

## Placer Dome Case Study: Porgera Joint Venture Catherine Coumans – April 2002

### **MINE: Porgera Joint Venture**

**Location:** Enga Province, at 2,500 metres elevation in the Highlands of Papua New Guinea.

**Ownership:** Placer Dome (50%), Goldfields Limited (25%), Orogen Minerals Limited (20%), Enga Provincial Government and Landowners (5%). Placer Dome has been the operator of the joint venture since 1975, during exploration. Placer Dome's ownership was increased from 25% to 50% as of January 1, 1997.

**Product and Reserves:** Gold. Proven and probable reserves as of December 31, 2000 (last available information): 8.3 million ounces of gold.

**Production Rate and Cost:** During 2000, 6,022,000 tonnes of ore were mined and milled to produce 910,434 ounces of gold. Placer Dome's share was 455,217 ounces at a total production cost of \$236 per ounce.

**Type:** Combination underground mining (1989-1997), and open pit mining, contained cyanide leaching

**Operating Dates:** 1989 – ongoing for another estimated 10 years

**Employment:** 2000 people

### **ISSUE: Riverine Disposal – Downstream Metal Contamination and Sedimentation**

Porgera is one of the few mines left in the world owned and run by a major mining company that still uses and justifies the direct discharge of mine wastes into a river system. Major companies such as Western Mining Corp., BHP, and Falconbridge have all committed not to use “riverine disposal” at their mines. At Porgera, mine tailings and overburden are dumped into the Porgera River, which drains into the Lagaip River then into the Strickland River and eventually into the Fly River before reaching the Gulf of Papua, 800 km from the mine site. The upper reaches of the river system are fast flowing and steep while about 200 km downstream the river enters an extensive flat floodplain where it meanders. Dumping into this major river system began in 1992 and has continued unabated ever since.

#### ***Inadequate permitting to protect environment and shareholders from liability:***

- 1) While PNG water quality criteria specify maximum allowable total metal concentrations (dissolved and particulate concentrations), the Porgera Joint Venture was granted a permit, in June of 1991, to consider only the dissolved metal loading to the river system. As the lower stretches of the river where there are oxbows, the water is often slightly acidic and likely to leach out the metals contained in the tailings. This is also where the river flows less strongly and tailings are accumulating and it is where the largest population base is located.
- 2) The “compliance point” was set at about 160 km downstream from the mine. In this so-called 160 km “mixing zone” any levels of pollutants are allowed. “The need for a mixing zone is a statement of a project's inability to meet environmental regulations”<sup>1</sup> and means environmental damage is being done and costs are being incurred and will one day have to be addressed.

#### ***Scientific studies highlight environmental impacts:***

As a result of independent scientific findings showing serious downstream impacts published by the

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<sup>1</sup> Shearman, P. 2001. Giving Away Another River:... in *Mining in Papua New Guinea: Analysis and Policy Implications*. B.Y. Imbun and P.A. McGavin eds. P.177.

Mineral Policy Institute in Australia,<sup>2</sup> the Porgera Joint Venture employed the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) to review their operations.<sup>3</sup>

CSIRO's 1996 report concluded that:

- 1) The impact of Placer's waste disposal on the river was significant,
- 2) PJV should urgently explore options to store tailings solids and waste rock on land,
- 3) Placer Dome's approach to managing and monitoring the impacts on the river was inadequate.

CSIRO on impacts:

\* *"riverine transport of tailings is the major source of environmental risk especially with the increase last year in maximum daily output to 17,700t/d."*

\* *"...the environmental plan gave insufficient consideration to overbank deposition and the fate and effect of mine derived sediment on the Lower Strickland flood plain."*

\* *"Much of the lower river is a depositional environment where exposure pathways potentially occur. The PJV has already identified the possibility of long-term low level effects of metal uptake on the human population...."*

In the upper river:

*"It is possible to detect an effect of the mine in the enrichment of the TSS (total suspended solids) by the metals measured at the compliance point, SG3. Particulate metals (As, Pb, Ag, Cd, Hg, Ni, on a per gram TSS basis) are steadily increasing and may now exceed concentrations that have been shown elsewhere to have long term ecosystem effects, particularly when the river is at low flow."*

Correspondingly CSIRO found in its preliminary analysis *"that fish populations in the upper river system have been in decline since 1993."*

CSIRO recommended that tailings be stored on land:

*"Considerably fewer potential contaminants would be added to the river system if even part of the tailings solids could be safely stored on-site. The PJV's major geotechnical consultant (Klohn Krippen) has reported that it may be possible to safely dispose of the tailings by integrating tailings impoundment with the waste rock dump or co-disposal of wastes. The review team considers the PJV vigorously pursue the possibility of containing all or part of the tailings solids on-site. A similar recommendation is appropriate for waste rock."*

CSIRO recommended improvements in PJV's managing and monitoring:

*"the PJV (should) aim for a more detailed understanding of the riverine system and how it functions, so it can better identify potential risks and strategies needed to reduce them."*

Recommendations were made to:

- add environmental staff
- focus on potential impacts not just compliance
- move the compliance point up closer to the mine site – from SG3, 160 km from the mine site, to SG2, 40 km from the mine site.

