

# BULLETIN

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## Message from the new President

*by E.H. Dahlberg*

I would like to use this opportunity to inform SMI members and others interested in small-scale mining about SMI's present status and our plans for the next three years.

Our major activity during this period will be the implementation of the International Small Scale Mining Information System Project. This project, financed by the International Development Research Centre (IDRC) of Canada, will be implemented in cooperation with the National Institute of Small Mines (NISM) of India. The major objective of this project is to establish a computer-based information system which covers the gamut of critical aspects of small scale mining. (For a full description of the information system, please see Page 2.)

We believe that the information system will become the nucleus of a global network which will link groups with an interest in small-scale mining, such as national associations (e.g. NISM), governmental bodies, international agencies, individual miners or mining cooperatives. Therefore, I consider the next three years of major importance in getting national affiliates established in countries which already have a small mining sector and an entrepreneurial, professional and administrative infrastructure which recognizes the need for information exchange. Establishing and linking national small-scale mining associations will give new stimulus to mineral resource development through North-South and South-South cooperation, shifting the emphasis from the inventory to the production stage, and involving local entrepreneurs in the development process.

This was the approach taken at the International Conference on Small Scale Mining, organized by the



**E. Bugnosen (ITDG), E.H. Dahlberg (President, SMI), V.S. Rao (President, NISM), S.L. Chakravorty (NISM) in Calcutta.**

Mining, Geological and Metallurgical Institute of India (MGMI). This conference was held in October 1991 in Calcutta, with about 120 delegates from about twenty countries. It covered crucial aspects of small-scale mining, including definition, policies, labour and social perspectives, global experiences, techniques, and specific problems and economies. South-South cooperation was exemplified by a special session on small scale mining in Asia, sponsored by ESCAP.

During the coming period, SMI will actively pursue contacts with small miners and their organizations, in order to identify their needs. The emphasis will be on assistance to existing operations with the objective of contributing to an orderly development. A particular challenge in this regard will be to communicate with the artisanal miners, a neglected group whose activities can sometimes have considerable socio-economic and environmental impacts.

Through our news bulletin and other means of communication, we will continue to highlight policies which have proven to be successful in bringing order to unregulated small mining activities in different countries, particularly to the mining of precious metals and of precious and semi-precious stones.

We will continue to face the challenge of defining small scale mining. This will allow us to better identify the needs of the very distinct and different categories of our membership and clients.

We are glad to announce the strengthening of our staff with the hiring of a new Office Manager, Ms. Dora Knez, who is an information specialist.

I would like to acknowledge the help and support of Mr. Roger A. Blais, the out-going President, who has so ably guided the initial phase of SMI, and to thank the Ecole Polytechnique for hosting us during this period.

## International Information System Project Initiated

The construction of an information system and service directed towards the needs of the international small-scale mining community has recently commenced in Montreal and Calcutta. The project, developed by Small Mining International (Canada) and the National Institute of Small Mines (India) together, is funded by the International Development Research Centre, based in Ottawa, Canada. The underlying idea of the project is to set up a system that would facilitate the exchange of information and experience between countries. The project also entails the development of a national data base and information service in India. A pilot study area at the tri-junction of Orissa, Bihar, and West Bengal States will serve as the main source of primary data about the small-scale mining sector in India, at least in the initial phase of the project. It will also provide a specific clientele with which NISM can directly work to establish an effective and responsive information service.

The information system will be computer-based, although not all the information gathered will be stored on disk. Consequently, documentation centres in Montreal and Calcutta will also be established. While the computer-based system will be jointly developed and tested, NISM will be primarily responsible for collecting data from the Indian subcontinent and directing its efforts towards servicing the information needs of the Indian small-scale mining community. SMI, on the other hand, will begin to build up the international component of the data base and directly service the rest of the world, until such time as other national or regional projects can be set up.

The specific objectives of the project are:

- ° to build a data base management system on critical aspects of small-scale mining, with the capability of accommodating bibliographic, statistical, text, and graphical/spatial data, as may be required;
- ° to create a cost-effective and user-friendly information system that can be easily updated, expanded and/or adapted to other contexts;
- ° to provide a facility for assisting government departments, technical institutions and individual small

miners alike to better understand, support, promote, and operate small mines;

- ° to deliver basic information, analysis and replies to specific queries to potential users in a rapid and timely fashion and on a regular basis;

- ° to survey basic information needs of the small mines community in India and identify available information resources;

- ° to identify researchable issues on social and technical aspects of small-scale mining;

- ° to strengthen the capacities of SMI and NISM.

A major project output will be a computer-based information system covering critical aspects of small-scale mining, such as prospecting, mining and beneficiation techniques and equipment, regulations and laws, marketing and finance, health and safety, and environmental protection.

The system, however, must not be seen as simply a repository of information, but rather as the means to an important end - which is to be able to disseminate information, experience, and analysis as quickly and effectively as possible to an international community of small mining interests and advocates. This community includes small-scale miners and mine entrepreneurs, miners' collectives and associations, syndicates, community interest groups, governments, researchers, consultants, equipment manufacturers, mineral traders, donor and development agencies, among others. The dissemination of information can ultimately take many forms: SMI Bulletin; direct responses to inquiries; equipment and consultancy catalogues; current opportunity lists; policy promotion and analysis; market intelligence; training manuals, programs and workshops; expert missions, etc.

Apart from the development of an information system and service, the project provides for studies on socio-economic and environmental impacts of small-scale mining on tribal populations within the study area, and preparation of an environmental protection manual for mining and processing operations with examples drawn from North America and India. There will also be a photographic and video study of small

mines, with a view to developing a photographic and video data bank for the support of instructional, analytical and information dissemination activities.

Work has now begun in earnest. Dr. Henk Dahlberg, SMI President, visited Calcutta in October to formally initiate the project with NISM. His trip was followed up with a more extended visit by SMI's Managing Director, Jeffrey Davidson, in December. At that time various operating modalities were worked out, project staff interviewed, and mines in the pilot study area visited. Meetings were also held with small mine entrepreneurs and their technical staff. In November, Ms. Dora Knez, a documentalist and information specialist, joined SMI in Montreal, to work on this project.

