LIABILITIES INTO ASSETS
SYNERGIES AND OPPORTUNITIES FOR REHABILITATION AND MINE CLOSURE – CREATING A SUSTAINABLE LEGACY

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INTRODUCTION

For over a century mining has formed the core around which the South African economy has developed. Mining, however, is a unique business in that it has a finite life span. In South Africa's particular situation with its long lived mines on the Witwatersrand formation, mine closure was until recently a rare event. The industry is however reaching the stage where many of the mines that built the Witwatersrand region into the economic powerhouse of Africa are ceasing to be viable. With increasing number of mines nearing the end of their lives, the impact of mine closure reaches deep into the sizeable and diverse communities that have grown up around these operations and which have a heavy economic dependence on mining.

From the mining company's point of view, the principal actions and liabilities associated with mine closure at present are:

- the retrenchment of employees and the cost of associated severance packages, as well as in some cases, mitigatory funds for the retaining of retrenched employees.

- The rehabilitation of the areas disturbed by mining and associated activities in line with statutory obligations.

THE COSTS OF MINE CLOSURE IN THE SOUTH AFRICAN CONTEXT

Retrenchment and rehabilitation costs represent sizeable expenses and long-term liabilities for mining companies, and their mitigation would thus be desirable from a purely commercial point of view. Leaving aside retrenchment costs, the largest expense associated with mine closure at present arises from the legal environmental rehabilitation requirements. While the mechanisms by which governments force mining companies to set aside the resources necessary to fund closure differ from country to country, the net effect is generally the same. What tends to vary is the degree of enforcement and it is in this context that the political/social dimension comes into play.

Under South African law mining companies have been, since 1991, required to set aside funds during the life of the mining operation, which by the end of its economic life should cover all closure costs. These funds are set aside in a legally separate trust fund that reimburses the company or any entity that performs part of the final closure work.

While many modern operations are able to curtail the growth of closure liabilities via effective environmental management systems, the long life of South African operations has to some extent worked against them. In a field of frequently moving rehabilitation goalposts, cumulative impacts incurred over decades of operation, and patchy

enforcement of legal obligations, providing the resources for closure of a 50, or 100 year old mine during what effectively amounts to the latter quarter of its life, imposes considerable pressures on current cash flows. In the case of South African operators of mature mines, total closure liabilities can amount to as much as between 5 – 15% of the total profits of the remaining life of the mines.

At mine closure mining companies are required in theory to restore the area affected by mining and mining related activities to the status quo ante. This entails the removal, demolition and rehabilitation not merely of the mining infrastructure but also of support infrastructure, such as mining towns, hostels, the associated roads, metallurgical plants, sewage works and mining recreational facilities. In a developing country desperately short of infrastructure such as houses, social service facilities and roads, this does not make much sense when such facilities are potentially valuable assets for the communities in which they are located.

Where communities have no economic rationale other than mining, this infrastructure would be of limited use unless some new economic rationale can be found for the area. This has formed the rationale for investigations into the conversion of mining infrastructure into assets with which to build new businesses. Such infrastructure is, for accounting purposes, already totally depreciated and actually presents a liability from a cash flow and accounting point of view. Therefore passing it on as a zero or low cost asset for the formation of a new business could facilitate business development without financially prejudicing the mining company. Furthermore, support for such business ventures helps speed up the closure process, thereby avoided the next move in the statutory goalposts.

ADDRESSING A STRATEGIC NEED

To understand the significance of mine closure in the context of developing countries such as South Africa, it is important to bear in mind that the number of people supported by an employed mineworker tends to be significantly higher than in the developed world. In southern Africa each mineworker on average supports 9-11 dependants, many in rural areas. In developed countries the number varies from 3 to 6.

Amplifying this is the sheer scale and still comparatively labour-intensive nature of most South African mining operations particularly the deep gold mining operations. Closure of a single shaft operation generally results in net job losses of between 1 500 – 3000 individuals. Against a background of more than 30% unemployment, closure of such operations has economic and social impacts on a scale sufficient to warrant national government attention.

South Africa's mining industry has over the past two decades experienced a sharp drop in employee numbers, from a high in the mid-1980s of 6000 000 to about 300 000 today. For the South African gold mining industry the corresponding drop has been from 530 000 to 250 000. Since the late 1980s, the impact of this drop in employee numbers on South African and the regional economy has been sufficient for the issue of mining industry retrenchments to receive on-going government attention in the form of dedicated task groups and crisis committees. As the trend of workforce downsizing continues, companies operating in the region have found their efforts at maintaining constructive labour and government relations overshadowed by this issue. This cannot but constrain their flexibility in strategic decision-making.

