in 31, 32 and 33 will provide adequate control to avoid repetition of problems that exist south of Paparoa Creek.

Plans for future development described by the mine manager involve diversion of natural watercourses along channels through areas of spoil. Water rights required for such work will need to incorporate conditions to restrict movement of debris and sediment into the water courses and to ensure that the integrity of the diversion channels is maintained. Under these circumstances it is presumed that the necessity for a 10 m buffer zone stipulated in condition 21 will be waived.

3.2 Mine Work Plans

Licences 34-056 and 34-066 require a proposed annual work programme to be submitted prior to commencement of mining, followed by annual progress reports and forward work programmes. Condition 26 of both licences also sets out a requirement for a plan detailing methods of stripping and stockpiling topsoil and overburden.

The conditions laid down in mining application 37-148, including those related to rehabilitation, also require detailed annual plans to be submitted for approval. Because rehabilitation is of prime importance in a large-scale, opencast mining operation the amount of detail required in the mining application is considered to be necessary. Annual plans should include estimates of volumes, depths and areas affected by excavation, stockpiling and disposal of overburden. The information should be presented in a form that can be readily understood by the regulatory authorities. However, it should be recognised that mine plans are unlikely to be very precise, because of difficulties in predicting subsurface conditions. Modifications to the plans are usually required as mining proceeds.

3.3 Implementation of Licence Conditions

Assessment of the performance of the mining company varies according to the standards applied, i.e. whether they are the conditions laid down in licences 34-056, 34-066 or licence application 37-148.

Measured against the conditions of licences 34-056 and 34-066, the mining company has not adhered to the conditions relating to deposition of debris and suspended sediment in water courses, maintenance of a buffer strip, stockpiling of topsoil and regrading of spoil dumps.

According to the conditions outlined in 37-148 the mining company has been deficient in ensuring stability of some overburden stockpiles, rehabilitation of disturbed ground and sediment retention.

3.4 Monitoring and Enforcement of the Conditions

Considering the difficulties involved in enforcing conditions that were inappropriate to the site and

to the type of mining, and the rugged nature of the site, including the high rainfall experienced, the regulating authorities have been successful in restricting environmental degradation to a moderate level.

The deficiencies outlined above in section 3.3 are the joint responsibility of the mining company and the regulating authorities. Under updated conditions for large-scale mining, it is essential that the mining company and the regulating authorities are satisfied that the environmental standards formulated are both realistic and achievable. It is then up to the regulating authorities to ensure that the standards are adhered to.

3.5 Remedial Measures

The extent of remedial measures required at the mine depends on whether future mining will take place. If mining does not proceed, the entire site will need to be rehabilitated to promote regrowth of vegetation, and the present surface drainage system will need to be reassessed to determine its suitability in the long term. In either case, remedial measures are required to improve surface drainage and to reduce erosion of spoil dumps south of Paparoa Creek.

The existing problems south of Paparoa Creek stem from a batter design which does not allow run-off to be properly controlled, leading to seepage through, and erosion of the side-cast spoil. This problem needs to be solved before revegetation is attempted. To this end a rehabilitation plan is required, involving recontouring of the batters and the spoil dump, as well as re-establishment of an effective surface drainage system. Once this has been completed and is operating effectively, appropriate revegetation measures can be applied.

4. ENVIRONMENTAL IMPACT OF THE ROA COAL PROCESSING FACILITIES

The coal processing facilities are located at the western end of Roa settlement at the end of the Roa-Blackball road. The site is on gently sloping land at the foot of the main ridge which leads to the mine. A yard for stockpiling the coal has been levelled off, with surface drains leading northwards to Ford Creek a short distance away. Occupied dwellings on either side of the Roa-Blackball road are adjacent to the site.

The facilities had not been operated for several months prior to the inspection on 16 August 1991. Hence it was not possible to assess the extent of noise and dust problems mentioned by the residents. However, it was apparent from the nature of the coal, with its high carbon content, and the close proximity of the houses to the coal-yard and the open-air screen, that operation of the facilities,

including the transport of the coal in heavy trucks through the settlement must have a significant effect on the lives of local residents.

