



# Porgera Mine Closure Consultation Document

December 2002





*Leaving behind a better future*

# Porgera Mine Closure Consultation Document



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December 2002  
CR 257\_44\_v3

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Published by  
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**Acknowledgements:**

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# 1. Introduction

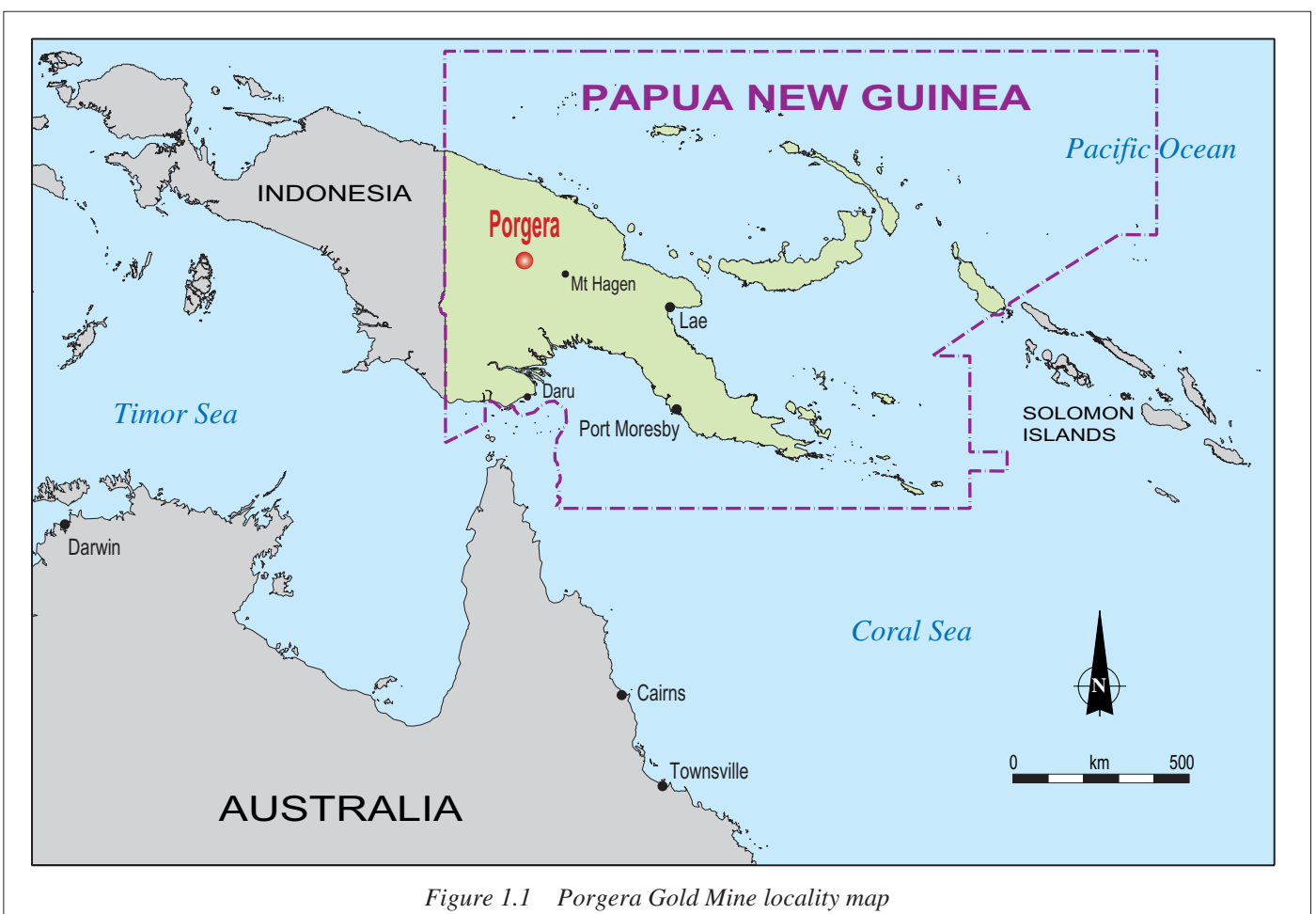
## 1.1 Background

The Porgera Gold Mine is located in what was once one of the more remote parts of Enga Province in the Central Highlands of Papua New Guinea (PNG) (Figure 1.1). The mine is situated in rugged, mountainous terrain at 2,500 m elevation on the floor of the Porgera Valley which rises to 3,850 m at the rim. The annual rainfall is approximately 3.7 m and daily temperatures range from 10 to 25°C.

The mine is approximately 200 km west of Mt Hagen by road and 680 km from Lae, the port of entry for most of the project's supplies. The mine's electricity is supplied via a transmission line from a gas-fired power station at Hides in Southern Highlands Province. Neutralised mine tailing is discharged to the Porgera River which flows into the Lagaip River and then the Strickland River before becoming the Fly River and entering the Gulf of Papua. Therefore, the mine's influence extends across numerous provinces of PNG (Figure 1.2).

The Porgera Valley is home of the Ipili people. They are distinct from their neighbours, the Engans in Enga Province and the Hulis in Southern Highlands Province. Before mining operations began in 1989, Porgera Station was only a small out-station with a sub-district administrative office together with several trade stores. The people were involved mainly in subsistence farming and small-scale alluvial mining.

The first documented discovery of gold in the Porgera Valley was in 1938. Small-



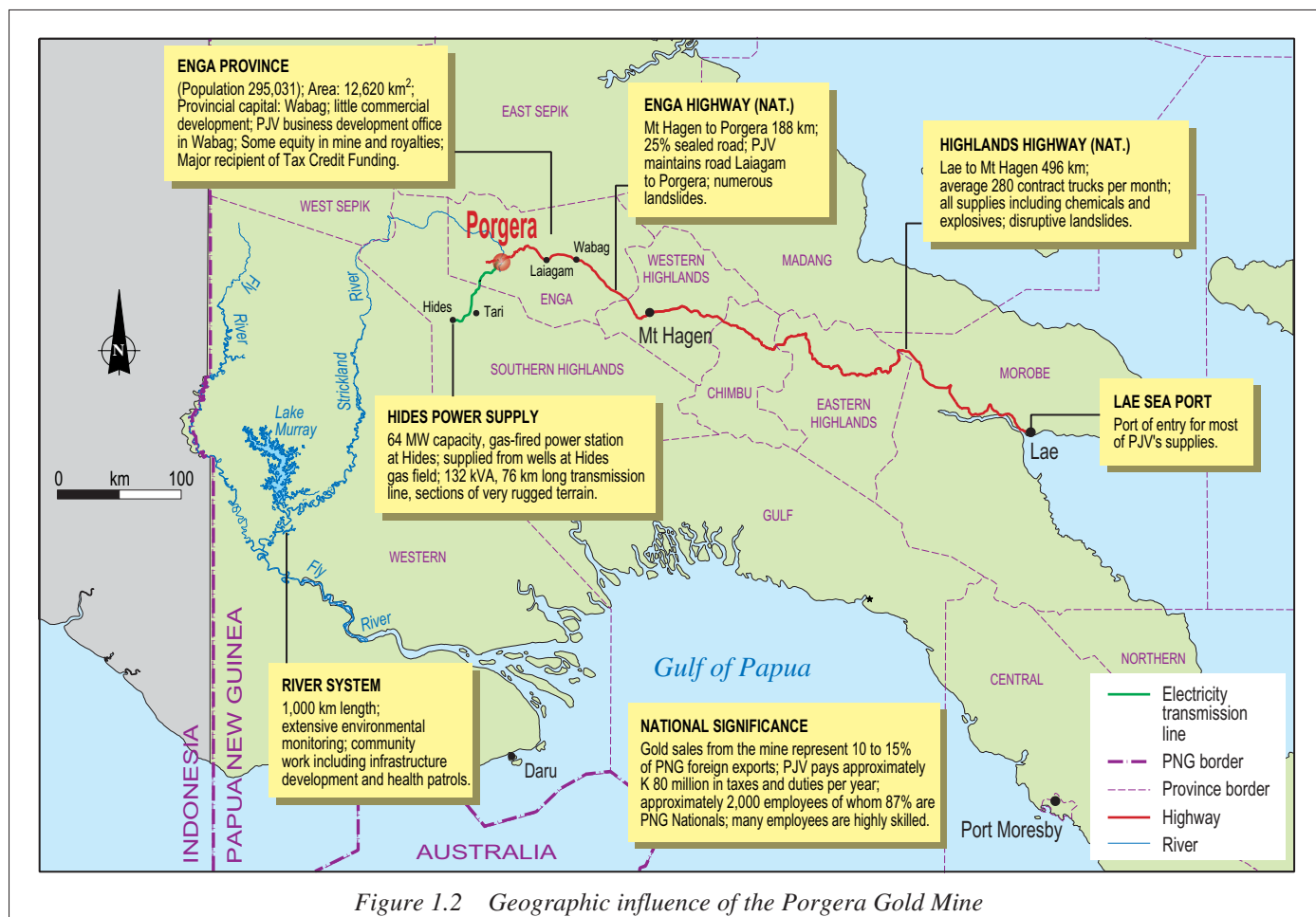


Figure 1.2 Geographic influence of the Porgera Gold Mine

scale mining of alluvial gold commenced in 1948 and has continued through to the present. Exploration to discover the source of the alluvial gold commenced in the 1970s. In 1984, high-grade gold mineralisation was discovered and this led to further exploration, feasibility and environmental studies. Approval to proceed was obtained in 1989 when the Environmental Plan was approved, the Mining Development Contract (MDC) was signed between the State and the proponent, and a Special Mining Lease (SML) and various Leases for Mining Purposes (LMP) were granted. Construction commenced in 1989 and gold was first produced in 1990. Several expansions have occurred, the most recent being in 1996. The mine currently employs approximately 2,000 people of whom 87% are PNG nationals. There are also significant numbers of local, national and foreign contractors.

The mine is owned by the Porgera Joint Venture (PJV) which comprises Placer Dome (75%), Oil Search Ltd<sup>1</sup> (20%) and Mineral Resources Enga Pty Ltd (5%). Placer Niugini Ltd operates the mine on behalf of the PJV (hereafter referred to as 'PJV').

Based on forward planning, the mine deposit will be exhausted in 2006, at which time open pit and underground mining will cease. At present gold prices, it is feasible to continue processing low-grade ore stockpiles until 2012. Thereafter, it is expected to take a further two years for decommissioning and rehabilitation to be completed.

## 1.2 Proposed Process for Closure Planning and Sustainability

The Porgera Gold Mine has brought profound social, economic and environmen-

tal change to the Porgera Valley. Influences have also been experienced along the highway from Lae, especially between Laiagam and Porgera, along the powerline to Hides, and down the Lagaip and Strickland river systems, including Lake Murray.

It is intended that this 'Porgera Mine Closure Consultation Document' be used as the basis for public consultation and discussion of closure issues for the Porgera Gold Mine. The document is public and will be made available to any interested person or organisation. It provides an initial discussion of the biophysical and socio-economic issues that are expected to dominate closure planning for the next decade. The objective is to provide relevant information to

<sup>1</sup> Oil Search is 19%-owned by the PNG Government.

stakeholders in the project, so as to allow for their full involvement in discussions and planning for the mine's closure.

Several factors have influenced the direction adopted in this document:

- **Sustainability:** this Porgera Mine Closure Consultation Document has been developed around the notion of sustainability rather than simply mine closure. It ties in closely with recent mining industry (and particularly Placer Dome Inc.) thinking and policy on mining and society. Sustainability also implies a shift from thinking of mine closure as an event to an acknowledgment that successful closure will be a process, parts of which are already underway. In this sense, sustainability more explicitly encapsulates the aims of the process: sustainability is the result that is being aimed for, rather than simply mine closure.
- **Multi-stakeholder involvement is essential:** PJV is only one of the stakeholders that will influence the outcomes of this mine closure process. A sustainable future for the people of Porgera and other affected communities cannot be achieved by PJV alone, but requires substantial commitment from all stakeholders<sup>2</sup>.

This document provides a discussion of the current situation, the major issues facing the mine, the community, and the other stakeholders in the lead up to closure and, where appropriate, outlines some options for addressing these issues.

The Porgera Mine Closure Consultation Document is premised on the assumption that, in the near future, PJV will join with other stakeholders in the project to establish and participate in some form of committee-based joint closure/sustainability planning and implementation group.

It is to be expected that the issues (and associated options) described here may be expanded and given different emphases as other stakeholders express their own views.

### 1.3 Partnerships for Sustainability

A fundamental principle in PJV's approach to sustainability is to facilitate the formation of partnerships amongst stakeholders. PJV also believes that there is a need for capacity building within affected communities to ensure that they are empowered to meet the planning and implementation challenges of sustainable development, both in the lead up to mine closure, and in the post-mine era. Concepts for partnerships and capacity building are further explored and discussed in Section 3.2.

### 1.4 Stakeholders in Closure Planning and Sustainability

A preliminary list of stakeholders who have an interest in mine closure and sustainability planning for the Porgera Gold Mine is given in Box 1:

### 1.5 PJV's Vision and Objectives for Mine Closure

PJV's Vision for Mine Closure is:

'Leaving behind a better future'

This vision will be achieved through PJV's Objectives for Mine Closure, which are to:

- Promote public safety and safeguard human health.
- Minimise or eliminate long-term environmental impacts.
- Assist stakeholders in preparing themselves for mine closure and in enhancing the sustainability of their communities and institutions.
- Develop a project-specific, cost-effective approach to mine closure.
- Engage stakeholders in a transparent, consultative process that finds a balance between the many social, environmental and economic issues associated with mine closure and sustainability.

<sup>2</sup> The recent Final Report of the MMSD (2002) project notes (p. 220) that 'The mining company has a major responsibility for achieving [local sustainability development], but it cannot achieve this alone. Communities need to own this process and organise themselves accordingly.'

#### *Box1 Stakeholders in Closure Planning and Sustainability(Plate 1.1):*

- SML and LMP communities within the Porgera Valley.
- Other Porgera Valley communities.
- Small-scale gold miners.
- Hides transmission line communities.
- Downstream riverine communities.
- Highlands and Enga Provincial Highway communities.
- PNG National, Enga Provincial, and local level governments.
- PJV and its partners: Placer Dome Inc., Oil Search Ltd., and Mineral Resources Enga Pty Ltd.
- PJV employees: national and foreign..
- Contractors: local, national, and foreign.
- National and international non-government organisations (NGOs).
- Porgera Mining and Allied Workers Union.
- PNG Chamber of Mines and PNG Chamber of Commerce.
- Suppliers: local, national, and foreign.





Plate 1.1 A few of the stakeholders in mine closure and sustainability planning for the Porgera Gold Mine:  
 A: Yarik Relocation Village on SML; B: Porgera High School students; C: Hides area youngster,  
 D: Suspension bridge across Lagaip at Sisamin; E: PJV employees and contractors; F: Rehabilitating a waste dump;  
 G: Small-scale mining; H: Immunisations at Komogato Village (World Alliance for Community Health Program);  
 I: Highlands Highway in Chimbu Province before repairs

## 1.6 Corporate Requirements

PJV is required to comply with the policies<sup>3</sup> of its largest shareholder, Placer Dome Inc.

PJV has its own Environmental Policy (Appendix 1), which contains several statements relevant to mine closure.

PJV has prepared a Mine Closure Policy and Principles statement (Appendix 2) that is intended to serve as a reference point for PJV as it works through the mine closure planning process with the other stakeholders.

## 1.7 Regulatory Requirements and Agreements

PJV has considered the closure requirements contained within the PNG regulatory instruments and other agreements. In addition, PJV has considered international best practice for mine closure as represented by international agencies and industry bodies. The list of PNG and international documents reviewed is presented in Appendix 3.

## 1.8 Impact of Premature Closure

PJV's current expectations are that mining operations will continue until 2006,

low-grade ore processing will continue until 2012 (gold price permitting) and decommissioning and final rehabilitation will be completed in 2014.

As with any mining operation, premature closure (i.e., closure before the planned date) of the Porgera Gold Mine could be brought on by external factors, such as natural disaster, civil unrest, or a prolonged period of low gold prices.

Premature closure would have a significant impact on the closure planning process and would result in less than optimal sustainability outcomes for PJV and other stakeholders. The impact would be greatest if premature closure were to occur in the next few years, but would be less if it occurred closer to the end of the planned project life.

Should premature closure occur, the approach outlined in this document would need to be modified.

## 1.9 Structure of this Document

This document contains three chapters:

- Chapter 1 Introduction: provides background, outlines the closure planning process, provides a preliminary

list of stakeholders, puts forward PJV's Vision and Objectives for Mine Closure and outlines corporate and regulatory requirements.

- Chapter 2 Biophysical Considerations: identifies closure issues and, for each component, outlines the pre-mine conditions, the present situation and the situation at closure, summarises known stakeholder aspirations, and then identifies some options for closure.
- Chapter 3 Socio-economic Considerations: examines the key socio-economic issues that confront the communities to be impacted by mine closure at the local, regional and national level. Each sector is handled by identifying stakeholders, describing pre-mine conditions and the present situation, stakeholder aspirations, discussing the major sustainability issues, sketching a vision for post-closure and then identifying some options for closure.

<sup>3</sup> More information on Placer Dome's Health and Safety Charter and Sustainability Policy is available at [www.placerdome.com](http://www.placerdome.com).





## 2. Biophysical Considerations

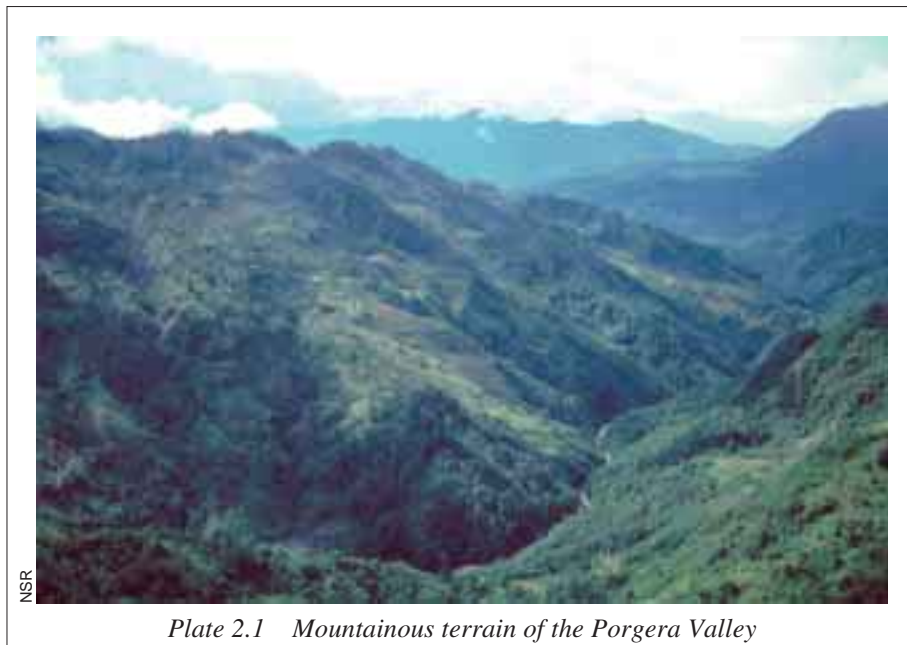
### 2.1 Introduction

This chapter identifies and discusses the biophysical considerations for closure of the Porgera Gold Mine. Each area of PJV's operations is dealt with by identifying closure issues, outlining the pre-mine conditions, the present situation and the situation at closure, summarising known stakeholder aspirations, and then identifying some options for closure.

It is recognised that agreement and commitment from stakeholders are required to ensure that sustainable biophysical outcomes are achieved beyond closure.

### 2.2 Biophysical Setting

The Porgera Valley's high elevation (2,300 m at the Anawe Plant), mountainous terrain (Plate 2.1) and high rainfall (3,700 mm/a) have presented numerous engineering challenges during the planning, construction and op-



*Plate 2.1 Mountainous terrain of the Porgera Valley*

eration of the Porgera Gold Mine. The region is also subject to seismic activity<sup>1</sup>. Landslides are a common feature of

the PNG Highlands (Plate 2.2) and are a major source of sediment to the regional drainage.

Given the expected engineering difficulties in constructing a conventional tailing storage facility in this setting, and the risk to public safety if the containment impoundment failed, the PNG Government approved the discharge of neutralised tailing to the river system and allowed the placement of incompetent (soft) waste rock in two valleys near the mine.

The soils of the Porgera Valley have generally low fertility and the high altitude is close to the limit for cultivation of traditional food garden produce (Plate 2.3). The mountainous area to the



*Plate 2.2 Maiapam landslide (centre at top of photo) advancing on Porgera Station in 1991*

<sup>1</sup> The last major earthquake (Richter magnitude 7) in the region was in 1954 at Tari, 45 km to the southwest.

south of Porgera Valley, where the Waile Creek water supply dam is located, is too high (elevation approximately 3,100 m) for traditional food gardens and has no permanent human settlement.

At the start-up of PJV's operations in 1990, the population of the Porgera Sub-district was about 10,000 people, most of whom were concentrated in villages and scattered settlements within the Porgera Valley. The Porgerans lived largely subsistence lifestyles, based on cultivation of food gardens up to 2,400 m elevation (the apparent upper limit of productive gardening for traditional produce), and some practised alluvial gold mining. Following the startup of the mine, natural population growth and immigration has raised the population of the Porgera Sub-district to 22,000 in 2000 (Section 3.3.1). As a result of land pressure, settlements and gardening now extend above 2,400 m elevation where agriculture is marginal, particularly around the mine area.

The project's major areas of disturbance are located in the catchments of four tributaries of the Porgera River (Kogai Creek, Kaiya River, Maiapam Creek and Pongema River). These tributaries are all located in steep-sided valleys with steep longitudinal gradients.

The Porgera River drains to the north. The lowest elevation for human settlement in the Porgera River valley is 1,400 m, approximately 12 km downstream of the mine. Thereafter, the Porgera River flows through an uninhabited steep-sided valley for 30 km before joining the Lagaip River, some 30 km north of the mine. Very few people live in the Lagaip River valley between the Porgera River and where the Lagaip River joins the Strickland River, 113 km further downstream. Isolated villages are scattered along the Strickland River; however, the total number of people living within 20 km of the Strickland River is about 10,000 over its entire 300-km length. The Strickland River joins the Fly River 820 km downstream of the mine and the Fly River ultimately discharges into the Gulf of Papua approximately 1,000 km downstream of the mine. The Porgera–



Plate 2.3 Traditional food garden above Kulapi Village. Note the mounds for growing kau kau (sweet potato)

Lagaip–Strickland river system is shown in Figure 2.1.

Lake Murray is home to a further 2,000 people and is located approximately 25 km from the lower Strickland River, about 750 km downstream of the mine. Lake Murray is permanently connected to the lower Strickland River by the Herbert River and occasionally via other hydraulic connections that can operate when water levels are high in the lower Strickland River. The flow in the Herbert River is out of Lake Murray for about 90% of the time; however, it reverses and flows into the lake when the Lake Murray water level is lower than the water level in the lower Strickland River. These flow reversal events and other hydraulic connections transport suspended sediment from the lower Strickland River into Lake Murray. Some of this suspended sediment is mine-derived.

The Porgera Gold Mine operations comprise various components, most of which are located in the Porgera Valley (Figure 2.2). Components located at or close to the mine include (Figure 2.3):

- Open pit and underground mining operations.
- Low-grade ore stockpiles.
- Two types of waste rock dumps:

- Erodible dumps (Anjolek and Anawe).

- Stable waste dumps (Kogai and Anawe North).

- Minesite infrastructure including:

- Ore processing facilities (Tawisakale Mill and Anawe Plant).

- Dynos' explosives plant.

- Workshops, warehouses administration facilities.

- Workforce accommodation (Alipis and Yoko camps).

- Roads, helipad and site services.

Satellite infrastructure located within the Porgera Valley includes:

- Workforce accommodation (Suyan Camp).

- Pangalita lime quarry.

Satellite infrastructure located outside the Porgera Valley includes:

- Power generation and a 76-km-long electricity transmission line from Hides in Southern Highlands Province (see Figure 2.1).

- Waile Creek water supply dam and pumping facilities, located 12 km south of the open pit.



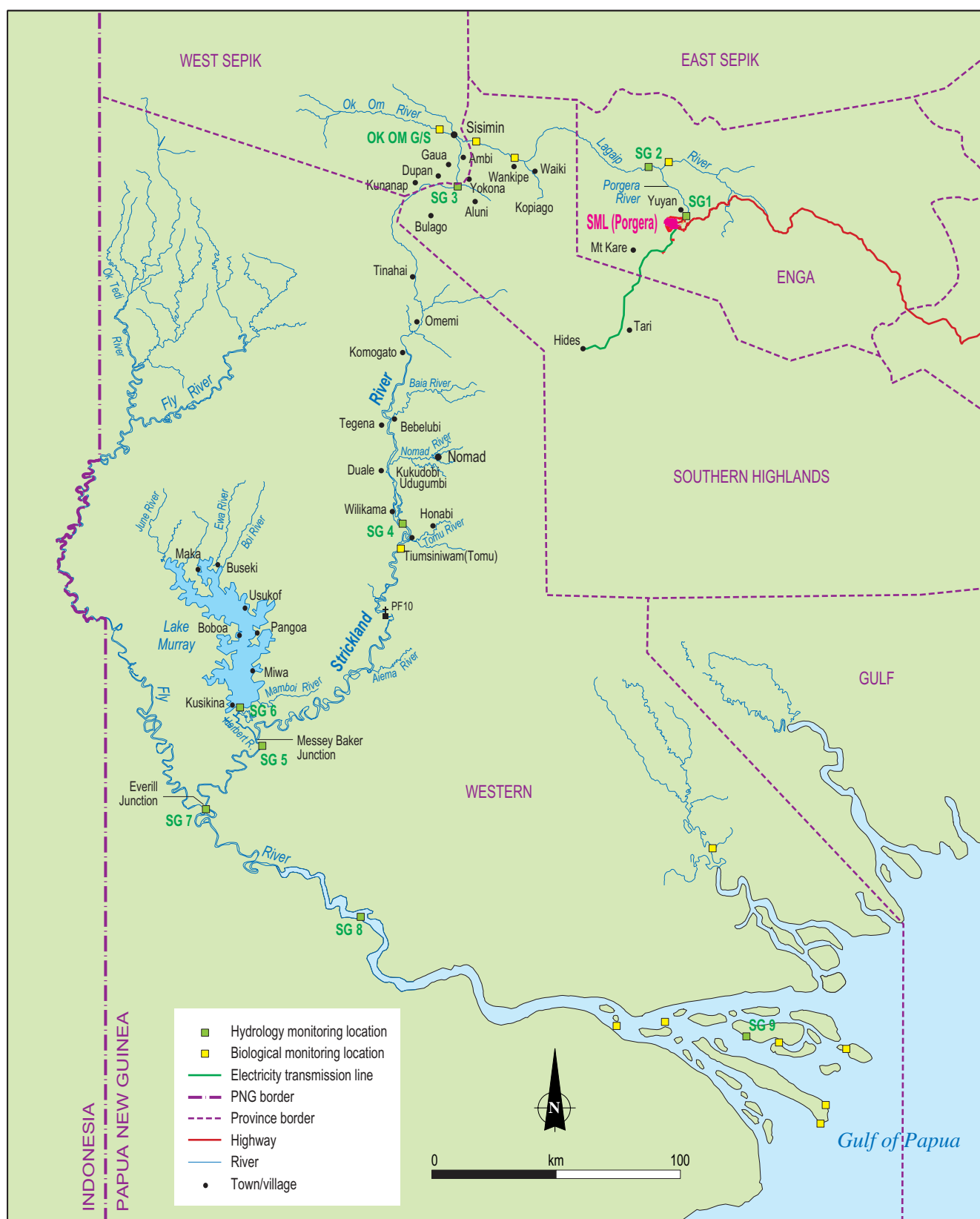


Figure 2.1 Porgera-Lagaip-Strickland river system

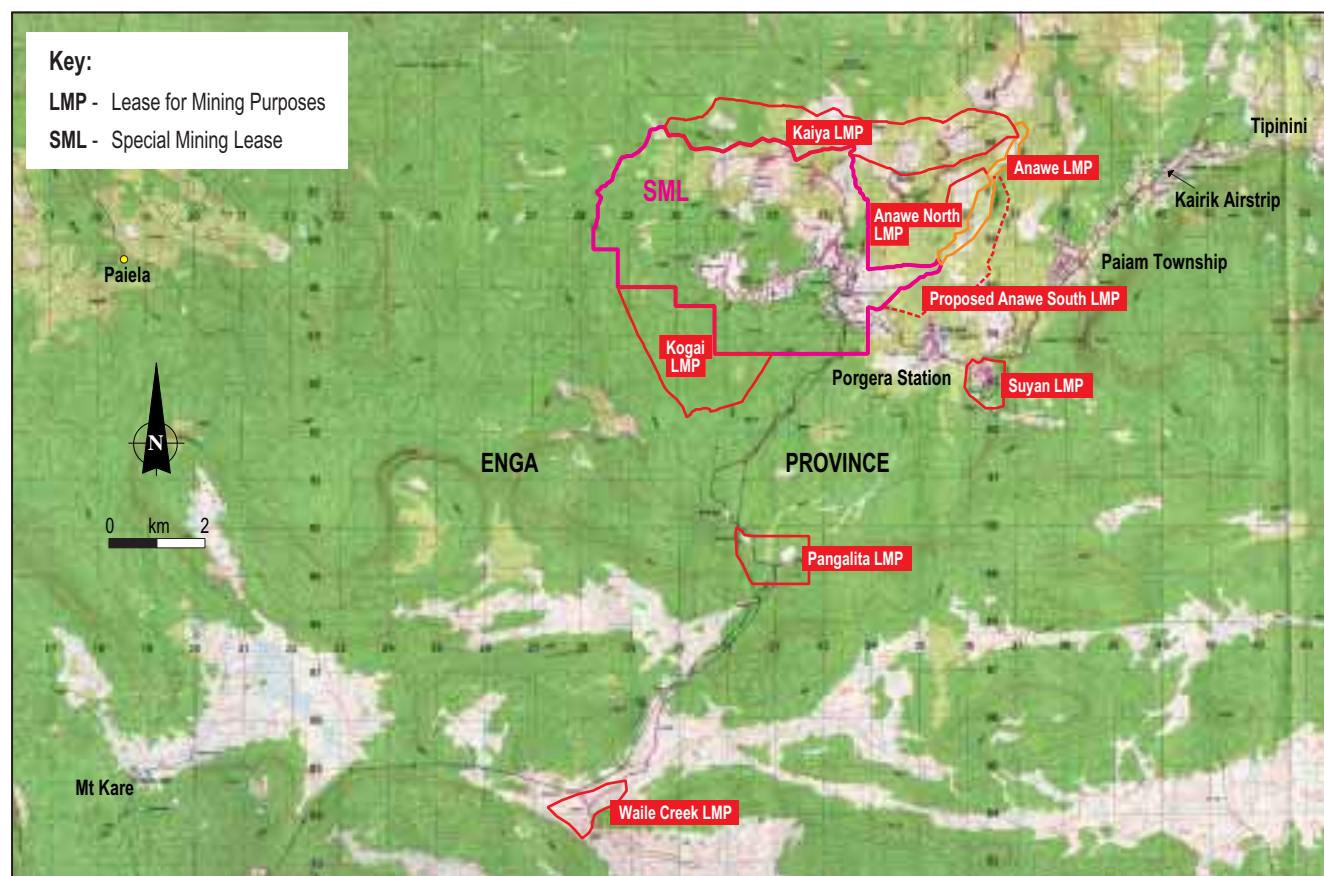


Figure 2.2 Porgera Gold Mine leases

## 2.3 Biophysical Closure Issues

### 2.3.1 Public Safety and Human Health

Promotion of public safety and safeguarding of human health are key objectives for PJV in its closure planning. Moreover, PJV is committed to utilising best management practices throughout the closure planning process to identify, communicate, and minimise potential health and safety risks. These objectives apply equally to employees, contractors and the general public.

The various phases of mine closure will carry different types and levels of risk to different groups of people. For example, the demolition and decommissioning of the mine and associated infrastructure may pose safety hazards to workers and, to a lesser extent, the community. For the post-closure period, protection of public safety and human health within the community becomes the focus.

PJV's extensive ongoing environmental monitoring program is focussed on the Porgera River valley and downriver environment. Metal concentrations in edible aquatic biota are routinely monitored

by PJV at various downriver locations (Plate 2.4). The human health of Porgerans, as well as downriver communities, has been addressed by a number of specific investigations and



Plate 2.4 Sampling barramundi for trace elements



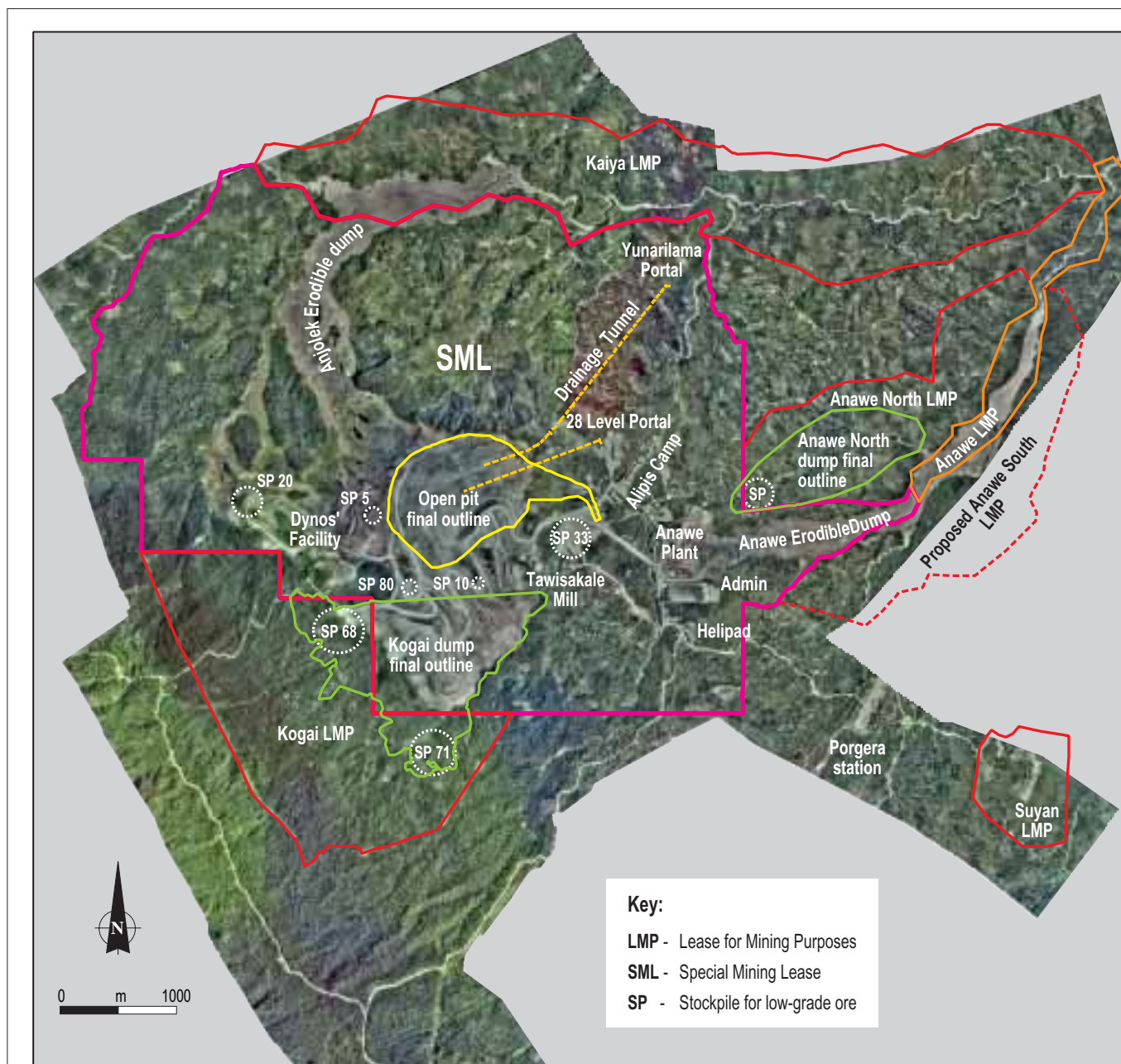


Figure 2.3 Aerial photo of the Porgera Gold Mine

research projects, such as that undertaken by CSIRO (1996). One of these research projects is the Health Risk Assessment that is currently in progress by Dr. K W Bentley & J L Dempsey from the Centre for Environmental Health Pty Ltd. PJV expects that the results of this study will be available within the next few years and can be used in closure planning and consultation.

### 2.3.2 Environmental Impacts

PJV began conducting baseline environmental monitoring of the downriver system including Lake Murray in 1984 (see Figure 2.1), well prior to construction of the mine. Since mine startup in 1990, PJV has monitored the effects of its operations on the river system and will continue to do so up until mine closure and beyond (Plate 2.5).

As mentioned previously, riverine disposal of tailing is practised at the Porgera



Plate 2.5 PJV Environment Department personnel performing a river cross-section survey

## 2. Biophysical Considerations

Gold Mine as is the placement of soft waste rock in valleys in erodible dump configurations. Neutralised tailing from the mill process is discharged into the Maiapam Creek catchment. Soft waste rock is placed in the valleys of Maiapam and Anjolek creeks. The neutralised tailing and soft waste rock introduce elevated loadings of sediment and metals (particulate and dissolved forms) to the Porgera River compared to background conditions. During operations, the tailing discharge is the major source of mine-derived sediment and metal loadings (iron, copper, and zinc, etc.).

Production of waste rock from the mining operations is scheduled to begin declining substantially in 2002 and ceases completely by the end of 2006. As a result, placement of soft waste rock in the Anjolek Erodible Dump is expected

to cease in 2002 and hard waste rock in the Kogai Stable Dump is scheduled to continue until 2004. Placement of soft waste rock to the Anawe Erodible Dump and hard waste rock in the Anawe North Stable Dump are both expected to cease in 2006. The discharge of neutralised tailing to the river system will end in 2012, or possibly as early as 2007 (see Section 2.4.1.3).

Therefore, loadings to the river system of mine-derived sediment and metals will decline progressively from current levels between 2006 and 2012. After 2012, the loadings of mine-derived sediment and metals will decline dramatically.

However, some erosion and metal leaching from the minesite area and waste storage areas is expected to continue after closure. Therefore, localised envi-

ronmental impacts are expected to persist within some creeks in the Porgera Valley and for a relatively short distance downstream of the mine in the Porgera River. These localised, post-closure impacts will gradually diminish over the longer term (see further discussion in Sections 2.3.2.2 and 2.3.2.3).

As part of the closure planning process, PJV is committed to exploring opportunities to minimise and, where possible, eliminate long-term environmental impacts.

### 2.3.2.1 Riverine System and Lake Murray

As mentioned previously, PJV expects to stop placement of waste rock in all erodible and stable dumps by the end of 2006. Neutralised tailing discharge to the river system will end in 2012 and



Plate 2.6 Lower Strickland River and floodplain near Lake Murray



possibly sooner (see Section 2.4.1.3). Therefore, mine-derived suspended sediment and particulate metal loads to the river system will begin declining between 2006 and 2012, or sooner. After 2012, the loadings of mine-derived sediment and metals will decline markedly.

PJV expects the closure of the Porgera Gold Mine to rapidly reduce the effects of its operations on the river system (Plate 2.6) and Lake Murray (Plate 2.7), to the point where they are indistinguishable from the natural variability that characterises such a large tropical river system.

### 2.3.2.2 Localised Erosion and Undercutting of River Banks

Steep slopes, high rainfall, frequent landslides and the presence of highly erodible rock types make the Porgera Valley naturally prone to erosion and undercutting of local river banks.

The surfaces of the erodible dumps are comprised of soft materials that are subject to erosion and downcutting by streams. The streams that drain the surfaces of the erodible dumps now flow in a constantly changing, braided pattern. Wherever those streams flow along the edge of the erodible dumps, undercutting of river banks and valley wall erosion has occurred, which has led to the loss of some gardening land (Plate 2.8).

Riverbed aggradation (raised riverbed levels) has occurred downstream of the erodible dump toes in the Kaiya River, the Pongema River and for the first 2 km of the Porgera River below its confluence with the Pongema River. In these areas, riverbed aggradation has caused some undercutting of river banks and loss of gardening land. However, further downstream along the Porgera River, monitoring data shows that no bed aggradation has occurred. This is believed to be due to the Porgera River's steep gradient and high flows providing sufficiently high sediment transport capacity to prevent further riverbed aggradation.



