CLOSURE AND SUSTAINABILITY INITIATIVES LEADING TO THE REOPENING OF THE GIBRALTAR MINE

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ABSTRACT

The Gibraltar Mine, which resumed production in October 2004, was known as a *swing producer* during its years of operation from 1972 to 1998 – delivering some excellent profits when copper prices were high but experiencing shutdowns when prices dropped. During an extended closure between December 1998 and October 2004, mine staff worked with two levels of government to initiate some creative programs to help sustain the operation through lower parts of the price cycle. One of the prime considerations of closure planning is to provide for the long-term environmental security of the site. Ideally mining companies strive towards a program that will require minimal maintenance, control and monitoring of the site, leading to the ultimate release of long-term liability. In more recent years, especially for mines with water quality issues, this relinquishment of long-term responsibility is unlikely, and large security bonds are now required by government. These security bonds insure an on-going sustainable fund to maintain the site. During the closure period, Gibraltar had posted reclamation security which included $17 million in a cash deposit and an asset security agreement for a further $13 million. There was a further unfunded liability of $12 million which government accepted as a risk. For small companies such as Gibraltar to maintain a presence at these mines, there is an incentive for both the company and government to make use of the existing infrastructure to create alternate businesses. Gibraltar has embarked on an aggressive program to look for alternative business ventures which generate revenue, to both lower the risk of default, and to offset long-term bonding arrangements. Projects being considered or in the works are a solid waste landfill to be located on top of a waste rock dump, a power generation project, metallurgical test work, maintenance work in existing shops, ranching and the possible development of a hydrometallurgical refinery plant that will operate long after reserves at the Gibraltar site are depleted. As a final innovation, Gibraltar was able to raise $17.6 million by independent investors by way of a Qualified Environmental Trust which allowed government to release the $17 million cash deposit to help finance the mine restart.

INTRODUCTION

Operating about 65 km north of Williams Lake, BC, the Gibraltar Mine had been known as a *swing producer* during its early years from 1972 to 1998 – delivering some excellent profits when copper prices were high but experiencing shutdowns when prices dropped. Since 1972 and until 1998, annual production at Gibraltar averaged 75 million pounds of copper in a 28% concentrate, 5 million pounds of

cathode copper from a solvent extraction electro winning plant and 700,000 pounds of molybdenum in concentrate. In total, the mine has processed 290 million tons of ore grading 0.35% copper and 0.016% molybdenum. Up to mine closure, Gibraltar had employed an average of 270 people, paid an average annual payroll of $15 million, expended some $5 million per year on goods and services in the Williams Lake area, and annually paid $10 million in direct taxes to the Provincial government.

During an extended standby period between December 1998 and October 2004, the mine staff, in cooperation with both the Provincial government and the Cariboo Regional District, initiated some creative programs to help sustain the operation through lower parts of the price cycle.

In December 1998, Boliden Ltd. (Boliden) was faced with declining metal prices and made the decision to close the Gibraltar mine permanently. Boliden submitted a closure plan under the *Mines Act* and initiated a detailed site investigation leading to a Voluntary Remediation Plan pursuant to the *Waste Management Act.*

In early 1999, Taseko Mines Limited (Taseko) met with both Boliden and the Provincial government to determine if there could be some way of purchasing the mine, maintaining it until copper prices improved, and hopefully, restarting the mine.

Government certainly did not want to see the mine decommissioned when there remained at least another 12 years of mine life, given favourable copper and molybdenum prices. On the other hand, government was concerned about transferring the mine and the environmental liability to a small mining company with limited assets.

Boliden was willing to sell the mine, place a substantial security to ensure that environmental control and reclamation was carried out, but was only willing to do so in exchange for an indemnification of all future environmental liabilities.

Taskeo was willing to purchase the mine, agreed with the closure plan developed by Boliden, and also agreed to be responsible for the long-term reclamation liabilities associated with the mine.

The total liability for government to fully reclaim the minesite and to pay the costs of long-term treatment of acid rock drainage was estimated to be $42 million. Boliden agreed to place security of $17 million in a cash deposit to be held by government, and government took an asset security agreement on the plant and equipment for a further $13 million. This left a further unfunded liability of $12 million which government was willing to accept as a possible risk. To reduce this risk, Taseko agreed (also required in its *Mines Act* Permit) to reduce the liability by $4 million over the period that the mine was closed. Taseko estimate that their costs to fully reclaim the minesite and to carry out long-term-treatment would be $33 million if work was carried out using mine equipment. All parties agreed that, in the event of a mine re-start, many of the reclamation liabilities would be absorbed as part of the ongoing mining costs. As a result, government agreed to remove the first charge on the mine's assets upon recommencement of mining.

