# 7. CASE EXERCISES

## 7.1 Case Example (Placer Dome, 2003)

### 7.1.1 Introduction

The Misima Mines Closure Committee (MMCC) has developed the Mine Closure and Sustainability Plan in accordance with the relevant government and corporate policies and strategies. The production of the plan involved the participation of all stakeholders in a process that took several years.

### 7.1.2 Ownership and Corporate Details

Misima Mines Limited is owned 80% by Placer Niugini Limited and 20% by Oil Search Limited. Placer Niugini Limited (PNL) is a wholly owned subsidiary of Placer Dome Asia Pacific Limited (PDAP), which in turn is a wholly owned subsidiary of Placer Dome Inc (PDI). Misima Mine is operated by Placer Dome Asia Pac Limited.

### 7.1.3 Brief Overview

Misima Mines is a large scale, open pit, gold and silver mine currently producing around 140,000 ounces gold equivalent per year. The milling operation utilizes standard cyanide leach and carbon-in-pulp methods for gold and silver extraction and recovery from stockpiled ore (mining ceased in May 2001). The entire operation has around 350 full-time employees, of which 91% are Papua New Guinea nationals. The vast majority of National employees are Misiman who mainly live in villages accessible by road from the mine.

### 7.1.4 Location of Operation

The mine is located near the town of Bwagaoia, on the eastern portion of Misima Island, Milne Bay Province, Papua New Guinea (Figure 7.1). Bwagaoia is the headquarters of the Samarai-Murua District (one of four districts in Milne Bay Province), which has a population of around 43,000 people. Misima Island forms part of the Louisiade Archipelago and lies some 200km east of the PNG mainland and 600km east of Port Moresby.