It therefore is certain that mining companies closing of downscaling their operations in developing countries increasingly will be pressured into not merely finding alternative employment opportunities but also establishing retraining or development funds with which to ameliorate the impact of job losses on the local communities. In their efforts many mining companies have entered into partnership with the communities and mineworkers unions. So far the success of these initiatives has been patchy.

The conventional approach for dealing with large-scale retrenchments resulting from mine closure involves the establishment of dedicated funds with which to retrain employees for other jobs or with which to support potential entrepreneurs among the retrenchees. While retraining can go a long way towards facilitating the move of retrenched miners into other sectors, there are real limitations to this in developing countries where national unemployment rates exceed 30%. Entrepreneurial support is equally constrained by the reality that the percentage of potential entrepreneurs in any population is small. Among mineworkers, people accustomed to work in a regimented, systematic way according to production schedules, this figure is likely to be even lower. Furthermore the impact of retrenchment on personal self-confidence is certain to shrink this number further among recently laid-off miners. Former mineworkers do, however make the most suitable candidates for employees as they have ample experience with the needs of systematic production processes and schedules.

In seems probable that in part the limited success of such efforts stems from the fact the mine closure/rehabilitation and the creation of new employment opportunities are generally treated as two separate issues when in fact there often exists considerable synergy between the two. Redundant mining assets have already been written off by the mine, and thus can be passed on to the new ventures at reduced costs, which offers a material advantage to these businesses versus their competitors. Wherever possible retrenched Group personnel would also be given preferential access to these jobs. Not only would the utilisation of old infrastructure for the creation of new businesses create new jobs in itself, it would also reduce the rehabilitation liabilities and costs for the mining company and thus raise its profitability and ultimately in some cases prolong the operational life of mine.

POST-MINING BUSINESS VENTURES – SOUTH AFRICAN CASE STUDIES

The projects discussed below comes from companies formerly within the Anglo American and De Beers Group. All have been implemented and are characterised by the following common features:

- the use of redundant mining and associated infrastructure as zero cost assets for new business ventures.

- the development of business structures and operations in a way that capitalises on the characteristics of the redundant infrastructure, thereby conveying a competitive advantage for the new business.

- the active participation of the mining company or its agents in the establishment and commercial stabilisation of the new business along purely commercial lines.

- the acceptance by the mining company that such businesses yield tangible if not immediately quantifiable benefits.

The case studies presented below fall into three categories of businesses:

- those based on the use of operational wastes as a resource for product manufacture,
- those based on the conversion of mining-related infrastructure, and
- those based on the conversion of specialised mining infrastructure.

SUMMARY DETAILS OF CASE STUDIES

1. Operational Wastes as Resource for New Businesses

Case Study 1 – Compost Production from Organic Mine Wastes

- Garden refuse, canteen wastes and treated sewage represent a significant percentage of non-tailings wastes.
- Highly specialised disposal requirements can be avoided by routing organic wastes into a composting process.
- Composting process yields a benign resource that can address a strategic shortage for rehabilitation projects.
- Operations at Vaal River and ERGO average 300 cubic meters of product per month at a production cost competitive to outside purchasing under a break-even cash flow scenario.
- Over life of mine each operation can expect to half non-tailings landfill requirements.

Mixing the product

Packing the finished product on the mine site

Case Study 2 – Bricks from Tailings

- Tailings and waste rock in some instances are very suitable substitute to river sand as an input to cementatious building aggregate.
- Elands Brick operated at Elandsrand Gold Mine.
- R 750 000 Capex.
- Employed 42 people.
- Supplied regional low-cost housing projects at competitive prices.
- Saved mine relocation of tailings from ad hoc clean-up operations and pipebursts.

Bricks in which riversand has replaced by tailings.

- Failed due to personal conflict between entrepreneurial partners.

2. Mine Closure: Conversion of Mining-related Infrastructure

Case Study 2 – Tailings Dam into Drive-in Theatre

- Old tailings facility encircled by urban sprawl
- Drive-in theatre offered commercial rationale for permanent seal of surface and terracing of slopes in return for commercial income.
- Has become a Johannesburg Landmark.