RECLAMATION ACTIVITIES DURING CLOSURE

During closure from 1999 until 2004, a number of reclamation activities were carried out to both maintain acid rock drainage collection systems and to reduce reclamation liability. In 1999, the #3 waste rock dump was resloped and capped with glacial till overburden. In 2000, the #3 waste rock dump was completed and the #5 waste rock dump was resloped and capped with glacial till overburden. As well, the tailings beach area was seeded to control wind erosion. In 2001, further work was carried out on #5 waste rock dump. Seeding of the tailings beach was continued during 2002. In 2003, 24 hectares of waste dump was prepared for a landfill. Finally, in 2004, glacial till pre-stripped from the pit areas was stockpiled adjacent to the waste rock dumps for future use.

REDUCTION OF ONGOING COSTS

The mine was kept in excellent standby condition by a core group of managers and engineers, which also worked on programs to generate alternate businesses during the closure period.

Since mine operations were suspended in December 1998, work programs are being maintained to insure that environmental security with respect to waste rock dumps, the tailing impoundment, pits and other mine components are being met. Although Gibraltar has sufficient funds in place to cover the long-term liability at the mine site once final closure is determined, it has become the mandate of mine personnel to develop sustainable businesses that will generate revenues to offset this long-term liability. As operating personnel will be present at the mine for an indefinite period, it only makes good economic sense to have them carry out alternate business in conjunction with regular work duties to offset security bonding.

The discount rate used to set security bonding can vary depending on the specific project and can range from 3.0 % to 4.0 %. The standard 100 year period was used in the assessment. At a discount rate of 3.0%, long-term liability discounted 100 years out calls for fixed funding of $3.16 million for every $100,000. of liability.

Gibraltar recently completed a closure report on the assumption that operations would not resume, and that the site would be reclaimed within 5 years. Along with the detailed assessment of reclamation cost, a hydrology model was constructed for the 100 year period and accounted for all water movement including pumping and treatment costs. Essentially the liability is broken down into a present day cost to reclaim the site and a long-term cost to manage water quality/treatment costs calculated over a 100 year period. All costs were allocated to their respective time frames and future costs converted into present day dollars to arrive at the bonding requirement.

The following general discussion highlights several of the sustainable businesses that Gibraltar is presently pursuing in order to offset some of its long-term costs.

Cariboo Regional Landfill

The Cariboo Regional District (CRD) had been looking for a new landfill site since 1991. Eight different sites were investigated with approximately 40 public meetings held over this time frame. Gibraltar, realizing there was a fit for the landfill at the mine site, approached the CRD with the concept of building such a facility on one of the waste rock dumps. The concept was discussed, then taken to a public meeting. After numerous open houses, public meetings and tours of the site, there was a general consensus that the Gibraltar site was the most favourable location for the new landfill.

Gibraltar entered into a private/public partnership with the CRD. Partnering and operations agreements were drawn up and signed off by both parties. Under the agreement, Gibraltar would remain responsible for the waste rock and drainage below the landfill, and the CRD would be responsible for the zone above the waste rock, which would include the landfill itself. Separating the waste dump and future landfill would be a 1 meter thick layer of compacted glacial till and a sealed 60 ml liner. A statutory right of way agreement was drawn up between the two parties to provide for legal ownership of the two horizons. This statutory right of way agreement was the first of its kind to be developed in the province.

Aside from profits of operation, the landfill operation guarantees a fixed income, most of which is labour cost. At a 3% real rate of return (NPV), this fixed income will potentially offset $2,610,000. of bonding requirement. Profits will further offset liabilities, however, these have not been factored in at this time. In addition to the revenue flow, the cost to reclaim the landfill site is borne by the landfill capital budget. As a result of the landfill being constructed and operated, government has now removed the liability for the cost of reclaiming the waste rock occupied by the landfill site itself. Government has not yet given any direct credit for the income and potential "profit" from the landfill, other than recognizing that the overall risk of default is reduced as a result of the landfill operations.

Hydroelectricity Generation

With the mine closure, the fresh water pumping system and pipeline from wells beside the Fraser River were shut down as part of the standby procedure. The tentative plans are to use this 500 mm buried pipeline to release tailing pond water to the Fraser River. Tailing water presently accrues in the pond and is discharged into one of the completed pits to maintain a constant freeboard in the pond. The pipeline has sufficient head to generate power by using the pipeline as a penstock. Turbines will be installed in all 3 pump houses along the pipeline. Gibraltar has sufficient treated water resources on the property that could be channeled down the pipeline at an annual release rate of 5 million m^3, which has the potential to generate about 1 megawatt of power annually. A proposal has been made to BC Hydro and has been accepted, pending obtaining an approval to discharge water to the Fraser River. BC Hydro will cover a portion of the cost under the Power Smart program. Consultants are presently conducting water chemistry and plume modeling studies to assess impacts of possible release of water into the Fraser River. Once completed, application will be made to discharge water via the pipeline to the Fraser River.

The potential revenue generated by the hydroelectric project could offset long-term liability by as much as $2,440,000. at a 3% real rate of return (NPV).

Metallurgical Laboratory

The metallurgical and analytical laboratory at Gibraltar is being set up to carry out “first pass” metallurgical and analytical test work. Due to the lower overhead and staffing present to carry out other functions at the mine, Gibraltar can offer lower cost services. The focus is to perform screening tests to determine the most appropriate course for future metallurgical work. Once the customer has a basic concept of the process requirements from the initial metallurgical work, then a refined program can be designed and carried out at the Gibraltar site or elevated to an accredited facility.