Plate 2.7 Lake Murray with inset of a village

In the lead up to closure and in the post-closure environment, erosion rates are expected to gradually decline as rehabilitation of the site is progressively completed, landforms stabilise and vegetation becomes established. However, some residual erosion is expected to continue post-closure, particularly from the erodible dumps. River banks alongside and downstream of the erodible dumps are expected to be affected by undercutting for some period after closure, though the frequency and severity is expected to diminish over time.

### 2.3.2.3 Water Quality of Local Creeks Suspended Sediment and Particulate Metals

The gold at Porgera is associated with sulfide mineralisation that contains metals such as iron, copper and zinc. Soils and waste rock removed from the mine also contain low levels of mineralisation and metals.

During the operational phase of the project, local creeks will continue to receive elevated concentrations of suspended sediment and particulate metals due to the discharge of tailing and erosion of the mineralised soils and waste rock removed from the mine.

Following closure, erosion and downcutting of the erodible dump materials is expected to continue in the long term. As a result, the presently elevated suspended sediment concentrations and elevated particulate metal concentrations in the local creeks downstream of the erodible dumps are likely to continue in the short term, but are expected to slowly decline over time. The erodible dumps are expected to be the main source of mine-derived sediment and particulate metals following closure.

Other areas of the site, such as the rehabilitated plantsite and stable dumps, will also be subject to some erosion post-closure, though at much lower rates than the erodible dumps. Over the long term, these sources are expected to contribute low levels of suspended sediment and particulate metals to local creeks, but at a gradually diminishing rate.



Plate 2.8 Undercutting of riverbank near the toe of the Anjolek Erodible Waste Dump in the Kaiya Valley

### Metal Leaching and Dissolved Metals

At closure, any mineralised rock that remains exposed to both water and oxygen provides opportunity for rainwater and/or groundwater percolation to dissolve metals and oxidise sulfide minerals. The latter can release mild sulfuric acid which lowers the pH thereby potentially dissolving more metals which can then be transported by local creek waters to the Porgera River and downstream environment.

At Porgera, there are several attenuating mechanisms that reduce the degree of metal leaching and the impact of dissolved metals in the downstream receiving environment:

- High levels of carbonate minerals, which neutralise any acid that is formed and provide surplus acid-neutralising capacity, occur in the majority of the waste rock.
- High rainfall (3,700 mm/a) provides significant dilution in the receiving waters and, within the waste storage areas, tends to keep the materials near saturation thereby reducing the supply of air (oxygen).
- Much of the catchment of the Porgera River is underlain by limestone and the regional runoff is characteristi-

cally alkaline with a pH 7.5 to pH 8.0. These naturally buffered waters tend to neutralise any acidity in the regional drainage, and the high pH causes dissolved metals to precipitate into less bioavailable forms.

- The high concentrations of suspended sediments in the local creeks tend to adsorb dissolved metals, thereby making those metals less bioavailable.

Notwithstanding the above attenuating mechanisms, some of the metals (notably zinc and cadmium) tend to remain in dissolved form and are transported into the downstream drainage. The post-closure behaviour (in terms of erosion and metal leaching) of exposed mineralised rock is a focus of current studies<sup>2</sup>, which will be continued as part of PJV's closure planning. The stable dumps (Kogai and Anawe North) are expected to be the main source of dissolved metals post-closure.

### 2.3.3 End Land Use and Lease Relinquishment

PJV will decommission and rehabilitate, wherever possible, the SML and other

<sup>2</sup> Geochemical modelling, and erodible dump performance modelling.



lease areas, to produce land that can be reused by the landowners and community for one or more beneficial purposes.

PJV will consult with stakeholders to identify the preferred end land use option(s) for specific areas of land and will, wherever possible, rehabilitate accordingly. It must be recognised however, that other closure objectives such as the protection of human health and safety and the minimisation of environmental impacts must also be considered in the selection of end land uses.

For some areas, it may be difficult to reach consensus among the stakeholders on what constitutes the preferred end land use. However, it is important that the stakeholders, in their deliberations, take into account the physical constraints of the project's setting and the potentially conflicting needs of the Porgera Valley communities to promote future food security as well as providing access to land for other future economic activities.

It is PJV's intention to progressively decommission and rehabilitate as much land as possible prior to closure. PJV also intends to seek phased relinquishment of leases, or portions of leases, that are no longer in active use, so that the land can be returned to the original landowners as soon as practicable.

Some possible beneficial end land uses might include:

- Subsistence gardening.
- Cash crops.
- Animal husbandry.
- Forestry.
- Bushland resources.
- Small-scale mining.
- Administrative, educational and/or tourism facilities.

### 2.3.3.1 Land Stability

The mountainous terrain of the Porgera Valley, with its generally weak rocks, steep and unstable slopes, and high rainfall, make land stability a key issue for closure. Before the mine was built, areas of unstable ground were common and, over time, some roads and buildings became deformed by downslope 'creep'. In addition, landslides are common and have occasionally resulted in damage to buildings. (Plate 2.9 and Plate 2.10).

These natural characteristics will constrain the end land use options and the permanence of PJV's rehabilitation efforts after closure. Therefore, it is important to plan for closure with the expectation that some of the post-closure land forms, in particular the erodible dumps, are likely to be subject to the same surface deformation and/or downslope movement.

Other areas to be rehabilitated, such as the Tawisakale Mill and Anawe Plant, are founded on stable ground and thus post-closure land stability is not expected to be a significant constraint.

### 2.3.3.2 Decommissioning and Salvage of Assets

Once production ceases, decommissioning of PJV's assets will commence immediately. PJV's priority will be to salvage as many of its assets as possible by dismantling, removing and selling those assets and then rehabilitating and making safe the sites except where re-use by others is negotiated.

Prior to the decommissioning and rehabilitation of project infrastructure and facilities, a comprehensive safety management system will be established that recognises the new jobs and activities to be performed by employees and contractors. New safety procedures will be developed to minimise safety and health risks. Employees and contractors will be trained in the new procedures and required to wear appropriate personal protection equipment (PPE).

A number of chemicals and reagents are currently used in the mining operation and milling process. In the lead up to closure, the inventories of these chemicals will be carefully managed and reduced to a minimum level. Any stocks of chemicals remaining at closure will be returned to the original supplier and/or safely disposed of in accordance with PNG safety and environmental legislation.



Plate 2.9 Porgera police station destroyed by the Maiapam landslide in 1991



Plate 2.10 Workshop damaged by the Yakatabari landslide in 1989

### 2.3.3.3 Progressive Rehabilitation

The total area disturbed by PJV's mining and processing operations to date (end of 2002) is 1,160 ha, the majority of which is within the Porgera Valley. Disturbed land can be divided into six main categories:

- Open pit mine.
- Low-grade ore stockpiles (currently seven in total).
- Two erodible waste rock dumps.
- Two stable waste rock dumps.
- Minesite infrastructure.
- Satellite infrastructure.

The amount of land that has been rehabilitated to date in each of the six categories is summarised in Table 2.1.

PJV has undertaken a series of rehabilitation trials over the past 10 years. This has resulted in the refinement of various rehabilitation techniques that will be applied during progressive rehabilitation (Plate 2.11) and also at final closure (Plate 2.12).

Before rehabilitating an area, landowner boundaries will be resurveyed and marked. PJV will consult with the landowners and agree on a feasible end land use prior to the start of rehabilitation.

PJV will rehabilitate as much of the disturbed land as possible prior to final closure (2012). To date, the active mining and waste placement operations have limited the areas available for rehabilitation. However, starting in late 2002, sizeable areas of the minesite will begin to become available for progressive rehabilitation: Kogai Stable Dump, Anjolek Erodible Dump and the west wall of the open pit. PJV is currently preparing to substantially enlarge its rehabilitation program in early 2003. Rehabilitation of the Anawe Erodible Dump and Anawe North Dump will begin near the end of 2006.

The Porgera Gold Mine is shown in Figure 2.4. This three-dimensional view of the mine (looking west) is how the site appears at the time of publication. Following progressive rehabilitation of the waste dumps and other areas scheduled to begin in 2003, Figure 2.5 provides a three-dimensional impression of how the site will look in 2008.



Plate 2.11 Porgerans planting grass as first step in rehabilitation process

Table 2.1 Projected disturbance and progressive rehabilitation at Porgera Gold Mine\*

	Expected Maximum Land Disturbance By 2012 (ha)	Land Rehabilitated to Date (end of 2002) (ha)	Land Projected to be Progressively Rehabilitated Prior to 2008 (ha)	Land Projected to be Progressively Rehabilitated Prior to 2012 (ha)	Balance of Land to be Rehabilitated After 2012 (ha)
Open Pit Mine	240	20	240	240	0
Low Grade Ore Stockpiles	90	0	30	75	15
Erodible Dumps	295	0	295	295	0
Stable Dumps	450	130	450	450	0
Mine Infrastructure	80	0	15	15	65
Satellite Infrastructure	110	0	0	0	110
<b>Total</b>	<b>1,265</b>	<b>150</b>	<b>1,030</b>	<b>1,075</b>	<b>190</b>

\*Disturbance and rehabilitation numbers do not include the Hides transmission line corridor, which will be allowed to revegetate naturally should the transmission line be decommissioned.





Figure 2.4 Three-dimensional view looking west of the Porgera Gold Mine as at December 2002  
(2 x vertical exaggeration)

### 2.3.4 Small-scale Mining

PJV is committed to working with stakeholders to explore opportunities for enhancing the efficiency and sustainability of small-scale mining, while promoting

methods that are safe and environmentally responsible (see Sections 2.3.3 and 3.6).

Small-scale alluvial gold mining was a primary source of cash to Porgerans long

before the development of the Porgera Gold Mine (Plate 2.13). Following closure, it may become so again. To facilitate this, the PNG Department of Mining is undertaking a study to assess the



Plate 2.12 Seven-year-old vegetation on a dump slope near Dynos' explosives plant



Plate 2.13 Traditional small-scale mining





Figure 2.5 Three-dimensional view looking west of the Porgera Gold Mine as envisaged by PJV in 2008 - after progressive rehabilitation (2 x vertical exaggeration)

sources of alluvial deposits available for post-closure small-scale mining within the Porgera Valley. The results of the study will be made available to the community once complete.

It is anticipated that small-scale miners will also want to work the residual hard rock gold resources after closure. Specifically, it is expected that small-scale miners will attempt to work the open pit area, and possibly the old underground workings, following closure. These areas are inherently dangerous and will pose substantial safety hazards to small-scale miners. If small-scale miners attempt to work the open pit, they will be exposed to loose rocks, steep slopes (Plate 2.14) and impounded water. The old underground workings would be even more hazardous. Therefore, PJV cannot condone post-closure small-scale mining within either the open pit or under-

ground workings. For safety reasons, the underground mine workings need to be sealed to prevent future access.



Plate 2.14 Small-scale miner working a steep slope

Another potential concern is that future small-scale mining activities may disturb rehabilitated areas and cause adverse post-closure environmental impacts. For example, PJV intends to rehabilitate the stable dumps by covering them with soil and then revegetating them. If small-scale miners attempt to strip off portions of the cover, it may result in increased erosion and/or metal leaching.

It is PJV's intention to rehabilitate in a manner that leaves all sites as safe as possible. PJV will educate the local community to understand the safety hazards and potential environmental impacts associated with small-scale mining in open pit and underground mining areas as well as in other rehabilitated areas.

## 2.4 Biophysical Components

### 2.4.1 Underground Mine and Open Pit Mine

#### 2.4.1.1 Underground Mine

##### *Pre-mining Conditions*

The entrance to the underground mine was used as a food gardening area prior to construction (see Section 2.4.1.2).

##### *Current Situation*

The Porgera Gold Mine was originally a high-grade underground mine that was worked between 1989 to 1997. Following further exploration, the underground operations reopened in early 2002 and are expected to continue until 2006. The underground mine is accessed via the 28 Level Portal (Plate 2.15) immediately to the north of the open pit (see Figure 2.3). A decline runs from this portal to the Eastern Deeps orebody, some 130 m below the base of the current open pit. The decline will be extended to develop the two other proven orebodies, known as the Central and North Zones.

Water from the overlying open pit drains into the underground workings and then exits via a 2-km-long drainage tunnel, which has a gradient of 1% and discharges at the Yunarilama Portal (Plate 2.16) to the Kogai Creek catchment.

##### *Situation at Closure*

PJV is required by the PNG Mining (Safety) Act, Section 52, to seal the drain-



Plate 2.15 Main entrance to the underground mine - 28 Level Portal

age tunnel and 28 Level Adit and any other access points to the underground workings to prevent human access.

The drainage tunnel is not designed to be a permanent structure and eventually, it is expected to collapse. Therefore, the only permanent solution for the post-closure period is to insert a plug in the drainage tunnel which will have the effect of flooding the underground mine workings and, ultimately, flooding the lower levels of the open pit so that a permanent lake will be created.

##### *Stakeholder Aspirations*

Small-scale miners are expected to request that they be allowed access to the underground workings. However, this is not possible for safety reasons.

##### *Some Options for Closure*

Government legislation limits the choice to just one option:

- Sealing all access points to the underground workings; plugging the drainage adit; flooding the underground workings and creating a permanent lake in the open pit.

#### 2.4.1.2 Open Pit Mine

##### *Pre-mining Conditions*

Porgera Gold Mine has required the excavation of the southern end of the mineralised Waruwari–Peruk ridgeline that separates the catchments of the Kogai Creek and the Kaiya River. Mt Waruwari (2,700 m) is located at the southern end of the ridgeline and was covered in oak and southern beech *Nothofagus* (moss) forest, the dominant forest type at that elevation. Despite poor soils, steep slopes and high elevation, the prospect of compensation led to much of the area surrounding Mt Waruwari being cleared and planted with food gardens prior to the start of construction.

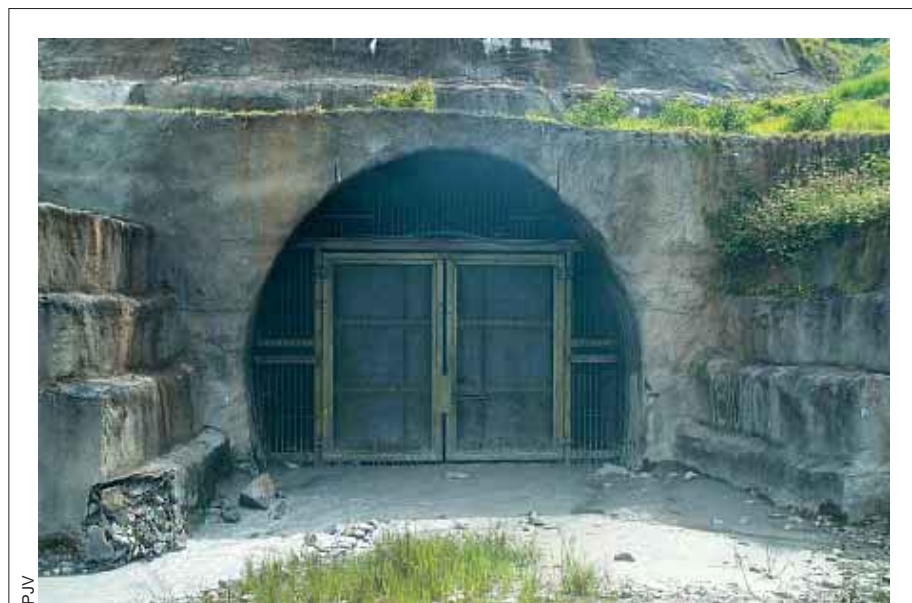


Plate 2.16 Drainage tunnel discharging water - Yunarilama Portal



### Current Situation

The mine is situated on the watershed between the Kogai Creek and Kaiya River. Drainage within the pit exits via the drainage tunnel described in Section 2.4.1.1. The open pit is currently 400 m deep and covers an area of approximately 180 ha (Plate 2.17). Some of the old underground workings, including drives and backfilled mine stopes, have been intersected by the open pit.

Further geochemical studies will be undertaken prior to closure to determine the potential for metal leaching from rocks in the pit walls and to determine if mitigating measures are required.

### Situation at Closure

At closure, the final pit dimensions will be approximately 2,100 m long by 1,100 m wide and 550 m deep. Final pit wall slopes are expected to vary from 18° for incompetent rock to 52.5° in competent rock (Figure 2.6).

The majority of the exposed walls of the final open pit will be too steep to attempt systematic revegetation and PJV intends that they be left as they stand, as is normally the case for open pit mines. Areas of the pit walls that are suitable for rehabilitation are those where brown mudstone is exposed, namely the west wall and the haul-road area at the entrance to the open pit. Education of the landowners and other community mem-

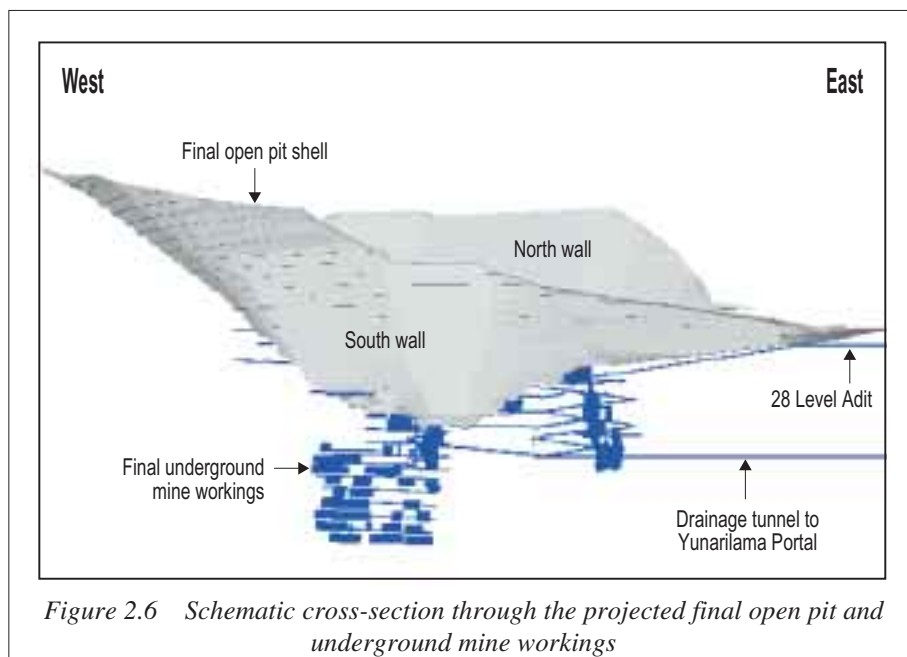


Figure 2.6 Schematic cross-section through the projected final open pit and underground mine workings

bers on the safety risks of entering the open pit after closure will be required.

### Stakeholder Aspirations

The exposed walls of the open pit may be prospective for future small-scale mining. PJV expects that some stakeholders will want the final open pit to be left in a state that maximises its potential for small-scale mining. Other uses may arise during consultation with the landowners and other stakeholders.

However, as stated in Section 2.4.1.1, due to the PNG Mining (Safety) Act, Section 52, the underground workings will be sealed and the open pit will be flooded. Therefore, only the exposed walls of the open pit above the lake will be accessible for small-scale mining.

### Some Options for Closure

Given that the open pit will be flooded following closure (Figure 2.7), surface water streams could be diverted into the pit to accelerate filling, if desired. PJV would construct an engineered spillway to safely pass overflow from the flooded pit during high rainfall events. Flooding the pit will significantly reduce the potential for metal leaching after closure because it will submerge approximately one-third of the rock types where reactive sulfides<sup>3</sup> are exposed in the ultimate pit walls.

#### 2.4.1.3 Possible In-pit Tailings Storage

The flooded open pit may provide a suitable facility to permanently store tailing that will be produced during the processing of low-grade ore stockpiles that is scheduled to occur from 2007 through 2012.

<sup>3</sup> Permanent underwater storage effectively pre-empt the oxidation of sulfides and minimises the potential for post-closure metal leaching. This is considered best practice management.



Plate 2.17 The Porgera open pit in September 2002



Figure 2.7 Three-dimensional view of the flooded open pit post-closure (2 x vertical exaggeration)

Preliminary volume estimates indicate that the flooded pit will have a capacity of approximately 50 Mm<sup>3</sup> and that six year's production of tailing solids is equivalent to approximately 35 Mm<sup>3</sup>. Therefore, the open pit should have ample capacity to store all the tailing that is produced between 2007 and 2012.

The drainage tunnel at the base of the open pit and all other access points to the underground workings would need to be sealed with appropriately engineered and constructed plugs. The tailing could then be added to the pit as a slurry.

While the technical feasibility of in-pit tailing storage has not been proven, a possible outcome of the closure planning consultation process is agreement among the stakeholders that in-pit tailing storage should be examined in detail. If so, then PJV will need to undertake a number of technical studies to explore

and assess the technical feasibility and provide the necessary assurance that tailing could be permanently and safely stored in the pit.

#### *Advantages of in-pit tailings storage*

- The cessation of riverine tailing discharge would be bought forward from 2012 to 2007. This would allow earlier recovery of the downstream river environment and a longer period of time for environmental monitoring.
- The pit lake will fill up at a faster rate than would occur by rainfall and runoff alone. This would accelerate the rate of submergence of exposed mineralisation in the walls of the pit and would be expected to reduce metal leaching and improve water quality.
- During the last six years of expected project life, the tailing would be contained in a localised area within the

SML rather than discharged to the river system.

#### *Disadvantages of in-pit tailings storage*

- Prevents small-scale mining below the water line.
- Sterilises any unmined ore that may exist in the pit but is presently uneconomic to extract and treat.
- Precludes access to and further exploration within the underground workings.

#### **2.4.2 Low-grade Ore Stockpiles**

PJV's operating plan has always been to process the highest-grade ore available and to stockpile low-grade ore for later processing, which improves the project economics and maximises the project's life. This has required the construction of seven low-grade ore stockpiles (Plate 2.18) and more of these are planned between now and 2006 when the open pit and underground mining



operations are scheduled to cease. Currently, PJV expects that reclaiming and processing the low-grade ore stockpiles will take six years to complete (i.e., will start in 2007 and continue until 2012). However, the economic feasibility of processing the low-grade ore, is subject to favourable gold prices. Should a prolonged period of low gold prices occur, then this situation may trigger the premature closure of PJV's operations.

### *Pre-mining Conditions*

The low-grade stockpiles are located at various elevations ranging from 2,300 m to 2,700 m. The highest elevation stockpile (SP 71) is located at the top of Kogai Stable Dump in an area formerly covered with *Nothofagus* (moss) forest and no permanent settlement. The lowest elevation stockpile is planned for construction on top of Anawe North Stable Dump, in an area formerly covered by mostly secondary regrowth, gardens and scattered forest.

### *Current Situation*

To date (end of 2002), approximately 19 Mt of low-grade ore has been placed in seven stockpiles. Collectively, these stockpiles now occupy an area of some 65 ha.

### *Situation at Closure*

Stockpiling of low-grade ore will cease in 2006 when the mining operations are expected to close down. By that time, PJV envisages that a total of 31 Mt of low-grade ore will have been placed in eight stockpiles, occupying a combined footprint of 90 ha (see Figure 2.3). Thereafter, the stockpiles are expected to be reclaimed and the low-grade ore processed at a rate of roughly 5.5 Mt/a (gold price permitting).

After any one stockpile is fully reclaimed, the underlying pad area will be rehabilitated. The rate of progressive rehabilitation of the low-grade ore stockpiles is expected to be about 15 ha/a between 2006 and 2012.

If any of the low-grade ore stockpiles are left unprocessed, they will be rehabilitated in situ to minimise metal leaching and enable revegetation.



Plate 2.18 Stockpile 20 of low-grade ore (right centre) that will be processed after 2006 (gold price permitting)

### *Stakeholder Aspirations*

Given the mineralised nature of the low-grade ore, PJV expects that the stockpiles may be prospective for small-scale gold mining. However, the low-grade stockpiles would only become a potential resource for small-scale miners in the event of premature closure.

### *Some Options for Closure*

The options for closure depend on whether and, to what extent, any low-grade ore remains unprocessed at closure.

As each low-grade ore stockpile is reclaimed and processed, the sites will be progressively rehabilitated. Some possible end land use options might include:

- Gardening and bushland resources.
- Forestry.
- Cash crops.
- Raising livestock.
- Settlement or community areas.

In the event of premature closure, some possible end land use options might include:

- Small-scale mining: for this option, the remaining stockpiles may not require rehabilitation.

- In situ rehabilitation: possible end land use options would be the same as those listed above.

## **2.4.3 Waste Rock Dumps**

### **2.4.3.1 Erodible Dumps**

#### *Pre-mining Conditions*

The higher elevation of the Anjolek Erodible Dump (2,600 m) meant that the dump was located in *Nothofagus* (moss) forest with very few houses in its upper reaches. In the lower parts of the steep-sided Kaiya River valley, the land comprised mixed forest, areas of grassland and some gardens. The lower elevation of the Anawe Erodible Dump (2,300 m) and its proximity to the pre-existing alluvial gold mining centre at Alipis, meant that it was located in an area comprising food gardens, secondary forest and scattered settlements. Prior to construction, both valleys had down-slope gradients ranging from 7 to 10°.

#### *Current Situation*

To date (end of 2002), 148 Mt and 86 Mt of incompetent waste rock have been placed in the Anjolek and Anawe erodible dumps, respectively (see Figure 2.3). The Anjolek Erodible Dump is located to the northwest of the open pit and is the largest erodible dump (170 ha) extending from 2,600 m elevation at its top (Plate 2.19) to 2,100 m elevation at its

toe in the Kaiya River (Plate 2.20), over a length of 5 km.

The Anawe Erodible Dump is located on the east side of the Anawe Plant and covers 125 ha in area and extends from 2,300 m elevation at its top to 1,900 m elevation at its toe in the Pongema River, over a length of 4 km (Plate 2.21). Neutralised tailing slurry from the ore processing plant is discharged to the river system at the top of the Anawe Erodible Dump.

The erodible dumps resemble and appear to have similar characteristics to the naturally occurring colluvial landslides in the PNG Highlands (see Plate 2.2).



Plate 2.19 Upper part of Anjolek Erodible Dump



Plate 2.20 Toe of Anjolek Erodible Dump



Plate 2.21 Anawe Erodible Dump



Plate 2.22 Natural revegetation occurring on the Anawe Erodible Dump looking eastwards and down the valley



Both dumps are currently creeping down their respective valleys and they are being actively eroded and contributing high loads of suspended sediment to the river system. Natural revegetation is already starting to establish on some parts of the erodible dumps (Plate 2.22).

### *Situation at Closure*

Placement of materials into the Anjolek Erodible Dump and Anawe Erodible Dump will be finished in 2002 and 2006, respectively. Once placement of materials is complete, it is expected that the rate of movement of the dumps will slow down substantially.

Over the longer term, these dumps are expected to retain their hummocky and irregular surface topography and behave in a similar fashion to natural landslides and to gradually creep down slope. Surface runoff is expected to flow in channels that will continue to meander across the dump surfaces. Over time, the dump surfaces will become colonised by natural revegetation and drainage channels are expected to incise and self-armour. These factors will combine to cause a progressive decrease in erosion and hence sediment yield to the natural drainage. It is anticipated that the materials will continue to erode slowly over the very long term, adding incremental amounts of sediment to the Porgera River system.

As per the terms of the Anawe LMP Agreement, PJV will rehabilitate (revegetate) the surface of the Anawe Erodible Dump and re-establish the original clan boundaries.

### *Stakeholder Aspirations*

Given the high intensity of gardening on land surrounding the two erodible dumps, it is expected that landowners will eventually wish to use the post-closure dump surfaces for both food gardens and, after forest is re-established, as a bushland resource.

Small-scale gold mining has long been practised on the Anawe Erodible Dump mainly directly below the tailing discharge point. At closure, or sooner if tailing is stored in the open pit, the tailing discharge will cease. However, it is expected that small-scale mining of deposited tailing material near the existing discharge point will still be a stakeholder aspiration.

### *Some Options for Closure*

Given that the erodible dumps are the largest single component (by area) of the Porgera Gold Mine, it is likely that they will be subject to multiple uses after closure of the mine. Therefore, agreement will be necessary between stakeholders as to the degree to which different end land uses can be implemented. For example, small-scale min-

ing of selected pockets that are prospective for gold may take precedence over re-establishment of gardens or forest.

### **2.4.3.2 Stable Dumps**

#### *Pre-mining Conditions*

The area in which the relatively high-elevation Kogai Stable Dump (2,360 to 2,720 m) is located, previously supported *Nothofagus* (moss) forest in the upper parts with mixed forest, secondary regrowth with a few gardens at the lower levels.

The Wendoko Creek catchment, in which the Anawe North Stable Dump (2,050 to 2,300 m) is located, was mainly secondary forest on the ridges, with gardening areas and some secondary regrowth in the valleys.

#### *Current Situation*

The Kogai Stable Dump currently covers an area of approximately 200 ha and is bounded to the north by the open pit (Plate 2.23). As at end 2002, it contains 203 Mt of competent (hard) waste rock and has been constructed in a series of benches 20–30 m high, supported by an engineered toe buttress. Waste rock with potential to cause metal leaching has been selectively handled and encapsulated within the dump and buried beneath competent non-potentially metal-leaching waste rock.

Approximately one third of the Kogai Creek catchment flows through the base of the dump via an engineered underdrain.

The Anawe North Stable Dump, located immediately to the north of the Anawe Erodible Dump, currently contains approximately 43 Mt of material and covers about 70 ha (Plate 2.24). Similar to the Kogai Stable Dump, an engineered underdrain and toe buttress were constructed. Potential metal-leaching material is being encapsulated within the dump.

The Kogai and Anawe North stable dumps have been designed to withstand a 1 in 100 year seismic event of Richter magnitude 7.5–8.0 with an epicentre within 50 km of the mine.



Plate 2.23 Kogai Stable Dump with Tawisakale Mill and workshops in foreground



### Situation at Closure

At closure, the Kogai and Anawe North stable dumps are expected to reach final areas of 300 ha and 150 ha, respectively (see Figure 2.3). At the Kogai Stable Dump, the highest point will be 2,720 m elevation and the lowest point will be 2,360 m elevation. At the Anawe North Stable Dump, the highest point will be 2,300 m elevation and the lowest point will be 2,050 m elevation.

The two final landforms will comprise a series of flat terraces and engineered outer batter slopes. The flow-through drains under each dump will be left 'as is'. Potentially metal-leaching (PML) materials will have been encapsulated within each of the dumps. The outer zones will be composed of competent non-potentially metal-leaching (non-PML) waste rock.

The final surfaces will be covered with colluvium or brown mudstone to seal the dumps and reduce oxygen ingress, as well as provide a suitable growth medium for revegetation. Dump surfaces will be graded to direct runoff to the natural drainage with minimum potential for erosion. Figure 2.8 shows the stable dump construction concept.

As per the terms of the Anawe North LMP Agreement, PJV will rehabilitate the Anawe North Stable Dump with a minimum of 1 m of top dressing on the



Plate 2.24 Anawe North Stable Dump with open pit in background

flat surfaces after having first consulted with the landowners.

### Stakeholder Aspirations

Given PJV's intention to create a series of flat terraces covered with a suitable growth medium, it is expected that stakeholders will want to use the rehabilitated dumps for gardening and establishing forest for future bushland resource use. While the elevation of Anawe North Stable Dump is suitable for gardening, the higher elevation of the Kogai Stable

Dump is not well suited to traditional types of food crops. The Kogai Stable Dump will be more suited to other uses, such as timber for construction and firewood, or possibly alternative high-altitude crops.

### Some Options for Closure

Some possible end land use options might include:

- Gardening and bushland resources.
- Forestry.
- Cash crops.
- Raising livestock.
- Settlement or community areas.

### 2.4.4 Minesite Infrastructure

#### Pre-mining Conditions

Conditions prior to mining at localities where minesite infrastructure is now situated range from intensively used gardening land to relatively untouched *Nothofagus* (moss) forest. The Tawisakale Mill was located on intrusive basement rocks which had sufficiently high strength to support the weight and expected ground vibrations from the crusher and grinding mills.

#### Current Situation

The mine infrastructure encompasses the Tawisakale Mill, Anawe Plant (Plate 2.25), administration buildings, portal area for the underground mine (Level 28) (Plate 2.26), Alipis and Yoko

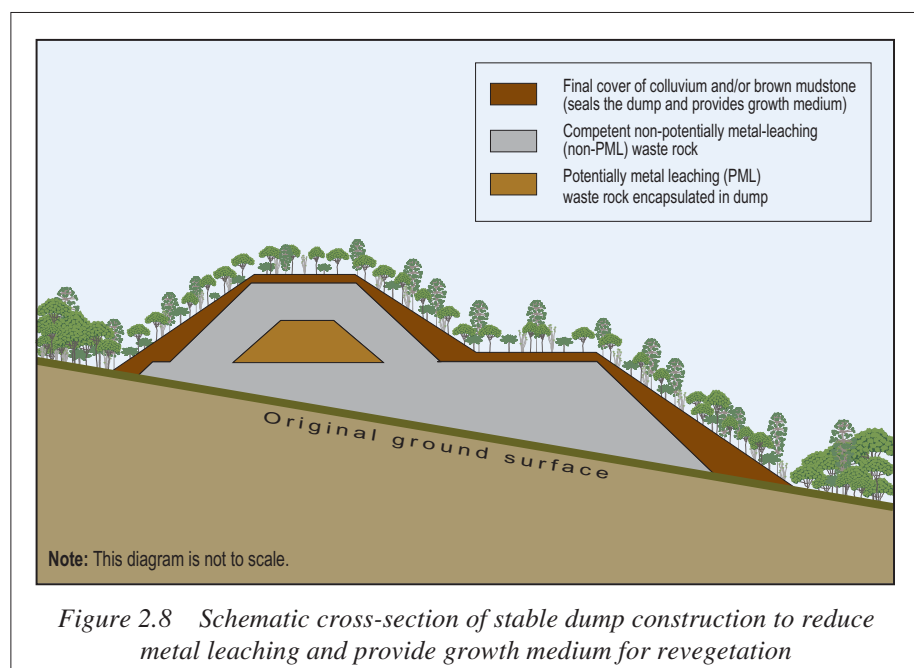
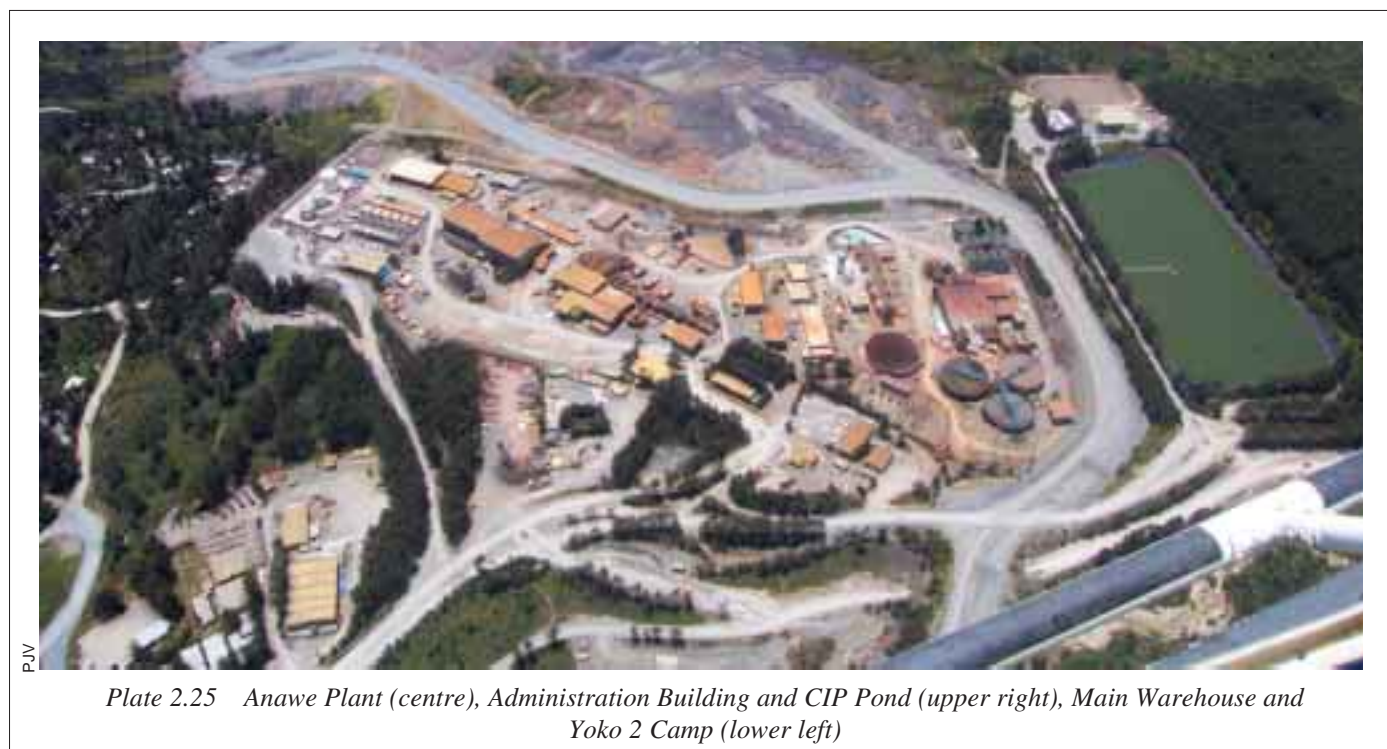


Figure 2.8 Schematic cross-section of stable dump construction to reduce metal leaching and provide growth medium for revegetation



camps, Dynos' explosives plant and various workshops and warehouse facilities in the mine area as well as roads and services (telephone, power, water and sewerage) (see Figure 2.3). Those facilities related to the mining operations will become obsolete as mining ceases whereas those facilities related to the ore processing will continue to operate up to closure. Opportunities for early closure, decommissioning and rehabilitation of obsolete assets will be actively pursued by PJV (Plate 2.27).

#### *Situation at Closure*

Once ore processing ceases, it is expected that decommissioning of minesite infrastructure will commence immediately. PJV's priority will be to salvage as many of its assets as possible by selling, dismantling and removing those assets and then rehabilitating and making safe the sites except where re-use by others is negotiated.

Wherever re-use by others is agreed, the new custodian(s) will need to accept legal responsibility of each asset after sale or transfer.

#### *Stakeholder Aspirations*

PJV expects that the government and the landowners will aspire to have at least some of the buildings left in an 'as is, where is' state to become assets for the local community after closure.

The Mining Development Contract specifies, 'The State shall have the option...to purchase the whole of the installations and infrastructure of the project (other than works and facilities)...as a complete installation (but not as an ongoing concern) and not on an individual basis...'.





### *Some Options for Closure*

PJV recognises that the decommissioning of the fixed plant and infrastructure involves a complex mix of public safety, government and landowner expectations, post-closure utility provision and rehabilitation considerations.

PJV will work with stakeholders to assess opportunities for re-use of residual infrastructure (after salvage). PJV will also work with stakeholders to assess opportunities and facilitate the transfer of responsibility for maintenance after closure of all, or portions of, existing public utility services to communities in the Porgera Valley.

Final decommissioning and rehabilitation works are expected to be completed in 2015. Figure 2.9 provides a three-dimensional impression of the site as envisaged by PJV.

## **2.4.5 Satellite Infrastructure**

### **2.4.5.1 Waile Creek Dam**

#### *Pre-mining Conditions*

The Waile Creek Dam and its catchment area are located in an alpine meadow area characterised by tussock grasses and sedge bog interspersed with shrubs and small trees. The high elevation (3,100 m elevation) precludes traditional food gardens and, consequently, there was no permanent human settlement in the area (see Figure 2.2).

#### *Current Situation*

The Waile Creek Dam is located in the Pagubiea River catchment some 14 km south of the mine and is the source of most of the mine's water supply. The catchment comprises 10.6 km<sup>2</sup> and the storage inundates an area of 13 ha at full supply level (Plate 2.28).

The original 7-m-high storage impounded 226,400 m<sup>3</sup> of water. Since the original construction, the dam has been raised twice by a total of 2.5 m and increased the storage capacity to 716,700 m<sup>3</sup>. A pump station located at the dam lifts water via a high-pressure steel pipeline some 160 m above the storage level to a ridgeline before dropping 780 m to the Anawe Plant in the Porgera Valley. With the exception of a 4-km diversion due to unstable ground, the pipeline generally follows the access road.



*Plate 2.28 Waile Creek Dam is the main water supply for the Porgera Gold Mine*

The dam was constructed in a unique manner utilising gabion rock baskets and concrete. A spillway and energy dissipation structure allows the dam to overflow when storage levels are high (Plate 2.29).

#### *Situation at Closure*

It is expected that the Waile Creek Dam will still be operating as the mine's water supply at the time of closure. PJV has

engaged independent experts to assess the long-term safety of the dam. As a result of those assessments, consensus has been reached that the dam is not suitable as a permanent structure for long-term use as a water supply source after closure.