Small Mining International now invites its members and the general readership of the Bulletin to participate in this effort. The first phase of the project involves information gathering and collection. Initially, SMI will be sending out questionnaires to equipment manufacturers and consultants, and later to small-scale mine operators and owners. In all cases, we will be hoping for timely and complete responses. SMI has also begun collecting published and unpublished documentation relating to the various aspects of mining enterprise at the small-scale, of either a technical, financial, legal, or statistical nature.

Readers are invited to send us references to national, regional or local documentation, or if possible, the documentation itself; photographs; names and addresses of contacts, including local equipment manufacturers, mines, processors, mineral trading companies, financial institutions that lend to miners. Where documentation is available, but the expense of acquisition and mailing are a hardship, SMI will be pleased to cover these costs.

If you have any questions, or wish to share any ideas with SMI regarding this project, please do not hesitate to contact either Jeffrey Davidson or Ms. Dora Knez directly.

## Small vs Big in the Benguet Concession Area

by Eugene Yocogan  
Introduction and Commentary by Roger Moody

The following article written by Eugene Yocogan with an Introduction and Commentary by Roger Moody serves to focus attention on what has become an increasingly problematic policy issue in many parts of the developing world: mineral rights and security of tenure for "very" small-scale miners. The problem becomes most obvious and especially volatile when the interests of large commercial mining enterprises collide with the activities of small-scale miners. This can happen when the mineral deposit is of a size, shape, and value that makes it economically and technically feasible for either larger-scale mechanized mining or small-scale exploitation. The potential for conflict is enhanced when the mineral is a high value, low bulk commodity like gold or tin. In places where local economies have developed around small-scale mining activities, but the national government, for one reason or another, has never formalized local claims or mining rights, mining communities can be left exposed to the possibility of dispossession. In such situations, the prospect of violent confrontation is heightened.

Circumstances vary from place to place, as do efforts to resolve conflict and reconcile the interests of "large" and "small". In Ghana, for example, creating workable legal frameworks for the co-existence of both commercial and artisanal operations was critical to the Ghana government's recent efforts to rationalize and promote production from the goldfields. The successful conciliation of "large" and "small" miner interests has yet to be realized, however, and will probably turn on the Government's ability to identify and secure enough "good ground" for small-scale entitlement. Much of the known gold bearing "ground" has long been tied up by large concession holders like Ashanti Goldfields and State Gold Mining Corporation. Negotiations for the relinquishment of certain areas are ongoing. While many small mines are now legally registered, as long as some miners feel that legal opportunities to mine are limited to sub-economic ground, "illegal" activity on large holder concession areas will continue, and the potential for conflict and confrontation will remain. In Papua New Guinea, local landowners have exclusive rights to mine alluvial

gold deposits as long as they use non-mechanized methods. This enfranchisement of local rights helped keep the peace in 1988, when CRA Ltd. of Australia reported promising gold finds along the streams of Mount Kare, within its licensed prospecting area. Shortly thereafter, a "legal" gold rush developed, involving thousands of local people. By year end, over US \$100 million in alluvial gold was estimated to have been removed by the small miners. However, the size, accessibility and richness of the surface landslide site at Mount Kare made it a commercially exploitable deposit in its own right. CRA finally implemented a plan to convert the site into a mechanized mine in joint venture with the local landowners. Agreements notwithstanding, mining operations at Mount Kare have been hampered from the outset by claim disputes among landowner factions. This recently erupted into an armed attack on the mine, which was then closed.

The following article describes an experience in the Philippines. The authors explain the production system of the "pocket miners" who work "illegally" in the Benguetcorp's mining concession area, and bring to our attention the recent development of a potentially explosive situation. While the mining activities of the company and pocket miners have been able to coexist for many years, Benguet's plan to shift from underground to surface mining will bring it into direct conflict with the small miners whose interest is in the near surface veins. At risk are the livelihoods of some 20,000 people, with no established legal mining rights, and as the authors suggest, in this case there may be no easy way out.

J. Davidson

### Introduction

While public attention in the past few months has been focused on the "gold rush" area of Mount Diwalwal, on the Philippine island of Mindanao (with understandable press attention to the wide-spread use by small miners of mercury), many Filipinos believe that the real battle to secure a future for small-scale mining is being waged further north. On the island of Luzon, "pocket miners" have a long-standing tradition of extracting gold, through



I. Adit entry to the "pocket" mine.

adits, from some of the richest seams of the so-called "rim of fire." Thousands of the indigenous Igorot people, including women and children, are now involved in gold mining or processing activities. This involvement supplements and in some cases secures their livelihoods, although only the most basic panning and mechanical separation methods are used. Inevitably, much of the fine gold is left behind in the tailings, which are then sold to corporate buyers. The biggest such buyer is the Benguet Corporation (Benguetcorp), itself the largest Philippines gold producer. Much of Benguetcorp's past fortune has depended on the leads provided by the pocket miners. However, cooperation between Benguet and the small-scale miner has often been tenuous. Recently, as Benguet has moved from underground to open-pit production--partly as a result of the disastrous 1990 earthquake which collapsed many underground workings--co-existence has been transformed into open warfare, with local communities barricading roads and mounting both national and international protests to protect their mining rights. Benguetcorp's Antamok Grand Project (or GAP as it is more colourfully called) is a major threat to the viability of pocket mining on the Cordillera. If GAP proceeds as now conceived, it will lead to the loss of livelihood for up to 20,000 miners.



Pocket-miners in the Benguet Concession area

It is difficult to establish, in exact gold revenue or production terms, just how much the pocket miners of Loacan and Ucab stand to lose to the AGP (the Antamok Grand Project or GAP). Like all small-scale miners in Benguet, the pocket miners of this area tend to be evasive with information concerning their gold output. This is because the operations of Benguet small-scale miners are basically illegal: most pay neither royalties nor taxes. Fearing a takeover of their mine workings by legal mining-claim holders, powerful personalities, or corporations like BC (Benguetcorp), they are especially wary of giving out any information which will point to the presence of high-grade ore in their areas of operation.