The effects described by the residents during the meeting on 15 August, and documented in correspondence supplied by the Parliamentary Commissioner for the Environment are discussed below. Comments on these aspects are limited to observations made by the writers during the site inspection and interpretation of documentary information.

4.1 Noise

The residents reported that while the facilities were operating, the noise created by trucks travelling from the mine to the railhead, the loaders and the screen plant are unacceptable. Also, during peak periods, the operations extend beyond "normal" working hours exacerbating the problem.

4.2 Dust

Dust from the coal-processing facilities and from trucks carting coal to the railhead was identified as a problem by the residents. Water is used at the Roa site to lower the level of dust, but the residents claim that it is ineffective. The coal carried in trucks is not dampened with water until they reach Blackball, after they have travelled through Roa settlement.

The residents point out that the dust is very fine and "penetrative", i.e. it settles in the houses, and blackens objects readily because of the high carbon content. It is also a difficult coal to dampen effectively because it forms a superficial crust which repels water.

4.3 Traffic Hazard

According to the Roa residents, the truck-and-trailer units which carry 35 tonne loads of coal on 40 round trips a day to Stillwater are a hazard to local residents and other road users, particularly on the narrow road between Roa and Blackball. The sealed surface of the road is deteriorating as the result of the heavy loadings and little has been done to repair the damage.

Sections of the road, particularly between the Ford Creek bridge and Blackball, are too narrow for two-lane traffic which includes heavy trucks. The road surface is in need of repair and the outer edge of the road has slumped in places where there is a considerable drop to Ford Creek. If the output of the mine is increased, this section of the road needs to be upgraded.

Alternative routes for transporting coal from Roa were investigated briefly during the site visit. The

alternatives consist of routes within the Roa valley, and in the valley to the south occupied by Paparoa Creek and Soldiers Creek.

In the Roa valley sufficient space exists to construct a road north of the existing one close to Ford Creek. This route would by-pass the settlement near the coal-processing site, but it would offer no improvement for the remainder of the Roa settlement and for Blackball residents. Use of the abandoned railway on the other side of the valley would by-pass most of the Roa settlement, and Blackball township. However, the cost of renewing bridges and upgrading the railway embankment could be prohibitive.

In the valley further south, use could be made of existing forestry and mine-access tracks which extend upstream from the bridge on the Taylorville-Blackball Road into the upper catchment of Soldiers Creek. The route crosses Paparoa Creek and climbs on to the ridge separating the Paparoa and Ford Creek catchments and follows the ridge westwards to intersect the existing access road to the Roa mine.

The section of this route downstream from the Ford Creek/Paparoa Creek confluence was investigated during the site inspection. The track along the true left bank was negotiated without difficulty in a car. Members of the Roa community reported that other tracks had been constructed further upstream for access to another coal-mining prospect. It was reported by the mine manager that on this route it would be difficult to achieve suitable grades to link up with the existing access road to the Roa mine.

The feasibility of this route would need to be assessed by an engineer. If the route followed existing tracks for a substantial distance the effect on the environment of further construction may be acceptable, particularly if the road could be shared. This route would be attractive if the coal-processing plant was shifted closer to the mine as suggested by the mine manager. It would have the added advantage of diverting all heavy traffic away from the Roa and Blackball communities.

4.4 Contamination of Water Supplies

The problems experienced by local residents as the result of contamination of domestic water by activities associated with the Roa coal mine are well documented in background correspondence.

One of the residents, Mr Bannister, holds a water right to extract water from Stony Creek for a plant nursery, but contamination of the water supply as a result of a landslide from the mine access road has badly affected the supply. Mr Bannister reported that this is affecting the viability of his nursery business to the extent that staff may have to be laid off.

Domestic water supplies to several of the homes at Roa were also contaminated by mining activities. The mining company assisted in establishing an alternative water supply - according to the residents this supply is affected by heavy frosts, and the flow at some homes is inadequate. In general, a satisfactory solution regarding water supply could have been reached if the mining company had co-operated at an early stage in assisting the residents to establish an alternative water supply.

The contamination of Ford Creek reported by the Roa residents was not investigated thoroughly during the site inspection because of restricted time. The stockpiles of crushed coal near Ford Creek outside the perimeter of the stockpile yard (photographed on 22-2-91 by Roa residents) had been removed and the area where other photographs were taken of contaminated run-off was not inspected.