Case Study 4 – Redundant Hostel/School Conversion

- Redundant Hostel – expensive to convert to residential or apartment usage.
- Design ideal for boarding school – secure facility and accommodation.
- Capex R3million, 72 temporary construction jobs.
- Employment – 59, mostly mineworker spouses.
- Teaching & boarding facilities for 900 students.
- Addressing a critical social need – affordable quality education.
- Avoidance of closure cost in excess of R 4 million.
- If replicated at four earmarked sites, closure savings could exceed R 18 million.

3. Mine Closure: Conversion of Specialised Mining Infrastructure

Case Study 5 – Final Void Closure – Diamond Coast Aquaculture Venture

- De Beers faces a R 150 million rehabilitation liability with respect to the open cast mining activity that it has conducted along the Namaqualand coast over the past sixty years.
- Aquaculture venture uses these open cast excavations as well as existing pumping infrastructure in order to reduce its capital expenditure (about R 30 million).
- The operation will eventually employ 54 people farming seaweed and shellfish.
- Utilising pits marked for rehabilitation and pumping infrastructure cuts rehabilitation costs by about R 2 million for De Beers.
- By providing part of the economic base on which the mining town infrastructure can be sustained after mining ceases, the venture would also allow De Beers to receive a return on its investment into Kleinsee. This could avoid the demolition of the remote but picturesque town allowing it to explore its long-term tourism potential.

Case Study 6 – Tunnel Closure – Diamond Mushroom Farms

Harvesting mushrooms in old De Beers mine.

- Underground drainage tunnels in historical mining area around the Big Hole of Kimberley are an ongoing maintenance liability for De Beers.
- Tunnels stable environment and climate provides competitive advantage for mushroom grower.
- Capex R 600 000.
- Employment 12
- Turrnover R 800 000/p.a.
- Leading supplier of speciality mushrooms with southern African distribution network.
- Rental income for De Beers.

Case Study 7 – Metallurgical Plant Closure – AngloGoldFish (West Rand)

- Metallurgical Plants designed for the circulation of liquids.
- CCD ponds ideal for managing water conditions for fish farming.
- Capex 2.5. million.
- Turnover R 3.6 million/p.a.
- Employment 18.
- Outgrower to existing exporter.
- Avoidance of closure cost in excess of R 7 million.
- If replicated at four earmarked sites, closure savings could exceed R 45 million and result in a world class player in the ornamental fish business.

Ornamental koi carp being grown in converted thickeners (CCDs) of an AngloGold metallurgical plant in South Africa

KEY PROJECT FEATURES

To be sustainable all projects must be approached as a business problem/opportunity.

- The project objective must be purely commercial as commercial viability alone achieves concrete benefits for company. Other benefits are desirable but of secondary importance.
- Feasibility studies must recognise and quantify the costs of avoided legislated closure requirements as reflected in annual financial statements for project management and cash flow projections.
- They accept that despite a preference for outside entrepreneurial champions, the project requires involvement on the part of the mining company or its agents in both business establishment and business operation.

In choosing between various opportunities for a particular site of infrastructure the company needs to consider;

- Financial viability and sustainability,
- Realisable savings from avoided closure expenditure,

- Employment opportunities for the community and where possible for retrenched miners that are compatible with the project skills needs.

Lessons for AngloGold

- Achievement of these projects forces personnel to take a long-term view
- Room for innovators in companies is necessary.
- Thinking sustainably and creatively can yield concrete financial and social returns.

The Role of Environmental Staff in Such Projects

- Understanding that in nature there is no waste and that they are responsible for rehabilitation, they are ideally placed.
- They must recognise that economics and ecology are not inherently at odds.
- They must accept the need to develop and drive the project over medium-term.
- Project development of this kind requires talking a different language and bringing in different skills.
- They must accept that feasibility studies can indeed yield negative outcomes.

Financial Benefits to Mining Companies from Such Efforts

- Avoidance of demolition and closure costs for part of a site.
- Transfer of long-term maintenance requirements to another viable and sustainable entity.
- Creation of equity stakes in financially viable businesses, which can be profitably disposed of at a later stage.

Other more strategic benefits to mining companies from such efforts include;

- Improvement in government and labour relations and the resultant greater flexibility in managing any downscaling or closure process,
- Concrete demonstration or commitment to sustainable development,
- Demonstration of creative capabilities to problem solving to enhance corporate image.
- Better chances at accessing new prospecting and mining licenses.