#### *Stakeholder Aspirations*

Some stakeholders have suggested that the Waile Creek Dam may be suitable





Figure 2.9 Three-dimensional view looking west of the Porgera Gold Mine as envisaged by PJV in 2015 - after final decommissioning and rehabilitation (2 x vertical exaggeration)



## 2. Biophysical Considerations

for a post-closure water supply and that the dam could be used as a source of hydroelectric power. However, a study has indicated that there is insufficient head to generate power efficiently. Furthermore, with regard to its possible future use as a water supply, it would be uneconomical to try to maintain the existing high-volume pumping system, especially when more cost-effective sources of water are available in the Porgera Valley.

### *Some Options for Closure*

PJV's preferred option is to remove the dam, decommission and salvage the pump station and pipeline, and rehabilitate the area. The access road would be left in place.

#### **2.4.5.2 Pangalita Limestone Quarry and Plant**

##### *Pre-mining Conditions*

The quarry site is situated at the base of a major limestone escarpment below Mt Kumbipota and immediately above a steep talus slope formed below the scarp. The elevation of the site is 2,920 m and the pre-existing vegetation was *Nothofagus* (moss) forest with no nearby human settlement (see Figure 2.2).

##### *Current Situation*

The Pangalita quarry and plant were constructed in 1993 and are located 6 km upslope from the mine on the main access road to Waile Creek Dam.



Plate 2.29 Waile Creek spillway

Site disturbance to date totals 38 ha, and this is expected to increase to some 50 ha at closure. Two areas of disturbance are associated with the Pangalita site; a small quarry and associated waste rock storage areas, and the lime plant where limestone is converted to lime (Plate 2.30). The latter site contains a crusher, kiln, conveyors, lime storage silos, a vehicle workshop, fuel storage and offices (Plate 2.31).

##### *Situation at Closure*

Under the terms of the Pangalita Lease for Mining Purposes<sup>4</sup>, on closure, PJV is

obligated to negotiate, in the first instance, with the landowners for the sale of the limestone plant.

##### *Stakeholder Aspirations*

Aspirations identified to date by various stakeholders include the continued operation of the quarry as a source of either crushed limestone and/or lime for:

- Long-term road maintenance and concrete aggregate (limestone).
- Agricultural use (limestone or lime).
- Water treatment (limestone or lime).
- Gold/copper ore processing such as at the proposed Kainantu Gold Mine in Eastern Highlands Province (lime).

##### *Some Options for Closure*

Once the Porgera Gold Mine closes, there will be a limited local market for lime unless other markets can be established. The site's location at the end of the Highlands Highway is likely to render it uneconomic to supply markets outside the immediate local area. Therefore, unless a commercially viable business can be demonstrated, it is proposed that the quarry and associated infrastructure be



Plate 2.30 Pangalita quarry and lime plant

<sup>4</sup> Reference: Letter of Understanding appended to the Pangalita lease agreement.

salvaged and the site decommissioned and then rehabilitated.

#### 2.4.5.3 Hides Power Infrastructure

##### *Pre-mining Conditions*

The topography along the transmission line between the Hides power station and Porgera varies from undulating to mountainous. Along the 76-km length of the transmission line, the ground rises from an elevation of 1,285 m to a maximum of 3,200 m before dropping to 2,300 m at the Anawe plant site.

Vegetation classes in the region surrounding the power station and along the transmission line were described by Paijmans (1975) and include:

- Coniferous Lower Montane Forest.
- Lower Montane Forest.
- Small-crowned Lowland Hill Forest.
- Alpine Grassland.

##### *Current Situation*

The power system for the Porgera Gold Mine consists of a gas turbine power station (1,285 m elevation) located 20 km southwest of Tari in Southern Highlands Province (see Figure 2.2), and a 76-km high-tension (132 kVA) transmission line extending from the power station to the Porgera Gold Mine.

The source of natural gas is the Hides Gas Field located 6 km from the power station. Power station facilities (Plate 2.32) consist of eight gas turbine generators (nominal 64 MW capacity),



Plate 2.31 Pangalita lime plant

substation and switch room, control room, workshop, accommodation and access roads.

##### *Situation at Closure*

It is expected that electricity generation from Hides Gas Field will continue to supply the Porgera Gold Mine with its power requirements up until the time of closure. Following closure, the transmission line may continue to supply power to the Porgera Valley or may be decommissioned.

At closure of the Porgera Gold Mine, the Hides Gas Field and associated pipeline will remain the responsibility of its owner, Oil Search Ltd.

##### *Stakeholder Aspirations*

Once the Porgera Gold Mine closes, the power requirements for the Porgera Valley will be substantially reduced, which will bring into question the long-term viability of sustaining power transmission over 76 km from the Tari area. The guyed transmission line towers are relatively lightweight for helicopter installation purposes, but are prone to acts of vandalism (Plate 2.33). Security of the transmission line is a key factor for long-term planning for mine closure. If the difficulties recently experienced by PJV in keeping the transmission line operational re-occur after closure then, without the financial resources of PJV, it is doubtful that the responsible authority would be able to fund the maintenance and repair of the transmission line. Without a significant commercial user, the costs for power generation and maintenance of the transmission line are likely to be uneconomic.

##### *Some Options for Closure*

PJV recognises that the future operation of the transmission line is a difficult issue and will work with stakeholders to assess all opportunities for power supply after closure of the Porgera Gold



Plate 2.32 Hides gas-fired electricity generating plant



## 2. Biophysical Considerations

Mine (see further discussion in Section 3.4.2). Some possible options include:

- Continuation of supply of electricity from Hides.
- Replacement of the electricity supply from Hides with an alternative power supply system such as a mini-hydroelectric scheme within the Porgera Valley<sup>5</sup>.
- Should the government not take up their option to purchase, the power station would be sold to another user or salvaged, decommissioned and rehabilitated. Should the transmission line be decommissioned, the towers and lines would be salvaged and removed and the transmission corridor allowed to revegetate naturally.

### 2.4.5.4 Suyan Camp

#### *Pre-mining Conditions*

Suyan Camp is situated on a low mudstone ridgeline at an elevation of 2,280 m immediately adjacent to a tributary of the Maiapam River and a major landslide feature, known as the Maiapam mudslide. The area is prone to minor landslips.

#### *Current Situation*

Suyan Camp is located wholly within LMP1 some 5 km from the Porgera Gold Mine, approximately half way to Paiam Township (see Figure 2.3). The Suyan Camp LMP occupies 69.5 ha and has



Plate 2.33 Transmission line tower from the Hides Power Station

power, water, telephone and sewerage services (Plate 2.34). The site contains 30 family houses and single-status accommodation for 424 personnel. It is serviced by a large mess and contains both indoor and outdoor recreational facilities.

#### *Situation at Closure*

PJV will assess its need to occupy Suyan Camp as employee numbers decrease when the open pit mine closes, during the period when stockpiled low-grade

ore is processed, and beyond 2012 during the final rehabilitation stage. PJV pays fees to the customary owners of the LMP land. Once the LMP is relinquished, the payment of fees will cease. Any post-closure use of Suyan Camp would need to address the land tenure issue before the LMP is relinquished.

#### *Stakeholder Aspirations*

Various stakeholders have made suggestions for possible post-closure uses of Suyan Camp. Some of the suggested end uses for Suyan Camp include, but are not limited to:

- Hotel/lodge.
- Educational facility.
- Sports/training facility.

#### *Some Options for Closure*

PJV will continue to discuss future potential uses of Suyan Camp with stakeholders.

<sup>5</sup> A feasibility study for a mini-hydro station on the Pongema River is in progress.



Plate 2.34 Suyan Camp with Mt Paiam in the background

## 3. Socio-economic Considerations

### 3.1 Introduction

The Porgera Gold Mine has brought with it social and economic change for the community at Porgera. Impacts have also been experienced along the Highlands Highway, especially between Laiagam and Porgera, along the transmission line to Hides, and down the Lagaip and Strickland river systems, including Lake Murray. Mine closure at Porgera will potentially bring changes at least as dramatic as those associated with its construction for these communities. Assuming that these changes will be primarily positive or negative has the potential to be a self-fulfilling prophecy, and is a trap to be avoided while reading this chapter. That being said, some things are predictable: approaching and after closure, government revenues from the mine's activities will decline, in the face of impact area re-adjustments. This document provides an initial discussion of the socio-economic issues that will dominate closure planning for the next decade. It is intended that this Porgera Mine Closure Consultation Document can be used as the initial basis of public consultation and discussion on mine closure at Porgera. The objective is to provide enough relevant material to stakeholders, so as to allow for their full involvement in discussions and planning for the closure of the Porgera mine.

In terms of the broad approach to socio-economics adopted here, three factors have influenced the development of this report. First, this Porgera Mine Closure Consultation Document is developed around the notion of sustainability rather than simply mine closure. This is more than a semantic shift. Sustainability offers advantages in terms of thinking about closure at Porgera. It ties in closely with

recent mining industry (and particularly Placer Dome) thinking and policy on mining and society. 'Sustainability' also implies a shift from viewing mine closure as an event to an acknowledgement that successful closure will be a process, components of which are already underway.

A second related consideration that has influenced the approach adopted here is the recognition that PJV is only one of the parties or stakeholders that will influence the outcomes of this mine closure process. This ties in closely with the idea of sustainability as a way of approaching closure that more obviously acknowledges the roles of other stakeholders in the process, whereas mine closure implies only a corporate concern with closing down a mine. Quite simply, a sustainable future for the people of Porgera and surrounding areas cannot be achieved by PJV alone, but requires substantial commitment from all stakeholders.<sup>1</sup> For this reason, we are careful throughout to clearly delineate the limits of PJV responsibility in different areas and to highlight the areas of responsibility of the other local, provincial and national stakeholders in the process.

Third, a focus on sustainability acknowledges and allows for the consolidation of links with existing initiatives and processes that are already contributing to sustainability. It further highlights the close links between the biophysical and socio-economic aspects of closure planning.

This chapter provides background to the major sustainability issues facing the mine, the community and the other stakeholders in the lead up to closure and, where appropriate, outlines some PJV

proposals for addressing these issues. The process of taking closure planning forward and articulating this document with the aspirations of other stakeholders has been dealt with in Chapter One.

#### 3.1.1 Rationale Behind This Document

This report presents PJV position on sustainability and mine closure, as a departure point for the involvement of all stakeholders in the mine closure process. This chapter has been primarily written by a group of consultants with substantial experience in Papua New Guinea mining, drawing extensively on PJV data and personnel. Even though other stakeholders' views have been consulted it may be that the issues selected as significant are not those that these others would choose to highlight. It is hoped that this document assists all stakeholders to develop and refine their own views and plans on closure and sustainability issues at Porgera.

This report is premised on the assumption that at some stage in the near future PJV will join with other stakeholders in the project to establish some form of joint closure/sustainability planning and implementation group, in which PJV personnel will presumably play a major role. In which case the issues and proposals listed here may be expanded and given different emphases as other stakeholders express their own views.

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<sup>1</sup> The recent Final Report of the MMSD project notes (p. 220) that 'The mining company has a major responsibility for achieving [local sustainability development], but it cannot achieve this alone. Communities need to own this process and organise themselves accordingly.'



The National Government's rules on general planning—wards to put up proposals to the Local Level Government (LLG) for consolidation and in turn pass them on to the district for resource allocation—have been largely neglected in the project area. It is believed that, if stakeholders' views are to be accurately sampled and if a closure/sustainability program is to be developed and successfully implemented, then the central place of the local government system in future planning will be an essential ingredient. They will, after closure, be the responsible authorities. Unfortunately they have, at the moment, neither the funds, the skills nor the personnel capable of shouldering those responsibilities. That, however, is no reason for excluding them from the closure process; indeed it is an even more important reason why they should be included. Their inclusion will be part of a capability building process.

An integral part of the process by which the Beca Gure Plan (detailed next paragraph) was developed was a 'social validation' component. An independent town-planning consultant, James Simet, was brought in to facilitate discussions of the Plan's draft proposals by community leaders and to comment on those proposals. Following this the Plan was finalised. In this way the Paiam Master Plan was validated by the community as a whole in a way that few, if any, other proposals for Porgera's development have been.

#### 3.1.2 Sources Used

It is a great advantage for the Porgera project that it, unlike many others, has already been the subject of a multitude of planning exercises by its various stakeholders. Three in particular, widely consulted for this study, should be highlighted. The 1998 Beca Gure Plan, although having the main aim of planning Paiam briefly examined regional potential in a way no other document sighted has done and examined the possibilities for an overall urban system; it is well written, easily understood, sensible and appears to have been widely accepted by the communities. The Porgera District Plan seems sensible but there is doubt that the communities ever

validated it. If such validation could be obtained, it could play a major role in planning future economic development. The recently completed SDS (Sustainable Development Solutions) Long-term Economic Development Study (LTEDS) is another source of information.

There are two other sources that guide the general approach adopted here. PDI's statement of corporate commitment says, in regard to the benefits of mining, that:

'Placer Dome believes that while a mine's life is finite, its benefits are sustainable beyond mine closure. When a mine closes, it should have minimal on-going or long-term negative impacts on the environment or communities. Closure planning should be inclusive involving input from a range of local, national and international stakeholders, and should be integrated into all phases of mine development and operation.'

Three principles with relevance to socio-economic issues flow from this. In brief they are:

- **Public Responsibility:** Communicate with stakeholders and work towards consensus based on honest discussion and a mutual understanding of concerns and needs.
- **Social Progress:** Contribute to the quality of life of employees, local communities and host countries, while respecting their cultures, needs and priorities.
- **Economic Benefits:** Integrate our activities with the economic development objectives of local communities and host countries in which we operate.

Secondly, the recently issued (May 2002) final report of the MMSD (p.208) states that:

'... ensuring that the goals and means of achieving sustainable development are defined by the community. Perhaps the greatest challenge... is determining who is responsible and accountable for realizing developmental choices and outcomes at the community level.'

As will be seen, following either of these worthy approaches need not be problem-free, nevertheless their basic axiom (closure cannot be achieved successfully without the full participation of the host community) is accepted in what follows.

#### 3.1.3 Current Revenue Stream Projections

PJV employment and production will begin to decline rapidly within the next five years, and is planned to effectively end in 2012. This sets the context and constraints for the closure process and the possibilities for achieving different goals. By 2006, with the conclusion of mining, production will drop to around 1/3 of current production levels, leading to the end of stockpile mining in 2012, and final decommissioning of plant and rehabilitation of the site in 2014. Post-closure monitoring will continue for some years after this before the relinquishment of the leases. This has a number of consequences for the community.

Based on current projections, the obvious consequences as the mining rate decreases from late 2003 is that fewer trucks will be required and therefore mine personnel and maintenance employees numbers decline by approximately 1/3 per year to 2006. Contractors will likewise be affected. This change is positive in that it reduces stresses on the Porgera host community. The closure of the underground mine in 2005 will lead to another 90 employees being retrenched. As mining operations wind up in 2006, operations and maintenance personnel will be further reduced (to 1/3 of current) while geology, supply, administration and other support services will be reduced to around 2/3 of present levels.

The rapid drop in production after 2006 also affects royalties and dividends for the local community (from K5 million in 2002 to an estimated K2.6 million in 2007). By 2012, with the end of stockpile milling, the workforce will comprise just 270 in total. It will effectively mark the end of mine-derived royalties, dividends, wages and other revenue streams for the local community (with the exception of occupation fees for leases still retained by PJV.) Lease re-

Table 3.1 Estimated benefit streams of stakeholders in millions of Kina\*

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Enga Prov Gov (EPG)	21.9	20.3	22.7	23.1	20.8	10.9	8.8	8.6	7.5	7.0	0.0
Landowners	18.2	16.9	18.7	18.7	17.1	10.8	9.2	8.9	8.0	7.5	3.0
Porgera Dev Auth (PDA)	5.2	4.9	5.4	5.5	5.0	2.6	2.1	2.0	1.8	1.7	0.0
Paiaam Mgmt Co (PMC)	6.9	3.8	3.7	0.7	0.7	0.3	0.3	0.3	0.2	0.2	0.0
PJV projects	0.9	0.8	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.1	0.0
Employees	34.7	35.4	34.5	34.7	30.9	27.2	21.1	19.0	17.1	15.4	6.2
Totals	88	82	86	83	75	52	42	39	35	32	9

\*EPG amounts include royalties, Special Support Grant, dividends and Tax Credit Scheme amounts spent in Enga but outside of Porgera area; landowner amounts include royalties, compensation and dividends. PJV project amounts based on a reduced tax credit scheme formula, as proposed to government in the reference paper. Employees includes wages, superannuation and training.

linquishment (projected to be in 2015) will see the end of occupation fees. All of the above reductions in resources highlight the urgent need for the development of alternate sources of income, as outlined elsewhere in this chapter.

The Department of Mining is currently undertaking a study of benefit streams and their management as part of a project to develop a sustainability Policy for mining. Draft proposals will be presented in 2002 and this draft plan will seek to include aspects of the proposed national policy if available.

Estimates of benefit streams for different stakeholders from this study are detailed in Table 3.1.

The obvious caution in examining revenue streams is that sustainability is not about the (re-)distribution of current mine-based revenue streams but the creation of new streams through enterprise, investment and partnerships (Figure 3.1).

### 3.1.4 Stakeholders

The influence of the Porgera Gold Mine in socio-economic terms can be divided into three broad groups of stakeholders: Porgera District; other mine-affected communities; and national and provincial governments. Recent history suggests it is also useful to consider the potential negative impact of stakeholders on the mine, especially in terms of re-allocation of resources and the potential for premature closure.

Primary stakeholders in the Porgera District include the various local arms of government (District Administration,

Porgera and Paiela LLGs, ward councillors and staff etc), the SML landowners, other Porgeran lease landowners, non-lease Porgerans, non-landowners and local businesses. This area is the primary focus of this chapter, as it is where communities have been most heavily impacted by the mine, and will feel the greatest impact of its closure. PJV's employees and contractors are included as groups facing major impacts.

Other mine affected communities include those living along the three 'corridors' that radiate from the mine—the Laiagam

to Porgera road; the Hides transmission line; and the Lagaip–Strickland river system and Lake Murray. Others with interests in these areas include the various levels of state, plus national and international NGOs.

The primary stakeholders in the last of the three domains are the National and Provincial Governments, while the wider Papua New Guinea and Enga peoples, and national non-governmental organisations (NGOs) are indirect stakeholders.

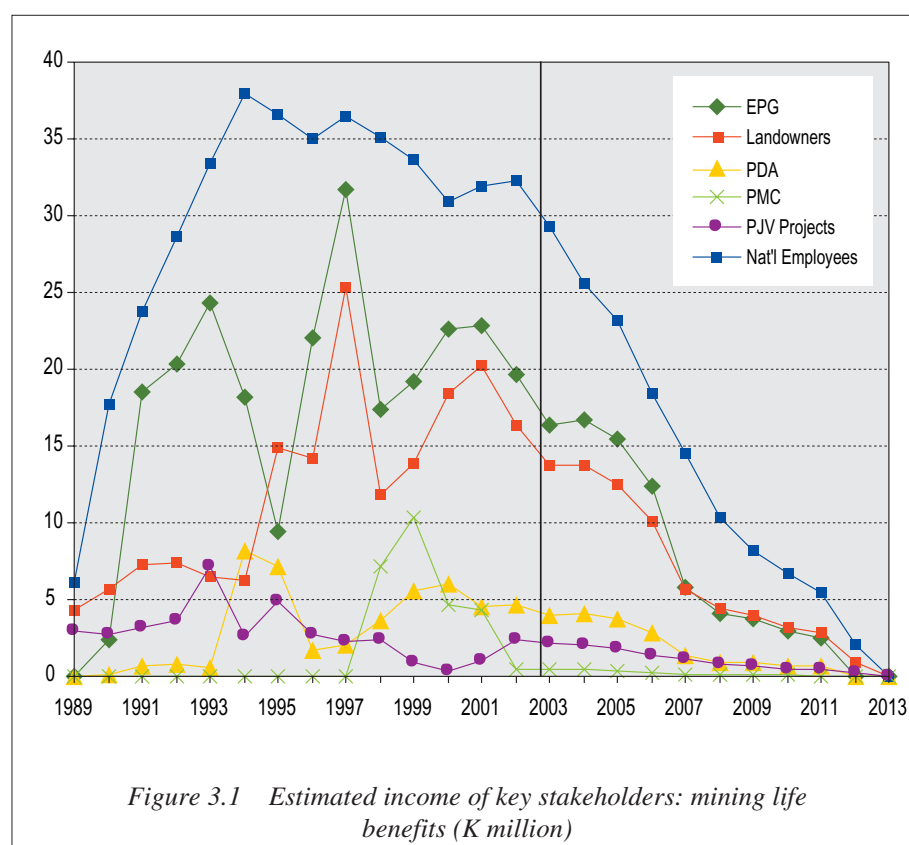


Figure 3.1 Estimated income of key stakeholders: mining life benefits (K million)

### 3.1.5 Structure of Chapter Three

There are obviously a number of ways of dissecting and analysing any society, and the divisions used in this report are merely one way of doing this, although it is a structure that matches, in large part, other government and PJV divisions. This chapter is structured around four divisions, all of which are underpinned by the need for capacity building and partnering:

- Community Services (Public Administration, Health, Education, Justice).
- Community Infrastructure (Transport Infrastructure, Power and Telecommunications, Urban Development, Relocation Settlements).
- Human Resources (Labour Force, Women's Participation).
- Economic Activities. (Agriculture, Food Security, Industry and Services).

Sustainable development requires attention to all four of these aspects of the society. The neglect of any one of these may not preclude short-term benefits for some or all of the members of the society, but it will make the securing of long-term achievements difficult.

Under each of these headings background information on the sector leads into a discussion of the major sustainability is-

sues. A vision for the sector post-closure is then sketched, options discussed and finally a proposed set of actions by PJV is put forward.

### 3.1.6 Population Information

The population of the Porgera District has grown quickly during the exploration and development years. This is shown in Table 3.2, with the adjoining district of Paiela – Hewa and the overall Enga population shown for comparison.

There is sometimes confusion as to the population in the area, since both Porgera and Paiela projects are administered by the Porgera Development Authority, the overall Porgera population is often mentioned as 'about 30,000'. More correctly, the overall Porgera population is 'about 20,000'.

Approximately 4,500–5,500 people live within the SML boundaries<sup>2</sup>. The inaccuracy is due to the difficulty in distinguishing short and long term visitors, settlers, squatters and itinerant workers

from genuine residents, who are reasonably enumerated at about 4,300.

## 3.2 Partnerships and Capacity Building

### 3.2.1 A Strategy to Implement Sustainability

A fundamental principle of our approach to sustainability is the use of partnerships and networking to grow ideas and to effectively implement development programs. For this reason the following section despite being short has the status of a sub chapter since it is an implementation strategy that will impact all the proposals that follow.

PJV has had increasing experience in using this as an implementation strategy however it is one that has further potential but does require a new approach to doing things. Partnerships have ranged from very small programs such as minor financial support to Mungalep training centre run by the Catholic Church to very large programs such as the World Alliance Health Program (Plate 3.1) along the riverine system. The Porgera mine is itself a most successful partnership between PJV and project stakeholders. Some other examples of existing and potential partnerships are listed in Table 3.3.

Donor agencies and international agencies are increasingly seeking partnerships to provide cost effective mechanisms to implement development programs where they are most needed and have greatest impact. In June 2002, the World Bank commissioned a study to examine the possibility of using Porgera as a pilot mine to try ways to promote local economic development (LED) in the immediate area of mines. The draft report stated:

<sup>2</sup> Brian Robins, Genealogy and Census, 1998-2000.

Table 3.2 Population information

Census Year	1980	1990	2000
Porgera District	5,029	10,405	22,809
Paiela-Hewa District	3,832	6,175	11,084
Enga Total	165,534	235,561	295,031

Source: National Statistical Office, various census reports.



Plate 3.1 Mothers and babies ready for immunisations at Komogato Village (World Alliance for Community Health Program)



Table 3.3 Some PJV partnerships

Activity or Program	Partners
Wabag Vegetable Depot	Enga Provincial Government, PJV
Tax Credit Scheme	PJV and Government of PNG
AIDS Awareness	PJV, CARE and Porgera Health Division
World Alliance for Health (providing health training and preventative measures to the Nomad District of Western Province.)	World Health Organisation, National Department of Health, Division of Health, Porgera and PJV.
Trades training at mine site using the National Trades Testing Accreditation System for trainees and provision of support to the Porgera Vocational Centre	National Trade Testing Board, Porgera Vocational Centre, PJV.
Agricultural training	National Agricultural Research Institute and PJV
Porgera Environmental Advisory Komiti (PEAK)	Individual and Community Rights Forum Inc.; Melanesian Institute; PNG Institute of Medical Research; National Spiritual Assembly of the Baha'is of PNG; DEC, DoM, PJV, Placer Dome Asia Pacific, technical experts
Fly-in, Fly-out agreement and implementation`	PDA (LLG's), DoM, EPG, PJV
Paiam Market	PMC/PDA and AusAID (through The Incentive Fund)
The Consultative Implementation and Monitoring Council (development and consultation forum)	Government, a wide range of business sector and NGO representatives, including PJV
Trade Certification	Technical Colleges, National Apprenticeship Trade Testing Board, PJV
Western Regional Training Authority –WRTA-(at proposal stage)	AusAID Incentive Fund, Oil Search Limited, PJV
Yaws Eradication Programme (Hewa areas of the upper Strickland River)	Lutheran Church, PJV
Caterpillar Training Certification	Caterpillar International, Hastings Deering, PJV
Porgera International Primary and Secondary School	Landowners, Children's Trust, PJV and the community
Business management training and outsourcing	Ipili Porgera Investments, Yelgun, PJV

'Overall there is a strong interest in developing and implementing a local economic development strategy and plan. In a number of instances, various stakeholders are initiating or considering initiating activities that would be more effective as part of a coordinated LED process (e.g., development of a community sustainability plan).'

This would be done under a leadership partnership calling on numerous existing key players in the community, with attention to capacity building activities involving the Porgera and Paiela LLGs and the District Administration. It is suggested that the World Bank initiate the process.

While the ultimate responsibility for launching and maintaining the process must rest with the LED Partnership Network as discussed above, it is suggested that the World Bank Mining Group and Urban Departments can, and should, play a facilitatory role in the process.

Should this eventuate it could mutually support the implementation of a sustainability and closure plan.

From the above specific example, we can expand to a general rationale for partnerships may which be summarised as follows:

International trends toward greater corporate social responsibility are a fact of operations; the issues are not going to go away. There is a business case for the Triple Bottom Line (economic, social and environmental sustainability) and for enhancing corporate social and environmental responsibility and credibility. However business activities and developmental activities will often use different analyses, frameworks and systems even though both may meet demands for poverty alleviation, rural development and community services. Partnerships allow the resource developer to pool local knowledge, contacts and infrastructure with development agency expertise, credibility, reporting and monitoring

mechanisms in ways which allow both to extend their reach into target communities and, quite possibly, beyond mine life.

Suggestions for potential partnerships that could be developed are sought from all as they read the following sections of this draft plan.

### 3.2.2 Capacity Building

Networks with NGOs and other sources of expertise offer an opportunity to address a major perceived problem: the lack of administrative, executive and implementation capacity in Porgeran institutions to sustain the Porgeran economy, infrastructure and services post-mine. PJV will assist in the needs assessment of both the public and private sectors for specific skills to enhance work effectiveness in areas of programme delivery, such as health services and AIDS/HIV awareness, planning capacity at Local Level Government and District levels and District Education planning and management.

Concurrent with efforts to build capacity will be greater efforts to work with government and avoid by-passing or assuming government roles. In a sense, this is demand driven capacity building, a persistent call for the systems and personnel in place to work on behalf of all stakeholders. Additionally, PJV staff redundancies will be examined as part of the capacity building process, since the return of highly capable employees to the national labour pool is a factor in sustainable development. The purpose is to mobilise resources to promote communities ready and able to plan and produce sustainable and improving livelihoods.

In terms of community, staff and business capacity development, PJV will consider the following areas, by sector (Table 3.4).

The above does not in any way preclude activities suggested by other stakeholders. The very range and complexity of issues calls for some rationalisation, to ensure that scarce resources are used wisely. PJV can neither address nor resolve all issues and so will work with stakeholders to prioritise the concerns, and seek appropriate partnerships to determine the best way forward to post-mine sustainability. It is important PJV disentangle its control and facilitate the move toward self management. This will

be true for both the environmental/bio-physical issues and for the social ones.

PJV is actively exploring partnerships through contacts with organisations such as Business for Social Responsibility, Partnerships in Rural Development and the Collaborative for Development Action.

#### 3.2.3 Consultation

As a broad outline, the essential components of the consultation process would be as follows:

- Information dissemination and education, starting with the public release of this document. Sub-tasks include ensuring that no legitimate stakeholders are uninformed; that feedback mechanisms are clearly stated by stakeholders and readily available to all stakeholders; that a realistic time frame for consultation is set.
- Clarification and explanation. This will probably be a period of quite intense communication using all available channels to ensure that the messages are accurately received and relayed and that stakeholders have co-ownership of the remaining processes.
- Encouraging and compiling stakeholders' comments and points of view; rules of engagement.

- Finding the common ground and defining areas requiring resolution.
- Relating stakeholder visions to resources.
- Prioritising, reaching agreement on important issues; social validation. This is an exceptionally important aspect of the process.
- Implementation of programmes suggested above.
- Discussion/negotiation on unresolved issues.
- Agreement(s) on activity plan(s) and assignment of implementation and monitoring roles; design of feedback mechanisms; governance.
- Monitoring, with feedback to stakeholders. It is assumed that these activities will become autonomous and extend beyond mine closure.

The above is primarily for communications and planning involving PJV and is true for both bio-physical and socio-economic issues (Plate 3.2). Other stakeholders will have to determine their channels and frequency of communications, for example, between landowners and the Enga Provincial Government.

### 3.3 Community Services

Like all communities, and particularly those in remote parts of the country, Porgerans place a high priority on the effective delivery of basic government services, particularly in terms of health and education. In this section the focus is on developing the institutions and capacity to ensure the maintenance of these basic services after the closure of the Porgera mine. The first issue considered is the performance and structure of district-level administration generally, as this will determine the extent to which sustainability will be able to be achieved in other sectors. Issues and ways forward relating to the health, education and justice (or 'peace and good order') sectors are developed within this more general governance framework.

#### 3.3.1 Public Administration

##### 3.3.1.1 Summary

The broad framework of government at Porgera is obviously critical to commu-



Plate 3.2 Consulting with Mungalep villagers prior to construction of the Anawe North Dump

Table 3.4 Issues for development of capacity

Sector	Sub-sector	Issues and Capacity Gaps
Agriculture	Food production	Food security, markets for excess production, land, techniques, irrigation, crop varieties, karuka (pandanus nut), training, micro-finance.
	Cash crops	Lack of market & value adding infrastructure; road network; limited access to advisory services; productivity
	Forestry	Building materials; furniture, environmental issues, access to expertise.
	Animal Husbandry	Introduced species and varieties of fish, birds and mammals, food supply, market; feedstock, veterinary services.
Commerce	Manufacturing	Power, markets, transport,
	Trading	Road security, backloads, pricing, logistics, plantation crops, timber, value added goods.
	Governance and Management	Fiscal security; role of Boards & Managers; role models, training.
	Services	Legal, accounting, bookkeeping, communications, training, government services, banking investment, communications, commercial training services.
	Alluvial mining	Fair price, techniques, mercury, scale & mechanisation, SYSMIN, training.
Government	Local Level Govt	Planning, prioritisation budgets, project management, proposal writing, training in roles etc., Western Regional Training Authority (WRTA)
	District Admin.	Resources, accountability, politicisation, leadership, relations with NGOs, donors, SPA (and WRTA when implemented.)
	Health	Planning, resources, logistics, in-service, maintenance, finance, prevention vs cure
	Education	Planning, accountability, in-service, maintenance, commercial education; volunteer and NGOs
	Women, youth and sports	Group and financial management; project proposals and management; youth mobilisation and motivation, leadership training, empowerment; NGO partnerships; affiliation with national bodies.
	DPI	Logistics, accountability, coffee development & markets; food security; training and extension, partnerships, proposal writing and monitoring.
	Bus Dev	Business and business group registration; advisory services; marketing advice, bookkeeping, commercial networks
	Police	Leadership, logistics, transport, community policing, law enforcement, case preparation.
	Courts	Communications, support staff, law enforcement, training (village courts).
	PDA	Planning, budget security, future insecurity, town management vs project management, practical capacity building, partnerships.
	WRTA	Start-up and logistic support; long term funding, partnerships.
Infrastructure	Transport	Maintenance of roads, Kairik; feeder roads, maintenance of equipment, council planning.
	Power	Mini-hydro maintenance; power line maintenance (if no PNG Power); collection of user fees; relationship with PNG Power
	Communications	Sustainable services; relationship with Telikom, user fee collection, internet services and service providers, community radio, market place meetings.
Retrenched Employees	Wage employment	Portability of experience and training; market demand; matching demand with skills; redundancy package and investments; SYSMIN*, skills transfer to village economy.
	Self employment in business	Business management, market analysis, training, SYSMIN
	Self employment, agric, casual, village	Exports for devaluation protection; personal budgeting, market access, investment strategies
	Retirement	Pension adequacy and security
	Contractors	Use of skills and assets; re-locating to meet market
Social Services	As for District Administration	In Porgera: bridging support until District Services are up to speed; for the riverine and Hides Transmission Line (HTL) impact areas, restoration, initiation or maintenance of basic services in health and education will be required.

\*SYSMIN is a European Union mineral stabilisation mechanism to protect incomes of developing nations from mineral price fluctuations.



nity well-being and development prospects both in the next decade, and after mine life. Delivery of essential community services post-mine will be the responsibility of (primarily) district-level government, set within Provincial and National Government structures. At present District Administration at Porgera is barely functioning, and falls a long way short of the levels of efficiency, capacity and accountability that will be required to maintain even the most basic levels of government service delivery post-mine. In this regard, Porgera is no different to most other parts of Papua New Guinea. What is different is that the possibility exists over the next decade of using mine-related revenues and resources to establish the structures and mechanisms to ensure that governance at Porgera meets the needs and aspirations of the population post-mine (Plate 3.3).

#### 3.3.1.2 Background

A detailed explanation of the PNG system of local, provincial and national government is available in Appendix 4. For our purposes, the reader should be aware that the local and provincial levels of government are organised under the New Organic Law on Provincial and Local Level Government (1995; hereafter, NOL). This law delegates substantial planning powers to local governments, and relates locally developed plans to the provincial and national planning and budgeting mechanisms. In theory, the system is highly democratic and responsive to local needs, starting as it does at the ward level. In practice, it suffers from the lack of trained planners and project managers, poor integration with budget processes and low levels of accountability. On the positive side, Local Level Governments (LLGs) have provision for inputs from women, youth and business, offering the hope that capacity building can work on several levels to improve responsiveness and efficiency in delivering goods and services.

The political wings briefly outlined above are supported by structures which administer each level of government's area of responsibility. These are coordinated by district and provincial level administrations headed by senior public



servants, the District and Provincial Administrators respectively.

Police, courts, mining wardens and coordinators, environment, education standards, examinations, and policies; public service terms and conditions of employment are examples of national government functions. Health and education staffing and payments, provincial roads, primary industry, business development, and community development, district services and the coordination of local level governments are provincial functions. Construction and care of aid posts and elementary schools, feeder road and ward level agriculture planning are examples of local level government functions.

#### Pre-mining Conditions

The Interim Enga Provincial Government was established in 1978 and full provincial elections were held in April 1980. The elections resulted in the establishment of a Provincial Assembly with 21 members. These members then elected one of their number as Provincial Premier. Unlike the current system, there was no provision for any Assembly Member or the Premier to be a Member of Parliament.

Provincial, district and LGC plans and budgets were coordinated centrally by the policy and planning units with Pro-

vincial Governments and funds disbursed on a quarterly basis to approved projects. In 1987 the total revenue available to the Provincial Government was K14.7 million. Of the total revenues available to the EPG only 4.3% was raised internally.

Prior to mine start-up the Porgera District Administration was limited to the provision of basic health and education services, agricultural extension support and the maintenance of law and order. Air services were limited and road access to Wabag was constrained by maintenance problems. While administrative services were limited and not always effective they were generally valued by the local communities and LGCs which usually played an active role in their establishment.

#### The Current Situation and Stakeholders

The Porgera Gold Mine is situated in the Porgera-Lagaip District (and electorate) of Enga Province (Figure 3.2). The district is serviced by the Porgera (c. 22,000) and Paiela LLGs, which have a combined population of approximately 30,000. While the official district administrative unit (and National electorate) covers Porgera and Laiagam the areas are treated as separate districts for local planning purposes, although

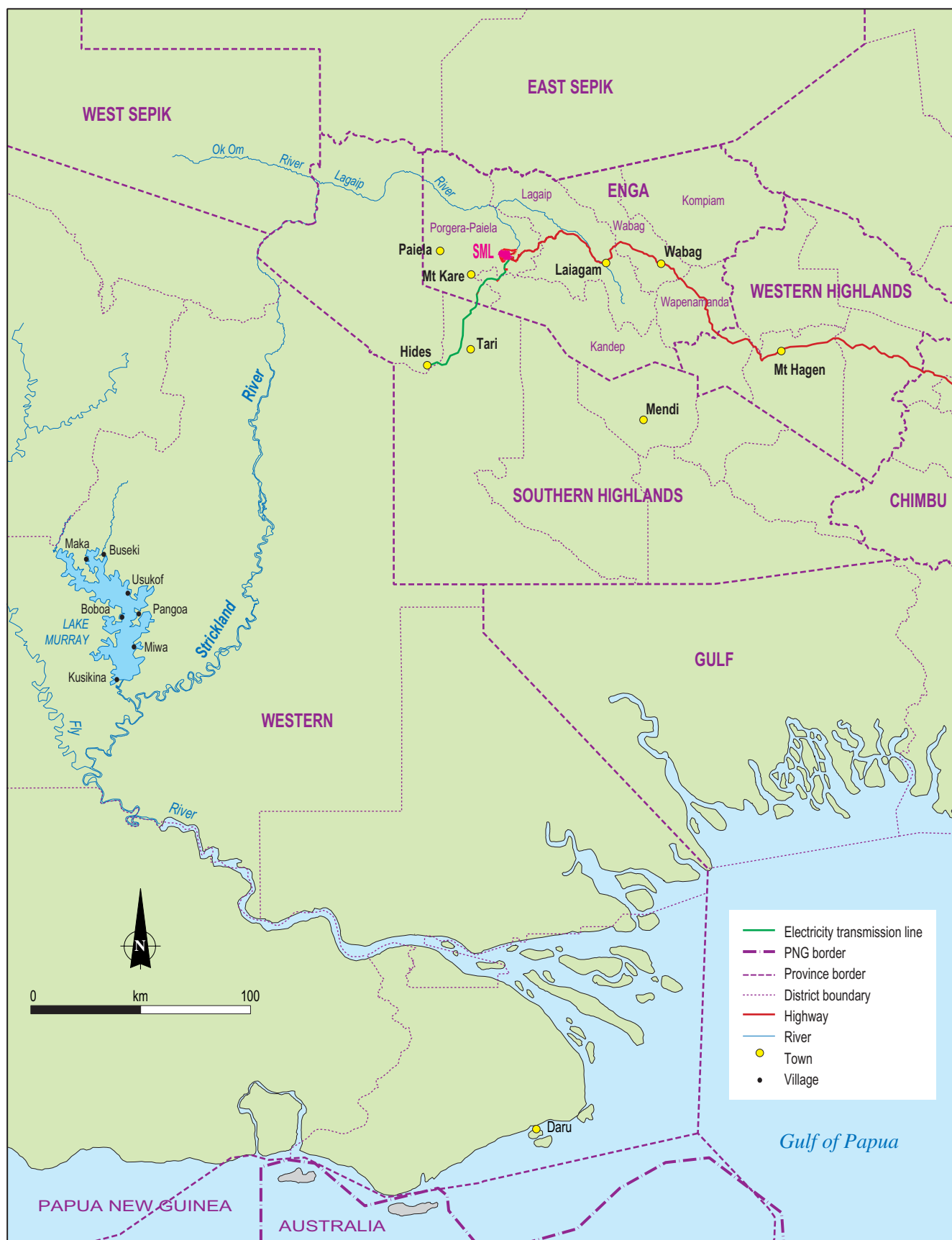


Figure 3.2 Provincial and administrative district boundaries

whether this situation will continue in the post-mine period remains unclear.