2. Preliminary crushing of ore.

Pressed for clues, however, the pocket miners of Itogon surrender information regarding their ore production and processing rates, the quality of the gold produced, the prices these fetch, and the average monthly net incomes they generate from these. Along with some knowledge of production features, these can be used to arrive at figures which may prove interesting.

Pocket mining, as practised in Itogon, is a simple, almost wholly artisanal undertaking. It employs very little equipment and a great deal of manual labour. The pocket miners first determine "where one expects to find gold." They try to spot outcroppings, or simply locate a potential mining site by means of sheer instinct. They dig until they find the ore and then sample it. They do their own preliminary assay, crushing the sample to a fine slime, and panning the fine slime in water to separate gold particles from lighter materials. If they see that there is a satisfactory amount of free gold to be recovered from the sample, they open a mine on the site--rarely, if at all, doing any blasting (see Photo 1).

Using hand-held hammers, pickaxes, spades and crowbars, they construct a permanent adit over a meter wide and over a meter high. Lighting their way with carbide lamps, they tunnel vertically or horizontally, following the ore vein. Shoring up the tunnels with timber wherever the earth is unstable, and using makeshift blowers to provide them with air, they can dig as deep as 50 meters from the surface. They chip off pieces of ore, collect them in plastic-straw sacks, and transport them to the surface in wheelbarrows.

Pocket miners in Loacan, Ucab, and neighbouring areas of Itogon operate in teams of five to six men. They

mine three months in a row and work a fourth month at ore-processing before mining again. They claim that over a three-month mining period, each team produces at least 150 sacks of ore. They are not sure, however, as to the weight of each sack; they say that their ore production rates can best be gauged on the basis of processing capacity.

Not all of the ore that has been mined is processed. The ore is examined for quality, and hand sorted, with many pieces ending up in a reject pile.

Processing begins with the manual hammering down of the pre-sorted ore to the size of corn kernels (see Photo 2). The kernels are then ground down to grain-size in a motor-powered or manually-operated ball or rod mill. Afterwards, the grain sized material is placed at the end of an inclined concrete trough. With a controlled flow of water, they are flushed down the trough, which is bottom-lined with jute or corduroy fabric (see Photo 3). The fabric traps most of the heavier mineral-bearing grains, while the water carries off some of the finer mineral-bearing particles as well as the lighter soil materials. This run-off, locally termed linang, is collected in a container placed at the end of the trough so that remaining mineral particles may later be retrieved from it.

Meanwhile, those particles already trapped in the jute or corduroy fabric are collected by rinsing the cloth in a basin. This "rinse-off" is then panned--jiggled skilfully in

a tilted rectangular box or a circular dish made of iron, as in a rice-winning process. The gold is recovered by gravity separation: being heavier, gold-bearing particles move to the lowered portion of the box or sink to the bottom of the dish, while lighter materials remain in the raised portion of the box or the upper sides of the dish (Photo 3). The gold is then collected for refining.

To assist in the processing of the ore, the miners employ the aid of women and children in the neighbourhood. For the first week, the miners, women, and children work together, selecting and crushing ore. Then the group splits into three crews. One begins milling while the second crew sluices and pans what has been milled. The third crew continues sorting and crushing. The three crews, now working simultaneously at different parts of the procedure for the next three weeks, can process ore at a rate of 150 kilograms every three hours. They work 12 to 24 hours a day, every day. Assuming an average of 18 hours' work daily, they can process 18,900 kilograms of selected ore over a period of three weeks or 21 days.

The miners compensate the women and children who help in the process by giving them the linang. Gold is retrieved from the linang only after the women and children turn it into a fine slime using the gaid--i.e., the residual solids are further pulverized, a handful at a time, between a smooth, flat-bottomed sandstone and either a flat-topped boulder or a wooden plank lined with

jute or corduroy fabric. The fine slime is rinsed off the fabric and collected in a bucket or basin. It is then panned.

The miners also compensate the owner of a milling house for the use of his facilities. They pay a fee of P50 for every 150 kilogram batch of ore processed. The miners pay P6,300 for the estimated 18,900 kilos milled by the end of each operation.

The miners add to the mill owner's compensation package the rights to all the reject collected in the process. Gold can still be recovered from these tailings, and so mill owners dehydrate them for sale to BC or to small chemical-processing plant operators at P20 to P60 a sack, the price depending on the tailings' assayed gold content. A DENR (Department of Environment and Natural Resources) study says that the gold content of Benguet pocket miners' tailings ranges from less than 3.73 grams to more than 8.09 grams per tonne. Over the period 1985 to 1989, the lowest gold tailings bought by BC from Itogon pocket miners was 4.94 grams per tonne. The highest was 11.07 grams per tonne.

As may be inferred from the fact that considerable amounts of gold can still be recovered from both the linang and the tailings, the processes employed by pocket miners yield a rather low rate of gold recovery. Indeed, miners say that they enjoy from this process a gold-recovery rate of only 40% at worst, and 60% at best.

What gold they recover from the process is usually refined by the miners themselves. The gold is treated with soda, wrapped in cellophane, and placed in a clay crucible. It is then cooked over a steady charcoal fire. The gold melts and is allowed to harden to the shape and size of a pellet.

The miners sell the pellets directly to illegal gold buyers at the Baguio public market. Here, the pellets are usually given an assay value of 16 to 18 carats, which means that they are 67% to 75% gold, with 33% to 25% base metal impurities respectively. In 1990, each gram of 16 carat gold fetched P270 to P290, while each gram of 18 carat gold fetched P315 to P320. Pocket miners say that prices have not veered far from this range for the past few years.

#### Commentary

The fundamental question which pocket miners in the Benguet Concession area now face is: what legal rights do they have to defend their operations against a big company like Benguetcorp? The sad reality is

that--whatever the avowed intentions of some more enlightened Filipino legislators--small-scale mining essentially remains an often illegal and usually precarious occupation in the Philippines, where the interests of large mining companies remain paramount and protected by law.