A cursory inspection along Ford Creek revealed a recent slope failure on the left bank opposite the coal processing yard. Debris from the slope failure discoloured the water, and scars of other slope failures were visible further upstream, indicating additional natural sources of suspended sediment.

Because of the proximity of the coal processing facilities to Ford Creek, it is inevitable that coal fines from the extensive stockpile yard will cause contamination unless it is intercepted by an effective sediment retention system. This issue should be addressed, and standards set, by the West Coast Regional Council as part of their responsibility in monitoring the conditions set in the water right granted recently to the mining company.

4.5 Summary of Roa Residents' Concerns

It appears that most of the residents' concerns regarding the impact of the mining company's activities on their lives would be solved if the coal-processing facilities were moved out of the settlement, and the traffic hazard removed. The residents emphasised that they are not opposed to mining at Roa - it is the processing facilities and the heavy coal trucks that are the main concerns.

The main concerns of the residents would not be resolved if the processing plant was moved a short distance away from the present site adjacent to the houses. Improvement of the road between Roa and Blackball would reduce the traffic hazard, but this would be counteracted by an increase in the number of heavy trucks when the output from the mine is increased.

5. ANCILLARY LICENCE CONDITIONS FOR THE ROA COAL PROCESSING FACILITIES

The main documents relating to the Roa coal processing facilities consist of ancillary coal mining licence 34-076 issued to Roa Coal Mines on 9 November 1988, and application 34-056-01 for an ancillary

coal mining licence submitted by Francis Mining Co. Ltd. on 30 November 1990. Other associated documents include a water right and an air pollution control licence to operate coal screening and processing plant.

5.1 Suitability and Adequacy of Licence Conditions

Licence 34-076 relates to an area of 1.3 hectares of land to be used for coal storage and ancillary work.

Many of the conditions are the same as those used for the mining licences described in section 3.0 of this report - hence they appear to be standard conditions and as such are not all relevant to specific sites or to specific operations. Some of the important conditions for controlling environmental damage are specific to mining operations or the construction of access tracks, and hence could be ruled to be inappropriate and unenforceable in terms of the ancillary licence. However, the conditions governing effects of the operation on water quality should be adequate to prevent environmental damage.

There are no conditions in licence 34-076 to control important environmental effects such as noise and air pollution.

Licence application 34-056-01 applies to an area of 6.9 hectares of land including the area covered by licence 34-076. The extended area forms a new boundary along Ford Creek and has a common boundary with one of the occupied dwellings. It also includes lots 20-38 which according to the survey plan have been allocated to the Department of Conservation (DOC). The Roa residents reported that they had obtained approval from DOC to use these sections of land to develop a nature reserve - if so, this portion may not be available for use by the mining company.

The draft conditions proposed by the Greymouth Inspector of Coal Mines for licence application 34-056-01 are more specific to the coal-processing operation than those attached to licence 34-076. A buffer strip 20 m wide is proposed between Ford Creek and the operation, and safeguards for the preservation of water quality are outlined. The control of noise, dust and working hours which is also included, should be adequate for monitoring and regulation.

The application is supported by a submission from consultants, Carryer and Associates Ltd on behalf of Francis Mining Co Ltd, and a completed environmental questionnaire required by the Ministry of Commerce. According to the submission, Francis Mining Co Ltd have agreed to carry out certain works and improvements to the existing site which are put forward as justification for extending the current boundaries. The improvements include settling ponds and a building for staff toilets and lunch room. It is their intention to move the screening plant and stockpile yard as far as possible from neighbouring houses, and to plant trees to reduce the noise and dust. Although these measures should

reduce noise and dust, the improvement is unlikely to be very significant, and the problem of heavy trucks on the road will remain unsolved.

Resiting of the plant and stockpiles, and rehabilitation of the present site to reduce environmental effects are not included in the list of conditions. If the granting of the licence is conditional on the completion of these improvements it may be necessary to incorporate them as licence conditions. An alternative is to ensure that they are included in the plan submitted to the Inspector of Coal Mines prior to recommencement of work.