Social and economic development in the Porgera District is inextricably linked to maintaining road transportation links to other Highland provinces and to Lae. Hence any planning exercise for the Porgera District must also consider social and economic development initiatives for communities along the Porgera–Laiagam road corridor, and should be extended to include the other mine impacted communities along the Hides transmission line and down the Lagaip–Strickland river system.<sup>3</sup>

The following outline lists the many political, administrative and economic and structures which make up the ‘institutional stakeholders’ operating on behalf of the impact area populations. A brief note indicates current status (October 2002) and opportunities for capacity building, or sources of expertise/excellence to be tapped in capacity building programmes. (A much fuller discussion is to be found in Appendix 5.)

**Ward Development Committees:** Neither the Porgera nor the Paiela LLG has prepared a five-year plan.

**Local Government Assembly and Executive Committee:** The Porgera LLG members face re-election due to disputes in the elections held earlier this year. As such, there is no Porgera LLG. The previous LLG left no five-year plan to be implemented in the interim. The Paiela LLG has nominated a President and has met in Assembly, showing an interest in re-opening the Paiela airstrip and rejuvenating the coffee industry.

**District and Provincial Administrations:** Political intervention in staff placement and lack of planning have hindered the effectiveness of these administrative bodies. The District Administration is nearly paralysed by absenteeism and lack of leadership and accountability. Budget cuts hamper the effectiveness of the Provincial Administration.

*As a note of some urgency,* the lack of both a Porgera LLG and effective District Administration creates a vacuum in which frustrations could too easily build in the district. The PDA is by default the

government body of choice, but suffers from limited resources and mandate. The temptation for PJV to step (or be pushed) into the breach must be resisted if disentanglement and capacity building are to commence.

**Joint District Planning and Budget Priorities Committee:** Nominally, the JDP&BPC is designated as the principal decision-making body in the district. It is mainly constrained by weaknesses in the District Administration.

**Joint Provincial Planning and Budget Priorities Committee:** The members of the Enga PP&BPC face similar constraints to their JDP&BPC counterparts: lack of plans to work from or support.

**National Government Department of Mining:** The DoM administers the Mining Act, the Mine Safety Act and conducts regular reviews relating to stakeholder commitments as defined in the various stakeholder agreements.

The DoM is currently seeking to integrate its draft policy on mine closure with a national policy on benefit stream management and planning for sustainable development. It is anticipated that a policy which covers benefit stream management, planning for sustainable development and mine closure will be in place by June 2003. In the interim the DoM refers mining project stakeholders to its draft Mine Closure Policy.

The current Draft Mine Closure policy provides for the development of a Social and Economic Development Plan (SEDP) for each mining project area and states that:

‘SEDP should embody the principles and practices of sustainability and aim at providing from benefit streams during the mine-operating phase, adequate finance for the provision and maintenance of community services after mine closure.’

**The Department of National Planning and Monitoring:** As part of its commitment under the Porgera Development Agreements the DNPM has recently produced a study for the development of a Long-term Economic Development Plan for the Porgera District.

**The Porgera Local Level Government Special Purposes Authority:** The Porgera Special Purposes Authority (PSPA) has its genesis in the Porgera Development Authority (PDA) which was established in 1989 by the Provincial Government to assist landowners, the District Administration and the Porgera and Paiela LLGs as part of the Porgera Development Agreements. It was revised in 1998 so that its functions were consistent with the New Organic Law (NOL.)

Under this proclamation the PDA is to:

- Construct infrastructure on behalf of the national, Provincial and LLGs within the Porgera District.
- Assist the Porgera and Paiela–Hewa LLGs in the implementation of their administrative functions.
- Manage the construction of facilities in Paiam, Porgera and Kairik towns and manage their operations.
- Manage the payment of royalties and other mine related income in the Porgera District.
- Manage and operate the Porgera District Hospital.
- Advise the landowners and the LLGs on natural resource project agreements.
- Implement the functions of the Tenders Board, Building Board, Physical Planning Board and other functions delegated to it by the National Government, Provincial Government or LLGs.
- Receive and expend funds on behalf of the Porgera and Paiela–Hewa Local Level Governments.

<sup>3</sup> Planning in the Porgera District will need to take account of the proposal (the Western Regional Training Authority) to support LLG planning initiatives in Tari and Laiagam through the AusAID Incentive Scheme. Public administration and law and order have largely broken down in these areas and a program of capacity building has been recommended to resurrect the district administrations and planning processes in these areas.



The combination of financial and technical capacity together with control over various boards make the SPA the key decision-making body in relation to planning for public infrastructure and services in the district.

While the SPA is acknowledged for getting the job done, its relationship with the District Administration, LLG executives, the JDP&BPC, and the SML landowners needs clarification and strengthening. A better planning framework to guide the SPA is the priority requirement.

**Paiam Town Management Company (PMC):** In response to Fly-In, Fly-Out (FIFO) Agreement for the reduction of commuting employees in PJV, the PDA established the Paiam Town Management Company (PMC) in 1998. The plan provides for the development of Paiam as a serviced residential and commercial town. A staff of 13 includes a Project Manager, Town Manager and Accountant with management and technical support from Yelgun. The PMC is proving itself to be one of the most effective small-town management organizations in the highlands region, but relies heavily on PJV and Yelgun.

PMC has largely fulfilled its development role and under the FIFO Agreement is scheduled to roll its town, administration, maintenance, planning and management organization to a newly constituted Urban LLG at the end of 2003. The urban council is proposed to include Kairik, Paiam, Suyan, Porgera Station and the Anawe Wards.

**The Paiam Accommodation and Development Company (PADC):** This company was established by the National and Provincial Government, PDA, Yelgun (for accounts) and the landowners to administer the funding, construction, renting and maintenance of houses for PJV relocation employees at Paiam under the FIFO agreement. It was originally estimated that PADC would build some 515 houses for PJV. However, due to localisation of workforce positions and a reduction in the overall workforce it is now estimated that the number of houses required by PJV will be considerably less.

The intent is for the PADC to progressively sell off PJV houses, and revenues used to repay interest free loans and maintain Paiam infrastructure. As for the PMC, PADC also offers high level management skills; however, its future and scale of operations needs to be reviewed by the state and the landowners.

**PJV Joint Venture Community Affairs Department:** PJV established Community Affairs to provide community services, social security for mine operations and handle negotiations with landowners and government agencies and manage agreements. Community Affairs has a seat on the Board of the PDA.

Currently PJV Community Affairs Department provides core support services to the operations of PJV and the project area communities through its sections which employ about 100 staff. Social Development, Business Development, and Community Projects (including the Tax Credit Scheme and Infrastructure Development programs) are the most active in supporting local social and economic development activities. The Department has added a Social Closure and Sustainability Section, to parallel the closure/sustainability functions within environment.

**Porgera Landowners Association:** The Porgera Landowners Association was formed to represent the SML landowners in their negotiations with the State and PJV, although it did not actually do this. Its current principal involvement in public administration is through representation on the board of the SPA.

**The Community Issues Committee (CIC):** has met regularly for over 10 years and is recognised by PJV as the main community forum for dialogue on issues within the community.

**The Porgera District Women's Association (PDWA):** The Women's Association is structured around wards and each has its own group who nominate a member to be on the Executive. The association runs small businesses such as a camp canteen, artifact shop and buys vegetables for sale to Crocodile Catering JV for the two messes. Out of profits they have initiated a mini-credit scheme.

Currently the Association relies heavily on PJV Social Development Section for logistical, advisory and management support and a major priority is to build independent capacity.

**Yelgun:** Yelgun is a Placer subsidiary originally incorporated to provide strategic and technical support to Ipili Porgera Investments (iPi), the Porgera landowner umbrella company. From 1998 Yelgun has also been responsible for managing and providing technical assistance to PMC. Yelgun's key role is to develop enterprise through iPi, PMC and PADC.

**Porgera Sustainability Planning Committee:** The Porgera Sustainability Planning Committee is an embryonic and evolving organisation of government and landowner representatives. It was formed to assist government and landowners to organise their response to the Porgera MOA review and to mine closure issues. The principal challenge facing this organisation is for landowner representatives and the District Administration (also representing LLGs) to agree on an agenda and procedures for negotiating with the State and PJV.

**Churches and Community Groups:** Church and community groups, particularly the Porgera District Women's Association, play an active role in promoting community development and women's activities throughout the Porgera District. The consolidation and expansion of their development activities is, however, constrained by lack of finance and basic training in community mobilization and project management.

**Local Business and Business Groups:** Due to the operations of the Porgera mine there is a high level of local business activity within the district associated with the mining industry. There is also growing interest by Porgerans in investing in non-mining activities both within and outside the district. As noted earlier, business activities are well supported by Yelgun and the CAD Business Development Section.

Business development activity has the potential to contribute to the maintenance of public infrastructure and services

through the payment of taxes and fees and the payment of wages to employees who can purchase public goods and services.

#### *Public Administration Revenue and Expenditure Estimates*

**Provincial Revenue and Expenditure Estimates:** The EPG revenue estimate for 2000 was K49.12 million. Of this, almost 81% (K39.6 million) comes in grants and subsidies from the National Government<sup>4</sup>. Of the remaining K9.52 million attributed to local revenue raising activities, K3.75 million comes from VAT, the value of which is tied closely to the consumption of goods and services related to activities associated with the Porgera Gold Mine.

In 2000 mining related revenues accounted for almost 30% of the total EPG budget and almost 70% of the revenues available for development expenditure.

**District and LLG Revenue and Expenditure Estimates:** The total revenue available to the Porgera District from government sources in 2001 was estimated at K8.171 million. This amount comprises:

- K0.684 million in national and provincial grants to the Porgera and Paiela LLGs.
- K6.440 million in PDA Administration and Development grants.
- K0.797 million in National Government salaries to support district public servants.
- K0.250 million in district support grants from the Lagaip-Porgera local member.

In sum, of the estimated revenue base of K8.171 million, 91% (K7.478 million) comes in grants and subsidies from the National Government. In 2001 mining related revenues accounted for 76% of the total Porgera District budget and almost 100% of the revenues available for development expenditure. With the exception of the local member's District Support Grant virtually all of the district's development revenue is managed through the PDA.

Base revenues are clearly supplemented by the Porgera Special Purposes Authority which plays an important role in the management of the District's mining revenue entitlements as specified under the various MOA. In addition to providing administrative support grants to both LLGs through the Special Support Grants (SSG), the PDA manages the funding and tender process for the district's community and public works programs.

In terms of the allocation of national and provincial grants by principal government activities for 2001, expenditure on administration in both LLGs is heavily subsidised by SSG grants through the SPA (PDA), and there is relatively minor expenditure on all government services with the exception of infrastructure. There is, however, no consolidated district revenue and expenditure plan that will allow for the analysis of the total allocation to the various development sectors.

Without belabouring the point, early closure throws all the above budgeting and implementation mechanisms into crisis management.

#### **3.3.1.3 Sustainability Issues**

**Budget Considerations:** Assuming that the current arrangements continue for the management and distribution of mining benefits in support of public administration and services and that there are no supplementary agreements negotiated, the following scenario is considered likely.

The Provincial budget will start to decline from its current ceiling of around K50 million at the cessation of mining in 2006. The decline is expected to continue to 2012 when PJV gold production operations at Porgera will cease. At this time the provincial budget is expected to stabilise out at between K30–35 million.<sup>5</sup>

Without replacement of these revenues the EPG will only have sufficient budget to meet the salaries and administrative costs of the provincial and LLG political executive and district public servants. There will be limited scope to support the maintenance of existing infrastruc-

ture, let alone the development of new infrastructure and services.

District and LLG budgets will follow the provincial trend. It is anticipated that the district budget will decline from its estimated ceiling of K7.5 million from the cessation of mining in 2006. The decline will continue to 2012 at which time it is expected that the district budget will stabilise out at between K1.5–2.0 million.

SML landowners and their business groups have not sought to support institutions that will be required to provide essential goods and services to landowners after the mine closes, with the exception of their contribution to PADC. However, subject to effective management of the Children's Trust Fund and their business investments, they will be the only group in the Porgera District with significant funds at the end of mine closure to support public infrastructure and services if they so desire.

In sum, *after 2006* (or sooner if the mine closes prematurely) *the current level of government activity throughout the province and Porgera will not be sustainable unless government mining revenues are supplemented from other sources*. In the period between 2006 and 2012 there will be a progressive decline in government revenues to the extent that the province and the district will experience difficulty in maintaining key infrastructure and services. In addition, services such as education and health will be particularly vulnerable to the decline in mining revenues given that these

<sup>4</sup> This figure includes royalty payments made by the National Government to the province which the Provincial Government has included as 'internally raised revenue'. It is also noted that the bulk of the LLG and Village Services Grants are used to cover recurrent operational costs of LLGs rather than to cover development expenditure. Grants to non-government organisations also principally cover the recurrent costs of mission health services. In sum available development expenditure in 2000 was more likely to be K18.337 million than K21.870 million.

<sup>5</sup> This calculation allows for the removal of royalty, equity dividend, SSG, special mining agreement projects, and a reduction in the amount of VAT as a result of declining business activity and consumption.

services are extensively subsidised through the application of mining revenue entitlements such as SSG and royalties for school fees.

**Expenditure Planning:** Having a development vision is important, however, having the money to develop and implement the vision is more important if people's aspirations are not to be continually frustrated. The challenge for those charged with public sector administration and planning is to ensure that the 'vision' and the public sector capacity to raise the necessary finance to support the vision are at least reasonably compatible. The reality of this challenge has yet to be confronted by the political and administrative executives of the EPG and the Porgera District and, most importantly, by the SML landowners.

If the budget scenarios presented above are accepted as the 'bottom line' for expenditure planning, the development vision for both the province and the Porgera District would require the immediate prioritisation of essential infrastructure and services and the development of a budget strategy to support these priorities.

If there is to be any realistic dialogue on the issue of sustainable development at the provincial and district level, the political and administrative executive must first of all establish what revenues are likely to be available in the lead up to and after mine closure and tailor their vision accordingly. This does not preclude negotiating for additional revenue sources to expand the vision, however, there must be provision for prioritising infrastructure and services should these additional revenues not be forthcoming.

In this context, it is suggested that as a first step the EPG and the Porgera District undertake an immediate exercise in determining their likely revenue estimates in the period 2003–2012. These revenue estimates should be acknowledged as *bottom line* estimates.

**Consolidating the Revenue and Expenditure Planning Process:** In the case of the Porgera District the expenditure planning, and prioritisation process could be significantly improved if revenue and expenditure estimates relating to the con-

tribution of the district, the PDA and external support agencies (PJV and Aid Donors) were consolidated in one document. Currently the district budget estimates detailed in the provincial budget do not reflect the revenues managed by the PSPA. Consolidated budget estimates would give project area stakeholders a clearer picture of the available revenues, their source and likely continuity.

Consolidation of the budget estimates must be accompanied by consolidation of the planning process for the formulation of the district, LLG and ward development plans. If sustainability issues are to be addressed it is important that a planning and budgeting process is facilitated which involves both the political and administrative executive in a coordinated analysis of the development needs, the formulation of program and project priorities and the budget implications. Without the involvement of all parties the planning system is likely to remain *ad hoc* and opportunistic despite the best efforts of individual agencies.

**PJV Planning and Budgeting Procedures:** While there is much criticism of the government planning process PJV accepts the need to examine its own procedures particularly in view of its proposed support for the development of a five-year plan for Porgera. As detailed above the Community Affairs Department (CAD) is heavily involved in supporting community development and public infrastructure and services, particularly through the Tax Credit Scheme (TCS) and Infrastructure Development Programme (IDP). Currently planning within the CAD is undertaken on an annual basis with little provision for forward estimates and programming across all sections. For PJV to enter into a planning partnership with the District which also involves budget support through the TCS and the IDP a more comprehensive approach to expenditure and development planning than is currently the case will need to be adopted, i.e., a shift from an annual planning and budget cycle to a medium-term approach.

**Management, Coordination and Politics:** PJV believes that the mining revenue transfers from the National to the

Provincial Government and landowners must be managed effectively if the benefits of mining are to outweigh the costs to project communities and the nation. Where there is gross inefficiency and mismanagement, it is understood that the State, through its proposed policy and guidelines on *benefit stream management and planning for sustainable development*, intends to be more proactive in supporting structures (including Special Purpose Authorities) which allow for sound management and coordination of benefits while outstanding administrative and political issues are resolved.

Based on its experience at Porgera over the last decade, PJV believes that politics will continue as a major influence on the administrative system. The executive costs of the Provincial Government members and the LLG executive are significant and impinge on the funding available for development activities. Provincial revenue entitlements generated from the Porgera mine currently allow generous subsidies to the operations of the provincial and LLG executive. Come mine closure, these funds will no longer be available and the political executive will be confronted with the task of balancing the demands of politicians and those of the line departments. For this reason, it is essential that the political executive of the province and LLG assemblies are actively involved in the provincial and district planning process so that they can make informed judgments on program and project priorities within the available budget. Failure to secure their participation in the planning and budget process is likely to lead to significant problems in the management of the provincial budget in the lead up to and after mine closure.

The above being said, it is still worth noting that improving government services is a worthwhile strategy in any Porgera development plan, as these same services will strengthen the overall 'market value' of Porgera–Paiela in the post mine era.

**District versus LLG Planning:** The NOL vests a wide range of functions with LLGs but it is questionable whether



most rural LLGs will ever have the resources to perform these functions. The Porgera and Paiela LLGs are largely dependent on the District administration and the PDA for planning and budget support. The exception in the Porgera District is likely to be the Paiam Urban LLG which, once constituted through the initial inputs of the PMC, can provide efficient and effective management and technical advice for urban development functions.

Experience elsewhere in PNG also suggests that rural LLG plans need to be constructed within the framework of provincial and district sectoral development profiles if they are to be realistic. Wards and LLGs are often too small for meaningful sector analysis and often all that is possible is to undertake a needs assessment and develop project priorities. The needs assessment and project priorities must then be integrated into a wider district and provincial expenditure plan which allows assessment of the available human and financial resources before committing to ward and council projects.

The problems of implementation at the rural level are exacerbated by problems of financial management and cash flow. Under the NOL, LLGs are supposed to receive administrative and development grants 'direct' from the National Government. In reality these funds are first deposited into the general account in the provincial treasury for disbursement to the district treasuries and are eventually used to cover LLG commitments. In the case of the Porgera District the PDA has played a pivotal role in the management of cash flows by being able to secure funds directly from either PJV or the National Department of Treasury.

**Early Closure:** If for a range of commercial and social reasons the mine closes well before 2012 (and the recent prolonged suspension of mining due to the felling of transmission line towers highlights the possibility) this will have a major impact on the capacity of the province and the district to develop a sustainability strategy. Government agencies need time to improve their capacity to plan and both government and landowners are counting on continued

revenue flows for at least another seven–eight years to support their development activities. In particular, there is growing support among some landowners and public servants for implementing a strategy which would see some of the remaining benefit streams allocated to a Trust Fund to maintain public infrastructure and services after mine closure. If, however, the mine were to close in the next 5 years there would be little scope for consolidating the planning and budget process and accumulating sufficient revenues for a Trust Fund. In other words, early closure would severely constrain the ability of the parties to provide for a sustainable post-mine social and economic environment.

It can be noted here that elections are due in 2007 and 2012, at which times the mine and PJV will be a particularly convenient target, having laid off numerous staff in 2006, and being near closure in 2012. Part of the 'social insurance' against early closure should include engagement of the mine's numerous beneficiaries in government to ensure that planned revenue streams do indeed eventuate.

#### 3.3.1.4 The Vision

PJV aspires to see a functional District Administration that operates within the framework of the NOL, supports Local Level Government, is actively involved in the mine closure process, and has sufficient funds to carry out its development functions for the remaining life of the mine and after closure. PJV believes that capacity building in the core areas of district, LLG and ward development planning is vital to effective administration in the Porgera District. PJV will also work with the DoM to develop appropriate mine closure/ sustainability administrative structures in line with the new policy currently being developed by DoM.

Specifically PJV has flagged its intent to work with the EPG, the Porgera District Administration and the PDA to develop the Porgera District Plan. It is probable that consultation will focus on six primary development sectors: Health, Education, Justice, Industry and Services, Primary Industry, and Infrastructure (see also Section 3.1.5).

This broad vision overlaps with what other stakeholders have already indicated they wish to see occur in the area of public administration. These other aspirations include good governance and public administration being carried out in accord with the provisions of the New Organic Law (NOL). The Enga Provincial Government have indicated a desire for greater financial benefits (through the Tax Credit Scheme, IDP and SSG) from the Porgera mine project and improved implementation structures at provincial and local level. Porgera District Administration and the Porgera and Paiela LLGs wish to take up a more central role in the planning and administration of the area as provided under the New Organic Law.

All the major stakeholders want to see the District Administration and LLGs operate more effectively. They recognise that if governance is not effective in Porgera District, any gains in economic and social development prior to mine closure are likely to be short-lived. To achieve this they variously recommend improvements to the planning process and, in particular, to consultations between the Provincial Government, the District Administration, the LLGs, the PDA and the SML landowners. All stakeholders are unanimous in their call for adequate revenue to be allocated to the LLGs to support the development and maintenance of public infrastructure and services.

#### 3.3.1.5 Options for PJV

The discussion above highlights a huge problem that requires addressing. PJV is prepared to assist wherever possible in this process, however, this is one of many areas where the scope for the company to 'solve' the problem is limited. Putting in place administrative structures that can lead to the retention and enhancement of benefits for the people of Porgera, (and enhanced administration and service delivery to other stakeholder communities) both in the next decade and post-mine, is clearly a responsibility of all levels of government. It is also a prime area for developing lasting partnerships to develop administrative, technical and executive capacity. Some suggestions, none of which are mutually

exclusive, are provided below, with the possible PJV role highlighted. It is worth noting that the options imply inevitable overlap and that the DoM process in Option 2 may soon have the force of regulation.

#### *Option 1: Develop a Joint Stakeholder Agreement*

Continuation of the existing situation clearly is not what any of the stakeholders want. There is recognition that a change in approach from all parties is required if the process of governance and administration is to be improved and the remaining public benefits streams are to be used for sustainable development. If change is to happen, however, agreement needs to be reached on a number of core issues in relation to public administration and planning in the Porgera District. There needs to be:

- Consolidation of the institutional arrangements for planning and budgeting.
- Discussion and agreement on the impact of mine closure on public infrastructure and services.
- Formulation of a rolling three to five year district sustainability plan for the core public infrastructure and service sectors.
- Procedures for managing and monitoring the plan.
- Capacity building support for the political, government and community structures which will be associated with the development of the plan.

If stakeholders cannot agree on, or adhere to, these processes then there is little likelihood of the political and administrative executive arms of government being able to collaborate in the development of a plan that will sustain public infrastructure and service activity beyond the life of the current development agreements which bind the Porgera stakeholders. PJV has the option of taking an active or a passive role in promoting stakeholder dialogue and convergence of views. The active role is a more natural part of the consultation process arising from this document.

#### *Option 2: Use the DoM Sustainable Development Process*

The National Government, through the Department of Mining, is involved in the development of a sustainability policy development process for the minerals sector. As part of this process, it appears at this stage that the policy will strengthen the role of SPA's in mining areas, improve benefit stream management and planning for sustainable development and mine closure, and make resources available at the national level to assist with the capacity of District Administration and LLG.

In the context of the National Government's mine closure planning policy the Porgera project stakeholders will need to assign representatives to the Mine Closure process and establish a Porgera District Development and Mine Closure Planning Committee (PDD&MCPC). This committee will be assigned responsibility for the design, implementation, management and monitoring of the plan under the supervision of the DoM (which already has the Misima and Ok Tedi closure modelling exercises to work from) and the DNPM. The National Government would take responsibility for the overall management and monitoring of the plan. The DoM may assign functional responsibility to the PDD&MCPC for the day to day management and implementation of the plan.

It is important that the planning process be developed beyond a list of sector projects which have no basis in needs assessment or the ability of the province to pay for these projects. In sum, a District Sustainability Plan must:

- Reflect demonstrated community needs and development opportunities.
- Take into account provincial and National Government development policies and strategies, as well as the priorities of the Joint District Planning and Budget Priorities Committee (JDP&BPC).
- Establish the respective service delivery/development roles of government, the private sector, community based organizations (e.g. churches

and development NGOs) and individuals.

- Address a set of feasible service delivery/development priorities, taking into account expected revenue receipts, community contributions and LLG implementation capacity.
- Provide operational guidance to program/project implementers through documenting clear development objectives, performance indicators, work plans and budgets.
- Provide a basis for monitoring implementation and promoting accountability and transparency in the way that public funds are spent.

The development of the PDD&MCP will require a range of planning and management skills, experience and resources which are currently in short supply in the Porgera District. While many of the PDD&MCPC members have planning and budget experience, few have been involved in a process which requires a more comprehensive approach to development planning. In this context, if there is to be a more comprehensive approach to planning then it will need to be accompanied by a capacity building program to support the development of core skills in those individuals and agencies charged with the responsibility for developing and approving the plan.

PJV recognises the need for a capacity building project (in association with international NGOs such as the World Bank or AusAID) which will assist the PDD&MCPC members and their agencies to design, manage, implement and monitor the plan. Until the effects of such capacity building become apparent, PJV may *in the short term* coordinate and communicate to move the consultation process forward.

#### *Immediate Action*

As noted above one of the biggest threats to the implementation of a sustainability strategy for Porgera is early mine closure. This would limit the scope for consolidating the planning and budget process and for investing in human and enterprise resources. In this context, it is suggested that there is little alternative than to immediately proceed with the:

- Consolidation of the institutional arrangements for the development of the Porgera District plan;
- Development of a capacity building program in support of the above.

#### 3.3.1.6 PJV's Proposal for Action

PJV proposes, conditional on the support of the other key stakeholders, to:

- Support the DoM in the establishment of a process for the coordination of mine closure activities in accordance with the principles of the draft policy.
- Support the establishment of the Porgera District Sustainability Planning Committee to coordinate the design, implementation, management and monitoring of the Porgera District Sustainability Plan.
- Support a capacity building program to assist government, communities, landowners and the private sector to participate in the development, management and monitoring of the plan.
- Extend the development planning initiatives of the PDSPC to communities living along the Porgera–Laiagam road corridor, the Hides transmission line, and the Lagaip–Strickland river system provided government and/or counterpart/NGOs commit to assistance in programme implementation and monitoring.

### 3.3.2 Health

#### 3.3.2.1 Summary

Any discussion of health and sustainability issues at Porgera needs to assess the level of health infrastructure and the level of preventive and curative health delivery services in the District. The health status of the community at Porgera has historically been relatively good by Papua New Guinea standards, although maternal and child health and pneumonia were poor, at least by international standards. The development of the Porgera mine has seen an increase in the health facilities within the valley, and the delivery of health services has, overall, improved. At the same time health service delivery has been constrained by administrative difficulties (see Section 3.3.1), and new diseases (or at least the incidence of particular conditions) has increased. These include HIV/AIDS, along with other STDs, reports of increasing alcohol and drug abuse, and increasing concerns about mental health problems in the community. The key sustainability issue is an agreement on an appropriate level of health care (preventative and curative) for the community post-mine closure and the identification of appropriate funding and administrative resources to support this level of service.

#### 3.3.2.2 Background

##### Stakeholders

The key local stakeholders are located in four geographic areas; Porgera District, the Porgera–Laiagam road corridor, the Lagaip–Strickland river communities and the Hides–Porgera powerline communities.

The National Department of Health is the key national level stakeholder.

**Porgera District:** The Porgera District health domain is defined as covering the approximately 30,000 people who are administered by the Porgera and Paiela LLGs. Within this area, identified stakeholders include:

- **The SML Landowners:** The SML landowners are among those who have the best access to health services given their proximity to Paiam Hospital (Plate 3.4) and the Porgera Urban Clinic. They are however the most significantly impacted community and must deal with a wide range of social and economic changes that can impact on their health.
- **Non-SML Landowners:** The non-SML landowners are represented by the Porgera and Paiela LLGs. They represent the bulk of the population in the Porgera District (over 20,000 people). They are particularly concerned about improving their access to social and economic services and health in particular.
- **Women:** Women have primary responsibility for the management of the household and care of family and relatives. They are also actively involved in the subsistence and cash economy. Given their pivotal role as carers and in the maintenance of the household economy they are major stakeholders as both users and providers of health care. In this context any health care strategy for the Porgera District needs to consider the special health care needs of women and the role that they can play in health extension and service delivery.

The special place of women in the health care system has been recognised by the Porgera District Wom-



Plate 3.4 Paiam Hospital



en's Association (PDWA) which coordinates women's groups throughout the district. The PDWA is a network of women's groups located in all 18 Wards of the Porgera LLG plus parts of Paiela. PJV employ staff who promote health education in the district and are already involved through the association. This is done through health education workshops and an awareness program conducted at ward level. Program content focuses on personal and home hygiene, nutrition, infant and childcare, and sexual transmitted diseases including HIV/AIDS.

- **The District Health Office:** The Provincial Health Office (PHO) requires that the District Health Officer prepare an annual report detailing progress against objectives and targets. The district reports are then consolidated into an Annual Report and forwarded to the National Department for analysis and comment. The district health plan basically follows the same format and detail as the provincial health plan (see below).

In general, health planning in the province is considered adequate. A review of the current district health plan for Porgera should, however, be undertaken as part of the mine closure planning procedures. The District Health Officer notes that, without sound justification, it is unlikely that the PHO will support the development of any additional health services that are not already included in the 2001–2005 plan.

- **PJV Community Affairs Social Development Section:** PJV Social Development Section is involved in promoting Health awareness within the framework of the district health plan. The awareness program in conjunction with the PDWA is centred around a nutrition and hygiene program that seeks to educate mothers with new babies on the basic principles of hygiene and nutrition. Awareness is conducted by way of demonstration and field days at selected locations throughout the district.

**Porgera–Laiagam Road Corridor:** The Porgera–Laiagam road corridor has been included as an area which needs to be considered as part of the mine closure plan because of the importance of maintaining the road link between Porgera and Wabag. It is estimated that some 30,000 people live along this road, and any planning efforts directed at securing road access into Porgera should take into account the health needs of the 'corridor' communities.

**Lagaip–Strickland River Communities:** The Lagaip–Strickland River communities form part of the Porgera mine's area of impact through the environmental monitoring that the mine is required to carry out on the environmental impact of the disposal of tailings and overburden into the river system. As part of the monitoring program PJV is also providing, in partnership with churches and international NGOs, health support services through Malaria and Filariasis programs. The company is seeking partners to ensure lasting health improvements in these isolated communities.

**Hides–Porgera Powerline Communities:** These communities have used their landowner status to disrupt power supply to Porgera when they feel they have a grievance with the government, PJV and/or Porgera communities. During and after the 2002 elections, power was disrupted for over three months. The potential for recurrences around the 2007 and 2012 elections is noted. Engagement of the communities through support of health care and Community Assistance Projects is a strategy to be reviewed by PJV and stakeholders, including the SHP Provincial Government when it emerges from the current political impasse.

**The National Department of Health:** The 10 year National health plan (2001–2010) has four main policy objectives: to increase services to rural populations; expand health promotion and preventive health services; develop staff professional, technical and management skills; and improve health information and data systems.

The principal function of the DOH is to encourage provinces to work within the framework of the plan and to monitor

national health trends. To this end the DOH has been proactive in providing technical support and operational funding to support health planning and service delivery in the provinces. Currently the principal focus of DOH support to provinces is through the Health Sector Development Program (HSDP) which is a joint Asian Development Bank and AusAID development initiative available to all provinces. Enga Province is a major recipient of HSDP support. Of the K7.8 million required for health service operational costs for the Enga Province in 2002, some 32% (K2.5 million) was being sought through the HSDP.

In response to the DOH request for a provincial health plan the Provincial Health Office has prepared a five-year plan (2001–2005) structured around 8 programs including, Rural Health Facilities, Family Health Services, Disease Control, Environmental Health, and Health Education and Promotion. Each program has a goal, objectives, strategies, activities, indicators of achievement and annual budget estimates. It is worth noting that the national, provincial and district health plans are the most comprehensive plans of any government department in PNG.

#### *Pre-mining Conditions*

In 1987, the Porgera SEIS study reported that the Porgera District was serviced by a Health Centre at Porgera Station, a Health Sub-Centre at Paiela and 14 aid posts, 12 of which were manned. MCH patrols were regularly conducted despite the lack of road access in the district. All health facilities were described as reasonably well run with adequate medical supplies.

In 1987, the disease pattern at Porgera based on admissions to health centres illustrated that respiratory diseases caused the highest number of admissions, followed by gastroenteritis, accidents and malaria. Child immunization rates compared to the rest of the province were high and the incidence of sexually transmitted diseases low.

In sum, despite its isolation Porgera health services were considered above average for the province.

The Mt Kare gold rush in 1988/89 severely disrupted health services in the Porgera district. Paiela was particularly affected. Aid posts and the health centre closed as staff left for the gold fields. There was a massive increase in sexually transmitted diseases associated with the Mt Kare gold rush in 1988. However at this time there was little concern with HIV.

#### *Current Situation*

**Health Problems and Issues:** The leading cause of deaths and admissions at Paiaam hospital is infant/early childhood pneumonia. The leading cause of adult death is violence linked to domestic violence and tribal fighting. Many cases of violence go unreported. It is believed that much of the violence is exacerbated by drug and/or alcohol abuse, both of which are seen as serious health issues. Other major diseases include typhoid, tuberculosis and pneumonia that are fatal when linked to HIV/AIDS. Malaria is a major problem in the Paiela sub-district but not for Porgera.

The disease pattern for communities along the Porgera–Laiagam road corridor and Hides Transmission line is understood to reflect the general health problems of the Porgera LLG as detailed in the Paiaam hospital statistics. The leading health problems of the Lagaip–Strickland river communities are mosquito borne diseases such as Malaria and Filariasis.

**HIV/AIDS:** In the lead up to mine closure HIV/AIDS represents the biggest health risk to the community. Paiaam hospital confirmed 62 cases of HIV/AIDS between 1998–2001. To date (May 2002) five people have been confirmed as having died of an AIDS related illness. A further 3 people have been diagnosed with full blown AIDS and sent home. The hospital offers no treatment. HIV positive cases are being confirmed at the rate of 4 per month. There are only guesses as to the full extent of unconfirmed HIV cases or AIDS related deaths in the community. This lack of information will be partly remedied when the results of a survey by PNGIMR (PNG Institute of Medical Research) become available. The authorities suspect many

more people are infected but do not present for diagnosis.

A Port Moresby forum sponsored by the British High Commission (March 2002) has warned that the HIV/AIDS epidemic is now so severe that it has the potential to affect every family in PNG. There is no treatment for AIDS in PNG as the country cannot afford the drugs. The PNG AIDS epidemic could seriously impact not only on the relevance of closure planning, but also the options for post mine sustainable development.

There is an Enga Provincial AIDS council and a Porgera District AIDS committee, but these organisations are constrained by lack of direction and funds from the National AIDS Council. Both government and PJV staff have been involved in HIV/AIDS community awareness in the Porgera District (Plate 3.5). However these people are in agreement that more work is urgently needed. In addition these staff have not been trained in the latest techniques of peer-mediated risk reduction counselling. There are currently limited counselling options for HIV+ and AIDS patients, and the potential for violence in a pay-back society.

#### *Health Facilities*

**Porgera District:** The Paiaam hospital was built under the Porgera MOA's and

when it was opened the staffing and operational costs exceeded the government grant. Since its establishment the operational and staffing costs have been subsidized by the PDA. A submission has been made to the DOH to have all staff working at the hospital designated as public servants. It is understood that this submission is likely to be approved thus affording more security for the operations of the hospital after mine closure<sup>6</sup>.

In 2002 it was reported that 22 aid posts have been constructed in Porgera District. Of these only 11 are operating as approved aid posts under the provincial health plan. A further 3 are operating but are being supported by PJV and missions.

The closure of 45% of the district's aid posts for a variety of reasons including financial constraints and tribal fighting has reduced the access of rural communities to basic health care services. In addition, those services that are operating frequently have staff attendance problems and a shortage of drugs. With the opening of the Paiaam hospital in 1998 the Porgera Health Centre was closed and an urban clinic now operates out of the premises. The clinic also provides MCH functions to rural areas.

The Paiela Health Sub-Centre is located in a remote area of the Porgera District. One of its primary functions is to provide MCH services to outlying villages.

PJV operates a medical centre for its employees at Anawe. The centre is staffed by three medical officers on rotation; they also assist at the Paiaam Hospital.

**Laiagam District:** The Laiagam road corridor is principally served by Laiagam district hospital, the Mulitaka Health Centre and the Yakenda Sub Health Centre. The operations of services are frequently affected by tribal fighting, staff problems and supply.



Plate 3.5 PJV Health Extension Officer at AIDS Awareness Sign in Porgera Station

<sup>6</sup> This move while necessary, will limit the ability of the PDA to 'manage and operate' the hospital as is its mandate.

**Lagaip–Strickland River:** People living along the Lagaip are principally serviced by occasional MCH patrols. Communities along the Strickland river are principally serviced from Nomad station in the Middle Fly District in the Western Province. Nomad sub-district has a health centre, a sub-health centre and 9 aid posts, 5 of which are functioning. These services are administered from the Western Province. PJV is working with Church (Evangelical Church of Papua, Lutheran, Seventh Day Adventist and others) and NGO partners supporting Malaria and Filariasis patrols along the Strickland river.

**Hides Transmission Line:** The communities along the transmission line, and particularly those close to Nogoli are reliant on accessing health services within the Tari Basin. In recent years these services have been curtailed due to the serious civil unrest in the area.

#### **Budget Issues**

**Provincial Health Budget:** The 2002 Provincial Government estimates assume a Health budget of K7.77 million of which 36% is provided by the EPG, 32% by the Health Sector Development Program (HSDP) and 25% from mining related agreements and revenue streams. In sum, the health budget for the Enga province is heavily dependent on donor support (HSDP) and mining related revenue. Between them these two funding sources account for almost 60% of the total health budget.

Assuming there is a drop of 30% in provincial revenues at the end of mine closure and tax credit and PDA funds are withdrawn (but that all other revenue sources continue) the total revenues available for health in the province are estimated to be K4.85 million. If donor support was discontinued after 2010 (or sooner) the budget estimates would drop to K2.25 million. In sum this would represent a 72% drop in available health revenues from 2002 estimates.

**District Health Budget:** Porgera receives the most support of the Districts in Enga for health (27% of total budget). Part of the reason for this is the heavy subsidy required from the PDA to support the staff and operational costs of the Paiam hospital. Of the district budget

almost 70% is allocated to General Administration and the Urban Health Facility at Paiam.

In conclusion the current budget for health services in Enga province and Porgera District is heavily dependent on the HSDP and revenue streams generated by the Porgera Gold Mine. Based on current estimates, with the closure of the mine health revenues will fall from K7.77 million to around K4.85 million and to K2.25 million if the HSDP is withdrawn. This scenario would pose significant problems for the maintenance and operation of health services throughout the Province and the Porgera District.

#### **3.3.2.3 Sustainability Issues**

**Budget:** There is a real prospect that the health budget will decline significantly by 2010 and that, in the absence of ongoing donor support and general economic growth, there will be a need for substantial rationalisation of Porgera District health services, including Paiam hospital.

**HIV/ AIDS:** Recognised as the largest future public health issue in PNG and Porgera, it will impact on all areas of community life in the period up to and beyond mine closure. Porgera Health educators (PNGIMR, PJV, Government and possibly Churches) have recently trained about 40 peer-educators and community based counsellors. This peer training of youth, women, magistrates, councillors, etc. is the preferred method as it has the potential to spread more accurate information to a wider audience in a short period of time. The Enga Provincial AIDS Council and the Porgera District AIDS Committee do not have the necessary resources to develop and implement a comprehensive peer-mediated training programme and then support the peer educators in field.

#### **Curative versus Preventative Services:**

As detailed above some 70% of the district health budget is allocated to administrative and urban health services. While this situation may satisfy those within reasonable proximity to Porgera and Paiam, the bulk of the population in the Porgera District must rely on MCH and aid post services that are constrained by a lack of resources. Preventative health

care has little political support within the Provincial or LLG Assemblies. While funding is available from mining revenues politicians will press for more curative health care services. It is possible that as funding for the construction and maintenance of health infrastructure declines preventative health care may become more popular. The political focus on curative health care is also a major impediment to mustering support for health awareness programs, particularly for HIV/AIDS.

**The Paiam Hospital:** Excluding administration, the Paiam hospital accounts for 53% of the health program expenditure in the Porgera District. While clearly performing an important function in the provision of curative health care (a function that has the support of politicians and most community members) it is important to keep its cost structure under review and seek cost savings where possible. It is anticipated that Paiam hospital, given its current cost structure, will be particularly vulnerable to any major budget rationalization. This would be unfortunate since the hospital plays a major role in immunisation and family planning activities and is the early warning system for the state of AIDS/HIV in the Porgera Valley.