For the past five years, efforts to recognize and accommodate the interests of small scale miners within a revised legal framework have met with stiff resistance. For example, the original Senate Bill 503, according to Stefan Cramer, was "the most radical formulation to date." Existing gold rush areas were to be declared People's Mining Areas. All small-scale miners were to apply directly to the state for contracts. In addition, "No license, permit, or contract for big scale mining or logging operations would have been issued within such areas." The Bill retained an earlier definition of small-scale mining of <50,000 tonnes per year. Corporate interests, represented by the Philippine Chamber of Mines, sponsored the introduction of an alternative Bill, which restricted the definition of small scale mines to those operating at depths of less than 20m, using only crude equipment, without mechanization or explosives. None of these bills were ever passed. Recently, Senate Bill 1333 gave priority to pocket miners who were in occupation of sites before August 1, 1987 (see SMI Bulletin No. 3, p.5). "Substantial support services for small-scale miners' cooperatives,

associations or corporations" were promised, while original claim owners could purchase mill tailings at the prevailing market price. Use of mercury was permissible only where no customs mills were in operation. As of Fall 1991, this Bill was still pending before Congress. In any case, it is of little assistance to the subsistence miners of Benguet province, where Benguetcorp has "patented" claims stretching back many decades, while the Igorots still await proper land rights. In such circumstances, the indigenous miners battle it out with a corporate body which has historically been backed by foreign capital and protected by some of the richest families in the Philippines.

In the absence of any real will by the country's legislators to recognize and strengthen small-scale mining as a key development option, the prognosis for the pocket miners of the Cordillera is a poor one.

Note: P60.48 = US \$ 1.00.

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Photos courtesy of R. Moody.



3. Gravity separation and recovery system using fabric lined trough and pan.

# Challenges of Establishing a National Gemstone Marketing Board

by Sandfor Mambwe

## Introduction

The Gemstone Corporation of Zambia (GCZ) was created in April 1991. The first annual general meeting was held on Sept. 14th, 1991, at which time 17 Board members were elected. They were drawn from the Zambia Emerald Association; Zambia Gemstone and Precious Metals Association (ZGPMMA), representing aquamarine, amethyst, tourmaline and garnet miners, lapidaries and jewellers; the Ministry of Mines, the Bank of Zambia, and the Ministry of Commerce and Industry. The GCZ's Managing Director was appointed as the 18th board member.

During a preceding meeting in August 1991, various issues were reviewed and discussed, including the relationship between the GCZ and the Bank of Zambia, the circumstances surrounding the formation of the GCZ and the gemstone auction of July (see below). Progress was also made in establishing a plant hire scheme in the three active areas of gemstone mining, namely, Kafubu block (emeralds), Kalomo (amethyst) and Lundazi (aquamarine).

## History of the formation of the Gemstone Corporation of Zambia

Highlights of the formation of the GCZ are as follows:

1) In February 1990, a seminar on the potential for employment creation from small scale mining in Zambia (see also *SMI Bulletin*, No. 2) was sponsored by the ILO and organized by the University of Zambia School of Mines. This seminar made recommendations to the government which were actively followed up.

2) In its July 1990 issue, *National Geographic Magazine* published information on the Zambian situation suggesting that Zambia held a 20% share of the world's emerald market of \$1 billion. This \$200 million is equal to Zambia's budget deficit. However, almost the whole of this amount is lost because of illegal trafficking of emeralds.

3) In December 1990 the Ministry of Mines followed up on the developments of that year by forming an ad-hoc committee which steered the formation of the Gemstone Corporation of Zambia in April 1991.

4) At the State House Gemstone and Jewellery Exhibition on April 17, 1991, miners, lapidary owners and jewellers were greeted by then President, Dr. Kenneth Kaunda. Dr.

Kaunda delivered a speech in which he encouraged liberalization of the gemstones sector. He reiterated the Government's commitment to support the local gemstone industry, as presented in the budget speech by the late Minister of Finance on Nov. 16, 1990. The President told his audience that what the central sales organization of De Beers had been able to obtain for diamonds, the Gemstone Corporation of Zambia (GCZ) should attain for emeralds and other gemstones. Given good will and support, he was confident this could be achieved.

In order to stimulate further investment in this sector, the Government of Zambia also took the necessary measure of allowing miners to be paid 50% in foreign exchange and reduced the mineral export tax from 11% to 5%.

5) A report which first appeared in the *Financial Times* of London was reprinted in *The Times of Zambia* of August 30, 1991, under the title "\$200m. of gemstone smuggled out." This report contributed to making the magnitude of the Government's loss of money very clear.

## Zambia Gemstone Auction (15-22 July 1991)

Through the Ministry of Mines' three departments - Geological Survey, Mines Development and Mine Safety - the Government organized the first Zambian Gemstones Auction. It was held at the Corporate Office of the Zambia National Commercial Bank in Lusaka. For the first time, assorted gemstones such as emeralds, aquamarine, garnet, and tourmaline, were put on the Auction Floor.

Fifteen (15) emerald companies, fifteen (15) amethyst companies, thirteen (13) aquamarine companies, one tourmaline and one garnet mining company presented their materials to the gemmologist at the Geological Survey Department for sorting, grading, valuation and pricing for the Auction.

Selected international buyers of gemstones were individually invited to the Auction, while others came as a result of advertisement through embassies and the local press. There were 59 potential bidders, from India, Kenya, Israel, the United Kingdom, Italy, Egypt, Namibia, Australia, S. Africa, South Korea, Switzerland, Mauritius, Norway, Hong Kong, Thailand and Zambia. Lot sizes of 89 stones for emeralds, 25 for aquamarine, five for tourmaline, one

for amethyst, and one for garnet, were available for bidding. Some companies did not accept the bids on the Auction Floor and therefore withdrew their products.

## Comments

Some observations on the Auction experience are perhaps in order, with a view to enhancing the chances for success at the next auction.