5.2 Implementation and Enforcement of Licence Conditions

Roa residents have documented the use of land, by Francis Mining Co. Ltd, outside the existing licence boundaries. This is confirmed on plan (Ref. 3132) prepared by Cowan and Holmes, Greymouth in November 1990 and was evident during the site visit. The regulatory and monitoring authorities were ineffective in supervising this aspect.

It appears that a water right was not obtained for discharge of stormwater from the coal stockpile yard until 19 July 1991, when the West Coast Regional Council issued a water right for the disposal of stormwater and for the extraction of water for dust suppression and other uses on the coal processing site. According to condition no. 12 of licence 34-076 the discharge should not have been permitted previously without such a water right. However, it is important that with the granting of the licence, and in the absence of data from this inspection, the council should determine whether the existing sediment retention system is adequate to prevent future contamination of Ford Creek.

A secure fence should be erected around the site to ensure the safety of the public. This is particularly important because of the proximity of the site to occupied houses.

5.3 Remedial Measures

The sediment retention system should be upgraded if it does not meet the standards stipulated by the water right. Other improvements such as upgrading the dust suppression procedure, and planting trees along the boundary between the coal processing yard and the houses should be carried out before operations recommence. If the facilities are abandoned the site will need to be restored as required under the terms of the existing licence.

6. CONCLUSIONS

6.1 Roa Coal Mine

1) If mining continues at Roa, severe local environmental damage is inevitable, particularly if opencast methods are used. However, it should be possible to minimise long-term environmental damage by well-planned mining, appropriate regulation and enforcement.

2) Conservation values at the Roa mine do not appear to be outstanding or unique. The natural ability for vegetation to regenerate at the site has not been determined. However, scientifically-based restoration will be essential to enhance rehabilitation.

3) To minimise environmental damage at the Roa mine the key issues are:-

- batter design
- stability of spoil dumps
- control of surface water
- restoration of vegetation
- control of suspended sediment

Some improvement in all these aspects will be required to reduce the environmental impact of future mining.

4) Remedial measures should be carried out south of Paparoa Creek to reduce long-term instability of side-cast spoil and to facilitate rehabilitation.

5) Conditions set out in mining licences should be site- specific, realistic and enforceable. The conditions in the existing licence are inadequate for achieving enforceability and environmental protection, and the conditions for the licence application, although an improvement, need revision and clarification.

6.2 Roa Coal Processing Facilities

1) The environmental impact of the coal processing facilities is mainly restricted to the effects on the Roa residents who live nearby. These effects consist of:-

- noise from machines and trucks
- coal dust from the site and from trucks travelling through the settlement

- traffic hazard of laden trucks on the narrow road between Roa and Blackball
- fumes from machines and trucks
- contamination of Ford Creek

2) Although the coal-processing facilities were not operating during the site inspection it was apparent that, due to the proximity of the facilities to the houses, some environmental effects are unavoidable. It was also apparent that some of these effects could be reduced by improving some corrective measures and by implementing additional measures.

3) The mining company has been using land outside the legal boundaries defined in the licence, including an area adjacent to the nearest dwelling. They were also discharging stormwater via settling ponds into Ford Creek without a water right - this has been rectified recently.

4) If permission is granted for the use of additional land at the existing site, and the mining company moves the plant and stockpile yard further from the houses as intended, only a minor reduction in noise and dust is expected. The number of heavy trucks and machines will increase to cope with the intended increase in coal output.

5) Narrow sections of the Roa-Blackball road are substandard and hazardous for two-lane traffic including heavy trucks. Improvements will be necessary to improve safety if use by heavy trucks continues.

6) It is unlikely that the environmental effects can be reduced to a level acceptable to the Roa residents while the coal-processing remains in the Roa valley. Although some of the effects may be reduced by relocating the processing plant elsewhere in the Roa valley, the problem of heavy trucks on the road is likely to remain. Improvements to the road could reduce this hazard.

7) Francis Mining Co Ltd. have indicated an interest in establishing or relocating the coal-processing plant near the coal mine. An alternative access route to the Roa coal mine has been suggested. This route follows the valley south of Roa, by-passing Blackball and Roa settlements. It would intersect the present access road to the mine near the ridge crest south of Roa settlement.