**The Porgera–Laiagam and Hides Transmission Line Corridors:** Currently the principal constraint to the sustainability of services along the Porgera–Laiagam road corridor is the law and order situation. The services provided to these communities are frequently suspended while law and order issues are sorted out. A similar situation exists for the transmission line landowners in the Tari Basin.

**The Lagaip–Strickland Communities:** Given the isolation of these communities it is difficult to provide services. The problems of the Nomad area are exacerbated by the fact that administration of health services rests with Balimo in the Middle Fly District. Given the distance and cost of travel from Balimo there is very little supervision of health service, which are also constrained by the usual problems of staffing and supplies.



#### 3.3.2.4 The Vision

PJV aspires to see a functional health service in the Porgera District, one that operates within the framework of the National Health Plan, responds to the special health needs of the Porgera District, and has sufficient resources to carry out its development functions for the remaining life of the mine and after closure. PJV believes that the health service should balance curative with preventative health care, and utilise the formal structures of the health care system and the services of community-based groups, most notably women's groups.

In this way, PJV vision for the future of health in Porgera largely matches that of the National Department of Health and other stakeholders. The national department aspires to see the EPG operating within the framework of the national health plan and preparing and monitoring its five-year health plan. In particular, the DOH wishes to ensure that the State is not faced with unreasonable demands for the construction and maintenance of infrastructure and services in the lead up to and after mine closure. The Enga Provincial Health Office has noted that it will not support any new project initiatives which are not in the existing 2001-2005 plan, and has sought an assurance from the National Department of Health that there will be resolution of the funding arrangements for all casual staff at the Paiam hospital through their reclassification as public servants. At the District level there is a more immediate concern about the lack of resources to implement the District health plan, and the need for more effective training for health workers. The SML landowners have articulated their demands for resolution of the staffing problems at the Paiam hospital and the upgrading of the urban clinic in Porgera station, while other Porgeran landowners, particularly those in remote areas, have argued for better access to primary health care services such as aid posts and MCH services.

In conclusion, National, provincial and district level health officers seek to develop health services within the framework of the national health plan. These plans are well developed by PNG stand-

ards but should be reviewed as part of the mine closure planning process and in the light of the likely reduction in provincial revenues available for health services. All stakeholders seek to blend health delivery through the formal structures of the provincial health services with churches, NGO and civil society groups such as the Porgera District Women's Association.

#### 3.3.2.5 Options for PJV

PJV, in partnership with other stakeholders, can facilitate the improvement of health delivery and status within Porgera. Potential options, none of which are mutually exclusive, would include:

- Supporting National, Provincial and District initiatives to implement the existing health plans at various levels. Given that health already has comprehensive provincial and district plans and established procedures for monitoring and reporting, development of a full sector plan is not considered necessary. However, within the framework of the established procedures and formats, PJV could assist health to undertake a review of the Porgera District health plan in the light of mine closure issues and the anticipated reduction to the health budget.
- Facilitate discussion between the stakeholders regarding appropriate approaches to health service rationalisation, and specifically assess the impact of budget rationalization on Paiam hospital and develop a contingency plan for service rationalization.
- Continuing support for health services to communities along the Porgera–Laiagam road corridor, Hides–Porgera transmission line and the Lagaip–Strickland River, in partnership with NGO and civil society groups. This would begin with an assessment of health sector needs and the formulation and costing of a health support program for these communities.
- Provide special support to the Porgera District Women's Association for community health initiatives, in part-

nership with national and international NGOs. This could include supporting the design and costing of a women's health initiative in consultation with Provincial and District Health Planners.

- In relation to HIV/AIDS, PJV is supporting PNGIMR's research proposal on the incidence of STI/HIV/AIDS in the Porgera Valley. Following from this, PJV has recently (October 2002) facilitated the PNGIMR running a training-of-trainers programme for individuals from PJV, government and church groups in Porgera. These people will then conduct workshops to train peer educators. If successful, this support could extend to other areas of Enga, the Hides transmission line communities and the riverine catchment areas.
- Promoting public acceptance that the community must contribute to the cost of health services and support health staff and facilities. Provincial and District Health planners can be assisted to liaise with civil society groups to develop a public awareness program on the need for community contributions to the cost of health services.

#### 3.3.2.6 PJV's Proposal for Action

PJV proposes that:

- They provide support for the implementation of the National Government's 10-year health plan and, through this plan, the development of provincial and district health plans.
- In partnership with NGOs, PJV will continue to provide special support for health services to communities along the Porgera–Laiagam road corridor, Hides–Porgera transmission line and the Lagaip–Strickland River. With the latter, PJV would continue working to coordinate activities and resources with churches working in the area.
- They continue to support the Porgera District Women's Association for community health initiatives. This will include continued attention to major problems related to violence, alcohol and drug abuse.

- PJV, in conjunction with other stakeholders), will continue to support PNGIMR's research proposal on the incidence of STI/HIV/AIDS in the Porgera Valley. If it is successful, this support could be extended to the riverine and powerline communities.
- Working with the Porgera AIDS Committee, PJV will continue to facilitate the PNGIMR in the running of a training-of-trainers AIDS peer education programme for individuals from PJV, government and church groups in Porgera. These people will then conduct workshops to train peer educators.

### 3.3.3 Education

#### 3.3.3.1 Summary

People with education are generally more mobile and therefore have better access to a range of income-earning opportunities than their less-educated colleagues. When the Porgera mine closes, those people with transferable administrative, technical and commercial skills will have the best chance of either taking advantage of local employment and business opportunities or seeking employment and business opportunities elsewhere.

There is currently no comprehensive plan for education services for the Porgera District. In the context of mine closure and the anticipated reduction to the education budget, a key priority is the development of such a plan. This plan should encompass a review of LLG/district education profiles, data and status, the objectives and priorities of the current education plan, estimates of the expected revenue and expenditure framework for education over the next 5 years, and district education expenditure priorities in the context of the above.

The Porgera District is administered by the District Education Office. The Porgera District has been a major recipient of education infrastructure and services utilizing mining-related benefit streams. The closure of the mine will have an impact on the maintenance of these services and a strategy needs to be developed to consolidate education infrastructure and service delivery in the lead-up to and after mine closure.

#### 3.3.3.2 Background

##### Stakeholders

The *primary* education stakeholders are located in the Porgera District and the Porgera–Laiagam road corridor, while secondary stakeholders are located along the Lagaip–Strickland river system and the Hides transmission line. Within the Porgera District, there are a number of stakeholders, including:

**Students, Trainees and School Leavers:** Obvious, numerous and mostly voiceless, students, trainees and school leavers are the most important stakeholders. Many will be young adults by the time the mine closes, and their preparation for life is an important consideration in sustainability planning.

**Principals, Teachers, Boards of Management or Governors:** The first line of education delivery and quality control, staff and management are important stakeholders.

**Parents:** have many roles in the impact communities and are a factor in the overall motivation, or lack thereof, of students and school staff. Capacity building and ownership of school development plans will be most effective if there is a high component of parent involvement.

**The District Education Office:** Planning at the district level is coordinated by the District Education Officer. The DEO is supported by a Community School Inspector.

**The Department of Mining SYSMIN Project:** The European Union has provided a grant to the Department of Mining which provides for the development of a Vocational Centre to support training activities for small-scale gold mining in the Porgera District. The EU package also includes support for the development of a Women's Resource Centre.

**PJV:** PJV provides an extensive range of industry-related training activities for its workforce. These activities range from apprenticeship training through to practical on the job training and skills accreditation. The company also sponsors students to professional level qualifications and training off site.

**The SML Children's Trust Beneficiaries:** The Children's Trust was established by an Agreement between the Provincial Government and the SML landowners. Ten percent of the royalty payments from the Porgera Gold Mine are transferred into the Trust each year through the EPG. The Trust is managed by a Board of Trustees which include SML landowners and representatives of the National Department of Treasury, the Porgera Development Authority and PJV.

**The International School:** The Porgera International School is operated as a private educational institution. The school is managed by a Board. It intends to add grade 11 classes in 2003 and grade 12 in 2004.

**The Porgera District Women's Association:** The Porgera District Women's Association is involved in literacy training for women.

Outside Porgera District, education sector stakeholders include the following:

**Porgera–Laiagam Road Corridor Communities:** The Porgera–Laiagam road corridor is considered to be a primary area for consideration given its importance in maintaining communication between Porgera and Wabag. Support for education services along this route is likely to have popular community appeal that may assist in reducing social disruption to road transport activities. The loss of the Laiagam High School to tribal fighting has also put pressure on facilities in Porgera.

**The Lagaip–Strickland River Communities:** These communities are linked to the Porgera geographic domain because the Porgera Gold Mine is required to monitor the environmental impact of the disposal of tailings and overburden into the river system. Support for education service development may assist PJV in the conduct of its monitoring activities and in any future negotiations with these communities.

**Hides–Porgera Powerline Communities:** These communities have disrupted power supply to Porgera when they feel they have a grievance with PJV and/or

any other party. Given the potential of these communities to disrupt power supply, any demands they may make for social and economic support services, including education, need to be considered when developing strategies for securing the operations of the mine.

**The National Department of Education:** The National Department of Education administers the National Education Plan (1995-2004). Under this plan, provinces are urged to establish elementary schools to replace the current grades 1-2. This would free up classrooms and teachers at an existing community school and allow it to become a primary school through the addition of grades 7 and 8. This action would, in turn, release teachers and facilities at high schools to become secondary schools catering for grades 9-10. Those students graduating from grade 10 and wishing to continue their education would be accommodated in a senior high school catering for grades 11-12.

**The Provincial Education Office:** The Provincial Education Office is responsible for responding to the national education plan. Planning is coordinated through a Provincial Education Board chaired by the Provincial Education Adviser. The Board decides on teacher's appointments and prioritizes service provision throughout the province.

#### *Pre-mining Conditions*

Formal education services were introduced to the Porgera District in the mid 1960s by mission agencies. The first primary school was established at Porgera in 1967. By 1978, three community schools had been established. Community support for and attendance at education services was variable from the outset. The opportunities provided by alluvial gold mining have tended to divert community attention away from the formal education system. All schools in the district closed during the Mt Kare gold rush of 1988. Many students and some teachers did not return when schools re-opened in 1989.

#### *Current Situation*

**Education Facilities:** The following discussion is drawn from the Porgera Long Term Economic Development Plan (Volume 2).

In 2002, there are 4 community schools (in various stages of transition to primary schools) and two primary schools (Tipinini and Paiam) (Plate 3.6) in the Porgera LLG and 3 community schools in the Paiela LLG. In 2001 these schools had an enrolment of 2,866 children. Enrolment figures for 2002 are obscured by massive absenteeism related to the elections.

The major constraints to education development at this level were identified as a shortage of teachers, overcrowded

classes (60 – 80 students per class in lower grades), limited curriculum materials and lack of relevance to the district, limited opportunity for teacher in-service training, and poor community support.

A primary school inspector is based at Porgera and is responsible for the supervision of all community schools. A secondary school inspector and guidance officer is based at Wabag.

All government schools follow the standard national curriculum. There is considerable scope to develop curriculum materials that are appropriate for Porgera social and economic conditions. The Porgera Long Term Economic Plan recommends development of curriculum materials for community schools covering Community Living, Health, Environment, and Making a Living. Development of high school and vocational school curriculum materials is also recommended.

**The Porgera Vocational School:** The Porgera Vocational School has a staff of 4 and some 80 students. The school offers courses in carpentry, agriculture, mechanics, spray painting and panel beating. The Vocational Centre is also the College of Distance Education (CODE) centre. CODE caters for students wishing to complete courses either up to grade 10 or for the Institute of Distance and Continuing Education (UPNG), which caters for matriculation courses into University.

**Porgera High School:** The Porgera High school opened in 1996 and has an enrolment of 628 and a staff of 17 (Plate 3.7). One of the main problems faced by the school is overcrowding caused by the inflow of children from PJV families who took up residence in Paiam as a result of the FIFO agreement. To resolve this problem, it is proposed that the school be developed as a lower secondary school which would mean dropping grade 7 and grade 8. These classes would be absorbed into various Primary Schools.

**Porgera International School:** The Porgera International school caters for primary and secondary school



Plate 3.6 Porgera primary school classrooms



enrolments. In 2001, the total enrolment was 185 students, 75% of whom were from the SML and paid for by the Children's Trust Fund.

**Commercial Education Providers:** The PLTEP noted one commercial provider offering courses in basic bookkeeping and computing

**The SML Children's Trust:** The Trust was established to receive, manage and disburse funds to promote educational opportunities to the children of SML landowners. The Trust seeks to improve community and high school attendance, provide assistance for technical and tertiary education, and specifically provide programs for students to help them overcome social changes caused by mining activities

**Budget and Planning Issues:** No details on the education budget could be obtained from the District education office. In general, however, provincial and District education authorities can anticipate a sharp drop in budget support after 2006 as provincial entitlements from mining revenues decline.

The District education office does not have a district plan. It does, however, prepare annual budget estimates for recurrent and new project expenditure which it submits to the provincial Education Adviser for the consideration of the provincial education board. The District education office notes that the Provincial Education Office has yet to provide guidance to the district on its long-term planning objectives for the district.

### 3.3.3.3 Sustainability Issues

**Direction and Funding:** As for other highland provinces, the education challenge in the Enga Province and the Porgera District is striking a balance between making the public education system more relevant to the needs of rural communities while maintaining an affordable system that provides access to more formal education opportunities.

Currently the provincial education services that are available to rural communities in the Porgera District (elementary, community and primary schools) provide a service which is under-resourced in terms of teachers and materials and



Plate 3.7 Porgera high school students ready for finals

not always relevant to the life skills required for rural living.

Similarly, access to higher education opportunity through the provincial education system (at this stage restricted to the Porgera High School) is plagued by overcrowding, funding and cash-flow problems, poor management and supervision.

Compounding these problems, there is a real prospect that the education budget will decline significantly by 2010 and that, in the absence of ongoing donor support, there will be a need for substantial rationalization of Porgera District education services. As of October 2002, the government has announced that 'free education' is not on the agenda for 2003, i.e., parents will contribute directly toward the education costs of their children. It remains to be seen whether the political will to implement this decision will become apparent at the national and provincial government levels.

**Community Acceptance:** For the people of the Enga Province and the Porgera District, the challenge is accepting that good education is not a free commodity. Good education demands that the community contribute to the cost and main-

tenance of education services. The misnomer 'free education' for subsidised education is, in part, responsible for the decline in community ownership of educational processes at all levels.

The current use of mining revenues (SSG) by the Provincial Government to subsidize school fees does little to encourage individuals or communities to contribute to education services. Lack of community support for teachers and education services is also a major cause of the collapse of education services in some communities.

The Porgera District Women's Association (PDWA) has demonstrated its capacity to support literacy development. The organization has a well-established women's network throughout the district and has significant potential to promote non-formal education and awareness activities throughout urban and rural communities. The education activities of the PDWA could be enhanced through the establishment of a new Women's Resource Centre which could be used to support the development of community-based education and training activities.

**The SML Children's Trust:** The core issue for SML landowners relates to the effective management of the Children's Trust. The Board has commissioned a review of the Trust and new guidelines have been drawn-up to address management and equity considerations. It is anticipated that the review work will be finalized by the end of 2002.

**A Role for PJV:** For PJV, the challenge is to strike a balance between maximising industry-related education and training opportunities up to mine closure and extending support to training activities not directly associated with the maintenance of its core business interests over the remaining life of the mine.

PJV has the capacity to make a significant contribution to technical and vocational education in the Porgera District over the remaining life of the mine and beyond. This can only be achieved in partnership with government and NGO stakeholders. For example, PJV is already providing technical and management support to the Porgera Vocational Centre. This could be extended in collaboration with the European Union and the DoM in the development of the SYSMIN-funded small-scale mining centre designed to promote small-scale alluvial gold mining. PJV will also endeavour to ensure that current training takes into account the needs of non-mining industry and provides skills portability within and outside the mining industry. This is discussed further in Section 3.5.1 below. Finally, more broadly PJV is prepared to support the Division of Education in the preparation of a rolling five-year education sector development plan.

**International School:** For the International School, the principal issue is to assess its viability after mine closure. The school is dependent on subsidies paid through the SML Children's Trust. Should the Trust be split, as proposed by some landowners, the International School would most likely cease to function.

#### 3.3.3.4 The Vision

PJV aspires to see a functional education service in the Porgera District that operates within the framework of the

National Education Plan, responds to and meets the education needs of the people of the Porgera District, and has sufficient funds to carry out its functions for the remaining life of the mine and after closure. PJV would like to see, and would support, an education plan and its implementation that recognises and provides for both formal education and vocational and life-skills training.

These aspirations are closely linked with the concerns of National and Provincial stakeholders. The National Department of Education clearly has an interest in ensuring that local stakeholders retain some of the mining benefit streams over the remaining life of the mine in a Trust Fund to support education services after mine closure, in part so as to ensure that the state is not faced with unreasonable demands for the construction and maintenance of infrastructure and services in the lead up to and after mine closure.

At the district level, the concerns are more immediate, with the District Education Office seeking to receive the necessary resources and guidance to implement the education reforms.

#### 3.3.3.5 Options for PJV

As is the case for administration and health, there is only so much PJV can contribute to the development of education in the short and long term. Primary responsibility must lie with the government and community. Initiatives designed to improve public administration and planning capacity in the Porgera District will provide a broad framework for the comprehensive review, planning and implementation of education reforms. The need for community support for these reforms, and for the on-going operations of schools in the District is obvious.

#### 3.3.3.6 PJV's Proposal for Action

PJV proposes that it:

- Facilitate and support the implementation of the National Government's education reform process and, through this process, encourage education planners to develop provincial and district education plans.
- Review current training practice in the context of servicing industry

needs and providing skill portability within and outside the mining industry (see Section 3.5, below).

- Consider extending, in partnership with other stakeholders, the scope of training to non-formal and livelihood development education and training programs.
- Seek a review of the operations and management of the International School and assist in the preparation of a strategy for its future operations up to and after mine closure.
- Consider support of a District Education Agency (modelled on successful church education agencies) under PDA or PMC to assist the District Education Office with its planning, logistics and in-service.

### 3.3.4 Justice (Peace and Good Order)

#### 3.3.4.1 Summary

Lawlessness in the community has the potential to undermine all efforts and good intentions relating to closure planning for sustainable community development. The recent and on-going destruction of pylons along the Hides transmission line also illustrates how easily the lack of law and order can impact the long-term operations of the mine. Peace and good order are also necessary prerequisites for the delivery of effective health, education and administrative services, as seen in the districts adjoining Porgera.

#### 3.3.4.2 Background

##### Stakeholders

The key stakeholders are located in three geographic areas: Porgera District, the Porgera–Laiagam road corridor, and the Hides–Porgera transmission line communities.

**Porgera District:** The Porgera District includes the 30,000 people who are administered by the Porgera and Paiela LLGs. Within this area, identified stakeholders include:

**The SML Landowners:** The SML landowners are those who have received the bulk of the economic benefits from the mine, as well as the greatest degree of social dislocation. They must deal with a wide range of social and economic

changes, including anecdotal reports of high levels of alcohol problems, violence (including domestic violence) and disgruntled, unemployed youth.

**Non-SML Porgeran Residents:** The non-SML residents represent the bulk of the population in the Porgera District (over 20,000 people) and face a range of issues relating to peace and good order. In addition to the ones listed above, tribal fights have occurred in a number of parts of the valley over the past decade. The problems are compounded by the lack of effective formal justice institutions (particularly the police and court system).

**Women:** Women have primary responsibility for the management of the household and care of family and relatives. Anecdotal evidence from health and community professionals indicates rising levels of rape and domestic violence directed at women.

**The National Government:** The formal institutions of state at Porgera include the police, reserve police, village courts and the District Court.

**PJV:** PJV has a vested interest in promoting peace and good order in the community. Disruption to the operation by elements of the local community poses the greatest risk of early closure of the mine. Within PJV, two departments are primarily concerned with peace and good order. The Loss Control Department provides direct security for the mine operation and Community Affairs provide advice and assistance to management, government and community members over justice issues and events.

Outside Porgera District, the stakeholders include:

**Porgera–Laiagam Road Corridor Communities:** The Porgera–Laiagam road corridor is considered to be a primary area for consideration given its importance in maintaining communication between Porgera and Wabag. Law and order along this corridor has been problematic long before the start of the mine operation. As a result, health, education and economic development have been adversely affected.

**Hides–Porgera Powerline Communities:** In the recent past, these communities have disrupted power supply to Porgera when they have felt they have a grievance with PJV and/or any other party. More broadly, the Tari Basin (traversed in part by the powerline) has experienced a widespread breakdown of law and order in the past decade, affecting the social and economic opportunities for these communities. Restoration of order has been taking place over the three months prior to this writing (end of October, 2002) to the extent that police, magisterial and district services are restored to the Tari area, with a programme of restoration in place for the Tari Hospital. Observers note that, while the peace is tenuous, it could not have been restored without public support.

#### *Pre-mining Conditions*

According to government and anthropological records, tribal fighting has always been a feature of the Porgera Valley. There was a marked decrease once the colonial administration became established at Porgera, although it has been suggested that tensions were simply stored rather than resolved. Tribal fighting began increasing again in the highlands post-independence. Many of the problems of lawlessness in Porgera are continuations of the trends that began with the excesses associated with the Mt. Kare gold rush of 1988–89.

#### *Current Situation*

There is a lack of reliable data from 1987 to the present to allow for the identification of trends in tribal fighting and major crimes such as murder, and armed robbery. The 2<sup>nd</sup> quarter 2001 District Report notes that a total of 242 summary offences were committed. Nine major crimes were recorded for the period, with eight arrests for a range of offences including armed robbery, abduction, wounding and grievous bodily harm. The report also notes four reports of tribal fighting in the Village Court's case register, with compensation either having been paid or in the process of being negotiated.

PJV support for law and order currently includes participation on the Porgera Law and Order Committee, involvement of

PJV staff as reserve police, and extensive logistical support for the police at Porgera.

It is notable that individuals are increasingly turning to court processes instead of violence for dealing with conflict. While the village court system suffers from problems common to much of PNG, District and National courts are being accessed by people for dispute resolution.

Anecdotally, there is widespread community concern at the level of violence in the community, generally blamed by Porgerans on 'outsiders' and PJV and Paiam medical staff believe that violence is a leading cause of death in Porgera. There is also anecdotal evidence of increasing levels of violence against women (particularly domestic violence and rape) and children (including incest and sexual abuse).

Alcohol is widely available in the community (despite Enga Province officially being 'dry') and there appears to be a shift towards much cheaper (K10 vs K60 for approx 350 ml) locally produced 'home brew' as opposed to 'imported' Gold Cup. Drugs (marijuana being the most common) are much more widely available than a decade ago, and community leaders (and others) blame these for the growth of an 'uncontrollable' youth element in Porgeran society. A lack of commitment to education, and few new job prospects for the young also contribute to this problem.

#### *3.3.4.3 Sustainability Issues*

There are a range of justice issues that impinge on planning for sustainability. From the PJV's point of view, the escalation of civil disturbances in and around Porgera (including illegal miners, damage to the power line and along the Porgera to Wabag Road) increases the risk of early closure of the mine. Local unrest may be compounded by the retrenchment (or loss by attrition) of 320 national employees between 2003 and 2004, an issue addressed further in Section 3.5.

Within the community, there is a perception that social issues such as marijuana, alcohol abuse, polygamy,



out-of-control youth, discos, gambling, etc. are creating social disruption and will undermine efforts towards sustainability in other areas. The forced closure of the only bank in Porgera is both a symptom of increasing social disruption in the valley and a factor in increasing the potential for violence as people must now face the risk of carrying cash to and from Mt Hagen. Likewise the perception that there are increasing levels of violence in the community especially towards women and children detracts from progress towards equity and justice in Porgera, prerequisites for a sustainable society.

The sustainability of formal justice institutions (police, courts) post-mine is an issue that the National Government needs to address. Current community and local government calls for more police to be located in Porgera need to be considered in the light of whether this is the most effective and sustainable solution to peace and good order in Porgera. Locally, there is some evidence that the Village Courts are operating outside their jurisdiction and, in particular, discriminating against women.

Outside Porgera, the much-reported, almost total collapse of government services in Tari and Laiagam (including the closure of Sopas Hospital) due to heightened levels of tribal fighting, not only impacts on the communities in those areas but also puts increased pressure on government services at Porgera and encourages visitors and settlers to the valley.

Law and order is a factor in the investment in, and overall attractiveness of, the Porgera area. Not only does a peaceful community have the potential to attract outside investment, it invites internal investment by reducing local risk. This is a serious factor in the Porgeran investment attitude, as local risk is considered quite high. In addition, money spent on repairs or replacement of vandalised equipment is not available for investment in positive programmes.

#### 3.3.4.4 The Vision

PJV primarily wants to run a gold mining business with a minimum level of civil disruption and crime affecting its

operations e.g., illegal miners, toppling of power pylons, violence against employees and other illegal activities. Importantly for sustainability, PJV recognise that any contribution made towards sustainable development at Porgera could be undermined by continuing lawlessness.

The state, through its formal justice systems of police, courts and corrective institutions, wishes to maintain the rule of law by effectively and professionally investigating crimes, and arresting and prosecuting offenders.

Porgerans generally wish to restore harmony and patch up relations that have deteriorated or resolve conflicts, preferably in their favour. There is a recognition that law and order problems affect the effective delivery of services. Women in Porgera wish to be able to conduct their lives without fear of domestic violence and rape.

A priority for other Engan and SHP communities is to access government in their own communities. Again there is the recognition that services are currently being denied by a lack of peace and good order.

#### 3.3.4.5 Options for PJV

Peace and good order at Porgera requires serious commitment from a range of stakeholders, and particularly community and government. While PJV can support a range of initiatives, at mine closure, it is the government and the community itself that must put in place and support the conditions for peace and good order in the community. Given the right incentives, some stakeholders have already shown a remarkable willingness and capacity to reduce law and order problems at Porgera. Security at Paiam, for example, has improved in the wake of the FIFO Agreement largely due to community efforts.

A proactive approach that would assist in the transition to a more sustainable and just post-mine Porgera society could take a number of forms. The initiatives proposed previously under District Administration would improve the ability of the formal justice institutions to function effectively. If there is support from

other stakeholders, PJV could facilitate NGO training-of-trainer programmes in conflict resolution and community planning such as those offered by the Melanesian Peace Foundation. Graduates could then be employed to conduct training at ward level as well as with peace and good order committees. Likewise, PJV could facilitate NGO peer education training programmes on marijuana and alcohol abuse, and facilitate supporting church youth programmes aimed at giving youth an identity. Assistance could also be provided to assist the local Radio Ipili to develop a programme on reducing law and order problems. These options require partnerships with other stakeholders to improve community 'message tracks' regarding social and community issues (Plate 3.8).

In terms of violence against women, PJV is prepared to continue their assistance to the Porgera District Women's Association to strengthen their "Women Against Violence" programmes, as well as continuing support for local capacity-building through the proposed Western Regional Training Authority. The Porgera District Women's Association will also be encouraged to continue to press for reforms within the village courts, including the appointment of female magistrates.

Support for local government capacity-building outside Porgera through the proposed Western Regional Training Authority is one option to partially address the problematic law and order issues in Tari and Laiagam that continue to increase the pressure on the government services (health and education in particular) at Porgera.

#### 3.3.4.6 PJV's Proposal for Action

PJV proposes that:

- PJV, in partnership with government and NGO stakeholders, facilitate NGO training-of-trainer programmes in conflict resolution and community planning, and examine the option of employing graduates of these to conduct training at ward level and with peace and good order committees. This process could be linked to NGO peer education training programmes (both inside and outside its

workforce) on marijuana and alcohol abuse.

- PJV continue to assist the Porgera District Women's Association with their "Women Against Violence" programmes.
- PJV continue to support regional and local capacity-building for LLGs and village courts through the proposed Western Regional Training Authority.

### 3.4 Community Infrastructure

#### 3.4.1 Transport Infrastructure

##### 3.4.1.1 Summary

Transport modes dealt with in this section are road and air. Along with an assured and reasonably cheap power supply, maintenance (or extension) of the existing road system is considered by almost all parties to be the most fundamental factor for the sustainability of the Porgera economy and society after mine closure. It is an obvious fact of economic geography throughout human history that the potential relative wealth of any place is *not* a function of its natural resources, its fertility or even the hard work and skills of its people, but one of its *relative location* on economic networks. An isolated society, no matter how well-governed and how productive its farmers or industries, cannot make economic progress without trading with the rest of the world. By contrast, if well organised, a society at the centre of a network of trading routes can prosper without any natural resources or the capacity to feed itself from the territory under its control. Transport networks are a necessary (but not sufficient) precondition for economic sustainability.

For the overwhelming majority of people living in the Porgera area after closure, the road link(s) to the outside world will be absolutely essential to all aspects of their lives. By comparison, only a few elite individuals will have need for air services and, providing the road is open, even they could manage if Kairik airstrip closed down altogether. Of course, in ideal circumstances, Kairik remaining open is a desirable outcome since it may offer some flexibility for economic



Plate 3.8 Youth officer promoting scout movement

development (flying out gold, flying in visitors) as well as offering an alternative emergency means of access and egress. However, keeping Kairik open is considered to be a much lower priority than keeping roads open.

##### 3.4.1.2 Background

###### Stakeholders

The major group of stakeholders is the people resident in the Porgera valley; irrespective of the many variables that fracture Porgeran society, all its members need road access to the outside world. Other key stakeholders include the EPG, the National Government and PJV.

Lesser stakeholders include residents along the existing Highlands Highway beyond Mt. Maip and especially those of the Laiagam District, Porgeran contractors to PJV seeking alternative customers, residents in the Tari area should the road network be extended, and private enterprise in PNG in general.

###### Pre-mine Situation

Prior to the construction of the mine, there was a motorable track from Alipis/Porgera Station via Mulitaka to Laiagam. The section overlooking the upper Lagaip valley immediately west of Mulitaka was particularly prone to landslips that would close the road for several weeks at a

time. There were very few motorable roads within the Porgera valley, the main one being the track to Mungalep. Most visitors from outside flew into the Porgera Station strip.

###### Current Situation

**Roads:** According to the SDS Study, there are currently 68 km of feeder roads within the Porgera District, excluding the Waile Creek Road. All require constant maintenance but, since the cost of such maintenance averages out at K9,000 per km annually, many are not maintained to a satisfactory level. The 101-km-long highway to Wabag has required an average annual expenditure of K2.4 million on maintenance, plus additional funds from the IDP. Whilst this latter fund is now generally exhausted, approximately K6 million of the K10 million originally reserved for roads and road maintenance still remains. The maintenance cost cited above excludes the costs of clearing up after frequent landslips. It should also be noted that PJV often has to repair roads well beyond Wabag (Plate 3.9) as the responsible agencies lack either the funds or the administrative and/or logistical capacity and the road remains the only vehicular way in or out of the Porgera valley.

Responsibility for road construction (and that of bridges, airstrips, buildings and

other infrastructure in the district), on behalf of all levels of government in the Porgera District, is the responsibility of the PDA. However, most roads are built and maintained by contractors working under PJV supervision. Local contractors own all road maintenance equipment.

The Beca Gure consultants noted that, in 1997, there were 1,200 traffic movements daily on the highway between Paiam and Suyan. (No further counts appear to have been made since.) They also noted that the number of pedestrian movements were much higher, that no specific provision for the latter had been incorporated in the road design and the potential dangers that this entailed. This situation still persists as it does in most busy areas in PNG.

**Airstrip:** No regular passenger transport (RPT) service currently operates in or out of Kairik. Although many local people complain that this is the fault of the airlines which might normally provide such a service (MBA in particular), it is evident that those airlines cannot readily provide such a service as long as the numbers of potential passengers remain limited.

#### 3.4.1.3 Sustainability Issues

**Roads:** Regionally and locally, there are two principal issues concerning the sustainability of road networks: first, the state of the road network at closure and, second, what density and quality of road network will be sustainable post-closure? The two issues are mutually reinforcing; the better the road network, the more economic (and other) opportunities there will be and thus the greater the revenues potentially available for network maintenance (and vice versa). If, at closure, the road network offers no more options than did the network in existence prior to mine operations, then it would be reasonable to conclude that the economic and social options available to Porgerans at closure will be roughly similar to those available in 1988.

Road links might be conveniently divided into links with the outside world (regional links) and means of movement within the Porgera District (local links).



*Plate 3.9 Landslip damage on Highlands Highway in Chimbu Province before emergency repairs by PJV*

**Regional links** - Reliable road links to the outside world are a high priority for some form of sustainable cash economy and the effective delivery of government services in the Porgera area. The range of possible regional links includes:

- The existing link via Laiagam to Wabag, Mt. Hagen and Lae.
- The proposed link to Tari.
- The (very remote) long-term possibility of a road link to the north coast.

The sustainability issues (and options) associated with each of these options are:

**Lae via Laiagam:** its main advantage is that it exists in a good state and will continue to do so until mine closure. It links Porgera to the rest of the population of the Highlands (and that population now constitutes over half the country's population) and to Lae's excellent port facilities. It is also increasingly possible that Asian Development Bank funds will be used to seal the Wabag–Laiagam section of the highway in the foreseeable future. Its main disadvantages are that its maintenance costs are high and that it places Porgerans in a position of dependency on the Laiagam people, who have frequently disrupted PJV traffic and will have no reason to do

Porgerans any favours after mine closure.

**Porgera to Tari:** In the short term, there might appear to be few advantages to such a link since Tari is itself both poorly linked to the rest of the country, is recovering from a state of near-anarchy and has little economic activity. The major disadvantage is that the road does not actually exist and the costs of its construction are not clear, though an estimate of K500,000 to K1 million per kilometer with an annual K1 million for maintenance is realistic. Problems at Tari would more readily spill over into the Porgera Valley. The ongoing maintenance of such a road might be complicated by the fact that it would link two provinces. In the longer term, however, such a road could have very significant advantages from a Porgeran viewpoint, in that it would increase the potential viability of Paiam as a regional market and service center. If the economy of the Tari area were to improve as a result of the gas project, then a connection would be more attractive. Further, the gas/oil companies are continuing to expand their TCS-funded road network linking with a route to the south coast. The prospect of mining development at Mt. Kare also exists and would significantly increase the potential of a road being constructed.



All these factors need to be assessed by local government and businesses and any one of them could greatly enhance both the desirability and sustainability of a Porgera–Tari road.

Above all else, if no Tari road is built then Porgera will remain at the end of a difficult-to-maintain road and that will greatly restrict the range of possible economic activities. There is no guarantee that with such a road such activities will develop but without it there is every guarantee that new opportunities not be developed.

**Porgera–North Coast:** this route was associated with a specific proposal for a gas pipeline. The gas pipeline proposal made sense for Japanese (or other East Asian) importers of liquefied PNG gas in terms of cost savings relative to travel to a loading point on the Papuan coast. However, the 1997 Asian economic crisis—which, at the very least, has lingered on if not worsened in Japan—put an end to that proposal. Without such an incentive, there is no economic purpose in such an expensive road.

**ii) Local links:** Reference is made in other sub-sections of this report (especially Public Administration and Urban Development) to the need for a comprehensive, coordinated approach to planning. One of the key elements of an effective District Plan would be an integrated local transport system.

The present transportation system within the area mainly affected by the project's operations is not entirely satisfactory even if it is a great improvement on pre-mine conditions. As pointed out by Beca Gure six years ago, and the PDWA since 1991, the mix of traffic and pedestrians on the main road from Tipinini to Alipis, given the general absence of footpaths, is dangerous.

On the other hand, the long list of demands for new local roads presented in recent landowner and LLG submissions seems to be unjustifiable, whether on grounds of initial capital costs, maintainability or even social equity (since only a minority of Porgerans would use them for anything other than pedestrian traffic).

Despite a cool recent reception, the SDS LTEDS proposal for walking track development would be cheap, readily sustained and of great benefit to the majority of Porgerans, especially women and children, who are not vehicle-owners. If these are seen as a complement to, rather than a replacement for, some (planned and systematic) extensions to the road network, as part of an overall valley wide transport plan, they may be more palatable. What little traffic data exist for the Porgera area show that many more people travel by foot than by road.

**Airstrips:** During PJV's operations phase, it has proved difficult to have regular RPT services to and from Kairik airstrip. Services that do not at least break even will not be provided after closure. Maintenance costs for Kairik after closure will probably be small providing earth movements do not affect it or the surface needs replacing. It is not seen as being a significant issue.

#### 3.4.1.4 The Vision

It has long been the aspiration of some of Porgera's more visionary leaders to see some extensions to the regional road network. The long-favoured candidate, mentioned above, has been a connection to Tari in the Southern Highlands. In the mid-1990s, there arose speculation that gas from the Southern Highlands fields might be piped northwards to a coastal location anywhere between Wewak and Madang for export to Asia. At that time the concept arose of a road link following this possible route and, despite the fact that the pipeline scheme has been shelved indefinitely, the aspiration of the Porgeran leaders is that such a road should be viewed as a highly desirable medium- to long-term possibility. However, it is fair to say that it takes a lower priority, even in the eyes of local leaders, than the Waile Creek–Tari road.

It has been the long-expressed wish of some Porgerans to develop a new road link to Tari extending south from the Waile Creek Road. The formal status of this road is unclear; insofar as the National Government seems to have set aside some funds for it in the past, it appears to have been approved in some form but since, when attempting to meet

its commitments under the FIFO Agreement to finance developments at Paiam, the NG has only met these (on at least one occasion) by transferring funds earmarked for the road to township development, it is evidently of a low priority in government eyes. Some work on a Waile Creek–Tari road, and an alternative route from Paiela to Mt Kare, has been undertaken but little progress has been made on either.

Recent LLG and Porgera District Administration submissions made three recommendations regarding roads that illustrate the aspirations of some stakeholders: first, that Porgera Development Authority be replaced by a District Works and Implementation Unit; second, that NG/EPG jointly provide K4 million for the completion of the Tari road; and third, that NG/EPG provide K20 million for a road to the East Sepik. More ambitious demands were contained in a 2001 proposal from Porgera landowners (SML and LMP) and their local member. These included:

- PJV fund a new road from Nekeyanga to Kumbapari, the sealing of the Maip to Anawe road and making the Paiela road all-weather.
- PJV and NG jointly provide K10 million for the Tari road.
- A Feasibility Study for a road to the north coast be undertaken (neither costs nor funder specified);
- EPG/NG/PJV each provide K5 million to construct roads between Yuyan–Politika–Paiela, Porgera–Laiagam via Mt. Kaijende (the road surveyed in 1984 as a possible alternative to the present road) and Paiela–Lake Kapiago.

Both submissions demand that the Wabag–Porgera road be sealed.

**Airstrips:** At the time of the Porgera Development Forum—and ever since—Porgerans have been very keen to have Kairik built to a standard capable of taking small jets. Both the submissions referred to under roads repeat this demand and add that PJV and National Government buy an aircraft for the landowners' use. The LLG and District Administra-

tion submission further demands that Kairik be upgraded to international status whilst the landowners and the local member demand (as a reflection of dissatisfaction with the absence of any RPT flights) that MBA be no longer allowed to use Kairik.

#### 3.4.1.5 Options for PJV

Options selected by PJV (and other stakeholders) in the matter of roads will have more impact on the long-term prospects of the Porgera area than decisions in any other area under consideration in this report. The possible options under 'transport' are rather more complex than those discussed in other subsections of this report.

From a Porgeran viewpoint, an acceptable situation at the time of mine closure in terms of regional linkages would probably be to have the road to Tari completed and sufficient funds available to the appropriate authority for the maintenance of both it and the road to Laiagam. This does not seem at all unreasonable. However, that does not mean that the Tari road should be immediately built. A number of development possibilities and activities are apparently being planned or actually being implemented that will impact on the various priorities. Hopefully, if these activities are being undertaken, coordinated action can be taken.

The cost of upgrading Kairik appears prohibitive. The key sustainability issue is the government's long term input as Kairik is state-owned. PJV will work with other project stakeholders to ensure that other sustainability issues- passenger usage, RPT services, maintenance etc are considered under an integrated transport plan.

There appears to be a more urgent need for PJV to work with other project stakeholders to ensure the establishment of a source of funds for overall road maintenance – which is not necessarily to say that PJV should be the sole or even the major provider of such funds.

In terms of internal local links, a Porgera Integrated Transport Infrastructure Plan needs to be drawn up as part of an overall development plan for the area. This plan could incorporate some road up-

grading for a central spine road linking the components of the emerging urban system, three or four regularly graded roads feeding into this central spine and be complemented by a network of improved walking tracks (as suggested by the SDS LTEDS). Whilst this is not PJV's responsibility, other stakeholders' apparent incapacity means that PJV will be required to play a leading role in facilitating the development of both the overall plan and seeking partnerships to complete most of its components.