1) Since this was the first gemstone auction under a liberalized marketing arrangement; there was caution on both the buyers' and the sellers' parts in their approach to the auction.

2) Some producers did not accept the bids offered for their lots because of lack of exposure to current ruling market prices. These producers may have over-valued their products.

3) The best gemstones, especially emeralds, may not have been presented on the Auction Floor because producers were being overcautious, taking into account the high prices offered on the black market. Big producers boycotted the auction, perhaps because it was the first under the new marketing arrangement.

4) It was evident that there is a large demand for raw Zambian gemstones, but producers have to learn to present good quality gemstones and take advantage of this market demand.

The next auction will be planned and mounted by the new GCZ Board of Directors. Good faith efforts to resolve the problems identified at the first auction will be critical for ensuring availability of supply at the next one. It is hoped that the relationships developing between Zambian gemstone miners represented by the GCZ on the one hand, and the international buyers on the other, will evolve into one of mutual trust, enabling a free and open market in which both buyers and sellers can benefit from their individual efforts.

Note: Final dollar sales figures at the auction have not been officially released.



## Ruby Mining in the Morogoro Region

by Andrew PB Msolo

Gem ruby, a red variety of corundum, has of late become a very popular stone in Tanzania, surpassed only by diamond and Tanzanite. It is found in large quantities in areas of Mahenge and Matombo in the Morogoro region in Eastern Tanzania. Gem, semi-gem and cabochon are common terms used in this part of the country to refer to the quality, and hence marketability, of different types of ruby found in the area.

Two main types of this mineral occurrence exist in these areas: primary ore and alluvial deposits. Primary ruby occurs in lenses of calc-silicate rocks within crystalline limestone rocks of the basement system. (The basement system refers to a series of Precambrian rocks, locally known as usagaran rocks, comprised of crystalline limestones, marbles, and biotite and amphibolite gneisses.) Alluvial deposits account for the larger portion of generally known occurrences. Mahenge and Matombo are hilly, with numerous valleys. These valleys host hundreds of unskilled small scale miners, whose tools are mainly picks, shovels and hand-sieves. In some cases, foreigners are working in joint ventures with locals. Those operations are sometimes mechanized, principally using hydraulic mining methods.

The Small Scale Mining Policy of 1983 encourages the mass participation of Tanzanians in mining activities,

while at the same time not discouraging their traditional modes of livelihood. While emphasizing the improvement of prospecting and exploration technology as well as marketing skills, the Policy anticipates that mining activities would go hand in hand with other activities, such as farming. In general, this Policy focusses on the needs and concerns of the labour-intensive mining sector as opposed to capital-intensive, big scale mining industry.

Some problems currently being faced by the small miners include:

- 1) The remoteness of their workings from established transportation and infrastructural services;
- 2) Their lack of technical know-how. The small individual miners usually lack knowledge in areas basic to the mining industry, such as exploration, evaluation, development and marketing;
- 3) Lack of adequate health facilities;
- 4) Lack of financial resources.

The government has been, and still is, doing its best to help overcome these problems. For example, the Ministry of Water, Energy and Minerals maintains a data bank of mines and minerals, and provides information on various aspects of the

mining industry to the small miners.

The Government of Tanzania has also invited international involvement in the gemstone trade. As an incentive to foreign investors, gemstone exporters are allowed to retain 70% of their foreign exchange earnings in order to import necessary inputs for their mining activities, in accordance with government trade policy.

MOREMA (Morogoro Region Miners' Association) is a mineral dealers' association in the Morogoro region. Its main objective is to assist miners and promote mineral industry in the region. It also hopes to solve problems facing the miners. It serves as a link between local miners and FEMATA (Federation of Miners' Associations in Tanzania), the Ministry of Water, Energy and Minerals, and the Government of Tanzania. Another Association, TAMIDA (Tanzania Mineral Dealers' Association), is a body bringing together all the mineral traders in the country.

The mining industry, and especially the small scale mining industry, is healthy and growing. A good future is anticipated, provided the bodies involved in the mining sector put their effort and emphasis on improvement of methods and equipment for mining, and on international cooperation as far as investment is concerned.

## Legal Notes

by Joaquin Garcia Doltz

A new mining law was published in Ecuador on May 31, 1991 (Official Registry #695). Compared to the old law, the new law seeks to actively encourage foreign and national investment for the exploitation of Ecuador's mineral endowment.

The following are some of the highlights of the text of the new law.

° While affirming the State's dominion over the mines and mineral deposits, the law allows the State to delegate or authorize mining rights for the rational use of the resources by companies or individuals, Ecuadorean nationals or foreigners.

° The new law legitimizes the mining concession as a real property right, open to mortgage or transferable to a third party, and transmissible (i.e., it can be inherited).

° The State can reserve special mining zones, mining reserved areas and restricted zones where it will develop its own projects, respecting any pre-existing mining rights.

° The new law will consider any capable individual, national or foreign company as a potential recipient of mining rights, subject to the existing legal dispositions. Any individual who holds a public office is considered ineligible to receive a mining right.

° The various phases or stages of mining development are identified, including prospecting, exploration, exploitation, concentration, smelting, refining and trading.

° Various government entities are charged with formulating, carrying out and managing the public policy. The Ministerio de Energía y Minas (Ministry of Energy and Mines) and the Dirección Nacional de Minería - Servicio Técnico de Catastro Minero Nacional (National Bureau of Mining - Technical National Service of Mining Cadastral Survey) are in charge of implementation of the mining policy and law enforcement. The Corporación de Desarrollo e Investigación Geológica Minera (National

Development and Geological and Mining Research Corporation) is in charge of promoting the development of the mining industry.

° A fee schedule is established. The concessionaire must pay, in advance, the following annual patents:

PROSPECTING: Free;  
EXPLORATION: S/. 1,000 (one thousand Sucres) per hectare;  
EXPLOITATION: S/. 3,000 per hectare.

° Exploration permits are now valid for two years, with the possibility of a two-year extension. Exploitation permits are set at twenty years, with the possibility of being extended for an additional twenty years.