7. RECOMMENDATIONS

Several issues should be investigated and resolved before approval is given for further mining at Roa.

These issues are:-

1) Revision of the licence conditions to the satisfaction of the regulatory authorities and the mining company.

2) Consultation with Department of Conservation, DSIR Land Resources and Forest Research Institute Ilam regarding the enhancement potential for revegetation of spoil dumps at the Roa site.

3) Suitable remedial measures should be implemented, in the area south of Paparoa Creek, to stabilise existing spoil dumps.

4) Investigation to establish the feasibility of an alternative access route to the Roa coal mine, by-passing Blackball township and Roa settlement.

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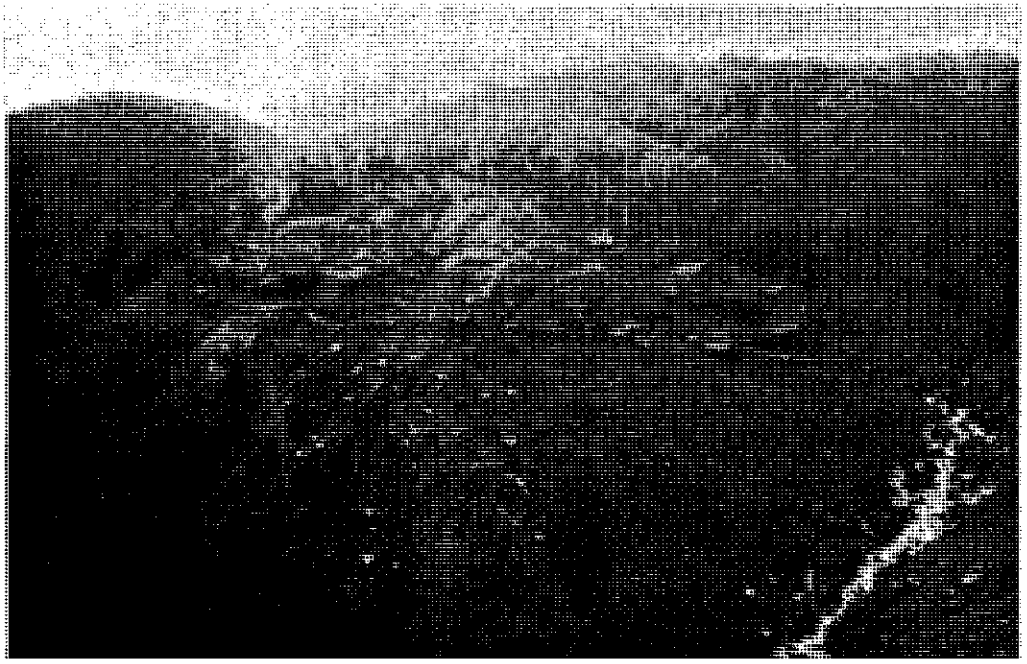

PHOTO 1. View looking west at spoil dumps and headwall of Roa mine. Early section mined is left (south) of Paparoa Creek. Mine access track in right foreground.

PHOTO 2. Drain intercepting run-off along western perimeter of Roa mine.