While the program is in its infant stage, it does have the potential to generate revenue to offset long-term maintenance costs at the mine.

Maintenance Complex

Once the mine is decommissioned, the maintenance complex could be contracted to local businesses such as equipment dealers or logging contractors for maintenance of heavy equipment. The complex contains warehousing, electrical, mechanical, welding and machine shops. This facility could be used for other industrial activities yet to be determined.

Ranching

Over the long-term, there is potential to use reclaimed lands for ranching. Lands around the minesite are presently used as open range for cattle. Since the mine was closed in 1998, the tailings pond has been home to a herd of cattle grazing on fall rye and grasses planted for soil stabilization. There is the issue of metal uptake in vegetation, however, this has not been a problem during the period of grazing. As reclamation continues on the waste dumps there will also be the opportunity for controlled grazing through proper management of access to the sites. It is difficult to evaluate the economic impact of this activity at this time, however there is a strong possibility of capitalizing on reclamation measures in the future.

Hydrometallurgical Plant

Feasibility work has been carried out on the construction of a hydrometallurgical plant for the Gibraltar site. Hydrometallurgical plants are extremely capital intensive and would require a relatively strong copper market over a 5 year period to realize a timely payback on capital. The hydromet process eliminates the shipping of concentrates to off shore smelters, by processing the concentrates at the minesite. The copper sulphide in the concentrate is oxidized to an aqueous copper sulphate solution in autoclaves in an extreme oxidizing environment. The copper sulphate solutions are then upgraded and placed in electrolytic cells to produce cathode copper. A hydromet plant offers an ideal sustainable business venture as it provides for a cost effective short-term benefit to operations, and a long-term business as a custom facility well after mine reserves are depleted at the site.

Recreation

Rainbow trout have been routinely stocked both in the tailing and seepage return ponds for the past 15 years. Sport angling is allowed on a catch and release basis. Anglers record weight and fork length and report information back to the environmental department. Stocking exercises have been successful over the years and it is not unusual to produce fish in the 5 to 7 pound range. Although there may not be a significant economic benefit of the fishery resource, it will add to the overall attractiveness of the property to the community, both as a business and recreational site.

Summary

Not all minesites can enter into post mine closure businesses due to their locale. Gibraltar has the distinct advantage of being located adjacent to a major transportation corridor and is in close proximity to several industry based communities. Although the presentation of these initiatives has been in simplistic terms, the studies, permitting, public and First Nations consultation that went along with the process have been intensive and time consuming.

MINE RE-START IN 2004

In 2004, copper prices improved considerably which prompted Gibraltar to look at ways of financing the start-up costs. Gibraltar submitted a 12 year mine plan to the Ministry of Energy and Mines, which was approved on June 1, 2004. Gibraltar then commenced pre-stripping of the Pollyanna Pit. The first ore was processed in the mill on October 7th and the first load of concentrate was shipped off site on October 12, 2004.

In order to help fund the re-start of Gibraltar, Taseko entered into a Joint Venture agreement, through its wholly owned subsidiary Gibraltar Mines Limited, with Ledcor Mining Ltd. (Ledcor). Under the Joint Venture, Gibraltar is responsible for concentrate sales and transportation and certain aspects of site administration, including property matters, and Ledcor is responsible for on-site operations. Ledcor provided lease financing guarantees and leases (U.S. $18.5 Million) for the new mining shovel and five haulage trucks.

Perhaps one of the most innovative financing initiatives of the mine start-up was the adoption of a Qualified Environmental Trust (QET) to be used as reclamation security. QET's have been available under the Income Tax Act for over a decade. They were designed to allow mining companies to place money in a trust fund during operations, deduct these costs from profits, then use these monies during closure. They were primarily designed for single mine companies who had no other cash flow from other operations.

Taseko was able to structure the QET to allow for independent investors to contribute and to obtain a tax advantage similar to "flow-through" shares. As a result, Taseko raised $17.6 million towards a QET which, in turn, freed up the $17 million to help finance mine start up, which had previously been posted as reclamation security.

Why would independent investors place money in a QET to pay for long-term reclamation obligations? First of all, investors receive a tax deduction for monies invested. Of equal importance, however, investors also receive a royalty interest in future copper production, convertible to shares of Taseko (at Taseko's option). This QET has potentially wide use for many other mines in Canada who are looking to secure long-term reclamation obligations.

The Gibraltar case study is an excellent example of how a mining company, with strong support from both provincial and regional governments, can withstand a period of low commodity prices, maintain high environmental standards, and re-open - producing jobs and requiring services from the local community. The Gibraltar mine provides substantial economic benefits to the region, employing 250 people with a projected annual payroll, including benefits, forecast to be approximately $21 million. The mine also spends in the neighborhood of $6 million on local purchases, and indirect and induced wages to the local communities. Finally, Gibraltar is expected to contribute $10 million in direct provincial taxes annually.