° The concessionaires must present, twice a year, a report of the work done and of any research carried out, including its results.

° Concentration plants, foundries and refineries can be built by the Concessionaire (holder of an Exploitation permit), or by any company or authorized individual.

° The holder of an Exploitation permit is free to trade his production nationally or internationally.

° The new law expects the holder of a

mining permit to assume responsibility for fairly compensating the workers, for maintaining safe and secure working conditions, for compensating land owners for damages due to beginning of mining works, for employing national personnel, and personnel training.

° The new law requires an environmental impact assessment and an environmental management programme, including water treatment, reforestation, waste storage, flora and fauna conservation, protection of the ecosystem among others.

° The relationship between permit holders and landowners is clarified, covering such matters as servitudes or agreements, rights of way to neighbours, damages due to water accumulation, use and modification of water courses, use of underground water, prohibition of interment.

° Mining rights can be prematurely cancelled as a result of the concessionaire's own renunciation or an unacceptable level of damage to the environment.

° The law establishes legal norms and compensation requirements for ceding and transfer, leasing, and irrevocable promises made with respect to mining rights. Standards are also set for mortgages, contract

mining and transitory associations.

#### What the law says about small mining

The law promotes the existence of mining consortiums, i.e. the assignment of mining rights to associations of several people. The law also takes into consideration the rights and obligations of the mining cooperatives, in which all members have equal rights. The cooperatives can sign contracts and develop associations with either individuals or companies, of both national and foreign origin. Artisanal mining, mining of construction materials and of salt deposits is also addressed.

The Dirección Nacional de Minería (National Bureau of Mining) and the Tribunal de lo Contencioso - Administrativo (Court of the Administrative - Contentious) are in charge of resolving any conflicts. All mining concessions must be legalized by a notary and then inscribed in the Property Register.

Now that the new Mining Law has been published, implementing Regulations remain to be issued, the institutions in charge of the mining activity have yet to be restructured, and the reaction of national and foreign investors is yet to be gauged.

Note: S/. 1,000 = US \$ 1.00.

## Zimbabwe —

### Legal Notes

by Jeffrey Davidson

On September 27, 1991, the Government of Zimbabwe published a new set of regulations on alluvial gold mining in public streams (Statutory Instrument 275 - Mining (Alluvial

Gold) (Public Streams) Regulations, 1991). These regulations are the culmination of a long process in which the Government evaluated the costs and benefits of allowing such

activities to continue. Legally, all land within 10 meters of a river bank is state property. However, since 1984, uncontrolled and illegal alluvial gold mining activity along a number of the country's major rivers and their tributaries (for example, the Mazowe River) has become a significant environmental and financial problem for the Government. As much as Z\$ 50 million worth of gold each year is estimated to have been mined and sold illegally. Damage to river beds and banks has been noted, and in some cases, deemed irreparable. Many injuries and deaths have been attributed to mining the alluvium at depth (5-8 meters) in unsupported pits and tunnels. At the same time, digging and panning activities may involve as many as 50,000 people, especially women and older men, providing critically needed cash supplements to rural family incomes.

Recognizing this reality, the new regulations attempt to establish a



Results of unsupervised mining of stream beds and banks, northeast Zimbabwe.



workable legal and institutional framework for mining gold along the country's public waterways, while at the same time minimizing environmental damage. The Government has chosen to do this by assigning prospecting and mining title, in the form of special grants, to those local councils in whose areas alluvial gold deposits have been identified. The grants will be specific to those segments of any public stream passing through a given council's area. It will then become the responsibility of the local council to divide up the stream(s) into permit areas of no greater than 50 metres length each. The council will then be able to issue mining permits to qualified individual applicants, who must be over the age of eighteen, of good character, and resident in the council area, or to registered cooperative societies, partnerships or other associations of persons, whose members must also conform to the same age, character and residency stipulations, as above. The purpose of the residency requirement is to reserve such mineral resources for the use of the local community - to provide it with a means by which to secure its own social and economic well-being. Consequently people who live outside the area are specifically excluded

from participation. All gold extracted from a permit area must be sold to the Reserve Bank or one of its licensed agents.

Under the regulations, local councils would be responsible for monitoring all workings under its aegis, for maintaining up to date registers of all permit holders and records of all gold production and sales from its grant areas, as well as for enforcing certain provisions of the regulations. In return, the local council would retain all permitting fees, and receive a 10% commission on all gold sales to the Reserve Bank or its licensed buyers.

The regulations also specify the conditions under which the working of alluvial gold deposits may proceed. For example mining operations are confined to the bed of a public stream, at least three meters distant from the lowest point of the stream's naturally defined banks. Mining of a river's banks is absolutely prohibited, and the distance between the workings and the banks can be increased at the discretion of the mines inspector in the interests of safety. With the objective of enhancing mine safety and minimizing environmental damage, the regulations also stipulate that workings are not

to exceed 1.5 meters in vertical depth, unless adequately terraced, sloped or otherwise supported. Undercutting of any workings is forbidden, as is the use of mechanical equipment for excavating in stream beds, unless specially approved by the mines inspectorate in consultation with both local and provincial government authorities.

Backfilling of mined areas must proceed as mining progresses along a permit area.

Such permits and mining operations may be cancelled and terminated by any one of a variety of government authorities should the permit holder be observed to be in non-compliance with any of the regulations. Similarly, special grants to local councils may be revoked should irregularities or breaches of the regulations occur.

Further information can be obtained from SMI or by directly contacting the office of:

The Minister of Mines  
Private Bag 7709  
Causeway  
Harare, Zimbabwe

Note: Z\$ 5.00 = US \$ 1.00.