#### 3.4.1.6 PJV's Proposal for Action

PJV proposes that:

- They facilitate, as part of the mine closure process, the development of a Porgera Integrated Transport Infrastructure Plan. This plan should address all the modes of transport (air, road, foot) and assess the current infrastructure against probable future requirements and budgetary resources. The development of this plan should also involve deliberations regarding the future of the proposed Tari Road, with a view to facilitating coordinated action by government agencies on this route.
- PJV work with other project stakeholders to ensure the establishment of a source of funds for overall road maintenance. Discussions with local, provincial and national stakeholders should commence as soon as possible on this, given the sharp fall-off in revenues available to all the stakeholders from the Porgera mine after 2006.

### 3.4.2 Power, Telecommunications, Banking and Postal Services

#### 3.4.2.1 Summary

The level of provision of these infrastructural items will affect all individuals whose livelihoods depend on the cash economy directly or indirectly. Direct effects will be felt most by individuals in urban areas of the Porgera region. Reliable telecommunications and power supplies will be *essential* for any sustainable development in Paiam and other urban pockets in the area. Also included in this section are banking facilities, as they pose similar issues for sustainability. All these issues will be *significant* for other areas of the Porgera LLG area.

#### 3.4.2.2 Background

##### Stakeholders

**Telecommunications:** Telikom, and through that organisation, the National Government have an important interest in post-closure provision at Porgera; this will apply whether or not privatisation of Telikom occurs although a privately run Telikom might have different implications for continued, post-closure service provision in the Porgera area. All Porgera residents, but especially those involved in 'modern' economy businesses, have a major interest in this sector.

**Power:** PNGPower, formerly ELCOM, and through that organisation, the National Government, have a major interest in this matter, even if they have shown little interest in power supply to Porgera so far. All Porgerans will be affected by the efficiency of post-closure power supply. Along with external road access, continuing power supply is seen to be the most single important post-closure issue.

**Banking:** All future business activity in Porgera would greatly benefit from at least a basic banking service. Although the majority of Porgerans neither now or will in future use banking services, the absence of such facilities will impinge indirectly – and negatively upon them, as well as on individuals. Unfortunately, the one essential stakeholder currently has no interest in banking services at Porgera – that is the banks themselves.

**Postal Services:** Business, government and individuals are all beneficiaries of postal services. Given the lack of banking services, EFTPOS services are very important, though for a small minority of people.

##### Pre-mine Conditions

In the mid-1980s the only means of communications out of Porgera was high-frequency (HF) radio. One HF radio, which was not always serviceable, operated out of the Porgera District Office whilst PJV exploration camp had several. There was no telephone service or any other means of mechanized communication facility available for the general public. Power supply to government offices was restricted to a few hours each day. There were no banking facilities.

*Present Situation*

**Telecommunications:** In September 2000, mainly as a result of sustained and strong pressure from local stakeholders, Telikom PNG installed a local switch with satellite backbone to Port Moresby. Situated at Paiam Township, this local exchange is providing the essential telecommunications service to Paiam, Porgera Township and PJV. This installation rendered the existing microwave link redundant and thus bypassed a major source of cost to the provision of telephone (and telephone-linked) services – vandalism. Although this system is fully installed and most landlines are laid, connection to some users' premises remain outstanding.

Current direct Telikom PNG-provided satellite services leased by PJV provide essential data connectivity for PJV operations. These services will be cancelled upon the closure of the mine. The microwave link from Paiam to PJV Administration office will remain as it is owned by Telikom PNG (Plate 3.10). This microwave link has capacity to provide essential telephone services to the community around the mine site.

**Power Supply:** Power is currently supplied to the Porgera Gold Mine and the Porgera valley from a gas-fired power station fuelled by the Hides gasfield and located on the edge of the Tari Basin. The electricity is supplied to Porgera via a 76-km transmission line. This has proved to be vulnerable to vandalism, but has generally allowed the provision of reliable power supplies to the Porgera valley.

Currently PJV supplies all the power nominally to PNGPower at 1 toea/kWh and PNGPower nominally sells it on to consumers at more than twenty times this price. PNGPower has no office in Porgera and only very occasionally sends up an agent to collect what fees are collected (by PDA) despite the fact that almost all new buildings have been fitted out by PJV or PDA/PMC with meters. Most private households never pay fees and many landowner households not only refuse to pay but believe they should receive free power. In addition, PDA faces power distribution maintenance



*Plate 3.10 Telephone satellite dish at Paiam*

nance and repair costs without a formal charter to supply power or work on power lines. These tasks are taken on reluctantly, as risk lies solely with the PDA for any accidents related to such work.

**Banking:** There is currently no bank in Porgera. A lengthy break-in in August 2001, one of a series of robberies, caused the PNGBC to withdraw. Some locally-owned businesses effectively use PJV for basic banking services – such as exchanging their cash for cheques. Others are forced to transport cash to and from Porgera from Mt Hagen, at significant risk.

**Postal Services:** As this draft was being completed, PMC took on a postal agency at Paiam, restoring postal service and including EFTPOS services.

#### **3.4.2.3 Sustainability Issues**

**Telecommunications:** Future telecommunication service will depend upon there being a power supply available. Currently, monthly costs of maintaining the service probably amount to between K20,000 and K40,000 per month—mainly in satellite rental fees. Demand following closure among non-PJV users would probably fall to between 200 and 400 subscribers. The existing dish would probably need to be replaced by a smaller one and satellite rental fees would prob-

ably fall to closer to K5,000 per month. Annual costs allowing for maintenance would probably be in the vicinity of K100,000. Payments received from telephone subscribers to date have been at a much higher level than those for electricity. There is a very good prospect that no subsidy will therefore be necessary.

Without the telecommunications that are essential to the management of any sort of modern business, government administration or social activity, most forms of post-closure activity would be severely constrained, if not ruled out altogether. It could be argued that the relative merits of keeping the road open and keeping telecommunications in place would favour the latter, at least for the support of the business and government user, if not the average villager. Only the maintenance of a power supply definitely takes priority over maintenance of telecommunications since the latter are dependent on the former.

**Power Supply:** The Hides gas-powered station and powerline to Porgera has the potential to be a major national asset, just as it has been *the* factor in determining the overall nature of the Porgera project to date. Unfortunately, it is vulnerable. More than thirty of its towers were felled or damaged in 2002. Pro-



duction has been affected for three months, and the cost of repairing damage to pylons alone has cost the project millions of kina. A continuing, similar rate of pylon loss could be instrumental in occasioning an early closure of the project. There is an increasing possibility that, at the time of the closure of the mine, the line and power station also would have to be abandoned, especially in the absence of any interest from PNGPower in taking over the facilities. Whilst the continued protection of the facilities during operations are a joint stakeholder responsibility with the onus of most of such protective measures falling on PJV, it will be principally the responsibility of the National Government to take measures if these assets are to be useful after closure since they will only be useful if they are connected into the existing national grid and remain intact. It is possible that such measures, including examining means by which landowners along the route can be encouraged to protect the line, could be successful. However, it appears more likely that this asset will end up being abandoned. That would leave Porgera, post-closure, with no source of electric power, unless the hydropower option outlined below is taken up.

The project at present has some diesel back-up capacity. Although this does not allow the project to operate anywhere near full capacity, it would be far in excess of post-closure Porgera needs. Moreover, the costs of running the existing capacity of diesel-powered electricity generating plant would almost certainly make it unsustainable. The default power scenario, in the absence of a valley-wide electricity solution, would almost certainly see individual households and businesses that can afford it, purchase their own diesel generators, as occurs elsewhere in Papua New Guinea (although generally more cheaply than would be the case at Porgera).

A third possibility—and one with the most promise for sustainability—might be the construction of a small hydropower station of 2.5-MW capacity. This is already considered to have some attraction from a PJV operations viewpoint because of ever increasing



Plate 3.11 Small hydroelectric generating station at Dauli near Tari

power demands but which would, were local staff trained in its maintenance, also be ideal as a post-closure source of supply (Plate 3.11). It is possible that an international aid partner may also have interest in such a project.

**Banking Facilities:** If, during the operations phase of mining when somewhere between K40 million and K60 million circulates (albeit briefly) in the Porgeran economy annually, a commercial bank cannot be maintained within the community, then the chances of one being a feature of post-closure Porgera appear to be very slim indeed. As noted earlier, a number of businesses in Porgera rely on PJV exchanging their cash takings for cheques that can be safely encashed outside the valley. It is highly unlikely that, after closure, there would be any organisation capable of fulfilling this function, even if it were willing to take on the security risk associated with such an activity. Without some form of banking facilities, few modern economic facilities will be feasible although gold buyers might service part of the demand. If banking services are to be provided at Porgera, community support for (and protection of) such services will be needed – as in several other areas of service provision. A Community Banking model, such as has been set up at Ok Tedi, may be an alternative model worth further

exploration, if only because it would involve community ‘buy-in’.

#### 3.4.2.4 The Vision

PJV would like to see a post-mine situation whereby the Porgera valley has sufficient power, telecommunications and banking facilities to support government service provision and the development of local economic enterprises. With reference to power, a small (2.5 MW) hydroelectric power scheme, located perhaps in the Pongema currently appears to be the most feasible way of ensuring continuing power to the valley post-mine. Clearly, provision of these services will require a ‘user-pays’ approach, which in itself represents a challenge for some of the stakeholders. In this sense, a focus on developing the economic capacity of local businesses and individuals to pay for these services is likely to reap greater rewards than aiming to regulate for the provision of these services.

Such an approach is not apparent *to date* in formal landowner aspirations, which have emphasised continuing access to low-cost, even free, service provision in these areas. In terms of telecommunications, all current non-landholder subscribers accept that normal user charges—for a relatively remote location—should apply both now and after

closure. Telikom expects that, at the very least, it should not make a loss on the provision of the service. A privatized Telikom would, presumably, be more inclined to maximise profits and to close down a loss-accumulating service.

In terms of power, while most businesses (and a few residents) are prepared to pay for their power, most existing electricity users have grown used to not paying and many other residents not connected to the supply demand to be connected free of charge. Several local leaders expect PJV to leave behind a cheap (to consumers) supply of power and are currently focussed on the construction by PJV (or donors) of a small hydropower scheme. While banking services are clearly of continuing importance to local business, most local stakeholders make no mention of banking.

#### 3.4.2.5 Options for PJV

In terms of telecommunications, PJV sees no role for itself. Given the existing, reasonably good state of telecommunications in the valley, the only reasonable option for all stakeholders appears to be to agree amongst themselves over the establishment of a maintenance fund (for ongoing satellite fees) and the extent to which subscribers should contribute to that fund. It is possible that subscribers alone could support this form of infrastructure whose post-closure cost is estimated at K100,000 annually.

All stakeholders have an interest in reducing losses to the project from interruptions to its power supply. Even though most do not show any visible signs of such interest, during operations the major (if not exclusive) responsibility for maintaining supply is that of PJV. However, if the state (and possibly other stakeholders) has any interest in the Hides facilities becoming a national asset after closure, they will need to shoulder responsibility for maintenance.

The option of developing a moderate (2.5-MW capacity) local hydropower station may well be the most sustainable option for ensuring power supplies for the Porgera area. In any costings and discussions regarding such a scheme, PJV will work with PDA, landowners and the District Administration, along

with the larger local businesses (iPi for example). These other parties should, in the interests of securing a reliable, sustainable power supply for themselves post-mine, be prepared to be involved in the planning and development of such a facility. Donor support for such a power scheme is currently being investigated.

The prospect of no banking facilities post-mine is of relatively little consequence to PJV itself but of very great significance to Porgerans. It may be that any commercial bank whose presence in Porgera is sought can follow PJV lead in inserting clauses relating to peace and good order in the community as a condition for the bank to proceed. Whilst PJV can assist in seeking out possible alternatives, without community support banking services are unlikely to return to Porgera. That is, a great deal of responsibility on this issue lies squarely with the Porgeran community and landowners.

#### 3.4.2.6 PJV's Proposal for Action

PJV proposes that:

- PJV encourage the other stakeholders to establish a firm understanding of the costs of ongoing satellite services, with an aim of ensuring that subscribers alone can support this service post-closure.
- In terms of power that, as part of the closure process, PNGPower participate in discussion with PJV and other stakeholders over the future of the Hides generating plant and powerline. In terms of hydropower development, landowners, local administration and business should be involved in discussions with donors concerning such a facility. This should occur in the broader context of planning in Porgera.
- PJV is prepared to facilitate discussions between other stakeholders concerning the provision of banking services for Porgera.

### 3.4.3 Urban Development

#### 3.4.3.1 Summary

Urban development has been the subject of intense debate and some acrimony over the life of the mine. However, in

terms of sustainability, further work needs to be done on Paiam and other aspects of urban development in the Porgera area and is currently being planned. Shortfalls in funding for urban development (from non-PJV sources, it should be noted) have meant that Paiam has not developed to the extent that many landowners had hoped. The overall outlook in this sector is good. This view is based on the facts that: a) already major changes have occurred since the signing of the 1998 FIFO Agreement and there is every prospect that by the end of the project a substantial urban infrastructure will be in place; b) that there is every indication that Porgera will face neither the post-closure problem of Ok Tedi – where much of the urban infrastructure will be surplus to community needs – nor that of Misima where infrastructure is rather minimal; and c) the quality of planning expertise and implementation being devoted to Paiam, in particular, is as high—if not considerably higher—than the best urban planning going on anywhere else in Papua New Guinea.

#### 3.4.3.2 Background

##### Stakeholders

Major stakeholders include:

**Landowners** of land at Paiam and neighbouring Palaipaka (in particular), Suyan, Porgera Station and the SML—there is some competition between all these groups to be host to the dominant urban cluster after closure.

**Porgera LLG**, especially since there is a strong possibility that it will be divided up in future to make room for a Porgera Urban LG leaving a rump Porgera Rural LG; for the implications of such a change and on bodies such as PMC and PADDC, see the 'Public Administration' section of this report.

**National and Enga Government** have pledged and in part provided funds for the construction of houses at Paiam.

##### PJV.

**Contractors** in the Porgera area – as work from PJV scales down so many of these will compete for contracts associated with urban development.

Lesser stakeholders include all neighbouring communities, along the road to Wabag, along the proposed road to Tari and in Paiela.

#### *Pre-mine Conditions*

What few urban facilities there were in the valley in 1985 were concentrated around the then airstrip at Porgera Station. The fact that they were limited and that it was imagined that the project would transform them into a significant town was a major reason why Porgerans were keen to see the mine developed.

#### *Current Situation*

Until 1997/8 urban development, particularly residential development continued to be limited at Porgera. PJV housed its FIFO employees at Suyan or at camps at the mine site. However, many new or greatly improved urban-style facilities had grown up as a result of both private enterprise and public expenditure. These included an International Primary School, a High School and a Hospital (at Paiam) and a rapid increase in stores, the most notable being iPi's store. iPi's activities grew up and continue to be located at Porgera Station where the Health Centre and previously chief primary school of the area also remained. The limited facilities at Suyan – basically a canteen, sports facilities and mess – were (and remain) closed to the general public. Ribbon development of small trade stores, video halls, food outlets occurred

along the length of the road from Alipis to upper Tipinini.

After extended and often acrimonious negotiations, PJV and other stakeholders negotiated the FIFO Agreement. PJV has consistently fulfilled its commitments in that agreement. Under the agreement, the PDA (as the Special Purposes Authority of the Porgera LLG) was given the responsibility of managing 'the construction of facilities in the Paiam, Porgera and Kairik towns and to manage the operations of these facilities'. Yelgun was contracted to manage the Paiam Town Management Company set up by the PDA for a period of five years. This remit expires at the end of 2003. Effectively, Yelgun, via PMC, have developed the Paiam Township under the supervision of the PDA.

Also in 1997/8 the Beca Gure Master Plan was developed. This is an excellent document; although now out of date in some respects, many of its insights, not only into urban issues but also into the overall development post-closure of the Porgera Valley, remain crucial. Beca Gure commented (p1-39):

'Spending money in a logical sequence on well designed public utilities and services will no doubt produce a potentially more efficient and sustainable community if Paiam develops in the way it is planned.

But it does not guarantee that Paiam will actually develop into a fully functioning community at all. It only ensures that the buildings and public services bought and paid for will exist....'

In essence, the plan concluded that, given constraints of land and given its own conclusion that duplication of provision of community-wide services at different places within the valley would be wasteful, adequate provision of urban facilities could best be provided by a central focus (at Paiam) supplemented by satellite urban nodes strung along the Tipinini–Alipis road. If such a linear necklace of a town were to work properly, it would require good transport between the nodes and the Paiam centre. That in turn would require the urban corridor not to be congested as a consequence of unplanned development along its sides.

By the end of 2001, Paiam had 245 allocated allotments and 255 residences, 99 of which were connected to sewerage – that fed into a liquid waste dispersal/anaerobic sewage treatment plant – and 89 to a reticulated, treated water supply. Forty-eight of the residences were housing PJV workers and their families who had previously been FIFO workers (Plate 3.12). The Paiam Hospital is now operating successfully (after a period of notable under-use), the new market and demonstration garden are a major asset and should be a source of pride to Porgerans and some secondary industry (joinery) has been established. By the end of 2001, K34.6 million had been spent on Paiam since the signing of the FIFO Agreement (of which K5.2 million was committed but as yet unexpended). Of this amount the Tax Credit Scheme had contributed 38%, the IDP 30%, the National Government 7%, the PDA 3% and all other sources 22%. The PMC budget for 2002 totals K10.6 million of which 4% will be raised internally, 32% is expected to come from National Government, 25% from IDP (exhausting these funds), 29% from international donor agencies and all other sources 10%. Given the difficulties the national government has had in the past



Plate 3.12 Paiam houses for PJV's 'fly in – fly out' employees



in fulfilling its commitments to expenditure at Paiam without transferring funds from other projects in Porgera and, given the vagaries and often long delays in donor funding, this budget cannot be regarded as secure. Whilst PJV has, to date, met its financial commitments made under the FIFO Agreement, most other parties, notwithstanding the heroic efforts of officers of the Department of Mining to ensure that the national government fulfils its promises, have not done so.

Despite the difficulties governments have had in meeting their financial commitments made under the FIFO Agreement, at the time of the fieldwork for this study PADC had (a little belatedly) accumulated K3.3 million in funds made up as follows: landowners K0.3 million; EPG K0.5 million (with a further K0.5 million promised for late April); and National Government K2.5 million. A relatively small additional bank loan has proven problematic, such that it is likely that in the remainder of 2002 and early 2003 no more than 10–15 PADC houses will be added to Paiam's housing stock. These are to be rented out to PJV and rentals should ensure that capital costs will be paid off within five years. If this transpires, then PADC projects that it will have approximately K8 million in cash and other assets by 2008. Finally it should be noted that the majority of residences built to date at Paiam are in fact privately owned. Private demand for residential allotments had been larger than expected.

In summary, despite funding difficulties, the planning of Paiam town is going well. Indeed, Paiam currently is probably the best planned town in PNG. A major question is what should happen at the end of 2003 when the present contract arrangements expire. Although there has been considerable thought given to the future of Suyan no agreement has been reached yet. Planning of the rest of the urban 'necklace' envisioned by Beca Gure is minimal. No overall regional plan showing how the Porgera area might relate in future to the surrounding areas and the rest of the world is in place.

### 3.4.3.2 Sustainability Issues

Behind the long-drawn out debate over FIFO and Paiam has been a sustainability issue, even if other factors have often overshadowed this. PJV and its consultants have consistently argued that, quite aside from these other factors, the building of a fully-residential mining township would waste resources since, at closure, many of its facilities would become redundant and maintenance costs would be excessive. There has always been some (varying) measure of PJV support for the provision of urban-style services even if there has been (also varying) reluctance to support large-scale residential development in the valley. The landowners have consistently argued the opposite, wishing to maximise residential development, demanding that each of PJV, NG and EPG contribute K5 million annually until closure into a fund for maintenance purposes. Certainly K135 million would go a long way to maintaining more structures (in the region as a whole, not just the urban system) than currently exist but whether any of the three parties, especially the two government bodies, could afford to comply with this demand is questionable.

Paiam town already raises some income (K375,000 is budgeted for in 2002). It does not seem impossible that, by 2010, internal revenue could reach K1 million annually *providing* capital accumulation in the regional economy as a whole can be promoted by then. Such a sum would certainly help the township toward becoming self-sustaining. The key issues of sustainability seem to lie more in the area of maintaining regional and urban infrastructure (power, road access, telecommunications) than in urban development as such.

Funding for Paiam is already a problem area and it could grow into a worse problem in future years. However, providing funds can eventually be raised for vital components of urban infrastructure then, *if regional economic development as a whole can be achieved and regional assets utilized effectively*, perhaps it is a mistake to see failure of governments (or any other outside agency) to give money as a setback. The real challenge

is to achieve a level of regional development that will create capital for years to come.

The Beca Gure Plan was designed in the face of uncertainty over future populations of the Porgera Valley. These uncertainties remain. Some argue that populations will inevitably decline following closure and that this might be a good thing since it would free up land resources and place fewer demands on government services. Others argue that maintaining population at current levels would assist in maintaining capital accumulation potential. The SDS study makes the useful observation that even if there were a decline at closure, population growth would rapidly bring the post-closure population back up and beyond current levels (barring an HIV/AIDS upsurge). What is required is a flexible plan and administration under which good urban services could be provided to the Porgera population (whatever its size). Similarly at present the challenge remains the same – to provide urban services that reflect long-term market demand and to stimulate that demand by encouraging non-mine urban and rural livelihood activities. Thus, providing the development of Paiam and other urban nodes is proceeding relatively well, then the key to future urban success will lie in the regional economy, including the rural village economy, as a whole. The reverse will not work: building hundreds of houses at Paiam will not generate regional development.

### 3.4.3.3 The Vision

The vision for Paiam is for the town to develop into a significant regional asset (Plate 3.13), with a strong, regionally-linked economy driving effective management of the town and its regional service infrastructure by an Urban Council. In line with the comment by Beca Gure, though, PJV does not believe that simply building houses is the way forward. Paiam should function as the centre of an urban 'necklace' that spreads from Tipinini up to Alipis, and includes significant facilities at Suyan and Porgera station. PJV has no preference for how its facilities at Suyan are used post-mine, although it would obviously prefer that they were used in a way that contributed

to sustainable development in the valley.

Other local stakeholders have always had strong views on the matter of urban facilities in the Porgera valley but they were not always unanimous. Some want a much more massive urban development at Paiam, others want compensation for lost economic revenues due to FIFO, the handing over of land around Porgera station by the national government, or a government declaration of Paiam (and Porgera) as 'urban centres'.

When PJV itself canvassed stakeholder views, two of the parties approached had specific comments relating to urban development. The Managing Director of Orogen placed the continued development of Paiam Town as the number one priority for sustainability. Similarly, a local personality who was not dominant on the boards of local institutions, also placed the strongest emphasis on Paiam's further development. Thus, a range of stakeholders appear to agree that urban development is the key to the area's ongoing economic sustainability. The previous District Administrator has argued, for many years, that one of the most important ways of generating sustainable economic development in the area is to build up the Porgera valley as a service centre for west Enga as a whole and the Tari Basin.

#### 3.4.3.4 Options for PJV

As discussed under Public Administration, it is clear under Papua New Guinea's laws who should normally be (and who *will* be, post-closure) responsible for all levels of planning in the Porgera area: the wards, LLGs and District Administration. This should/will be the case whatever the fate of PDA. Currently, they do not take on this responsibility and there is no sign that they are presently able to do so. It is evident that a capacity-building program is necessary if governance is to be properly managed after closure. PJV could assist in facilitating such a program but responsibility should lie with the Porgera Sustainability Group or whatever body results from the mine closure process (as discussed elsewhere in this report). Until that capacity is created and even if the pro-



Plate 3.13 Paiam market

posed Porgera Urban Local Government is established, as foreshadowed, at the end of 2003, the present urban planning structures involving PDA, Yelgun, PMC and PADC should remain in place.

PJV has largely met all its obligations under the FIFO Agreement. It will continue to strenuously resist pressure to go beyond its agreed residential building program, not only on the grounds that such additional residential development would become a maintenance burden post-closure, but also because the long-term success of Paiam (now that its basic outline is in place) will depend on economic development in the Porgera area. PJV can better support Paiam's ongoing success by investing its available resources in regional economic development efforts rather than building more houses.

Porgeran businesses with investments in non-mobile capital assets located in locations other than Paiam cannot be expected to shift their investments to Paiam rapidly (and, indeed, should continue to be allowed total freedom to decide what is the best location for their investments). However, all publicly-provided services intended to serve the Porgera valley as a whole should be located within Paiam Town, with one major proviso that, at closure, a variety of physical assets may

become available as PJV exits the area. These will include the Suyan Camp as well as various office buildings and workshop areas in the SML. The existing facilities at Suyan could, at closure, become: the indoor sports area for the Porgera valley as a whole, a hotel site, the site of any tertiary education centre for Porgera and a residential suburb. Similarly, workshops within the SML could become the site of a Porgera District Works Unit whilst the main administration block could become the administration headquarters for whatever local level governments/District Administration exists at closure. Note that this would not preclude the political arm of government establishing a presence at Paiam in the form, for example, of a meeting chamber. Analysis by and agreement amongst members of the Porgera Sustainability Group (or whatever body results from the mine closure process) in the near future on such issues, would both clarify these matters and simplify the issue of what public structures are needed, between now and closure, at the Paiam site. Such a process would coincidentally push forward the Beca Gure concept of a 'necklace' of urban service provision whilst helping to minimise duplication of such provision.



### 3.4.3.5 PJV's Proposal for Action

PJV proposes that:

- PJV continue to work with all other stakeholders to ensure that the urban system grows successfully by widening its endeavours and devoting more attention to regional economic planning for the Porgera District as a whole.
- PJV work with other stakeholders to facilitate the introduction of an administrative capacity-building program at ward, LLG and District level so as to develop background material for a Porgera District Plan. This capacity building would fit within the broader institutional strengthening program discussed above (Public Administration).
- PJV continue to support technical planning and engineering work associated with Paiam town and will press for the current arrangements between PDA, PMC, PADC and Yelgun to be extended beyond the completion date of the current agreement. Some rationalisation of these services could occur, in anticipation of developing a sustainable local government authority.

### 3.4.4 Relocation Settlements

#### 3.4.4.1 Summary

The relocation settlements within the SML (and those outside the SML) are a direct consequence of the mine develop-

ment. Households, whose houses met guidelines on safety and noise or other nuisance, were given a permanent-material house and associated benefits. The affected landowners chose the site for their homes, with the vast majority choosing to locate in areas within the SML. The majority of these homes are now at least 10 years old, and are located in settlements that are very different to when they were established. While PJV is partly responsible for the current conditions in these communities, the conditions in the communities at mine closure will be a factor in how the costs and benefits of the mine are assessed by the landowners and outside observers.

#### 3.4.4.2 Background

##### Stakeholders

The direct stakeholders are the residents of communities of the SML. It is possible to discern (at least on paper) four sub-groups of these communities: landowners who have relocation houses; children of these landowners who feel they should also have relocation houses; landowners who did not receive relocation houses; and *epo atene* (described as 'non-related friends' and residents '...generally related through another clan name with the individual granting the [land] use right.')<sup>7</sup>

PJV is also a stakeholder, as both the architect of the relocation program and as the immediate neighbour of the settlements.

#### Pre-mine Conditions

With the notable exception of Alipis village, pre-mine, most Porgerans lived in scattered family hamlets. Traditionally, the Ipili were relatively mobile and did not live in settlements. The population was low (probably 2,000 or so) within the SML in 1989 (and less than 10,000 in the valley as a whole) and landowners had adequate food gardening land within the area.

#### Current Situation

There is now severe overcrowding in the SML relocation villages of Kulapi, Yarik/Olonga/Timorope (Plate 3.14) and Apalaka. Within the SML, a census carried out for PJV in 1993-1994 gave a total population of 5,257, of whom 1,131 (21.5%) were categorised as *epo atene* 'non-landowners'. By the end of 1999, when the same person repeated the exercise, the population of the SML had ballooned to 8,710 in total, with 4,126 (or 47%) *epo atene*. The *epo atene* population grew, then, by 265% over five years, while the landowner population increased by just 11%. This gives an indication of the huge pressure that is being put on members of the SML clans by relatives and others from outside the area. There are some serious implications of this population growth. The SML area was home to around 2,000 people at the start of the mine: this same area now is home to over four times as many people as well the mine operation (open pit, waste storage areas, mill and all the ancillary parts of the operation). A number of factors are behind the high population growth including; in migration due to marriage especially to outsiders, in part fuelled by increasing polygamy; high natural population increases associated with polygamy; bone fide land owners who did not receive relocation houses and children of relocatees themselves getting married; and opportunists taking advantage of traditional links or entering into agreements with landowners in order to reside in the communities.

<sup>7</sup> Quotes respectively from Alex Golub, *Gold Positive* Kristen Press, Madang 2001; and Richard Jackson and Glenn Banks, *In Search of the Serpent's Skin: The Story of the Porgera Gold Project*, PJV, 2002.



Plate 3.14 Yarik relocation village on the SML



Not surprisingly basic resources in the area—land for gardens (see Section 3.6.3), water and privacy—are all stressed, due to this overcrowding. The water tanks on houses are too small and supplementary systems inadequate as a result of the population increase. This is despite recent PJV efforts to establish communal tanks in the main settlement areas. There is increasingly a lack of firewood and bush materials for house building/fencing, and there are problems of sewerage contaminated groundwater, rubbish disposal, soil erosion.

#### 3.4.4.3 Sustainability Issues

While much of the focus of PJV Community Affairs monies and human resources have already been directed at assistance for the SML communities, they are the people who have been most impacted by the mine development. They are the PJV's most important local partner and (despite frequent noises to the contrary) supporter. The attraction of permanent materials housing was a central reason why the communities cooperated in the development of the mine; the changes in lifestyle accompanying this benefit (for example, permanence, maintenance demands, relations with visitors) may obscure the value of such houses, and lead to feelings of dissatisfaction.

PJV has constructed approximately 600 relocation houses from late 1988 to present (Plate 3.15). Few more are expected in the next ten years as the mine operation (including pit area, waste storage areas etc.) has virtually reached its maximum extent. By mine closure, the original relocation houses constructed in 1989–90 will be nearly 20 years old and many will exhibit the signs of lack of maintenance. Water, sewerage, firewood and rubbish disposal facilities and services are currently suffering from the inherent overcrowding of these communities.

The stresses induced by overcrowding in the SML relocation villages are relatively new for Porgerans, and along with relatively high disposable incomes for the landowners and *epo atene* (from royalties, wages, compensation and business contracts), has resulted in what is perceived at least as higher incidences



Plate 3.15 Typical relocation house

of alcohol and drug abuse, violence and domestic violence. The high proportion of *epo atene* also weakens traditional forms of community leadership and control.

As a result of the problems outlined above, resettlement of these villages (perhaps more accurately for some, the people that have not been relocated) has been a recurrent theme over the past decade from the landowners. This issue has been raised at every opportunity and in every conceivable forum, and politically is one of the two major areas in which landowners have expressed dissatisfaction with PJV (the other being, up to 1997 at least, *Paiam* and the *FIFO* arrangements). The children of the original landowners have also been arguing for houses for themselves once they marry, and male landowners have argued for extra houses for new wives they marry (it is not unusual to have 2 or more wives living in the same house in these settlements, a situation that is not conducive to marital bliss for any of the parties).

#### 3.4.4.4 The Vision

PJV wants to help find a solution to the issues raised but is constrained by the fact that it has rarely been able to exercise an authority over who resides within or moves through the SML communities (even though it could – at least on pa-

per). It sees the *epo atene* issue as one that the landowners themselves must resolve, although Community Affairs staff do recognise the difficulties landowners face in expelling relatives from the area.

#### 3.4.4.5 Options for PJV

The easiest option for PJV in terms of these relocation settlements is to do nothing more than what is specified in the various Relocation Agreements. Legally, this is all that is required of PJV. It can also be argued that many of the *epo atene* (and hence many of the problems) will leave when the mine closes, but this is as much dependent on conditions in the home areas of the *epo atene* as it is on the post-mine environment and opportunities at Porgera. In other words, the problem will solve itself at mine closure.

As a minimal response, PJV could develop a program to train home owners (especially women) in basic house maintenance skills; e.g., fixing leaking taps, repairing broken PVC pipes, repairing stove, replacing ridge caps, louvres, fly wire etc. An audit of maintenance needs by order of occupation (using original relocation list) could be the basis for the development of a maintenance program (developed in consultation with the communities and run by PJV or another local business) for selected items.

Options to reduce overcrowding in the existing settlements largely rest with the landowners themselves.

Any discussion between the primary stakeholders of re-relocation or large-scale resettlement is likely to be acrimonious and unproductive, if recent history is any guide. PJV is simply unable to meet the costs associated with a large-scale resettlement scheme for all SML landowners. Stating this does not mean it will drop from local aspirations and demands, though. PJV purchase of land (either inside or outside Porgera) equivalent to areas of food gardens lost within the SML may be an option worth investigating further (and is discussed in Section 3.6.3). Certainly, all rehabilitation of land within the SML will involve landowners in the planning and implementation to ensure that, post-mine, the landowners have access to as much land as is possible for their chosen needs. The facilitation of a resettlement move by landowners to land that they (the landowners) purchase may also be possible.

#### 3.4.4.6 PJV's Proposal for Action

Most of the options outlined above require investigation, discussion and negotiation with other stakeholders. More immediately, PJV proposes that:

- PJV facilitate an audit of relocation house maintenance needs by order of occupation (using original relocation list). This could then form the basis

for a maintenance and training program (developed in consultation with the communities and run by PJV or another local business) for selected items, such as water tanks.

### 3.5 Human Resources

#### 3.5.1 Labour Force

##### 3.5.1.1 Summary

PJV workforce will obviously decline along with the mine itself. This workforce, and particularly the Porgeran component of it, can provide an important contribution towards sustainable development within the Porgera valley. It is as much, if not more, to the advantage of nearly all stakeholders in the Porgera Gold Mine to manage retrenchment properly and fruitfully as it would be to manage any other aspect of closure.

##### 3.5.1.2 Background

###### Stakeholders

Almost all Porgerans and many people across PNG have an interest in the retrenchment of workers from the mine. However, those with a direct interest are, obviously PJV itself (Plate 3.16), the Porgera Mining and Allied Workers Union, individual workers – expatriate, national and local – and the PNG National Government especially Department of Labour. An additional category requiring specific attention is contractors. In this discussion, with its focus on

sustainability at Porgera, the interests of expatriate worker interests are ignored.

#### Current Situation

The following figures are drawn from SDS (2000) and PJV sources. Obviously, they will need to be constantly updated if the options proposed later in this section are to be followed.

At the end of 2001, there were a total of 1,967 PJV employees of whom 1,171 were Porgerans, 86 Engans, 499 other PNG nationals and 211 expatriates. The SDS Study suggests (Vol. 1, p.10) that the numbers of Porgerans and Engans are doubtful with a significant number of Laiagams, Kandeps and Hulis (the latter from Southern Highlands) included in the 'Porgeran' total.

Total wages paid in 2001 to 'local' workers amounted to K24.2 million, although this includes Engan workers as well. Of this, Porgeran wages and salaries probably accounted for K15-20 million, at an average (including training costs and superannuation contributions) of K15-18,000 per Porgeran worker. Note that this is almost three times the royalties and nine times the value of compensation paid to Porgeran groups in that year. Certainly, except for a few leaders of the landowner community, for most Porgerans having a job with PJV is far more remunerative than being a royalty or compensation recipient. PJV wages are both the largest source and the most widespread form of cash benefits in Porgera.

The following table is derived from data PJV Life-of-Mine data.

PJV has developed several programs that provide national employees, including many Porgerans with certifiable, transferable trade skills (Plates 3.17–3.19). Examples include:

- Caterpillar heavy equipment training, certified by Caterpillar.
- On-going training in High Performance Culture (HPC).
- Block courses for apprentices at technical colleges (or in exceptional cases, at PJV) and recognised by the National Apprenticeship Trade Testing Board.

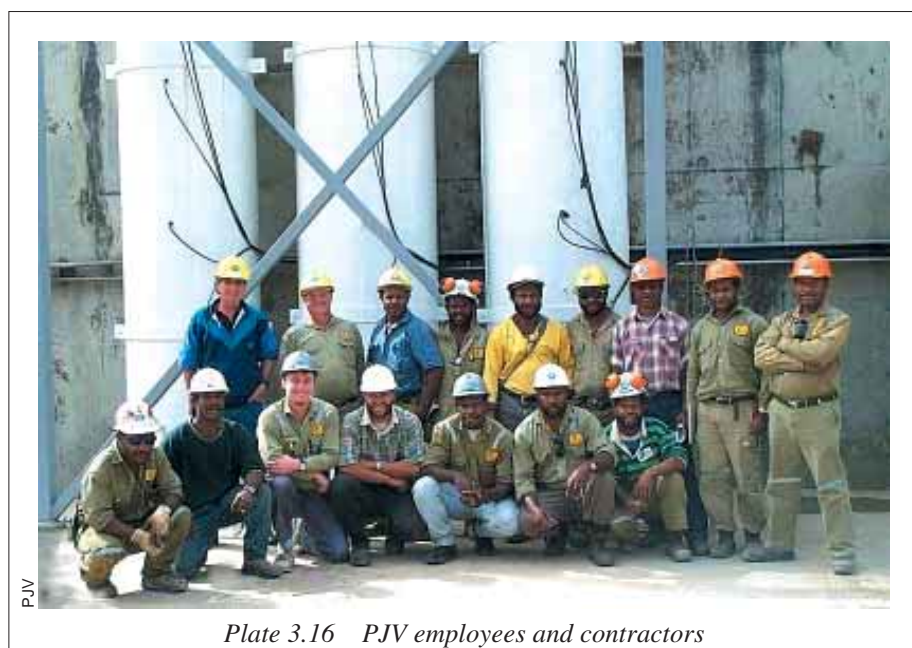


Plate 3.16 PJV employees and contractors



- The certification of trades assistants by way of competency-based examination at technical colleges.
- In-house training in MS Word, Excel, Access and other programmes as required by the job.

**Retrenchments** start in earnest during late 2003 – and even if this is largely achieved by natural attrition, this will be the very first concrete aspect of closure to make itself felt on the community, far earlier than most other closure matters. It needs to be prepared for with some haste. Importantly it will be staged – by the time the period of stockpile milling only starts (2006), 605 Porgerans will have been laid off.

No formal retrenchment package has been developed as yet; existing award rules on retrenchment entitlements and applicable legislation seem likely to be applied.

### 3.5.1.3 Sustainability Issues

It is generally argued that a chief reason why Papua New Guinea needed to develop the mining industry was to develop its peoples' skills and capabilities, the ultimate sustainable resource. Whether or not the cash mining has paid into government coffers over the years has been used as well as it might have been to this end is debatable. What is *not* a moot point is that the PNG employees of the mining industry (and of PJV of course) have for the most part far more skills marketable in the 'modern' world

than does the average Papua New Guinean. Some have skills that are internationally marketable. The great majority have improved those skills whilst working for PJV. PJV and the mining industry in general have directly contributed to the overall goal of the national mining policy.

A more specific issue relates to other aspects of the closure plan and its proposed emphasis on livelihood development. The various possibilities for the development of secondary industries and services in the Porgera valley made elsewhere in the present study depend very heavily on there being the local, skilled

labour to manage and run them. The most obvious source would be ex-PJV employees.

If one, possibly the major, aim of closure planning is to soften if not eliminate the shock of reduction of cash flows in the local impact area, then it is obvious that wages currently represent easily the largest single source of private incomes there. A single ex-PJV employee in a new, non-mine wage job inside the Porgera valley would almost certainly add several times the economic value than a single coffee farmer. The realistic chances of generating either a new flourishing coffee industry or full employ-



PJV

Plate 3.17 PJV workers have marketable skills, engine rebuilding



PJV

Plate 3.18 PJV workers have marketable skills, surveying



PJV

Plate 3.19 PJV workers have marketable skills, computer maintenance



ment for all ex-PJV Porgeran employees are probably equally low – but the returns even for partial success are likely to be higher in the latter than in the former.

#### 3.5.1.4 The Vision

PJV has set out its own goals for closure in its Draft Closure Policy (Appendix 2.) Among these are optimizing benefits, communication with stakeholders, and providing capacity building. A carefully designed retrenchment/further employment policy matches all these aims.

PJV is aware of the ways in which other business units of PDI have put considerable effort into this aspect of mine closure or re-structuring. The experience of PDI in the Care Project in southern Africa in particular and the efforts of the Misima Mines Union in developing a joint venture partnership with a major placement agency will be drawn upon to enhance certain aspects of the nature of the retrenchment/ retraining program. A particularly novel aspect of the former generally novel scheme was that retrenched workers could, if they wished, nominate another member of their immediate family to take their own place in Care's retraining programs.