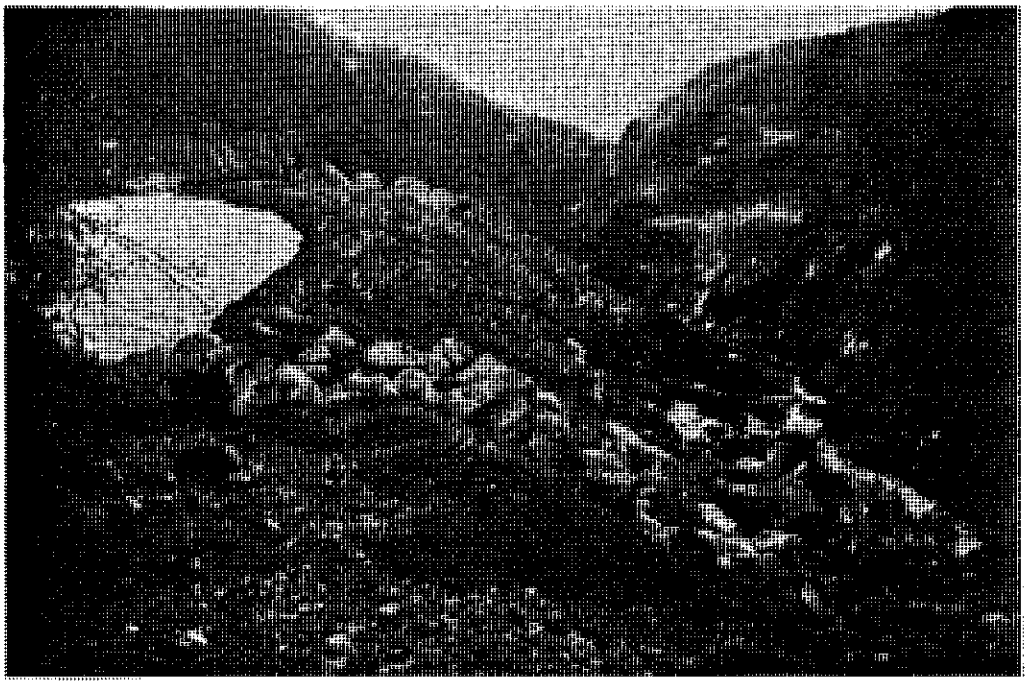

PHOTO 3. Large settling pond with overflow channels into Paparoa Creek near western perimeter of Roa mine.

APPENDIX B

Public authority questionnaire

PLEASE COMPLETE AND RETURN THIS CONFIDENTIAL QUESTIONNAIRE BY WRITING YOUR COMMENTS IN THE SPACES PROVIDED

(**NB:** "Coal mining licence", as referred to in this questionnaire, means any type of resource consent under the Resource Management Act 1991 associated with a coal mining activity, or a coal mining permit under the Coal Mining Act 1979)

ADMINISTRATIVE PROCEDURES

1. Do you have a manual of procedures for dealing with "coal mining licence" applications and their subsequent administration once granted?

2. Do you have a training programme in operation for staff who deal with monitoring and enforcement of "coal mining licences"?

CONDITIONS

3. Can you give an example of conditions on a "coal mining licence" which you consider are not practical or are unenforceable?

4. How many coal mining sites are there in your geographical area of jurisdiction where problems of rehabilitation are experienced?

MONITORING OF CONDITIONS

5. What analytical services do you use or contract for when monitoring "coal mining licences"?

6. How often in a 12 month period do your staff visit each coal mining site in their geographical area of jurisdiction?

7. What sort of records/data are kept by your organisation to enable you to know when there is a breach of conditions of a "coal mining licence"?

COMPLIANCE

8. Does your organisation keep a register of complaints about coal mining activities or impacts?

9. Has there been any coal mining activities in your area for which:

a) an enforcement order, or
b) an abatement notice, has been issued, or
c) a prosecution taken?

Thank you for spending time to complete this questionnaire.

If you have any queries please contact either:

Doug Gibbs
Wendy Basire (Mrs)
Investigating Officers
Office of the Parliamentary Commissioner for the Environment
Phone (04) 471-1669 Wellington

PO Box 10-241
WELLINGTON

APPENDIX C

Coal mining industry questionnaire

PLEASE COMPLETE THIS CONFIDENTIAL QUESTIONNAIRE BY WRITING YOUR COMMENTS IN THE SPACES PROVIDED

(**NB:** "Coal mining licence", as referred to in this questionnaire, means any type of coal mining resource consent under the Resource Management Act 1991 or a coal mining permit under the Coal Mining Act 1979)

CONDITIONS

1. Can you give an example of conditions on a licence which are not practical and are unenforceable?

2. Do you have a coal mining rehabilitation plan? Does rehabilitation commence before you have finished extracting coal?

MONITORING OF CONDITIONS

3. How often does the Inspector of Coal Mines (Ministry of Commerce) and staff from regional and district councils in your area visit you?

4. Do you carry out any of the following environmental monitoring activities? If yes, how often?

a) Measure dust/air pollution levels

b) Measure noise levels

c) Test water quality downstream from any mining activity

Thank you for spending time to complete this questionnaire. We will be sending a copy of our final Coal Mining Report to you once it has been completed in October 1992.