## ***Bringing the market to the miners: some thoughts on the Zimbabwe situation from the President, Small-Scale Miners' Association***

In SMI Bulletin No. 1 (June 1989), John Spiropolous, then ITDG technical advisor to the Small-Scale Miners Association of Zimbabwe (SSMAZ), described the history and goals of the Association. In June 1991, SMI Managing Director Jeffrey Davidson was in Zimbabwe and visited SSMAZ's major project, the Shamva Mining Centre, a mining and processing service centre for district miners. At the time, a new mechanized ore crushing system was being installed and vat leaching facilities were being built. A new "captive" underground gold mine was being developed by the Centre, to provide a secure flow of ore to the new mill. The Centre's air compressor and drilling/blasting team were working on a contract basis for the owner of a small mine further north.

Mr. Davidson interviewed Mr. Giles Munyoro, elected President of SSMAZ, in Harare on June 19, 1991. Below are some of Mr. Munyoro's revealing, sometimes controversial comments on small-scale mining in Zimbabwe.

### On the Association's membership:

In all we have over 5,000 small-scale

miners, in two categories. We have the active miners, who remain on their mines and on their claims--nearly 1,600 at the moment. Then there is this group that is on and off, that is interested in going for agriculture when the rainy season comes.... They keep their claims going by keeping one or two boys to watch or dig. After the season, they come back to mine and sell their minerals.

I am finding that more and more, the people are now coming to this seriously, more interested in taking this on as a business.

### On training programs and seminars:

This year the British Geological Survey organized a number of workshops [on prospecting and mining practice for small-scale miners at the grass roots level] which we supported and which were well attended. We are in full support of these seminars and workshops.... But the problem we find ... is to get the follow-up, to see the people that were trained, how they are performing, and how to keep in touch.



**Mr. Giles Munyoro.**

### On government understaffing:

We have one government geologist working from Mutare to Victoria Falls--nearly 400 kilometres for one geologist. The government is overstretched. That is why we have been requesting assistance from outside. So that we can have more extension people to assist in the development of these mines, to give more training to our miners.

#### On access to information:

We have a mining news circular.... This we send every two months. But again, we should be able to make it larger and circulate it once every month, because the miner in the bush areas has no access to any other information. As it is, 1,000 copies of each issue are circulated. First we send to our paid-up members. The rest we send, a few each to certain areas where there is a concentration of miners and they can be shared. The circular publishes news in the three languages: Shona, Ndebele, and English, with a contribution from the Ministry of Mines or one of the government departments in every issue.

#### On SMI Bulletin:

It will surprise you to know that the three copies that you gave me last week have already been read by more than twenty people. They have been borrowed from our office every night. Now there is a future for this paper if I may say that. I read your article on legal codes. This information is very good. That's because it is giving us the information on what's going on--the laws, the legal aspects in other countries. I think from the information in this bulletin, there is much for Zimbabwe and there is much for my association.

#### On artisanal miners:

In Zimbabwe, we have small companies, syndicates, cooperatives and individual miners. Where you get individual families working in areas like the precious stones where a person fears the loss of stones and cannot trust another peasant to join him. And the rural folk on the river beds. We have over 70,000 of these peasant people on the river beds throughout the country. These are illegal miners. They sell their products, their gold or emeralds, illegally. They have no marketing place. Some have come to our Association very interested in getting licenses.

Since 1987, we have had continuous droughts in the country, ... and the peasants have nothing to eat, but in the areas where gold panning is active, the people there are happy. There are strong children, whose school fees are paid and who wear school uniforms. The teachers are happy; the businessmen also. Goods are being bought by people in these areas. But in the areas where there is no gold in the rivers, the people are really in bad shape.

#### On the legalization of alluvial gold mining:

We are saying to our government that

stopping the people from retrieving the gold from the river beds doesn't make sense.... We have been requesting the government to formalize this group of 70,000 peasant people and to buy their gold. Today they are selling gold illegally, but where is the market? Can the market go to the people? We are quite aware that the state is losing in the region of Z\$ 50 million a year--a lot of money by Zimbabwe standards.

#### On the silting of rivers:

Some are saying that the rivers are silting as a result of the panning. But we are saying that the farmers have cattle that go and drink from these rivers. They open up paths as they walk down to drink. When the heavy storms come in the rainy season, the topsoil is washed down into the rivers. This is what is causing the siltation. We, the miners, are only digging small holes.

#### In answer to a question about the use of mercury by illegal miners:

No, not at all. The gold that is recovered from the river beds is gold dust and stones. There is no way a miner would need to use mercury; they do not even know about it. But the miners that are working on the reefs and those that are working on the dykes, yes, they are using mercury.

#### On the problem of mining at depth:

What has happened is that the small-scale miner has had no chance of getting the equipment that he requires for actually mining underground: compressors, jackhammers, generators, water pumps, gears and winches. He is undercapitalized. Those that are now working on the shafts are those that have access to capital input.

#### On technology transfer:

What are industries in developed countries doing with their old, smaller equipment or technology that may still have a useful life, but does not interest them any more? What about sending them here?

I asked one of these companies once. They said to me, even if we gave it out, who could pay for the shipping to Zimbabwe? If the idea is promoted by the government to donor organizations, perhaps a fund could be set up, to get some of that equipment. If we were allowed to pay back the shipping costs long term, we could manage it.

#### On multinational mining companies and local prospectors:

You will find that most of the claims have been found by old people--miners

in the countryside. These old people are good prospectors. But when they discover a mine, they go to the big miner and tell that they have found a good reef. This multinational company will go there and look at it and say thank you very much. They give him nothing. . . . We have mines here that have been called by the gifts that have been given to the man who found the claim, like Blanket Mine. Meaning this old man was given a blanket for discovering the mine. So we look at the politics of prospecting and say, "In Zimbabwe, it is not fair." How about compensating a man like that? He finds these claims and what does he get? Nothing.

#### On the Shamva Centre:

In the long run the project is going to assist most of the small-scale miners in that area. It is difficult for small-scale miners to each have their own infrastructure, but a centre such as Shamva can provide milling, as well as training and assay lab services. The government assay department is eighty or ninety kilometres away. In time, the miners will be able to have their assays done at Shamva, mill their ore there, and pick up their gold to market, to bank. It is their centre; we have provided the centre for them. Eventually, the miners will be encouraged to buy shares in the centre.