The intention is to develop a relevant and successful retrenchment/ retraining program that accords with international best practice (MMSD and PDI good corporate practice guidelines for example), and with the National Government's Draft Mine Closure policy and Guidelines. The latter has as one of its 'Key Policy Elements':

'Proper provision .....for the orderly retrenchment of the workforce from closing mines and retention of their skills for the benefit of the country' (ISPNG, 2000, p.5)

Landowner views as represented in submissions to date contain no mention of retrenchments. They are focussed on localising virtually every position in the project.

#### 3.5.1.5 Options for PJV

Almost every aspect of closure policy development and implementation involves the willing efforts of many parties other than PJV. It will be challenging

to obtain such cooperation. The preparation and implementation of a positive policy for retrenchment and further employment *requires only the cooperation of PJV, the union and the workers* themselves – with the National Government giving its assent to any agreement reached. For this reason, PJV believes it should be achievable rather more readily than most of the other closure policy matters, and is determined to put in place a world class program.

The reason why the cumbersome term 'retrenchment/further employment' has been used throughout this section is simple: PJV's future policy options in this area fall into two distinct categories – policies related to how redundancy and retrenchment are managed and policies related to how further employment can be achieved.

Any *retrenchment* policy that could extend the value of wages received between now and the end of the mine (any retrenchment should not be restricted to the end of employment) or redundancy package could provide a source of cash for local investment and capital accumulation. An example of the first sub-type could include an agreed increase in superannuation contributions. (This has started to happen as of this version of the Consultation Document: PJV National Employees Welfare Fund has been initiated, creating savings of 20% of net income.) An example of the second type might be something similar to the Anawe North LMP relocation investment option – local employees could, with appropriate incentives, be encouraged to place part of their redundancy pay outs into locally based investment trusts.

Any *further employment* policy that either placed ex-PJV employees in industries and service sectors within a growing local, non-mine economy or in jobs elsewhere in the country (or even outside it) would either provide a source of labour to work on locally accrued cash or provide external sources of cash (via remittances). It would serve to retain at least part, and possibly further enhance, the labour skills acquired during PJV operations.

PJV can assist not only in helping employees find further employment at the time of redundancy, but, during the last years of the mine's operations prepare employees for such further employment. As at March 2002, PJV employed 941 Porgerans as award workers and 126 as national staff. Of the former group, around 70 worked in the mill, around 80 were security guards, the same number were drillers in the open pit and close to 300 were involved in pit operations, while around 220 were trades assistants of one sort and another. Among Porgeran staff around 30 were 'clerks', 20 'supervisors' and 30 community workers of various sorts.

The question arises what will be the skilled labour needs of the Porgera area as closure approaches and after it has occurred? Following this, can those PJV employees being made redundant (progressively) as mining operations wind down fill those needs? The answer to the first question will necessarily be vague and based on the best estimates of a few individuals. A broad estimate could be that:

- Some—say forty—highly skilled specialist trades people will certainly be required in such fields as power generation and maintenance, refrigeration, computer technology and telephonic communication, gold assayers and general engineering.
- Rather more—say eighty—more general trades people will be required in automobile maintenance, plumbing, building and electrical trades and general carpentry and joinery.
- Skilled managers—say a dozen or so—will certainly be required as will rather more accountants and bookkeepers.
- There may be additional openings in local security services, one of Papua New Guinea's fastest growing industries.

Whilst a detailed investigation of precisely what is covered by 'trades assistants' and the potential of members of that group for training might reveal that some of the above categories can be met from a stream of ex-PJV employees, it

seems doubtful that the third category will be so readily filled. Only eight or nine Porgerans are currently employed by PJV in accountancy areas and fewer at senior levels of management.

Whilst that conclusion may be arguable, what seems to be much more clear is that quite large numbers of Porgerans in PJV employment will not find the skills they have developed with the company of very much value in the post-PJV Porgeran economy. It seems likely though that they will also be the ones most receptive to attempts at retraining for future economic opportunities. Moreover because they are somewhat spread across the whole of the Porgera/Paiela area (even if more concentrated close to mining operations), any success in creating post-mine economic or livelihood options for them could help create a diffusion effect to others less used to participation in the cash economy. A positive aspect is that a substantial work force has acquired modern skills and is trained in safe work practices, communications, hygiene and punctuality. These people are assets, wherever they go with their portable attitudes and skills.

A number of other closing mines have, obviously, had to face exactly the same kinds of problems that PJV faces. PJV will seek to draw on the lessons learnt at other Placer operations such as South Deep in South Africa, and Misima Mines, as well as others such as the Rio Tinto PT Kelian mine in Indonesia.

#### 3.5.1.6 PJV's Proposal for Action

In summary, retrenchment/further employment policies will play a very major role in the success or failure of overall closure policy and, because retrenchments begin in 2003, are a matter of urgency. Since major retrenchments are planned to start within eighteen months, PJV recognises that there is urgent need to consider what policies it should be adopting in this area. Clearly, the role of the Human Resources Department in closure issues will be extremely significant and they will take the lead on many aspects of this process. Some degree of integration between training of Porgerans in PJV workforce, development of new forms of industrial employment in the urban areas of Porgera and efforts to

introduce new forms of livelihood in the rural sector of the area will be necessary and seems possible.

PJV proposes that:

- PJV will establish with some urgency a working group reporting to the Mine Manager, headed by HRD and including the Coordinator Social Closure and Sustainability, to develop and implement policy in regard to all aspects of retrenchment including further employment. PJV will consult with the PMAWU during the policy development phase and then publicise that policy widely amongst the workforce. Without pre-empting this policy process, such a policy might include, but not be restricted to, any of the following measures:
  - The possibility of making redundancy pays available to non-Porgeran Engan and Huli workers in their district of origin.
  - The consideration of some of the methods used in the South Deep CARE program such as the retrenched Porgera worker being able to nominate another family member to take his/her place for retraining. Retraining could be centred on the proposed Vocational Centre rather than on site.
  - For non-Porgeran Engan and Huli workers, consider offering some training support in their home districts.
  - The working group liaise with other PJV sections and other Porgera agencies so as to enable retrenched worker to participate in any local livelihood projects that may be developed by these sections/agencies.
  - Assistance be provided to local contractors to plan the use of their assets to generate post-mine incomes.

### 3.5.2 Women's Participation

#### 3.5.2.1 Summary

At Porgera, as in most parts of the world, women do have a different perspective on, and set of priorities for, life than men. They are primarily concerned with

matters that affect family and community stability. In order to get a balanced approach for post-mine sustainable development it is essential to ensure that women participate in closure planning.

#### 3.5.2.2 Background

##### *Stakeholders*

The primary stakeholders are the SML women, and women elsewhere in Porgera District, including Paiela. Indirectly, an improvement in the power and situation of women (particularly in relation to closure planning) is likely to impact on the wider community at Porgera, PJV, and the state.

##### *Pre-mine Situation*

As noted earlier in this report, gender was an important defining axis within pre-contact Ipili society. Men and women had very different, though complementary, roles and places within the society. Men tended to be involved in the building of houses, the clearing of gardens and, most importantly, the most prominent roles in public discussions and exchanges. Much of a man's time was spent in the public sphere, engaging in, or talking about, tribal fighting, trade, compensation payments, marriages and exchange. Women, on the other hand, played a central role in the private sphere – raising children, tending gardens and raising pigs to be used in exchanges. While the influence of women in public life was generally low, their indirect influence through their husbands and brothers does seem to have been significant in some circumstances. The arrival of the cash economy generally focussed on men and, if anything, imported structures of colonial administration tended to reduce the power of women.

##### *Current Situation*

Although vocal and articulate, it has been hard for Porgeran women to have a public voice. Women are not represented on the Porgera Landowners' Association; they have lost their token place on the Porgera Development Authority. There are no female village court magistrates in the district. More recently, there have been some successes – the negotiations over the North Anawe dump and associated compensation and investment package involved a local committee that included a significant number of women.

Women also do have a public voice in the form of the incorporated Porgera District Women's Association (PDWA). The association initially began with 6 groups in 1989 and now has more than 96 member groups. The association is presently restructuring to conform to the reforms under the Organic Law on PG & LLG. The association is recognised as the 'voice' of women in Porgera.

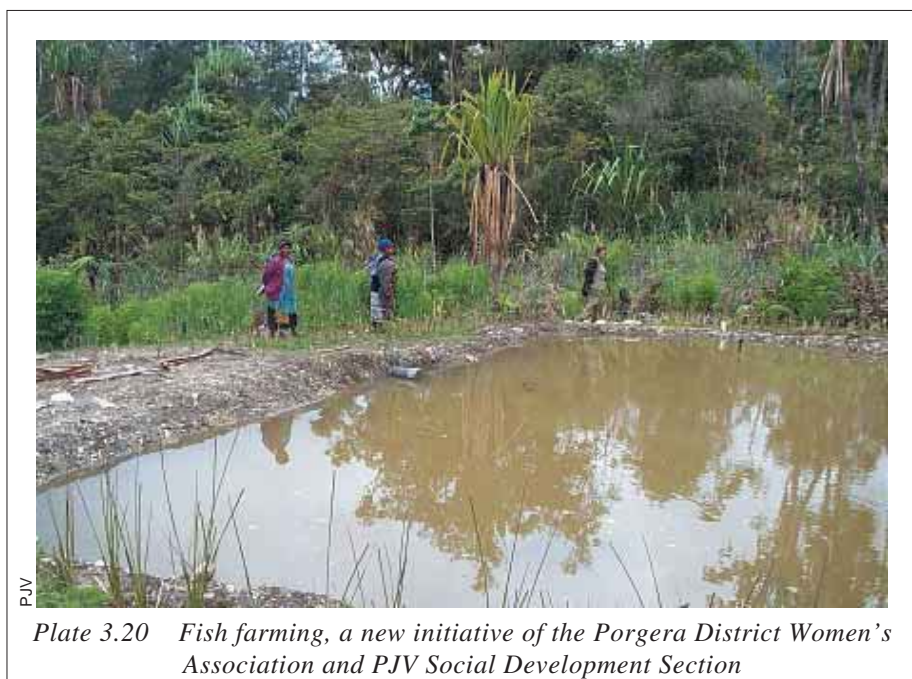
The PDWA, with assistance from the PJV's Social Development Section, is involved in a wide range of activities for the benefit of all women (Plate 3.20). These activities include literacy, health education, family life development, a well-run credit scheme, agricultural projects, vegetable buying, screen printing and contract sewing. This association is the only organisation in the district that is presently involved in ward-level community development activities.

The two main problems facing the PDWA are:

- The association's dependency on the PJV's Social Development Section.
- The potential for conflict between SML women's groups and non-SML groups if SML issues dominate the association's agenda. For this reason it is suggested by PJV that a SML women's committee (as a sub-group of the PDWA) be formed to deal solely with SML issues. The PDWA would then deal with broader issues that affect all women in the district.

### 3.5.2.3 Sustainability Issues

There are two major sustainability issues relating to women's participation. The first is ensuring that women participate effectively in closure planning. Given that until the last few years women's involvement in negotiations with PJV and the state has been limited, there is a need by all stakeholders to ensure that women are more centrally involved in planning Porgera's future beyond the end of the mine life. This is particularly the case for the SML women, who sometimes feel that their interests are not well enough represented by the PDWA, which has a broader constituency and mandate. Many of the sustainability issues, such as post-mine food security, are issues in which women have particular interest.



Secondly, and not unrelated to the first, there is a need for capacity building to ensure the PDWA continues to be a leading organisation for community development post-mine. The association currently exists with support from PJV that obviously will not continue post-mine.

### 3.5.2.4 The Vision

PJV recognise women as a key stakeholder in Porgera District, and will continue to engage with them in a variety of ways during the closure process. Other stakeholders such as the National Government and Porgeran males have little to say about the aspirations and development requirements of women during their negotiations.

Women in Porgera have themselves expressed the following aspirations in a variety of settings, and particularly through the PDWA:

- They want to live in peaceful communities that do not have the disruptive influences of alcohol and marijuana abuse, and to be free of the fear of domestic violence and rape (Plate 3.21).
- They would like to see polygamy abolished. Polygamy as currently practised by men at Porgera bears no relationship to traditional practices,

and creates situations where the risk of domestic violence is high.

- They want to have access to quality health care for themselves and their families, effective schools for their children, and adult education opportunities for themselves.
- They want to have adequate productive land for food gardens and easy access to clean water and firewood.
- They would also like to have opportunities for income generation, so they have funds to spend on food, basic family needs and their children.

### 3.5.2.5 Options for PJV

In terms of ensuring that women are adequately represented and involved in closure planning, PJV Social Development Section has facilitated the re-establishment of a SML Women's Committee within the PDWA and ensures the views of this committee are incorporated into their closure planning. Social Development will continue this support. This committee may also be an appropriate body to be represented on PEAK, be consulted in relation to specific domain and rehabilitation planning within the SML, and represent themselves on any other committee/group involved in closure planning, including any that comes out of the Mine Closure proc-



ess. Non-SML women, under the broad umbrella of the PDWA, also have sustainable development issues within the District and PJV should facilitate their inclusion in closure planning. The DEC/DoM quarterly Social Monitoring Committee would be an appropriate venue to monitor the inclusion of women in the closure process.

PJV will actively facilitate construction of a Women's Development Resource/Training Centre funded, at this stage, by EU SYSMIN funds. The company will assist the PDWA to have substantial ownership of this facility, within the bounds of the SYSMIN agreements. PJV will also facilitate the PDWA securing long-term NGO funding for staff needed to operate the association's programs (e.g., an executive officer, bookkeeper/accountant, literacy coordinator, health extension officer, agricultural extension officer, and welfare/legal affairs officer). This would require the development of a plan for a Women's Development Program to secure potential funding sources.

#### 3.5.2.6 PJV's Proposal for Action

PJV proposes that:

- PJV continue to support the PDWA / SML Women's Committee and ensure the views of this committee are adequately incorporated into the closure planning process, as detailed above.
- PJV facilitate the inclusion of the PDWA in the closure planning process.
- PJV actively to facilitate construction of a Women's Development Resource/Training Centre in association with the SYSMIN funded Vocational Centre at Paiam.
- PJV continue to facilitate the PDWA securing long-term NGO funding for staff needed to operate the Association's programs in the post-closure environment.

### 3.6 Economic Activities

#### 3.6.1 Introduction: Private and Public Capital Equity

The past fifteen years or so of PJV efforts to create economic opportunities for Porgerans have taught several les-



Plate 3.21 Porgeran women protesting against domestic violence

sons. The first is that, in general, Porgerans are like everybody else with respect to business acumen: a few have it but most do not. It is not possible to say that all Porgerans lack entrepreneurial abilities but it is possible to say that, like the rest of us, most do.

The second lesson is that those who do have entrepreneurial abilities have to deal with socio-cultural variables and overcome socio-cultural obstacles that most outsiders don't quite understand. Many business proposals put forward by outsiders, including PJV personnel, have not been successful. Some successful small businesses have not had assistance from outsiders.

Inequalities are evident just below the surface in Porgera. In many other societies around the world, one would expect to see those who had reaped especially large benefits from a project of this kind building ostentatious mansions. This is far from being the case at Porgera. Nevertheless, the inequalities are there. The single largest shareholder in iPi (and apart from one small exception, all shareholders are individuals) owns over 4% of the company's shares and his immediate family members own a further 3.5%. iPi's shareholders constitute less than 12% of the total estimated population of the Porgera/Paiela area (although they comprise probably 25% of the

10,000 Ipili in Porgera). A small handful of individuals dominate the 'representative' positions of authority that modern government and business has draped over Porgeran society and it is quite possible that some have done rather well financially out of this dominance.

Given this situation (which is not unusual: Australia or Canada, for example, exhibit the same sorts and degrees of inequality, and other countries such as Indonesia even more so), it is evident that any success achieved in increasing money-earning opportunities in the valley's private sector will largely accrue to relatively few individuals. It might be argued that, if this is the case, then PJV should not assist in making a few individuals rich and should, instead, concentrate its efforts in the public sector. It should be remembered, though, that for several decades before the mining commenced, similar inequalities existed e.g., alluvial gold proceeds, which were by no means inconsiderable, were concentrated in a few families.

Additionally and unfortunately, the record of PNG's public sector in either managing funds, ensuring equity or in creating lasting development from them is not good. The capacity-building inputs suggested elsewhere in this study are intended to partially address this issue.

Whilst the mine is in operation and employing hundreds of Porgerans, it has had a distributive impact in the area of wages. Wages form the biggest single flow, by far, of cash into the local economy and, at present they flow into hundreds of Porgeran households, not just those of a few. Once closure occurs, and wages cease, most incomes will come from business and investment income and will therefore be concentrated in fewer hands, namely, those individuals who have accumulated funds at the time of closure, unless the Porgeran economy is developed. It will not be developed by public investment although good governance will help it to grow – it will be developed by individuals and groups of entrepreneurs. Thus, paradoxically, it can be strongly argued that if the existing levels of inequality, held in check at the moment by wage employment, are not to deteriorate sharply after closure, then private enterprise must be encouraged.

Despite inequalities and inefficiencies, it is worth recalling the very real assets which the Porgera District brings to the development table:

- A hard-working people, with a sizeable group having learned modern work skills and attitudes ( they worked a large part of the 6 million accident-free hours).
- Productive if difficult land; numerous streams.
- Contractors with substantial assets and work experience.
- An unquantified but significant alluvial gold resource.
- Potential investment capital from wages, royalties, and compensation.
- Power and telecommunications.
- A road link with major markets and suppliers; the link has basically stayed open for over 15 years.
- A District Administration with a very real possibility of being targeted for capacity-building programmes.
- Access to technical expertise and NGOs.
- Support from PJV.

### 3.6.2 Agriculture

#### 3.6.2.1 Summary

The bulk of Porgerans still rely very heavily on their gardens for food; few rely on agriculture for cash earnings. As closure nears, reduced mine-related incomes will put greater pressure on gardens as producers of both food and cash. The lower portions of the valley will be better able to absorb this pressure than those at higher altitudes. These lower areas have benefited least from mining activities to date. Factors relating to climate (especially temperatures), soils and the areas location (and therefore costs of transport) mean that the prospects for cash crop production, given the presently limited investigations of different crops' potential in the area, are themselves limited. Factors relating to the greatly increased population of the area since mining began and given that some households (a minority) have lost significant proportions of their land to mining mean that food security may become a problem for that section of the population that has neither the land to grow food on nor the money with which to buy it (see Section 3.6.2). Whilst it is true that those who have lost land are also the nominal recipients of royalties, compensation and dividends (and wages/ contracts): a) the distribution of these funds by agents may have left some with very small incomes and b) even those with significant incomes at present may, after closure, find themselves with little or no income.

Many of the facilities needed to encourage and support both cash crop and food production are already in place in Porgera: a very large cool room (at Paiam); cheap transport to Highlands Highway markets (cheap because iPi owned or part-owned vehicles travel down to Lae largely empty); and wholesale marketing facilities.

It should be stressed that inputs into agriculture have not only long been considered by PJV but also recommended. A PJV 'Long-Term Planning Report' of 1994 that was mainly concerned with social matters, recommended that short-term agricultural extension officers should be hired on contracts so as to work with the District Administration.

#### 3.6.2.2 Background

##### Stakeholders

The key stakeholders in terms of commercial agriculture are Porgerans, especially those in areas below 2,200m altitude, Paiam businesses, District Administration staff and PJV.

##### Pre-mine Conditions

Before mining started, the lower parts of the valley were the most densely populated for the simple reason that its climate and, to a less important degree, soils were more favourable for agriculture. From the 1950s onwards, with the introduction of small-scale mining, population began to shift upslope and people began to settle in areas climatically unsuited to most forms of traditional agriculture. With the advent of small-scale mining and employment associated with the long period of exploration by larger companies, dependency upon store-bought food for everyday living grew. Partly because of the cash brought in by gold, partly because of unfavourable environmental conditions and partly because of the area's location distant from markets, Porgera exported virtually no agricultural products outside the valley. However, the level of food security was relatively high; whilst gardens were not especially productive, most households, especially in the lower areas, fed themselves from their own land whilst mining households supplemented garden production with store-bought foods (Plate 3.22).

##### Current Situation

Around a third of the area of the SML has been lost to mining operations. Most of the land lost to the pit and the Kogai dump was, however, little used for gardening prior to project commencement mainly because of the altitude. However, the majority of the land on which the processing plant stands at Anawe was productive, and areas along the erodible dump sites have been usurped by mine operations. The loss of land to the mine is significant for future agricultural activities among the SML community, although it is of lesser importance in terms of the entire valley. However, a far more significant factor constraining present and future agricultural produc-



tion, whether for food or cash crops, has been the rapid growth of population concentrated in areas close to the mine and Porgera Station where gardening was never easy.

During the life of the project, relatively little progress has been made in agriculture, indeed it has probably regressed as young people lose associated skills. Although land is now far more extensively and intensively used as a source of subsistence food, the valley still exports virtually no agricultural produce. Even in areas where natural conditions are reasonably favourable, cash cropping has not been extended beyond some minor supplies of vegetables to project caterers (Plate 3.23). A previous District Administrator did attempt to establish a nucleus coffee plantation at Tipinini but his removal from office has seen efforts lapse.

#### 3.6.2.3 Sustainability Issues

In areas within and adjoining the SML, all agricultural issues are focussed on land shortage because of in-migration and loss of land to mine activities. In other areas, three key factors will determine whether improvements can be made to existing agriculture or not: edaphic/temperature conditions; whether or not migrant populations accumulated over the years of the project remain or return to their original homes after closure; and access to roads. Unfortunately, most areas with advantageous climatic condi-



Plate 3.22 Local produce at Paia Market stall

tions are distant from roads (hence the relationship between internal roads and agricultural progress).

The issue of migrants' future intentions is one that affects all aspects of post-closure planning. Yet it is not one that PJV is either entitled to or in a position to make recommendations on. It is a fundamental decision about Porgera's future that can only be taken by stakeholders (and particularly the landowners) operating in unison, and one that requires far more information about public attitudes than are presently available.

It will be an underlying parameter for post-closure planning in all sectors and will need to be taken early by any joint closure stakeholder planning group.

Given ongoing cultural views concerning division of labour by gender, it seems certain that agriculture for both food and cash will concern women very much more than it will men. Yet in most, if not all, formal organisations that will likely provide members of any post-closure planning group, men dominate almost to the exclusion of women.

In terms of cash crops there is a strong set of arguments that would suggest many difficulties facing future progress: indeed, it can be argued that any such efforts will be unsustainable. Yet, the counter-arguments are also strong; above all, the argument that closure will see a very much greater dependence on agriculture.

#### 3.6.2.4 The Vision

PJV recognises that agricultural production can contribute to the range of post-closure economic activities in the valley, as well as in the other mine affected areas. It can provide a source of income to a wide range of people across the valley and beyond, a broader reach than any other form of economic activity. A vibrant agricultural sector will also pro-



Plate 3.23 Women's association buying vegetables at Tipinini



vide conditions whereby local and regional infrastructure is more highly valued.

In terms of other stakeholders, none have said very much publicly on agricultural matters; one suspects that if more women's voices were represented in public domains, greater concern might be uncovered. The absence of interest almost certainly reflects a wish not to have to revert to pre-mine conditions – even if that seems a distinct possibility. Thus it appears that only PJV is interested in a vital aspect of post-closure life in Porgera.

#### 3.6.2.5 Options for PJV

Few PJV staff have agricultural expertise. There is at present no agricultural section within the community affairs area, though a small team under an Agricultural Officer with the Social Development Section of Community Affairs has worked on vegetable and ground crop trials, fish pond and livestock development. The District Administration has three or four agriculture extension officers without the means to do any effective work. One such officer has been attached to Paiam Town Management Authority and has set up a demonstration garden with some success (Plate 3.24). Staff at Yelgun have already begun to prepare proposals for a cash crop agricultural program as part of their efforts to develop links between Porgera's rural economy, such as it is, and the urban facilities at Paiam that could assist its growth. But as yet, all options relating to future agricultural planning are open. Yelgun's efforts are unlikely to close off future options and there is no reason to curtail them pending the development of a joint stakeholder strategy – especially since, at this time, there is no guarantee that such a strategy will be developed in the near future.

In theory (and hopefully and eventually in practice), the responsibility for agricultural planning should clearly rest with government. Yet, as in several other social and economic sectors at Porgera, positive government involvement in agriculture is almost non-existent at present. As in these other areas, the most likely



Plate 3.24 Demonstration garden above Paiam Market

avenue for future success of any sort is likely to lie with local government staff assisted by PJV facilitation. PJV will concentrate its efforts in this area at assisting District Administration officers who, although given no incentive to do their work for many years, are at least on the ground. A second source of local input will clearly be one of the very few organisations in Porgera that is having success among ordinary people—the PDWA.

Information on agriculture and agricultural conditions is poor. Although such information is not vital to ordinary people cultivating their gardens—they usually have that, or at least enough for their own purposes—it will be essential if external funds for agriculture are to be attracted to Porgera.

#### 3.6.2.6 PJV's Proposal for Action

The primary need, as identified by Yelgun staff, amongst others, is for a comprehensive investigation into the potential of the region for commercial agricultural production. PJV (including Yelgun) are now beginning to facilitate access to external funding and expertise for this purpose.

### 3.6.3 Food Security

#### 3.6.3.1 Summary

Food security refers to a population's ability to have access to an adequate

food supply over time. 'Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (Bourke 2001:5). Food security is achieved by:

- Being able to grow/hunt sufficient food to completely supply nutritional needs.
- Having enough money to purchase all food needs.
- Through a combination of cash supplemented by subsistence agriculture.

As noted in the previous section, the mine has brought a shift within the SML and surrounds from a largely subsistence economy to very much a cash-dominated one. At mine closure, the available cash will diminish substantially for these communities, and food security will become an issue, particularly where communities or households have lost large amounts of their traditional land to the mine operation.

#### 3.6.3.2 Background

##### Stakeholders

Food security is an issue for all communities in the project impact area. The primary focus of concern, and hence the primary stakeholders are the landowners

(and particularly women) living in SML villages of Kulapi, Yarik and Apalaka.

Other stakeholders include other landowners that have been impacted by the large influx of outsiders into the Porgera valley, as well as by internal migrations.

#### *Pre-mine Conditions*

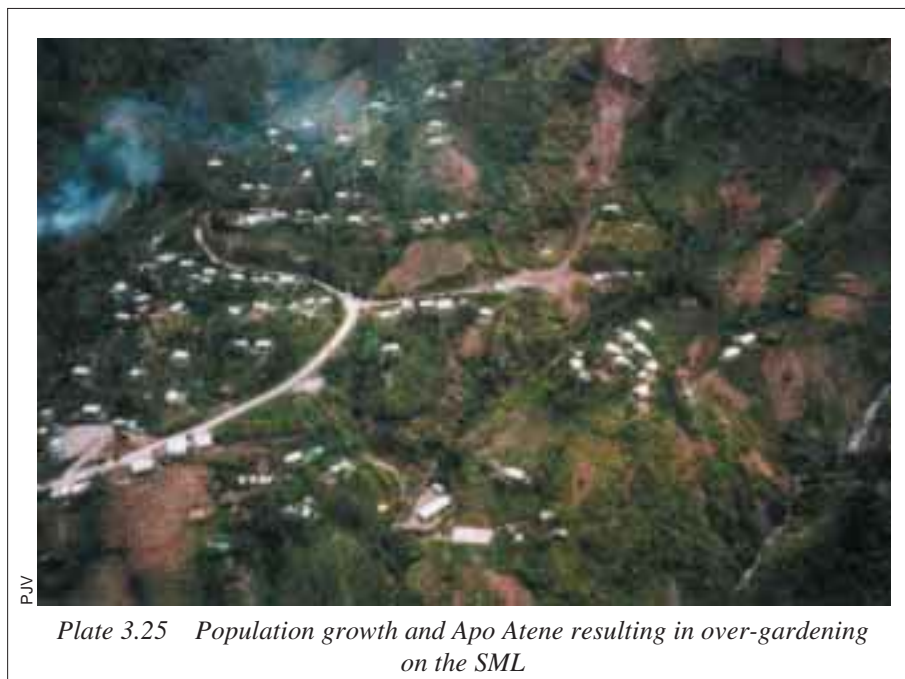
Traditionally the Ipili of Porgera lived in small, scattered hamlets. Their agricultural practices were less intensive than their Enga neighbours as the Ipili had adequate land for a long fallow system, and populations were lower. The higher altitude and generally poorer soils meant that the system was less productive than to the east. Sweet potato was the staple, and generally food security was good (better in Paiela than Porgera).

#### *Current Situation*

As a consequence of the mine, SML landowners lost access to food gardening land. With the development of the mine, the population increased within the SML boundaries (see Section 3.3.4, Relocation Settlements). Overall within the valley, the population has increased from less than 10,000 in 1989 to over 22,000 in 2001. Within the SML, population increases are due to non-landowners taking up rights of residence, polygamy and out-marriage with consequent chain migration, and natural increase compounded by increased polygamy (Plate 3.25).

Problems with food gardens were first noted in 1989 in Kulapi. The other relocation areas also had problems with food gardens and these problems were documented in the social monitoring reports from 1994 (see Filer 1999 for the published versions of the early reports and Banks and Bonnell 1997 for more recent information). In short the problems in the SML communities are:

**Kulapi:** Not enough land below the limit of cultivation (most of their land was taken for the Anawe plant site), poor soils which have deteriorated further over time and through use, and the actual or perceived impact of the Kogai dump. It can be noted, however that improved drainage has improved soil structure and garden output, to the point that successful plots are being copied.



**Apalaka:** Loss of access to food gardens on both sides of the Kaiya valley due to the Anjolek dump, as well as too little land.

**Yarik:** Insufficient land and low yields due to overworked soil and short fallow periods.

These problems are compounded by polygamy, as a male landowner may not have enough land for gardens for all his wives. This has given rise to the situation where SML landowners are largely dependent on cash income from wages, royalties and other benefits for their food.

In addition, future food security is threatened as the younger generation has lost the skills required for subsistence agriculture. This includes the male skills of clearing land, building fences, and digging drains as well as crop technology methods. Population increases also mean that traditional methods of gardening are no longer effective and more intensive methods of agriculture are required (composting, companion planting etc.) to ensure current and future food security.

The outlook is by no means universally seen as bleak. One consultant studying genealogy and population in the SML in 1998-2000 concluded, "Notwithstanding these disappointing trends, (poor school

attendance, low employment and alcohol consumption) the houses remain largely clean, the women do the difficult job of keeping the family together well, the gardens are well kept and no one need go hungry."<sup>8</sup>

#### **3.6.3.3 Sustainability Issues**

Three related issues can be identified. First, there is a current lack of suitable land for subsistence agriculture in the SML communities for the range of reasons discussed above. This then raises the issue of whether these communities will have suitable and sufficient land post-closure for subsistence agriculture when their cash incomes are likely to drop substantially. Third, the reduction in subsistence agriculture currently being practised within the SML means that there is a loss of knowledge and skills for sustainable subsistence agriculture.

#### **3.6.3.4 The Vision**

In the lead up to, and after closure, PJV wishes to ensure that landowners continue to have access to food: from their gardens, cash or some combination of the two. Likewise, in the post-closure period, access to both subsistence and cash resources should be ensured.

<sup>8</sup> Brian Robins Genealogy and Census, 1998-2000, report to PJV.



### 3.6.3.5 Options for PJV

One option, overly optimistic in our view, is that there is no need to do anything as currently people have access to cash for food, and the closure of the mine will see a reduction in population numbers within the SML as *epo atene* return to their home districts, so that the land resources will again be able to support the population. This is optimistic as natural population growth alone in the SML population will mean that the area will be supporting twice the population at closure that it had in 1989. The loss of skills and knowledge over a twenty-year period will also affect the ability of the population (particularly the younger population), to feed themselves.

In terms of actively addressing the current SML situation, one possibility exists. Given that the mine impact area has largely reached its maximum extent, it is possible to progressively allow access by the SML landowners to within the SML from which they have been excluded, provided this can be done safely. This will involve coordination with the mine site rehabilitation program, and will be more feasible once waste placement ceases to draw illegal miners into dangerous sites.

In terms of the post-closure situation, there is also a need to involve women as the primary subsistence food producers in the mine site rehabilitation planning.

This should be done through a SML Women's committee (under the PDWA), and aim to ensure that as much land as possible is rehabilitated for food garden use and handed back to traditional land-owners at mine closure.

In terms of the loss of knowledge and skills, these could be dealt with by a comprehensive food security program (training and extension) that includes a range of intensive agricultural practices and provides material on recent innovations in the sector. PJV is prepared to take a lead on such an issue, working with both government and NGO partners.

### 3.6.3.6 PJV's Proposal for Action

PJV proposes that:

- PJV will facilitate, in partnership with other stakeholders, the development of a comprehensive food security program for the Porgera Valley with a particular emphasis on the SML communities.
- PJV will reassess access to parts of the SML suitable for agriculture.
- PJV will continue to involve the SML women in mine site rehabilitation planning.

## 3.6.4 Industry and Services

### 3.6.4.1 Summary

Given the present distance of Porgera from major markets and location at the

very end of the Highlands Highway, it is self-evident that any product made in Porgera for sale beyond its boundaries must have a high value in relation to its weight and/or volume in order to bear the costs of transport. Only one presently known or considered Porgera product meets this basic criterion – gold (Plate 3.26). It is certain that gold will continue to be produced from the Porgera area after closure, whether measures of assistance are provided by PJV or not. Such measures could, however, improve the return on gold mining to Porgerans. Whether or not other products can be developed that will meet the same criterion by containing a very high value added content will depend on any efforts made in the next few years.

The extent to which employment can be generated by services will depend very much on a) the primary generation of cash in the local economy through agriculture, gold, possibly wood products and tourism and/or b) improved access to Porgera's existing service facilities through extensions in the road network. If there is neither extensive primary cash generation nor improved access, already existing services will almost certainly prove to be excessive.

### 3.6.4.2 Background

#### Stakeholders

The stakeholders in this sector are all the residents of the Porgera/Paiela area, government, and PJV via Business Development Department (PJV's contractual commitments) and Yelgun (sustainable businesses).

#### Pre-mine Conditions

The only non-agricultural product of Porgera prior to the construction of the mine was gold. This dominated the economy—at a lower level of intensity overall—as much as it does today. However, no value was ever added to the gold other than extracting it from the ground. Prices received were usually no more than half the world price (allowing for its non-gold content) and the cash generated was rarely invested in anything but short-term consumer goods.

#### Current Situation

**Gold** continues to be mined by individuals and groups using simple equipment



PJV

Plate 3.26 Married couple panning for gold



despite PJV's presence and despite the sedimentation of Lower Porgera terrace deposits. Estimates of production vary considerably. The SDS Study estimated incomes from gold at between K4 and 6 million. Other local estimates are twice this figure. In fact this wide degree of variability in estimating gold incomes (actual and potential) has a long and, in terms of practical outcomes, disastrous history at Porgera e.g., in the case of the Lower Porgera dispute and gold assessments associated with it.

Whatever the value of gold bought at present it is still thirty to forty percent below the price that would be obtained for it in Port Moresby. Moreover, even now, no further value is added to it once it is extracted from the ground. It is simply sold on to the traditional buyers whether inside or outside Porgera.

An unknown quantity of the gold marketed is stolen from PJV stockpiles or mine workings, rather than the gold room. Most, however, is produced by small miners who use mercury with very few precautions (Plate 3.27). In many cases, roasting off takes place indoors in ill-ventilated huts so, aside from environmental issues, community health has probably been affected as a result.

**Other products** include most notably housing materials, an activity that has arisen out of the need to construct relocation homes within the SML and residences at Paiam arising out of the FIFO Agreement. There are currently two places of fabrication, one at Paiam owned by an iPi joint venture and one operated within the mine site. The former (Mountain Steel Builders) has acquired high-quality joinery equipment, unrivalled anywhere else in PNG.

It is estimated that approximately 450 people are currently employed in the Porgera area, excluding PJV and its contractors and excluding self-employed individuals. Of these, approximately 200 are employed by iPi and companies in joint ventures with iPi. Outside of iPi, almost all are employed in retail trade or government/social services.

iPi is involved heavily in retail trade through its ownership of the Supa Stoa,



Plate 3.27 Mercury used in gold recovery – on sale at Porgera market

Paiam Warehouse complex, Hari Hardware and the Porgera Service Station. Although closure will impact heavily in these areas, for the next few years they are capable of continuing to build up capital for their shareholders. Even more susceptible to the negative impact of closure will be iPi's joint venture for PJV catering. Mountain Transport will be less, but nevertheless substantially, affected by the wind-down and closure. iPi has done well over the past seven years and is now not only profitable but has very substantial assets. The iPi Board recently adopted a revised business strategy:

'to revert to its role as a true 'investment' company by out-sourcing management.... and diversify[ing] its interests...[one element of such a strategy being]...to initiate prudent investment in property and other business elsewhere in PNG and in Australia.' [iPi 2001 Annual Report]

One such investment has already occurred with the purchase of 138 ha of land outside Lae for the development of a base for the future operations of Mountain Transport. An example of the diversification is the proposed establishment of a company aiming at selling small gold extraction plants and possibly buying/selling gold and processing it.

At the end of 2001, iPi had 2,506 named shareholders owning 291,156 shares. The top 2.1% shareholders (those owning 1,000 or more shares) held just under 38% of all shares while the top 21% of shareholders (those holding 100 or more shares) held 78.5%. SML villages accounted for 40% of shareholders and 62% of shares. However, shares do have a wide spread geographically – 17% of shareholders (holding 10% of total shares) are in Paiela LLG area.

iPi is, at the moment, probably the strongest mining landowner company anywhere in PNG. Its management is heavily dependent on Yelgun but, with nine years before final closure of the mine, this is not especially worrying at this stage, particularly given the strategy adopted of building up capital for 'prudent investment'.

**Tourism** is a possibility for the Porgera area – it is a possibility for any place, of course. At the present time the industry in the area can be said to be non-existent. The iPi-owned Mountain Lodge is a basic facility used largely for iPi staff and business visitors to PJV. The extent of this latter (or any other) group's collateral involvement in tourism may be judged by the fact that the Lodge does not have any facilities for artifact sales and no informal sellers festoon the two

entrances. Pawsey and Prowse undertook a study of tourism potential in association with I. L. Kennedy and Associates in 1999. They concluded:

‘there is a small but in due course viable tourism industry for the Porgera District in the medium term.’

As tourism feasibility studies go, this was one of the better ones. But even more than in most other economic activities, successful tourist business depends on a very high level of skilled management and coordination of networks of widely separated suppliers, agents, marketers and customers. It also generally involves rather large up-front capital expenditures (in hotels). The Pawsey and Prowse study recommended the provision of ‘first class accommodation’ (the construction of a 3-4 star hotel) and recognised that PJV patronage of the hotel would be a key factor in its financial sustainability.

#### 3.6.4.3 Sustainability Issues

**Gold:** In the short and medium term there is little doubt that small scale gold mining will occur, will be the main source of incomes in Porgera and will require no inputs from anyone to encourage those Porgerans who have access to gold-bearing areas to participate. In this respect, it is entirely different from any other likely or possible post-closure livelihood activity. It will however pose some problems for PJV both for the rest of the mine’s life and in developing a final closure strategy. This will include, for example, the dilemma between closing the mine in the best possible way environmentally (e.g., placing all post-mining mill tailings in the, by then, abandoned pit) and acting in accord with the local community’s wishes (these will probably be that, once mining finishes, small miners have access to the pit for scavenging the remaining gold). Because of both its likely future dominance of the post-closure Porgeran economy and its significance for PJV operations, PJV closure policy will pay particular and specific attention to small-scale gold mining.

European Community SYSMIN funds have recently been released for the construction of a vocational training school/

women’s centre at Paiam. It is currently planned to use that centre for the training of small-scale miners in both more efficient and safer (i.e., mercury-free) extraction techniques.

The existing size of the small mining sector at Porgera and its possible size in future makes it easily the most likely activity to cushion the economic blow of mine closure – even if it will itself have several negative environmental and social consequences, if not managed properly. Yelgun, in ongoing planning for future diversification into activities designed to support small miners, has calculated that the industry could be worth up to K20 million (500 kg of gold at K40 per gram) annually. *No other activity presently known of for Porgera remotely approaches this level of capital generation, if it can be achieved.* This compares with K24 million annually paid in wages to local hires (significant numbers of who, it is suspected, are not Porgerans), K7 million in royalties and K3 million in compensation<sup>9</sup>. Contractors’ wages, contractors’ profits, dividend payments and all other sources of income in the Porgera area at present are estimated to be between K55 and 60 million, annually. Gold will, if Yelgun’s projections are in any way accurate, therefore go some way towards softening the economic impact of closure. Note also that whilst the great bulk of existing incomes (most royalties and compensation, two-thirds of iPi dividends, most dividends from project equity etc) go to SML landowners, at least a good proportion (over 40%?) of the smaller projected income from gold would accrue to non-SML people. It would, from the points of view of both equity and reducing economic shocks, be desirable if other forms of post-closure income could be generated.