Doug Gibbs
Wendy Basire (Mrs)
Investigating Officers
Office of the Parliamentary Commissioner for the Environment

The questionnaire was sent to the following mining companies:

1. Crooks Farm Mine,
   P O Box 664, Hamilton

2. Coal Corporation of New Zealand Ltd,
   Customer Services Centre (North Island),
   P O Box 99385, Auckland

3. Glencoal Energy Limited,
   P O Box 9300, Hamilton

4. Francis Mining Company Limited,
   P O Box 436, Greymouth

5. Dunollie Coal Mines Limited,
   P O Box 18, Greymouth

6. Coal Corporation of New Zealand Ltd,
   Customer Services Centre (South Island),
   P O Box 250, Westport

7. New Zealand Forest Products, Mataura Paper Mills,
   P O Box 9, Mataura

8. Kai Point Coal Company Limited,
   P O Box 50, Balclutha

9. Newvale Coal Company Limited,
   P O Box 151, Gore

APPENDIX D

Chronology of correspondence and actions concerning Francis Mining's activities at Roa Mine, West Coast

DATE	ACTION
1/2/83	Westland Catchment Board (WCB) advises Mines Division of the Ministry of Energy (MOE) of standard conditions in Coal Prospecting Licence 34 018
10/7/89	WCB issues consent (with conditions) to Francis Mining for authority to divert Paparoa Creek.
21/9/89	WCB requests MOE, Greymouth, to enforce conditions on CML 34 056 for revegetation.
21/9/89	WCB request to Francis Mining to comply with condition (c) of its coal mining licence of Paparoa Creek diversion authority and place heavy rock at toe of overburden dump.
27/9/89	MOE, Greymouth, request to Francis Mining for revised workplan on stripping operations and protecting Paparoa Creek from overburden.
9/2/90	Francis Mining's Application 37 148 for a coal mining licence is acknowledged.
12/2/90	Maruia Society objects to Ministry of Commerce (MOC) on CML 37 148 application and breaches of conditions of current licence causing erosion and pollution.
27/2/90	Maruia Society seeks information from West Coast Regional Council (WCRC) on compliance to keep overburden out of creek.
6/4/90	WCRC reports to Maruia Society on results of site inspection and states heavy rock placement at toe of overburden will be carried out.
29/4/90	Maruia complaint to Minister of Energy on the operations of Francis Mining.
2/5/90	Complaint to WCRC concerning pollution of water and need to protect water right on Stony Creek.
- /5/90	Maruia geologist assesses requirements for CML application area 37 148 and states overburden disposal plan required.
22/5/90	Department of Conservation (DOC) report on site inspection of 27/4/90 indicates draft conditions for 37 148 are weak. Opposed to opencast mining on site.

24/5/90	WCRC issues consent to Francis Mining for clearing vegetation and stockpiling overburden. Conditions include sidecast material to be kept out of Paparoa and Soldiers Creeks. Revegetation plan to be implemented.
-/7/90	Minister for the Environment expresses concern to WCRC on the regulation of mining operations for control of water and soil aspects. (Letter undated)
4/7/90	WCRC advises Maruia Society that s.34 permit (under W&SCA 1967) issued. Stabilisation and revegetation of overburden to be carried out in spring.
6/7/90	Minister for Environment expresses concern to Minister of Energy on unclear responsibilities of Mines Division of former MOE and regional council for monitoring and enforcement.
11/7/90	West Coast Area Health Board (WCAHB) identifies dust and noise problems to Grey District Council. Clean Air licence required. Diesel fumes should be controlled. Water supplies were polluted.
24/7/90	WCAHB requests WCRC take action to protect drinking water supplies by requiring alternative supplies.
30/7/90	Maruia Society expresses concern to WCRC over s.34 permit, stating expansion of mining not desirable given lack of compliance.
31/7/90	DOC, West Coast, requests Head Office action to stop current mining operations until an environmental evaluation of the effects of the activity has been completed.
10/8/90	WCRC responds to Minister of Energy's concern over CML 37 148 and indicates more information on handling and quantity of overburden is needed. Considered Francis Mining had not fully evaluated environmental impacts.
20/8/90	DOC again requests Head Office action to halt mining.
10/9/90	DOC expresses concern at failure of Mines Inspectors to enforce conditions.
16/10/90	Maruia Society requests action from Minister of Energy to stop opencast mining.
9/11/90	MOC responds to Maruia Society, noting progress being made. Company now working to WCRC expectations: reseeding area, installed settling ponds, mitigating run-off.
17/11/90	Objection from Roa residents to Grey District Council on Clean Air licence on the basis that dampening down procedures for dust are ineffective.
19/11/90	Roa residents complain to Minister of Energy over expansion of mining activities beyond licence area and lack of action of local authorities.
20/11/90	Complaint to WCRC requesting action to protect a water right against Francis Mining for operating without a water right and discharge permit.