We have also found that neighbouring countries are interested in Shamva. Several visiting delegations have told us that they are interested to see local people participating in small-scale mining. Multinational companies might be interested in working the big deposits. Now what about the smaller deposits which they have no interest in?

#### On new projects:

We are looking for projects that have something to do with rural development, like coal. There is a lot of deforestation in Zimbabwe, but Zimbabwe is sitting on coal. We only need to have the resource systematically appraised; then we should be able to have our small-scale miners mine the coal where it is found. Here too we need [appropriate] technology, because coal, at the moment, is unacceptable as fuel in homes in the rural areas. Also, coal could be used to fire bricks, strong durable bricks that could be used for better home construction.

For more information, please contact:  
Mr. Giles Munyoro  
SSMAZ  
P.O. Box 4380  
Harare  
ZIMBABWE

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# CALENDAR OF EVENTS

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March 18-21, 1992. The Third Asia/Pacific Mining Conference will be held in Manila, Philippines sponsored by the ASEAN Federation of Mining Associations and hosted by the Chamber of Mines of the Philippines. For more information contact The Conference Manager, 3rd Asia/Pacific Mining Conference, Cahners Exposition Group (S) Pte Ltd., 1 Maritime Square, #12-01, World Trade Centre, SINGAPORE 0409, Tel: (65) 271-1013, Telex: RS 39200, Fax: (65) 274-4666.

April 21-24, 1992. The conference Investing in the Americas (Invirtiendo en las Americas) will be held at the Hotel InterContinental in Miami, Florida, hosted by International Investment Conferences, Inc., and The Mining Journal Ltd. For further information, contact Investing in the Americas, 9100 S. Dadeland Blvd., Suite 702, Miami, Florida, USA 33156. Tel.: (305) 670-1963, Fax: (305) 573-3989.

May 12-16, 1992. Expomin '92--The Latin American Mining Exposition will be held on the premises of Feria Internacional de Santiago in CHILE. For details contact George L. Zanetakos, U.S. Department of Commerce, ITA/OGC, Rm. H.2107, Washington DC, 20230, U.S.A.; Fax: (202) 377-0552.

May 17-19, 1992. The 10th Industrial Minerals International Congress will be held in San Francisco, USA. For more information contact Joyce Griffiths (Editor), Industrial Minerals, 16 Lower Marsh, London SE1 7RJ, ENGLAND, Telex: 917706, Fax: (44) (71) 928 6539.

May 25-29, 1992. The 15th World Mining Congress will be held in Madrid, Spain. For information contact the Secretariat, 15th World Mining Congress, c/o Alenza, 1, 28003 Madrid, SPAIN, Tel.: (34) (1) 442 99 69.

June 1-12, 1992. The United Nations Conference on Environment and Development (UNCED) will be held in Rio de Janeiro, Brazil. For information contact Julie Hauser, National Secretariat UNCED '92, International Affairs Directorate, Environment Canada, Les Terraces de la Chaudière, 10 Wellington St., 4th Floor, Hull, QC., K1A 0H3, CANADA; Tel.: (819) 953 1420; Fax.: (819) 953 3557.

August 12-14, 1992. The International Symposium on Industrial Minerals and Coal Processing will be held at the Marina Mandarin Hotel, Singapore. For more information contact Dr. B.A. Wills, Camborne School of Mines, Cornwall, UNITED KINGDOM; Tel.: 0209 714866; Fax: 0209 716977.

September 20-27, 1992. Marble Machina: 30th International Exhibition on Marble, Stone, Granite, Machines and Equipment will be held in Verona, Italy. For more information contact Mr. Lucio Caputo, Verona Fairs Organization, New York, NY, USA 10048; Tel. (212) 775-1050; Fax: (212) 938-8317.

November 22-26, 1992. Stona 1992: 2nd International Granites and Stone Fair will be held at the Palace Grounds in Bangalore, India. For more information contact All India Stone Association, P.O. Box 5233, G.P.O. Bangalore, INDIA 560001.

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## CURRENT OPPORTUNITIES

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### Investment and Technical Assistance Opportunities

**Ghana.** Holder of a gold and diamond mining concession seeks investors for a 20 km<sup>2</sup> deposit with gold contents of 4-12 g per tonne. Prefeasibility study available. Total project cost: \$10 million; foreign investment required: \$8 million. Felix C. Nkuakotse, Exwafi Ltd., P.O. Box 641, Accra.

**Nigeria.** Entrepreneur seeks financial assistance to produce 300 tonnes of dry-sieve and wet-sieve refined kaolin per day. Deposit of crude kaolin, land, facilities and labour available. Patrick Adimefe, Lezzu International Limited, P.O. Box 2160, Ikeja Lagos. Telex: 20202 tds box 559 ikeja.

**Nigeria.** Mining company seeks joint-venture partners, plant and equipment know-how, training and financial assistance to mine and exploit local and export markets of gold, diamond, large quarry-stones and granite blocks, limestone, dolomite, kaolin, gypsum, scrap mica, bentonite, perlite and diatomite and baryte deposits. Mr. F.O.B. Abgeseyi, Chairman/C.E.O., Société Africaine pour l'Industrie et le Développement (Nigeria) Ltd., G.P.O. Box 639, Marina, Lagos.

**Tanzania.** Mineral prospector seeks foreign investor for the mining of small deposits of gold, ruby, tourmaline, emerald, amethyst and red garnet. Geological surveys and reports available. Isaack Mwakilima, Director, Ima Industrial Enterprises, P.O. Box 267, Mbeya. Telex: 51215 (cobtot).

Extracted from recent issues of the UNIDO newsletter.



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SMI is a non-profit organization dedicated to strengthening and supporting the small mining sector as an aide to rural development, social and economic, especially, but not exclusively, in developing countries.

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Contributions in English, French, and Spanish on all aspects relating to small-scale mining, including up-coming events and new publications, as well as, comments and suggestions are welcome.

Requests for information on membership and subscription requirements can be addressed to SMI's Managing Director at the above address.

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