**Figure 7.1**: Map of Misima Island Showing Location of the Mining Operation.

**Figure 7.2**: Aerial Photograph of the Misima Mine Plant Site.

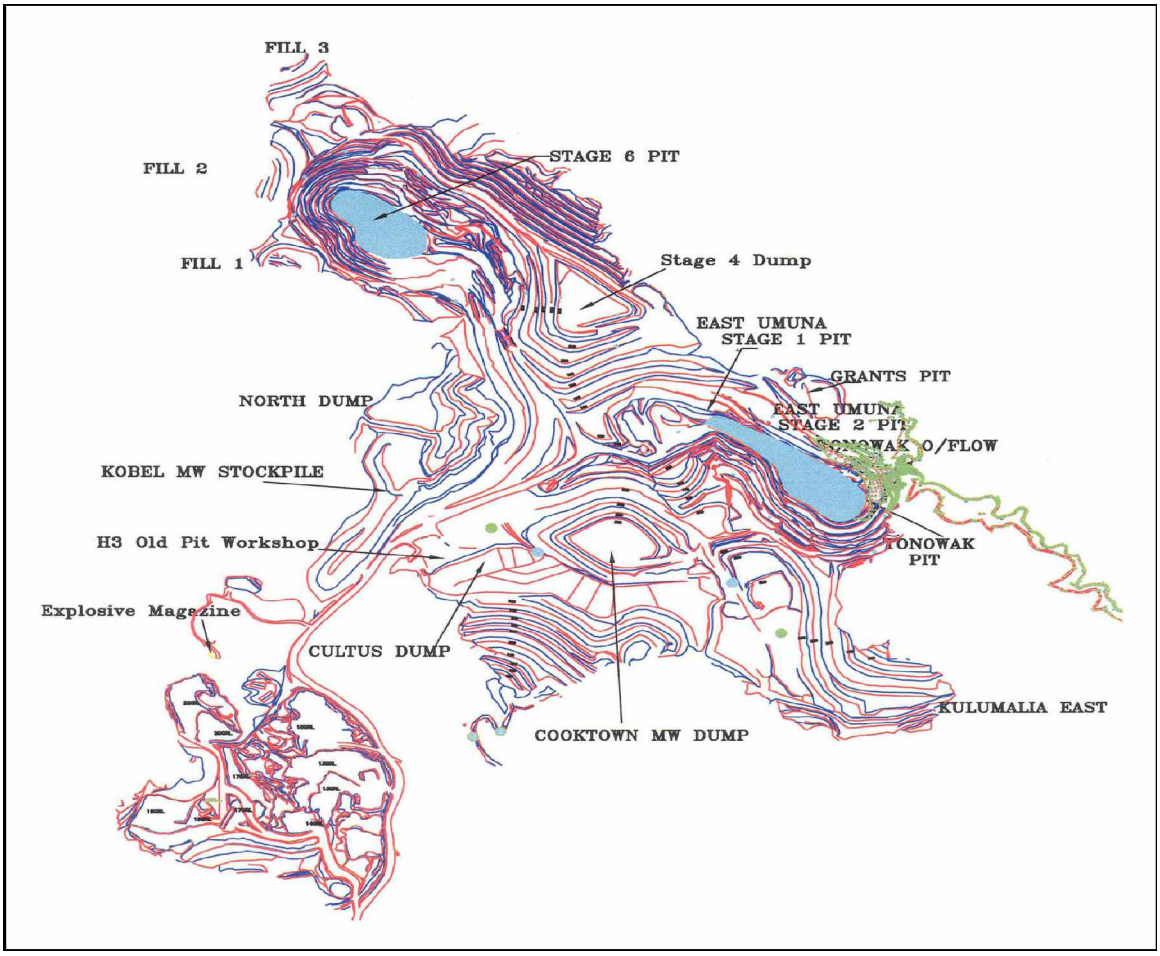


**Figure 7.3**: Layout of Mining Pits and Waste Dumps.

**Figure 7.4**: View from Mt. Sisa Showing Revegetated Pits and Dumps.

### 7.1.5 Closure Programme

Planning for closure commenced prior to mine development and has been an ongoing process throughout the life of the operation via mine and environmental planning, stakeholder consultation and progressive rehabilitation. The actual closure of the mine has been undertaken as a staged closure program.

**Stage 1**: Pit Closure

Open pit mining operations ceased in May 2001. Pit Closure began at the time mining operations ended and involves revegetation of open pits, waste rock dumps, and haul roads, as well as the sale and removal of the majority of the mobile earth moving equipment. Pit Closure is expected to take about 3 to 4 years to complete, although the majority of work in terms of landscaping and first-phase revegetation has already been completed.

**Stage 2**: Final Closure

When milling operations end, Final Closure will take place. Final Closure will involve the sale, demolition and removal of the mill and all other remaining buildings, equipment, infrastructure and facilities. The footprint of these areas, and other disturbed areas, will be revegetated or otherwise rehabilitated. Some items will remain temporarily to facilitate a period of post closure maintenance and monitoring. Some items will remain permanently to continue to benefit the community.

Final Closure is expected to take between 6 months and 1 year to complete, depending on the decommissioning strategy used.

**Stage 3**: Post Closure Maintenance and Monitoring

Post Closure Maintenance and Monitoring commenced immediately following Pit Closure, and is expected to continue for approximately five years after Final Closure. Post Closure Maintenance and Monitoring will involve maintenance and later phase planting of areas that have been revegetated, as well as monitoring of revegetation, stream water quality and the near shore marine environment to gauge the success of the rehabilitation activities.

Each of the physical components of the mine will be described in terms of:

- Specific objectives for the component;
- Obligations and stakeholder input specifically pertaining to the component;

- § Projected final configuration/status;
- § Current/ proposed work and an update on work conducted since the previous mine closure consultation document; and,
- § Proposed post-closure maintenance and monitoring.

The nature of the required biophysical end-points (e.g. provision of subsistence agricultural land) means that the initial required physical works (e.g. first-phase revegetation) are relatively independent of end-points. Consequently, it can be reported that the majority of the disturbed area of the site no longer required for mining purposes has been revegetated to a state that enables the attainment of closure criteria after a suitable period of growth time.

## 7.2 Case Study

### 7.2.1 Introduction

The Chora Mines Committee had developed the plan for closure of mine and sustainability in accordance with the relevant government and corporate policies and strategies. The production of the plan involved the participation of all stakeholders in a process that took several years.

### 7.2.2 Ownership and Corporate Details

Chora Open Cast Project is owned 100% by Eastern Coalfields Limited (ECL), a wholly owned subsidiary of Coal India Limited (CIL).

### 7.2.3 Brief Overview

Chora Mine was a medium scale, open cast, coal mine producing around 170,000 tonnes coal equivalent per year. Year wise production is given in Table 7.1. The working of mine was discontinued in October 2000. The entire operation had around 320 full-time employees, of which 100% were Indians. The first survey was done in 1st April 1994 and last survey was done in 1st October 2000. At beginning 15-18m cover was there in rise side and 35-38m in dip side. Grade of coal was ‘C’. The work was progressed from rise side to dip side.

**Table 7.1:** Year Wise Production of the Chora Mine.

| Year | Coal (tonnes) | Overburden ($m^3$) |
|---|---|---|
| 1993-1994 | 105970 | 0527915 |
| 1994-1995 | 229390 | 0721094 |
| 1995-1996 | 258000 | 1018656 |
| 1996-1997 | 225090 | 1384356 |
| 1997-1998 | 228120 | 1033032 |
| 1998-1999 | 212700 | 0923400 |
| 1999-2000 | 130290 | 0809208 |
| 2000-2001 | 027405 | 0224614 |

### 7.2.4 Location of Operation

The mine is located near the city of Raniganj and is under Kenda Area. This mine lies around 1.5 KM away from the Kenda village.

**Table 7.2**: Year Wise Profit of the Chora Mine.

| Year | Profit (Rupees) |
|---|---|
| 1993-1994 | 20905,000 |
| 1994-1995 | 69476,000 |
| 1995-1996 | 71037,000 |
| 1996-1997 | 93402,000 |
| 1997-1998 | 92270,000 |
| 1998-1999 | 69037,000 |

### 7.2.5 Reasons for Closure

Two reasons were responsible for the closure of the Chora Mine. They were:

- Stripping ratio was increased as working was extended. In the year 1993-94, stripping ratio was 4.98 and in 2000-01, stripping ratio was reached to a value of 8.19. So it was not possible to continue the working with such high stripping ratio.
- The working was progressed towards the Regional Hospital, Chora and the Main Road for transportation.