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<sup>2</sup> Mineral Policy Institute, 1995. *The Porgera File: A Legacy of Destruction*.

<sup>3</sup> CSIRO Australia. December 1996. *Review of Riverine Impacts, Porgera Joint Venture*.

### ***Placer Dome's response:***

Placer Dome responded to the issues raised by the CSIRO report and the recommendations therein by creating PEAK, the Porgera Environmental Advisory Komiti.<sup>4</sup> According to Placer, PEAK is an independent advisory group that counsels on the environmental performance of Porgera and represents the interests of key stakeholders in the mine, including the PNG government, environmental and aid groups, independent technical experts and the PJV.

PEAK's defined terms of reference are:

1. To oversee the implementation of the recommendations made by the CSIRO independent review;
2. Review the annual environmental monitoring reports and trends in monitoring data; and
3. Review environmental issues raised by external stakeholders, including community and environmental groups, for consideration by the Porgera Joint Venture.

### **CURRENT SITUATION:**

In May 2001, another CSIRO study was published.<sup>5</sup> This study, aimed at finding "tracer metals" to track the deposition of tailings in the river, makes it abundantly clear that heavy metal enriched tailings are being deposited in the lower reaches of the river, in overbank depositions and off-river water bodies.<sup>6</sup> The study found that silver, arsenic, cadmium, zinc, lead were all present in the tailings in far higher concentrations than in natural river sediments. For example, silver was 140 times more enriched in tailings than in natural river sediments, arsenic was 52 times more enriched, and lead was 45 times more enriched.<sup>7</sup> Furthermore, the study notes that metals such as arsenic, cadmium and zinc are known to be easily mobilized (dissolved) in aquatic environments, making these metals easily bioavailable.

On June 6<sup>th</sup>, 2001, PEAK's most recent chairman, Yati Bun (MSc), the Executive Director of Foundation for Peoples of the South Pacific, resigned from PEAK, stating: *"My conscience cannot tolerate being involved any longer with the PEAK process of expediting the continuation of riverine discharge, as when the history of Porgera is written I do not wish to be the one that oversaw Porgera's impacts and did nothing."*

Placer Dome was dropped from the Dow Jones Sustainability Index following the resignation of Yati Bun.

### **POTENTIAL UNCOVERED LIABILITY:**

As Placer Dome does not provide public information on its closure plan for this mine, its estimated reclamation costs, or the amount of the bond or security in place at this mine, it is difficult to estimate what the uncovered liability may be here. However, nearby, BHP's Ok Tedi Mine, which also disposed of its waste into a nearby river system, has become infamous for both the ecological damage that is now acknowledged to have been done, as well as for the cost BHP bore to extract itself from that mine. In 1995, BHP agreed to pay \$100 million to settle a lawsuit by affected landowners in the region.

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<sup>4</sup> <http://www.peak-pjv.com/aboutpe/peakindex.htm> N.B. This web site is outdated. The World Wide Fund for Nature resigned from PEAK shortly after the resignation of PEAK's former chairman Yati Bun.

<sup>5</sup> CSIRO Australia. May 2001. *Tracing Mine-Derived Sediments and Assessing Their Impact Downstream of the Porgera Gold Mine*. By S.C. Apte.

<sup>6</sup> Ibid. p.13.

<sup>7</sup> Ibid. p.7.

However, criticism from both villagers and environmental groups has continued.<sup>8</sup> In August 2001, BHP did a US \$148 million write-off on the project.<sup>9</sup> BHP gave away its 52% shareholding to the PNG government. Perhaps the greatest cost to BHP has been the cost to the company's reputation. Placer can expect similar lawsuits from affected communities, similar write-down expenses, and another blow to the company's reputation.

**DISCLOSURE ISSUES:**

Placer Dome does not provide public information on its closure plan for this mine, its estimated reclamation costs, or the amount of the bond or security in place at this mine. Outstanding requests for this information have not received a response to date.

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<sup>8</sup> PNG AGREES OK TEDI EXIT DEAL, Sean Smith, Sun Herald & News Limited, 27 Sept 01

<sup>9</sup> BHP BILLITON EXITS OK TEDI COPPER MINE, Stewart Oldfield, Australian Financial Review, Sep 27, 2001