**Secondary Industries and Business Development:** This presents a greater indirect challenge than gold mining and is less assured of success. Nevertheless, as PJV intends to leave behind a better future for Porgera, then continued development of various forms of sustainable industry and business are worth supporting. PJV has already had signifi-

cant success in the area, not only because a partial urban/industrial infrastructure is now in place or because significant individual pieces of industrial equipment are in place (furniture and woodworking equipment for example), but skilled Porgeran labour has been trained at the mine. On top of this, a successful retailing and transport complex has been developed in the form of iPi. One or two individual Porgerans have succeeded in retail business independently.

There are at least some rather obvious (if short-term) businesses that exist – very successfully – at other mine sites in the country and which do not appear to exist in any properly organised way at Porgera. Landowners at OTML, for example, run a successful joint venture in scrap metal with a Newcastle-based company. Its business will expand as closure approaches and should last for three or four years after closure.

Business development in the initial years of the project was aimed at maximizing immediate benefits to Porgerans. As long as there are contracts to issue, this function will remain and be an important one. However, it is evident that by their very nature, ‘spin-off’ businesses cease to have much life once the whirling engine that is the project stops rotating. It is possible that a few may outlive the project but generally, since the economic circumstances after closure are so radically different from those operative during the mine life, most will find it very difficult to adjust. Certainly it is highly unlikely that sustainable economic activity can be based upon these. However, the cash they raise, the business and other skills they help to enhance *can* become that basis. Just as the building of infrastructure via the TCS/IDP at some stage, well before closure, has to mutate into a program that ensures the structures’ ongoing maintenance, so as closure approaches the emphasis on ‘spin-off’ has to shift to ‘stand alone’ activities. This transition is well under way, as Yelgun has grown. Yelgun’s

<sup>9</sup> On average, compensation in 2001 was much higher due to the North Anawe agreement.

functions, whether overtly stated or not (or whether entirely successful or not), are basically directed at developing activities that *should* survive closure and that should be able to stand alone. The Business Development Department of Community Affairs principal function is to fulfill PJV's commitments in regard to maximizing *earned* benefits during mine life via activities, some of which will probably survive, given that assets have been purchased and business lessons learned during the course of providing the company with goods and services.

**Tourism:** The mining industry in PNG has been touted by many pre-construction impact assessments as a potentially valuable stimulus to regional tourism. This, so far, has not been the case. Although it might be argued that FIFO schemes at Misima and Porgera have undermined this potential, it has not been any more advanced at Ok Tedi with its large, resident population. A handful of OTML workers do occasionally go fishing in Lake Murray or visit Bensbach, but it cannot be said that this has been the catalyst for any significant development of the industry in Western or Sandaun Provinces. Tabubil, also unlike Porgera or Bwagaoia, has a rather pleasant hotel (with extremely high rates) and it is true that around six times a year, small parties of foreign birdwatchers or insect fanciers are brought to the Cloudlands Hotel by specialized tourist operators. But 95% of the hotel's trade is generated by manufacturer's representatives, consultants, government personnel and others visiting Tabubil on official business.

#### 3.6.4.4 The Vision

PJV would like to see a diverse, viable economy functioning at Porgera after closure, sufficient to meet the needs of the community, and providing an environment within which government service delivery can operate efficiently. The vision is of a community that is relatively self-sufficient but also has products to trade with the rest of the world and which has generated enough capital during mine operations to have made substantial investments outside its own territory.

In principle, the other key stakeholders want the same thing, although there is a wide variety of views on how this should best be achieved. There is a desire from some of the landowners to see a hotel or lodge built; the transfer of the PJV lime plant to landowner ownership for the production of not only lime for the project operations but also gravel, cement and fertilizer manufacture; and for PJV to train people in alluvial mining techniques.

Generally speaking, however, local stakeholders to date have shown a tendency, given their growing awareness of impending closure, to see what further 'rent' they can extract from the project rather than to examine ways in which existing capital can be invested in a sustainable way.

#### 3.6.4.5 Options for PJV

**Small-scale Gold Mining:** First, a clearer idea of what parts of the mine site would attract most small-scale mining activity after closure (and even during operations, subject to safety requirements) will be developed, together with an assessment of potential gold working areas beyond the mine's leases.

Second, PJV will proceed with its plans to assist in training for more efficient, environmentally sound and safe alluvial mining. This will occur in partnership with the SYSMIN-funded vocational centre, DoM and MRO. If mercury-free gold recovery techniques, in particular, can be introduced then a contribution to ongoing environmental safety will have been made.

Third, Yelgun/iPi will be encouraged by PJV to proceed with its plans to establish a corporate body to service the gold industry. However, the activities of other gold buyers should be monitored – there is certainly some external interest in extended gold-buying and more highly mechanized methods of alluvial mining are already being practised.

**Other businesses:** As mine activity slowly winds down, and the balance of activity in business development shifts from the fulfillment of commitments regarding spin-offs to the establishment/

encouragement of activities than can profitably run themselves after closure, human resource allocation within PJV will reflect this shift. Whilst Yelgun staff have given considerable thought to a number of secondary industry possibilities, they do not have sufficient time or resources of their own to follow through with all their proposed investigatory and feasibility studies. Further, much of this work needs community validation by being endorsed and adopted as part of a joint stakeholder planning group's overall closure strategy. Furniture manufacture, manufacture of parts for kit homes, scrap metal collection and export, lime production and jewellery manufacture all have potential worth closer investigation.

Tourism will require investment and skill training that will be very expensive and not readily based on existing skills. It will also require cultural adjustments on behalf of Porgerans that will at least be as great and wrenching as those that PJV's own arrival demanded. Given other priorities, PJV does not believe tourism should be a high priority. Mountain Lodge is more than adequate for existing and any likely future demand.

#### 3.6.4.6 PJV's Proposal for Action

PJV proposes that:

- PJV develop a better understanding of areas where small-scale mining is likely to occur, both over the next decade and post-closure.
- PJV will, in partnership with other stakeholders, actively facilitate training of existing small-scale miners in safe mining practices.
- Yelgun/iPi will be encouraged to establish businesses focussed on servicing the small-scale mining sector.
- Work with stakeholders to prioritise investment options is a matter of urgency. This must be jointly approached with a view to using limited resources in the most productive/sustainable fashion.



### 3.7 Summary of Major Issues and Options

#### 3.7.1 Introduction

This section presents a brief review of the major issues and actions that PJV is proposing to carry out. It opens with some general notes on the capacity of PJV and other stakeholders to carry out what needs to be done to ensure a sustainable economy and society at Porgera.

#### 3.7.2 PJV Capacity for Post-closure Economic Development

As closure approaches, the need for PJV community interaction will not decline but the balance within particular sections may do. For example, the thrust of the TCS program will shift from provision of new infrastructure towards ensuring that maintenance of infrastructure already provided is assured well into the future. The emphasis in relocation will shift from designing houses (especially given the innovative alternatives developed for the Anawe North Agreement) to general ‘after care’ or ‘investment management’<sup>10</sup>. In Business Development, the stress will shift from maximizing—as required by PJV’s legal obligations—benefits to local contractors working to supply project needs towards working with others to attempt to develop economic activities that are independent of the project. Youth programs may shift towards training – in co-operation with the Human Resources section.

Yelgun—originally set up to assist with iPi and later expanded to help the PDA develop Paiam Town—is now the leading group within PJV dealing with post-closure economic issues. Its record in reviving iPi’s fortunes and in developing Paiam to its present stage (Paiam is almost certainly the best planned town in Papua New Guinea at the moment) both recommend it for further involvement in economic and corporate governance projects (Plate 3.28).

Internally, PJV will focus on two issues. First, there are a number of areas in which it has little or no expertise that will be necessary if the full range of economic closure issues are to be addressed or assisted by its staff. The most evident is agriculture where the community affairs’ women’s section has quietly made most progress but this requires greater inputs. It seems clear at this stage that while it is not PJV’s job to do this, it is unlikely that, without PJV assistance, progress will otherwise be made.

Second, closure will require a degree of realignment and cooperative effort between different sections of PJV. Examples will include: liaison between HRD and Yelgun in post-employment placing and training; strong cooperation between the Business Development section and Yelgun on economic initiatives; and the input of PJV’s geologists into assessing the potential for small-scale mining, post-

closure. Such realignments and the perceived need for co-operation imply important structural changes within PJV and new reporting chains to senior management. These are in the process of being developed.

#### 3.7.3 Other Stakeholders’ Capacity

Only in a few areas do other stakeholders currently exhibit much capacity for post-closure planning and implementation. Some landowner leaders certainly have laid out plans for future developments that make sense. Others, however, make demands that cannot, under known projections of project income, possibly be implemented whilst paying little attention to post-closure strategies (other than demanding that other stakeholders provide the cash to support the lifestyle to which they have become accustomed). Local government exists but cannot be said to function on its own; only women’s groups appear to be working at the ward level. Whilst the PDA operates rather well, in the end, it, like PJV, will not be available for post-closure sustainable development. District Administration appears paralysed by both politics and lack of funds. National Government inputs, apart from those from the Department of Mining, are largely non-apparent whilst many national service organisations have seemingly abandoned Porgera. This is not a healthy situation.

It is inescapable, however, that local government will have to be responsible for the Porgera area when the project ends. Consequently, it is self-evident that if anything PJV does is to be maintained, local government capacity—no matter how unlikely that appears to be at present—needs to be improved. Additionally, it is also self-evident that ultimately Porgerans will have to make their own rational choices about their possible futures. Consequently, no matter how well-intentioned, well-thought out or well-implemented projects undertaken by PJV are, they need ‘social validation’. This does not mean that present activities will cease. It does mean that both



Plate 3.28 Paiam Market opening celebration

<sup>10</sup> Note that as a result both Yelgun and the Business Development Department (as well as others) now have investment decision-making and management as one of their major functions.

capacity building programs and future planning structures need to be established with considerable urgency. The ‘urgency’ is reinforced by the sharp fall in projected future benefit that will occur after 2006.

#### 3.7.4 Summary of the Major Sustainability Issues

In the context of the capacity of the various stakeholders, a number of central issues have been identified that will determine the extent to which the post-closure society and economy at Porgera will meet the needs and expectations of the Porgeran community. After a brief description of each of these, the proposed actions of PJV are listed. The order of these items in no way implies a priority list.

##### 3.7.4.1 Public Administration

There is currently a range of local institutions involved in forms of public administration, including PDA, PLLG, PLA, PDWA, Yelgun, PADC, etc. The effectiveness of these varies markedly with, generally speaking, the private sector institutions being more transparent and effective. Many of these institutions (both government and private sector) are facing a severe drop in revenue and resources from 2006.

- Working within the framework for mine closure/sustainable development, PJV will support the establishment of the Porgera District Sustainability Planning Committee at the national government level to co-ordinate the design, implementation and management of District planning at Porgera in the lead-up to mine closure.
- Clearly there is a serious need for capacity building within local and district administration to ensure that planning budgeting and expenditure mechanisms can be established and implemented effectively. PJV will support any such initiatives.

##### 3.7.4.2 Health

HIV/AIDS looms as a critical health issue in the lead up to closure. Resources for existing health services will decline over the next decade, and rationalisation of these services is inevitable. The role

of, and funding for, the Paiam Hospital will need to be revisited in this context. The balance between curative and preventative health services will also need to be evaluated.

- PJV will support initiatives to identify the scale of the HIV/AIDS problem in Porgera, and continue its support of peer-education programmes on the issue.
- PJV will support the implementation of the National Government’s health planning, particularly at District Levels.
- PJV will facilitate the development of health sector partnerships between local (including the PDWA) and international NGOs to provide services in the impact area.

##### 3.7.4.3 Education

Porgera currently has, by Papua New Guinea standards, excellent educational infrastructure, but the sector experiences chronic resourcing problems and relatively low levels of community support. With closure looming, there is a need to evaluate and rationalise the educational services offered in the light of likely funding scenarios. The development and focussing of training, with an emphasis on its relevance to the post-mine environment and skill portability, is an area where PJV can contribute directly.

- PJV will support government planners in their efforts to develop and implement education plans within the district and provincial structures. The concept of a District Education Agency located within the PDA is also supported.
- PJV will review its current training practice in the context of servicing industry needs and providing skill portability within and outside the mining industry and will consider extending, in partnership with other stakeholders, the scope of training to non-formal areas and livelihood development education.

##### 3.7.4.4 Justice

‘Peace and good order’ remains somewhat elusive at Porgera with a number of socially disruptive influences in the

community. A lack of law and order can undermine efforts for sustainable community development, and interfere with the delivery of effective health, education and administration services.

- PJV will, in partnership with government and NGO stakeholders, facilitate the development of conflict resolution and community planning programmes, such as the PDWA’s “Women Against Violence” program.
- PJV will continue to support regional and local government and community capacity building in Laiagam, Tari and Porgera through the proposed Western Regional Training Authority.

##### 3.7.4.5 Community Infrastructure

The mine development at Porgera has led to the development of a range of high-quality transport and communication links within the community. Paiam town has also developed as a potentially major regional centre. The challenge is to ensure the resources and capacity exist for the consolidation of these benefits through to and beyond, mine closure.

- PJV proposes that they facilitate, as part of the mine closure process, the development of a Porgera Integrated Transport Infrastructure Plan, and work with other project stakeholders to ensure a source of funds is established for maintenance of existing infrastructure (especially the road to Laiagam) in the period after mining ceases.
- The proposed development of a mini-hydro scheme, with significant Aid money, is currently being facilitated by PJV. This will provide a major benefit to the Porgeran community in the period up to and after mine closure.
- PJV will continue to work with other stakeholders to ensure the urban system, with Paiam at its core, grows into a major regional economic and administrative centre.

##### 3.7.4.6 Relocation Settlements

The relocation settlements in the Porgera Valley are a direct consequence of the mine development. Many of these set-

tlements, and particularly those within the SML, are now overcrowded and require maintenance. While only partly PJV's responsibility, the conditions of these settlements at mine closure will influence how the costs and benefits of the mine are assessed by landowners and outside observers.

- PJV will facilitate an audit of relocation house maintenance needs and the subsequent development of maintenance and training programmes for landowners.

#### **3.7.4.7 Labour Force**

The staged decline in the workforce over the next decade poses a challenge for PJV, both in trying to ensure that the skills acquired by employees are used to maximum advantage, and that retrenched employees don't feel sufficiently slighted by the mine to work against its interests.

- PJV will establish a working group within the company to develop and implement policy in regard to all aspects of retrenchment including further employment. Where appropriate, this policy will draw on experience within the corporation and within the industry, both inside Papua New Guinea and elsewhere.

#### **3.7.4.8 Women's Participation**

At Porgera, as in most parts of the world, women do have a different perspective on, and set of priorities for, life than men. They are primarily concerned with matters that affect family and community stability. In order to get a balanced approach for post-mine sustainable development it is essential to ensure that women participate in closure planning.

- PJV will actively facilitate the inclusion of local women in the closure planning process, and will seek to facilitate the PDWA securing long-term resources for staffing and operations in the post-closure period.

#### **3.7.4.9 Agriculture**

Despite being in a relatively unproductive environment, the bulk of Porgerans still rely heavily on their gardens for food, and a few rely on agriculture for cash income. Porgera has a number of advantages in terms of the production of cash crops (good local infrastructure and, in the lower areas at least, significant areas of undeveloped land). Food security is already an issue in parts of Porgera, with rapid growing populations and loss of land to the mine operation. It will become more significant as closure approaches and cash incomes decline.

- PJV will facilitate a comprehensive investigation into the prospects for commercial agricultural production in the region.
- PJV will facilitate, in partnership with other stakeholders, the development of a comprehensive food security program for the Porgera Valley, with a particular emphasis on the SML communities and the role of women in agriculture.

#### **3.7.4.10 Industry and Services**

While the nature of the post-closure economy is unknown, it is certain that gold will play a prominent role. Small-scale mining can be expected to provide

a significant source of revenue for many years. The scope for other activities and industries depends on the size of the post-mine economy, and improved access to Porgera's existing facilities through extension to the road network.

- PJV will facilitate, through a number of initiatives, the development of the small-scale mining sector in Porgera.
- Efforts will be made to ensure that employees and contractors who wish to enter private enterprise when retrenched do so with the skills and knowledge required to make success possible.

#### **3.7.4.11 Capacity Building and Partnerships**

Recognising that there is a need for more capacity, (perhaps even excess capacity to allow for attrition and outflows of talent) in private and public sector management, planning and implementation skills, PJV will encourage and facilitate local and international NGOs in building partnerships within the mine impact area. These partnerships may be tripartite (local group, NGO, PJV) or multipartite (coalitions of local groups, coalitions of NGOs, PJV.) Impact area populations will also be encouraged to think of partnerships as long term arrangements which extend beyond mine life, and to take steps to sustain those relationships.





## 4. Acronyms

ADB. Asian Development Bank	GMI. Global Mining Initiative	NARI. National Agriculture Research Institute
ANZMEC. Australia and New Zealand Minerals and Energy Council	GoPNG. National Government of Papua New Guinea	NDOE. National Department of Education
ATCDI. Appropriate Technology and Community Development Institute	HPC. High Performance Culture	NEC. National Executive Council
AusAID. Australian Agency for International Development	IBD. Interest Bearing Deposit	NFA. National Forest Authority
BDO. Business Development Office(r)	IDP. Infrastructure and Development Program funds	NGO. Non-Government Organisation
CAD. Community Affairs Department	iPi. Ipili Porgera Investments	NOL. New Organic Law
CDC. Coffee Development Company (Porgera)	IRC. Internal Revenue Commission	NPF. National Provident Fund
CHW. Community Health Worker	JDP&BPC. Joint District Planning and Budgets Priority Committee	NPO. National Planning Office
CIC. Community Issues Committee	LLG. Local Level Government	OLPG&LLG. Organic Law on Provincial Government and Local Level Government
CIL. Carbon-in-Leach	LMP. Lease for Mining Purposes	PADC. Paiam Accommodation Development Company
CIP. Carbon-in-Pulp	LNC. Landowner Negotiating Committee	PDA. Porgera Development Authority now The Porgera Local Level Government Special Purposes Authority
CTF. Children's Trust Fund	LTEDS. Long Term Economic Development Study	PDI. Placer Dome Inc.
DA. District Administration/Administrator	MAP. Mining Agreement Projects	PDSP. Porgera District Sustainability Plan
DAL. Department of Agriculture and Livestock	MCA. Minerals Council of Australia	PDWA. Porgera District Women's Association
DEC. Department of Environment and Conservation	MDC. Mining Development Contract	PEAK. Porgera Environmental Advisory Komiti
DHQ. District Headquarters	ME. Mining Easement	PJV. Porgera Joint Venture
DOH. Department of Health	MFF. Mountain Fuel Freighters	PLA. Porgera Landowners Association
DoM. Department of Mining	MMSD. Mining, Minerals and Sustainable Development	PMAWU. Porgera Mine and Allied Workers Union
DPI. Division of Primary Industry	MOA. Memorandum of Agreement	PMC. Paiam Management Company
DSG. District Support Grants	MRDC. Mineral Resources Development Company	PMV. Public Motor Vehicle
EMMP. Environmental Monitoring and Management Plan	MRE. Mineral Resources Enga Ltd.	PNG. Papua New Guinea
EP. Environmental Plan	MSB. Mountain Steel Builders	SDS. Sustainable Development Study
EPG. Enga Provincial Government	MT. Mountain Transport	
FIFO. Fly-In Fly-Out Agreement	MTDP. Medium Term Development Plan	
GIS. Geographic Information System	MTDS. Medium Term Development Strategy	

#### 4. Acronyms

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SEDP. Socio-Economic Development Plan

SEIS. Socio-Economic Impact Study

SML. Special Mining Lease

SPA. Special Purpose Authority

SSF. Smallholder Support Facility

SSG. Special Support Grants

TCS. Tax Credit Scheme

UNITECH. University of Technology

UPNG. University of Papua New Guinea

VBA. Village Birth Assistant

WA. World Alliance for Community Health

WHO. World Health Organisation

WRTA. Western Regional Training Authority



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# Appendix 1

## PJV Environmental Policy







# PJV ENVIRONMENTAL POLICY

The Porgera Joint Venture is committed to minimize the environmental impact from its operation.

**To achieve this, PJV working with its employees and contractors, will:**

- Attain higher levels of environmental performance by striving to continuously improve the Environmental Management System;
- Comply with environmental legislation and regulations; undertake monitoring programs to meet compliance; determine PJV's impact on the environment; undertake all activities as a signatory of the Australian Minerals Industry Code for Environmental Management; and publicly report the results.
- Maintain a high standard of environmental protection by applying practices and technologies that minimise pollution and enhance environmental quality at every stage of mine planning, from development to closure;
- Commit to the principles of sustainable development, allowing the economic, social and environmental considerations of all stakeholders to be integrated into decision-making and management; this includes consciously enhancing opportunities for stakeholder engagement.
- Review and update the policy, objectives, targets, procedures and systems on an annual basis as part of the strategic business planning to ensure that they reflect the scale and nature of the operation;
- Undertake an independent analysis to identify environmental risks at least every three years, and prepare and implement an Issue Management Plan for each prioritized risk every two years;
- Continue dialogue with communities within and around the SML, along the downstream river system, and in other areas potentially affected by the mine;
- Progressively rehabilitate the disturbed areas with most suitable vegetation for the region, and develop closure plans that can be continuously improved by reviewing at least once every three years.
- Initiate and support research to expand scientific knowledge of water quality, biota and hydrology of the river system impacted by PJV operations;
- Train all employees and contractors to understand environmental and social responsibilities, and to follow established responsible work practices and procedures.

**J. PETER NEILANS**  
**Mine General Manager**  
16 March, 2001



## Appendix 2

### PJV Mine Closure Policy and Principles







# PJV MINE CLOSURE POLICY AND PRINCIPLES

The Porgera Joint Venture is committed to the integration of closure planning and sustainability objectives into our mine planning and operations consistent with the principles embodied in Placer Dome's Sustainability Policy.

## **PJV Commitment:**

- Develop a systematic “design for closure” approach that addresses long-term closure issues and likely changes in societal expectations or standards.
- Integrate closure into the business planning process and employ continuous improvement principles.
- Establish a comprehensive safety management system for closure that recognises the new jobs and activities to be performed by employees and contractors.

## **Public Responsibility:**

- Engage stakeholders at an early stage in decisions that could affect them.
- Utilise best management practices reflecting stakeholder's views, values, and standards.
- Establish credible monitoring and verification systems to assess the closure process, plans and completion criteria.

## **Social Progress:**

- Work with stakeholders to enhance sustainability of impacted communities, their public and private institutions, and their general quality of life beyond mine closure.
- Respect the right of traditional communities to maintain customary lifestyles, cultures and livelihoods, both during and after the mine's life.
- Assist employees and their families, in preparing themselves for a self-sufficient future beyond mine closure.

## **Environmental Stewardship:**

- Utilise risk management principles to identify, communicate and minimise potential for long-term risks to public health and safety and/or environmental values.
- Design, construct and operate our facilities in a manner that minimises closure costs and long-term liability.
- Return disturbed areas to viable and self-sustaining ecosystems, or an acceptable alternative.

## **Economic Benefit and Responsibility:**

- Encourage and facilitate sustainable economic expansion and diversification in the communities impacted by mine closure.
- Give priority to the local community and PNG citizens in participating in economic activities associated with mine closure.

Work with stakeholders to develop closure cost estimates that address environmental and social issues, provide adequate financial resources for PJV's closure responsibilities, and assist our stakeholders in identifying and efficiently utilising sources of funds to address their own closure needs and responsibilities.





## Appendix 3

### Regulatory Requirements and Agreements Reviewed



## **Regulatory Requirements and Agreements Reviewed**

### ***Legislation***

Mining (Safety) Act 1980

Mining Act 1992

Environment Act 2000

Public Health (Drinking Water) Act 1984

International Trade (Fauna and Flora) Act 1979

Environmental Planning Act 1978

Water Resources Act 1982

### ***Agreements***

*Tripartite Porgera Agreements (1989) between the Porgera landowners, the Enga Provincial Government and the National Government*

*Mine Development Contract (1989)*

*Land Tenements (12)*

*Landowner Agreements*

### ***Policies and Guidelines***

*PNG Draft Mine Closure Policy and Guidelines*

*PNG Draft Sustainable Development Policy for Mining Projects*

### ***Codes of Practice and International Guidelines***

*Environmental Code of Practice, PNG Mining Industry*

*Minerals Council of Australia Code for Environmental Management*

*World Bank Guidelines*

*Mining, Minerals and Sustainable Development Project (Global Mining Initiative)*

*Strategic Framework for Mine Closure document (2000), Australian and New Zealand Minerals and Energy Council (ANZMEC) and the Minerals Council of Australia (MCA)*





## Appendix 4

### Government Structure under the New Organic Law





## Government Structure under the New Organic Law

Government administration in Porgera District is a part of the broader system of public administration in PNG. To understand the current situation and the options for public governance in Porgera, this section briefly reviews three critical elements of public administration:

- the New Organic Law (NOL) on Provincial and Local Level Government (LLG);
- the capacity of the District Administration, its LLG special purpose authority and subsidiaries to implement the provisions of the NOL, and
- the contribution of the Porgera Joint Venture (PJV), landowner groups and civil society groups (women, youth and church groups) to the development of the district planning process and the development of public infrastructure and services are reviewed.

**The New Organic Law:** The National Parliament passed the New Organic Law on Provincial and (NOL) in July 1995. The NOL decentralises significant powers down to LLGs and thus provides the potential for a system of planning which gives greater emphasis to local-level decision making and resource management. The NOL provides for LLGs to receive guaranteed funding each year, have revenue raising powers, and to pass laws. While the NOL increases the powers and functions of LLGs, all legislative control of LLGs rests with the National Government. Under the old system, control of LLGs was vested with the Provincial Government.

A summary of the three tiers of government is shown in the table below followed by a map of the administrative districts in Enga Province:

**Political and Administrative Support Structures**

Political Structures	Administrative
<b>National Level</b>	
<ul style="list-style-type: none"> <li>National Parliament</li> <li>National Executive Council</li> <li>Ministries</li> </ul>	<ul style="list-style-type: none"> <li>National Departments</li> <li>Statutory Bodies</li> </ul>
<b>Provincial Level</b>	
<ul style="list-style-type: none"> <li>Provincial Assembly</li> <li>Provincial Executive Council</li> <li>Provincial Committees</li> <li>Joint Provincial Planning and Budget Priorities Committee</li> </ul>	<ul style="list-style-type: none"> <li>Provincial Administration</li> <li>Provincial Treasury</li> <li>Provincial Audit Services</li> </ul>
<b>District Level</b>	
<ul style="list-style-type: none"> <li>Joint District Planning and Budget Priorities Committee</li> </ul>	<ul style="list-style-type: none"> <li>District Administration</li> <li>District Treasury</li> </ul>
<b>Local Level Governments</b>	
<ul style="list-style-type: none"> <li>Each LLG is made up of elected Ward Councilors and appointed councilors</li> <li>Councilors elect one of their members to be head of the Council (LLG President who is a member of the Provincial Assembly)</li> </ul>	<ul style="list-style-type: none"> <li>There is a small support staff to assist each LLG.</li> <li>District and sub-district public servants are also responsible for supporting LLG administration</li> </ul>
<b>Ward Level</b>	
<ul style="list-style-type: none"> <li>Ward Councilors are elected by eligible voters in the ward</li> </ul>	<ul style="list-style-type: none"> <li>Ward Development Committees are made up of community representatives. Village recorders keep basic population and service delivery data.</li> </ul>
<b>Communities and Villages</b>	
Each ward is made up of many hamlets, villages and non-traditional village areas	

Some of the main responsibilities of Wards, the LLG and the District & Provincial Administrations in terms of supporting essential service delivery in the health and education sectors as they may be applied to a rural LLG are as follows:

**Ward Committee:** Promoting community awareness. Mobilising the provision of land, labour, bush materials and local cash contributions for providing such services as village hygiene, elementary schools and aid post maintenance.

**LLG Level:** Planning/budgeting for and managing the provision of basic infrastructure, repairs and maintenance, and sanitation and waste disposal services.

**District/Provincial Administration:** Planning/ budgeting for and managing the provision of health staff & teacher salaries and basic operational support costs, clinical and educational equipment & supplies, management and training support, and construction of health and educational facilities which have district or provincial catchments (e.g. hospitals and high schools).

To help ensure that essential services are properly planned for, effectively established and maintained it is therefore essential that Wards, LLGs and the District & Provincial Administrations prepare coordinated and consistent plans. Clear and regular communication is obviously critical. Plans flow down from National Government, to the provinces to LLG level, and need to take account of the following guidelines and priorities.

**Medium Term Development Strategy (MTDS):** The MTDS sets out the approach the Government of PNG (GoPNG) has adopted for the planning and implementation of development programs and projects over a five year period (currently 1997-2002)<sup>1</sup>. Key themes in the MTDS include redefining the functions and roles of Government (smaller and more efficient, focusing on what it does best), and promoting the role of the private sector, community based organizations and individuals in development planning and service delivery.

The MTDS is important because LLG plans must be framed with the MTDS priorities clearly in mind so that LLG requests for project funding fit within the expenditure priorities (and therefore financial appropriations) of the National Government.

Reference to the National Government's Public Investment Program is also important in the preparation of LLG and District plans. There are a number of key programs, which may be delivering infrastructure and services within specific LLG areas. Examples of such ongoing programs include: (i) Construction of Health Staff Housing; (ii) High School Maintenance Program; and the Provincial Roads Assistance Program.

**Provincial plans and priorities:** LLGs must also take note of provincial plans when formulating their local plans. This is particularly important when LLGs wish to access Provincial Government funding or technical support, over and above that which they are entitled to as part of their core LLG grants from National Government. In particular, provincial health, education and infrastructure plans should be referenced.

Given that the head of each LLG is also a member of the Provincial Assembly, he/she has a key role to play in ensuring that LLG members are aware of provincial plans and priorities.

**LLG planning framework:** Under the NOL, Local Level Government should play an increasingly important role in both local development planning and managing the delivery of essential services. Planning should start at the Ward level, then flow through to the LLG, district and provincial levels. The statutory planning responsibilities of LLGs as set out in the *LLG Administration Act 1997* (amended January 1999) include the:

- Preparation of a five year rolling development plan based on community needs and ward plans.
- Preparation of annual budgets to implement the LLG plan, to which shall be applied the: (i) New Organic Law grants paid to the LLG; (ii) LLG's own revenue; and (iii) revenue from other sources.
- Submission of the LLG plan for approval and endorsement by the Joint District Planning & Budget Priorities Committee (JDP&BPC).

<sup>1</sup> The MTDS is currently being revised to cover the period 2003-2007

## Appendix 5

### Evaluation of Stakeholder Input to Public Administration





## Evaluation of Stakeholder Input to Public Administrations

**Ward Development Committees:** Ward Development Committees have largely been inactive since their establishment under the NOL. None of the Wards in the Porgera/ Paiela LLGs has prepared a 5 year plan.

**Local Government Assembly & Executive Committee:** The Assembly Members and the Executive Committee of the Porgera and Paiela Rural LLGs are extremely active in local and provincial politics and in, particular, in seeking funding for priority projects within their own constituencies.

While there is significant political activity within the two LLGs, neither Assembly have yet formulated their 5 year plans as required under the Organic Law. As such, planning tends to be project based and focused on constituency development with little consideration of the wider LLG and district development planning issues.

**District & Provincial Administrations:** The Provincial Government revenue entitlements from the Porgera mine have enabled a significant expansion of divisional activity throughout the province and the Porgera District. However, this activity is, as yet, not guided by any social and economic development sector analysis or medium-term expenditure planning process.

The Porgera District Administration has been the focus of political intervention over the past 3-5 years and as such the administration has had difficulty in functioning.

The Department of National Planning and Monitoring has recently convened a provincial and district planning workshop in Wabag and the province and the districts (including Porgera) have started to prepare draft 5 year plans. It is anticipated that with further capacity building assistance these plans could provide a framework for sustainable social and economic development throughout the Enga Province.

**Joint District Planning & Budget Priorities Committee:** Under the NOL the Porgera JDP&BPC is designated as the principal decision-making body in the district. However, its activities are constrained by the absence of an overall district expenditure plan to guide its deliberations. Given their many other commitments, most members of the JDP&BPC have difficulty in attending meetings and important decisions on planning and budgeting often have to be deferred because of lack of a quorum.

**Joint Provincial Planning & Budget Priorities Committee:** The members of the Enga PP&BPC face similar constraints to their JDP&BPC counterparts. While members are generally well-versed in Provincial Government administrative procedures the lack of formal provincial and district plans frequently means that their deliberations are not always focused on addressing core social and economic development issues.

**National Government Department of Mining:** The Department of Mining is the principal National Government agency involved with the Enga Province and the Porgera District. The DOM administers the Mining Act and conducts regular reviews relating to stakeholder commitments as defined in the various stakeholder agreements.

In addition to the Mining Act the DOM is currently seeking to integrate its draft policy on mine closure with a new initiative designed to develop a national policy on benefit stream management and planning for sustainable development. It is anticipated that a policy which covers benefit stream management, planning for sustainable development and mine closure will be in place by June 2003. In the interim the DOM refers mining project stakeholders to its draft Mine Closure Policy.

The current Draft Mine Closure policy provides for the development of a Social and Economic Development Plan (SEDP) for each mining project area and states that:

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*'SEDP should embody the principles and practices of sustainability and aim at providing from benefit streams during the mine-operating phase, adequate finance for the provision and maintenance of community services after mine closure.'*

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**The Department of National Planning and Monitoring:** As part of its commitment under the Porgera Development Agreements the DNPM has recently commissioned a study for the development of a Long-Term Economic Development Plan for the Porgera District. This plan provides an analysis of the status of current social and economic development sector activities and the opportunities and constraints for future development activity.

The study is a useful reference document even though its coverage is not as complete as some stakeholders may wish.

The DNPM also recently conducted a district planning workshop in the Enga province. This workshop has resulted in the preparation of a Draft Porgera District plan. While considerable work has yet to be done, the plan provides a footing for the development of a more comprehensive district plan.

**The Porgera Local Level Government Special Purposes Authority:** The Porgera Special Purposes Authority (PSPA) has its genesis in the Porgera Development Authority (PDA) which was established in 1989 by the Provincial Government to assist landowners, the District Administration and the Porgera and Paiela LLGs as part of the Porgera Development Agreements. With the introduction of the NOL in 1995 it was necessary to revise the PDA so that its functions were consistent with the NOL.

In 1998 a MOA was signed between the Porgera LLG, the Paiela Hewa LLG, the Porgera Local Level Government Special Purposes Authority and the Porgera Landowners Association relating to the proclamation of the Porgera SPA. Under this proclamation the PDA is to:

- Implement the construction of infrastructure on behalf of the national, Provincial and LLGs within the Porgera District
- Assist the Porgera and Paiela-Hewa LLGs in the implementation of their administrative functions
- Manage the construction of facilities in Paiam, Porgera and Kairik towns and manage their operations
- Manage the payment of royalties and other mine related income in the Porgera District
- Manage and operate the Porgera District Hospital
- Advise the landowners and the LLGs on natural resource project agreements
- Implement the functions of the Tenders Board, Building Board, Physical Planning Board and other functions delegated to it by the National Government, Provincial Government or LLGs.
- To receive funds on behalf of the Porgera and Paiela Hewa Rural Local Level Govts and to make payments as directed by them.

The PDA reports to a board comprising 2 Porgera and 2 Paiela LLG representatives, 2 persons appointed by the SML landowners, the Porgera District Administrator, 2 persons appointed for their technical skills, one National Department of Finance representative, and a PJV representative.

Because of its powers under the 1998 MOA the PDA plays a key role in the mobilisation of finance and technical support for LLG development activities throughout the District. The combination of its financial and technical capacity together with its control over the Tenders, Building and Physical Planning Boards make the SPA the paramount decision-making body in relation to planning for public infrastructure and services in the district.

While the SPA is acknowledged for getting the job done, its relationship with the District Administration, LLG executives, the JDP&BPC, and the SML landowners needs clarification and strengthening. SPA's relationship with these groups could be significantly improved if the District Administration was able to fulfill its obligation of developing a district plan. This plan could then be used to guide the SPA in its management and allocation of district mining revenue entitlements.

**Paiam Town Management Company (PMC):** In response to the provisions of the Fly-In, Fly-Out (FIFO) Agreement for the reduction of commuting employees in the PJV, the PDA established the Paiam Town Management Company (PMC) in 1998 to coordinate Paiam town development. The plan provides for the development of a town centre, the construction of roads and housing and the provision of sewerage, water and electricity. The organisation currently has a staff of 13 including a Project Manager, Town Manager and Accountant. PMC, with the management and technical support of Yelgun, provides professional management for the development and administration of Paiam. The PMC has built up town administration, Geographic Information System (GIS), accounting, maintenance and development systems and has established an efficient and effective management team. The PMC is proving itself to be one of the most effective small-town management organizations in the highlands region.

PMC has largely fulfilled its development role and under the FIFO Agreement is scheduled to roll its town, administration, maintenance, planning and management organization to a newly constituted Urban LLG at the end of 2003. The urban council is proposed to include Kairik, Paiam, Suyan, Porgera Station and the Anawe Wards.

**The Paiam Accommodation and Development Company (PADC):** This company was established by the National and Provincial Government, PDA, Yelgun and the landowners to administer the funding, construction, renting and maintenance of houses for the PJV relocation employees at Paiam under the FIFO agreement. It was originally estimated that PADC would build some 515 houses for the PJV. However, due to localisation of workforce positions and a reduction in the overall workforce it is now estimated that the number of houses required by the PJV will be considerably less. The management requirements of the PADC are currently under review.

The intent is for the PADC to progressively sell off the PJV houses as the workforce declines, and revenues can be returned to the State, the PDA, Yelgun and the landowners. As for the PMC, PADC also offers high level management skills, however, its future and scale of operations needs to be reviewed by the State and the landowners.



**PJV Joint Venture Community Affairs Division:** The PJV established Community Affairs to provide community services, social security for mine operations and handle negotiations with landowners and government agencies and manage agreements. Community Affairs has a seat on the Board of the PDA.

Currently the PJV Community Affairs Department provides core support services to the operations of the PJV and the project area communities through a number of its sections. In total the department employs a total of 110 professional and administrative staff. Of the CAD Sections, Social Development, Business Development, and Community Projects (including the Tax Credit Scheme and Infrastructure Development programs) are the most active in supporting local social and economic development activities. The Department has added a Social Closure and Sustainability Section, to parallel the Closure/Sustainability functions within Environment.

**Porgera Landowners Association:** The Porgera Landowners Association was formed to represent the SML landowners in their negotiations with the State and the PJV, although it did not actually do this. Its current principal involvement in public administration is through representation on the board of the SPA.

**The Porgera District Women's Association:** The Women's Association is structured around wards and each has its own group who nominate a member to be on the Executive. The association runs small businesses such as a camp canteen, artifact shop and buys vegetables for sale to Crocodile Catering JV for the two messes. Out of profits they have initiated a mini-credit scheme. Currently the Association relies heavily on PJV Social Development Section for logistical, advisory and management support and a major priority is to build independent capacity.

**Yelgun:** Yelgun is a Placer subsidiary originally incorporated to provide strategic and technical support to Ipili Porgera Investments (iPi), the Porgera landowner umbrella company. From 1998 Yelgun has also been responsible for managing and providing technical assistance to PMC. Yelgun's key role in the area is to provide strategic managerial support to iPi, and to the development of Paiam through PMC and PADC.

**Porgera Sustainability Planning Committee:** The Porgera Sustainability Planning Committee is an embryonic and evolving organisation of government and landowner representatives. It was formed to assist government and landowners to organise their response to the Porgera MOA review and to mine closure issues. The principle challenge facing this organisation is for landowner representatives and the District Administration (also representing LLGs) to agree on an agenda and procedures for negotiating with the State and the PJV.

**Churches & community groups:** Church and community groups, particularly the Porgera District Women's Association, play an active role in promoting community development and women's activities throughout the Porgera District. The consolidation and expansion of their development activities is, however, constrained by lack of finance and basic training in community mobilization and project management.

**Local business and business groups:** Due to the operations of the Porgera mine there is a high level of local business activity within the district associated with the mining industry. There is also growing interest by Porgerans in investing in non-mining activities both within and outside the district. As noted earlier, business activities are well supported by Yelgun and the CAD Business Development Section.

Business development activity has the potential to contribute to the maintenance of public infrastructure and services through the payment of taxes and fees and the payment of wages to employees who can purchase public goods and services.