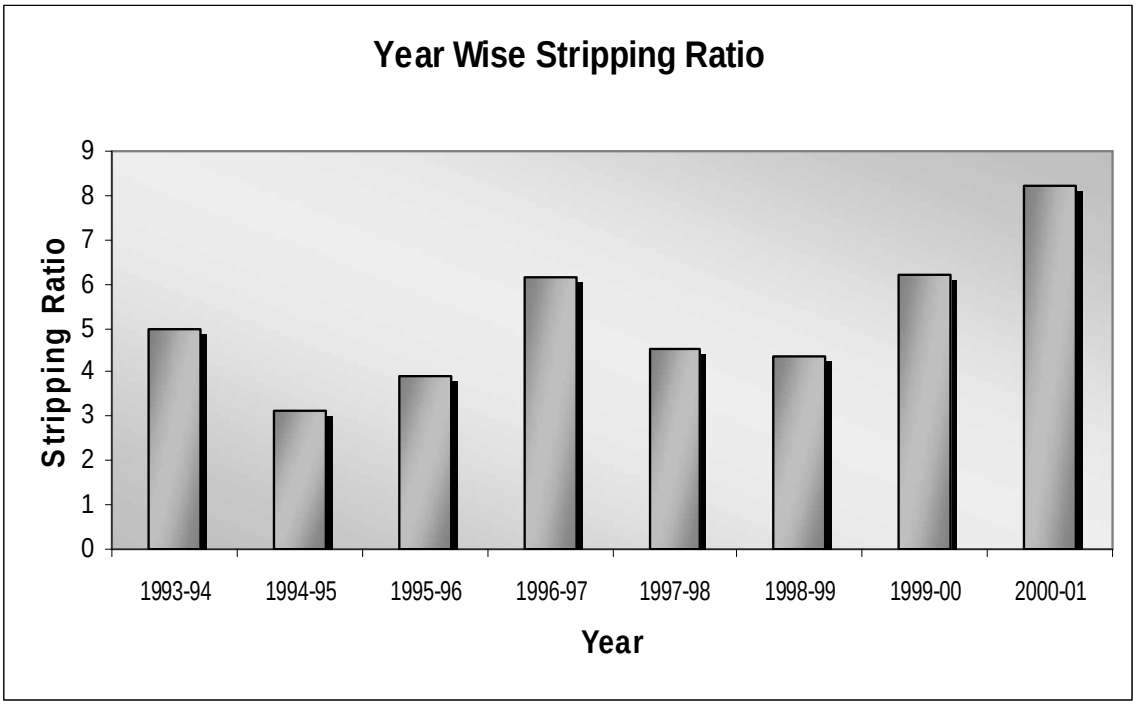


**Figure 7.5**: Year Wise Stripping Ratio of the Chora Mine.

### 7.2.6 Closure Programme

Planning for closure has been an ongoing process throughout the life of the operation via mine and environmental planning, stakeholder consultation and progressive rehabilitation. The actual closure of the mine was undertaken as a staged closure program.

**Stage 1**: Open pit mining operations ceased in October 2000. Pit Closure began at the time mining operations ended and involves revegetation of open pits, waste rock dumps, and haul roads, as well as the sale and removal of the majority of the mobile earth moving equipment. While OCP was being worked, backfilling was going on. Later on, this backfill area was dozed, leveled and plantation was done. Plantation was done through private contractors. The cost of each plant sample was Rs.1.60. Price was fixed on the basis of each plant grow upto a particular level. Two dozers were utilized for dozing overburden to cover open coalfaces in decoaled area for avoiding illegal mining. There was high water seepage. So continuous pumping was done to avoid water problem. Garland drain was also there to deal with water problems.

**Table 7.3:** Year Wise Plantation of the Chora Mine.

| Year | No. of Trees Planted |
|---|---|
| 1997-1998 | 10950 |
| 1998-1999 | 16080 |
| 1999-2000 | 16500 |
| 2000-2001 | 10000 |

**Stage 2**: Final Closure involved the sale, demolition and removal of remaining buildings, equipment, infrastructure and facilities. The post-mining, waste dump and other disturbed areas will be revegetated or otherwise rehabilitated. Some items were shifted to workplace in Jambad Seam, a portion of Sankarpur OCP extension in the leasehold area of Chora Incline. Infrastructure was handed over to 7/9 Pit.

**Stage 3**: Post Closure Maintenance and Monitoring commenced immediately following Pit Closure, and was continued for approximately three years after final closure. Post Closure Maintenance and Monitoring involve maintenance and later phase planting of areas that had been revegetated, as well as monitoring of revegetation, stream water quality, etc.