20/11/90	Complaint to Inspector of Mines, MOC that Francis Mining had exceeded boundaries of ancillary mining licence area.
20/11/90	Complaint to Minister of Energy on illegal operations of Francis Mining and calling for halt to mining.
21/11/90	Inspector of Mines, MOC reports carrying out survey to see if boundary exceeded.
21/11/90	WCRC state agreement on an alternative water supply has been reached. Request Francis Mining apply for right to discharge storm water.
22/11/90	Another residents' complaint to WCRC about continued pollution of a local water supply.
23/11/90	WCAHB reports to Grey District Council that noise performance levels need to be imposed on the licence.
12/12/90	Maruia Society objects to MOC over application 37 168 from Francis Mining.
18/12/90	Inspector of Mines, MOC again advised about breaches of conditions and area exceeded.
5/1/91	Request to Chief Inspector for action on dust and noise nuisance from Roa community.
5/1/91	Complaint from Roa community to WCRC concerning illegal discharge to waterways and seeking information on settling ponds.
9/1/91	WCRC reports progress re alternative water supply. Settling ponds would be constructed after water right consent obtained.
14/1/91	Grey District Council requested Company action on exhaust discharges, relocation of screening operations, dust control.
14/1/91	Inspector of Mines reports action over boundary encroachment. Recommendation to Minister on noise performance standards for CML 34 076.
15/1/91	Objection from Roa community to water right lodged with WCRC. Residents should assist with formulating conditions. Discharges should cease in interim.
17/1/91	Inspector of Mines reminded about need for action on dust problem.
- /1/91	Meeting of WCRC and Roa residents. Conditions for water right discussed with residents. Discharge to be limited. No legal action to be taken pending water right hearing and construction of settling ponds.
1/2/91	Grey District Council request Company avoid coal spillage on road.
3/2/91	Complaint to Grey District Council that still dust and noise pollution.
21/2/91	Request to WCRC to impose water right procedures that will protect other users.

15/3/91	Grey District Council state working with Company to alleviate dust.
15/3/91	WCRC state Company's actions now comply with Council's water management policy. No intention to prosecute for past performance.
4/4/91	Mines Inspector, Greymouth notes recommendation has been made to Head Office for prosecution. Requests Company identify boundary.
11/4/91	Company informs Grey District Council of actions to alleviate dust, noise and truck loading.
- /4/91	Roa mine closed pending applications for new licences.
17/4/91	Complaint by residents to Grey District Council re dust, noise and road.
26/4/91	WCRC requested by Roa residents to ensure facilities are constructed to enable water right conditions to be met, particularly settling ponds, before restart of mine.
- /5/91	MOC, Head Office, decision not to prosecute.
6/5/91	Grey District Council informs Minister of Energy of its support for Francis Mining's mining application 37 148 at Roa.
21/5/91	WCRC informs MOC ancillary licence (34 056 01) could breach Soil Conservation and Rivers Control Act 1941. Requests standard mining conditions be inserted.
22/5/91	WCAHB reports to MOC that conditions of ancillary licence area appear to meet residents' concerns.

Thereafter, consultants were employed by the Office to carry out an independent investigation of the mining practices at the Roa Mine site. Terms of Reference were subsequently drawn up for an internal investigation, involving an examination and comparison of operations at Roa and the associated performance of public authorities on the West Coast, with those of a further two case studies around New Zealand.